



***SA-h/p* SERIES**

高速成型專用注塑機
High Speed Injection Molding Machine

SA-h 薄壁包裝專用機

SA-p 桶專用機

SA-h PET 採血管專用機

產品定位 Product Position

FCS五十年技術結晶與積累，創造了多樣性的產品與穩定的性能品質，同時針對各行業不同產品特性，提供差異化整合與服務。

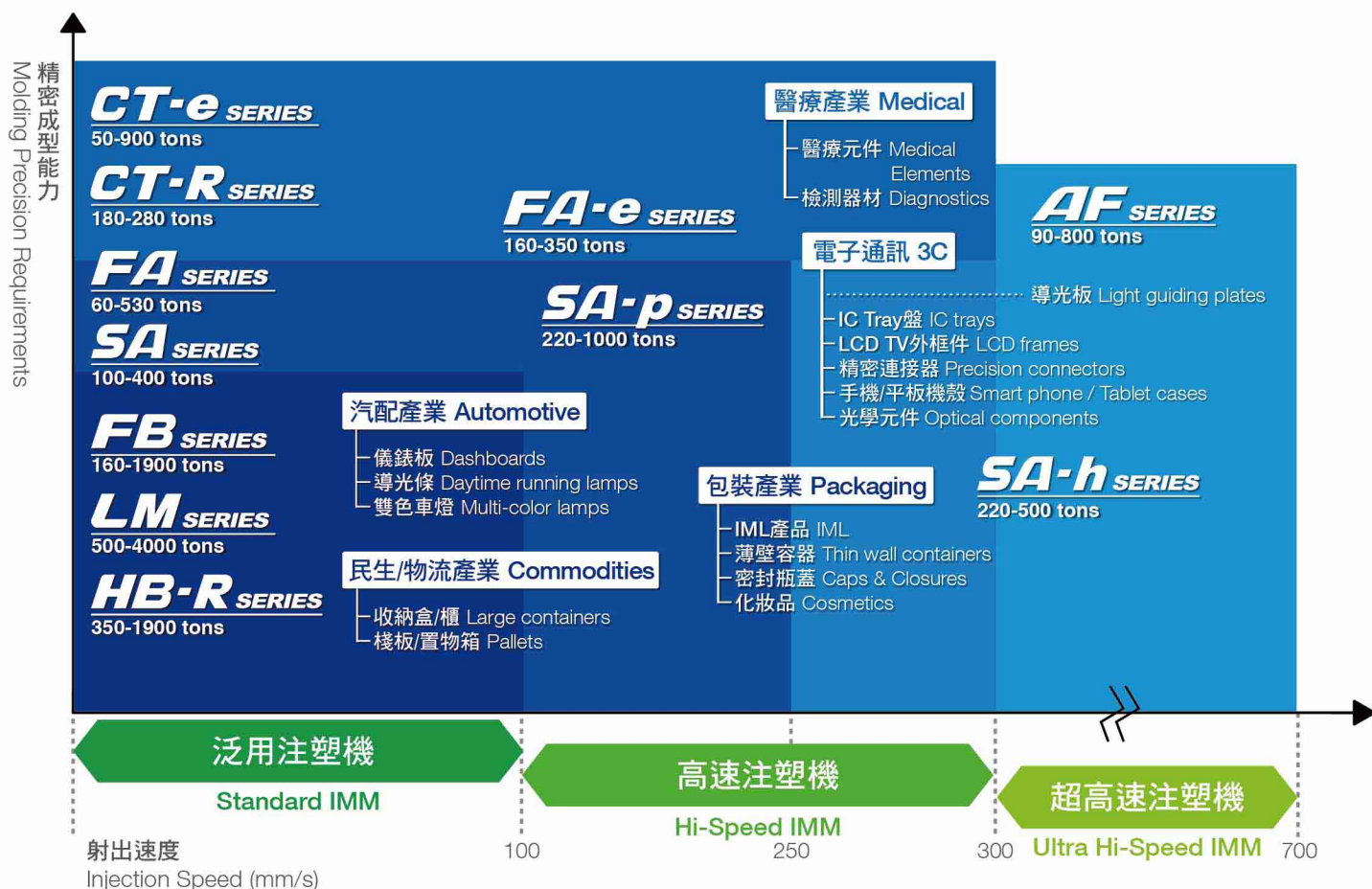
SA-h/p系列為FCS全新發表之高速成型專用注塑機，除了標配紅外奈米加熱圈，採用比例閥，開模響應快且定位精準，更可選配雙迴路動作，最大程度縮短成型週期。

本設備適用於生產薄壁或桶型食品包裝容器，更可搭配專用料管組，生產PET採血管。

FCS has created various products with steady performance by utilizing its 50 years expertise in technological developments and innovations; also providing customized integration and service for different product characteristics for many industries.

The brand new released SA-h/p series is a High-Speed model. It standardly adopts the infrared heater which can be quickly heat up and with good heat preservation. The proportional valve offers fast mold open response and accurate positioning. It's also can be optional equipped with double loops system to improve production efficiency.

SA-h/p series High-speed Injection Molding Machine is suitable for food packaging containers with thin-walled or bucket body and lids. It can also be matched with a special injection unit to produce PET blood collection tubes.



電控單元 Control Unit



FCS-6500S ▲

應用功能

- 全新設計畫面風格與圖示，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。
- 採多重通訊介面(USB、串行接口、Ethernet、EtherCAT、Sercos III)。
- 支援OPC協定，且依據IEC-61131設計，其特點為模組化並易於軟硬體維護。
- 多種語言可供客戶選擇。

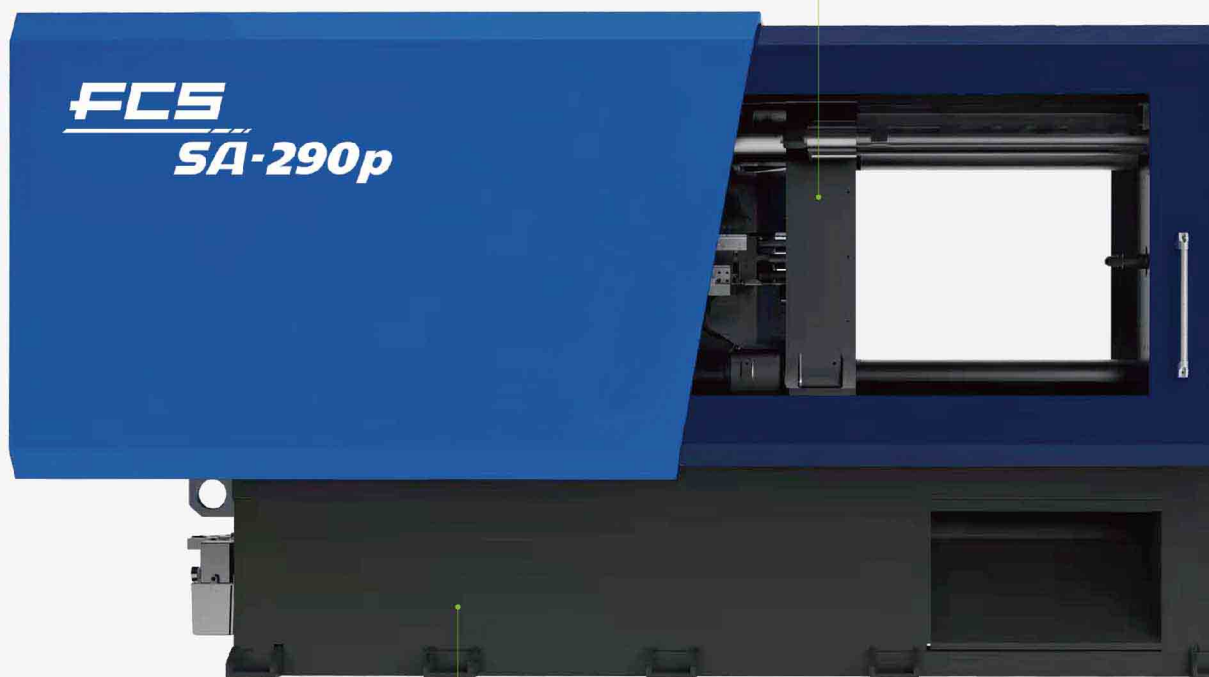
Application

- New control is designed for easy operator interface.
- 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 waveforms to improve production quality and efficiency.
- Convenient access to USB data, mold parameters and display screens.
- Multiple communication interfaces (USB, serial interface, Ethernet, EtherCAT, Sercos III).
- Control supports OPC protocol and has a modular design to easily maintain the software and hardware.
- Multiple languages are available for users.

SA-h/p 高速成型專用注塑機 High Speed Injection Molding Machine

夾模設計 Clamping structure design

- 高剛性模板設計，彈性變形小，成型鎖模力更低。
- 標配高速比例閥，開模響應更快，定位更準，循環週期短。
- High rigidity platen mechanism, less deformation, lower clamping force.
- Standard high-speed proportional valve, with fast mold open response, accurate positioning and short cycle time.



先進機架工藝 Advanced machine base technology

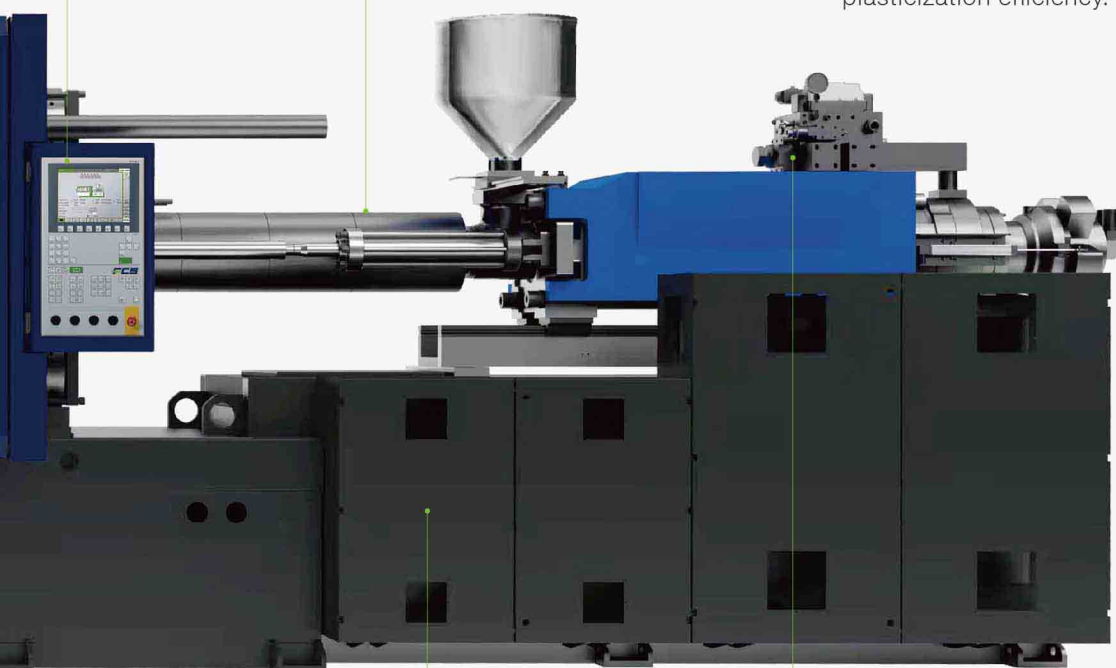
- 整機管路採用無焊接工藝，降低漏油風險。
- 提升油路清潔度，機台壽命更長。
- The pipelines adopt no welding processing, decreasing the risk of oil leaking.
- Improving the cleanness of oil circuits and increase machine life.

電控單元 Control system

- 標配KEBA控制系統。
- 動作掃描週期1ms以內。
- 符合人體工程學佈局。
- 具資料圖像監控功能。
- Standard equipped with KEBA control system.
- Operation mode scan within 1ms.
- Ergonomic layout.
- Data image monitoring.

精準溫控 Precision temperature control

- 標配紅外奈米加熱圈，升溫快，保溫性能好，節能超過30%。
- 採用PID溫度控制，可控制在 $\pm 1^{\circ}\text{C}$ 。
- 採用大L/D比，高混煉螺桿，塑化效果好。
- Standard infrared heater, fast heating, good heat preservation, energy saving over 30%.
- Adopt PID temperature control, temperature control within $\pm 1^{\circ}\text{C}$.
- Adopt large L/D ratio, high mixing screw and good plasticization efficiency.



伺服電機系統 Servo motor system

- 標配高性能伺服動力系統，響應時間最快至40ms。
- 獨特的模組化設計，方便維修。
- 可以實現雙迴路動作，最大程度縮短成型週期。
- Equipped with high performance servo power system, the fastest response time is up to 40ms.
- Unique modular design, easy maintainance.
- It can be realized double loops system, improving production efficiency.

精準注射 Precision injection molding

- 射台及座移採用雙線軌設計，摩擦阻力低，精度更高。
- 中慣量單缸射出結構，起速快，重複精度高。
- The injection unit support adopts high-precision double linear guides, the lower friction resistance, the higher precision.
- The medium-inertia single-cylinder injection mechanism, fast response and high repeatability.

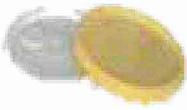
薄壁包裝經典應用 Application of Thin-Walled Packaging

產品 Product		容量 Capacity	腔數 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	4	14~16	0.35~0.4	4.5~5.5	SA-380h/900
			6			5.2~5.8	SA-460h/1000
			8			5.5~6.0	SA-500h/1000
	打包盒蓋 Round food box Lid	-	6	7~8	0.35~0.4	4.5~5.2	SA-330h/770
			8			5.0~5.5	SA-380h/900
			12			5.5~6.5	SA-500h/1000
	9070模內 貼奶茶杯 9070 IML bubble teacup	700ml	6	21~25	0.4~0.5	6.0~7.0	SA-380h/900
			8			6.5~7.2	SA-460h/1000
	奶茶杯蓋 Bubble teacup lid	-	12	4~6	0.4~0.5	5.2~5.5	SA-290h/770
			16			5.5~6.0	SA-330h/770
			24			6.0~6.5	SA-380h/990
	4格 便當盒 Bento box with 4 compartments	1000ml	2	22~26	0.35~0.4	6.5~7.0	SA-290h/770
			4			6.0~6.5	SA-460h/1000
	P4醬料杯 P4 Sauce cup	120ml (4 oz)	16	5.0~5.5	0.35~0.4	6.0~7.0	SA-290h/770
			32			6.5~7.0	SA-460h/1000
	食品包裝桶 Food container	1000 ml	2	55~60	0.7~1.2	7.0~7.5	SA-290h/770
			4			9.0~9.5	SA-380h/990
	勺 Spoon	-	32	1.7~1.8	0.4~0.6	7.0~8.0	SA-290h/770
			48			8.5~9.0	SA-290h/770

桶體應用 Application of Bucket Body

產品 Product	規格 Dimension (TopxBottomxHeight) (mm)	腔數 Cavity	產品克重 Weight (g)	壁厚 Thickness (mm)	成型周期 Cycle time (s)	適配機型 IMM model
	10L	1	400	1.5	14.3	SA-460p/2500
		2	800		15.0	SA-550p/3900
		2	800		15.8	SA-800p/7600e
	20L	1	800	1.85	22.0	SA-550p/3900
		1	800		19.7	SA-650p/5000e
		1	800		18.0	SA-700p/7600e
		2	1600		21.9	SA-1000p/8800e
	33L	1	1020	2	22.5	SA-800p/7600e

桶蓋應用 Application of Bucket Lids

產品 Product	規格 Dimension (mm)	腔數 Cavity	產品克重 Weight (g)	壁厚 Thickness (mm)	成型周期 Cycle time (s)	適配機型 IMM model
	10L	1	140	1.6	14.8	SA-220p/770
		2	280		15.6	SA-290p/900
	20L	1	245	2	20.2	SA-290p/900
		2	490		21.3	SA-330p/1100
	33L	1	296	2.15	23.0	SA-290p/900

應用產品 Examples of SA-h PET Series



SA-h 標準與選購配備 SA-h Standard & Optional Accessories

- 曲手潤滑油品：採用多效齒輪油。 ● Toggle lubricating by gear oil.
- 外銷機台配置與內銷相同。 ● Configuration is same between Export and domestic machines.

配備項目	ITEM	SA-170h	SA-220h	SA-220h	SA-290h	SA-290h	SA-330h	SA-380h	SA-460h	SA-500h	SA-600h
		/400	/600	/770	/770	/900	/770	/900	/1000	/1000	/1000
射出安全護罩	Safety cover for injection	●	●	●	●	●	●	●	●	●	●
射出止逆裝置	Shot-off Nozzle	○	○	○	○	○	○	○	○	○	○
伺服馬達加料	electric screw drive	—	—	○	—	○	—	○	○	○	○
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	●	●	●	●	●	●	●	●	●	●
模壁T型槽	T-slot platen	—	—	—	—	—	—	—	—	—	—
隔熱墊板	Insulator sheets	—	—	—	—	—	—	—	—	—	—
固定式模定位圈	Check ring of mold (Non-replaceable)	●	●	●	●	●	●	●	●	●	●
成品落下口	Article Collecting Channel	●	●	●	●	●	●	●	●	●	●
電動安全門	Automatic safety gate (Electric type)	—	—	—	—	—	—	—	—	—	—
機械安全桿保護裝置	Mechanical Safety bar Protection device	○	○	○	○	○	○	○	○	○	○
水流分佈器16入16出(鋁合金)	Water manifold - 16 in & 16 out (aluminum alloy)	●	●	●	●	●	—	—	—	—	—
水流分佈器24入24出(鋁合金)	Water manifold - 24 in & 24 out (aluminum alloy)	—	—	—	—	—	●	●	●	●	●
強制托退	Ejector pull back	—	—	—	—	—	—	—	—	—	—
電眼檢出	Photo cell drop-out checking device	○	○	○	○	○	○	○	○	○	○
成品落下板	FINISHED DROP BOARD	●	●	●	●	●	●	●	●	●	●
開模定位迴路	Mold opening positioning device	●	●	●	●	●	●	●	●	●	●
多段數位背壓(螢幕設定)	Multi-stage back pressure control(Screen set up)	○	○	○	○	○	○	○	○	○	○
多段數位背壓(螢幕設定及顯示)	Multi-stage back pressure control(Screen set up and display)	○	○	○	○	○	○	○	○	○	○
蓄壓器高速射出	Accumulator for high-speed injection	—	—	—	—	—	—	—	—	—	—
射出閉迴路(伺服閥)	Closed-loop control for injection(servo valve)	—	—	—	—	—	—	—	—	—	—
曲手電動注油器(1組)	Auto lubrication system for toggle (1 set)	●	●	●	●	●	●	●	●	●	●
車壁潤滑：電動注油器	Auto lubrication system(platen)	●	●	●	●	●	●	●	●	●	●
單中子(一公)	Single core pull device	○	○	○	○	○	○	○	○	○	○
雙中子(一公一母)	Double core pull device	○	○	○	○	○	○	○	○	○	○
轉牙裝置(計時/計次)	Unscrew device by timer or counter	—	—	—	—	—	—	—	—	—	—
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	●	●	●	●	●	●	●	●	●	●
托模止逆閥	Non-return valve for ejector	—	—	—	—	—	—	—	—	—	—
射出壓力螢幕顯示	Injection pressure display on screen	○	○	○	○	○	○	○	○	○	○
射嘴獨立溫控	Temperature control of injection nozzle	○	○	○	○	○	○	○	○	○	○
落料口溫度顯示及控制	Temperature display & control of feeding gate	—	—	—	—	—	—	—	—	—	—
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	●	●	●	●	●	●	●	●	●	●
六個風托(四公兩母)	Air ejector sets	●	●	●	●	●	—	—	—	—	—
八個風托(六公兩母)	Air ejector sets	—	—	—	—	—	●	●	●	●	●
油溫顯示	Oil temperature display for hydraulic system	●	●	●	●	●	●	●	●	●	●
油溫顯示及控制	Oil temperature display & control	○	○	○	○	○	○	○	○	○	○
微電腦控制器(彩色：KEBA)	Controller (color& key screen:KEBA)	●	●	●	●	●	●	●	●	●	●
微電腦控制器(彩色觸控：KEBA)	Controller (color & touch screen:KEBA)	—	—	—	—	—	—	—	—	—	—
電控穩壓器	Power stabilizer for controller	○	○	○	○	○	○	○	○	○	○
資料保護鎖(硬體鎖)	Data lock function(key)	●	●	●	●	●	●	●	●	●	●
機械手電氣接口	Robot electrical interface	●	●	●	●	●	●	●	●	●	●
機械手電氣接口 (歐規12)	Robot electrical interface (EUROMAP 12)	○	○	○	○	○	○	○	○	○	○
三色警示燈	Three-color alarm lamp	●	●	●	●	●	●	●	●	●	●
CE安全插座	CE safety socket	●	●	●	●	●	●	●	●	●	●
電源插座	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	●	●	●	●	●	●	●	●	●	●
氣壓式閥澆口控制閥	Pneumatic type Valve Gate	○	○	○	○	○	○	○	○	○	○
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	—	—	—	—	—	—	—	—	—	—
吊桿組	Hanger set for lifting molds	—	—	—	—	—	—	—	—	—	—
避震器	Anti-vibration mounting pad	●	●	●	●	●	●	●	●	●	●
工具箱組	Tool box	●	●	●	●	●	●	●	●	●	●
標準出車附件	Spare parts	●	●	●	●	●	●	●	●	●	●
外銷出車附件	Export accessories	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲

● 標準配備 Standard ○ 選購配備 Option ▲ 選附配備 Free Option — 無 N/A

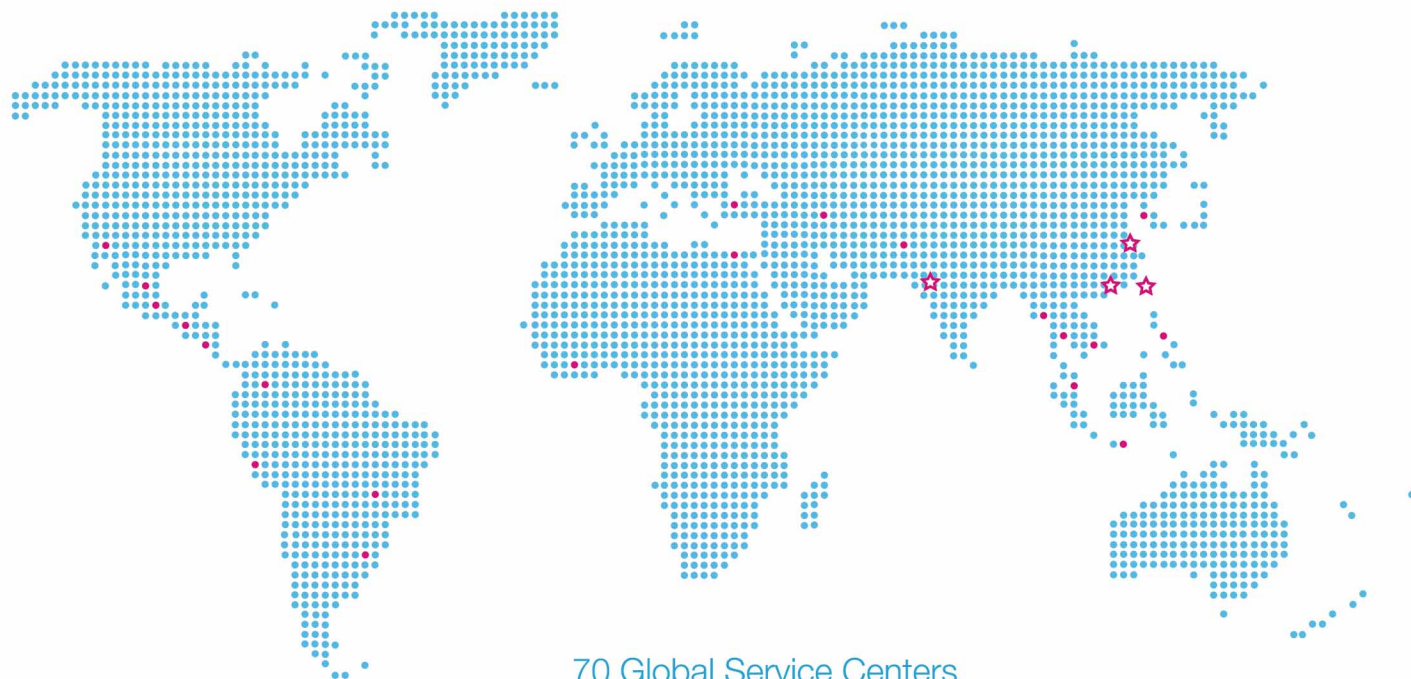
SA-p 標準與選購配備 SA-p Standard & Optional Accessories

- 曲手潤滑油品：採用多效齒輪油。 ● Toggle lubricating by gear oil.
- 外銷機台配置與內銷相同。 ● Configuration is same between Export and domestic machines.

配備項目	ITEM	SA-220p /770	SA-290p /900	SA-330p /1100	SA-460p /2500	SA-550p /3900	SA-650p /5000e	SA-700p /7600e	SA-800p /7600e	SA-1000p /8800e
射出安全護罩	Safety cover for injection	●	●	●	●	●	●	●	●	●
射出止逆裝置	Shot-off Nozzle	○	○	○	○	○	○	○	○	○
伺服馬達加料	electric screw drive	—	—	—	—	—	●	●	●	●
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	●	●	●	●	●	●	●	●	●
模壁T型槽	T-slot platen	—	—	—	—	—	—	—	—	—
隔熱墊板	Insulator sheets	—	—	—	—	—	—	—	—	—
固定式模定位圈	Check ring of mold (Non-replaceable)	●	●	●	●	●	●	●	●	●
成品落下口	Article Collecting Channel	●	●	●	●	●	●	●	●	●
電動安全門	Automatic safety gate (Electric type)	—	—	—	—	—	—	○	○	○
機械安全桿保護裝置	Mechanical Safety bar Protection device	○	○	○	○	○	○	○	○	○
水流分佈器16入16出(鋁合金)	Water manifold - 16 in & 16 out (aluminum alloy)	●	●	●	—	—	—	—	—	—
水流分佈器24入24出(鋁合金)	Water manifold - 24 in & 24 out (aluminum alloy)	—	—	—	●	●	●	●	●	●
強制托退	Ejector pull back	—	—	—	—	—	—	—	—	—
電眼檢出	Photo cell drop-out checking device	○	○	○	○	○	○	○	○	○
成品落下板	FINISHED DROP BOARD	●	●	●	●	●	●	●	●	●
開模定位迴路	Mold opening positioning device	●	●	●	●	●	●	●	●	●
多段數位背壓(螢幕設定)	Multi-stage back pressure control(Screen set up)	○	○	○	○	○	○	○	○	○
多段數位背壓(螢幕設定及顯示)	Multi-stage back pressure control(Screen set up and display)	○	○	○	○	○	○	○	○	○
蓄壓器高速射出	Accumulator for high-speed injection	—	—	—	—	—	—	—	—	—
射出閉迴路(伺服閥)	Closed-loop control for injection(servo valve)	—	—	—	—	—	—	—	—	—
曲手電動注油器(1組)	Auto lubrication system for toggle (1 set)	●	●	●	●	●	●	●	●	●
車壁潤滑：電動注油器	Auto lubrication system(platen)	●	●	●	●	●	●	●	●	●
單中子(一公)	Single core pull device	○	○	○	○	○	●	●	●	●
雙中子(一公一母)	Double core pull device	○	○	○	○	○	○	○	○	○
轉牙裝置(計時/計次)	Unscrew device by timer or counter	—	—	—	—	—	—	—	—	—
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	●	●	●	●	●	●	●	●	●
托模止逆閥	Non-return valve for ejector	—	—	—	—	—	—	—	—	—
射出壓力螢幕顯示	Injection pressure display on screen	○	○	○	○	○	○	○	○	○
射嘴獨立溫控	Temperature control of injection nozzle	○	○	○	○	○	○	○	○	○
落料口溫度顯示及控制	Temperature display & control of feeding gate	—	—	—	—	—	—	—	—	—
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	●	●	●	●	●	●	●	●	●
六個風托(四公兩母)	Air ejector sets	●	●	●	—	—	—	—	—	—
八個風托(六公兩母)	Air ejector sets	—	—	—	●	●	●	●	●	●
油溫顯示	Oil temperature display for hydraulic system	●	●	●	●	●	●	●	●	●
油溫顯示及控制	Oil temperature display & control	○	○	○	○	○	○	○	○	○
微電腦控制器(彩色：KEBA)	Controller (color & key screen:KEBA)	●	●	●	●	●	●	●	●	●
微電腦控制器(彩色觸控：KEBA)	Controller (color & touch screen:KEBA)	—	—	—	—	—	—	—	—	—
電控穩壓器	Power stabilizer for controller	○	○	○	○	○	○	○	○	○
資料保護鎖(硬體鎖)	Data lock function(key)	●	●	●	●	●	●	●	●	●
機械手電氣接口	Robot electrical interface	●	●	●	●	●	●	●	●	●
機械手電氣接口 (歐規12)	Robot electrical interface (EUROMAP 12)	○	○	○	○	○	○	○	○	○
三色警示燈	Three-color alarm lamp	●	●	●	●	●	●	●	●	●
CE安全插座	CE safety socket	●	●	●	●	●	●	●	●	●
電源插座	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	●	●	●	●	●	●	●	●	●
氣壓式閥/澆口控制閥	Pneumatic type Valve Gate	○	○	○	○	○	○	○	○	○
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	—	—	—	—	—	—	—	—	—
吊桿組	Hanger set for lifting molds	—	—	—	—	—	—	—	—	—
避震器	Anti-vibration mounting pad	●	●	●	●	●	●	●	●	●
工具箱組	Tool box	●	●	●	●	●	●	●	●	●
標準出車附件	Spare parts	●	●	●	●	●	●	●	●	●
外銷出車附件	Export accessories	▲	▲	▲	▲	▲	▲	▲	▲	▲

● 標準配備 Standard ○ 選購配備 Option ▲ 選附配備 Free Option — 無 N/A

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