

FE系列

BOLE 伯乐智能
BOLE Intelligent Machinery

咨询电话
400 777 6111



伯乐智能装备股份有限公司
BOLE INTELLIGENT MACHINERY CO., LTD

地址：浙江宁波北仑纬三路99号
销售部电话：0574-86179688 86179588
传真：0574-86175878
售后服务电话：0574-86181111

ADD:NO.99 WEISAN ROAD,XIAOGANG,NINGBO,CHINA
TEL:+86-574-86188007
FAX:+86-574-86188008
P.C:315821

www.bole-machinery.com
E-mail:bole-sales@shuangma-machinery.com

本手册受版权法保护。未经版权法明确许可的任何使用均需事先得到双马公司批准。
本手册为2023年5月印刷版本，之前印发的双马公司产品样本为无效版本。
个别插图和信息可能与实际交付的机器不同。

THIS CATALOGUE ARE PROTECT BY LAW OF COPY RIGHT.
ANY USE WITHOUT THE EXPRESS PERMISSION OF THE LAW OF COPY RIGHT, MUST GET APPROVAL OF SHUANGMA IN ADVANCE.
THIS VERSION WAS PRINTED IN MAY. 2023,
ANY DIFFERENCE SPECIFICATION FROM OLD VERSION SHOULD BE SUBJECT TO THIS VERSION.

FE系列 电动注塑机 Electrical Injection Moulding Machine



BOLE 伯乐智能
BOLE Intelligent Machinery

全电动注塑机的优势 相比传统的液压式注塑机 Advantage Of Full Electrical Injection Moulding Machine Compared to the traditional hydraulic injection moulding machine



节能 Energy Saving

与液压机相比，能量转换更高效，进一步节省能源，无需液压系列冷却水
Efficient energy conversion, Reduce power consumption. No need water for hydraulic oil cooling.

高效 Efficient

多种同步动作，实现最短的成型周期
Synchronous machine movement is possible to achieve a short cycle time

精密 Precise

高达0.01mm级别的高定位精度，保证产品质量
Up to 0.01mm high position control accuracy, ensure product quality

清洁 Clean

无液压油，带来洁净的生产环境
No pressure hydraulic oil, keep a clean production environment

高速 High Speed

易于实现的高射速，满足特殊产品的成型需求
High-speed & smart movement control for mold and injection, fulfill different application

安静 Quiet

低噪音，工作环境更舒适
Low noise level, create comfortable environment

伯乐电动注塑机

BOLE Electrical Injection Moulding Machine

精密 Precise 高速 High-speed 通用 Common 可靠 Reliable



高速闭环控制系统，优异重复精度的可靠保障
Fast & close loop control system excellent repeatability performance



专利的中心锁模结构模具变形小，受力更均匀
Patented central clamping toggle system create uniform clamping force. reduces platen deflection



伺服电机驱动的锁模结构
Platen drive by servo motor and ball screw.



拉杆脱离结构，精度恒定
No-touch Tie bar structure, constant accuracy



喷嘴接触力，保护模具防止漏料
Nozzle contact force protecting mould avoiding leakage



德国设计的塑化系统，塑化效率提高20%以上
German design of plasticizing system increase efficiency of plasticizing over 20%



稳定的下料口温度：将下料口温度纳入温度单元的闭环控制中，提升整个注塑单元的效率与精度，同时避免下料结块及不顺产生的注塑精度低的现象。
The stable temperature of the feeding throat prevents the instability of the feed due to the change of the temperature, affects the screw plasticization and injection accuracy, and improves the stability of the whole machine.



专利的封闭式丝杆结构
Patented encapsulated ball screw

伺服驱动锁模结构

E-version Of Central Clamping Toggle System

全国发明专利 中心锁模
Central locking toggle, inventional patent in China
(Patent No.: ZL2011 10250342.5)
(专利号: ZL2011 10250342.5)



• 省 Saving

- 省料
Save material
- 省电
Save electricity
- 省机台
Save nr. Of machine
- 省保养
Save maintenance

• 准 Precise

- 位置准
Precise position
- 速度准
Precise speed
- 模保准
Reliable mold protection
- 平行度准
Precise parallelism

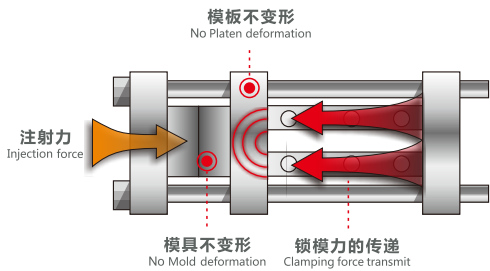
• 大 Large

- 拉杆间距大
Large space between tie-bars
- 开模行程大
Large open stroke

• 洁 Clean

- 产品区域无油污
The product area is free of oil

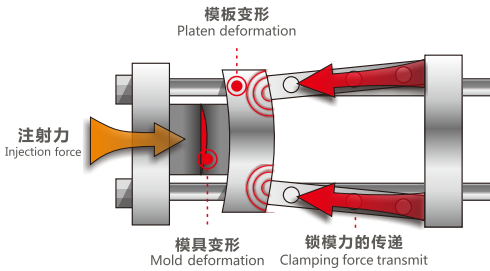
外曲式与内曲式受力图解 Toggle System Comparison



BOLE

伯乐塑机中心受力
BOLE centre clamping structure

- 100%
锁模力利用率
Clamping force efficiency
- 2-5%
原料节省
Material saving
- 精度高、少飞边
High accuracy, less possibility of flash
- 保护模板和模具
Offer good protection to mould and platens
- 适合小模具
Suitable for small mould
- 开模行程大
Big open stroke



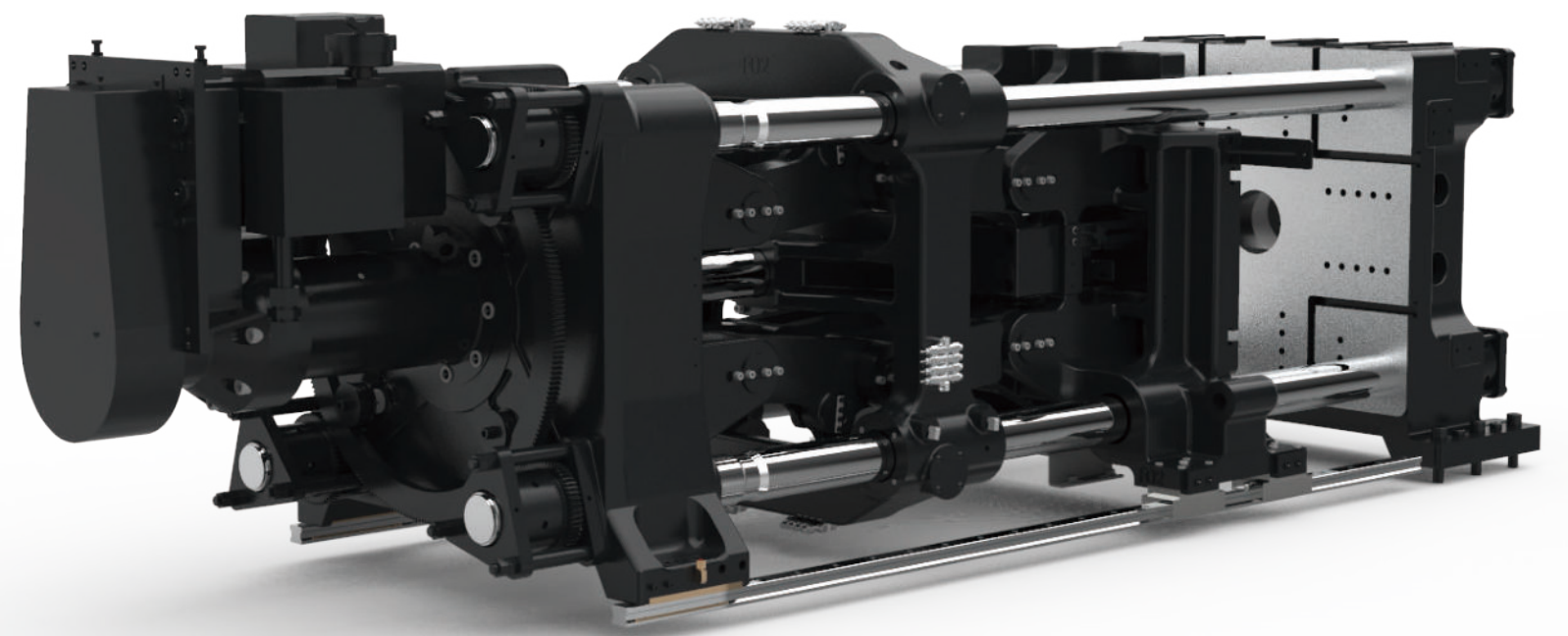
Others

传统结构(其它品牌)
Tradition Toggle system

- 80-85%
锁模力利用率
Clamping force efficiency
- 动模板会变形, 造成飞边浪费人力和材料。
Moving platen with obvious deformation, cause flashes, waste of material and labor of trim the flashes.

伺服电机及滚珠丝杆驱动的中心锁模结构

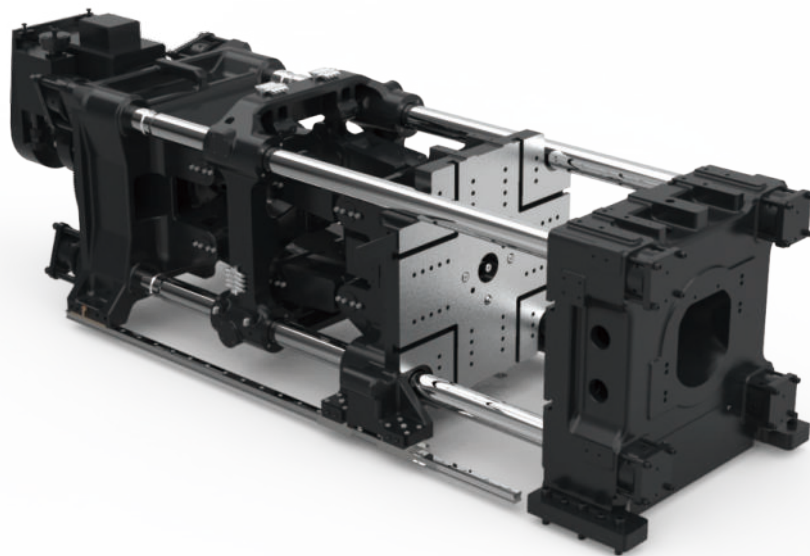
Central Clamping Toggle System Driven By Servo Motor & Ball Screw



- 更加精准的开合模控制，模板位置重复精度可高达0.01级别，特别适用于模内贴标及机械手自动化配合
Precise control for mold movement, repeatability up to 0.01 mm, fit for IML or automation.
- 更加灵活的运动控制曲线，开合模控制又快又稳
Flexible control curve, fast and smooth mold movement
- 更灵敏可靠的模具保护功能
Sensitive mold pretention function
- 拉杆脱离，无需润滑，保证模区清洁；
无需铜套，无磨损，精度恒定
Tie bar no touch with moving platen, no lubrication, ensure the mold area clean.

模板支撑采用线性导轨

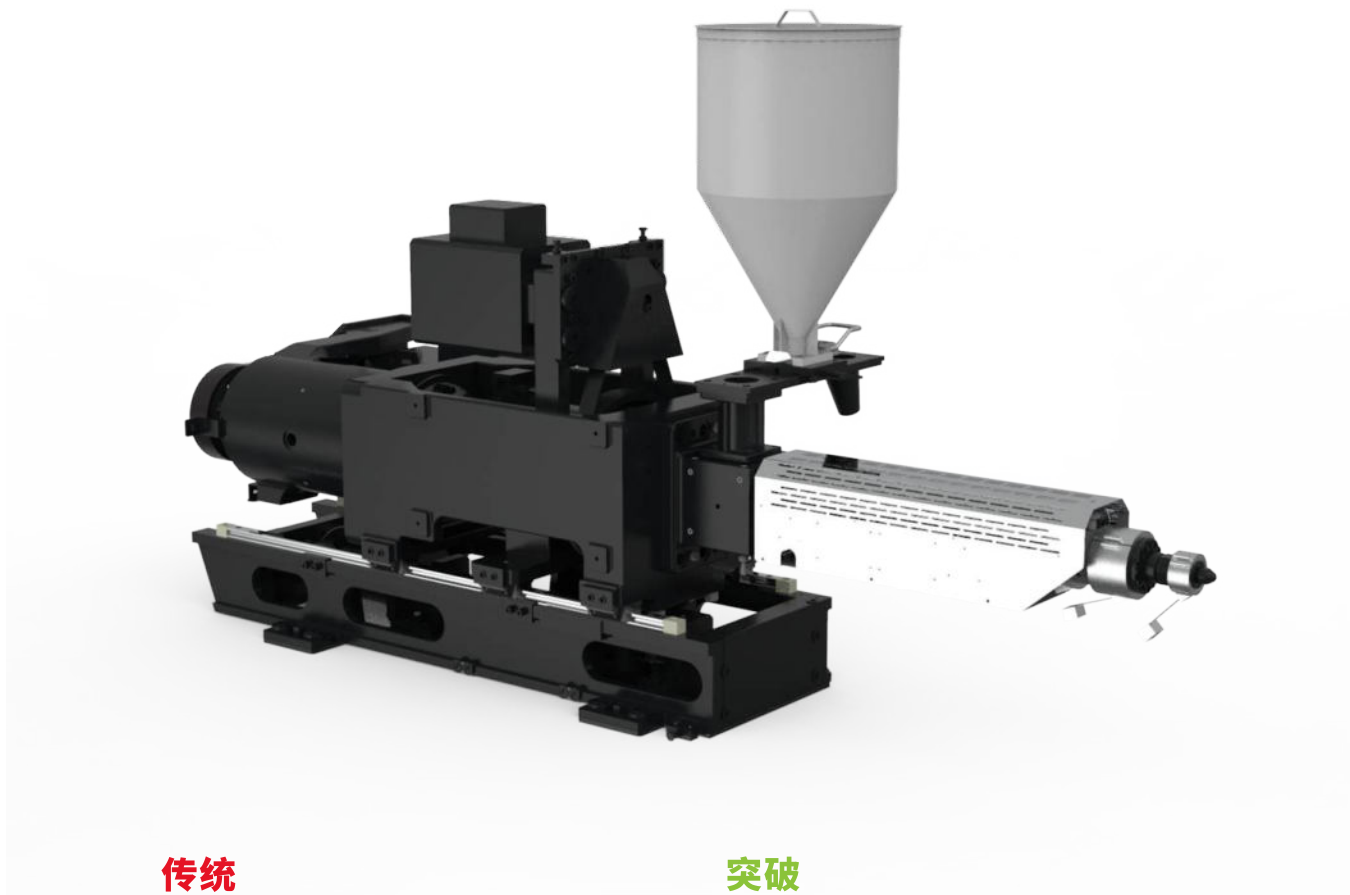
Platen Supported By Linear Guide



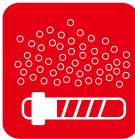
- 更好的模板平行度
High platen parallelism
- 移动模板无需润滑
No lubrication on movable platen
- 保持产品跌落区清洁
Keep clean around Part-drop-area

专利封闭式滚珠丝杆结构

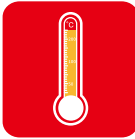
Patented Encapsulated Ball Screw Structure



传统 Tradition



丝杆表面容易吸附灰尘
Traditional design of ball screw structure is open to the air, dust will stick on the ball screw surface



丝杆容易因为摩擦造成温升
Friction will increase ball screw temperature



丝杆润滑状况差
Lubrication condition become worse

突破 Breakthrough



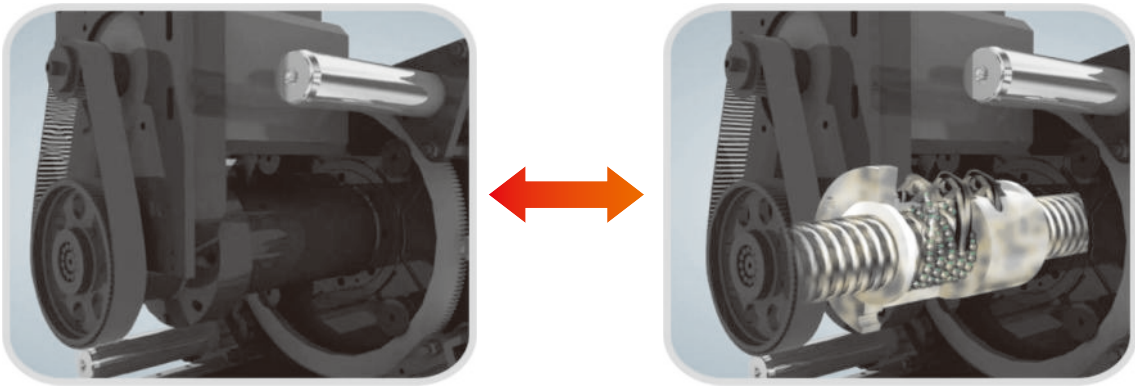
全封闭壳体，防止灰尘附着丝杆，降低车间环境的要求
Encapsulated ballscrew, reduce the requirement of workshop environment



丝杆摩擦热量及时通过润滑油扩散，控制温升
The heat created by friction is taken by oil bath, Ballscrew is well kept cool.



油浴润滑，油膜充分可靠
Lubrication is kept on the friction surface by oil bath



- 迅速带走摩擦热量，降低丝杆温度，减少磨损
Take away friction heat rapidly, reduce ball screw temperature and abrasion.
- 阻隔灰尘污染，对使用环境要求低
Obstruct dust pollution, request of using environment is low.
- 无须使用昂贵的进口丝杆润滑脂
Expensive and imported ball screw lubrication grease is unnecessary.
- 维护简单，不需要清理油泥
More easy for maintenance, no need to clean fatlute.
- 专利的封闭式射出结构设计，防尘、浸泡式、润滑，提高丝杆寿命
Special design of enclosed electric clamping cylinder which is anti-dust immersion type good lubrication. It will improve the ball screw lifetime.

控制系统 Control System

伊士通（标配） EST

15

Inches | 英寸

I/O

Module | 模块

PC

Port | 端口

4.0

Germany

CAT

Ether | 高性能

0.01

Precision | 精密



- 配置iDream系列电脑控制器，15英寸一体式触摸显示屏，颜值高，操作轻便，性能强大。
IDream Series Control system,with 15inch full touchscreen,exquisite in design, super performance and easy for operation.
- 丰富的扩展资源，便捷的扩展方式，满足客户各类非标定制需求。
Rich extension resource,and easy extension mode for all kind of customized requirements.

科霸（选配） KEBA

12/15

Inches | 英寸

I/O

Module | 模块

PC

Port | 端口

4.0

Germany

CAT

Ether | 高性能

0.01

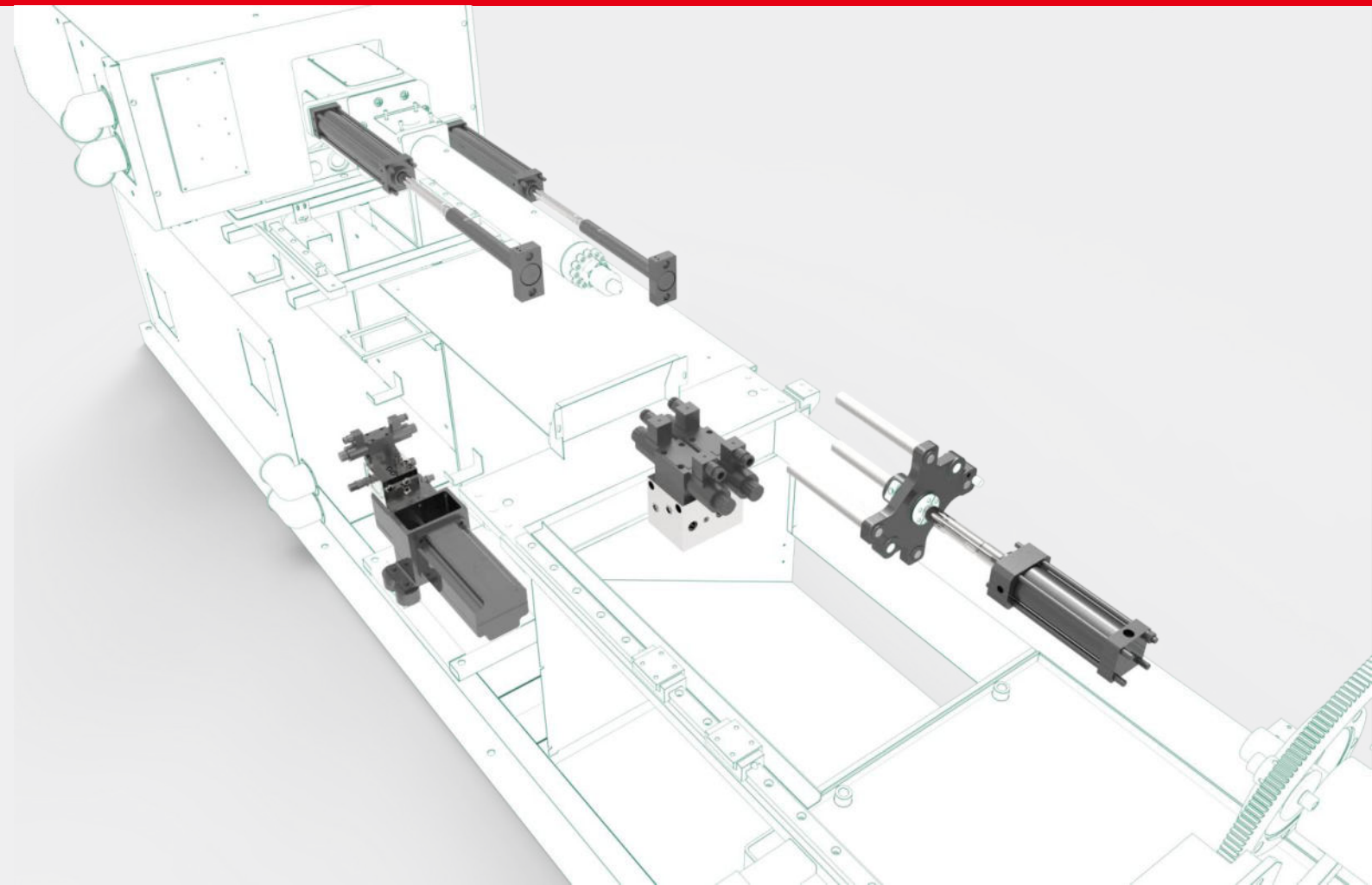
Precision | 精密



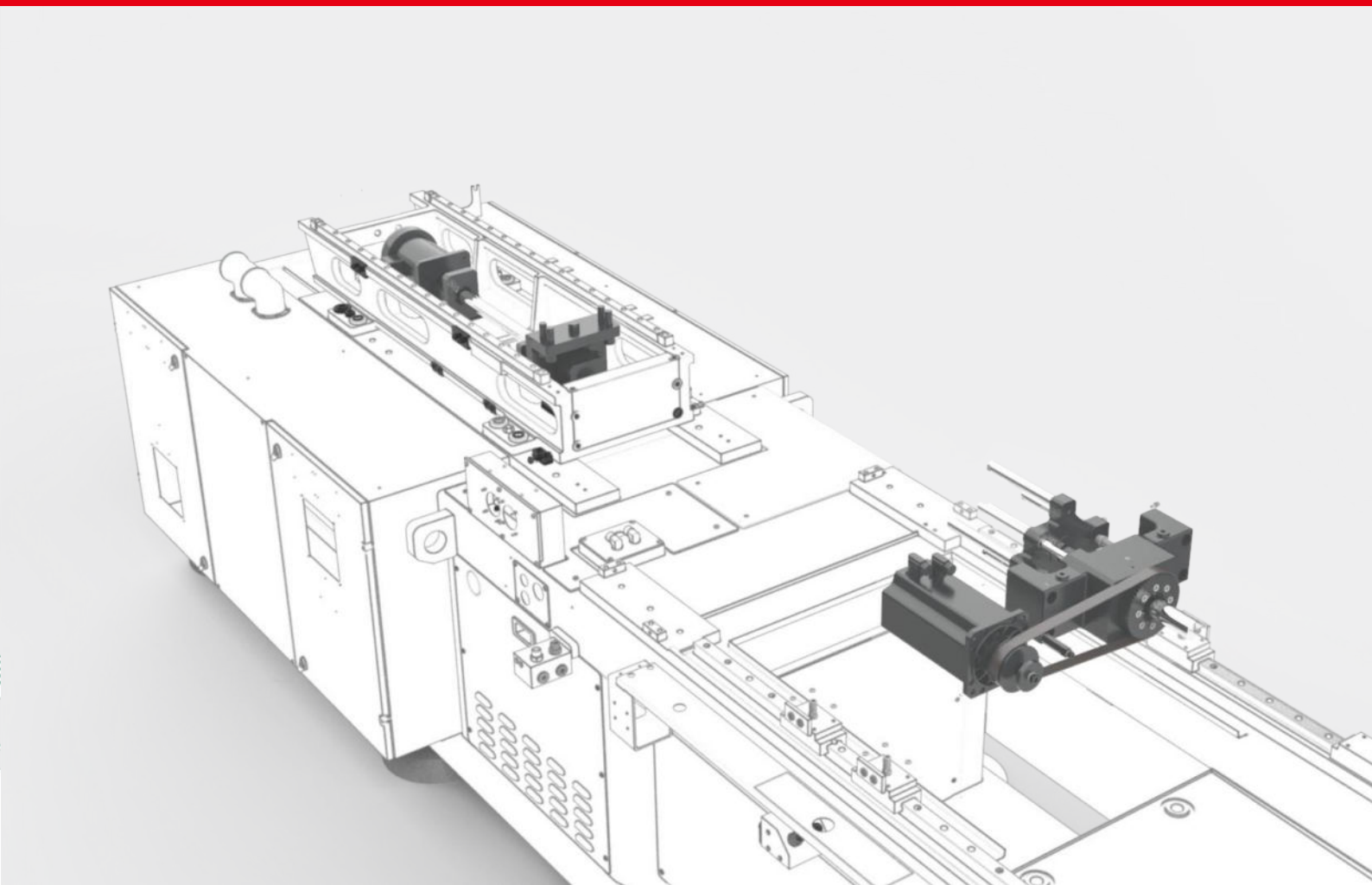
- 标配KePlast系列电脑控制器，15英寸触摸式显示屏，性能强大。
KEBA controller as standard with 12 inch touchscreen, user friendly interface
- 基于PC的控制平台，采用Windows 系统，操作方便，易于扩展。
PC-based control platform, windows system, easy operation, easy to be extended.
- EtherCAT 现场总线系统，配置具实时特性的超高速 I/O 模块。
EtherCAT fieldbus control system, utilize superspeed I/O module with real time function.
- 德国工业4.0标准，易于实现的智能制造技术。
Germany industry 4.0 standard, intelligent manufacturing technology which is easy to implement.

- 配置EtherCAT总线实现电脑、伺服驱动伺服电机三者间实现运行数据实时共享。
EtherCAT fiedbus control system,utilize the running data ontime sharing among controller, servo driver and servo motor.
- 结合全电专用动态算法及高响应高过载电机，提升成型产品质量。
Combined with specific dynamic progarmming and high-response and high-overload motor to improve the product quality.

嵌入式伺服液压泵站 (FE油电混合系列) Embedded Servo Hydraulic Pump Station



标准日系全电配置 (FE-A全电系列) Embedded Servo Hydraulic Pump Station



- 对称式移射，射嘴顶靠受力更平衡、可靠
Symmetrical cylinder arrangement for injection carrier, offer reliable and balance nozzle contact
- 伺服驱动泵站，更节能高效
Servo drive hydraulic pump station, power saving and effetely
- 标配液压顶出和中子功能，灵活满足不同模具使用
Hydraulic ejector and core puller flexiable to meet different mold requirement

- 全电配置，带标配中子信号，射移及顶出电机驱动
Option for Full-electrical version: without hydraulic pump station and corepull, electrical drive for carrier movement and ejector.



德国设计的塑化系统 German Designed Plasticizing System

- 优异的塑化效果
Excellent plasticizing efficiency
- 满足各种应用的螺杆方案
Options for different application

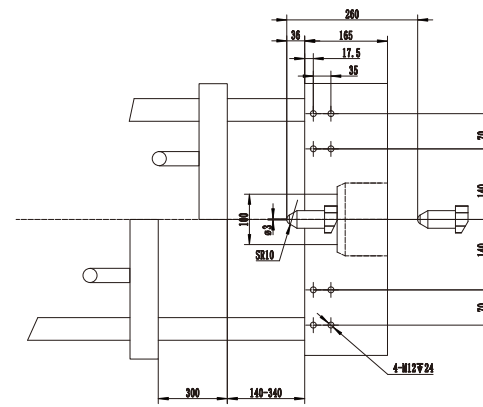
广泛应用领域 Various Application

- 注射采用低惯量高响应结构，静音皮带传动，灵活配置传动比
Adopt low inertia&high response structure for injection, quiet conveyor, meet various condition
- 注射重复精度高，产品稳定
Higher injection precision repeatability, stabilize in product
- 应用广泛，薄壁包装到厚壁透镜均能适用
Meet various condition, thin wall packing and wall thick lens can be applied
- 注射位置重复精度 $\pm 0.01\text{mm}$
Injection position repeatability $\pm 0.01\text{mm}$

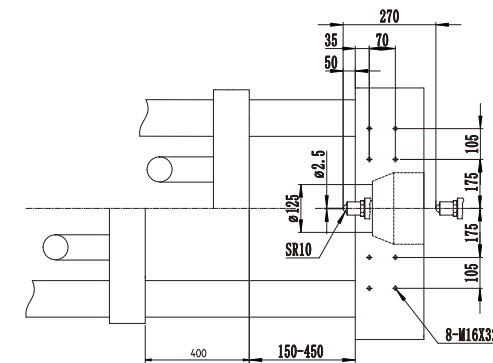
技术参数 Technical Data

		BL50FE-A			BL110FE/BL110FE-A				BL150FE/BL150FE-A				BL180FE/BL180FE-A				BL230FE/BL230FE-A				BL280FE/BL280FE-A				BL350FE/BL350FE-A				BL450FE/BL450FE-A							
螺杆型号		A	B	C	AA	A	B	C	AA	A	B	C	AA	A	B	C	AA	A	B	C	AA	A	B	C	AA	A	B	C	A	B	C	D	A	B	C	D
螺杆直径 Screw Diameter	mm	22	25	28	25	28	32	36	28	32	36	40	32	36	40	45	36	40	45	50	40	45	50	55	45	50	55	60	60	65	70	75	70	75	80	85
螺杆长径比 Screw L/D Ratio		23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	21.3	
塑化能力ps Plasticizing ability	g/s	9	12	18	9	12	18	24	11	15	21	25	15	21	25	40	18	24	34	45	24	34	45	59	34	45	59	74	49	62	76	91	76	91	110	126
注射行程 Screw Stroke	mm	100			140				160				180				200				230				260				325				370			
理论注射容积 Injection Capacity	cm³	38	49	62	69	86	113	143	99	129	163	201	145	183	226	286	204	251	318	393	289	366	452	546	414	511	618	735	919	1078	1251	1436	1424	1635	1860	2100
注射量(PS) Shot Weight Ps	g	35	45	56	63	78	102	130	90	117	148	183	132	167	206	261	185	229	289	357	263	333	411	497	376	465	562	669	836	981	1138	1307	1296	1487	1692	1911
喷嘴接触力 Nozzle contact pressure	KN	20			25				30				40				50				55				55				60				60			
标准注射单元 standard injection unit		E100			E225				E325				E400				E570				E800				E1100				E2150				E3250			
注射速度 Injection Speed	mm/s	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	190	190	190	190	190	190	190	190	165	165	165	165	165	165	165	165	165	165	165	
注射压力 Injection Pressure	MPa	284	220	175	328	261	200	158	331	253	200	162	313	247	200	158	313	253	200	162	313	247	200	165	269	218	180	151	235	200	172	150	230	200	176	156
保压压力 Holding Pressure	MPa	232	180	143	262	209	160	126	264	203	160	130	250	198	160	126	250	203	160	130	250	198	160	132	239	194	160	134	188	160	138	120	184	160	141	125
高速注射单元 high speed injection unit		E100H			E225H				E325H				E400H				E570H				E800H				E1100H				E2150H				E3250H			
注射速度 Injection Speed	mm/s	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
注射压力 Injection Pressure	MPa	284	220	175	328	261	200	158	331	253	200	162	313	247	200	158	313	253	200	162	313	247	200	165	269	218	180	151	234.7	200	172.4	150.2	230	200	176	156
保压压力 Holding Pressure	MPa	232	180	143	262	209	160	126	264	203	160	130	250	198	160	126	250	203	160	130	250	198	160	132	239	194	160	134	187.8	160	138	120.2	184	160	141	125
最大螺杆转速 Screw Speed	rpm	400			400				350				350				300				300				300				200				200			
锁模力 Clamping Force	kN	500			1100				1500				1800				2300				2800				3500				4500							
拉杆内间距 (H×V) Tie-bar Distance (h×v)	mm	360×330			460×410				510×460				560×510				660×610				710×660				810×760				910×860							
开模行程 Opening Stroke Max	mm	300			400				450				500				600				650				750				820							
最小模具厚度 Mold Height Min	mm	140			150				180				200				200				220				240				350							
最大模具厚度 Mold Height Max	mm	390			450				500				550				650				700				800				830							
最大模板距离 Max Daylight	mm	690			850				950				1050				1250				1350				1550				1650							
顶出行程 Ejector Stroke	mm	70			100				120				130				130				150				150				180							
顶出力 Ejector Force	kN	20			30				35				45				45				50				60				98							
顶出杆数 Number of ejector rods	PCS	5			5				5				5				13				13				13				17							
干循环 Dry cycle time	s	1.2			1.3				1.4				1.6				1.8				2.1				2.3				3							
总电气容量(高速版) Total electrical capacity(High speed)	kW	25.4(36.8)			52.6 (69.6)				59.6 (71.6)				60.5 (76.5)				70.2 (82.2)				110.3 (132.3)				156 (178)				220.9 (244.9)				233.1 (277.7)			
电热功率 Heater power	kW	5.4	6.2	7.2	5.6	6.4	7.4	8.4	7	7.9	8.85	9.8	7.8	8.65	9.6	10.7	9.7	11.7	13.6	15.5	13.3	15	16.9	18.8	17.2	19.1	21.9	24.5	21.8	24	26.2	26.2	29	33	37	37
温控区数 Number of temp. control zones		3+1			3+1				3+1				3+1				3+1				3+1				3+1				4+1				4+1			
料斗容积 Hoper capacity	L	25			25				25				25				25				50				50				50				50			
最小模板尺寸 (长×宽) Min. platen size(L×W)	mm	250×250			320×320				360×360				390×390				460×460				500×500				570×570				640×640							
模板尺寸 (长×宽) Platen size(L×W)	mm	530×500			660×610				730×680				820×770				940×890				1020×970				1130×1080				1270×1220							
固定模板承重 Stationary platen load	kg	153			323				459				612				935				1173				1700				2170							
移动模板承重 Moving platen load	kg	247			527				711				948				1455				1827				2640				3360							
机器重量(约) Net weight(appro.)	ton	3.5			4.2				5.7				6.9				8.5				11.5				15				20				21			

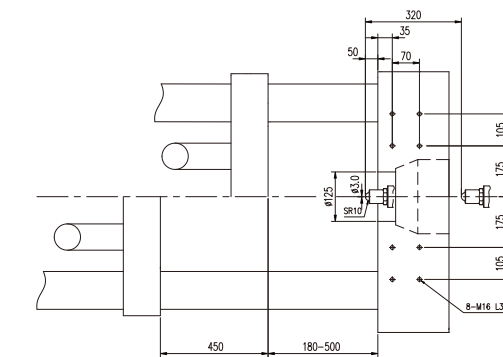
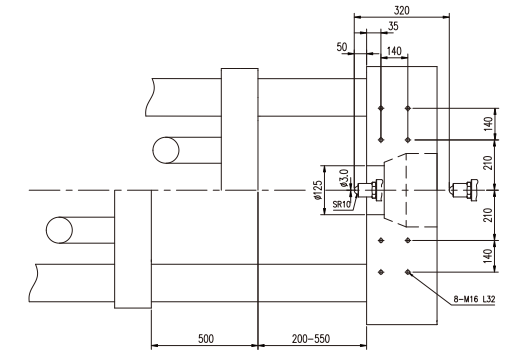
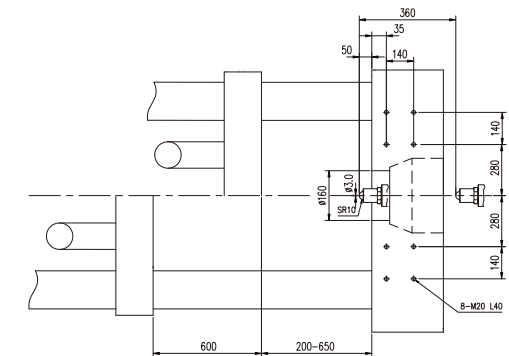
Platen Dimensions & Machine Dimensions



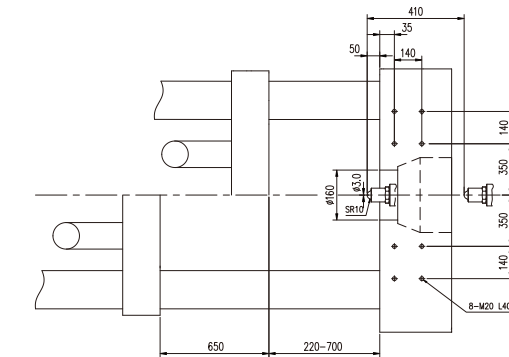
BL50FE



BLI 10FE

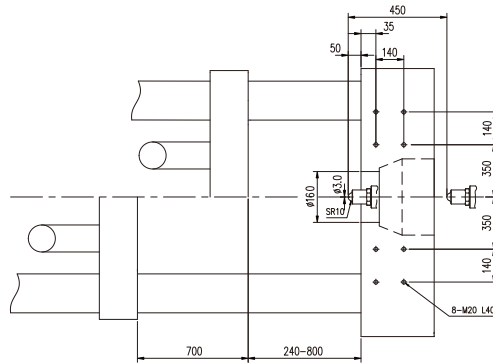
**BLI 50FE****BLI 80FE**

BL230FE

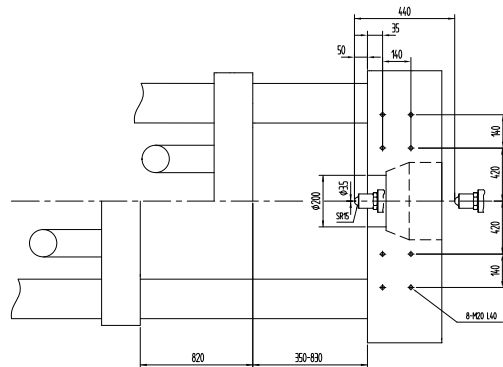


BL280FE

配置表 Configuration List



BL450FE



BL450FE

国际单位切换(公制/英制)

控制、监视装置

成型品落下检测装置

其他