



HT SERIES

伺服節能環保型射出機

Servo Power-Saving Injection Molding Machine

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HT系列機種應用範圍廣泛，如一般家用五金製品、電子資訊產品外殼、汽車部件、一般鏡片、框架等。此外，可配置歐美半閉迴路系統，有效免除油溫變異之干擾，提升成型精度及機台穩定性，可進一步生產光學元件、手機元件等精密度要求較高之產品。

The standard capability of the HT series makes it applicable to a wide range of products like housewares, electronic product casings, automotive parts, lens and frames. This series may apply a semi-closed loop system for more intricate products like optical or handset devices.

● 模組化

機構、油路、配線模組化，更替容易。

● 簡單

射座改良，射嘴校正容易；使用免潤材料，易於保養。

● 精密

選購半閉迴路，成型控制更精密。

● 快速

射速提高，空循環時間減短。

● 穩定

選購半閉迴路與高效率冷卻器，使成型更穩定。

● 潔淨

射出座採二硫化鉬塗佈襯套，永久免潤滑。

● 省能源

配備伺服節能系統，最高節能達70%。

● Modularized

Hydraulic, modularized mechanical components for low maintenance.

● User Friendly

Improved carriage design for easy nozzle alignment, maintenance, and management.

● Precise

A semi-closed loop system gives a more reliable molding process. (Optional)

● Fast

High injection speed to reduce cycle time.

● Stable

Semi-closed loop and high efficiency cooling system for a more stable molding process. (Optional)

● Clean

Uses Molybdenum Disulfide coated bushings, bearings and IHI Auto-lube systems for a clean & messfree maintenance.

● Power-Saving

Adopted FCS servo power-saving system which could reduce the energy consumption up to 70%.



文具用品 Stationery items



叉匙 Multi-Utensil



PVC管件 PVC fittings

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.

優異特點 Specific Features



● 新式調模機構

調模機構與調模壁採整體式設計，使四支大柱受力均勻，鎖模力調整簡易準確。

● New Mold Adjusting Mechanism

The new mold adjusting platen mechanism design doesn't require its mounted nut for torque tuning and distributes force evenly on the tie bars.



● 無給油軸承

曲肘及車壁活動部位均採用無給油軸承，減少潤滑油使用，降低保養成本並可減少油污，提升機台清潔度。

● Oil-less Bearing

Oil-less bearing on the moving parts of platen and toggle, greatly reduces maintenance cost, and provides for a cleaner production environment.



● 自動潤滑系統

循環式電動注油系統，油量分配平均，潤滑效率高，增長曲肘壽命。

● Automatic Lubrication System

An automatic lubrication system circulates and distributes oil equally for greater efficiency in lubrication and enhanced toggle life.





● 電控單元

- 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。

● Control system

- Standard equipped with KEBA control system.
- Operation mode scan within 1ms.
- Ergonomic layout.
- Data image monitoring.



● 導柱式射移結構

跨距縮短，避免料管前傾及導柱下垂變形。使用二硫化鉬塗佈襯套，阻力小，移動快速，且永久免潤滑，潔淨度高。

● Injection Sliding Structure

Injection Sliding Structure pillar guiding plate structure is shortened to avoid barrel inclination and deformation. And with Molybdenum Disulfide coated bushings, it produces a less resistant, faster moving, very clean, oil-free injection sliding structure.



● 數位背壓裝置

可直接從電控螢幕設定背壓，操作簡易。

● Digital Back Pressure Installation

The back pressure can be directly changed and set on the controller for easy operation.

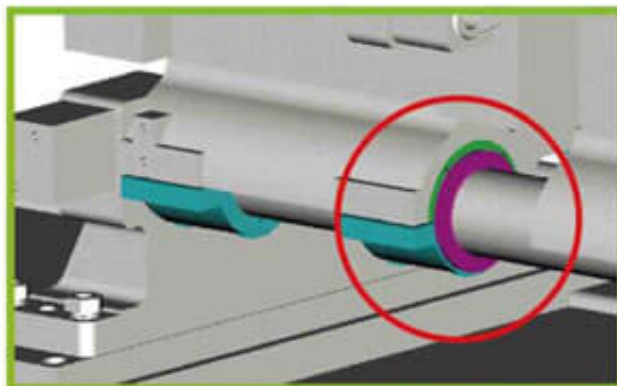
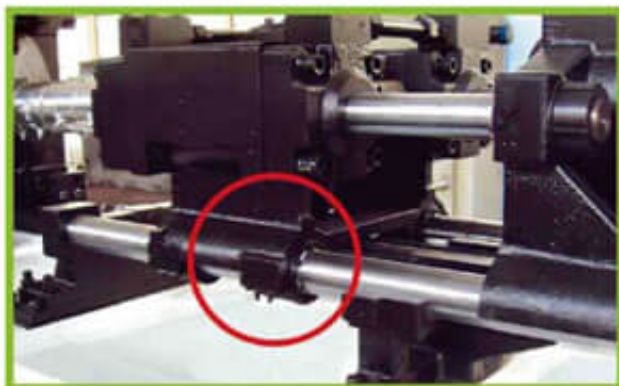
● 高剛性機架結構

精簡堅固之設計，經有限元素分析變形量及應力分佈，確保機架結構及強度達到最佳化，使HT系列機種「穩如泰山」。

● Highly Rigid Structure Frame

Designed based on Finite Element Analysis (FEA) for Stress and Strain effects to ensure the HT's excellent frame structure.

射出單元 Injection Unit



- **導柱射座，維修保養容易**

富強鑫的導柱式射座結構使用專利二硫化鉬塗佈襯套，並以半圓的夾持座適度鎖緊，使導柱孔與導柱軸沒有間隙，解決傳統導柱式射座容易下垂、上翹、變形、干擾及不易組立等問題。

- **免潤材料使用，潔淨環保美觀**

導桿經表面硬化、研磨、鍍鉻處理，而襯套及夾持座表面則經二硫化鉬皮膜處理，兩滑動的金屬表面被二硫化鉬皮膜隔開，使兩金屬面不受磨耗，加上其為乾式皮膜，阻力小，移動平穩快速且永久免潤滑，易於保養、潔淨度高。

- **Pillar guiding injection stand for easy maintenance.**

The pillars supporting the injection unit is equipped with patented semi-circular molybdenum disulfide-coated bushings to avoid issues from traditional guide bushings like bending, distortion and other issues.

- **Lubrication free parts for a clean working environment.**

The pillar surface was hardened, chromed, and even treated with molybdenum disulfide coating to avoid the quick wear and tear of the two metal surface during production. The coat layer provides a lubrication-free solution, less resistance, smooth and fast movement.

傳統導柱式 Conventional Guide Plate Design

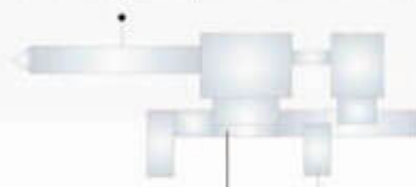
料管前端下垂，導致螺桿磨損。
Barrel deflection will accelerate wear of screw.



固定座跨距大，導柱易下垂彎曲變形。
Guide plate deflected, bent or deformed due to larger stand span.

FCS導柱式 FCS Developed Guide Plate

導柱孔與導柱軸沒有間隙，料管不下垂。
Clearance between the guide rod and plate has been re-designed to prevent deflection of the barrel.



二硫化鉬皮膜處理
無間隙、無磨耗、免潤滑。
Molybdenum Disulfide film treated for permanent lubrication free operation.

固定座跨距縮短，
導柱不彎曲變形。
Reduced span to prevent the guide plate from being bent or deformed.

夾模單元 Clamping Unit



● 機械規格加大，容模範圍更廣泛

新一代HT系列採超大容模空間及超長行程之四方模板設計，其大柱內距及開模行程均特別加大，可用於更廣泛的模具尺寸及各類成型作業。

搭配新型機架結構，成品落下的空間寬廣，能彈性運用，可放置其它週邊設備，亦可視實際需求搭配多向輸送設備，以達整廠自動化之目的。

● 車壁剛性強化，保護大柱及模具

設計上採用有限元素分析(FEA)進行結構最佳化設計，確保夾模結構之剛性及強度。

● 內藏式安全桿，免調整安全性高

新型免調整安全桿機構，及先進的低壓關模保護迴路，直接由螢幕設定，快速簡便且保護靈敏，確保模具及操作人員安全。

● Extended mechanical specification and wider application range of mold accommodation.

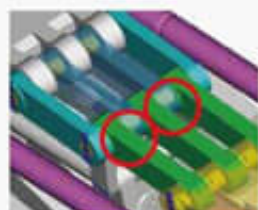
The next gen HT series feature a large daylight opening and longer opening strokes. All of these were enlarged to accommodate a wider range of mold sizes and types of operations. Its new frame allows even large finished product to freely fall and increase peripheral flexibility like a multi-directed delivery system using conveyers to achieve an automated plant setup.

● Enhanced rigidity and reinforced tie bars and platens.

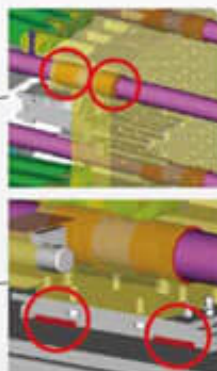
Advanced Pro/Engineer CAD was used to design the next gen HT series. FEA 3D models were set up for the optimal design of the structure to ensure rigidity and strength of the platens. FCS took it further with a performance measuring system that conducts planned analysis and studies on each parameter (including temperature, pressure, and speed) to ensure high consistency and precise performance.

● Adjustment free, built-in safety bar for improved safety.

Its newly developed non-adjusting safety bar mechanism and advanced LP mold close protection loop can be directly set up from the controller for a fast, easy and sensitive protection system to ensure the safety of mold and operators.



曲肘襯套使用無給油軸承搭配自動潤滑系統，潤滑確實、使用油量少。
Oiliness bearings used for the toggle sleeve adapted with automatic lubrication system to warrant reliable lubrication and minimum oil consumption.



活動壁襯套及活動壁滑腳使用德國B+S高分子耐磨材，大柱不易刮傷，永久免潤滑，使成型區十分潔淨。

Movable platen skates and movable platen sleeves use German B+S high-density wear resistance material, permanent lubrication free to help maintain the molding area extremely clean.

伺服節能系統 Servo Power-Saving System

● 高節能 High Power-Saving

在理想狀態下，比變量泵系統節能40%，比定量泵系統節能70%，有效節省能源成本。

Under ideal working conditions, power consumption is reduced by 40%, when compared to that of variable displacement and 70% less than that of fixed displacement pumps in an effort to become more efficient.

● 高精度 High Precision

低壓、低流量域的重複再現性為 $\pm 0.5\%$ ，成型產品重量誤差約達0.7%~0.4%，接近半閉迴路控制的水平。FCS machine movement is precisely controlled even at low pressure and flow rates with variations of $\pm 0.5\%$. The semi-closed loop hydraulic system can produce part weight error in the range of 0.4-0.7%.

● 高應答 Fast Response

性能穩定的伺服電機，配備了高精度、高靈敏的壓力回饋裝置，形成閉迴路精準控制，有效縮短週期，提高生產效率。

The dynamically controlled servo system is equipped with a pressure feedback monitoring device for high precision and sensitivity. The closed-loop design allows precise control, shorter cycle times and improved production efficiency.

● 低噪音 Low Noise

有別於傳統定量泵油壓機長期的運轉噪音，伺服節能型機台只在需要作動的時候運轉，運行噪音低於70dB，使您的工作區間更寧靜。

As opposed to a standard fixed pump hydraulic system, the HT series servo-pump is only "on" when there is fluid demand, which greatly reduces the noise level in the work area to less than 70dB.

● 低油溫 Low Oil Temperature

電機只有在需要作功時啟動，不會產生多餘熱能，可降低油路系統發熱現象，有效避免油溫上升，實現大幅節水的效益。

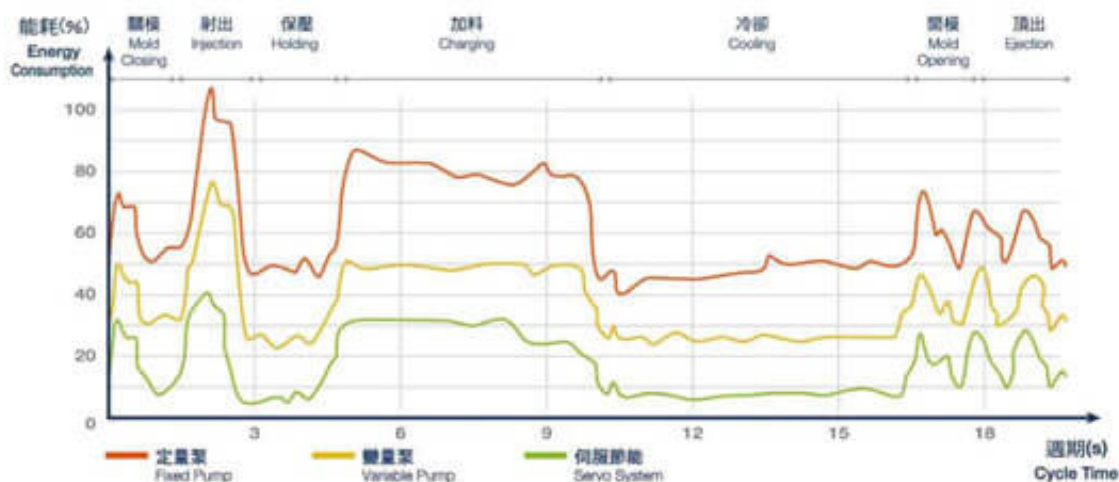
Due to the servo-pump efficiency, the hydraulic oil temperature is maintained at a lower temperature, which intensively saves water.

● 易操作 PQ Control

由射出機控制輸入壓力(P)、流量(Q)的模擬電路，當達到設定壓力時，會自動切換至壓力控制，無須手動進行複雜之操作。

Pressure (P) and flow (Q) can be controlled by a simple voltage signal into FCS' Computer Control System.

功率消耗曲線圖 Power Consumption Graph



耗電量比較 Power Consumption Comparison

根據產品、成型條件的不同，伺服節能射出機與傳統定量泵射出機相比，最高節能可達70%；與變量泵射出機相比，節能可達40%。

Depending on products and molding conditions the FCS injection molding machine can save up to 70% of the power required of fixed pump, and 40% more than variable pump injection molding machines.



節能效果比較 Comparison of Power-Saving

項目 ITEMS	定量泵 Fixed Pump	變量泵 Variable Pump	伺服節能 Servo System
成型穩定性 Stability	一般 General	差 Worse	佳 Better
射出重複精度 Precision	中等 Medium	低 Lower	高 Higher
機台運轉噪音 Noise	普通 Normal	小 Silent	最小 Silentest
電量節約程度 Power-Saving Degree	-	30-45%	40-70%
成型週期時間 Cycle Time	短 Shorter	長 Longer	中等 Medium
機台應答速度 Response	快 Quicker	慢 Slower	中等 Medium
機台維修成本 Maintenance & Repair Cost	低 Lower	一般 General	高 Higher
機台投資成本 Investment Cost	低 Lower	一般 General	高 Higher
投資回收期間 Payoff Period	短 Shorter	一般 General	長 Longer
節能系統壽命 System Life	長 Longer	壽命短，油路須保持清潔，保養成本較高。 Shorter. Hydraulic system must keep clean, maintenance cost is higher.	一般 General
可應用範圍 Application Scope	所有機種均適用 Can be used on most models.	鎖模力超過500噸以上機種較難應用。 Difficult to apply on models with clamping force higher than 500T.	所有機種均適用 Can be used on most models.
建議適用情況 Suggestion	第一代節能系統，適用於各種成型。 The 1st power-saving system, suitable for all kinds of production.	適用於成型精密度及穩定性要求不高的塑料製品。 Suitable for precise injection, but less steady production.	性價比較高的新世代節能系統，適用於兼顧節能省電及穩定性高的塑料製品。 This new generation system with higher C/P value covers steady and power-saving production.

註：使用上述各項節能系統的最佳條件為保壓時間長、冷卻時間長、一分鐘兩模以內的产品、厚件产品等，如此節能效果較顯著。

Remark: To achieve best performance of these systems, production should be under the following conditions: Long hold pressure time, long cooling time and production speed slower than two cycles under one minute, thick wall products. These energy-saving systems will have outstanding efficiency.

標準及選購配備 Standard & Optional Accessories

配備項目	ITEM
射出安全護罩	Safety cover for injection
射出止逆裝置	Shot-off Nozzle
雙合金螺桿・料管	Bi-alloy Screw/Barrel
托拉式落料裝置	Sliding material feeding device
曲手：無給油軸承	Oiliness bearing(Toggle)
曲手：套鋼	Steel bearing(Toggle)
模壁T型槽	T-slot platen
模壁T型墊板	T-slot board
隔熱墊板	Insulator sheets
活動式模定位圈	Check ring of mold (Replaceable)
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)
水流分佈器4入4出(銅製)	Water manifold - 4 in & 4out (copper)
水流分佈器8入8出(銅製)	Water manifold - 8 in & 8out (copper)
水流分佈器10入10出(銅製)	Water manifold - 10 in & 10 out(copper)
安全踏板	Security Pad
機架架高(落下口取物)	High base
機械安全桿保護裝置	Mechanical Safety bar Protection device
車壁潤滑：電動注油	Auto Manual lubrication(platen)
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)
射出閉迴路	Closed-loop control for injection
曲手電動注油器(1組)	Auto lubrication system for toggle(1 set)
曲手電動注油器(2組)	Auto lubrication system for toggle(2 set)
單中子(一公)	Single core pulling device
雙中子(一公一母)	Double core pulling 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)
伺服節能系統	Servo power saving system
自封式磁性吸油過濾器	With check valve magnetic suction filter
油溫預熱功能	Oil temperature preheating function
開關模比例閥控制	Proportional valve for mould open and close
射嘴獨立溫控	Temperature control of injection nozzle
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
電眼檢出	Photo cell drop-out checking device
油溫顯示	Oil temperature display for hydraulic system
油溫顯示及控制	Oil temperature display & control
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 & touch screen:KEBA)
電控穩壓器	Power stabilizer for controller
三色警示燈	Three-color alarm lamp
CE安全插座	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
油壓、電氣雙重保護裝置	Dual safety device: hydraulic and electrical
資料保護鎖(硬體鎖)	Data lock function(key)
機械手電氣接口	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
避震器	Anti-vibration mounting pad
填料台	Filling material stand
工具箱組	Tool box set
標準出車附件	Spare parts
外銷出車附件	Export accessories

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富強鑫集團 FCS Group



富強鑫精密工業股份有限公司

Fu Chun Shin Machinery Manufacture Co., Ltd.

71841 臺灣台南市鹽水區埤墘里保東路269號
No.269, Baodong Road, Pitsui Village, Guanmiao District, Tainan City 71841, Taiwan
TEL: +886-6-5950688 • FAX: +886-6-5951129 • E-mail: fcsco@fcs.com.tw

東莞富強鑫塑膠機械製造有限公司

Dongguan Fu Chun Shin Plastic Machinery Manufacture Co., Ltd.

廣東省東莞市大朗鎮石廈管理區金廈東路18號 郵編：523792
No.18, Jinsha East Road, Shixia Administration District, Dalang Town,
Dongguan City 523792, Guangdong Province, China
TEL: +86-769-83312753 • FAX: +86-769-83181903 • E-mail: cdg@fcs.com.tw

富強鑫(寧波)機器製造有限公司

Fu Chun Shin (Ningbo) Machinery Manufacture Co., Ltd.

浙江省寧波市江北區海川路115號 郵編：315032
No.115, Haichuan Road, Jiangbei District, Ningbo City 315032, Zhejiang Province, China
TEL: +86-574-56138688 • FAX: +86-574-56138600 • E-mail: cnb@fcs.com.tw

印度富強鑫

FCS Manufacturing (India) Private Limited

Block Number 218, Xcelon Industrial Estate, Near Intas Pharmaceutical, Village Chanchanvadi Varna,
Sankhej Bavla Road, Taluka Sanand, Ahmedabad, Gujarat - 382213
TEL: +91-99-98897768 • E-mail: fcsindia@fcs.com.tw

