



高效型/高速型 - 外曲肘射出機

High-performance / High-Speed

Outward Toggle Injection Molding Machine

SA SERIES

SA Series



高效率 - 生產效率提升15~20%
高性能 - 射出速度提升20%以上

High Efficiency - Increasing production efficiency 15~20%.

High Performance - Improving injection speed by 20% ↑.



FCS五十年技術結晶與積累，創造了多樣性的產品及穩定的性能品質，同時也針對各行業不同產品特性，提供差異化技術整合與服務。**SA系列**為FCS全新發表之外曲肘射出機，不僅規格升級，設計也更加優化，外觀造型仍堅持美學與人因工程兼備之要求，更整合高階電控系統優勢，可充分結合FCS工業4.0解決方案，是一款集性能、效能與智能於一體的智能射出成型機，可廣泛應用於家用民生、文具、汽車、3C等產業，鞏固客戶競爭優勢。

With 50 years of technological developments and innovations, FCS offers a new and optimized design with increased performance and reliability for a wide variety of industries.

The new **SA Series** delivers unmatched efficiency with its Outward toggle system. The clamp and injection unit specifications have also been increased to allow our customers more flexibility in the range of molds they can run in the machine. The outside appearance of the machine was developed with friendly ergonomics to make working in and around the machine easy, comfortable and safe for the operator. The KEBA control now offers an enhanced capability to integrate the FCS iMF 4.0 system to assist in making your facility a Smart Injection Molding Machine Plant. Overall, these new enhancements to the SA Series will help our customers increase their competitiveness in the industry and propel them to the next stage in new machine technology.



展 合優翼 風生水起



長度縮短
15-20%

Reduce the length
by 15-20%

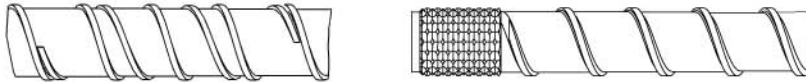
相比傳統同噸位機型
Compared to traditional IMM
of the same-tonnage

Thriving and Flexible



精準的射出單元 Accurate Injection Unit

高混練螺桿
High mixing screw

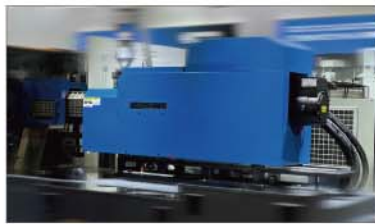
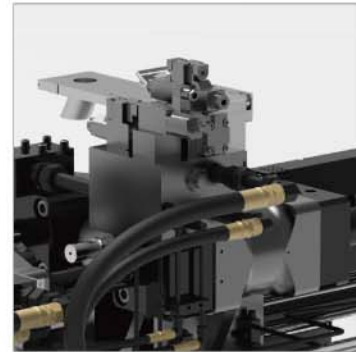


高混練螺桿

提升L/D比，滿足高射量產品。

High mixing screw

Improve L/D ratio and meet high injection volume products.



電動儲料

- 儲料電動化實現精準加料控制。
- 滿足開模加料同步動作，適用短周期需求。
- 可依螺桿扭力需求選用直驅型或齒輪箱型儲料馬達。

Electric Plasticizing System

- Electrified plasticizing mechanism delivers precise material feed control.
- Supports simultaneous plasticizing during mold opening, ideal for short-cycle molding applications.
- Direct-drive and gearbox motor options available based on screw torque requirements.



射座線性滑軌

- 負荷輕、減少磨耗，注塑控制精準穩定。
- 儲料背壓阻力低，減少熔膠溢流改善70%。

Linear guide for the injection carriage

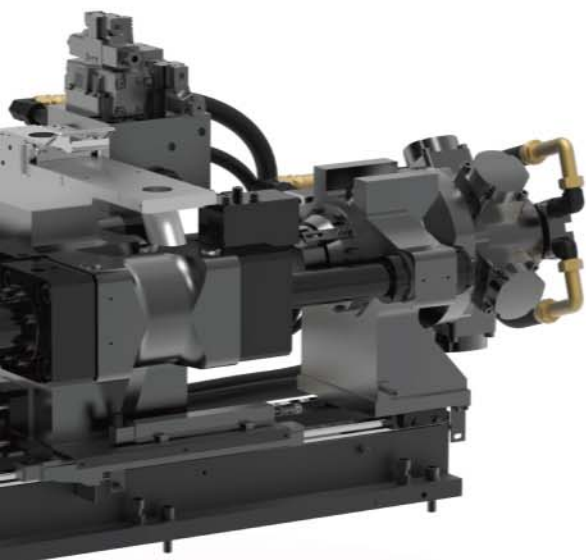
- Lighter load and less abrasion which ensures precise and stable injection.
- Basic charging back pressure to reduce the melt overflow improve 70%.

優化的油壓迴路

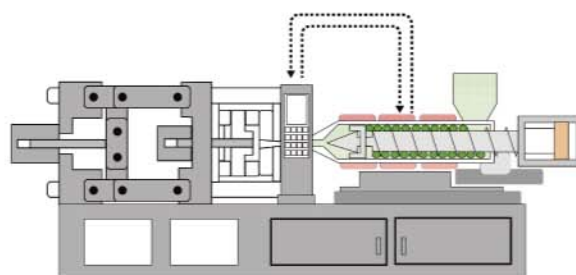
- 射出油路板與油缸整合優化，系統壓力提升，提升射出響應。
- 油箱循環優化，提升液壓油效率，延長油品使用壽命。

Optimized Hydraulic Circuit

- Integration of the injection manifold and cylinder enhances system pressure and improves injection responsiveness.
- Upgraded hydraulic tank circulation increases oil utilization efficiency and prolongs hydraulic oil service life.



全閉迴路系統 Closed-loop system



回授螺桿位置於控制器
Screw position feedback to the controller.

伺服動力全閉迴路

精準控制每模射速，射出時間穩定性 >99.9%，
成型品重量穩定性佳。

Servo power closed-loop system

Accurately controls the injection speed, injection
time and shot weight.

射座前拉設計

形成力量閉循環，減少機架受力，使射出推力
更集中。

Injection Carriage with front pulling cylinder

Closed loop design minimizes frame load and
concentrates injection thrust for enhanced
performance.

模組化規格選型

提供高速款規格，彈性化滿足食品包裝、薄壁
容器等產業需求。

Optional modular specification

High-speed option is available for food packag-
ing industry and thin-walled product molding
requirements.

優化的夾模單元 Optimized Clamping Unit

機台高效緊湊

- 機身總長縮短17%，減少占地空間，提升廠房利用率。
- 機台高度符合人體工學設計，操作更舒適。

High-Efficiency, Compact Machine Layout

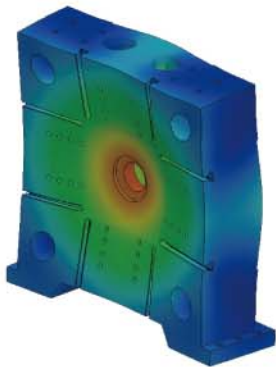
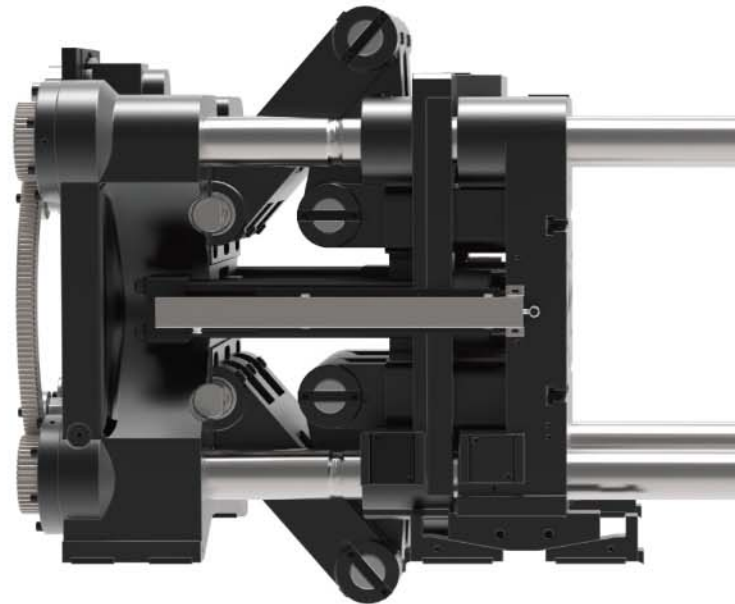
- Overall machine length reduced by 17%, minimizing footprint and optimizing plant space utilization.
- Ergonomic machine height design improves operator comfort and accessibility.

模具動作配合優化

- 中子可設定多組動作順序並支援反向運行，靈活配合各式模具需求。
- 具強制頂針退回功能，滿足模具特殊需求。

Enhanced Mold Action Synchronization

- Supports multiple core action sequences with optional reverse operation capability.
- Equipped with Ejection-pullback function to accommodate specialized mold requirements.



模盤強度提升

- 剛性提升30%，模盤變形量更低，提升模具使用壽命。
- 成品重量有效縮減3%
- 成品重量穩定度提升40%

Linear guide for the injection carriage

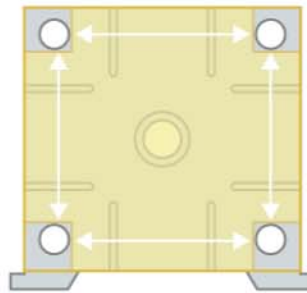
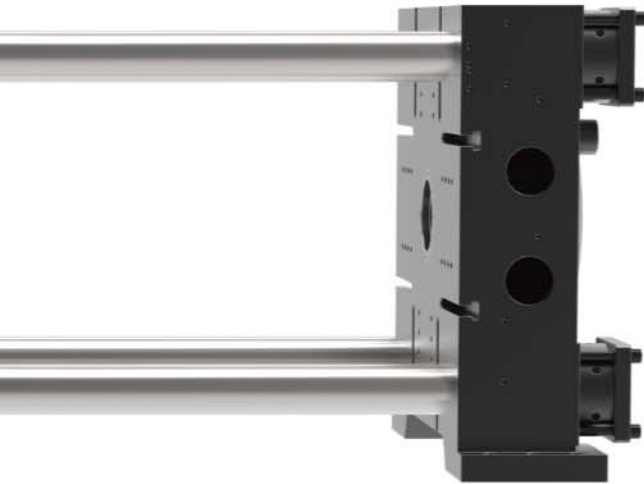
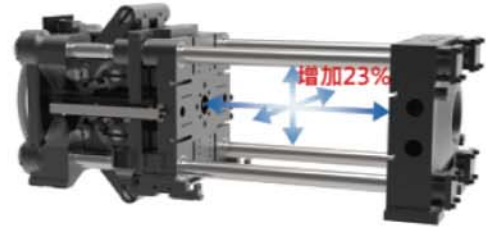
- Finished Product Weight Optimization
- Product weight variability reduced, achieving a 3% decrease in overall weight.
- Product 40% improvement in weight consistency.

總容模空間全方位增加23%

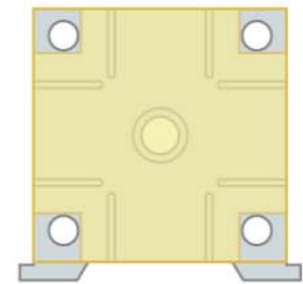
- 開模行程增加18%，搭配柱內距加大及寬模板設計，全方位增加容模空間。
- 全系列標配T型槽，提高模具使用彈性。

Expanded Mold Accommodation Capacity

- Mold opening stroke increased by 18%, with larger tie bar spacing and wider platen design, achieving a 23% overall increase in mold space.
- Standard T-slot platens across all models enhance mold installation flexibility.



SA Series



HN Series

柱內距加大
模具應用彈性高。

Tie bar spacing increase
More flexible choices for mold application.

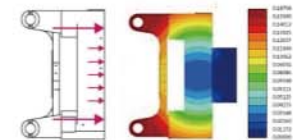
活動壁設計優化

- 中心鎖模結構，力流均勻化，可減少模具變形。
- 剛性提升30%，模盤變形量更低，生產穩定性提升40%。
- 夾模雙缸設計，位置同步性>99.95%

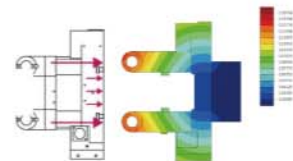
Optimized Moving Platen Design

- Centralized clamping structure ensures uniform force distribution, effectively reducing mold deformation.
- Rigidity improved by 30%, resulting in lower platen deflection and a 40% improvement in production stability.
- Dual-cylinder clamping system achieves synchronization accuracy exceeding 99.95%.

HT Series



SA Series



智能的電控單元 Intelligent Control Unit

直覺式操作介面

- 全新設計畫面風格與圖示，12" TFT真彩色顯示螢幕，操作更為便利。
- 具多階密碼保護功能，記錄與限制各階使用者參數修改。
- 提供統計製程控制及射出波形圖，提高生產品質與效率。
- USB資料存取介面，模具參數、顯示畫面存取便利。
- 支持常用通訊介面RS-485、USB、CAN、Ethernet、EtherCAT、遠端介面顯示VNC、OPCUA(選配)、Euromap77(選配)。
- 開合模5段控制，射出9段/保壓5段控制、熔膠/背壓5段控制、頂出3段控制。
- 模具參數500組，警報記錄每個等級512條。
- 多種語言可供客戶選擇。

Intuitive HMI

- 12" TFT full-color display with redesigned UI and intuitive icons for enhanced operability.
- The multi-level password protection function is used to record and limit the parameters modification from various levels of users.
- Provide statistical process control and injection waveformsto improve production quality and efficiency.
- Convenient access to USB data, mold parameters and display screens.
- Supports RS-485, USB, CAN, Ethernet, EtherCAT; Remote interface display VNC, optional OPCUA (Optional) and Euromap 77(Optional).
- Multi-stage control:
 - Clamping: 5 stages
 - Injection: 9 stages / Holding: 5 stages
 - Ejection: 3 stages
 - Plasticizing / Back pressure: 5 stages
- 500 mold data sets; 512 alarm logs per level.
- Multiple languages are available for users.

控制精度

- 加熱控制精度0.1°C並有效分段控制，以提升塑化能力。
- 位置控制精度0.1mm，可準確控制動作行程。
- 即時能耗紀錄與碳排履歷計算即時能耗紀錄，隨時掌握機台生產效率。
- 計算產品碳排履歷，協助可視化數據管理。

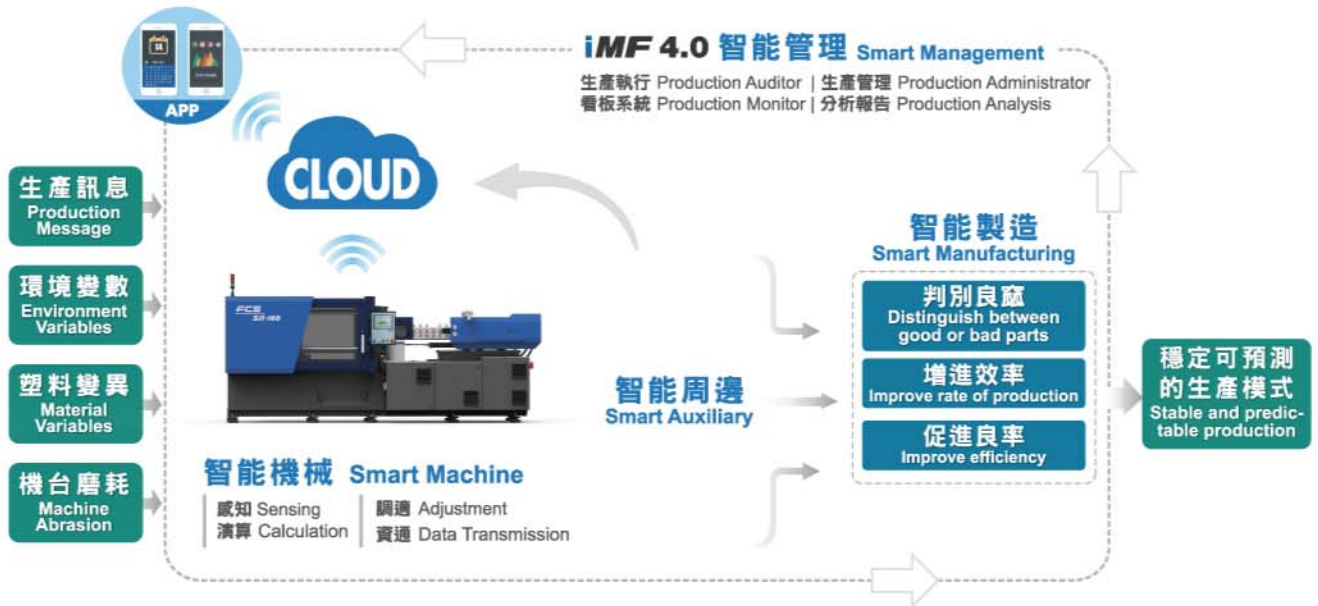
Real-Time Energy Consumption and Carbon Footprint Monitoring

- Barrel heat zones are accurate to 0.1 degree C to ensure stable material plasticizing.
- Screw position is controlled with in 0.1mm to precisely control shot size and cushion position.
- Continuous recording of energy usage facilitates real-time production efficiency tracking.
- Integrated carbon footprint calculation supports data visualization and sustainable production management.



iMF 4.0 智能製造工廠

intelligent ManuFactory



遠端監控&工業4.0 (選配)

- 生產品質記錄。
- 模具資料上傳及下載。
- 機台稼動率及產能統計。
- 機台停機狀態顯示及記錄。
- 可將資訊匯出以進行看板管理。

Remote Control & Industry 4.0 (Optional)

- Production quality recording.
- Mold information upload and download.
- Machine utilization rate and production capacity statistics.
- Machine downtime status display and recording.
- Information can be exported for visual management.

智慧功能模組 (選配)

- 大柱鎖模力回饋控制各別大柱鎖模力及總鎖模力SPC顯示，達到數據可視化及不平均監視。
- 鎖模力免停機自動校正調控，隨時保持最佳鎖模狀態。

Smart Functional Modules (Optional)

- Tie-bar clamping force feedback control module provides real-time SPC visualization for both individual tie-bars and total clamping force, enabling precise unevenness monitoring.
- Automatic clamping force recalibration without machine downtime ensures optimal molding conditions at all times.

即時能耗紀錄與碳排履歷計算 (選配)

- 即時能耗紀錄，隨時掌握機台生產效率。
- 計算產品碳排履歷，協助可視化數據管理。

Real-Time Energy Consumption and Carbon Footprint Monitoring (Optional)

- Continuous recording of energy usage facilitates real-time production efficiency tracking.
- Integrated carbon footprint calculation supports data visualization and sustainable production management.

控制器 Control	FCS 6510S (SA-100-SA-400)	FCS 6500S (SA-470-SA-1000)
螢幕尺寸 Screen Size	12"	12"
操作方式 Operation Method	按鍵 Button	按鍵 Button
反應時間 Reaction Time	≤1ms	≤1ms
螢幕顯示 Screen Display	• 800x600像素 • 800x600 pixel	• 160萬色真彩顯示 • 16 million color palettes

薄壁包裝經典應用

Application of Thin-Walled Packaging


產品 Product	容量 Capacity	模穴數 Cavity	單個產品克重 Weight (g)	壁厚 Thickness(mm)	成型周期 Cycle time(s)	適配機型 IMM Model	
 打包盒 Square food box	1000ml	2	16.5~18	0.38~0.4	4.5-5	SA-250	高速型 High Speed
		4			4.5-5.5	SA-350	高速型 High Speed
		6			5.2-5.8	SA-400	高速型 High Speed
		8			5.5-6.0	SA-470	高速型 High Speed
 打包盒蓋 Round food box Lid	-	4	7.5~8.5	0.36~0.4	4.5-5	SA-250	高速型 High Speed
		6			4.5-5.2	SA-350	高速型 High Speed
		8			5.0-5.5	SA-400	高速型 High Speed
		12			5.5-6.5	SA-470	高速型 High Speed
 9050模內 貼奶茶杯 9050 IML bubble teacup	500ml	6	14.5~15.5	0.45~0.5	6.0-7.0	SA-350	高速型 High Speed
		8			6.5-7.2	SA-470	高速型 High Speed
 9070模內 貼奶茶杯 9070 IML bubble teacup	700ml	6	21~25	0.4~0.5	6.0-7.0	SA-350	高速型 High Speed
		8			6.5-7.2	SA-470	高速型 High Speed
 奶茶杯蓋 Bubble teacup lid	-	12	4.7~5.5	0.8~0.42	5.2-5.5	SA-350	高速型 High Speed
		16			5.5-6.0	SA-350	高速型 High Speed
		24			6.0-6.5	SA-400	高速型 High Speed

產品 Product		容量 Capacity	模穴數 Cavity	單個產品克重 Weight (g)	壁厚 Thickness(mm)	成型周期 Cycle time(s)	適配機型 IMM Model	
	4格 便當盒 Behto box with 4 compartments	1000ml	2	22~26	0.38~0.4	6.5-7.0	SA-300	高速型 High Speed
			4			6.0-6.5	SA-400	高速型 High Speed
	P4醬料杯 P4 Sauce cup	120ml (4 oz)	16	5.0~5.5	0.36~0.4	6.0-7.0	SA-350	高速型 High Speed
			32			6.5-7.0	SA-470	高速型 High Speed
	食品包裝桶 Food container	1000ml	2	55~60	0.7~1.2	7.0-7.5	SA-300	高速型 High Speed
			4			9.0-9.5	SA-350	高速型 High Speed
	食品包裝桶蓋 Food packaging bucket LIDS	1000ml	4	55~60	0.6~0.8	7.0-7.5	SA-250	高速型 High Speed
			8			9.0-9.5	SA-350	高速型 High Speed
	勺 Spoon	-	32	1.7~1.8	0.6~0.8	7.0-7.5	SA-300	高速型 High Speed
			48			7.0-8.5	SA-350	高速型 High Speed
			64			8.5-9.5	SA-400	高速型 High Speed

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桶體應用 Application of Bucket Body






產品 Product	容量 Capacity	模穴數 Cavity	單個產品克重 Weight (g)	壁厚 Thickness(mm)	成型周期 Cycle time(s)	適配機型 IMM Model		
	2.5L	205X160X140	1	70	0.75~1.0	12	SA-250	高速型 High Speed
			2	140		15	SA-300	高速型 High Speed
	5L	255X221X195	1	135	0.75~1.0	14	SA-300	高速型 High Speed
			2	270		17	SA-400	高速型 High Speed
	10L	258x228x265	1	400	1.50	14.3	SA-470	高效型 High Performance
			1	400		15.0	SA-470	高效型 High Performance
			1	400		15.8	SA-470	高效型 High Performance
	20L	305x270x365	1	800	1.80	22.0	SA-530	高效型 High Performance
			1	800		19.7	SA-530	高效型 High Performance
	25L	305x270x385	1	800	1.80	18.0	SA-530	高效型 High Performance
			1	1000		21.9	SA-530	高效型 High Performance
	33L	305x310x400	1	1020	1.80	22.5	SA-530	高效型 High Performance



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桶蓋\瓶蓋應用 Application of Bucket Lids and bottle caps

產品 Product	容量 Capacity	模穴數 Cavity	單個產品克重 Weight (g)	壁厚 Thickness(mm)	成型周期 Cycle time(s)	適配機型 IMM Model		
	2.5L	2	28	0.6-0.7	6.5-7	SA-250	高速型 High Speed	
		4	112		7.5-8.5	SA-350	高速型 High Speed	
	5L	1	37	0.6-0.7	5.5-6.0	SA-250	高速型 High Speed	
		2	74		6.5-7	SA-300	高速型 High Speed	
	10L	1	140	1.60	14.8	SA-250	高效型 High Performance	
		2	280		15.6	SA-300	高效型 High Performance	
	20L	1	245	2.00	20.2	SA-250	高效型 High Performance	
		1	490		21.3	SA-250	高效型 High Performance	
33L	385	1	296	2.15	23.0	SA-250	高效型 High Performance	
	外置提手 Handle	35*120*20	16	10.00	1.3	18	SA-250	高速型 High Speed
			32	10.00		18	SA-350	高速型 High Speed
	5L提手 5L Handle	205	16	5.00	0.6-0.7	8	SA-250	高速型 High Speed
			24	5.00		8	SA-300	高速型 High Speed
	利樂蓋外蓋 Lid	Φ25.7*11.5	24	1.05	1.00	10.0	SA-250	高效型 High Performance
			48	1.05		10.0	SA-300	高效型 High Performance
	利樂蓋螺口 Closure neck	35*27*13.5	24	1.35	1.00	10.0	SA-250	高效型 High Performance
			48	1.35		10.0	SA-300	高效型 High Performance
	利樂蓋內芯 Cutting mechanism	20*12.5	24	0.45	1.00	8.0	SA-250	高效型 High Performance
			48	0.45		8.0	SA-300	高效型 High Performance
	醬油拉環翻蓋 Pulling ring flip top cap	35*70*20	16	5	1.3	15	SA-250	高速型 High Speed
			32	5		15	SA-350	高速型 High Speed

標準與選購配備 Standard & Optional Accessories

配備項目		ITEM	SA-250	SA-300
射出止逆裝置	Shot-off Nozzle		○	○
PVC、PC、壓克力、尼龍專用螺桿組	Special Screw for PC/PMMA/PA/PVC...		○	○
雙合金螺桿、料管	Bi-alloy Screw/Barrel		○	○
托拉式落料裝置	Sliding material feeding device		●	●
曲手：套鋼	Steel bearing(Toggle)		●	●
模壁T型槽	T-slot platen		●	●
隔熱墊板	Insulator sheets		○	○
活動式模定位圈	Check ring of mold (Replaceable)		●	●
強制托退	Ejector pull back		○	○
射出安全護罩	Safety cover for injection		●	●
半罩式板金(射出)	Half machine housing (Injection)		—	—
全罩式板金(射出)	Whole machine housing (Injection)		●	●
成品落下口	Article Collecting Channel		●	●
成品落下板	Article Collecting Channel		▲	▲
電眼檢出	Photo cell drop-out checking device		○	○
水流分佈器12入12出	Water manifold - 12 in & 12 out		●	●
水流分佈器16入16出	Water manifold - 16 in & 16 out		○	○
水流分佈器24入24出	Water manifold - 24 in & 24 out		○	○
車壁潤滑：電動注油器	Auto Manual lubrication(platen)		●	●
曲手電動注油器	Auto lubrication system for toggle		●	●
開關模比例閥控制	Proportional valve for mould open and close		○	○
電預塑裝置	Electric plastification device		●	●
單缸射出	Single cylinder injection unit		—	—
雙缸射出	Double cylinder injection unit		●	●
紅外線電熱片	Infrared heating coil		●	●
射出閉迴路(伺服閥)	Closed-loop control for injection(servo valve)		○	○
托模止逆閥	Non-return valve for ejector		●	●
中子裝置	Core pulling device		○	○
轉牙裝置(計時/計次)	Unscrew device by timer or counter		○	○
自封式磁性吸油過濾器	With check valve magnetic suction filter		●	●
雙迴路(開模與托模同動)	Double loops system(mold open - ejector start)		○	○
雙迴路(開模與加料同動)	Double loops system(mold open - screw charge start)		●	●
三迴路(開模、托模與加料同動)	Parallel movement for material charging & mold ejecting during mold opening		○	○
伺服節能系統	Servo power-saving system		●	●
電動安全門	Automatic safety gate (Electric type)		—	—
射出壓力螢幕顯示	Injection pressure display on screen		○	○
多段數位背壓(螢幕設定)	Multi-stage back pressure control(Screen set up)		●	●
多段數位背壓/射出壓力螢幕顯示	Multi-stage back pressure/Injection pressure display on screen		○	○
油溫顯示	Oil temperature display for hydraulic system		●	●
油溫控制	Oil temperature display & control		○	○
落料口溫度顯示	Temperature display of material feeding section		●	●
落料口溫度控制	Temperature control of material feeding section		○	○
射嘴獨立溫控	Temperature control of injection nozzle		●	●
射出電阻尺	Linear potentiometer for injection		●	●
射座電阻尺	Linear potentiometer for injection carriage		○	○
夾模電阻尺	Linear potentiometer for clamping		●	●
托模電阻尺	Linear potentiometer for ejection		●	●
兩個風托(一公一母)	Air ejector sets		●	●
六個風托(四公兩母)	Six Air ejector sets		○	○
八個風托(六公兩母)	Eight Air ejector sets		○	○
FCS-6500S微電腦控制器 (彩色：KEBA)	FCS-6500S controller (color & key screen:KEBA)		●	●
FCS-6500微電腦控制器 (彩色觸控：KEBA)	FCS-6500 controller (color & touchscreen:KEBA)		○	○
電控穩壓器	Power stabilizer for controller		○	○
資料保護鎖(硬體鎖)	Data lock function(key)		●	●
三色警示燈	Three-color alarm lamp		●	●
CE安全插座2組(380V/32A)	CE safty socket		●	●
電源插座(110V/220V)	Power socket (110V/220V)		○	○
主電源斷路器	Main power breaker		●	●
24H料管自動定時預熱	24 hours auto-preheat for barrel sets		●	●
氣壓式閘澆口控制閥	Pneumatic type Valve Gate		○	○
機械手電氣接口(EU12/EU67)	Robot electrical interface		○	○
不銹鋼漏斗	Stainless hopper		○	○
乾燥機	Hopper dryer		○	○
抽料機	Auto loader		○	○
模溫機	Mold temperature controller		○	○
乾燥機磁鐵	Magnet of hopper dryer		○	○
門式吊桿	Frame hanger		○	○
吊桿組	Hanger set for lifting molds		—	—
避震器	Anti-vibration mounting pad		●	●
填料台	Filling material stand		—	—
工具箱組	Tool box		●	●
標準出車附件	Spare parts		●	●
外銷出車附件	Export accessories		▲	▲

