



自信 诚心 创新

天通智能装备有限公司

TDG INTELLIGENT EQUIPMENT CO., LTD.

企业
简介
ABOUT US



泛半导体材料
高端装备制造商

283 + 项

专利授权

93 + 项

发明专利

天通智能装备



天通控股股份有限公司(股票代码:600330)创建于1984年,于2001年在上海证券交易所挂牌上市,是国内首家自然人直接控股的上市公司。经过四十年的艰苦创业,天通拥有多家控股和参股公司,目前已经形成电子材料、电子模组、绿色能源、智能装备四大业务板块。业务涵盖电子信息材料产业链上下游,是集科研、制造、销售于一体的国家高新技术企业。

公司致力于成为泛半导体材料高端装备制造商,专业制造生产泛半导体材料的设备,如单晶炉、硅芯炉、蓝宝石晶体生长炉,压电晶体生长炉等拉晶设备,以及相关切、磨、抛设备和自动化设备研发制造,产品范围包括用于单晶/多晶硅棒、半导体硅片、蓝宝石、光伏等泛半导体材料的加工,如:切割、开方、研磨、抛光、减薄等系列加工设备及其自动化成套设备等,产品技术指标达到国际同类产品先进水平,国内领先地位。公司拥有各种专利授权283余项,其中发明专利93余项。

公司秉承“立工匠精神、做功夫产品、创行业品牌、树百年企业”的企业精神做专“中国制造”产品。

TDG Holding Co., Ltd. (stock code: 600330) was established in 1984 and was listed on the Shanghai Stock Exchange in 2001, becoming the first domestic company with natural persons directly holding shares. After four decades of hard work, TDG has several holding and equity-participation companies and has now formed four major business segments: electronic materials, electronic modules, green energy, and intelligent equipment. Its business covers the entire electronic information materials industry chain, making it a national high-tech enterprise integrating research, manufacturing, and sales.

Our company is committed to becoming a high-end equipment manufacturer of pan-semiconductor materials, specializing in the manufacturing of equipment for the production of pan-semiconductor materials, such as single crystal furnace, silicon core furnace, sapphire crystal furnace, piezo-electric crystal furnace and other crystal growing equipment, including the research, development and manufacturing of related cutting, grinding, polishing and automation equipment. Our products include the processing of monocrystalline/polycrystalline silicon rods, semiconductor silicon wafers, sapphire, photovoltaic and other pan-semiconductor materials, such as: cutting, squaring, grinding, polishing, thinning and other series of processing equipment and complete sets of automation equipment, product technical indicators to reach the international advanced level of similar products, domestic leading position. The company has more than 283 patents, including more than 93 invention patents.

Our company adheres to the enterprise spirit of "upholding the spirit of craftsmen, making exquisite products, creating industry brands, and establishing a hundred-year enterprise" to specialize in "Made in China" products.

天通智能装备有限公司
TDG INTELLIGENT EQUIPMENT CO., LTD.

使命 Mission

**用科技创新实现绿色发展
用卓越产品打造企业品牌
用发展成果承担社会责任**

Achieving green development with scientific and technological innovation
Building corporate brands with excellent products
Assuming social responsibility with development results

愿景 Vision

**成为全球行业技术领先、有品牌影响力的
创新产业集团**

To become a global industrial group
with leading industry technology and brand influence

价值观 Values

理解、尊重、和谐

Understanding、Respect、Harmony

企业精神 Enterprise Spirit

自信、诚心、创新

Confidence、Sincerity、Innovation

企业优势 ADVANTAGES

1 研发能力 Research And Development

283 + 项
专利授权
Patent Authorization

93 + 项
发明专利
Invention Patent

18 + 项
PCT专利
PCT Patent

19 项
软件著作权
Software Copyright

授权专利超283项, 其中发明专利授权超93项, PCT专利超18项、软件著作权19项;

高新技术企业、省专精特新企业、省科技型中小企业, 先后获得和通过省/市首台套产品、浙江制造团体标准、质量管理体系/环境与职业健康管理体系、两化融合管理体系认定, 市级技术中心/研发中心、数十项省级新产品/工业新产品。

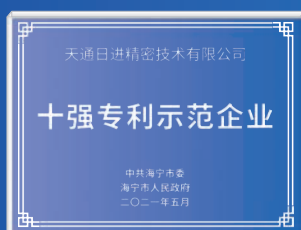
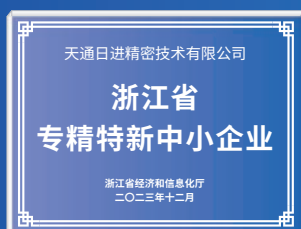
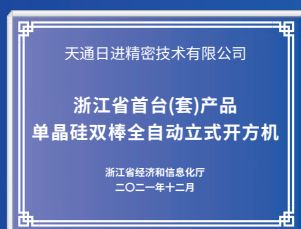
There are a total of 283 authorized patents, including over 93 invention patents, 18 PCT patents, and 19 software copyrights;

High tech enterprises, provincial specialized and innovative enterprises, and provincial technology-based small and medium-sized enterprises have successively obtained and passed the certification of the first set of products in the province/city, Zhejiang manufacturing group standards, quality management system/environmental and occupational health management system, and integrated management system of industrialization and industrialization. They are also recognized as municipal technology centers/research and development centers, and dozens of provincial-level new products/industrial new products.



资质平台 Qualification Platform

- 国家高新技术企业
National High-tech Enterprise
- 国家专精特新小巨人企业
National Specialized, Refined, Unique, and New Small Giant Enterprise
- 国家企业技术中心
National Enterprise Technology Center
- 浙江省专精特新中小企业
Zhejiang Unique and New Small and Medium sized Enterprises
- 浙江省企业研究院
Zhejiang Enterprise Research Institute
- 浙江省高端装备制造业骨干企业
Zhejiang backbone enterprise in high-end equipment manufacturing industry
- 浙江省创新型示范中小企业
Zhejiang Innovative Demonstration Small and Medium sized Enterprises
- 浙江省标准创新型企业
Zhejiang Standard Innovative Enterprise



企业优势 ADVANTAGES

荣誉 Honors

- 1项** 国家科技进步二等奖
The second award of the Scientific and Technological Progress of the State
- 2项** 浙江省科技进步三等奖
Zhejiang Province Science and Technology Progress Third Prize
- 1项** 浙江省制造业首台套产品 (国内首台套)
The first set of manufacturing products in Zhejiang Province (the first set in China)
- 8项** 浙江省制造业首台套产品 (省内首台套)
The first set of manufacturing products in Zhejiang Province (the first set in the province)
- 1项** 浙江省优秀工业新产品一等奖
First Prize for Excellent Industrial New Products in Zhejiang Province
- 3项** 浙江精品制造产品
Zhejiang premium manufacturing products





客户认可 Recognition

- 通威：中国光伏20年·智造典范奖
TONGWEI: China Photovoltaic 20 Years · Intelligent Manufacturing Model Award
- 隆基：协同创新奖
LONGI: Collaborative Innovation Award
- 鸿新：优秀合作伙伴
HONSUN: Excellent Partner



行业使命 Industry Mission

- 主导9项行业标准, 5项团体标准
Leading 9 industry, 5 group standards
- 泛半导体产业链链长单位
Chain head enterprise of omniseiconductor industry chain
- 金切机床标准化委员会磨床分标委员单位
Committee enterprise of gold cutting machine standardization, grinding machine sub standardization
- 工业电热标委会单位
Committee enterprise of industrial electric heading standard



2 装配能力 PRECISION MACHINING

公司在光伏行业深耕多年，我们不仅积累了丰富的经验，还持续创新，提升制造能力，已满足全球不断增长的清洁能源需求。我们的制造基地采用国际先进的光伏技术，结合环保理念，打造出可靠、稳定、高效的光伏产品；凭借强大的制造能力，我们能够实现规模化生产，满足国内外大规模光伏项目的需求。公司目前具备制造年产50GW所需配套的拉晶+机加设备的能力，同时，我们也为客户提供定制化的解决方案，满足不同客户的特定需求。

Our company has developed in the photovoltaic industry for many years. We have not only accumulated rich experience, but also continuously innovated and improved manufacturing capabilities to meet the growing global demand for clean energy. Our manufacturing base adopts internationally advanced photovoltaic technology and combines environmental protection concepts to create reliable, stable, and efficient photovoltaic products; With strong manufacturing capabilities, we are able to achieve large-scale production and meet the needs of large-scale photovoltaic projects both domestically and internationally. The company currently has the ability to manufacture the necessary pulling and machining equipment for an annual production of 50GW. At the same time, we also provide customized solutions to meet the specific needs of different customers.



3 精密加工

EQUIPMENT CAPABILITY

公司精密部品制造事业部分海宁、徐州两大厂区，配置了德马吉、大隈、马扎克、O-M等国际一线品牌的立式、卧式和五面体龙门加工中心，设备配置可满足车、削、铣、镗等多种加工需求，最大加工尺寸8000*3000*2000mm，更有两条马扎克自动化柔性产线，可实现个性化多品种小批次生产节拍，同时可满足对于热处理、表面处理、焊接、洁净度等特定要求。



The precision parts manufacturing division of the company has two major factories in Haining and Xuzhou, equipped with vertical, horizontal, and pentahedral gantry machining centers from international first-line brands such as Demagi, Okuma, Mazak, and O-M. The equipment configuration can meet various processing needs such as turning, cutting, milling, and boring, with a maximum processing size of 8000 * 3000 * 2000mm. There are also two Mazak automated flexible production lines, which can achieve personalized multi variety small batch production rhythm, and can also meet specific requirements for heat treatment, surface treatment, welding, cleanliness, etc.



4 品控能力 Quality Control

高标准是高质量的前提，公司建立了标准化体系，始终坚持高标准要求，发布行业标准9项，其中6项为主导制订，3项参与制订；发布团体标准3项，2项浙江制造标准。

公司坚持以质取胜，通过了质量管理体系认证，对原材料、制造、出货以及售后服务等进行全过程质量控制并策划制定完善的进货、过程和出厂等质量控制SOP文件，对产品进行严格的检验把关，严格控制产品质量。

公司拥有大尺寸的德国雷兹固定梁式高精度三坐标测量机、美国法如便携式测量关节臂、日本基恩仕图像尺寸测量仪、英国雷尼绍的激光干涉仪、日本奥林巴斯显微镜等国际著名品牌精密先进检测设备，强大的检测能力有力地保证了产品的质量。

High standards are a prerequisite for high quality. Our company has established a standardization system and always adheres to high standard requirements. It has released 9 industry standards, of which 6 are the leading ones and 3 are participating in the formulation; Publish 3 group standards and 2 Zhejiang manufacturing standards.

Our company adheres to the principle of winning by quality and has passed the quality management system certification. It conducts full process quality control on raw materials, manufacturing, shipping, and after-sales service, and plans to develop comprehensive quality control SOP documents for procurement, process, and delivery. Our company strictly inspects and controls the quality of its products.

Our company has internationally renowned brands of precision and advanced testing equipment, including large-sized German Reiz fixed beam high-precision coordinate measuring machines, American French portable measuring joint arms, Japanese Keinz image size measuring instruments, British Renishaw laser interferometers, and Japanese Olympus microscopes. Its strong testing capabilities effectively ensure the quality of its products.



德国Leizi三坐标测量机
German Leizi coordinate measuring machine



日本基恩士图像尺寸测量仪
Japanese Keyence image size measuring instrument



日本奥林巴斯测量显微镜
Japanese Olympus measuring microscope



美国法如测量关节臂
American law for measuring articulated arms



英国雷尼绍激光干涉仪
British Renishaw laser interferometer

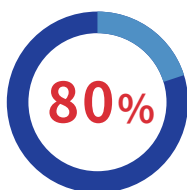
5 售后服务团队

After Sales Service Team



500+

工程安装和
售后服务队伍人数
Engineering installation
and after-sales engineers



设备维护技术型
人才占比
Equipment maintenance
engineers

公司拥有一支专业的服务管理，
Our company has a professional service management team.

500余人的工程安装和售后服务队伍，
We have more than 500 engineers for engineering installation and after-sales service;

设备维护技术型人才超过80%。
moreover, equipment maintenance engineers take up more than 80%,

通过永不满足的专业能力和超越客户需求的服务，
to maximize the value of customer equipment through professional

实现客户设备价值最大化。
competence and attentive service.



服务管理团队

Service management team

现场安装调试

Installation and commissioning team

售后服务团队

After-sale service team



售后服务
After-sale service



备品备件仓库
Spare parts stock



现场/远程技术支持
On/off line technical support



客户端人员培训
Personnel training in customer end

产品沿革

PRODUCT HISTORY

2008年

NWSS-125A/125B 数控多线钢丝切方机
NWSS-125A/125B CNC multi wire steel wire cutting machine

2016年

NWSS-812 多晶金刚线截断机
NWSS-812 polycrystalline diamond wire cutting machine

NVG-4500 磨倒一体机
NVG-4500 Grinding and Inverting Integrated Machine

NWSS G7+ 多晶硅锭金刚线开方机
NWSS G7+ polycrystalline wire square machine

2015年

AWM600 蓝宝石全自动贴片机
AWM600 Sapphire Fully Automatic SMT Machine

2014年

NWSS-500D 数控多线蓝宝石开方机
NWSS-500D CNC multi wire sapphire square cutting machine

NWD-500JD 单线截断机
NWD-500JD single line cutting machine

2017年

研发SiF130炉
Research and development of SiF130 furnace

NVG-7500 晶棒加工中心
NVG-7500 Crystal Bar Processing Center

NWSS-4525 半导体单晶截断机
NWSS-4525 Semiconductor Single Crystal Cutting Machine

NWSS-JK4700 单晶截断开方一体机
NWSS-JK4700 single crystal cutting and squaring integrated machine

NWSS-DD700Z 单晶单根开方机
NWSS-DD700Z single crystal single root square machine

NWSS-125GS 数控多线金刚线切方机
NWSS-125GS CNC multi wire diamond wire cutting machine

2018年

研发SiF140炉
Research and development of SiF140 furnace

NWSS-7S 数控多线金刚线截断机
NWSS-7S CNC multi wire diamond wire cutting machine

NWD-600JD 单线截断机
NWD-600JD single line cutting machine

NWSS-DS700Z 双工位全自动单晶开方机
NWSS-DS700Z dual station fully automatic single crystal square cutting machine

NWSS-DH02 单线截断机
NWSS-DH02 single line cutting machine

DPL160JA 双面精密研磨机
DPL160JA Double sided Precision Grinding Machine

2025年

双工位截磨一体机TN-DJM1200
TN-DJM1200 dual station cutting and grinding machine

小块回制料综合利用自动线TN-XBJ9000
Small piece recycling material comprehensive utilization automatic line TN-XBJ9000

智能180单晶炉
Intelligent 180 Single Crystal Furnace

三工位蓝宝石单线截断机TN-DXQ3-650
Three station sapphire single line cutting machine TN-DXQ3-650

双工位蓝宝石单线截断机TN-DXQ-2-1000
Dual station sapphire single line cutting machine TN-DXQ-2-1000

高精度单工位蓝宝石多线截断机TN-TD600CA
High precision single station sapphire multi line cutting machine TN-TD600CA

勇于创新
追求卓越

2009年

NWSS-125D 数控多线金刚线切方机
NWSS-125D CNC multi wire diamond wire cutting machine
NVG-BM 单刀切割机
NVG-BM single blade cutting machine

2010年

NWSS-125H/E 切方机 (金刚、砂浆线两用机)
NWSS-125H/E square cutting machine
NWSS-210 单晶金刚线截断机
NWSS-210 single crystal diamond wire cutting machine
NWSS-250 硅棒线截断机
NWSS-250 silicon bar and wire cutting machine
NWSS-125G 数控多线 (金刚、砂浆线两用) 切方机
NWSS-125G CNC Multi line Cutting Machine

2011年

NSM-175A 全自动多刀切割机
NSM-175A fully automatic multi blade cutting machine
NWSS-250A/B 硅棒线截断机
NWSS-250A/B silicon rod wire cutting machine

2013年

NK-13-9B 双面研磨机
NK-13-9B double-sided grinder
DPL160T 双面精密研磨机
DPL160T double-sided precision grinder
SPL600T 单面精密研磨机
SPL600T single-sided precision grinding machine
NBG822 背面减薄机
NBG822 back thinning machine

2012年

NWS-180 数控多线钢丝切片机
NWS-180 CNC multi wire steel wire slicer
NWSS-125K 数控多线钢丝单晶切方机
NWSS-125K CNC Multi wire Single Crystal Cutting Machine for Steel Wire
NWSS-125M 数控多线钢丝多晶切方机
NWSS-125M CNC Multi wire Steel Wire Polycrystalline Cutting Machine

2019年

研发SiF145炉
Research and development of SiF145 furnace
KF900 长线双工位开方
KF900 Long Line Double Station Square Cutting
磨床MD900A双工位磨床
Grinding machine MD900A dual station grinding machine
NWSS-JD900 长线单根截断机
NWSS-JD900 Long Line Single Cutting Machine

2020年

研发初代SiF160炉
Research and development of SiF160 furnace
磨床MD900A双工位磨床
Grinding machine MD900A dual station grinding machine
NWSS-KF900E 长线双工位开方出口版
NWSS-KF900E Long Line Dual Station Square Opening Export Edition
NWSS-JD900E 长线单根截断机出口版
NWSS-JD900E Long Line Single Cutting Machine Export Edition

2021年

研发第二代SiF160炉
Annual research and development of second-generation SiF160 furnace
NWSS-JM1000 截磨一体机
NWSS-JM1000 cutting and grinding integrated machine
TN-HJ01 单工位环线截断机
TN-HJ01 Single Station Loop Line Cutting Machine
TN-HJ09 多工位环线截断机
TN-HJ09 Multi Station Loop Line Cutting Machine
TN-MS1000 开磨一体机
TN-MS1000 integrated grinding machine
Kf950 长线双工位开方
Kf950 Long Line Double Station Square Cutting

2024年

HDK1000 环线四工位开方
HDK1000 Loop Line Four Station Square Cutting
边皮加工流水线
Edge leather processing assembly line

2023年

研发HJT专用CCZ单晶炉
Research and development of HJT dedicated CCZ single crystal furnace
NVG-SMD1000 单工位磨床
NVG-SMD1000 single station grinding machine

2022年

研发第三代SiF160炉
Research and development of the third-generation SiF160 furnace
HDK900 环线四工位开方
HDK900 Loop Line Four Station Square Cutting
KF1000 长线双工位开方
KF1000 long line double station square cutting
磨床MD1000 双工位磨床
Grinding machine MD1000 dual station grinding machine

多刀截断机

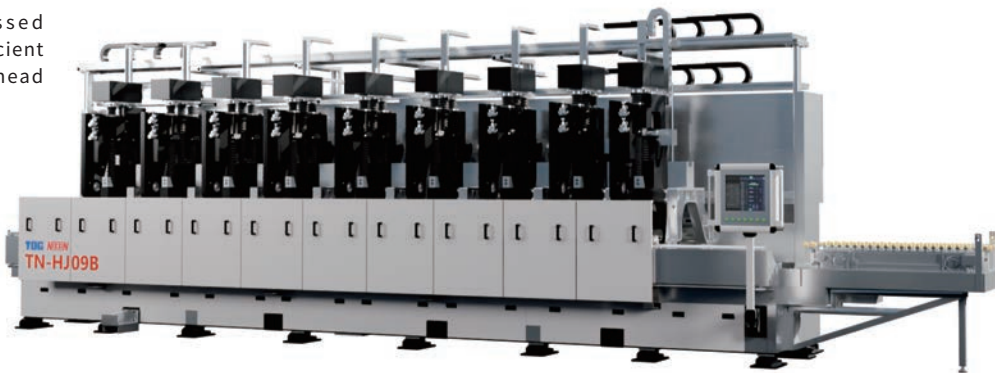
MULTI BLADE CUTTING MACHINE

机加设备

MACHINE
PROCESSING

A 产品优势 DVANTAGE

- 1 采用环形线,比传统钢线截断切割更节省耗材,比循环线截断机效率提高 ≥ 1 倍,无断线穿线麻烦。**
Using circular wire cutting saves more consumables than traditional steel wire cutting, improves efficiency by ≥ 1 times compared to circular wire cutting machines, and eliminates the hassle of wire breakage and threading.
- 2 新型截断支撑机构,料损更少,支撑更稳定。**
New type of cut-off support mechanism, with less material loss and more stable support.
- 3 合理化的整机设计,具有截断定位准确,截断工件崩边更少。**
Reasonable overall design, with accurate cutting and positioning, and fewer broken edges of cut workpieces.
- 4 自动化程度高,自动完成上料、定位、截断、下料工序。**
High degree of automation, automatically completing loading, positioning, cutting, and unloading processes.
- 5 单个截断头可自由移动,在加工尺寸范围内,加工长度可自行设置。**
A single cutting head can move freely, and within the machining size range, the machining length can be set by oneself.
- 6 新增工件底部辅助托起结构,使截断处工件更稳定,截断料损更少。**
Add an auxiliary lifting structure at the bottom of the workpiece to make the workpiece at the cutting point more stable and reduce material loss during cutting.
- 7 九个截断头同时加工,与原单截断头截断机相比,效率更高。**
Nine cutting heads are processed simultaneously, which is more efficient than the original single cutting head cutting machine.



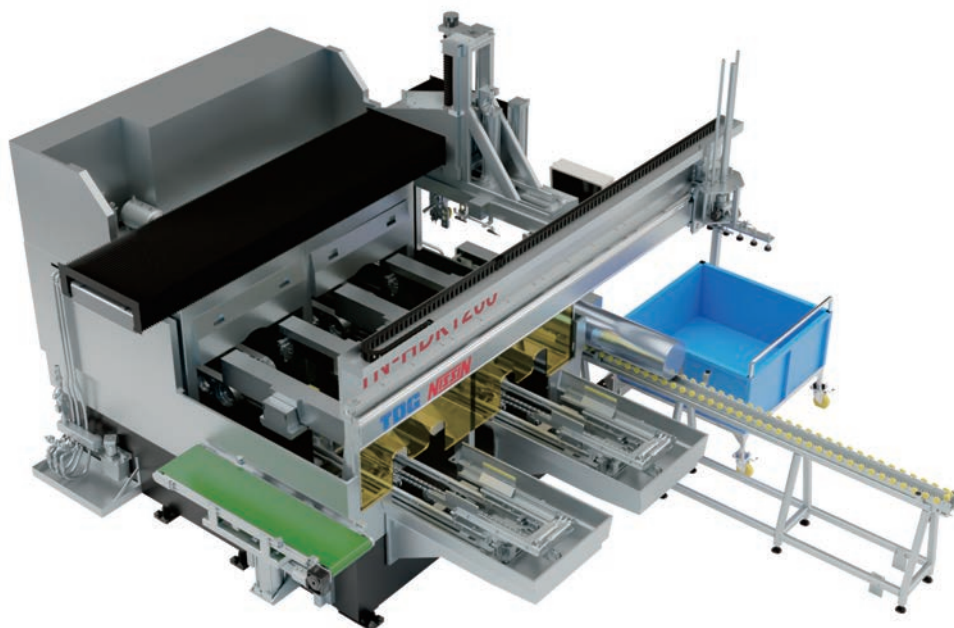
T 技术参数 echnical Parameter

设备主机尺寸(长*宽*高) Device host size (length x width x height)	10000X2500X高3200低2700mm
硅棒长度 Silicon rod length	最大支持8500mm硅棒切割
硅棒直径 Silicon rod diameter	$\Phi 200 \sim \Phi 350 \text{mm}$
切割段长 Cutting section length	300~1000mm
切割丝线速度 Cutting thread speed	0~25m/s
切割效率 Cutting efficiency	$\leq 7 \text{min/刀}$ (M10规格); $\leq 10 \text{min/刀}$ (G12规格);
张力范围 Tension range	0~150N (可调)
金刚线长度 Diamond wire length	环线2960mm

环线双工位开方机NWSS-HDK1200S型

LOOP DOUBLE STATION SQUARE OPENING MACHINE NWSS-HDK1200S TYPE

机加设备
MACHINE
PROCESSING



T 技术参数 Technical Parameter

主体尺寸(含外围功能设备尺寸)
Main body size (including peripheral functional device size)

长*宽*高7820*5370*3800mm
(Length * Width * Height 7820 * 5370 * 3800mm)

占地面积
Floor area

(长*宽) 7820*5370mm
(Length * Width) 7820 * 5370mm

重量
weight

≈20000kg (具体以实物为准)
≈20000kg (subject to actual product)

周边环境
Surrounding environment

温度10~35℃;相对湿度≤45%,
不结露;周围无腐蚀性介质、强电磁干扰和强振动;
Temperature range of 10-35 °C; Relative humidity ≤ 45%, no condensation;
no corrosive medium, strong electromagnetic interference, or strong vibration around

额定功率(汇川伺服)
Rated power (Inovance servo)

≈32kw, 380V ± 5% AC, 50 ± 1Hz, 三相五线制;
≈32kw, 380V ± 5% AC, 50 ± 1Hz, three-phase five wire system

气源压力/流量
Gas source pressure/flow rate

0.5~0.7Mpa/均值≈25m³/hr
0.5-0.7Mpa/Mean ≈ 25m³/hr

进水压力/流量
Inlet pressure/flow rate

0.2~0.3MPa/均值≈3m³/hr
0.2-0.3MPa/mean ≈ 3m³/hr

出水口(切削用水)
Water outlet (cutting water)

外径Φ76mm
outer diameter of Ø 76mm

排风量/排风口
Exhaust air volume/exhaust outlet

均值≈1200m³/hr/外径200mm PVC管*2个
Mean ≈ 1200m³/hr/200mm outer diameter PVC pipe * 2

润滑
lubrication

润滑油采32#抗磨液压油, 润滑脂采000#极压锂基脂
Lubricating oil is 32 # anti-wear hydraulic oil, lubricating grease is 000 # extreme pressure

E 设备运行参数

Equipment operating parameters

加工方式 Processing method	双工位 (整棒4线切割) (注: 带有半剖功能时为5线切割) Dual station (whole bar 4-wire cutting) (note: 5-wire cutting with half section function)
工件直径范围 Range of workpiece diameter	Φ240~Φ340mm
工件高度范围 Workpiece height range	加工硅棒长度范围: 300mm~1200mm, 加工装可加工150mm~1050mm Processing silicon rod length range: 300mm~1200mm, processing equipment can process 150mm~1050mm (150mm~300mm manual loading and unloading)
加工方棒边距范围 Range of edge distance for processing square bars	加工边距范围: 170mm~240mm (注: 182-212mm整棒规格 可自由切换) 2#工位兼容182、210半棒 (需要更换相应配件) Processing margin range: 170mm~240mm (note: 182-212mm whole rod specifications can be freely switched) 2 # workstation is compatible with 182 and 210 half rods (corresponding accessories need to be replaced)
晶棒上料定中心方式 Center setting method on crystal rod	机械手夹爪配合V型工作台自适应 Mechanical arm gripper with adaptive V-shaped worktable
晶棒对棱方式 Crystal rod alignment method	使用测量仪器自动找棱 Using measuring instruments to automatically find edges
取边皮方式 Edge skin extraction method	边皮通过设备内部输送机构输出/外部机械手运至指定位置 The wing is transported to the designated position through the internal conveying mechanism of the equipment/external robotic arm
上/下料方式 Loading/unloading method	人工或AGV或机械手 (AGV或机械手由用户配置) Manual or AGV or robotic arm (AGV or robotic arm is configured by the user)
触摸屏操作盘 Touch screen operation panel	机床侧面落地式 Machine tool side floor standing type

P 工艺运行参数

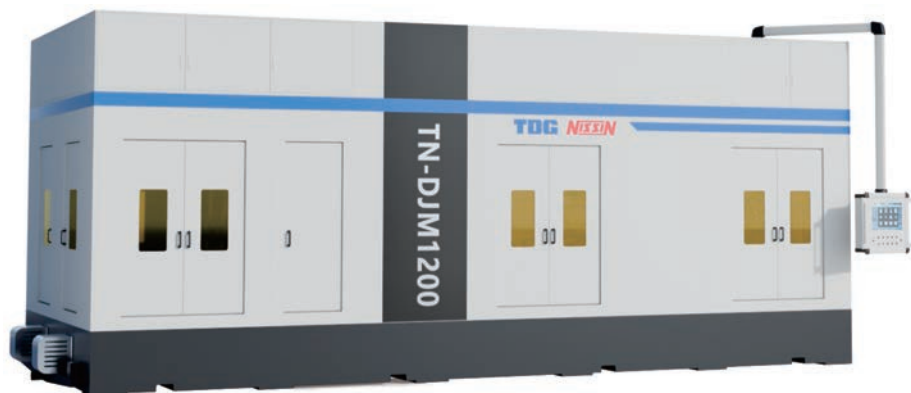
Process operating parameters

环线线径 Loop line diameter	Φ0.4~Φ0.5mm, 验收按照 (Φ0.42mm环线验收) Φ0.4~Φ0.5mm, (Φ0.42mm for Acceptance)
环线运动速度 Loop motion speed	0~50m/s (可调 (Adjustable))
环线长度 Loop length	4320mm
切割进给速度 Cutting feed speed	0~120mm/min (视工艺可调 (Adjustable))
台面快速移动速度 Rapid movement speed of the tabletop	Max25000mm/min
线张力/控制方式 Line tension/control mode	Max150N/气缸 Max150N/Air cylinder

双工位截磨一体机TN-DJM1200

TN-DJM1200 DUAL STATION CUTTING AND GRINDING MACHINE

机加设备
MACHINE
PROCESSING



本设备采用全新结构，配备2个竖式半剖切割架、4个磨面主轴、2个倒角主轴，可同时对2根整棒进行半剖和磨倒加工。设备具备外部缓存机构，可对接自动化。

This equipment adopts a brand new structure, equipped with 2 vertical semi cutting frames, 4 grinding spindles, and 2 chamfering spindles, which can simultaneously perform semi cutting and grinding on 2 whole rods. The device has an external caching mechanism that can be integrated with automation.

M 机型特点 MODEL FEATURES

- 1 效率高：**双工位卧式设计，可同时对2根整棒进行半剖和磨倒；
High efficiency: With a dual station horizontal design, it can simultaneously perform half cutting and grinding on two whole rods;
- 2 半剖尺寸精度高：**采用竖式半剖结构，切割面粗糙度低，线痕小，损伤层低，单边留磨量少，有效缩短后道工序加工时间，降低硅料损耗，提升磨倒产能；
High dimensional accuracy of half section: adopting a vertical half section structure, the cutting surface roughness is low, the line marks are small, the damage layer is low, and the single-sided grinding amount is small, effectively shortening the processing time of the subsequent process, reducing silicon material loss, and improving grinding capacity;
- 3 切割适应性强：**支持M10、G12 主流规格方棒，边距自动兼容182~245mm，棒长自动兼容150mm~1200mm；
Strong cutting adaptability: Supports mainstream specifications of M10 and G12 square bars, with edge distance automatically compatible with 182-245mm and bar length automatically compatible with 150mm-1200mm;
- 4 自动化水平高：**来料自动识别棒长和宽度，整棒上料、内部搬运、半棒下料，均可实现自动化工作。外置缓存工位及助力臂，既可人工上下料，也可对接自动化。
High level of automation: Automatic identification of rod length and width for incoming materials, including whole rod loading, internal handling, and half rod unloading, all of which can achieve automated work. External caching station and assist arm, which can be manually loaded and unloaded, as well as connected to automation.

技术参数

Technical Parameter

主机尺寸 Host size	(长*宽*高(L*W*H)) 7550*3300*3300mm
主机重量 Weight	≈40t
额定功率 rated power	≈110kw, 380V±5%AC, 50±1Hz
气源压力/流量 Gas source pressure/flow rate	0.5~0.7Mpa/≈50m ³ /hr
进水压力/流量 Inlet pressure/flow rate	0.2~0.3MPa/≈10m ³ /hr
排风量/排风口 Exhaust air volume/exhaust outlet	≈25404m ³ /hr/Φ150mm*4
砂轮规格 Grinding wheel specifications	粗磨Φ300mm, 120#, 4个 精磨Φ350mm, 800#, 4个 Rough grinding Φ300mm, 120#, 4 Fine grinding Φ350mm, 800#, 4
砂轮转速 Wheel Speed	Max 4000rpm
倒角砂轮规格 Specification of chamfering grinding wheel	倒角Φ120mm, 800#, 2个 Chamfering Φ120mm, 800#, 2
倒角砂轮转速 Chamfering wheel speed	Max 24000rpm
排水口尺寸 Drainage outlet size	外径Φ150mm*2个 Outer Φ150mm*2
加工长度 Machining length	150mm~1200mm
边距范围 Margin Range	1821mm~245mm
边距公差 Margin tolerance	±0.03mm
相邻面夹角 Angle between adjacent faces	90°±0.02°
弧长、倒角误差 Arc length and chamfer error	±0.1mm
粗糙度 roughness	≤Ra0.15μm
加工效率 processing efficiency	H1000mm, 12吋硅棒: 磨面、抛光、倒角≤10min/1根半棒 H1000mm, 12-inch silicon rods: grinding, polishing, chamfering ≤ 10 minutes per half rod

单根立式磨倒机

SINGLE VERTICAL GRINDING MACHINE

机加设备
MACHINE
PROCESSING

A 产品优势 DVANTAGE

- 1** 采用直线导轨配合气缸压紧工件，精度由直线导轨保证。
Using a linear guide rail in conjunction with a cylinder to compress the workpiece, the accuracy is guaranteed by the linear guide rail.
- 2** 工件竖直放置，重心处于工件轴心，稳定可靠。
The workpiece is placed vertically with the center of gravity on the workpiece axis, ensuring stability and reliability.
- 3** 工件一次装夹完成粗磨到精磨以及滚圆/倒角的磨削加工，精度高。
The workpiece is clamped in one go to complete the grinding process from rough grinding to fine grinding, as well as the grinding process of rounding/chamfering, with high accuracy.
- 4** 配有检测机构，硅棒自动定中心。
Equipped with a detection mechanism, the silicon rod automatically centers.
- 5** 高精度浮动球面针对有端面偏差的工件具有自适应功能。
The high-precision floating sphere has adaptive function for workpieces with end face deviation.
- 6** 具有磨削后尺寸自动测量及储存功能。
It has the function of automatic measurement and storage of dimensions after grinding.
- 7** 自动化程度高，自动完成检测、磨削、清洗吹干工序。
High degree of automation, automatic completion of detection, grinding, cleaning and drying processes.
- 8** 具有MES接口预留，可以在生产过程中对机器的各种数据进行采集。
Equipped with MES interface reservation, various data of the machine can be collected during the production process.
- 9** 具有远程调试功能预留，可以对机器进行远程诊断、维护和软件升级。
Reserved with remote debugging function, allowing for remote diagnosis, maintenance, and software upgrades of the machine.



T 技术参数 Technical Parameter

主机尺寸 Host size	2965×2900×3500mm
硅棒直径 Silicon rod diameter	Φ220-Φ340mm
硅棒长度 Silicon rod length	200-1000mm
加工边距 Processing margin	166~230mm (兼容矩形棒、半棒, 无须更换工装) 166~230mm (Compatible with rectangular rod and half rod, no need to change tools)
磨头数量 Number of grinding heads	2个 (单磨头双砂轮组合) 2 units (single grinding head with dual grinding wheels combination)
边距公差 Margin tolerance	±0.03mm
边距极差 Marginal range	≤0.03mm
直径/对角线公差 Diameter/diagonal tolerance	±0.03mm
倒角宽度公差 Chamfer width tolerance	±0.2mm
弧长投影公差 Arc length projection tolerance	±0.2mm
四平面粗糙度 Four plane roughness	≤Ra0.1μm
弧面粗糙度 Curved surface roughness	≤Ra0.2μm
方棒四面夹角 The angle between the four sides of a square rod	≤90°±0.02°
方棒四面平面度 Planarity of four sides of a square bar	≤0.03mm
加工效率 Processing efficiency	H700mm, M10滚圆棒: ≤28min (不含辅助时间); H700mm, M10 round bar: ≤ 28 minutes (excluding auxiliary time); H700mm, M10直角棒: ≤23min (不含辅助时间); H700mm, M10 right-angle bar: ≤ 23 minutes (excluding auxiliary time); 单台设备产出方棒: ≈2.2t/天 Output per single equipment: ≈ 2.2 tons per day



双工位磨抛一体机NVG-DMD1200

DUAL STATION GRINDING AND POLISHING INTEGRATED MACHINE NVG-DMD1200

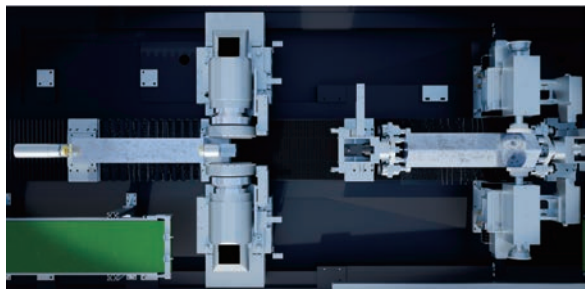
机加设备
MACHINE
PROCESSING



该机型用于太阳能光伏行业的单晶硅棒/多晶硅块的磨面、抛光、滚圆、倒角环节加工。该机型采用了全新的结构，配备有双夹紧移动加工架，使得磨面、抛光工序与倒角滚圆工序分开，节约加工时间；标配搞高精度上料夹爪机构，保证加工的精度；同时上下料架外置设计，实现内部在加工时，外部在上料检测，可直接对接自动化机构，实现短时间内上下料，可选配加工半棒功能。

This model is used for grinding, polishing, rounding, and chamfering of monocrystalline silicon rods/polycrystalline silicon blocks in the solar photovoltaic industry. This model adopts a brand new structure and is equipped with a dual clamping mobile processing frame, which separates the grinding and polishing processes from the chamfering and rounding processes, saving processing time; Equipped with high-precision feeding gripper mechanism as standard to ensure machining accuracy; At the same time, the external design of the loading and unloading rack enables internal processing and external loading detection, which can be directly connected to the automation mechanism to achieve short-term loading and unloading. It can also be equipped with the function of processing half bars.

M 机型特点 MODEL FEATURES



该机型最主要的特色磨面磨头与倒角磨头是独立设置的。在磨削过程中，两个夹紧架是一起同步运行的，即在一根在磨面的同时另一根已经磨完面的在倒角，在磨削完毕后下料机械手下倒角完的料后取磨面工位料到倒角工位，在倒角工位装夹过程中，上机械手上新料到磨面工位上装夹，完成后开始同步磨削。

The main feature of this model is that the grinding head and chamfering head are independently set. During the grinding process, the two clamping frames run synchronously together, that is, one is on the grinding surface while the other has already been ground and chamfered. After the grinding is completed, the material chamfered by the cutting machine is taken from the grinding station to the chamfering station. During the clamping process at the chamfering station, the new material is loaded onto the grinding station by the upper robot and clamped. After completion, synchronous grinding begins.

技术参数

Technical Parameter

主机尺寸 Host size	(长*宽*高 (L*W*H)) 6200*2300*2350mm
主机重量 Weight	≈20000kg
额定功率 rated power	≈50kw, 380V±5%AC, 50±1Hz
气源压力 Mpa	0.5~0.7Mpa / ≈15m ³ /hr
进水压力/流量 Inlet pressure/flow rate	0.2~0.3MPa / ≈4m ³ /hr
排风量/排风口 Exhaust air volume/exhaust outlet	≈600m ³ /hr / Φ95mm*2
砂轮规格 Grinding wheel specifications	粗磨Φ300mm, 120#金属结合剂 Coarse grinding: Φ300mm, 120# metal bond; 精磨Φ350mm, 800#树脂结合剂 Fine grinding: Φ350mm, 800# resin bond
砂轮转速 Wheel Speed	Max 3000rpm
倒角砂轮规格 Specification of chamfering grinding wheel	Φ160mm, 倒角800#树脂结合剂; 160mm diameter, chamfered at 800# resin binder; 修弧: 粗磨120#金属结合剂; 精磨 800#树脂结合剂 Arc finishing: rough grinding with 120# metal binder; fine grinding with 800# resin binder
倒角砂轮转速 Chamfering wheel speed	Max 8000rpm
排水口尺寸 Drainage outlet size	外径Φ76mm Outer Φ76mm
加工高度 Processing height	300mm~1200mm
加工边距范围 Processing margin range	166mm~240.00mm, 半棒需配工装 166mm~240.00mm, tools needed for half rod
加工直径范围 Processing diameter range	Φ230mm~Φ340mm
边距、直径、倒角公差 Margin, diameter, chamfer tolerance	±0.04mm
四平面相邻夹角 Adjacent angles of four planes	90°±0.03°
弧长、倒角误差 Arc length and chamfer error	±0.2mm
粗糙度 Roughness	四面≤Ra0.1μm/圆弧≤Ra0.2μm Four sides ≤ Ra0.1 μm / Arc ≤ Ra0.2 μm
加工效率 Processing efficiency	H700mm硅方: 磨面、抛光、倒角≤20min每根(取决于磨余量) H700mm silicon block: Grinding, polishing, chamfering ≤ 20 minutes per piece (depending on the remaining material) H700mm硅方: 磨面、抛光、滚圆≤25min每根(取决于磨余量) H700mm silicon block: Grinding, polishing, chamfering ≤ 25 minutes per piece (depending on the remaining material)

回制料加工线

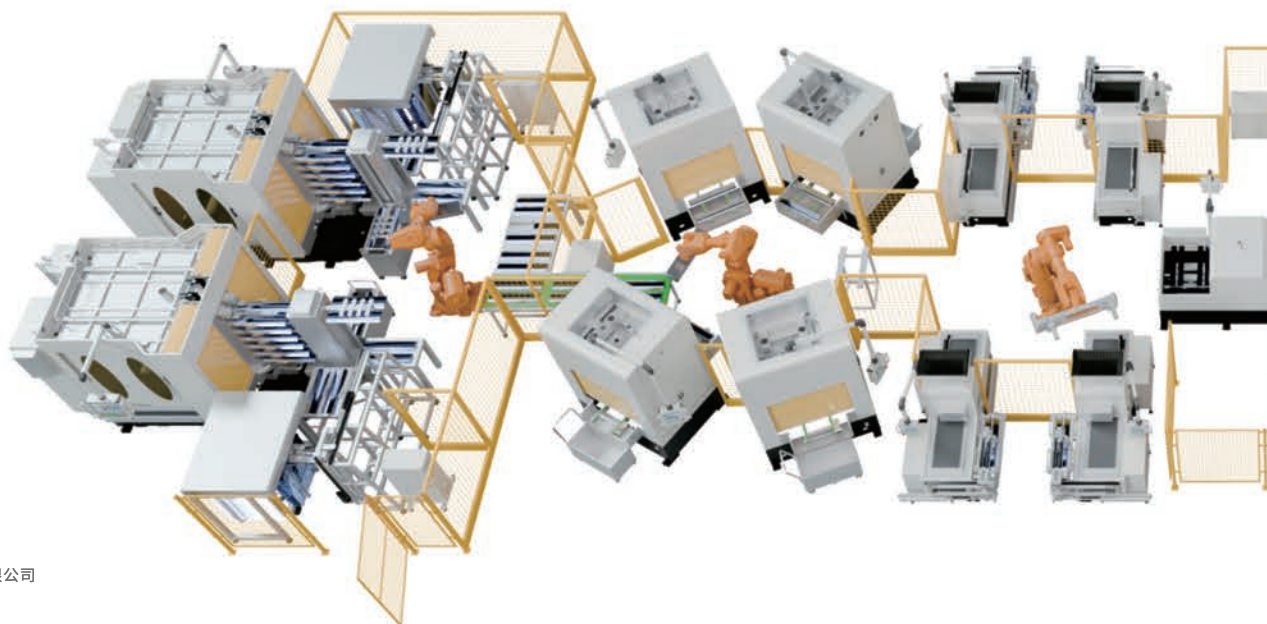
SMALL PIECE RECYCLED MATERIAL PROCESSING LINE

机加设备
MACHINE
PROCESSING



A 产品优势 DVANTAGE

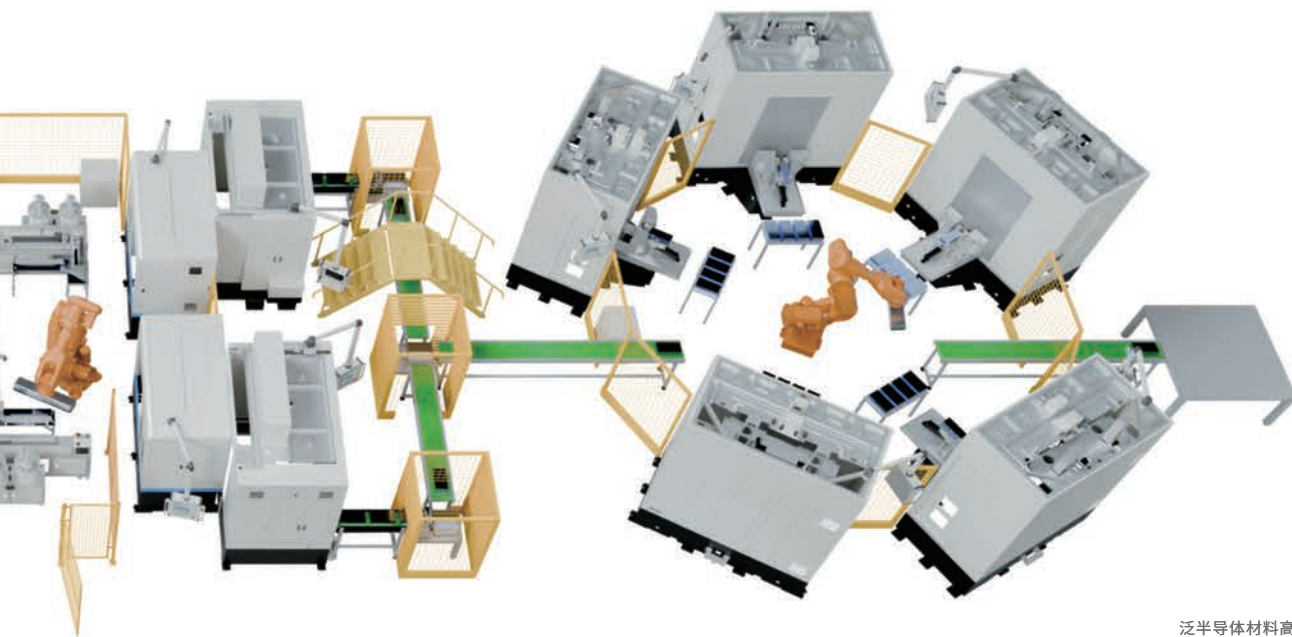
- 1 整线工序：上料→去顶→去耳→修面→清洗→点胶→压胶截断→磨倒→下料。**
The entire production process: loading → removing the top → removing the ears → trimming → cleaning → dispensing → pressing and cutting → grinding down → unloading.
- 2 全自动进行回制料加工，每个工序地衔接采用输送带、桁架或者六轴机器人。**
Fully automatic processing of recycled materials, with each process connected by conveyor belts, trusses, or six axis robots.
- 3 产出的边角料均有专用收集小车，人工定期更换。**
The produced scraps are collected by dedicated collection carts and replaced regularly by manual labor.
- 4 整体布局紧凑，占地面积小，人员配备少，自动化程度高。**
The overall layout is compact, with a small footprint, fewer personnel, and a high degree of automation.
- 5 具有MES接口预留，可以在生产过程中对机器的各种数据进行采集。**
Equipped with MES interface reservation, various data of the machine can be collected during the production process.
- 6 具有远程调试功能预留，可以对机器进行远程诊断、维护和软件升级。**
Reserved with remote debugging function, allowing for remote diagnosis, maintenance, and software upgrades of the machine.



T 技术参数

Technical Parameter

1GW整线尺寸 1GW full line size	45000×12000×3500mm
来料规格 Incoming material specifications	182mm规格/210mm规格(厚度32~55mm)
来料长度 Incoming length	650~900mm
加工边距 Processing margin	长×宽≈182×91mm/210×105mm(粘接后高度≈200~400mm)
环线直径 Loop diameter	φ0.42mm
环线张力 Loop tension	0~150N
边距公差 Margin tolerance	±0.03mm
边距极差 Marginal range	≤0.03mm
直径/对角线公差 Diameter/diagonal tolerance	±0.03mm
倒角宽度公差 Chamfer width tolerance	±0.2mm
四平面粗糙度 Four plane roughness	≤Ra0.15μm
方棒四面夹角 The angle between the four sides of a square rod	≤90°±0.02°
方棒四面平面度 Planarity of four sides of a square bar	≤0.03mm
加工效率 Processing efficiency	1GW整线产能:≈1000根/天(回制料小块:≈4000块/天)



小块回制料加工线

SMALL PIECE RECYCLED MATERIAL PROCESSING LINE

机加设备
MACHINE
PROCESSING

A 产品优势 ADVANTAGE

- 1 整线工序：上料→去顶→去耳→小块截断→小块磨倒→下料。

Enterprise qualification whole line process: loading → top removal → ear removal → small piece cutting → small piece grinding down → material cutting.

- 2 全自动进行回制料加工，每个工序地衔接采用输送带或者六轴机器人。

Fully automatic processing of recycled materials, with each process connected by conveyor belts or six axis robots.

- 3 产出的边角料均有专用收集小车，人工定期更换。

The produced scraps are collected by dedicated collection carts and replaced regularly by manual labor.

- 4 整体布局紧凑，占地面积小，人员配备少，自动化程度高。

The overall layout is compact, with a small footprint, fewer personnel, and a high degree of automation.

- 5 具有MES接口预留，可以在生产过程中对机器的各种数据进行采集。

Equipped with MES interface reservation, various data of the machine can be collected during the production process.

- 6 具有远程调试功能预留，可以对机器进行远程诊断、维护和软件升级。

Reserved with remote debugging function, allowing for remote diagnosis, maintenance, and software upgrades of the machine.



T 技术参数 Technical Parameter

1GW整线尺寸 1GW full line size	29000×12000×3100mm
来料规格 Incoming material specifications	182mm规格/210mm规格(厚度32~55mm)
来料长度 Incoming length	650~900mm
加工尺寸 Processing dimensions	长×宽≈182×91mm/210×105mm(厚度20~33mm)
环线直径 Loop diameter	φ0.42mm
环线张力 Loop tension	0~150N
边距公差 Margin tolerance	±0.03mm
边距极差 Marginal range	≤0.03mm
直径/对角线公差 Diameter/diagonal tolerance	±0.03mm
倒角宽度公差 Chamfer width tolerance	±0.2mm
四平面粗糙度 Four plane roughness	≤Ra0.15μm
方棒四面夹角 The angle between the four sides of a square rod	≤90°±0.02°
方棒四面平面度 Planarity of four sides of a square bar	≤0.03mm
加工效率 Processing efficiency	回制料小块:≈4000块/天(1GW整线产能:≈1000根/天)



蓝宝石切片机TNSM4700

SAPPHIRE SLICER TNSM4700

机加设备
MACHINE
PROCESSING



高刚性

Rigidity



超高速

Ultra High-speed



高负荷摆动

High Load Swing



智能化

Intelligent



大张力

High Tension

本设备专为蓝宝石、石英等大尺寸晶体加工设计，能够实现对1吨1060mm(W)*840mm(H)*990mm(L)蓝宝石晶体的高精度切割，其平面度控制在 $\leq 0.3\text{mm}$ 以内。采用创新的结构设计，集成了单线切割、视觉识别、工作台自动移动旋转以及自动对刀等多项功能，以最大程度地满足客户多样化的切割需求。

This equipment is designed specifically for processing large-sized crystals such as sapphire and quartz, and can achieve high-precision cutting of 1 ton of 1060mm (W) * 840mm (H) * 990mm (L) sapphire crystals, with flatness controlled within $\leq 0.3\text{mm}$. Adopting innovative structural design, it integrates multiple functions such as single line cutting, visual recognition, automatic worktable movement and rotation, and automatic tool alignment to maximize the satisfaction of customers' diverse cutting needs.

M 机型特点 MODEL FEATURES

- 1 高刚性:** 整机结构有限元分析确保了设备具有卓越的刚性和热稳定性,有效降低了高速运转时的振动现象;
High rigidity: Finite element analysis of the entire machine structure ensures excellent rigidity and thermal stability of the equipment, effectively reducing vibration phenomena during high-speed operation;
- 2 大张力:** 先进的张力系统控制,最高张力达120N,确保切割过程中的平稳高速运行,显著减轻切割线痕;
High tension: Advanced tension system control, with a maximum tension of 120N, ensures smooth and high-speed operation during the cutting process, significantly reducing cutting line marks;
- 3 超高速:** 最高线速度可达1800m/min;
Ultra high speed: The highest linear speed can reach 1800m/min;
- 4 高负荷摆动:** 升降机构采用高负荷摇摆方案设计,保证在承受较大张力的情况下,实现从上至下的整体切割精度和高效率;
High load swing: The lifting mechanism is designed with a high load swing scheme to ensure overall cutting accuracy and efficient cutting efficiency from top to bottom under high tension;
- 5 智能化:** 可选配智能实现自动对刀,可选配自动上下料机构实现自动上下料。
Intelligence: Optional intelligent tool alignment and automatic loading and unloading mechanism for automatic loading and unloading.



- 预留远程调试功能, 可以对机器进行远程诊断、维护和软件升级。
Reserved remote debugging function, which can perform remote diagnosis, maintenance, and software upgrades on the machine.
- 预留MES接口, 可以在生产过程中对机器的各种数据进行采集。
Reserved MES interface, which can collect various data of the machine during the production process.
- 可配置集控软件实现设备数据采集和控制。
Configurable centralized control software enables device data collection and control.

T 技术参数 Technical Parameter

最大工件尺寸 Maximum workpiece size	4-6" L700mm
进线方向 Incoming direction	单向进线/双向进线 Single-direction input / Bidirectional input 2400m/min
最大线速 Maximum line speed	2400m/min
轴间距 distance between shafts	350mm
主辊数量 Number of main rollers	2
主辊外径 Outer diameter of main roller	Φ192mm-Φ202mm
张力范围 Tension range	10-50N
张力控制轮行程 Tension control wheel stroke	±15°
切割方式 Cutting method	下切割 Lower cutting
工件移动行程 Workpiece movement stroke	240mm
工件摆动范围 Workpiece swing range	±10°
储线量 Storage capacity	40KG
小导轮直径 Small guide wheel diameter	Φ165mm
小导轮数量 Number of small guide wheels	6
切割液水箱容量 Capacity of cutting fluid water tank	700L
切割液泵功率 Cutting fluid pump power	7.5KW
切割液流量 Cutting fluid flow rate	Max300L/min
切割液热交换方式 Cutting fluid heat exchange method	冷却水控制, 双通道, 板式换热器 Cooling water control, dual channels, lever-type heat exchanger
切割液热交换面积 Cutting fluid heat exchange area	10.5m ²
操作面板 operation panel	中文彩色触摸屏15" Color touch screen 15" 5040×1750×3480mm
主体尺寸长×宽×高 Main dimensions: length x width x height	5040×1750×3480mm
设备重量 Equipment weight	13000kg
工件固定方式 Workpiece fixing method	自动 Automatically

多工位晶体截断机

SINGLE LINE CUTTING MACHINE

机加设备

MACHINE
PROCESSING



双工位晶体截断机(蓝宝石)

TN-DXQ-2-1000



三工位晶体截断机(蓝宝石)

TN-DXQ3-650

功能对比 Function comparison	TN-DXQ-2-1000	TN-DXQ-3-650
设备外观尺寸 Equipment appearance dimensions	5230×2670×2700mm	6000×2320×2780mm
设备精度 Equipment accuracy	任意100cm ² 的切割面上,平面度<0.5mm;与工作台面的垂直度<0.1° On any 100cm ² cutting surface, the flatness is less than 0.5mm; the perpendicularity to the workbench is less than 0.1°	
可切割行程 Cutting stroke	0~1100mm	0~1100mm
可切割宽度 Cutting width	≤1000mm	≤650mm
切割线速度 Cutting line speed	0~25m/s可调(电机额定) 0~25m/s adjustable (motor rated)	
切割进给速度 Cutting feed speed	0~999mm/min可调 Adjustable from 0 to 999mm/min	
切割线张力 Cutting line tension	0~120N可调(电机额定) 0~120N adjustable (motor rated)	
金刚线线径 Diamond wire diameter	Φ0.23~Φ0.5mm	
切割进给机构 Cutting feed mechanism	精密直线导轨和丝杠传动模组机构 Precision linear guide and screw drive module mechanism	
设备精度 Equipment accuracy	任意100cm ² 的切割面上,平面度<0.5mm;与工作台面的垂直度<0.1° On any 100cm ² cutting surface, the flatness is less than 0.5mm; the perpendicularity to the workbench is less than 0.1°	
切割进给电机 Cutting feed motor	4×400W伺服驱动电机 4×400W servo drive motor	6×400W伺服驱动电机 6×400W servo drive motor
摇摆切割 Swing cutting	摇摆幅度:15mm;摇摆度:1000mm/min Swing amplitude: 15mm; Swing degree: 1000mm/min	
收放线机构电机 Cable retraction mechanism motor	2×12KW伺服驱动电机 2×12KW servo drive motor	
排线机构电机 Cable laying mechanism motor	2×1KW伺服驱动电机(配1:10减速机) 2×1KW servo drive motor (equipped with 1:10 reducer)	
张力机构电机 Tension mechanism motor	2×7.5KW伺服驱动电机 2×7.5KW servo drive motor	
驱动轮机构电机 Drive wheel mechanism motor	1×5KW伺服驱动电机 1×5KW servo drive motor	2×5KW伺服驱动电机 2×5KW servo drive motor
控制系统PLC Control system PLC	汇川 Inovance	
触控显示屏 Touch screen display	汇川/昆仑通态(一台) Huichuan/Kunlun Tongtai (one unit)	
晶锭切割位置对刀 Cutting position alignment of crystal ingot	自动对刀精度0.1°(晶锭基准块) Automatic tool alignment accuracy of 0.1° (ingot reference block)	
工作台旋转 Workbench rotation	2套自动旋转 2 sets of automatic rotation	3套自动旋转 3 sets of automatic rotation
工作台前后移动行程 Front and rear movement of workbench	0~990mm	0~620mm
工作台前后移动电机 Workbench front and rear moving motor	2×1.5KW伺服驱动电机 2×1.5KW servo drive motor	3×1.5KW伺服驱动电机 3×1.5KW servo drive motor
移门 sliding door	自动门 Automatic Door	
设备主体重量 Equipment body weight	13t	15t
设备主体颜色 Equipment body color	象牙白色RAL1013 Ivory white RAL1013	
电源电压 Supply voltage	380VAC	
控制电压 Control voltage	24VDC	
电力负荷 Electric load	51KVA	
抽水雾口 Pump mist outlet	2×口径200mm 2 x 200mm caliber	3×口径200mm 3 x 200mm caliber
预留远程调试功能,可以对机器进行远程诊断、维护和软件升级。 Reserved remote debugging function, which can perform remote diagnosis, maintenance, and software upgrades on the machine.		
预留MES接口,可以在生产过程中对机器的各种数据进行采集。 Reserved MES interface, which can collect various data of the machine during the production process.		
可配置集控软件实现设备数据采集和控制。 Configurable centralized control software enables device data collection and control.		

高精度单工位蓝宝石多线截断机

HIGH PRECISION SINGLE STATION SAPPHIRE MULTI LINE CUTTING MACHINE

机加设备

MACHINE
PROCESSING



高精度单工位蓝宝石多线截断机

TN-TD1000CA



高精度单工位蓝宝石多线截断机

TN-TD600CA

功能对比 Function comparison	TN-TD1000CA	TN-TD600CA
设备外观尺寸 Equipment appearance dimensions	4600×3300×4300mm	3600×2700×3600mm
设备精度 Equipment accuracy	任意100cm ² 的切割面上, 平面度<0.3mm; 与工作	任意100cm ² 的切割面上, 平面度<0.3mm; 与工作
可切割行程 Cutting stroke	0-1100mm	0-600mm
可切割宽度 Cutting width	≤1000mm	≤700mm
切割线速度 Cutting line speed	0~25m/s 可调(电机额定) 0-25m/s adjustable (motor rated)	
切割进给速度 Cutting feed speed	0-999mm/min 可调 Adjustable from 0 to 999mm/min	0-999mm/min 可调 Adjustable from 0 to 999mm/min
切割线张力 Cutting line tension	0~120N 可调(电机额定) 0-120N adjustable (motor rate)	0~120N 可调(电机额定) 0-120N adjustable (motor rate)
金刚线线径 Diamond wire diameter	φ0.23-φ0.42mm	φ0.23-φ0.42mm
切割进给机构 Cutting feed mechanism	精密直线导轨和丝杆传动机构 Precision linear guide and screw drive mechanism	
设备精度 Equipment accuracy	任意100cm ² 的切割面上, 平面度<0.3mm; 与工作台面的垂直度<0.1° On any 100cm ² cutting surface, the flatness is less than 0.3mm; the perpendicularity to the workbench is less than 0.1°	
切割进给电机 Cutting feed motor	1.8KW 伺服驱动电机 1.8KW servo drive motor	1.8KW 伺服驱动电机 1.8KW servo drive motor
摇摆切割 Swing cutting	摇摆角度: ±10°; 摇摆度: 1000mm/min Swing angle: ±10°; Swing degree: 1000mm/min	摇摆角度: ±10°; 摇摆度: 1000mm/min Swing angle: ±10°; Swing degree: 1000mm/min
收放线机构电机 Cable retraction mechanism motor	2×12KW 伺服驱动电机 2×12KW servo drive motors	2×12KW 伺服驱动电机 2×12KW servo drive motors
排线机构电机 Cable laying mechanism motor	2×0.75KW 伺服驱动电机 2×0.75KW servo drive motors	2×0.75KW 伺服驱动电机 2×0.75KW servo drive motors
张力机构电机 Tension mechanism motor	2×7.5KW 伺服驱动电机 2×7.5KW servo drive motors	2×7.5KW 伺服驱动电机 2×7.5KW servo drive motors
驱动轮机构电机 Drive wheel mechanism motor	2×3KW 伺服驱动电机 2×3KW servo drive motors	2×3KW 伺服驱动电机 2×3KW servo drive motors
控制系统 PLC Control system PLC	汇川 Inovance	汇川 Inovance
触控显示屏 Touch screen display	汇川/昆仑通态(一台) Inovance/Kunlun Tongtai (one)	汇川/昆仑通态(一台) Inovance/Kunlun Tongtai (one)
工作台旋转 Workbench rotation	1套自动旋转 1 set of automatic rotation	1套自动旋转 1 set of automatic rotation
工作台前后移动行程 Front and rear movement of workbench	0~980mm	0~900mm
工作台前后移动电机 Workbench front and rear moving motor	1.5KW 伺服驱动电机 1.5KW servo drive motor	1.5KW 伺服驱动电机 1.5KW servo drive motor
设备主体重量 Equipment body weight	20T	15T
设备主体颜色 Equipment body color	灰白色 RAL9002 Grey white RAL9002	灰白色 RAL9002 Grey white RAL9002
电源电压 Supply voltage	380VAC	380VAC
控制电压 Control voltage	24VDC	24VDC
电力负荷 Electric load	50KVA	50KVA
抽水雾口 Pump mist outlet	2×口径95mm 2×95mm caliber	2×口径95mm 2×95mm caliber
预留远程调试功能, 可以对机器进行远程诊断、维护和软件升级。 The remote debugging function is reserved, allowing for remote diagnosis, maintenance and software upgrade of the machine.		
预留MES接口, 可以在生产过程中对机器的各种数据进行采集。 Reserve the MES interface, which enables the collection of various data from the machines during the production process.		

可配置集控软件实现设备数据采集和控制

拉晶到方棒加工自动化整体解决方案

INTEGRATED SOLUTION FOR AUTOMATION OF CRYSTAL PULLING TO SQUARE BAR PROCESSING

自动化设备
AUTOMATION
EQUIPMENT

智能车间层



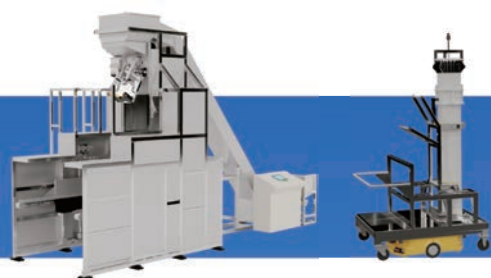
智能产线层



智能装备层



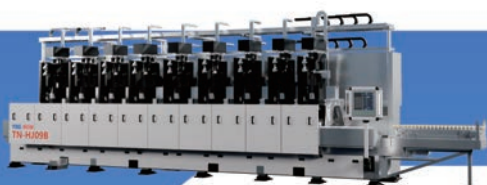
装料



拉晶



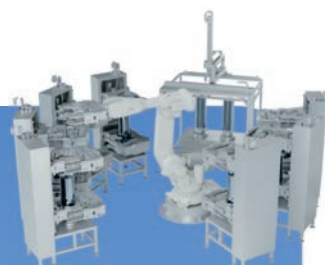
截断



圆棒检



粘棒



开方磨倒



磨后检



A 产品优势 DVANTAGE

- 1** 系统架构先进,支持分布式调度,支持微服务化运行。
The enterprise qualification system architecture is advanced, supporting distributed scheduling and microservice operation.
- 2** 通过高效的资源管理和优化算法,我们的系统在保证性能的同时,极大地降低了对硬件资源的占用,实现了高效的资源利用。
Through efficient resource management and optimization algorithms, our system greatly reduces the occupation of hardware resources while ensuring performance, achieving efficient resource utilization.
- 3** 通过引入负载均衡、容灾备份等技术手段,系统能够在面临各种挑战时保持高度的稳定性和可靠性。
By introducing technologies such as load balancing and disaster recovery backup, the system can maintain high stability and reliability in the face of various challenges.
- 4** 系统采用了模块化设计,易于维护和扩展,有利于适配厂家现有的生产系统。
The system adopts a modular design, which is easy to maintain and expand, and is conducive to adapting to the existing production systems of manufacturers.
- 5** 远程控制支持客户端及远程桌面两种方式,客户端方式性能好,远程桌面方式兼容性强。
Remote control supports both client and remote desktop modes, with good performance in client mode and strong compatibility in remote desktop mode.
- 6** 数据统计全面,即可单独为各部门提供所需全部数据,也可为其他系统做数据支持行业覆盖范围广,已涵盖拉晶、机加等环节,有利于数据打通。
Comprehensive data statistics can provide all the required data for each department separately, and can also provide data support for other systems with a wide industry coverage, covering processes such as crystal drawing and machining, which is conducive to data integration.
- 7** 根据厂家个性化需求定制功能,采用功能模块组件化覆盖业务痛点。
Customize functions according to the personalized needs of the manufacturer, and use functional module componentization to cover business pain points.

5 大组成 系统

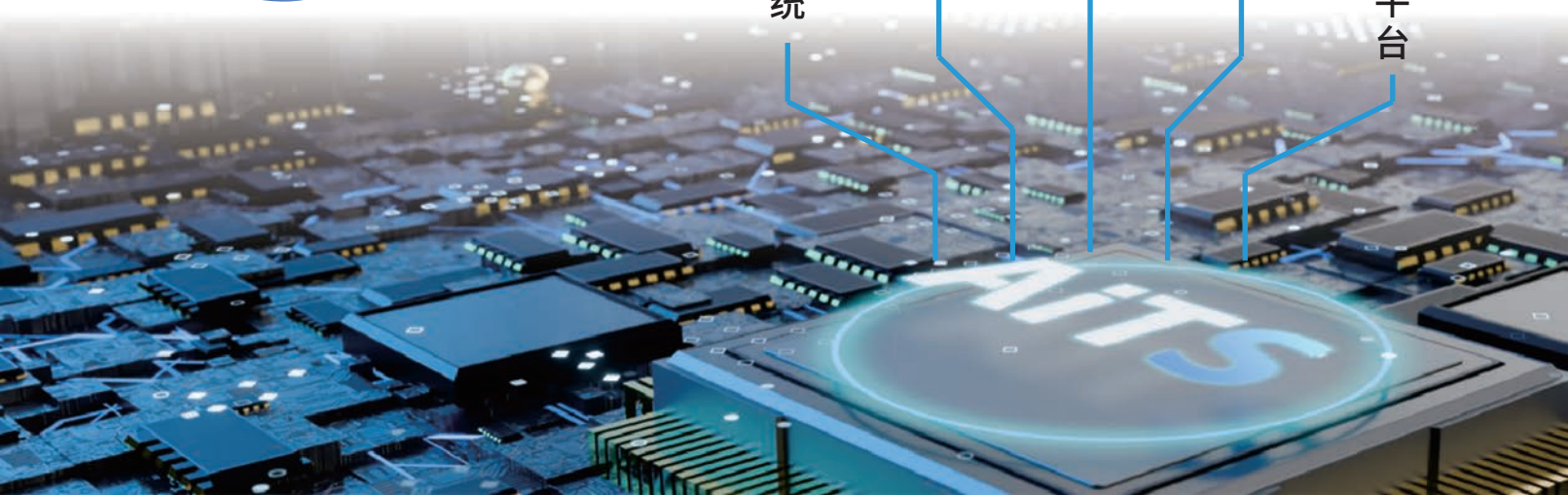
硅长晶智能控制系统

通用集控

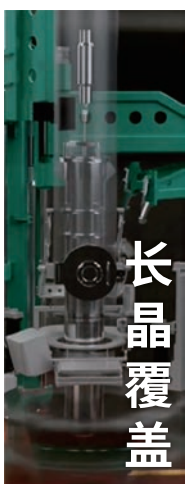
数字孪生

AI智能控制系统

天通智能长晶智控平台



自动化加工场景全覆盖



硅长晶智能控制系统

采用传感技术+AI-PID调控+远程控制
实现单晶精准生长控制
提升晶体质量与生产效率
减低能耗30%及人工成本



通用集控

硅纯化炉/机加工双线智能管控
远程集控+全流程监控+智能预警
保障高效安全生产, 推动硅材料加工
数字化升级



Ai智控系统

数据验证+自适应调整代替人工经验
实现高效低废生产
成为工业数字化与自动化进程的关键
革新阶段



天通智能长晶智控平台

AI+物联网驱动晶体智能制造
深度学习优化工艺
远程智控提升良率
降本增效安全可靠



数字孪生

实时交互
真实反馈设备状态
垂直定制光伏单晶硅智造方案
全流程精准控制与持续工艺优化

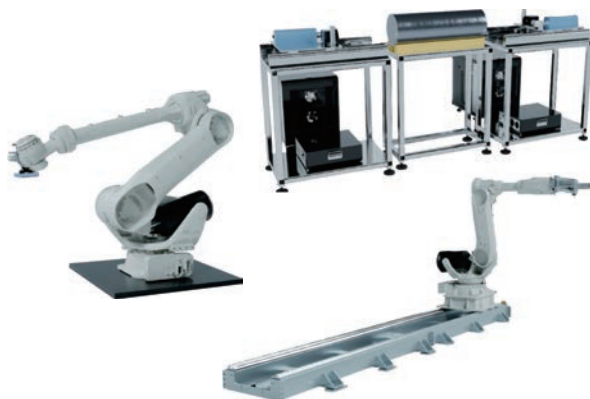


支持天通全产品管理、应用、仿真 同时兼容其他设备接入

系统支持多设备接入监控调试终端命令，极速反馈，保障企业生产高效安全。



机加设备



自动化设备

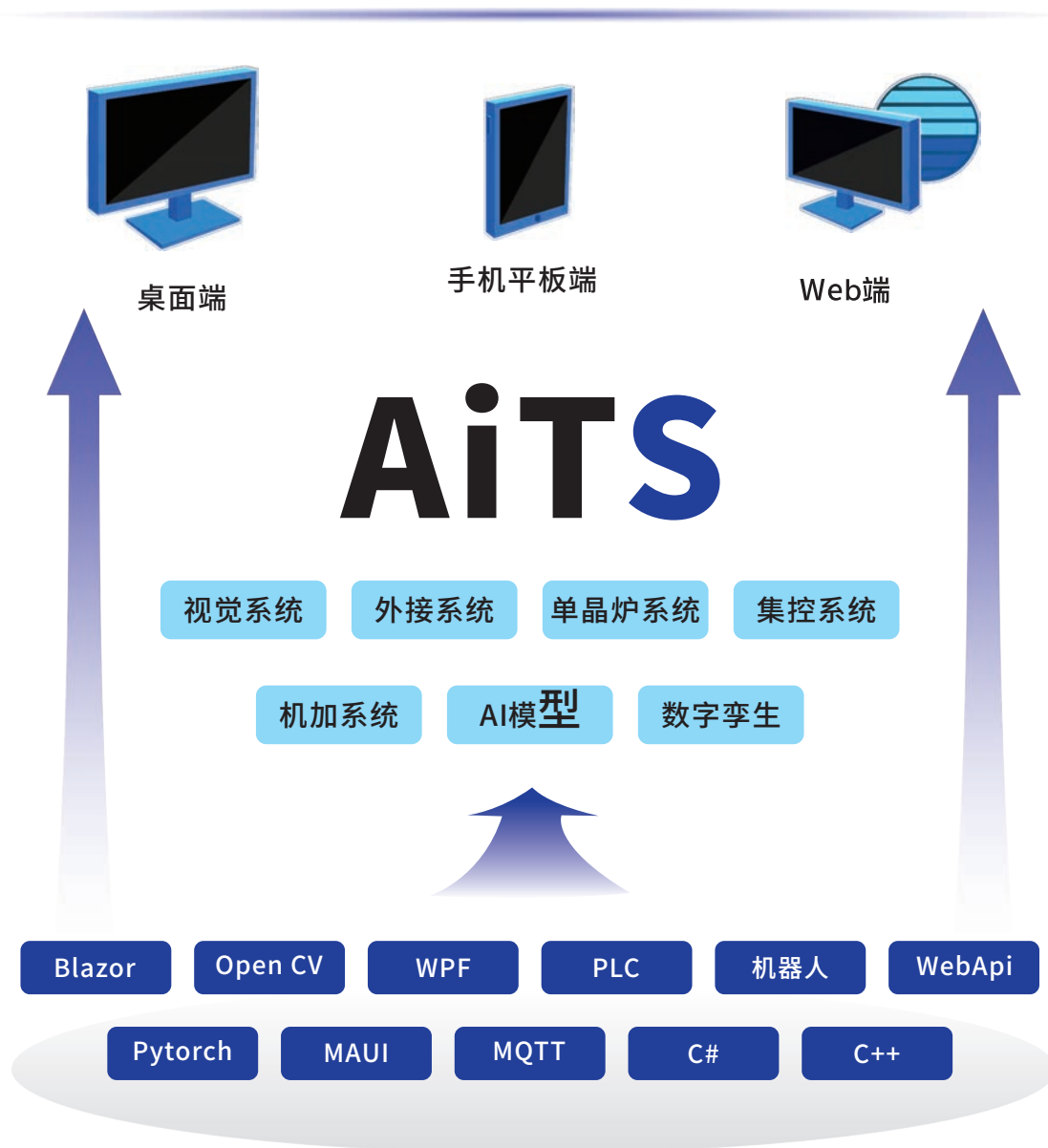


长晶设备



第三方设备

天通新一代通用工业智慧系统



智能集控系统实现精准视觉检测与数据驱动优化
单晶级精细加工助力降本增效

客户

案例

CUSTOMER CASES

携手并进

共谋发展



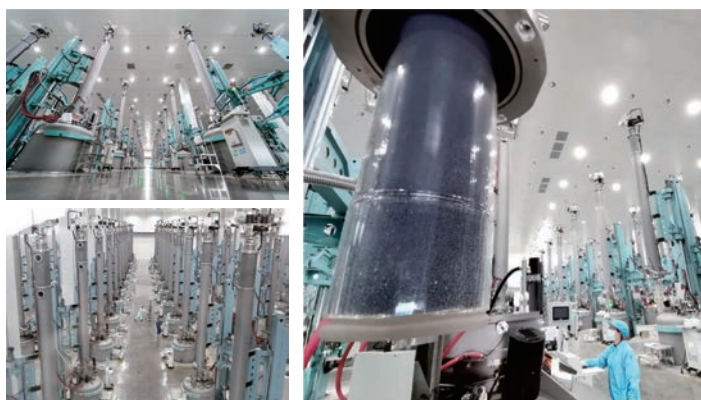
产品:天通单晶炉

央视报道



产品:天通单晶炉

央视报道



产品:天通单晶炉

央视报道

合作 PARTNERS 伙伴

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ASTRONERGY
润阳光伏

RUNERGY
润阳光伏

*仅展示部分客户,排名不分先后。

TDC NISSIN

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