TROY INTELLIGENT

PRODUCT

产品手册



CONTACT US

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- 模块化
  Modularization
- 快部署
  Quick deployment
- 易操作
  Easy operation

ROBOT



PRODUCT VISION
产品愿景

协作机器人将延伸您的时间和空间，解放繁杂的低效重复，让您的双手和大脑拥抱更广袤的天际。未来，您将见证我们的协作机器人**与众协同。**
随着它的出现，不仅提高了人机协作的效率，也加快了更多企业自动化进程，对许多制造商来说，它还节省了空间，降低了部署机器人产线的成本。

Collaborative robots will extend your time and space, liberate complex and inefficient repetition, and let you embrace a wider horizon.In the future, You will see **ROBOTS**.
With its emergence, it not only improves the efficiency of human-machine collaboration, but also speeds up the automation process for more enterprises and frees floor space and lowers the cost of implementing robots for manufacturers.

PRODUCT DISPLAY
产品展示



TR3MT　TR3　TR5　TR10　TR16　TR20　TR30

TR SERIES

系列排布

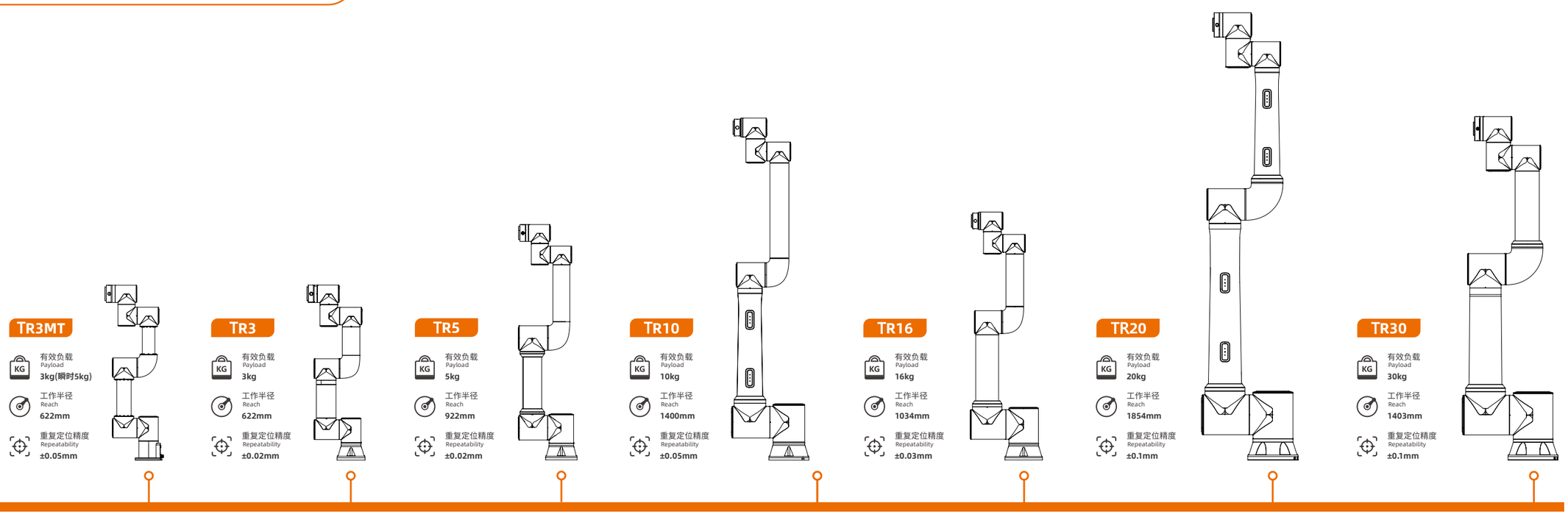
根据不同的负载能力和参数范围，协作机器人产品TR系列拥有六个型号：
TR3、TR5、TR10、TR16、TR20和TR30。
法奥通过国际权威机构已获取更全产品认证，为伙伴以及客户提供更优品质保障。

协作机器人FR系列产品生产通过了ISO 9001质量管理体系认证产品
认证：CR, CE, KCs, NRTL, RoHS 2.0, NSF, SEMI, IP65
ISO功能安全认证：ISO 10218, ISO 13849, ISO 15066

According to different payload and parameter, collaborative robots TR series are divided into six models: TR3, TR5, TR10, TR16, TR20 and TR30.
To provide partners&customers with better quality assurance, has obtained a more comprehensive range of certificates through international certification organizations.

Quality Management System: ISO 9001
Product Certification: CR, CE, KCs, NRTL, RoHS 2.0, NSF, SEMI, IP65
ISO Functional Safety Certification: ISO 10218, ISO 13849, ISO 15066

智能人机系统解决方案
Intelligent human-robot cooperation system solutions



TR3MT
有效负载 Payload 3kg(瞬时5kg)
工作半径 Reach 622mm
重复定位精度 Repeatability ±0.05mm

TR3
有效负载 Payload 3kg
工作半径 Reach 622mm
重复定位精度 Repeatability ±0.02mm

TR5
有效负载 Payload 5kg
工作半径 Reach 922mm
重复定位精度 Repeatability ±0.02mm

TR10
有效负载 Payload 10kg
工作半径 Reach 1400mm
重复定位精度 Repeatability ±0.05mm

TR16
有效负载 Payload 16kg
工作半径 Reach 1034mm
重复定位精度 Repeatability ±0.03mm

TR20
有效负载 Payload 20kg
工作半径 Reach 1854mm
重复定位精度 Repeatability ±0.1mm

TR30
有效负载 Payload 30kg
工作半径 Reach 1403mm
重复定位精度 Repeatability ±0.1mm

TROY INTELLIGENT

ROBOT ARM TECHNICAL SPECIFICATION

机械臂规格参数

	TR 3MT	TR3	TR5	TR10	TR16	TR20	TR30
有效负载(Payload)	3kg(瞬时5kg) (Instantaneous 5kg)	3kg	5kg	10kg	16kg	20kg	30kg
工作半径(Reach)	622mm	622mm	922mm	1400mm	1034mm	1854mm	1403mm
自由度(Degrees of freedom)	6个旋转关节 6 rotating joints	6个旋转关节 6 rotating joints	6个旋转关节 6 rotating joints	6个旋转关节 6 rotating joints	6个旋转关节 6 rotating joints	6个旋转关节 6 rotating joints	6个旋转关节 6 rotating joints
人机交互(HMI)	10.1 英寸示教器或移动终端 Web App 10.1 inch teach pendant or mobile terminal Web App				10.1 英寸示教器或移动终端 Web App 10.1 inch teach pendant or mobile terminal Web App		
符合ISO 9283的位姿可重复性 (Pose repeatability per ISO 9283)	±0.05mm	±0.02mm	±0.03mm	±0.05mm	±0.03mm	±0.1mm	±0.1mm

轴移动(Axis movement)	工作范围(Working range)	最大速度(Maximum speed)	工作范围(Working range)	最大速度(Maximum speed)	工作范围(Working range)	最大速度(Maximum speed)	工作范围(Working range)	最大速度(Maximum speed)	工作范围(Working range)	最大速度(Maximum speed)	工作范围(Working range)	最大速度(Maximum speed)	工作范围(Working range)	最大速度(Maximum speed)
基座 (Base)	±175°	±150°/s	±175°	±180°/s	±175°	±180°/s	±175°	±120°/s	±175°	±120°/s	±175°	±120°/s	±175°	±120°/s
肩部 (Shoulder)	+ 85°/ – 265°	±150°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±120°/s	+ 85°/ – 265°	±120°/s	+ 85°/ – 265°	±120°/s	+ 85°/ – 265°	±120°/s
肘部 (Elbow)	±150°	±150°/s	±150°	±180°/s	±160°	±180°/s	±160°	±180°/s	±160°	±180°/s	±160°	±120°/s	±160°	±120°/s
腕部 1 (Wrist 1)	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s	+ 85°/ – 265°	±180°/s
腕部 2 (Wrist 2)	350°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s
腕部 3 (Wrist 3)	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s	±175°	±180°/s
典型 TCP 速度(Typical TCP speed)	1m/s		1m/s		1m/s		1.5m/s		1m/s		2m/s		2m/s	
防护等级(IP classification)	IP54 (可选 IP65)	(IP65 Optional)	IP54 (可选 IP65)	(IP65 Optional)	IP54 (可选 IP65)	(IP65 Optional)	IP54 (可选 IP65)	(IP65 Optional)	IP54 (可选 IP65)	(IP65 Optional)	IP54 (可选 IP65)	(IP65 Optional)	IP54 (可选 IP65)	(IP65 Optional)

噪音(Noise)	<65dB		<65dB		<65dB		<65dB		<65dB		<70dB		<70dB	
安装方向(Robot mounting)	任何方向 Any orientation		任何方向 Any orientation		任何方向 Any orientation		任何方向 Any orientation		任何方向 Any orientation		任何方向 Any orientation		任何方向 Any orientation	
I/O端口(I/O Ports)	数字输入(DI) 2	数字输出(DO) 2	数字输入(DI) 2	数字输出(DO) 2	数字输入(DI) 2	数字输出(DO) 2	数字输入(DI) 2	数字输出(DO) 2	数字输入(DI) 2	数字输出(DO) 2	数字输入(DI) 2	数字输出(DO) 2	数字输入(DI) 2	数字输出(DO) 2
	模拟输入(AI) 1	模拟输出(AO) 1	模拟输入(AI) 1	模拟输出(AO) 1	模拟输入(AI) 1	模拟输出(AO) 1	模拟输入(AI) 1	模拟输出(AO) 1	模拟输入(AI) 1	模拟输出(AO) 1	模拟输入(AI) 1	模拟输出(AO) 1	模拟输入(AI) 1	模拟输出(AO) 1
工具I/O电源 (Tool I/O power supply)	24V/1.5A		24V/1.5A		24V/1.5A		24V/1.5A		24V/1.5A		24V/1.5A		24V/1.5A	
底座直径(Footprint)	125mm		128mm		149mm		190mm		190mm		240mm		240mm	
整机重量(Weight)	≈10kg		≈15kg		≈22kg		≈40kg		≈40kg		≈85kg		≈85kg	
工作温度(Operating temperature)	0-45℃		0-45℃		0-45℃		0-45℃		0-45℃		0-45℃		0-45℃	
工作湿度(Operating humidity)	90%RH(non-condensing)		90%RH(non-condensing)		90%RH(non-condensing)		90%RH(non-condensing)		90%RH(non-condensing)		90%RH(non-condensing)		90%RH(non-condensing)	
设备材料(Materials)	铝、钢 Aluminium、Steel		铝、钢 Aluminium、Steel		铝、钢 Aluminium、Steel		铝、钢 Aluminium、Steel		铝、钢 Aluminium、Steel		铝、钢 Aluminium、Steel		铝、钢 Aluminium、Steel	

■ 典型功率测试负载设置，根据机器型号设置不同的负载,负载配置参数如下：
Typical power test payload settings, different loads are set according to robot models, payload configuration parameters are as follows :

FR3MT负载设置:3kg，Z轴:18 FR3MT payload setting: 3kg, Z-axis: 18	FR3负载设置:3kg，Z轴:18 FR3 payload setting: 3kg, Z-axis: 18	FR5负载设置:5kg，Z轴:30 FR5 payload setting: 5kg, Z-axis: 30	FR10负载设置:10kg，Z轴:60 FR10 payload setting: 10kg, Z-axis: 60	FR16负载设置:16kg，Z轴:96 FR16 payload setting: 16kg, Z-axis: 96	FR20负载设置:20kg，Z轴:120 FR20 payload setting: 20kg, Z-axis: 120	FR30负载设置:30kg，Z轴:200 FR30 payload setting: 30kg, Z-axis: 200

选用老化测试程序，机器人总电源接入功率计，机器人设置自动模式，全局速度设置为100，点击运行,运行两个周期无异常则开始持续测试，持续24小时。24小时后分别统计功率计的峰值和平均功率，依次对各个型号进行统计：
Select aging test program, connect robot's total power to power meter, set robot to automatic mode, set global speed to 100, click run, if there are no abnormalities after running two cycles, start continuous testing for 24 hours. After 24 hours, respectively, record the peak and average power of the power meter, and then statistically analyze each model :

典型平均功率 (Typical average power)	198W	224W	261W	294W	315W	624W	594W
典型峰值功率 (Typical peak power)	231W	276W	314W	503W	410W	806W	909W

CONTROLLER TECHNICAL SPECIFICATION
控制箱规格参数






		直流mini控制箱	mini控制箱2kw	控制箱4kw	控制箱6kw
设备特性 Features	防护等级(IP classification)	IP54	IP54	IP54	IP54
	工作温度(Operating temperature)	0-45°C	0-45°C	0-45°C	0-45°C
	工作湿度(Operating humidity)	90%RH(non-condensing)	90%RH(non-condensing)	90%RH(non-condensing)	90%RH(non-condensing)
	I/O端口(I/O Ports)	数字输入(DI) 16 数字输出(DO) 16	数字输入(DI) 16 数字输出(DO) 16	数字输入(DI) 16 数字输出(DO) 16	数字输入(DI) 16 数字输出(DO) 16
		模拟输入(AI) 2 模拟输出(AO) 2	模拟输入(AI) 2 模拟输出(AO) 2	模拟输入(AI) 2 模拟输出(AO) 2	模拟输入(AI) 2 模拟输出(AO) 2
		高速脉冲输入(High speed pulse input) 2	高速脉冲输入(High speed pulse input) 2	高速脉冲输入(High speed pulse input) 2	高速脉冲输入(High speed pulse input) 2
	I/O电源(I/O power supply)	24V/1.5A	24V/1.5A	24V/1.5A	24V/1.5A
	标配通讯(Standard communication)	I/O、TCP/IP、Modbus_TCP/RTU	I/O、TCP/IP、Modbus_TCP/RTU	I/O、TCP/IP、Modbus_TCP/RTU	I/O、TCP/IP、Modbus_TCP/RTU
	可选通讯(Optional communication)	CC-Link、Profinet、Ethernet/IP、EtherCAT	CC-Link、Profinet、Ethernet/IP、EtherCAT	CC-Link、Profinet、Ethernet/IP、EtherCAT	CC-Link、Profinet、Ethernet/IP、EtherCAT
	软件开发包(Software development kit)	C#/C++/Python/ROS/ROS2	C#/C++/Python/ROS/ROS2	C#/C++/Python/ROS/ROS2	C#/C++/Python/ROS/ROS2
物理性能 Physical	尺寸参数(L*W*H)	245*180*44.5mm (不含凸出物)	245*180*44.5mm (不含凸出物)	245*180*89mm (不含凸出物)	320*183*100mm (不含凸出物)
	设备重量(Weight)	2.1kg (不含线重量)	2.5kg (不含线重量)	3.6kg (不含线重量)	6.5kg (不含线重量)
	设备材料(Materials)	镀锌板 Galvanized plate	镀锌板 Galvanized plate	镀锌板 Galvanized plate	镀锌板 Galvanized plate
	供电电源(Power supply)	30-60VDC	176-264VAC ~ 50-60Hz 100-240VAC ~ 50-60Hz	100-240VAC ~ 50-60Hz	176-264VAC ~ 50-60Hz

TEACH PENDANT
示教器

〖选配 Optional〗



操作尽在掌心
All operations are gathered in the hand

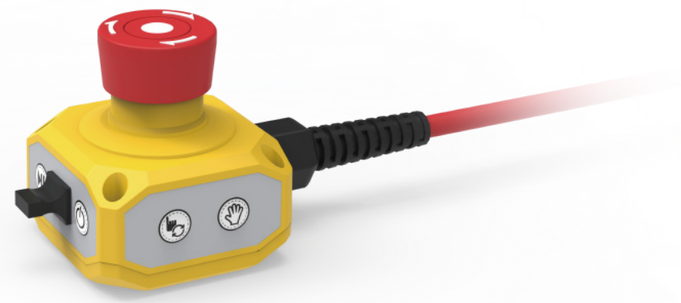
示教器、电脑、平板或手机与WebAPP系统连接，从而实现对协作机器人的操控。

The teach pendant, computer, tablet or mobile phone is connected to the WebAPP system to realize the operation of the collabroative robot.

- 用户界面更直观
- 工艺包种类更齐全
- 云端部署更便捷
- The user interface is more intuitive
- Wide range of technological packages
- Cloud deployment provides greater convenience

设备特性 Features	防护等级(IP classification)	IP54
	工作湿度(Operating humidity)	90%RH(non-condensing)
	显示分辨率(Display resolution)	1280 x 800 pixels
物理性能 Physical	尺寸参数(L*W*H)	268*210*88mm
	设备重量(Weight)	1.6kg
	设备材料(Materials)	ABS、PP
	线缆长度(Cable length)	5m

SAFTY BOX
按钮盒



人机交互工具，可实现基础交互功能。通过RJ45接口可与电脑、平板等设备链接，直接登录到web示教界面。

Human-cobot interaction tools for basic interaction functions. It can be linked with computers, tablets and other devices through the RJ45 interface, and directly log in to the Web App teaching interface.

- 简单易用
- 操作方便
- 灵活部署
- Simple to use
- Easy to operate
- Flexible to deploy

设备特性 Features	防护等级(IP classification)	IP54
	按钮功能(Button function)	手动/自动、拖动、点记录、是否配合按钮盒、开始/停止、关机 Manual/Auto, Drag, Point Record, Match or Not with Safety Button Box, Start/Stop, Shutdown
	协议类型(Communication)	TCP/IP
	网络传输速率(Network transfer rate)	100M
	供电(Power over ethernet)	标准POE Standard POE
物理性能 Physical	尺寸参数(L*W*H)	136*60*66mm (不含凸出物) (No protrusions)
	设备重量(Weight)	490g (带线重量) (Cable weight included)
	设备材料(Materials)	ABS
	线缆长度(Cable length)	5m
	按键次数(Number of keys)	≥20W 次

INDUSTRY APPLICATIONS



上下料解决方案

Pick And Place Solution

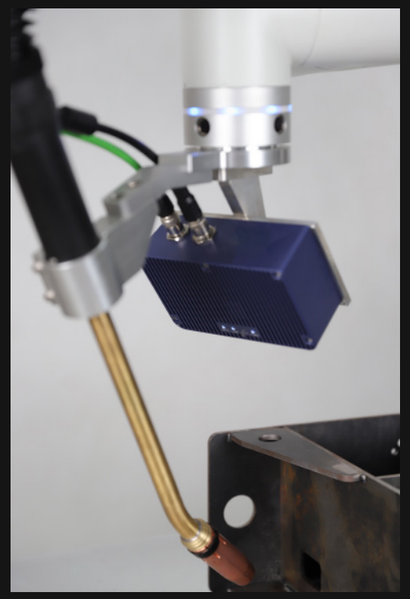
上下料机器人能够提高生产效率、质量和安全性，降低劳动强度，并提供灵活适应性，为企业带来更高的效益和竞争优势。

Material handling robots can improve production efficiency, quality, and safety, reduce labor intensity, and provide flexibility and adaptability, bringing higher benefits and competitive advantages to businesses.

Welding Robot
焊接机器人

丰富的焊接工艺包，具备多种焊接工艺，包含有点焊、段焊、直焊、摇摆焊、圆弧焊、多层多道焊，并且具备焊丝寻位、焊缝追踪的智能焊接技术，显著提升焊接效率，保障焊接品质。

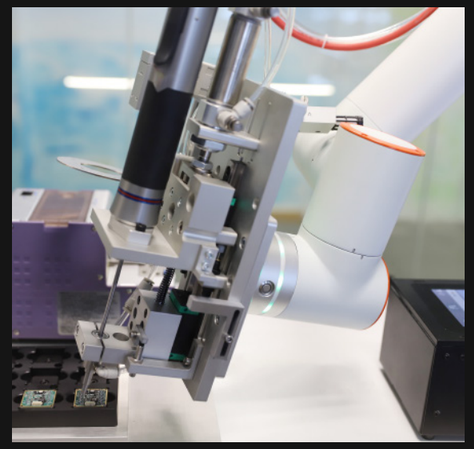
Abundant welding process kits, with a variety of welding technologies such as spot welding, seam welding, straight welding, oscillating welding, arc welding, and multi-layer multi-pass welding. It also incorporates intelligent welding technologies for wire positioning and weld seam tracking, significantly enhancing welding efficiency and ensuring welding quality.



Screw Tightening Robot
螺丝锁付机器人

搭配末端智能拧紧装置，实现了扭矩可调、可控、可编辑，适合各种场景下的螺丝锁付，能够稳定、高效、准确完成生产过程，极大减少工人重复性劳动，支持数据溯源。

Combined with the end intelligent tightening device, it achieves adjustable, controllable, and programmable torque, making it suitable for screw locking in various scenarios. It can stably, efficiently, and accurately complete the production process, greatly reducing repetitive labor for workers and supporting data traceability.





涂胶解决方案 Glue Dispending Solution

搭配末端智能出胶装置，精细化作业，适合多场景下的精细化涂胶、点胶工作，能够稳定、高效、准确完成涂胶过程，保证涂胶效果，极大减少工人重复性劳动，保护工人健康。

Paired with an intelligent dispensing device at the end effector, it enables precise operations and is suitable for precise gluing and dispensing tasks in various scenarios. It can achieve stable, efficient, and accurate adhesive application, ensuring the quality of the adhesive work. This greatly reduces repetitive labor for workers and protects their health.

传送带解决方案 Conveyor Belt Solution



- 提升工作安全性 Enhance work safety
- 实时监控与反馈 Real-time monitoring and feedback
- 降低错误率和损耗 Reduce error rate and losses
- 提高生产效率 Improve production efficiency
- 数据记录与溯源 Data recording and traceability
- 精确追踪与识别 Accurate tracking and identification

COMMERCIAL APPLICATIONS

茶饮机器人
Automated Tea Robot

节约人力成本，替代人工，提高工作效率；冲泡茶饮口感一致，改善不同人操作、不同时间点操作而带来的差异性；具有表演性，给消费者带来乐趣，而员工可以去完成更有成就感、待遇更高的工作；成本低，快速回本，经济效益好；占地面积小，坪效更高，能适应多种新颖的创业模式。

协作机器人可以应用在多类型的新零售场景，并且根据不同场景需求，进行个性化定制。

Collaborative robots can be applied in various types of new retail scenarios and can be customized according to different scenario requirements. Benefits include:

Cost-saving: They replace manual labor, reducing manpower costs while increasing work efficiency.

Consistent tea brewing: They ensure consistent taste regardless of different operators or different time points, eliminating variations caused by human factors.

Entertainment value: The robotic performance brings enjoyment to consumers, while employees can focus on more fulfilling and higher-paying jobs.

Cost-effective: They have low costs and provide a quick return on investment, resulting in good economic benefits.

Small footprint: They occupy less space, resulting in higher space utilization and adaptability to various innovative business models.



康复解决方案
Rehabilitation Solution

实现了上肢康复与下肢锻炼的一体化，通过运动轨迹的复现,降低了使用门槛。通过实时记录反馈数据，显著提升安全性能。多种模式设定，让康复治疗更有针对性，显著提升康复效率。

It has achieved integration of upper limb rehabilitation and lower limb exercise, reducing the barrier to entry through the reproduction of motion trajectories. By recording real-time feedback data, it significantly enhances safety performance. With various mode settings, it makes rehabilitation treatment more targeted, leading to a significant improvement in rehabilitation efficiency.



艾灸解决方案
Moxibustion Solution

完整复刻五大灸法，提供悬停灸、雀啄灸、回旋灸、往复灸和循经灸,降低艾灸门槛。经过最新认证，搭配末端碰撞检测、温控、红外测距，三重防护保障艾灸安全。内置吸入装置，避免艾灸过程烟尘吸入。

- 极致安全
- 部署灵活
- 门槛降低
- 高效艾灸

It fully replicates the five major moxibustion techniques, offering hovering moxibustion, sparrow pecking moxibustion, rotating moxibustion, reciprocating moxibustion, and meridian moxibustion, thus reducing the barrier to entry for moxibustion. With the latest certifications, it is equipped with end collision detection, temperature control, and infrared distance measurement, providing triple protection to ensure the safety of moxibustion.

It also has a built-in suction device to prevent inhalation of smoke and dust during the moxibustion process.

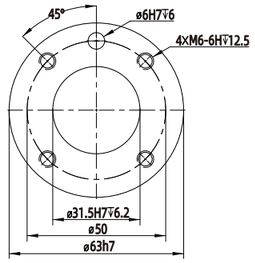
- Ultimate safety
- Flexible deployment
- Lower barrier to entry
- Efficient moxibustion



TROY INTELLIGENT

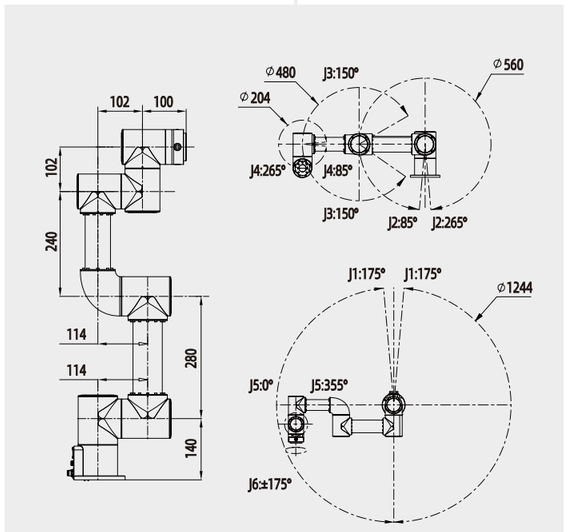
DRAWINGS
技术图纸

单位(Unit) : mm

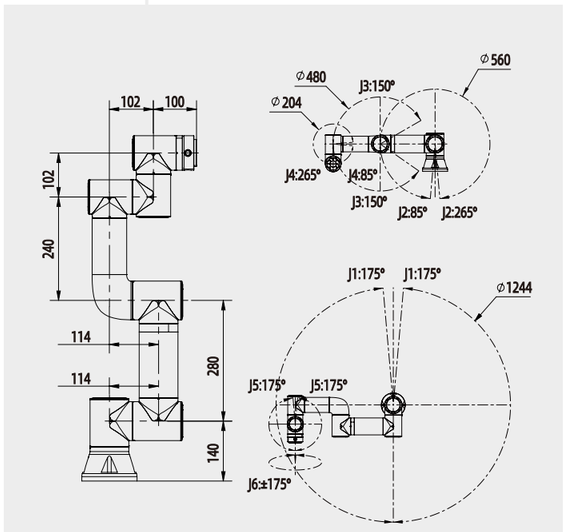


机器人末端
均采用国际标准

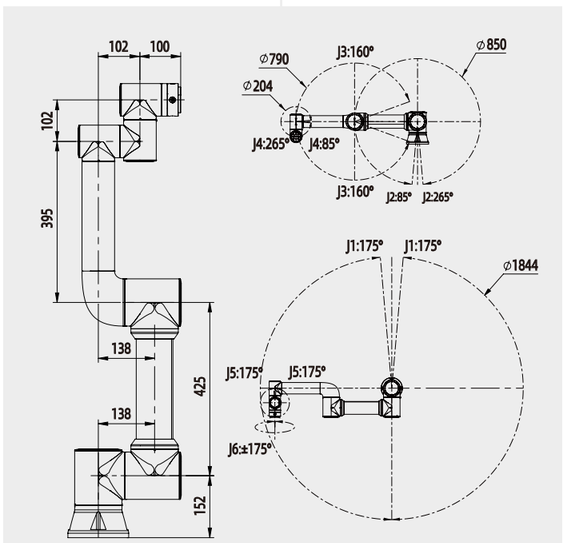
ROBOT END-EFFECTOR COMPATIBLE WITH
INDUSTRIAL ROBOT END-EFFECTOR CONNECTION METHODS



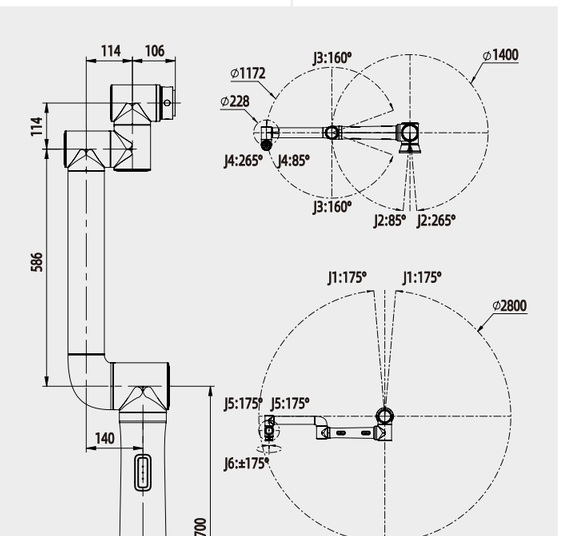
TR3MT



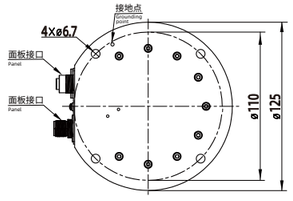
TR3



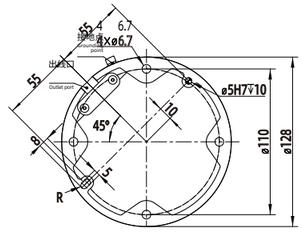
TR5



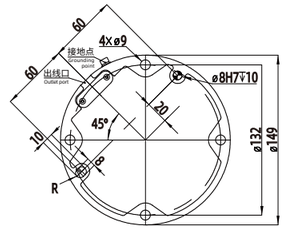
TR10



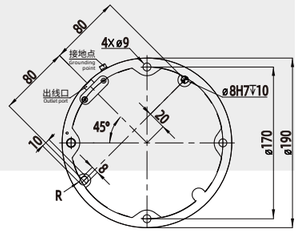
TR3MT 基座图
Pedestal diagram



TR3 基座图
Pedestal diagram



TR5 基座图
Pedestal diagram

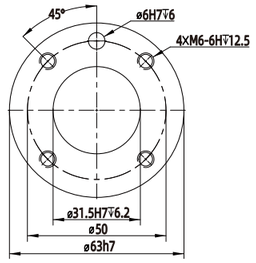


TR10 基座图
Pedestal diagram

TROY INTELLIGENT

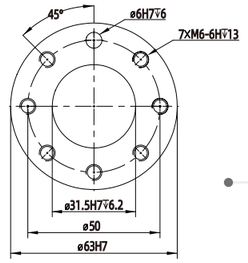
DRAWINGS
技术图纸

单位(Unit) : mm



机器人末端
均采用国际标准

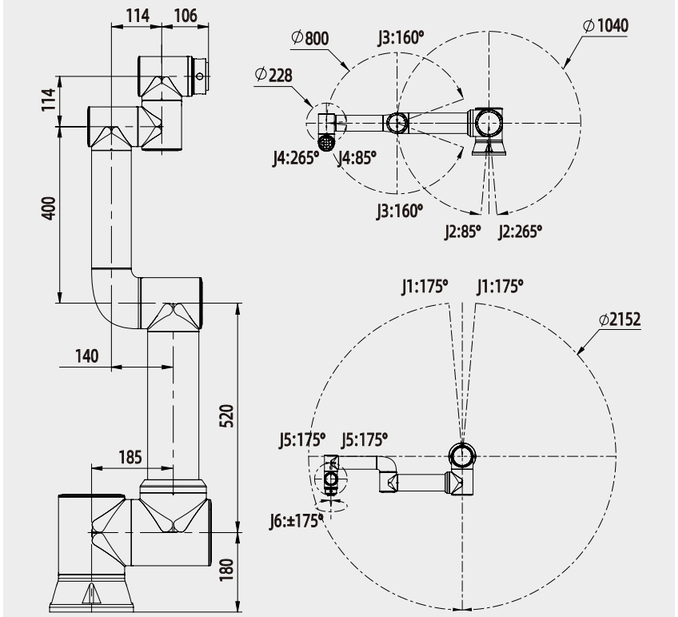
ROBOT END-EFFECTOR COMPATIBLE WITH
INDUSTRIAL ROBOT END-EFFECTOR CONNECTION METHODS

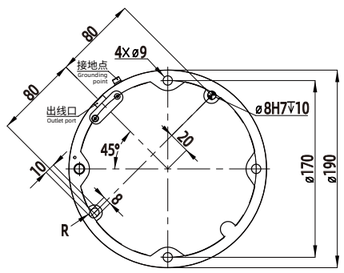


机器人末端兼容
工业机器人末端连接方式

ROBOT END-EFFECTOR COMPATIBLE
WITH INDUSTRIAL ROBOT END-EFFECTOR CONNECTION METHODS

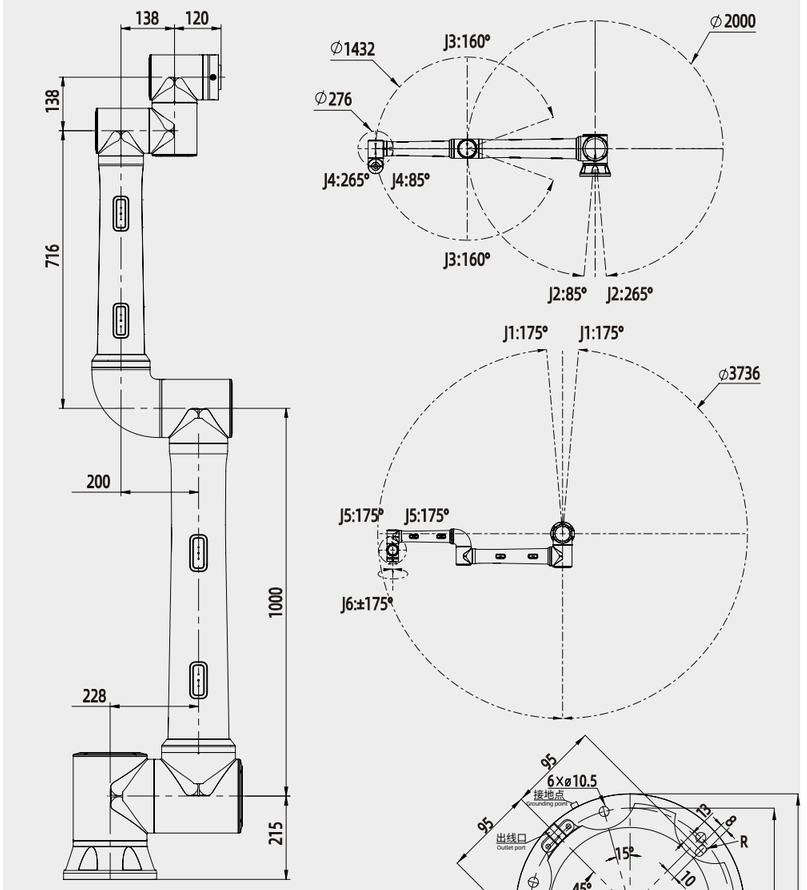
TR16





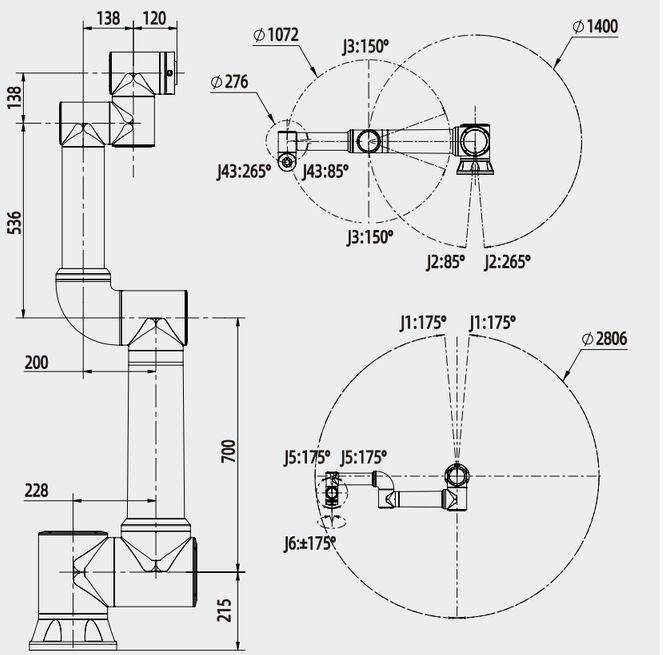
TR16 基座图
Pedestal diagram

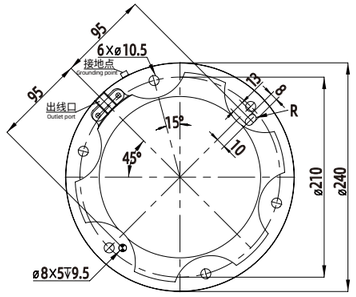
TR20



TR20 基座图
Pedestal diagram

TR30





TR30 基座图
Pedestal diagram