

Leshan 乐善®

Tornado Series

小旋风全电吹瓶机系列

Tornado Electric EBM Machine

并非**吹**能做到
乐善吹瓶机

Leshan Blow Molding Machine

小瓶型生产的最佳选择
Priority for Small Bottles



GUANGDONG LESHAN INTELLIGENT EQUIPMENT CORP.,LTD.

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公司简介 | Company profile

广东乐善智能装备股份有限公司是新三板挂牌公司，证券简称：乐善智能，证券代码：871695。公司成立于1995年8月，位于佛山市顺德区大良五沙工业区，占地面积约37570m²，拥有员工380余人，目前已发展成为一家专注于“塑料吹塑中空成型”领域，集机械设计、研发、生产、销售及服务于一体的智能机械设备公司。

乐善是中国吹瓶机行业标准起草单位之一、国家高新技术企业、广东省省级企业技术中心，拥有广东省著名商标、广东省名牌产品、广东省装备制造业100强等众多荣誉。

目前，乐善与多位全球知名企业、中国500强企业达成良好合作关系。有P&G、美孚石油、中国石油、蒙牛、伊利、娃哈哈、统一等合作客户。

在未来，乐善将布局全球，以“乐创高新技术，善助用户发展”服务宗旨，为全球客户提供最优质的产品和服务。

Leshan Intelligent Equipment Corp. Ltd., a listed company (Stkname: Leshan, Stock Code: 871695), was founded in Wusha Industrial Area, Daliang, Shunde District, Foshan City, in August, 1995, covering about 37570 square meter and having over 380 employees. In the field of "Plastic blow hollow molding", Leshan has grown into intelligent equipment company integrated with design, research and development, production, sales and relevant services.

Leshan is one of drafting committees of EBM Industry of China, owning honors, such as, the National High-tech Enterprise, Guangdong Provincial Enterprise Technology Center, Guangdong Famous Trademark, Guangdong Famous Brand Product, Guangdong Top 100 Equipment Manufacturing Industry and many other ones.

Nowadays, Leshan are in corporations with world-known enterprises and China's top 500 companies, like P&G, Mobil, PetroChina, Mengniu Dairy, Yili Dairy, Wahaha, Tongyi etc.

In the future, with the purpose of "Aids for Customers' Development with High-tech Methods", Leshan provide the best products and services for people all around the world.



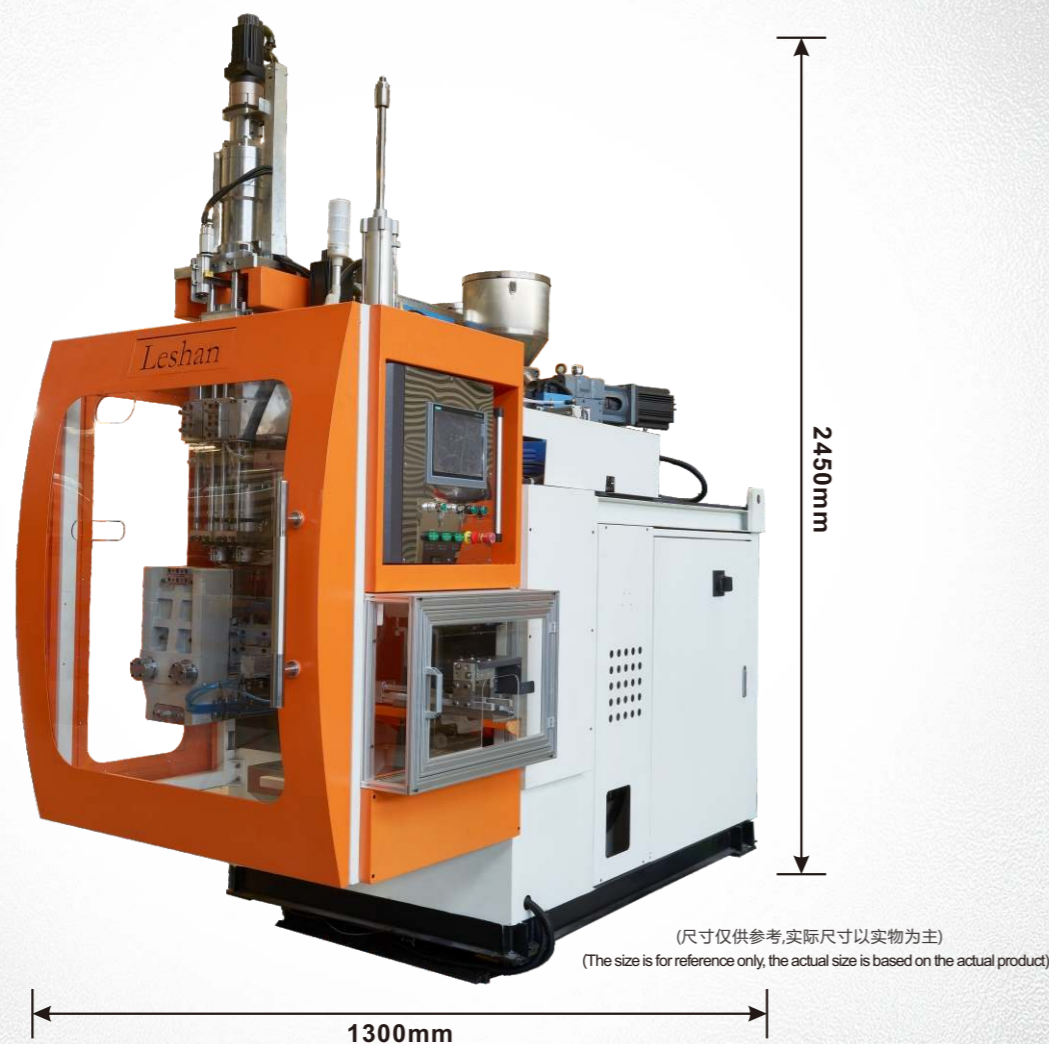
乐善自主研发产品
Self-developed
Products from
Leshan

环保 Environmental

全电动驱动，环境洁净无油污，
适应食品行业、药品行业、化妆品行业
对生产环境的要求。

Full-electric drivers, clean without grease
meeting requirements of producing containers
of food, pharmacy cosmetic industry





【小身材·大容量】 Small Size-Large Capacity

小旋风系列吹瓶机专门为小型吹塑制品高效生产而定制，整机小巧、快速、运行稳定、温控精准、能耗低、自动化程度高的系列。

Tornado Series EBM Machine is specially designed for highly-efficient production of small bottles small and exquisite, swift, stable, accurate temperature control, low energy-consumption, highly-automatic

小旋风零件配置及技术参数 / Configuration and technical parameters

单工位双层双模头 Single Station, Double layers, double die heads	外形尺寸 Size	总装功率 Total Installed Power	总重量 Weight
中心距: Center Distance: 125mm	长 Length:3.6m 宽 Width:1.3m 高 Height:2.46m	约45KW About 45 kW	约7吨 About 7 Ton



精密 / Accurate

锁模、移模、插笔伺服电机驱动，动作快速、稳定、移位精准，重复精度高达0.01mm。
Clamping, mold-moving and blow pin driven by servo-motor, swift, stable and accurate up to 0.01mm

高效 / Efficient

干循环周期在5秒。
5-second dry cycle



低噪音 / Low-noise

运行噪音在70分贝以内
Under 70 DB on operation



节能降耗
Energy-saving



智能调节
Intelligent Adjustment



远程维护
Remote Maintenance



红外感应
Infrared Induction



安全防护
Safe



壁厚控制
Thickness Control System



互联网+
Internet Plus



总线技术
Bussing Technique

WHY?

为什么选择乐善智能? / Why Choose Leshan?

一次用心的选择, 只因您比别人更懂它
A Careful Choice with better consideration

精工制造·品质卓越 Perfect Manufacturing Excellent Quality

- 优质材质
- 持久耐用
- 精密加工
Precision Maching
- 高效工作
High Efficiency
- 人性化设计
Humanized Design

电控系统/Computer-controlled System:

全电脑控制, 自动进行工艺参数优化及故障诊断, 控制精度高, 保证机器设备运行的可靠与安全。
Wholly controlled by computer, automatic process optimization and fault diagnosis, highly precision control, stable and safe operation.



简易操作/Easy to Operate

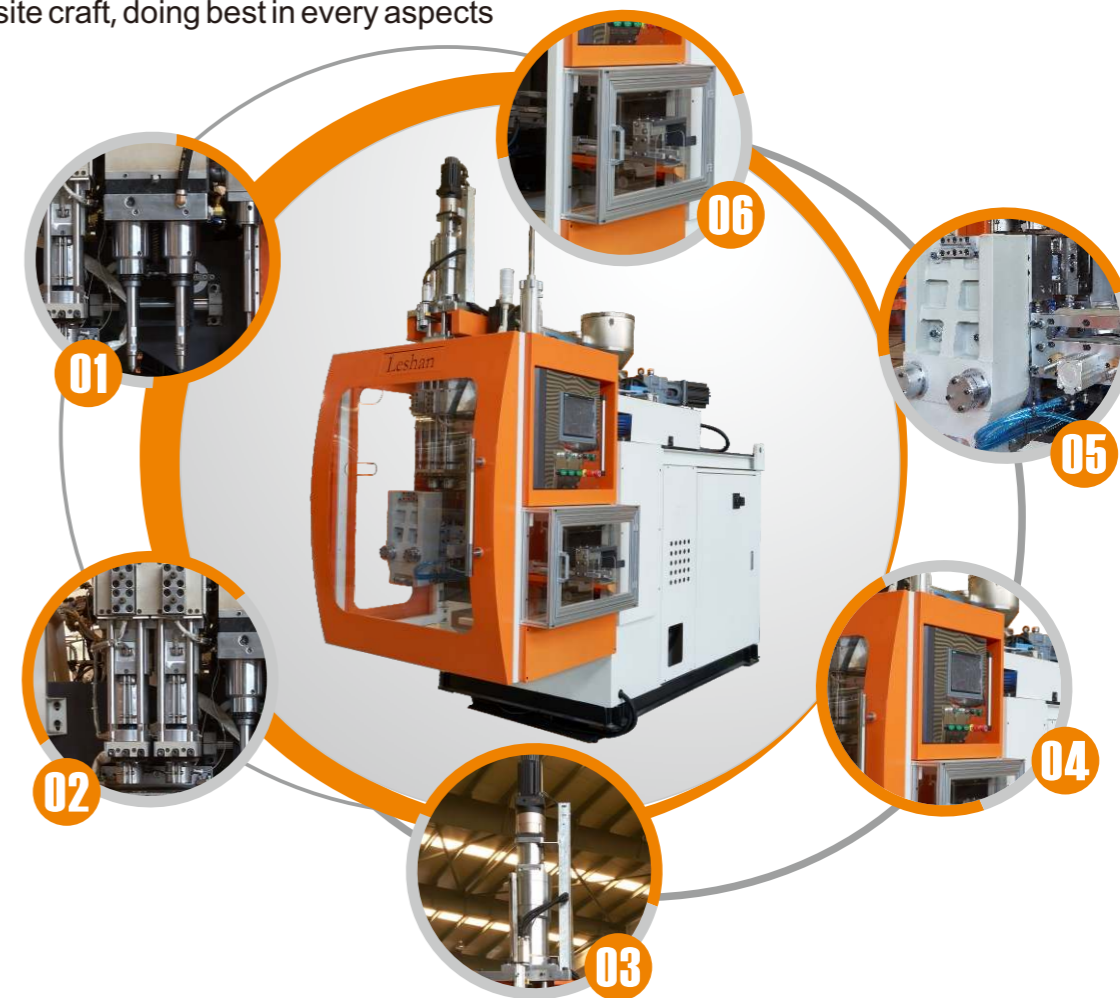
- 电动机开合模数值化调整
Numericalization adjustment of mold opening and closing
- 电动机摆架数值化调整
Numericalization adjustment of carriage
- 气循环参数可调整
Adjustable air circle

一目了然 / As Transparent As Possible

- 实时报表
Real-time Report
- 年报表
Yearly Report
- 月报表
Monthly Report

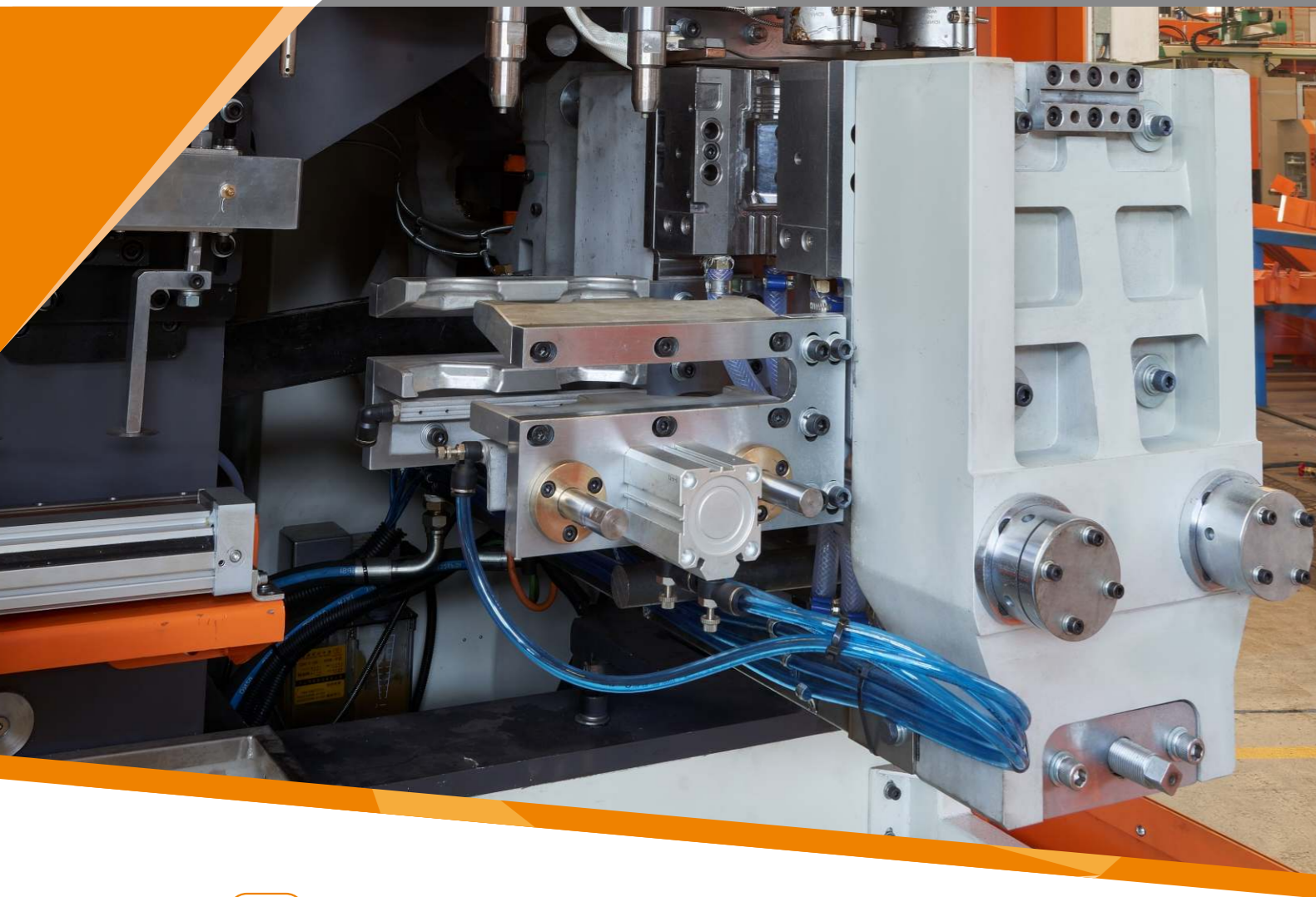
细节决定品质/Details Determine Quality

精湛工艺, 每个细节我们都做到了极致
Exquisite craft, doing best in every aspects



扫码观看
小旋风系列
机器视频
Scan for
videos of
Tornado EBM
Machine



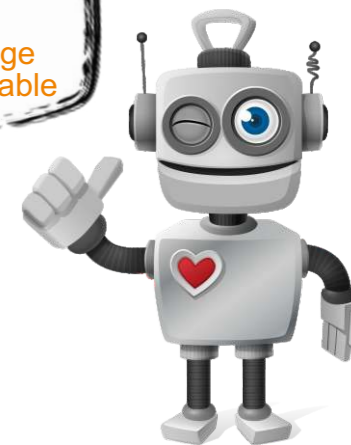


单工位结构: Single Station

适应小批量订单,
减少模具和辅机的投入,
方便生产切换。
Suitable for small orders
Save cost mold and auxiliary machine
Convenient for mold changing

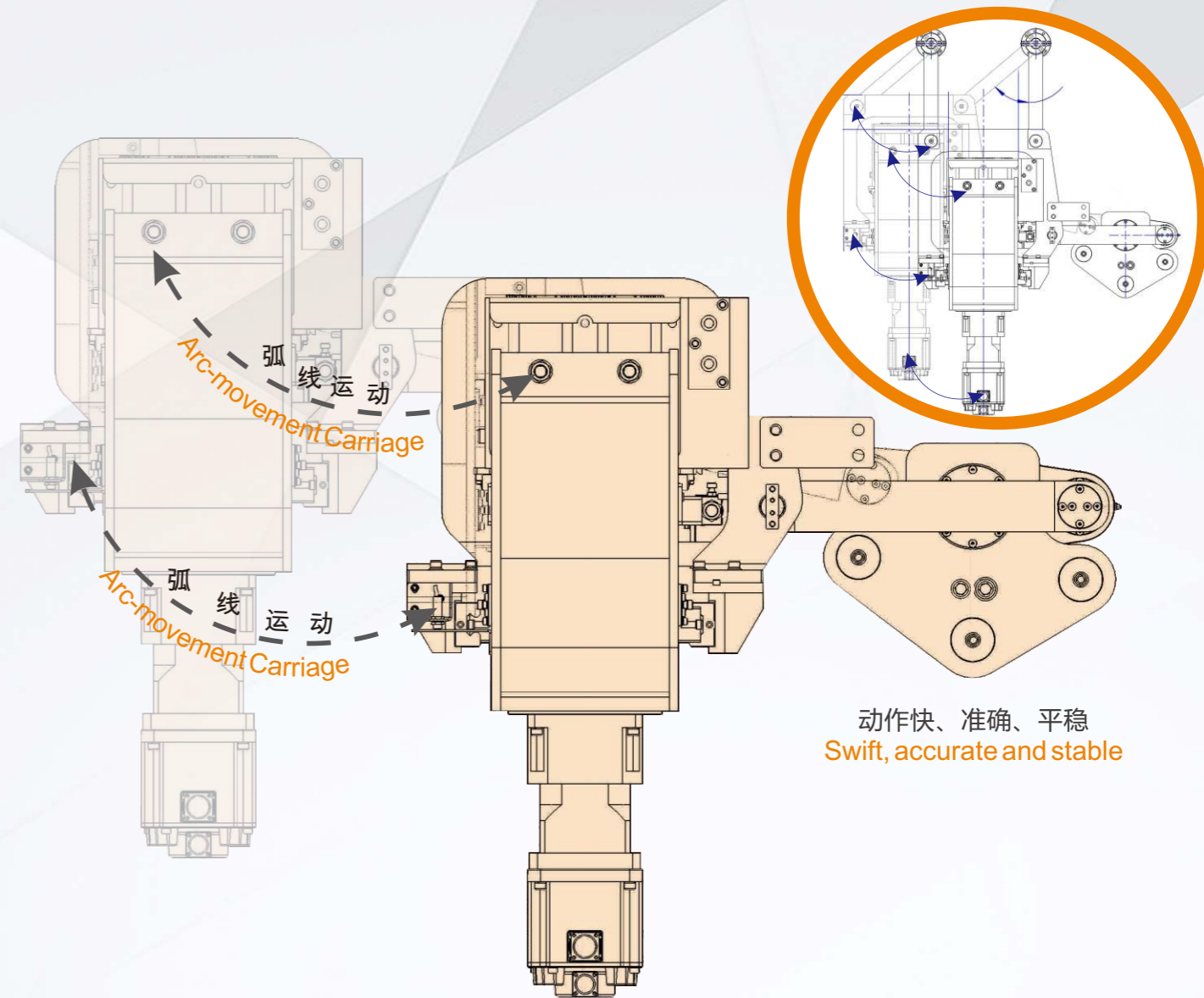
动作搭载专利锁模技术的应用,
使机器动作能耗比传统液压机低50%-60%。
Application of patented clamping technology.
Saves 50%-60% of energy consumption
comparing with hydraulic machines.

摆架为弧线运动,
动作快、准、稳
Arc-movement Carriage
Swift, accurate and stable



锁模架结构 Carriage Structure

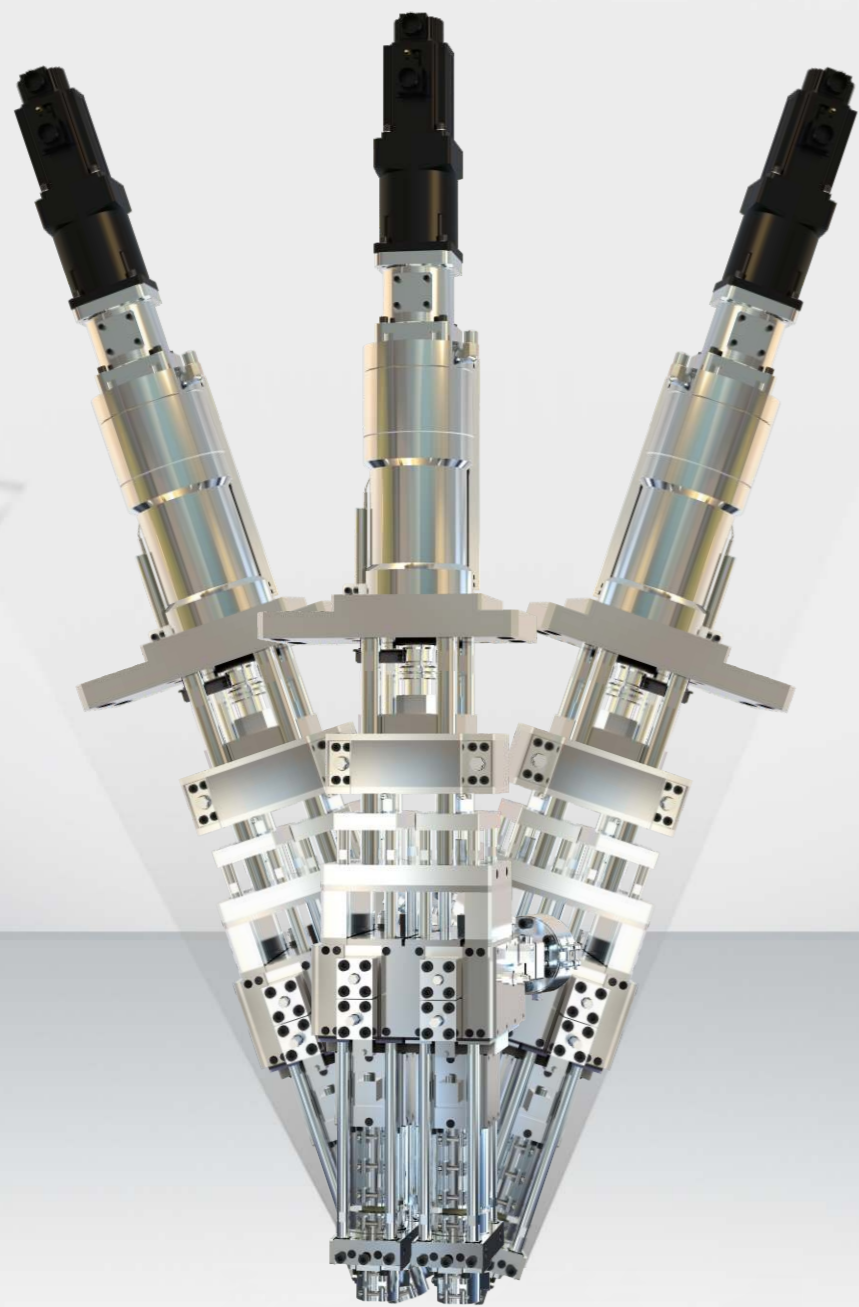
- 摆动式摆架结构，弧线运动。
Swing-style carriage structure, moving in arc.
- 锁模板和摆架座采用航空铝合金制作，
Aviation aluminum-alloy-made clamping plates and carriage bases.
- 满足轻量化和高强度，摆架动作快、准、稳。
Swift, accurate and stable movement, suitable for lightweight and high strength.



摆架行程 Carriage Stoke	开合模距离 Mold Stoke	锁模力 Clamping Force	锁模电机功率 Power of Clamping motor	摆架电机功率 Power of Carriage Motor	模具高度限制 Max Mold Height
水平Horizontal:300mm (+7.5mm) 竖直Vertical:150mm (+10.5mm)	180mm—330mm	2.7吨/kN	1kW	1.5kW	≤300mm
摆架时间 Carriage Stoke	开模时间 Mold Opening Time	锁模时间 Mold Closing Time	锁模厚度范围 Range of Mold Thickness	锁模宽度范围 Range of Mold Width	
0.7秒	0.6秒	0.6秒	183±0.5mm	≤300mm	/

高性能模头设计/High-performance Die Head

德国技术, 拉杯式电动厚薄控制, 高效换色, 适应高端瓶型工艺要求。
 German Technology, Pull-cup-style Electric Thickness Control System
 Highly-efficient color changing, meeting requirements of craft of advanced bottles

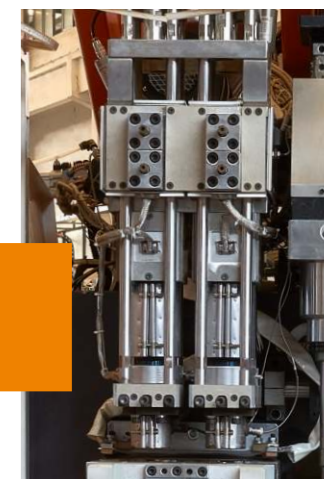


量身定制,
走差异化之路。
Customized
Take the road of differentiation

每一台机器都从客户实际需求出发,
Every machines is customized according to customers' requirements
我们专注吹塑工程解决方案。
Leshan is specialized in blow molding solutions

模头结构部分/Structure of Die Head

- 德国技术, 中国制造。
German technology, made in China
- 机外调口模和重量, 调试快捷。
Swift outside adjustment of die cup and weight
- 双层螺旋流道, 换色快, 无汇合线。
Double-layer spiral flow channel for fast color-changing and invisible knitlines
- 流道光滑, 不会出现溢料。
Smooth channel with no flash
- 段温控, 温度控制更精准。
More precision segments' temperature control
- 拉杯式电动伺服壁厚控制。
Pull-cup-style electric thickness control system



壁厚控制
Thickness Control



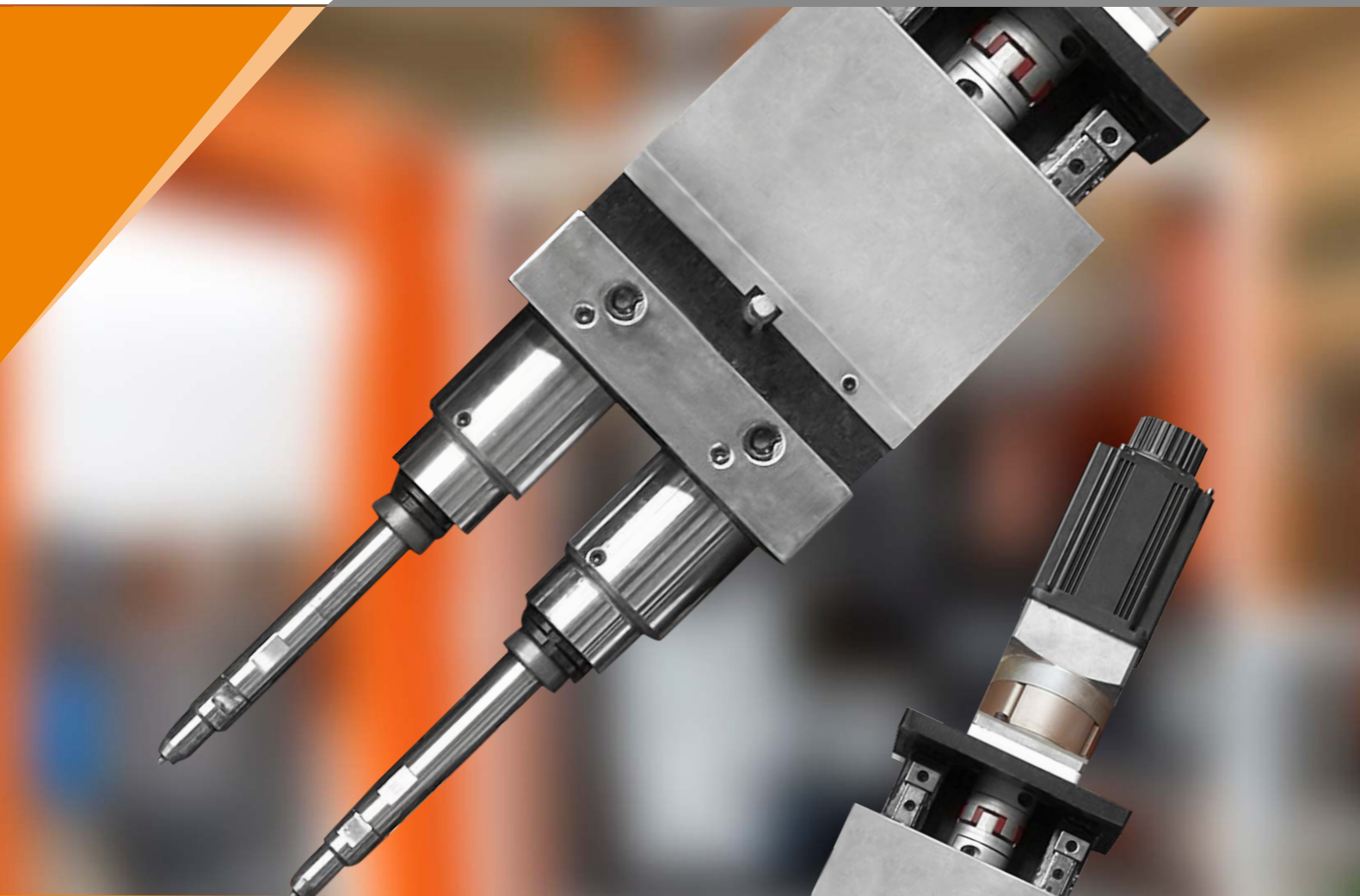
节能降耗
Energy-saving



智能调节
Intelligent Adjustment



伺服电机
Servo-motor



电动伺服插笔装置/ Electric Servo Blow Pin Device

伺服电机驱动，动作快速、稳定，移位精准，重复精度高达0.01mm
 Swift, stable and accurate movement driven by servo-motor; the repetition accuracy is up to 0.01mm

- 线性导轨导向，提高插笔动作精准度。
Linear-guide railway for more precision blow pin movement.
- 插笔无管连接实现吹排气功能及运水冷却。
Exhaust and cooling with pipeless blow pin structure.
- 整齐美观，避免接头漏水引起故障。
Neat blow pin structure, avoiding problems caused by connections.

小旋风插笔架技术参数/Parameter of Blow Pin Frame

插笔电机功率 Power of blow pin motor	最大插笔力 Max blow pin force	插笔行程 Blow pin stroke	中心距 Central distance	插笔左右调节 Left/right adjustment
2KW	1.5KN	160mm	125mm	左(向模头)40mm Left(Die head side) 40mm 右(向外)140mm Right(Out side)140mm



好品质
Excellent Quality

**二次定径冷却装置
Second-sizing cooling device**

- 加快吹瓶时瓶样内部表面的冷却速度。
Reduce cooling time of inner surface when blowing
- 制品可高温脱模，把瓶口定径及冷却转移到二定径位置。
Demold at high temp.; sizing and cooling in second-sizing device
- 提高生产效率，缩短瓶样成型周期。
Higher productivity by less cycle time

二次定径冷却装置 (350ML一出二全电动机对比) Second-sizing cooling device (comparing with 350ml two-cavity samp EBM machine)		
项目 Program	循环时间 (秒) Cycle time(s)	瓶内温度 (度) Inner-bottle temp.
二次定径冷却有 With second-sizing cooling device	14秒/s	59度/°C
二次定径冷却无 Without second-sizing cooling device	14秒/s	30度/°C



No. 1

伺服厚薄控制系统
Thickness Control System

- 100点电动伺服厚薄控制系统，响应速度1MS，重复精度0.005。
100-point electric thickness control system driven by servomotor; response speed 4ms, repeated accuracy 0.005
- 伺服电机驱动、滚珠丝杆传递动力。
Servo motor driven and ball screw transmit power
- 精度更易控制，质量更有保证。
Accuracy is easier to control and quality is more assured



No. 5

压力传感器
Pressure Sensor

- 具有检测挤出系统进料压力作用。
Able to detect the pressure of feeding in extrusion system.



No. 2

简易机械手装置
Simple manipulator

- 取瓶快速，效率高。
Swift and highly-efficient bottle taking.
- 铝合金侧箱设计。
Aluminium alloy side box.



No. 6

警报器装置
Alarm Device

- 系统故障、感应检测。
Detection of system false



No. 3

彩色触摸屏
Color touch screen

- 12寸彩色触摸屏。
12 inches color touch screen.
- 可调节多角度操控。
Adjustable and multi-aspect control.



No. 7

空调装置
Air Conditioning

- 保持电箱恒箱，起了保护作用。
Protect the electric box by controlling the temp.



No. 4

安全门
Safety Door

- 采用钣金结构，左侧面开门方便维修与调试。
Sheet metal structure, opening on left side to repair and adjust.
- 弧形造型透视感强实力与颜值并存。
Arc structure of strength and artistry.



No. 8

伺服挤出机系统
Servo Extrusion System

- 全电机直连式减速机，占用空间少。
Electric direct gearbox, taking up less space
- 少了皮带损耗，传动效率提高，减少能耗。
Higher transmission efficiency and less energy-consumption with less energy-loss on belt.



战略合作伙伴

Strategic Partners

乐善智能为全球超过3000家知名品牌企业提供服务
Leshan Intelligent provides services for over 3000 well-known enterprises all around the world



好服务 High-quality Service
售后服务管理 After-sales management

国内服务人员30人，国外服务人员5人，国内市场特配服务专车12辆。
设立售后服务专线、VIP用户专线、售后配件仓库。

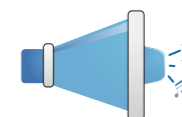
30 domestic service personnel 5 foreign service personnel and 12 special service cars for the domestic market, after-sales service line, VIP user line and after-sales accessories warehouse.



信息管理
Intelligence Management

设备出机前,将该机的部件图纸存放于该机台的电脑上,客户直接调阅这些部件图纸。

Before being delivered to customers, the drawings of parts are stored on the computer of the machine so that customers have direct access to these component drawings.



实时报警
Real-time Alarm

机器接入WIFI或3G通信,当设备发生故障时,在乐善终端的设备分布图以上以红点形式实时显示报警信号灯。

Connecting to WiFi or 3G network, when the equipment goes wrong, the alarm signal light will be displayed in the form of red dots on the equipment distribution diagram of Lesun terminal in real time.



故障分析诊断
Fault analysis and diagnosis

实时记录故障信息,并以各种报表形式进行分析处理,找出最优解决方案。

Record the fault information in real time, and analyze and deal with it in various forms to find the optimal solution.



短信报警
Message Warning

支持远程短信通知和报警。即使老板在外出游,也能监控生产。

Remote SMS notification and alarm. Even when the boss is away on vacation, he can monitor production.



24小时在线服务
24 hours online service

- 乐善机械是国内唯一一家免费向用户提供全方位。 Leshan is the only company in China which provides all-round.
- 吹瓶技术培训的厂家,课程涵括。 training of blow molding technology, including.
- 现代吹塑生产线整合及新技术应用、高级吹塑工艺和维修技巧的讲授。 integration of blow-molding production line, application of new tech, advanced blow-molding craft and repairment.
- 吹塑生产记录、管理与统计分析、高级案例分析。 Analysis of production, management and statistics and senior cases.

销售网络/Sales Network

乐善智能吹瓶机远销海内外 Hot-sales EBM machines of Leshan

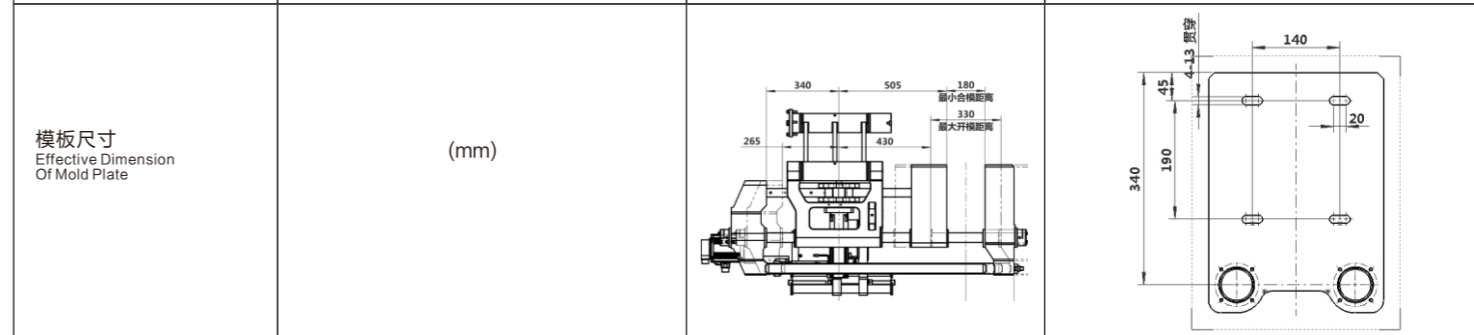




类别 Category	电动机系列(摆臂式) / U Series(Linear Guide Way)		
机型	S1-150+04-40+30-2		
项目	Items	单位Units	基本参数 Specification
类别	Category	/	摆臂式 Swing arm
制品最大容量	Max. Blow Volume	L	500ml
适用原料	Material	/	PETG, PE, PP, PS, PC, PVC
模头坯料数量	No. Of Die Head	/	2
模头中心距	Die Head Distance (Center to Center)	mm	125
机器净重约	Net Weight	kg	3000
机器外形尺寸	Machine Dimension	L×H×W mm,	L3300XW1385XH3275
模头 die head			
模头加热段数	Die Head Heating Zone	/	16
模头加热功率	Die Head Heating Power	kW	11
开合模系统 Mold opening and closing system			
模架数量	No. Of Station	/	1
最小合模距	Min Clamping Distance Of Mold	mm	180
摆架行程	Stroke	mm	水平300 竖直150
锁模力	Clamping Force	kN	27
挤出系统 Extrusion system			
螺杆直径	Extruder Diameter	mm	30
螺杆长径比	Length/Diameter Ratio	L/D	25
螺杆转速	Extruder Rotating Speed	r/min	60-150
最大塑化能力	Max Extrusion Capacity	kg/h	15
挤出电机功率	Extruder Motor Power	kW	5.5
机筒加热段数	Barrel Heating Zone	/	2
机筒加热功率	Barrel Heating Power	kW	3
动力系统 power system			
油泵电机功率	Oil Pump Motor Power	kW	0
液压系统工作压力	Hydraulic System Pressure	Mpa	0
气动系统工作压力	Pneumatic System Pressure	Mpa	0.6-0.8
水冷系统工作压力	Cooling System Pressure	Mpa	0.2-0.3
耗气量	Air Consumption	m³/h	5
热切刀变压器功率	Hot Cutter Power	kW	2
总功率	Total Power	kW	39.1

备注: 以上机型均可叠加50点壁厚控制系统, 叠加后改变的参数如下:
All the machines above can be optionally equipped with 50 points parison control system, parameters would be changed as below:

叠加壁厚控制后 After stacking wall thickness control			
机型	Model	/	S1-150+04-40+30-2
伺服电机功率	Servo Motor Power	kW	5.5
总功率	Total Power	kW	44.6



*页面数据均源于乐善智能厂内测试, 设备具体数据以定制设备情况为准。

经典案例 Classic Customers

乐善智能自动化工程案例-6人管理46台机
Leshan Intelligence Automation Engineering Cases- Manage 46 machines with 6 employees

乐善客户 Customer	缅甸客户 Customers from Burma	配置吹瓶机 Machine	46台一出八85U奶瓶机 46 85U 8-cavity EBM machine
生产产品 Product	300ML易拉罐奶瓶 / 100-200ML奶瓶 300ML bottle cans 100-200ML milk bottle	自动化工程 Automation Engineering	自动化输送系统中央供料系统 Automatic conveying system Central feeding system
车间面积 Plant size	2600个平方 2600 square meters	实际产能 Practical output	25000瓶/小时/一条生产线 25,000 pcs/hr for each line
产能需求 Output requirement	每条生产线25000瓶/小时 25,000 pcs/hr for each line	配置人手 Allocation	2人检瓶, 2人供新料, 2人巡检 two for picking products, two for feeding, two for patrol



供料、制品输送一体化
Integration of feeding and conveying

制品输送区
Product conveying area

破碎区
Crushing Area

模块Unit	小旋风全电机系列功能配置Configuration and Function of Tornado Electric EBM Machine	标准配置 Standard Configuration	备选配置 Optional Configuration
挤出系统 部分 Extruder	镀合金主螺杆 Inlaid alloy screw	●	
	皮带传动机构 Belt drive mechanism	●	
	三相异步电机 Three phase asynchronous motor	●	
	不锈钢料斗（带放料口） Stainless steel hopper(with discharge port)	●	
	网线式发热圈或发热板 Cable heating ring and heating plate	●	
	机筒冷却风机 Barrel cooling fan	●	
	连续挤出模头 Continuous extrusion die head	●	
	电机直连式减速箱机构(ZLYJ挤出系统专用硬齿面减速机) Motor direct connection reducer mechanism		○
	挤出系统使用德国技术German designed extruder		○
	模头使用德国技术 German designed die head		○
	自动缺料报警 Automatic empty hopper alarm		○
	磁力架 Magnetic frame		○
	配合真空上料机、四合一上料系统、螺旋式上料机所用料斗 Equipped with hopper for material feeder, four-in-one feeding system, spiral feeder, etc.		○
	模头防烫保护罩工 Anti-hot protective cover for die head		○
	手动换网机构（机架总成需变更） Manual filter net changing mechanism(Frame assembly needs to be changed)		○
	锥套式皮带传动机构Cone belt drive mechanism		○
瓷接头式发热圈或发热板 Porcelain connector heating ring and heating plate		○	
陶瓷式发热圈及发热板 Porcelain heating ring and heating plate		○	
锁模机构 部分 Clamping Mechanism Parts	连杆式锁模机构 Connecting rod type clamping mechanism	●	
	摆架使用电子控制刹车 The carriage uses electronically controlled brakes	●	
	标准机型锁模力（参考画册参数） Standard model clamping force(Refer to album parameters)	●	
	标准机型容模尺寸（参考画册参数） Standard model allowed mold size(Refer to album parameters)	●	
	摆架运动采用电动驱动 Station movement use electric motor drive	●	
	开合模运动采用电动驱动 Mold clamping use electric motor drive	●	
	模具装卸机构（电葫芦） Mold loading crane mechanism(electric hoist)		○
机架部分 Frames Parts	机架主体（不配升降机构） Frame body	●	
	模头支撑架 Die head supporting frame	●	
	预留机械手安装位置 Reserved position for robot hand		○
	楼梯 Stairs		○
	平台防护栏 Platform guard railing		○
	挤出平台左右移动功能 Extrusion platform left and right movement function		○
	避震脚 Foot shock		○
安全门 部分 Safety Door Parts	小旋风机安全门外观（参考画册） Tornado machine safety door appearance(refer to album)	●	
	标准配色（参考画册） Standard color(Refer to album)	●	
	浅蓝色半透明亚克力观察窗 Light blue translucent acrylic viewing window	●	
	主电箱 Main carbinet	●	
	悬挂式后侧门 Hanging rear door	●	
	前安全门防护网 Front safety door protection net	●	
	与标准配色不同的配色要求 Different color requirements from standard color		○
插笔架 部分 Blow Pin Parts	插笔上下运动采用电动驱动 Blow pin up and down movement use electric motor drive	●	
	上下运动导向采用线性导轨 Up and down motion guide using linear guide rail	●	
	手动前后调节丝杆调节插笔架 Manual hand wheel to adjust the blow pin from front to back	●	
	固定式插笔杆 Fixed blow pin rod	●	
	可拆卸式剪口环 Removable cutting ring	●	
瓶内快速冷却系统和插笔 Rapid cooling system and blow pin	●		
切刀部分 Knife Parts	通用冷热共用切刀（纵向） Universal hot and cold sharing knife(horizontal)	●	
	1-2千瓦热切刀变压器 1-2 kW hot knife transformer		○
	通用热切刀（前后）或者左右横向冷切刀 Universal hot knife (front and rear) or horizontal cold knife(left and right)		○
	多模头特殊用冷切刀 Multi-die head special cold knife		○
	冷切刀片 Cold cutting blade		○
进口热切刀片 Imported hot cutting blade		○	

模块Unit	小旋风全电机系列功能配置Configuration and Function of Tornado Electric EBM Machine	标准配置 Standard Configuration	备选配置 Optional Configuration
插笔架 部分	插笔上下运动采用液压油缸驱动	●	
	上下运动导向采用线性导轨	●	
	手动前后调节丝杆调节插笔架	●	
	固定式插笔杆	●	
	可拆卸式剪口环	●	
	瓶内快速冷却系统和插笔	●	
切刀部分	通用冷热共用切刀（纵向）	●	
	1-2千瓦热切刀变压器		○
	通用热切刀（前后）或者左右横向冷切刀		○
	多模头特殊用冷切刀		○
	冷切刀片		○
	进口热切刀片		○
电气控制 部分 Electrical Control Parts	SIEMENS S7-1200控制系统SIEMENS	●	
	7寸彩色触摸屏 7 inches color touch screen	●	
	SIEMENS 交流接触器 Siemens AC Contactor	●	
	汇川变频器 Md500 Inovance frequency converter Md500	●	
	CO-TRUST控温模块 CO-TRUST Temperature Control Module	●	
	转速、位移、压力、流量、温度、时间参数设定、编辑、存取 Speed, displacement, pressure, flow, temperature and time parameters can be set, edited, accessed	●	
	100套模具工艺参数储存功能 Receipt data storage of 100 sets of mould	●	
	故障报警、记录、自诊断功能； Malfunction alarm, malfunction record, malfunction self-diagnose	●	
	输入、输出、动作状态、动作时间监控功能； Monitoring of input, output, action, state and action time	●	
	自动计算产量、自动复位功能； Output Auto-counting, auto-reset	●	
	一键恢复功能； auto-reset	●	
	挤出机温度超高、超低保护； protecting extruder from low temperature and high temperature	●	
	模具温度报警功能； mold temperature alarm	●	
	中英文操作界面，多语种HMI HMI Chinese and English operation screen, multilingual HMI	●	
	远程维护功能 Remote maintenance system	●	
	模咀用温控表控制（与电脑控温2选1） Head nozzle control led with temperature-controlled meter		○
	模咀用电脑控温（与控表控温2选1） Head nozzle use PLC temerature control		○
12寸彩色触摸屏 12 inches color touch screen		○	
对射式光幕 light curtain		○	
模头防静电装置 Die head static remover		○	
电动100点壁厚控制系统 Electric 100-point thickness control system		○	
气动系统 Pneumatic system	空气净化器 Air cleaner	●	
	三联件 Triplex-parts	●	
	标准气缸 Standard air cylinder	●	
	安沃驰膜片式电磁换向阀 Aventis electromagnetic reversing Valve	●	
	节流阀 Throttle valve	●	
	减压阀 Relief Valve	●	
	快排阀 Aerofluxus Valve	●	
	消音器 Sliencer	●	
	压力表 Pressure Meter	●	
Pa管 PA tube	●		
润滑系统 Lubrication System	自动油脂润滑泵 Automatic grease lubrication pump	●	
	分配器 Distributer	●	
	Pa管 PA tube	●	
	铜管 Copper pipe		○
冷却系统 Cooling System	二进二出冷却进水，管径不低于1寸 Two in and two out cooling water, pipe diameter is not less than 1 inch	●	
	模具分水块 Mold water distributor	●	
	涡流水流量计 Vortex flowmeter		○
机械手Robot Hand	横取机械手Cross taking manipulator		○
除溢装置 Deflasher	旋切式除溢装置 Turning deflasher		○
	机内锣口机(左右) In-machine spin trimmer(left&right)		○
	模具一体式除溢装置 Mold integrated deflasher		○
二次定径Second-siz	二次定径 Second-sizing		○