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TSDQH2018-A



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工业机器人篇

INDUSTRIAL ROBOTS SERIES



让工业文明回归自然之美
Let Industrial Civilization Return To Natural Beauty



让工业文明回归自然之美 *Let Industrial Civilization Return To Natural Beauty*

作为中国整厂自动化第一品牌，拓斯达专注于高端智能装备，主张**让工业文明回归自然之美**的品牌价值，即随着技术不断进步与突破，用智能系统替代人工，开拓可替代的应用领域，推动产业进步助力企业发展，同时把制造业从劳动密集型带入完全的自动化，回归到自然，人性，和谐的状态。

As the top brand of complete factory automation in China, TOPSTAR focuses on high-end innovative equipment, proposes the brand value of **Let Industrial Civilization Return To Natural Beauty**. We initiate to replace labor with intelligent systems, expand replaceable application areas and promote industrial progress to help enterprise developing, transform labor intensive type to full automation and return to a natural, human-oriented and harmonious status.

新出现的文明与传统的旧工业文明有许多矛盾之处：它既有高度的科学技术，同时又是反工业化的。

摘自《第三次浪潮》
——阿尔文·托夫勒

Much in this emerging civilization contradicts the old traditional industrial civilization. It is, at one and the same time, highly technological and anti-industrial.

from TheThird Wave,
Alvin Toffler

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公司简介 Company profile

广东拓斯达科技股份有限公司是一家创业板上市的智能制造综合服务商（简称：拓斯达，股票代码：300607），专注于工业机器人为代表的智能装备的研发、制造、销售，致力于打造系统集成+本体制造+软件开发三位一体的工业机器人生态系统和整体自动化解决方案。

2007年成立以来，坚持“让工业文明回归自然之美”的品牌主张及“做一年回本的自动化”的核心价值理念，企业一直保持着高速增长的态势，2015年被国家工信部电子信息产业发展研究院评为“中国工业自动化领军企业”。主要客户包括世界500强企业在内的国内外知名企业近4千家，销售服务网络遍布全国，产品远销亚、美、欧、非等30多个国家。

2014年，被世界权威杂志《福布斯》评为“中国非上市潜力企业百强”第30名；2015年，被国际四大会计师事务所之一安永联合复旦大学评为“中国最具潜力企业”，同时荣获高新技术企业，广东省级企业技术中心、广东省高成长性中小企业，作为唯一一家机器人企业入选广东省制造业500强。2014、2015年度高工金球奖等多项荣誉。2016年被评定为广东省首批机器人骨干企业，多次受到省、国家部委、市领导高度评价。

拓斯达聚集了加拿大、韩国、台湾等全球顶尖研发人才，长期与清华大学、华中科技大学、华南理工大学、东莞理工、深圳大学等研究机构和知名高校开展了产学研合作。企业获得国家授权的发明及实用新型专利100项，软件著作权10项。具有完全自主知识产权的直角坐标机器人荣获广东名牌产品3个，广东高新技术产品5项，多项产品通过欧洲CE认证。

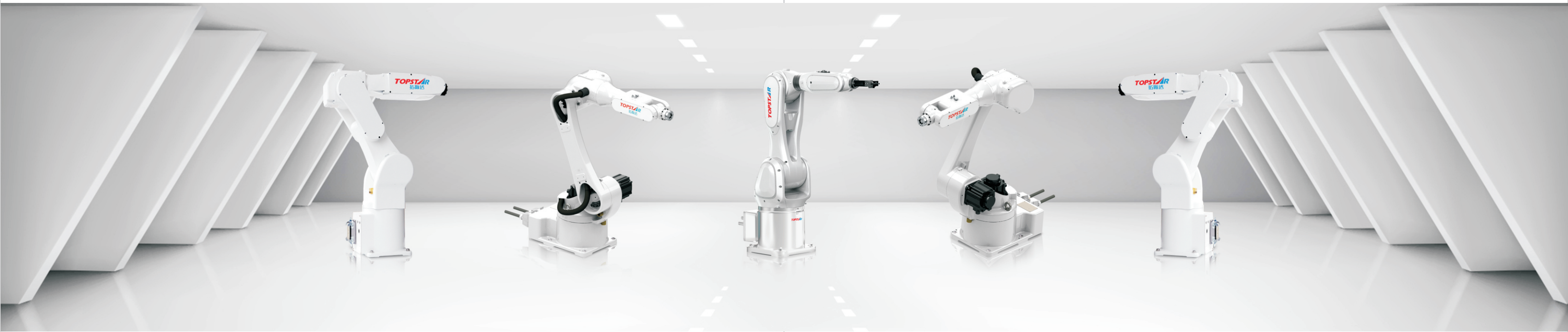
Guangdong Topstar Technology Co., Ltd. is a GEM listed intelligent manufacturing integrated service provider (Abbr. TOPSTAR, stock code: 300607), focusing on the R&D, manufacturing and sale of the industrial robots as the representative of intelligent equipment, dedicated to system integration, product manufacturing and software development--three in one integration of industrial robot ecosystem and turn-key automation solution.

Since the establishment in 2007, adhering to the brand advocate "Let Industrial Civilization Return To The Natural Beauty" and the core value "one year investment return for the automation solution", the business has maintained a rapid growth. In 2015, Topstar was assessed as "China Industrial Automation Leading Enterprise" by the State Ministry of Information Industry Development Institute. We have served about 4000 customers in domestic and oversea market, including well-known companies from Global 500. Now our sales and service network are all over the country in China and the products have been exported to more than 30 countries in Asia, America, Europe, Africa, etc.

In 2014, we were ranked on the 30th as "Potential 100 Non-Listed Chinese Enterprises" by Forbes. In 2015, we were assessed as "China's Most Potential Enterprise" by Ernst & Young with Fudan University, at the same time won the Guangdong Provincial-level Enterprise Technical Center, the Rapid Growth of Small&Medium Enterprises of Guangdong Province, and as the only one robot enterprise selected in Guangdong Province Manufacturing 500, honored "2014 and 2015 Annual Golden Globe" by GG Robots, etc. In 2016, was assessed as the first batch of robot key enterprises in Guangdong Province. Our enterprise is highly appreciated by national ministries, provincial and municipal leaders.

Topstar has recruited top R&D experts from Canada, Korea and Taiwan, and carried out long-term research cooperation with Tsinghua University, Huazhong University of Science and Technology, South China University of Technology, Dongguan Institute of Technology, Shenzhen University and other research institutions and well-known colleges. We have achieved 100 national patents and 10 software copyrights. Three kinds of Robots with independent intellectual property are named as Guangdong Provincial Famous Brand and five kinds of machines are named as Guangdong High-Tech Products. Many machines have been certified by CE.





智能制造综合服务商

广东省首个登陆创业板的机器人企业
 广东省首批机器人骨干企业
 首倡“做一年回本的自动化解决方案”服务理念
 也是中国“无人工厂”、“智慧工厂”“智能制造”的早期践行者
 多次获得“最具投资价值企业”、“最具成长性企业”等殊荣

Intelligent manufacturing integrated service providers

The first robot enterprise in Guangdong Province landed on the GEM.
 The first batch of robot backbone enterprise in Guangdong Province.
 Initiated a service philosophy of " To do automation solution which can back within one year" .
 It is also the pioneer of China's 'Unmanned Factory', 'Wisdom factory', 'Intelligent manufacturing'.
 Awarded with 'The Enterprise With the Best Investment Value','The Enterprise With the Most Growth' and many other honors.



拓斯达不是雇佣和解雇型企业，而是打造创业型平台，集众人之力，实现凭一己之力所无法达成目标的平台，其核心精神是‘分享’。

————— 《拓斯达宣言》

TOPSTAR is not a hiring or dismissal enterprise, but aim to create a business platform, which setting the power of everyone to achieve the goal which can not achieve by their own. Its core spirit is 'Share'.

《TOPSTAR'S Declaration》

企业文化

|| 公司宗旨

全心全意为客户服务。

|| 公司愿景

让工业文明回归自然之美。

|| 公司使命

聚焦全球制造业智能化需求，为客户提供有竞争力的智能制造解决方案与服务。

|| 公司定位

专注建立工业机器人、自动化解决方案生态圈的全球智能制造综合服务商。

|| 核心价值观

诚信 / 务实 / 专注 / 创新

|| 企业理念

共赢 / 分享 / 感恩

|| 企业精神

乐于拼搏，勇于进取

Company Culture

Company Purpose

Serve customers wholeheartedly.

Corporate Vision

Let the industrial civilization to regain nature beauty.

Corporate Mission

Focus on global manufacturing intelligence needs, providing a competitive manufacturing intelligence solutions and services to customers.

Corporate Positioning

Focus on the establishment of industrial robots, automated solutions for the ecological circle of intelligent manufacturing integrated service providers.

Core Values

Honesty / Pragmatic / Dedicated / Innovative

Corporate Philosophy

Win-win / Share / Gratitude

Entrepreneurial Spirit

Be happy to struggle and bold to make progress.

发展历程 Development History

2007 奇迹起点 横空出世

- 确立“打造世界一流品质”的企业和产品定位；
- 制订出行业第一个内部标准，细化每个制程，专注产品细节。
- 重新定义了行业最高端产品的标准。

2008 技术先行 迅速崛起

- 研发出新型节能三机一体，省电70%以上；
- 行业首创直接冷却160度水温机，降温速度缩短80%；
- 业绩保持50%以上的增速。

2009 抓住机遇 高歌猛进

- 成立拓斯达商学院；
- 成为海天注塑机合格配套供应商；市场成交客户量突破一千家；
- 二厂正式成立，钣金完全自制，产量再上新台阶。

2010 系统整合 整体输出

- 无锡分公司成立，设立上海、昆山、苏州等地办事处；
- 与清华大学强强联手，引入最先进的企业管理理念，成立拓斯达商学院；
- 成功并购机械手生产厂商，成为自动化系统输出全套产业链运营商，产能扩大5倍以上。

2011 众志成城 阔步前行

- 自主研发的三轴、五轴伺服机械手下线，通过客户验证并获得广泛好评；
- 建立整体设备维修外包规模60人以上的客服中心，提供全方位的维修外包服务；
- “华南塑料工业高端论坛”在商学院正式成立。

2012 立足国内 布局全球

- 外贸部成功打开东南亚、欧洲、南美洲等地市场；
- 市场部迈入正轨，覆盖全国；
- 与华南理工大学签署产学研合作协议；
- 获得国家高新技术企业称号。

2013 增资扩产 海纳百川

- 投资6亿扩产，建设国内最大的自动化制造基地，该项目被纳入东莞市重点建设项目；
- 成立浙江分公司；
- 机械手获得广东省名牌产品，多项产品通过CE认证；
- 面向全球引进人才，组建自动化项目部；
- 成功导入3D打印项目。

2014 成功上市 乘风破浪

- 被评定为“福布斯中国非上市潜力企业百强”，排第30名；
- 荣获高工机器人“全球奖”；
- 汽车领域专用大吨位牛头机成功下线应用于客户现场；
- 9月81亩地新厂区奠基开工，届时将成为华南最大的自动化生产基地；
- 12月成功在新三板挂牌上市（股票代码：831535）并实现同步定增，引入第二轮风投；
- 北京、武汉两大营销中心成立，并在全国各省市新设20多个办事处。

2015 布局深耕 逆势成长

- 申报创业板上市；被安永联合复旦评为“中国最具潜力企业”；
- 荣获4项高工机器人“全球奖”；
- 被工信部直属机构评选为“中国自动化领军企业”；
- 自动化行业首个在线平台“达云在线”上线运营，信息化建设高速前进；
- 与清华大学签订清大拓斯达机器人开发框架合作协议；

2016 合纵连横 打造生态

- 战略合作签约ABB，携手国际巨头，打造机器人生态圈；
- 本体TSR090-05成功上市；
- 被评为首批“广东省机器人骨干企业”；广东省机器人名牌产品；
- 确立四大事业部，商学院、机器人研究院，矩阵式组织架构；
- 创业板上市成功过会；

2017 研发生产 智能制造

- 登陆创业板，股票代码 300607；
- ABB亚洲价值服务商最具创新奖；
- 3项机器人自动化发明专利；

What we are proud of is
not just history.....

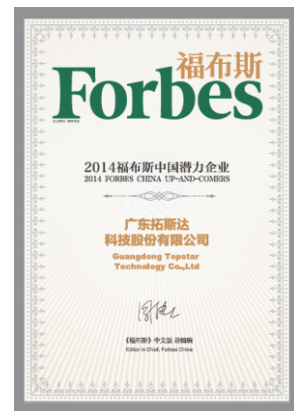
骄傲,不仅仅是历史.....

资质评定 Qualification evaluation

拓斯达坚持技术为王的经营理念，先后取得了各项高新技术企业的资质和认证，为客户提供最先进和高端的产品。
TOPSTAR adheres to the business philosophy, which puts technology in the dominant position. It has successively obtained many qualifications and certifications of high-tech enterprises, and provided the most advanced and high-end product to customers.



国家级高新技术企业认证
欧盟CE认证
ISO9001质量体系认证
广东省名牌机器人
广东省名牌机械手
机器人控制系统软件著作权5项
累计产品技术专利100项
广东省级企业技术中心
华南理工大学产学研合作基地
校企合作实践基地
.....



National high-tech enterprise certification
CE Certification
ISO9001 Quality System Certification
Guangdong Province Top Brand Robot
Guangdong Province Top Brand Manipulator

Five kinds of copyright in software of Robot control system
100 technology patents for products
Guangdong provincial enterprise technology center
South China University of Technology production and research cooperation base
School-enterprise cooperation practice base

行业影响 Development History

拓斯达致力于为客户打造健康机器人生态圈，提供有竞争力的自动化解决方案和服务。
与国内外知名企业保持良好的合作关系，更好服务行业发展和客户需求。

TOPSTAR committed to creating a healthy robot ecosystem for customers, provided competitive automation solutions and services. And it established a good working relationship with famous domestic and foreign enterprises, provided a better service for industry development and customer demand.



拓斯达六轴工业机器人

Topstar Six-Axis Industrial Robot

TSR090-05-A

TSR070-07-A

- ▶ 高速 /High speed
- ▶ 稳定性高 /High stability
- ▶ 软件运动控制技术
/Software motion control technology
- ▶ EtherCAT总线控制系统
/EtherCAT bus control system
- ▶ 高精度 /High precision
- ▶ 扩展性强 /Strong scalability
- ▶ 控制、视觉合二为一
/Combination of control and visual
- ▶ 简单的安装方式
/Simple installation



功能概览 Function Overview

作为拓斯达自主研发第一款6轴工业机器人，TSR090-05整机采用流线型设计，外观简洁美观。采用双臂对称结构，不易产生振动。四五六轴采用超薄型中空减速机传动，整体小巧，能够进入狭小空间作业。

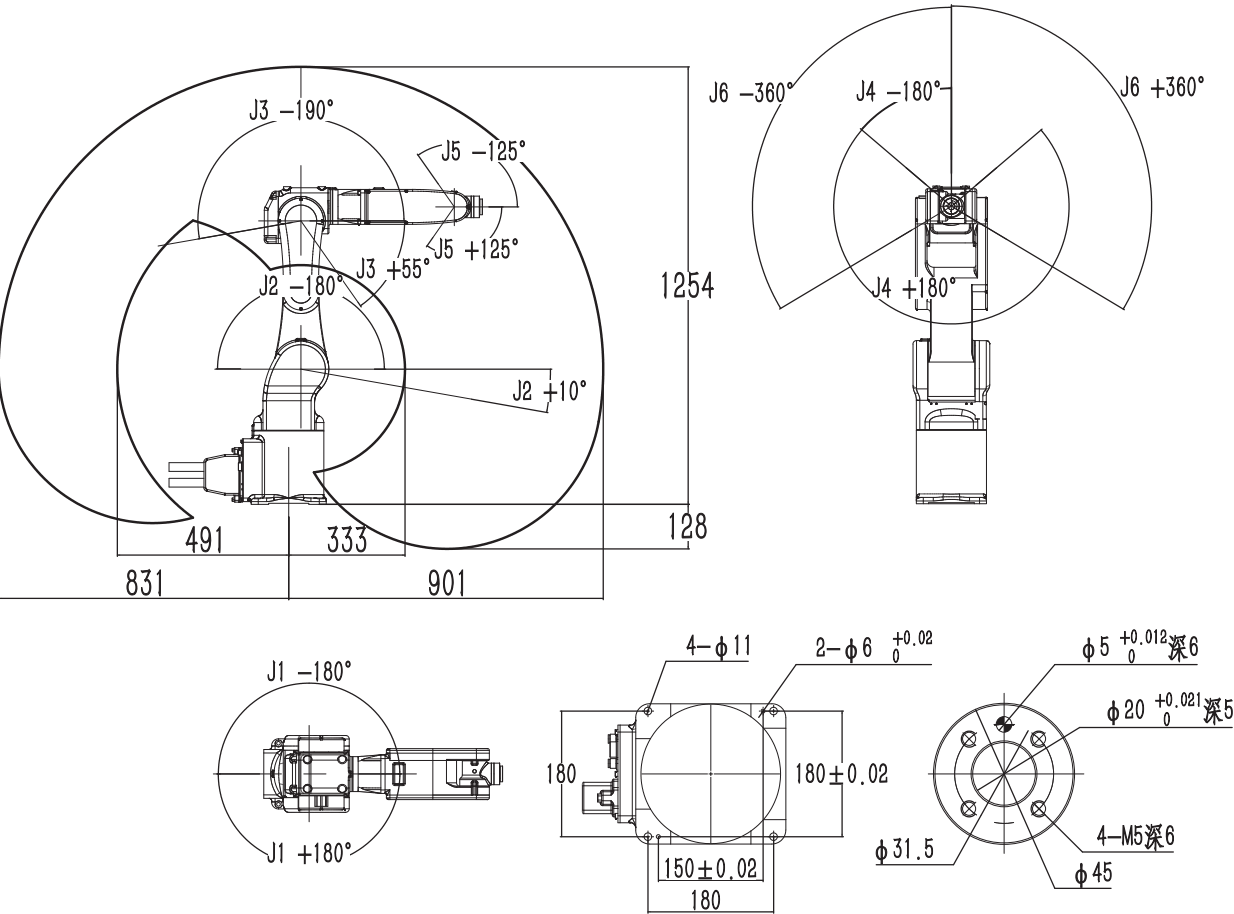
As the first 6-axis industrial robot which independently developed by TOPSTAR, TSR090-05 adopts the overall streamlined design, simple and beautiful appearance. Using symmetrical structure of arms, not easy to produce vibration. The fourth, fifth and sixth axis adopts ultra-thin hollow reducer driving, small and exquisite, making it able to work in a small space.

机器人参数表概览 Robot Parameter

机器人本体 Robot Body	机器人型号/Robot Model	TSR090-05-A
	手臂形式 /Arm Form	垂直多关节 /Vertical Multi-joint
	动作自由度 /Freedom of Movement	6轴 /6 Axis
	额定负载 /Payload	5kg
	重复定位精度 /Repeat Positioning Accuracy	±0.03mm
	最大覆盖范围 / Maximum Stroke	900mm
	本体重量 / Body Weight	40kg
	安装方式 / Installation Method	任意角度 /Any Angle
	IP等级 / IP Level	IP54



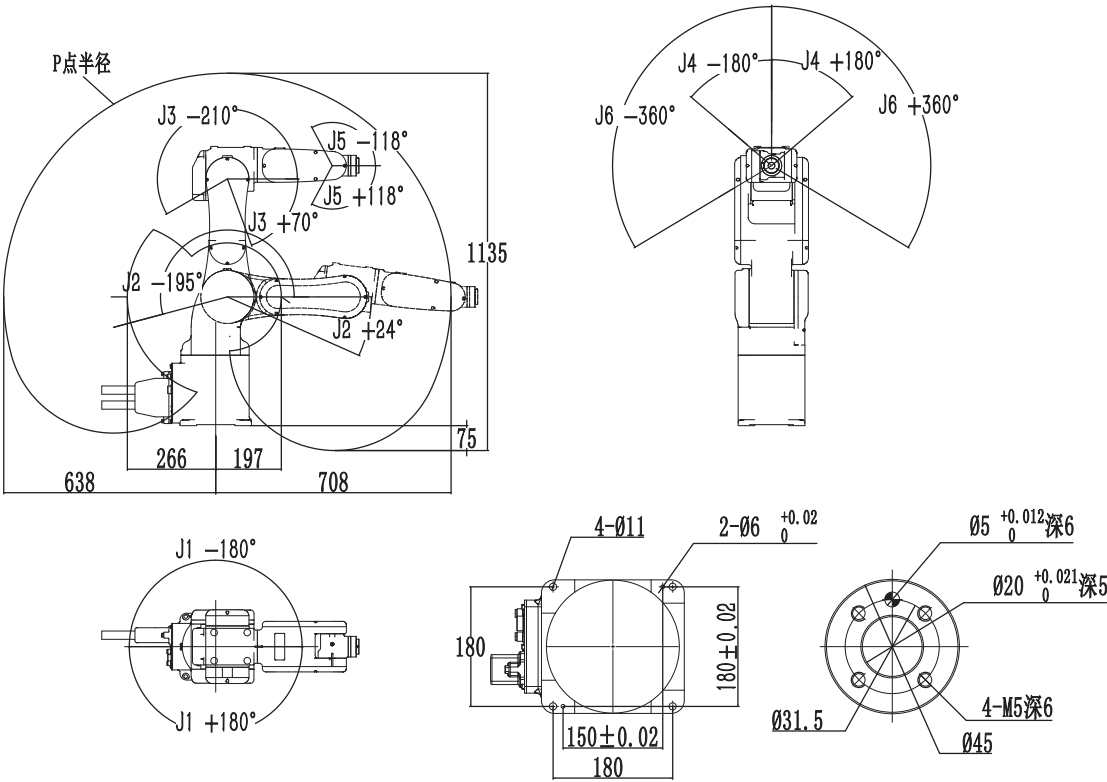
工作空间、固定尺寸概览 Work Space, Fixed Size Overview



机器人参数表概览 Robot Parameter

机器人本体 Robot Body	机器人型号/Robot Model	TSR070-07-A
	手臂形式/Arm Form	垂直多关节/Vertical Multi-joint
	动作自由度/Freedom of Movement	6轴/6 Axis
	额定负载/Payload	7kg
	重复定位精度/Repeat Positioning Accuracy	±0.03mm
	最大覆盖范围/Maximum Stroke	710mm
	本体重量/Body Weight	38kg
	安装方式/Installation Method	任意角度/Any Angle
	IP等级/IP Level	IP54

工作空间、固定尺寸概览 Work Space, Fixed Size Overview



拓斯达六轴工业机器人

Topstar Six-Axis Industrial Robot

TSR140-10-A

TSR170-20-A

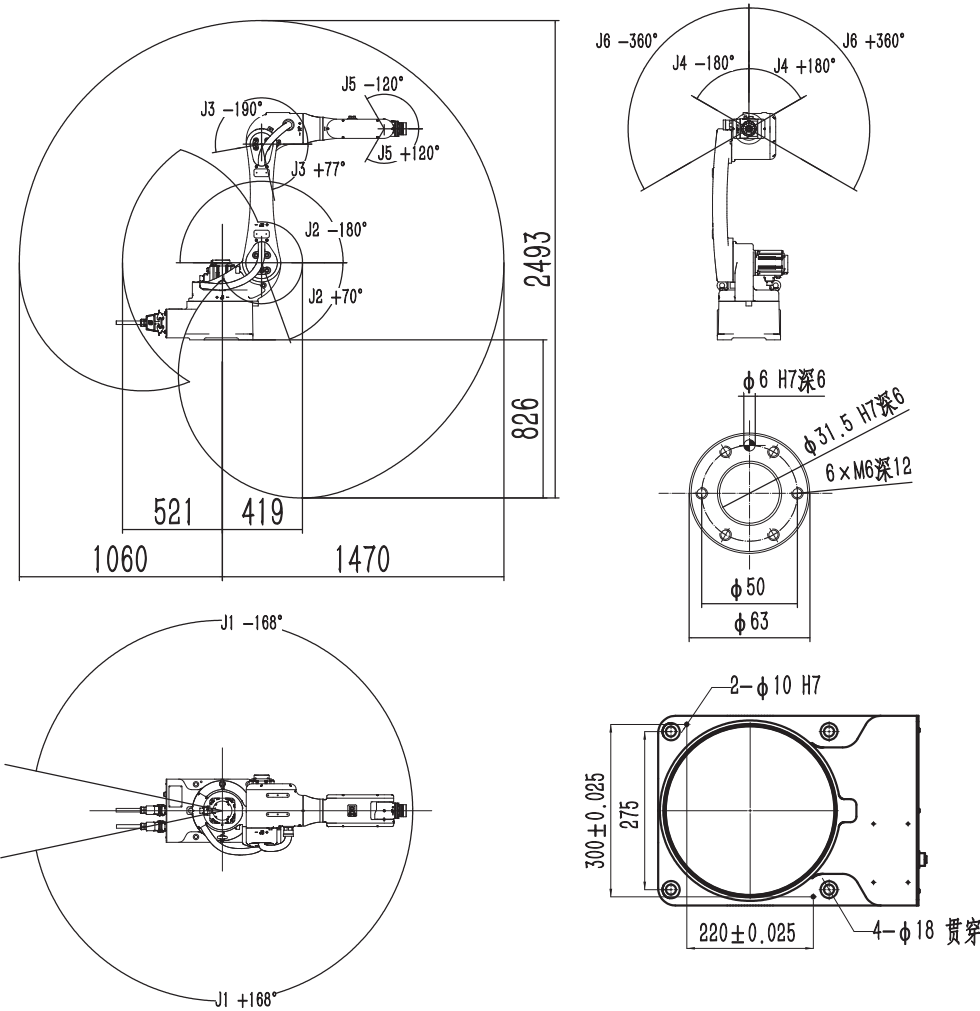
- ▶ 高速 / High speed
- ▶ 稳定性高 / High stability
- ▶ 软件运动控制技术
/Software motion control technology
- ▶ EtherCAT总线控制系统
/EtherCAT bus control system
- ▶ 高精度 / High precision
- ▶ 扩展性强 / Strong scalability
- ▶ 控制、视觉合二为一
/Combination of control and visual
- ▶ 简单的安装方式
/Simple installation



机器人参数表概览 Robot Parameter

机器人本体 Robot Body	机器人型号/Robot Model	TSR140-10-A
	手臂形式 /Arm Form	垂直多关节 /Vertical Multi-joint
	动作自由度 /Freedom of Movement	6轴 /6 Axis
	额定负载 /Payload	10kg
	重复定位精度 /Repeat Positioning Accuracy	±0.05mm
	最大覆盖范围 / Maximum Stroke	1470mm
	本体重量 / Body Weight	170kg
	安装方式 / Installation Method	地面安装 /Ground -mounting
	IP等级 / IP Level	IP54

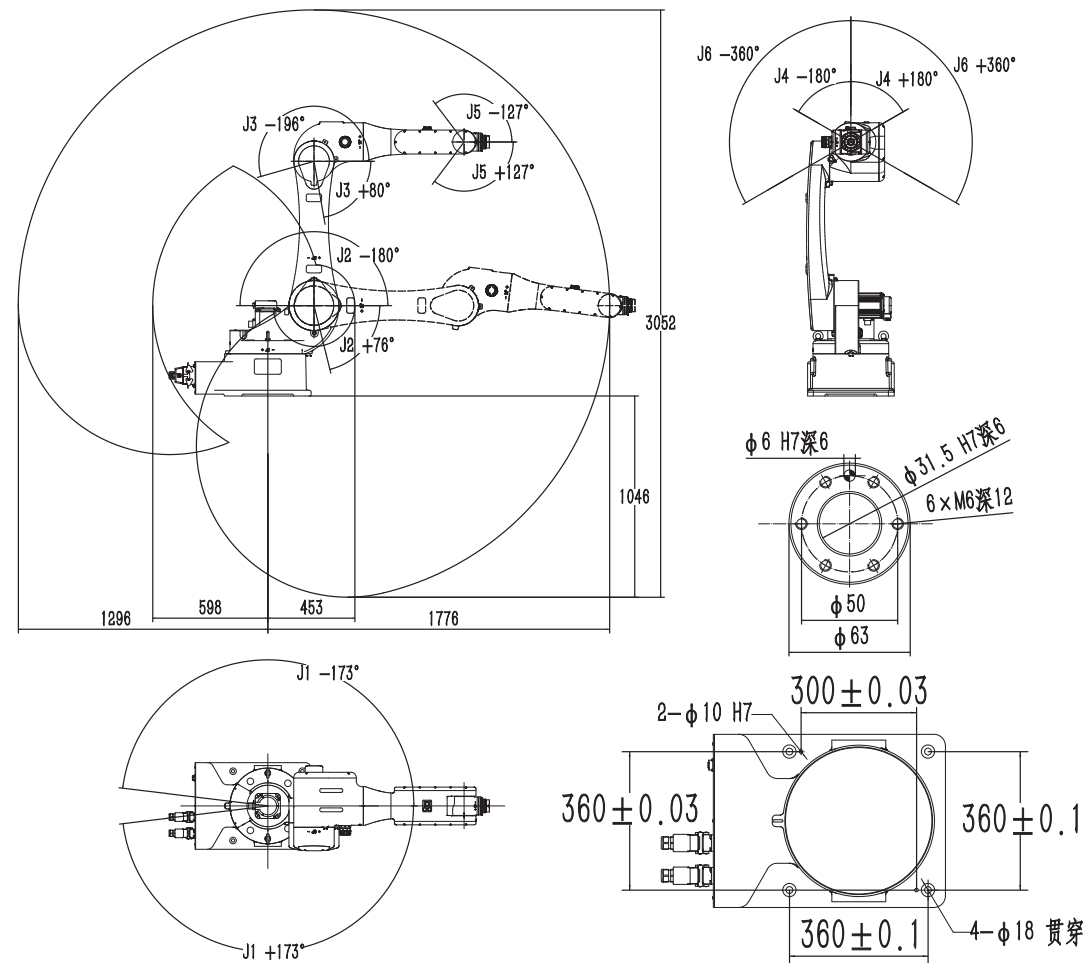
工作空间、固定尺寸概览 Work Space, Fixed Size Overview



机器人参数表概览 Robot Parameter

机器人本体 Robot Body	机器人型号/Robot Model	TSR170-20-A
	手臂形式/Arm Form	垂直多关节/Vertical Multi-joint
	动作自由度/Freedom of Movement	6轴/6 Axis
	额定负载/Payload	20kg
	重复定位精度/Repeat Positioning Accuracy	±0.05mm
	最大覆盖范围/Maximum Stroke	1776mm
	本体重量/Body Weight	270kg
	安装方式/Installation Method	地面安装/Ground-mounting
	IP等级/IP Level	IP54

工作空间、固定尺寸概览 Work Space, Fixed Size Overview



拓斯达四轴工业机器人

Topstar Four-Axis Industrial Robot

TS650-03-A

TS450-01-A

- ▶ 高速 /High speed
- ▶ 稳定性高 /High stability
- ▶ 软件运动控制技术
/Software motion control technology
- ▶ EtherCAT总线控制系统
/EtherCAT bus control system
- ▶ 高精度 /High precision
- ▶ 扩展性强 /Strong scalability
- ▶ 控制、视觉合二为一
/Combination of control and visual
- ▶ 简单的安装方式
/Simple installation



系统硬件 Hardware system

机器人系统部件概览 Overview of robot system components



控制柜 Control cabinet

EtherCAT总线控制技术 EtherCAT bus control technique

使用EtherCAT总线作为整个系统的通信线路，具有高稳定性、高传送速度、接线方便、扩展简单。
Use the EtherCAT bus as the communication line for the entire system, with high stability, high transmission speed, easy wiring, easy expansion.

WINDOWS实时内核 WINDOWS real-time kernel

PC机+实时内核+软体控制技术，保证了运行的平稳性和兼容性，节约了40%成本。
PC + real-time kernel + software control technology to ensure the smooth operation and compatibility, save 40% on costs.

强大的仿真功能 Powerful simulation capabilities

实时在线仿真和离线编程仿真功能，为现场作业提供保障，提高编程效率50%，降低作业过程故障率。（国产机器人控制系统独有）
Real-time online simulation and off-line programming simulation function, to provide protection for field operations, improve programming efficiency by 50%, reduce the failure rate of the operation process. (Domestic robot control system unique)

软体运动控制内核 Software motion control kernel

完全自主研发机器人运动控制算法，核心技术自己掌握，为持续保证市场的竞争力提供保障，不受第三方牵制，无任何硬件成本。
Fully independent research and development of robot motion control algorithms, to master the core technology, to ensure the continued competitiveness of the market without any hardware costs.



示教器 Controller

针对机器人的伺服控制技术 Focus on robot servo control technology

自助研发的伺服驱动控制技术，针对机器人运动特点进行全面优化，保证了良好的软性和刚性，运动过程更加平稳可靠。
Self-developed servo drive control technology, fully optimized for the robot movement characteristics to ensure good softness and rigidity, the movement process is more stable and reliable.

软PLC功能 Soft PLC function

与运动控制插补内核无缝对接，可接管逻辑及变量计算功能，使机器人具有更强的可靠性和操作性能。
Seamless connection with the motion control interpolation kernel, can take over logic and variable calculation function, to make the robot has more reliability and operational performance.

丰富的外设功能 Rich peripheral functions

支持工作空间、网络通信、软体（按钮）解刹、全触摸屏控制、IO扩展自动配置、示教绝对移动、GPS定位、实时状态追踪显示功能。
Support work space, network communications, software (button) brake, full touch screen control, IO expansion of automatic configuration, teaching absolute movement, GPS positioning, real-time status tracking display.

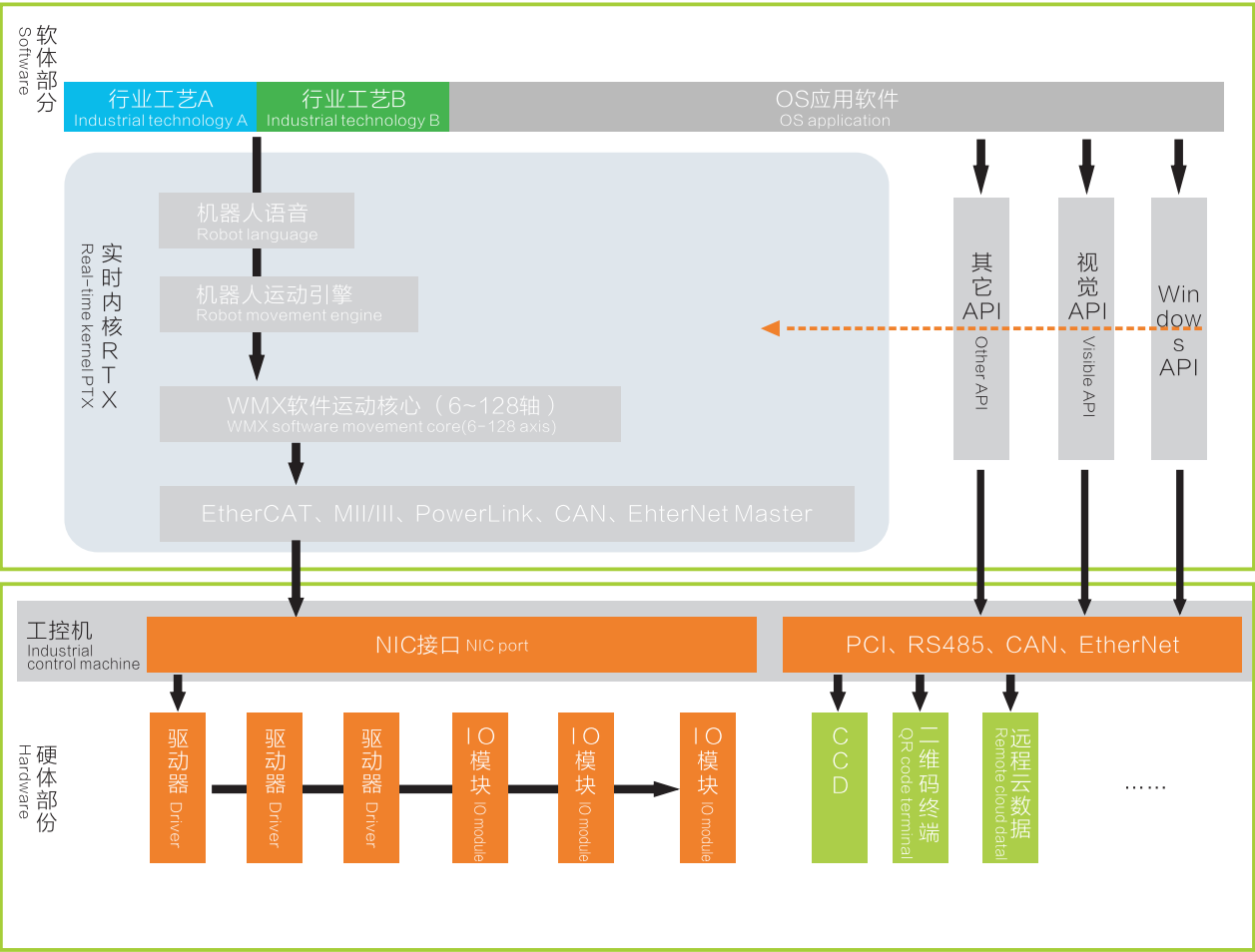
硬件结构 Hardware structure

控制柜系统结构图概览 Overview of control cabinet structure



内核体系 Kernel system

多关节机器人内核体系架构概览 Overview of Multi-Joint Robot Kernel Architecture



视觉系统 Visual System

机器人视觉系统特性概览 Overview of robot vision system features

- ◆ 模块化操作步骤，快速配置视觉系统。
Modular operation, quickly configuration.
- ◆ 丰富的图像处理工具箱，可满足绝大部分工业应用。
Multi-function image processing toolbox, can meet most of the industrial applications.
- ◆ 亚像素级别检测识别精度算法。
Sub-pixel level detection recognize accuracy algorithm.
- ◆ 灵活的通信方式，包括TCP/IP通信和RS232通信。
Flexible communication method, include TCP/IP and RS232.
- ◆ 高精度机器人手眼标定方法。
High precision robot hand-eye calibration method.
- ◆ 高精度在线识别定位与缺陷检测，为客户提供更低的使用成本和更高的投资回报。
High-precision online identification and defect detection, to provide customers with lower operating costs and higher return on investment.
- ◆ 稳定高效，可7×24小时不间断工作。
Stable and efficient, Can work 7x24 hours without interruption.

用户开发界面概览 User development interface

- ◆ 模块化操作，无需编程，极大地降低了开发难度，提高开发效率。
Modular operation without programming, greatly reducing the difficulty of development, improve development efficiency.
- ◆ 视觉处理软件友好，易操作。
Interface friendly, easy to operate.
- ◆ 丰富的图像处理工具箱，可满足绝大部分工业应用。
Multi-function image processing toolbox, can meet most of the industrial applications.
- ◆ 强大的底层算法，响应快，准确率高。
Powerful underlying algorithm with fast response and high accuracy.



行业应用 Industry applications

<1> 读码 Scan Code

- ◆应用场景：能广泛应用于流水线、仓储中心、中转站和集散中心等场合。
Application scenario:Can be widely used in assembly lines, storage centers, transit stations and distribution centers and other occasions.
- ◆降低成本：有效替代劳动力，提高生产效率。
Reduce costs: an effective alternative to labor, improve production efficiency.
- ◆强大稳定的算法平台：可24h不间断稳定工作，识别率高。
Strong and stable algorithm platform:24h uninterrupted stable work, high recognition rate.
- ◆一维码/二维码多种符码识别与产品分类：通过视觉识别产品上贴装的符码信息，机器人自动将产品归类放置。
One-dimensional code / QR code a variety of code identification and product categories: By visually identifying the product code on the mount information, the robot automatically placed the product classified.



二维码
QR code



一维码
One-dimensional code



解决方案 Solutions:

物流感知系统 Logistics awareness system:

- ◆采用固定式扫描方式，实现对包装上数字码信息的采集、识别、管理与分析等功能，大幅度提升条码的处理速度和准确率。
Adopt the fixed scanning mode to realize the functions of collecting, identifying, managing and analyzing the digital code information on the package, greatly improving the processing speed and accuracy of the barcode.

系统概述 System overview :

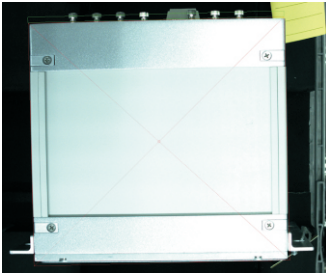
- ◆系统由物流感知系统、传输系统及后端系统组成。
The system consists of logistics awareness system, transmission system and back-end system.
- ◆物流感知系统：包括触发单元，读码和图像采集单元。可按照通讯协议需求输出标准的编码格式，并根据用户需求增加扩展模块。
Logistics awareness system: Includes trigger unit, code scanner and image acquisition unit. Could output standard encoding format according to communication protocol requirements, and according to user needs increase expansion module..
- ◆传输系统：使用工业交换机根据现场情况进行合理匹配，保障数据稳定高效传输。
Transmission system: use industrial switches according to the scene to conduct a reasonable match, to ensure stable and efficient data transmission.
- ◆后端系统：包括第三方处理软件，机器装置和声光报警等，主要进行读码后的数据管理与结果反馈。
Back-end system: including third-party processing software, machine equipment and sound and light alarm, mainly responsible for data management and feedback after scanning.

<2> 定位引导 Location guide

- ◆强大的算法可对箱体进行快速定位，引导机器人抓取并放置于指定位置，广泛适用于目标工件的抓取放置，自动码垛卸垛。
Powerful algorithm for rapid positioning of the box, guide the robot to grab and placed in the designated location, widely applicable to the capture of the target position, automatic stacking and unstacking.



现场图
Site picture



算法处理效果
Algorithm processing effect

解决方案 Solutions:

- ◆高精度定位及机器人引导：视觉定位引导系统能快速准确地识别出物体特征，机器人控制系统通过逆运动学求解得到机器人各关节位置的误差，最后控制高精度的末端执行机构，调整机器人的位姿。
High-precision positioning and robot guidance:Visual positioning and guidance system can quickly and accurately identify the object characteristics. The robot control system obtains the position error of each robot through inverse kinematics, and finally controls the high-precision end effector to adjust the posture of the robot.
- ◆应用场景：元件定位 机器人引导
Application scenario: Component positioning robot guidance.

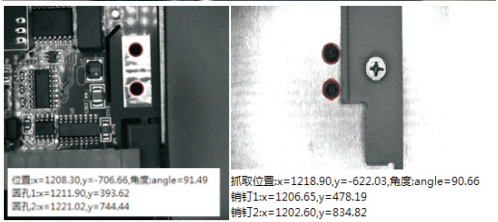
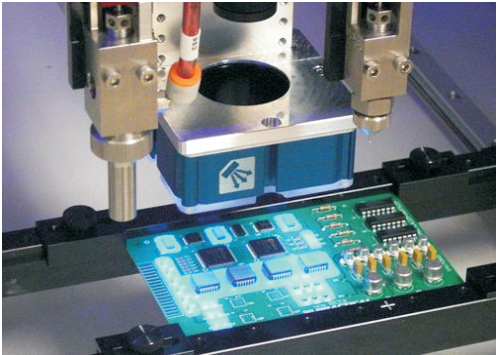
应用案例 Applications case:

- ◆手机导光板定位引导系统：系统采用高分辨率工业相机与自主研发的工业平台，一次拍照即可获得工件的坐标信息和旋转角度信息，降低组装线对料盘和载具的精度需求，提高手机组装的自动化水平，提高生产效率。
Mobile phone guide plate positioning system:The system uses high-resolution industrial cameras and independent research and development industrial platform, can get the workpiece coordinate information and rotation angle information by once picturing, reduced accuracy requirements that assembly line to tray and carrier, improve the automation level of the mobile phone assembly and improve the production efficiency.
- ◆手机充电插孔定位系统：在手机充电插孔进行塑料内边的加工中，USB孔的定位信息的精确性会直接影响整个加工精度，传统的探针探测方式定位精度不够，同时定位速度慢，移动时间长，且需要直接接触产品，容易破坏产品外观。
Phone charging jack positioning system:When adding the plastic inside into the phone charging jack, the accuracy of the positioning information of the USB hole will directly affect the processing accuracy. The traditional method probe detection positioning accuracy is not enough, slow positioning speed, long moving time, direct contact with the product, easy to damage the appearance of the product.

系统采用自主研发的算法平台，快速得到充电插孔的位置和旋转角度信息，同时避免对产品的直接接触，提高整个生产线的稳定性。
The system uses self-developed algorithm platform, quickly get the location of the charging jack and rotation angle information, while avoiding direct contact with the product, improve the stability of the entire production line.

- ◆PCB板定位系统：定位系统通过视觉识别生产线上PCB指定特征，确定抓取位置，并引导机器人抓取PCB，放置到相应位置。相对于传统人工检测方式，PCB板定位系统可有效提高效率，降低成本，杜绝漏检错检。
PCB board positioning system: The positioning system through visual to identify the designated features of PCB in the production line, confirm the capture position, and guide the robot to capture the PCB, placed in the appropriate location. Relative to the traditional manual detection methods, PCB board positioning system can effectively improve efficiency, reduce costs and eliminate missed detection.

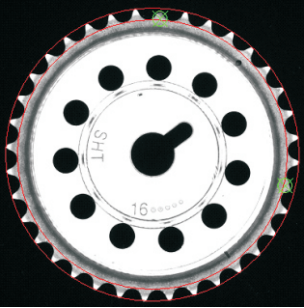
- ◆系统特点：定位速度快，定位误差小；System Features:
结构简单，易于安装调试；Positioning speed, small positioning error;
可7×24h稳定工作，满足工业生产需求；Simple structure, easy to install and debug;
采用主流通信协议TCP进行通信；7×24h stable work to meet the needs of industrial production;
环境适应力强，可在相对恶劣的环境中工作。Environmental adaptability, can work in a relatively harsh environment.



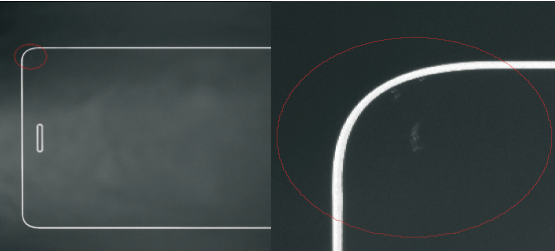
<3> 视觉检测 Visual inspection

- ◆ **主要应用:** 齿轮缺陷检测，包括缺齿，破齿等。
Main application Gear defect detection, including missing teeth, broken teeth and so on.
- 玻璃缺陷检测，包括玻璃表面划痕、凸凹包等。
Glass defects detection, including scratches on the glass surface, convex bump and so on.
- PCB缺陷检测，包括PCB线路短路、断路、凸铜、凹铜等。
PCB defect detection, including PCB circuit short circuit, open circuit, convex copper, concave copper and so on.

◆ **应用实例:**
Applications case:



破齿检测
Broken tooth detection



玻璃划痕检测
Glass scratch detection



PCB断路检测
PCB open circuit detection

检测系统强大的视觉算法，可以检测出微小的、人工容易忽略的缺陷，提高合格率的同时可大幅降低平均成本，并且还可以进行在线检测，优化生产工艺，提高生产效率。

The powerful visual algorithm of the inspection system can detect tiny, easily overlooked defects, improve the pass rate and reduce the average cost significantly, and also can perform on-line inspection, optimize the production process and improve the production efficiency.

光源配件 Light accessories

<1>wordop光源 Wordop light source

光源的选择是为了将被测物体与背景尽量明显分别，获得高品质、高对比度的图像。而光源的正确选择，直接影响系统的成败，处理精度和速度。

The light source is used to distinguish the object from the background, to get high quality, high contrast images. The correct choice of light source, directly affect the success or failure of the system, processing accuracy and speed.

光源选择标准The standard of choose the light source:

1.寿命：光源一般需要持续使用，为保持图像一致的精确性，视觉系统必须保证长时间获得稳定一致的图像。

1.Lifespan: The light source generally needs to be used continuously. In order to maintain the consistent accurate images, the visual system must ensure a stable and consistent image for a long time.

2.对比度：光源的主要任务是使需要被观察的特征与需要被忽略的特征之间产生强烈的对比度，从而易于区分特征。

2.Contrast: The main task of a light source is to create a strong contrast between the features that need to be observed and those that need to be ignored, making it easy to distinguish features.

3.光谱特性：光源的颜色及测量物体表面的颜色决定了反射到相机的光能大小及波长。

3.Spectrum characteristics: The color of the light source and the color of the surface of the object are measured to determine the amount of light energy and the wavelength of light reflected to the camera.

4.亮度：若光源亮度不够，可能出现以下几种不好的情况。首先，相机的信噪比不够，同时导致对比度不够，这样在图像上出现噪声的可能性也随之增大；亮度不够，势必要加大相机光圈，导致景深减小；最后，亮度不够时，自然光等随机光对系统的影响会增大。

4.Brightness: If the light source brightness is not enough, there may be the following kinds of bad situation. First, the camera's noise reduction ratio is not enough, while not enough contrast, so the possibility of noise in the image also increases; brightness is not enough, it is bound to increase the camera aperture, resulting in reduced depth of field; Finally, when the brightness is not enough, the impact by natural light and other random light on the system will increase.

5.光源均匀性：不均匀的光会造成不均匀的反射。均匀性关系到三个方面。

5.Light source uniformity: Uneven light can cause uneven reflection. Uniformity relates to the following three aspects:

①对于视野，在摄像头视野范围部分应该是均匀的。简单的说，图像中暗的区域就是缺少反射光，而亮点就是此处反射太强了。

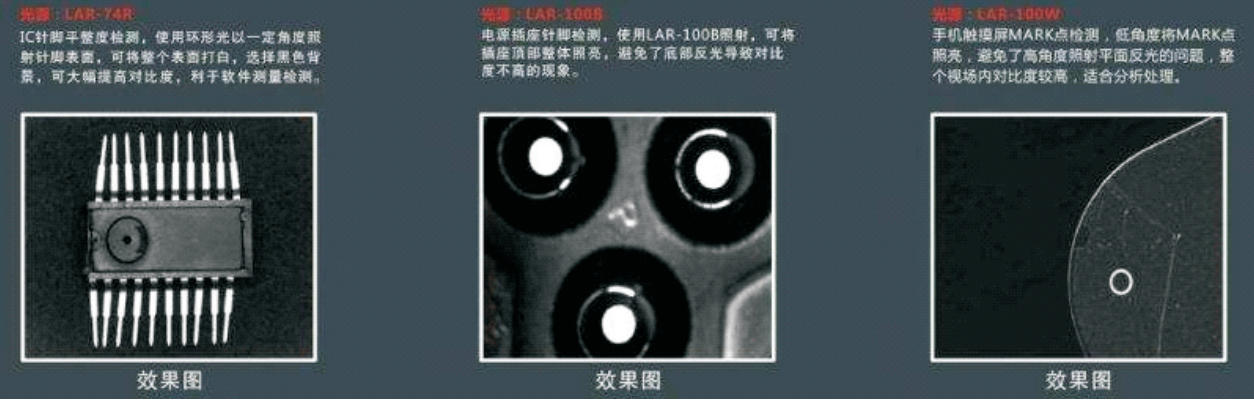
① For the field of view, the field of view of the camera should be uniform. In short, the dark area in the image is the lack of reflected light, and the bright spot is that the reflection is too strong here.

②不均匀的光会使视野范围内部分区域的光比其他区域多，从而造成物体表面反射不均匀（假设物体表面的对光的反射是相同的）。

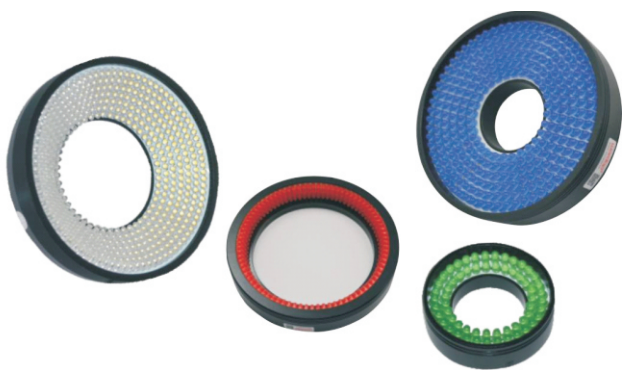
② Uneven light will make the part of light in the vision field more than other regions. Resulting in uneven reflection on the surface of the object (assuming that the reflection of light on the surface of the object is the same).

③均匀的光源会补偿物体表面的角度变化，即使物体表面的几何形状不同，光源在各部分的反射也是均匀的。

③ Uniform light source will compensate for changes in the angle of the object surface, even if the geometry of the surface of the object is different, the light source in all parts of the reflection is uniform.



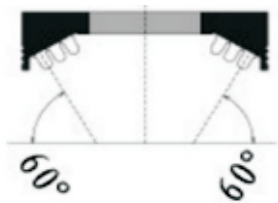
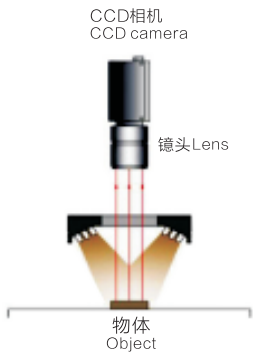
<2>高角度环形光源 High-angle ring light



- ◆ 高密度LED阵列，亮度高
High-density LED array, high brightness;
- ◆ 选配漫射板，增加光源均匀性
Optional diffuser to increase light uniformity.

技术指标 Technical indicators

光源颜色（波长） Light color (wavelength)	红色Red: 620-630nm	绿色Green: 520-530nm	蓝色Blue: 460-475nm
	白色色温White color temperature: 6000-7500K	红外Infrared: 850/940nm	紫外UV: 365/385nm
使用环境（室内）Environment (indoor)	温度: 0-40℃，湿度: 20%-85%非凝结 / Temperature: 0-40 ℃, humidity: 20% -85% non-condensing		
使用寿命 Service life	白色: 3万小时，红色: 6万小时（据使用环境寿命不同，非保证值） White: 30,000 hours, red: 60,000 hours (according to the use of different environmental life, non-guaranteed value)		
配套控制器 Supporting controller	PS1/PS2模拟控制器，PD2数字控制器，PBT2增量模块 PS 1 / PS2 analog controller, PD2 digital controller, PBT2 incremental module		
选配件 Optional accessories	1.漫射板、偏振膜 / Diffuser, polarizing film		
	2.光源与镜头连接环 / Light source and lens connecting ring		
	3.延长线: 1m/2m/3m/5m / Extension cable: 1m / 2m / 3m / 5m		



角度*1指光线与水平面的夹角
HDR系列环光角度计算示意图
Angle * 1 refers to the angle between the light and the horizontal plane
HDR series ring light angle calculation diagram

应用范围 Applications:

- PCB基板检测
PCB board detection
- IC元件检测
IC component detection
- 显微镜照明
Microscope detection
- 通用外观检测
Universal appearance detection
- 塑胶容器检测
Plastic container detection
- 集成电路印字检测
Integrated circuit printing detection

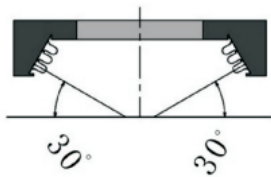
<3>低角度环形光源 Low-angle ring light



- ◆ 可根据发光角度定制光源
Light source can be customized according to the lighting angle
- ◆ 高密度LED阵列，高亮度
High-density LED array, high brightness
- ◆ 紧凑设计，节省安装控件
Compact design, saving installation controls
- ◆ 突破波峰焊接工艺，有效提高产品品质
Breakthrough wave soldering process, effectively improve product quality
- ◆ 及生产效率
And production efficiency

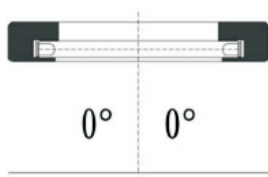
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	白色色温White color temperature: 6000-7500K	红外Infrared: 850/940nm	紫外UV: 365/385nm
使用环境（室内）Environment (indoor)	温度: 0-40℃，湿度: 20%-85%非凝结 / Temperature: 0-40 ℃, humidity: 20% -85% non-condensing		
使用寿命 Service life	白色: 3万小时，红色: 6万小时（据使用环境寿命不同，非保证值） White: 30,000 hours, red: 60,000 hours (according to the use of different environmental life, non-guaranteed value)		
配套控制器 Supporting controller	PS1/PS2模拟控制器，PD2数字控制器，PBT2增量模块 PS 1 / PS2 analog controller, PD2 digital controller, PBT2 incremental module		
选配件 Optional accessories	1.转接块 / Transfer block		
	2.连接环 / Connecting ring		
	3.延长线: 1m/2m/3m/5m / Extension cable: 1m / 2m / 3m / 5m		



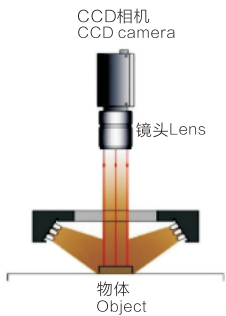
LAR环光系列角度计算示意图
(*1角度指光线与水平面的夹角)

HDR ring light series angle calculation diagram
(Angle * 1 refers to the angle between the light and the horizontal plane)



LAR1环光系列角度计算示意图
(*1角度指光线与水平面的夹角)

HDR ring light series angle calculation diagram
(Angle * 1 refers to the angle between the light and the horizontal plane)

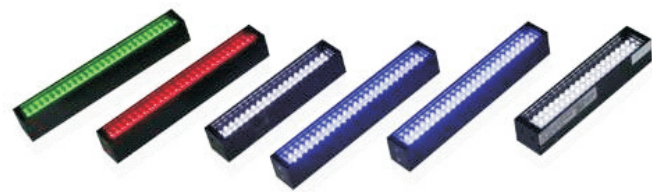


照明结构图
Lighting structure diagram

应用范围 Applications:

- PCB基板检测
PCB board detection
- IC元件检测
IC component detection
- 显微镜照明
Microscope detection
- 通用外观检测
Universal appearance detection
- 塑胶容器检测
Plastic container detection
- 集成电路印字检测
Integrated circuit printing detection

<4>条形光源 Bar light



技术指标 Technical indicators

型号代码 Model code:

HDL	-	119	X	16	R
型号 Model		发光长度 Luminous length		发光宽度 Luminous width	颜色 Color

HDL	-	146	X	30	R	-	WD
型号 Model		发光长度 Luminous length		发光宽度 Luminous width	颜色 Color		宽角度 Wide angle

- ◆ 高密度贴片LED, 高均匀, 高密度;
High-density SMD LED, high uniformity, high density;
- ◆ 采用特殊光学透镜, 有效改变LED照射角;
Using special optical lens, effectively changing the LED irradiation angle;
- ◆ 采用标准模具成型、拼接安装, 结构稳定;
Using standard mold forming, splicing installation, structural stability;
- ◆ 可选配漫射板导光, 光线更均匀;
Optional diffuser light guide, more uniform light;
- ◆ 尺寸、颜色可根据实际要求定制。
Size, color can be customized according to actual requirements.

应用范围 Application range:

- 电子元件识别与检测
Electronic components identification and detection
- 家用电器外壳检测
Household appliances shell detection
- 灯箱照明
Light box lighting

- 服装纺织
Clothing and textiles
- 圆柱表面缺陷检测
Cylindrical surface defect detection
- 替代荧光灯
Replace fluorescent light

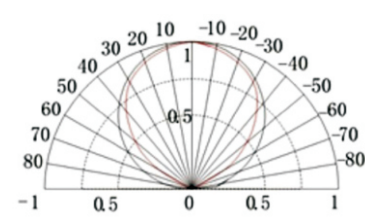
- 印刷品质质量检测
Print quality detection
- 食品包装检测
Food packaging detection



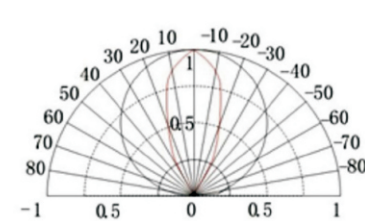
凹镜发光面放大照片
Concave lens shiny surface enlarge photo



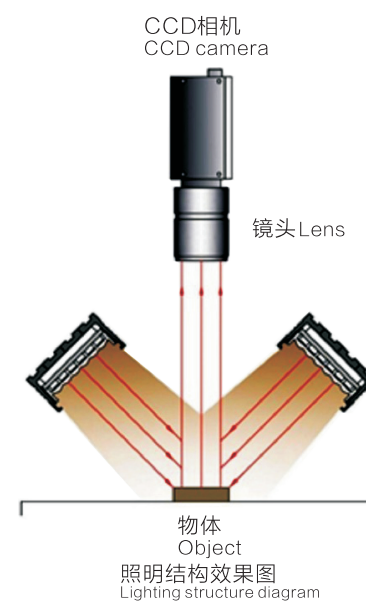
凸镜发光面放大照片
Convex lens shiny surface enlarge photos



条光发光角度示意图 (凹镜)
Beam angle Schematic (concave lens)



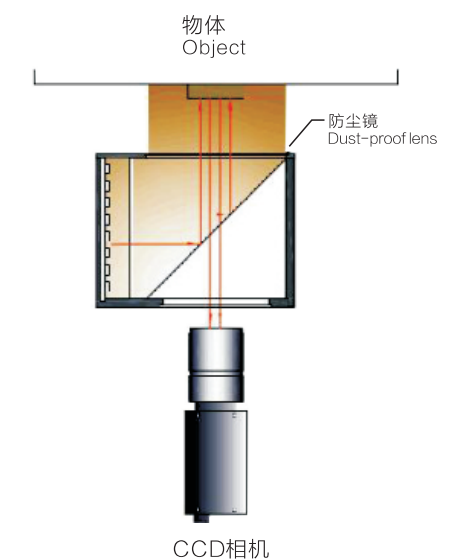
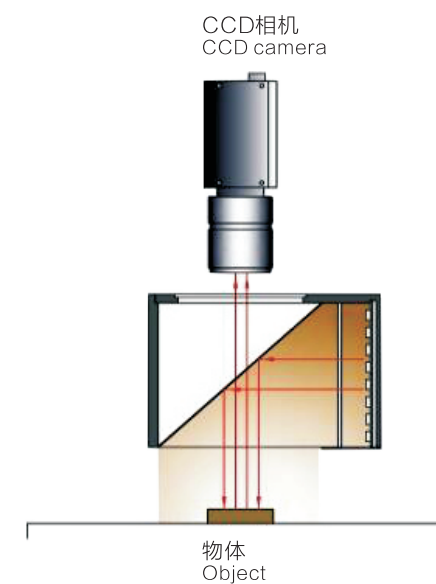
条光发光角度示意图 (凸镜)
Beam angle Schematic (Convex lens)



<5>同轴光源 Coaxial light source



- ◆ 锐利度更高、宽度更大;
Higher sharpness and wider width;
- ◆ 灵活的安装方式, 插件贴片灯珠共用结构;
Flexible installation, plug-in SMD lamp beads shared structure;
- ◆ 件出线方式更加牢靠, 耐折弯;
Wiring method more solid, bending resistant;
- ◆ COSQ系列外形紧凑设计, 节省安装空间。
COSQ series compact shape design, saving installation space.



<6>Basler相机 Basler camera



参 数Parameters	型 号Model	acA640-750uc	acA1300-200um	acA1920-25uc	acA640-300gc	ac1920-25gm	acA2500-20gm	acA2040-180kc	acA2000-340kc
色彩 Color		彩色 Color	黑白 Black and white	彩色 Color	彩色 Color	黑白 Black and white	黑白 Black and white	彩色 Color	彩色 Color
分辨率 Resolution		640*480	1280*1024	1920*1080	640*480	1920*1080	2590*2048	2046*2046	2046*1086
快门类型 Shutter type		全局 Global	全局 Global	卷帘 Roller shutter	全局 Global	卷帘 Roller shutter	全局 Global	全局 Global	全局 Global
帧率 Frame rate		751fps	203fps	25fps	376fps	25fps	21fps	180fps	340fps
接口 Interface		USB3.0	USB3.0	USB3.0	GigE	GigE	GigE	Camera link	Camera link
镜头接口 Lens interface		C-mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount
功耗 Power consumption		2.8w	3w	2.2w	3.5w	2.2w	3.2w	3.0w	3.0w
像素位深 Pixel deep		10bits	10bits	12bits	10bits	12bits	10bits	8,10,12bits	8,10,12bits
外壳温度 Crust temperature		0~50℃	0℃~50℃	0℃~50℃	0℃~50℃	0℃~50℃	0℃~50℃	0~50℃	0~50℃
感光芯片 Photosensitive chip		PYTHON 300	PYTHON1300	MT9P031	PYTHON 300	MT9P031	PYTHON 5000	CMV4000	CMV2000
芯片类型 Chip type		CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOSIS	CMOSIS
芯片尺寸 Chip size		3.07mm x 2.30mm	6.14mm x 4.92mm	4.22mm x 2.38mm	3.07mm x 2.30mm	4.22mm x 2.38mm	12.44mm x 9.83mm	11.26mm x 11.26mm	11.26x5.98mm
相机尺寸 Camera size (L*W*H)mm		29.3x29.0 x 29.0	29.3 x 29.0 x 29.0	29.3 x 29.0 x 29.0	42.0 x 29.0 x 29.0	42.0 x 29.0 x 29.0	42.0 x 29.0 x 29	43.5 x 29.0 x 29.0	43.5 x 29.0 x 29.0
相机重量 Camera weight		80g	80g	80g	90g	90g	90g	96g	96g
输出格式 Output format		Bayer BG 8, Bayer BG 10, Bayer BG 10 Packed	Mono 8, Mono 10, Mono 10 Packed	Mono 8, YCbCr422_8, Bayer GB 8, Bayer GB 12, Bayer GB 12 Packed	Mono 8, Bayer BG 8, Bayer BG 10, Bayer BG 10 Packed, YUV 4:2:2 Packed, YUV 4:2:2 (YUYV) Packed	Mono 8, Mono 12, Mono 12 Packed, YUV 4:2:2 Packed, YUV 4:2:2 (YUYV) Packed	Mono 8, Mono 10, Mono 10 Packed		

<7>大恒相机 IMAVISION Camera



参 数Parameters	型 号Model	色彩 Color	分辨率 Resolution	帧率 Frame rate	接口 Interface	传感器 Sensor	像素尺寸 (μm*μm)	工作温度 Operating temperature	重量 Weight	机械尺寸 Mechanical dimensions	镜头接口 Lens interface
MER-031-860U3M/C		黑白/彩色 Black and white/color	640*480	860fps		PYTHON 300	4.8*4.8				
MER-230-168U3M/C		黑白/彩色 Black and white/color	1920*1200	168fps	USB3.0	IMX174	5.86*5.85		57g	29mm*29mm*29mm	
MER-1810-21U3C		彩色 Color	4912*3684	21fps		AR1820	1.25*1.25				
MER-031-300GM/C-P		黑白/彩色 Black and white/color	640*480	120fps		PYTHON 300	4.8*4.8				
MER-133-54GM/C-P		黑白/彩色 Black and white/color	1280*960	54fps	GigE PoE	AR0135	3.75*3.75	0℃~45℃	75g	29mm*29mm*38.3mm	
MER-1520-7GC-P		彩色 Color	4608*3288	7fps		MT9F002	1.4*1.4				
MER-031-300GM/C		黑白/彩色 Black and white/color	640*480	300fps		PYTHON 300	4.8*4.8				
MER-231-41GM/C		黑白/彩色 Black and white/color	1920*1200	41fps	GigE	IMX249	5.86*5.86		60g	29mm*29mm*29mm	C(标准) Standard/CS(定制) Customized
MER-1520-7GC		彩色 Color	4608*3288	7fps		MT9F002	1.4*1.4				
DH-SV401FM		黑白 Black and white	780*582	50fps		ICX415	8.3*8.3				
DH-SV1411FC		彩色 Color	1392*1040	15fps	IEEE 1394	ICX285	6.45*6.45	0℃~50℃	350g ±5	44mm*65mm*65mm	
DH-SV2001FC		彩色 Color	1628*1236	14fps		ICX274	4.4*4.4				
MER-030-120UM		黑白 Black and white	656*492	120fps		ICX618	5.6*5.6				
MER-130-30UM		黑白 Black and white	1280*1024	30fps	Mini USB 2.0	行曝光CMOS	5.2*5.2	0℃~60℃	41g	29mm*29mm*29mm	
MER-500-7UM		彩色 Color	2592*1944	7fps		行曝光CMOS	2.2*2.2				

<8>控制器 Controller



处理器 Processor	Intel i5 3317U双核22nm处理器1.8GHz TDP 17w / Intel i5 3317U Dual-core 22nm processor1.8GHz TDP 17w			
芯片组 Chip Set	Intel NM70高速芯片组 / Intel NM70 express chip set.			
内存 Ram	4GB DDR3			
显示 Display	集成Intel HD4000核心显卡，提供VGA，LVDS，HDMI显示输出，LVDS支持双通道24bits，支持单独显示，双显复制，双显扩展 Integrated Intel HD4000 core graphics, providing VGA, LVDS, HDMI display output, LVDS supports dual-channel 24bits, stand-alone display, dual display replication, dual significant expansion			
网络 The Internet	集成双Intel 82583v千兆网卡，支持网络唤醒，PXE功能 / Integrated dual Intel 82583v Gigabit Ethernet, Wake on LAN, PXE function.			
音频 Audio	集成ALC662 6声道高保真音频控制器，支持MIC，Line_out / Integrated ALC662 6-channel high-fidelity audio controller with MIC, Line_out			
扩展总线 Expansion Bus	提供1个MPCIE插槽，支持WIFI，USB WIFI，3G模块，1个MSATA插槽，支持WIFI，USB WIFI，SSD固态硬盘 Provide 1 MPCIE slot, support WIFI, USB WIFI, 3G module, 1 MSATA slot, support for WIFI, USB WIFI, SSD solid state drive			
存储功能 Storage Function	提供1个SATA II硬盘接口，传输速度可达3Gbps / Provide a SATA II hard drive interface, transfer speeds up to 3Gbps			
背板I/O接口 Backplane I/O interface	接口 Interface	数量Quantity	接口 Interface	数量Quantity
	USB 2.0	2	12V DC_JACK输入 / 12V DC_JACK input	1
	HDMI接口 / HDMI interface	1	POWER（前面板）/ POWER (front panel)	1
	VGA接口 / VGA interface	1	RESET（前面板）/ RESET (front panel)	1
	RJ-45网络接口 / RJ-45 network interface	2	LED1（前面板）/ LED1 (front panel)	1
	Line out（绿色）/ Line out (green)	1		
内置I/O接口 Backplane I/O interface	接口 Interface	数量Quantity	接口Interface	数量Quantity
	LVDS接口2*15pin / LVDS interface 2 * 15pin	1	AUDIO插针 前置音频接口 / AUDIO pin front audio connector	1
	JVGA1接口 2*15pin与DB15相同信号 JVGA1 interface 2 * 15pin and DB15 the same signal	1	SIMM卡座 / SIMM deck	1
	RS232串口，其中COM2支持485/422 Rs232 serial port, among them COM2 supports 485/422	6	FPI（2*5pin前面板功能按钮和指示灯接口） FPI (2 * 5pin front panel function buttons and indicator interface)	1
	JLPC插针 2*6pin / JLPC pin 2 * 6pin	1	JSATA2插针1*5pin / JSATA2 pin 1 * 5pin	2
	USB 2.0接口 / USB 2.0 interface	4	PWR0UT（硬盘供电接口） PWR0UT (hard disk power supply interface)	1
	PS/2鼠标键盘接口 1*6pin PS / 2 mouse and keyboard interface 1 * 6pin	1	LVDS INVERTER（背光供电接口） LVDS INVERTER (backlight power supply interface)	1
GPIO	4路输入输出 / 4 input and output			
散热系统 Cooling System	1*CPUFAN 4pin和1*SYSFAN 3pin / 1 * CPUFAN 4pin and 1 * SYSFAN 3pin			
BIOS	AMI 32MB Flash ROM			
Watchdog	支持硬件复位功能 / Support hardware reset function			
电源 power supply	DC_12V单电源供电 / DC_12V single power supply			
尺寸、环境 Size, environment	主板尺寸 / Motherboard size	148mm*102mm	工作湿度/Working humidity	5~90%相对湿度，无冷凝 5 ~ 90% relative humidity, no condensation
	工作温度 / Working temperature	-20℃~70℃	储存温度/Storage temperature	-40℃~80℃

案例应用 Case application

拓斯达机器人案例 Topstar Robot case



客户服务篇

Chapter of Service

主动服务理念
Serve customers wholeheartedly.



试机现场
Test machine site



坚持自有品牌，自主研发路线。

专业的研发团队：在系统规划、机械设计、电路控制、程序开发、软件测试方面均配有专业团队，专职从事相关工作。

严苛的制造工艺：激光切割，CNC精密零件加工中心，采用先进涂装工艺，标准化的组装流程。

Stick to our own brand and independently research and develop routes.

Professional R&D teams: professional teams dedicated to system planning, mechanical design, circuit control, program development and software test have been allocated to engage in relevant work in a full-time manner.

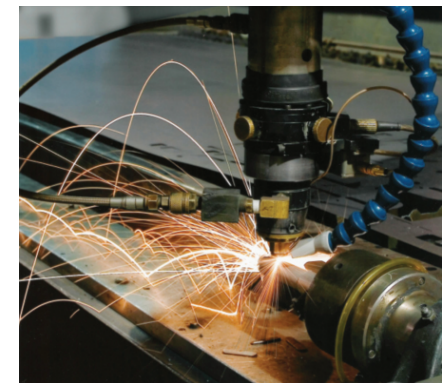
Rigorous manufacture process: advanced coating process and standardized assembly flow are adopted for laser cutting and CNC precision part machining center.



加工现场 Processing Site

采用国际先进的数控冲床，数控折弯机、剪板机及车、铣床，确保加工工艺的精确优良及品质稳定。

International advanced CNC pressing machine, bender, steel plate shearer, lathe and milling machine are adopted to guarantee precise and stable quality of machining process.





售后服务 After-Sale Service

对于传统设备供应商将重点放在业务推销和质量管控而言，对于售后服务的重视是拓斯达公司深入人心的又一大亮点。

我们率先提出了“主动服务”的概念。

不再满足于被动维修的快捷，我们专门设立了售后服务电话回访制度，对售后服务的满意度全程追踪，同时我们建立了季度巡检和年度检修制度。主动帮助客户保养设备并找出需要改善的方面，然后协同研发部找出对策，使产品不断趋于完善。

Traditional equipment suppliers will place their focus on business promotion and quality management and control. However, TOPSTAR attaches much importance to after-sales services, which is another highlight for the company to win public support.

We have initially proposed the concept of “Active Service”.

We are no longer satisfied about the quickness of passive repair. Therefore, we have specifically established an after-sales service telephone return visit system to conduct full-journey tracking of the satisfaction of after-sales services. Meanwhile, we have established a quarterly routing inspection and annual overhaul system to initiatively help customers maintain the equipment and find places to improve. Then, we coordinate with R&D department to find relevant countermeasures to continuously perfect the products.

衷心感谢 Sincerely Appreciate



比亚迪



海尔



美的



康佳



TCL



五菱



劲胜



欣旺达



捷普绿点



安费诺



莫仕



长盈精密



裕同



精研



铭祥汽车



正崴



立讯



兴科集团



华众



长城汽车



伯恩光学



台达



超过4000家客户鉴证并长期支持
Over 4000 customers have witnessed TOPSTAR growth and long supports

全球服务网点 Global Service Net

