

# **HB-R** SERIES

**水平轉盤雙色注塑機**

Horizontal Rotary Table Two-Component Injection Molding Machine

## 滿足大型塑件廣域的應用需求 Wide application for large-sized parts

傳統的垂直旋轉盤雙色機一般運用在鎖模力1500噸以下的產品及模具，但是當產品尺寸更大，需要更高的鎖模力，以及模具結構相對複雜的時候，垂直轉盤雙色機即受到限制。因此，富強鑫開發「大型水平轉盤雙色射出機」（簡稱HB-R）可解決此問題，即採用水平旋轉盤的方式進行雙色生產，將可避免垂直轉盤轉動的慣性問題及重力的影響，優勢極為明顯。

此外，由於本機種採用了二板式鎖模結構、兩組水平對置的射出單元以及重疊模技術，若應用於單色產品生產，將可產生兩倍的產量，效益大幅提升，運用於深腔類型產品也極具優勢。

轉盤呈水平型式，模具均衡掛載於中央轉盤模壁兩側，由於採水平式的旋轉運動，無明顯之重力與機構限制問題，得以實現大型雙色件之成形量產工作，且免除了垂直轉盤因模具置重而產生傾斜磨耗，導致運轉不順等問題。

射出單元採水平對射形式，配合水平轉盤結構，相較於垂直轉盤，在相同大柱內距之下，模具可使用範圍更大，亦能應付滑塊行程較長的模具設計需求。

鎖模單元採二板式結構，不但節省佔地空間，且特別滿足大型雙色模具之生產要求。（可配置伺服節能系統，達到更高的能源使用效益。）

可運用於大型家電外殼及面板、汽車天窗、車燈、角窗等……雙色製品生產。

本機種單色及雙色產品均可生產，一機雙用，投資效益高。

The conventional two-component injection molding machines are generally suitable for products and molds under 1500 clamping tonnage. However, higher clamping force is required when the size and structure of the product becomes bigger and more complex. By using HB-1900R, influence coming from external forces such as gravity and inertia resulting from its vertical rotation can be easily avoided. Therefore, FCS development the "Large Horizontal, dual-colored Injection Molding Machine"(referred to as HB-R), to resolve this problem.

Moreover, if this machine is used for the production of single component products, it doubles the capacity and increases production efficiency.

Its rotary table spins 180° along the horizontal line placing the mold evenly on the two sides of the rotary table. And because of its horizontal rotation, gravity nor any probable mechanical limits would not be an obvious problem. This eliminates any abrasion caused by the mass of its vertical rotary table and unsmooth rotation, allowing the mass production of huge dual component products.

Its injection unit is a horizontal type alongside with the horizontal rotary table. If compared to the vertical one, its mold could be larger and designed for longer mold daylight opening under the condition of a same tie bar distance.

Having only two platens for its clamping unit not only saves space, but also satisfies the demand for products that uses huge two-component molds. Equipped with servo system for higher energy efficiency.

Highly suitable for the two-component products, such as covers for huge household appliances, sunroofs and car lamps.

This model is applicable for both single and double component machines to increase efficiency.



## 一機多役 兼容並蓄

### Single Machinery Diversity Application

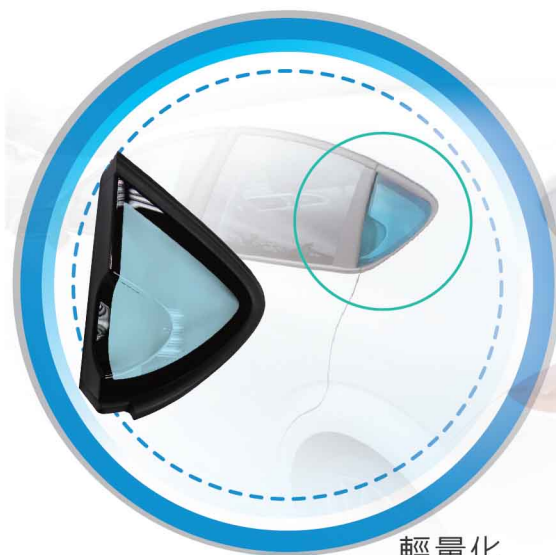
- 雙色汽車零件 (車燈、車窗、內飾件)
- 雙色各式塑件 (家電、3C、殼件)
- 單色堆疊重模 (汽車塑化鈹件)
- Dual-colored automotive parts (lamp, window, interior)
- Dual-colored general parts (household appliance, 3C)
- Monochrom stackable parts (car fender)

## 節能減碳及汽車電動化：引領新應用潮流

### Carbon reduction and vehicle electrification lead the trend of new applications



塑化  
Plasticizing



輕量化  
Part Lightening



零部件整合化  
System/Part Integration



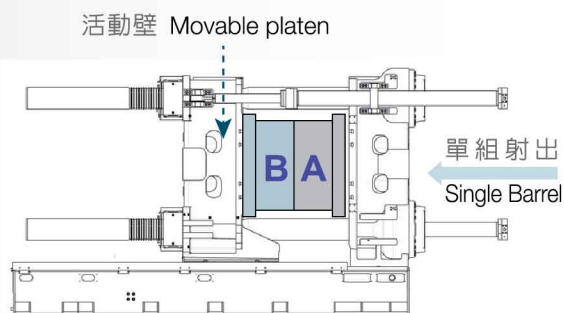
造型自由化  
Styling Freedom

## 二板機再進化 Evolution of two-platen IMM

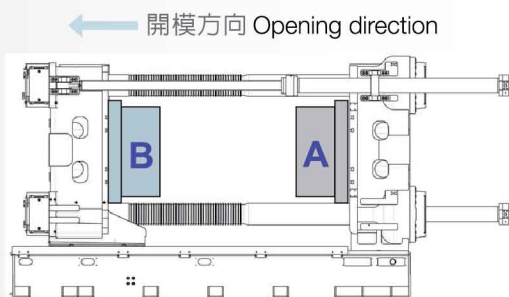
### 二板機 Two-Platen IMM

作動簡捷，適用單色（材料）成型。  
A simple, single colored production.

#### Step1



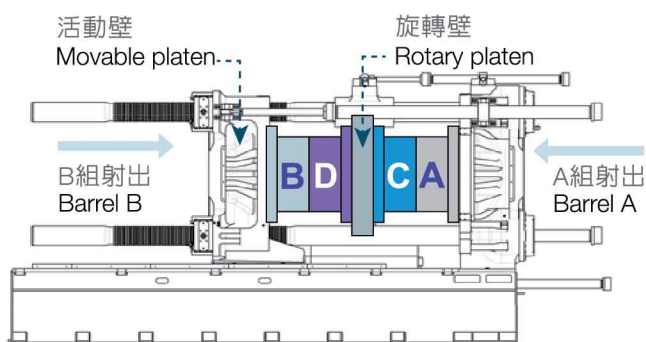
#### Step2



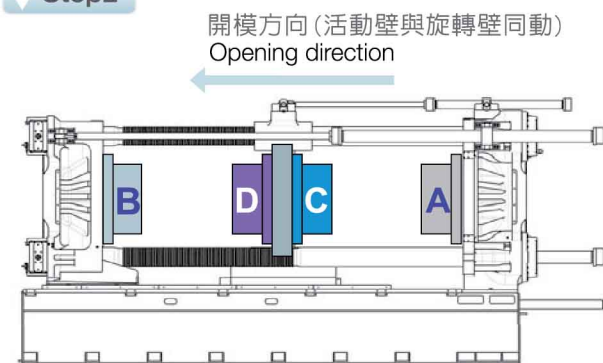
### HB-R Series

以二板機為架構，增設旋轉車壁滿足雙色成型需求。  
Added dual-colored injection based on the two-platen structure and the extra rotary platen.

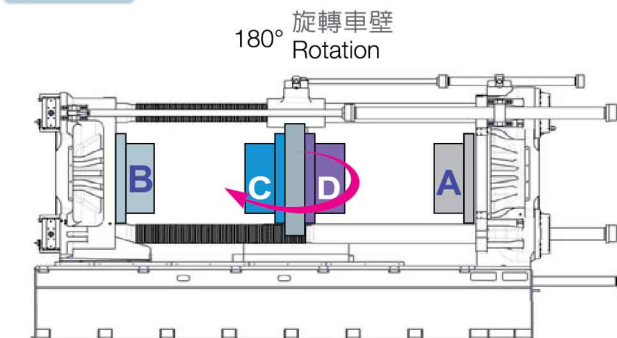
#### Step1



#### Step2



#### Step3

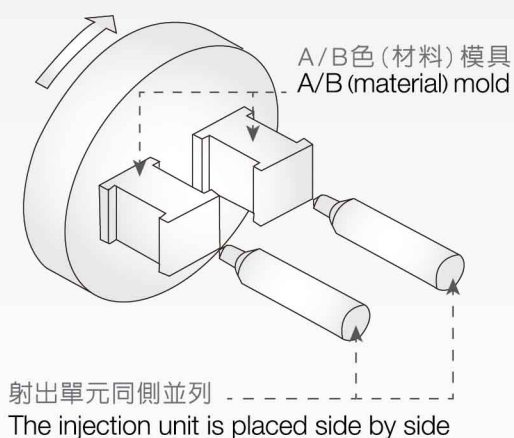


## 雙色機新概念

## New concept for a dual injection molding machine

### 雙色機 Traditional Dual IMM

鎖模壁繞水平軸正反180°旋轉  
A 180 degree reversible rotation  
along the horizontal axis.



機台噸數  
Machine  
tonnage

1600 ton為最大噸數。  
The maximum machine tonnage is at  
1600 ton.

應用狀況  
Application

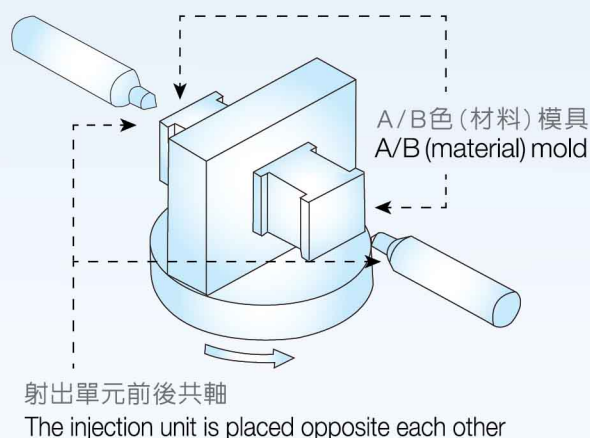
1. 以LCD TV雙色前框為例，此機台最大僅能成型32吋之規格。
2. 垂直轉盤架構不利於大型模具 (5噸以上) 的載重與轉盤旋轉穩定性問題，故機台噸數發展與應用受限。

1.Maximum molding capacity: a two colored frame for a 32" LCD TV.

2.Rotary table is not conducive to carry large molds of more than 5 tonf,making it difficult to expand.

### HB-R Series

鎖模壁繞垂直軸正反180°旋轉  
A 180 degree reversible rotation  
along the vertical axis.



機台噸數  
Machine  
tonnage

噸數級距寬廣  
Easy to develop a wide range of models.

應用狀況  
Application

- 1.以LCD TV雙色前框為例，此機台最大可成型55吋之規格。
2. 水平轉盤架構將重力問題降至最低，且模具掛於轉盤兩側，達到均衡承載與應用更廣的效果。

1.Maximum molding capacity: a two colored frame for a 55" LCD TV.

2.Rotary table has better carrying capacity and could easily carry two average weighted molds, making it easy to expand.



1

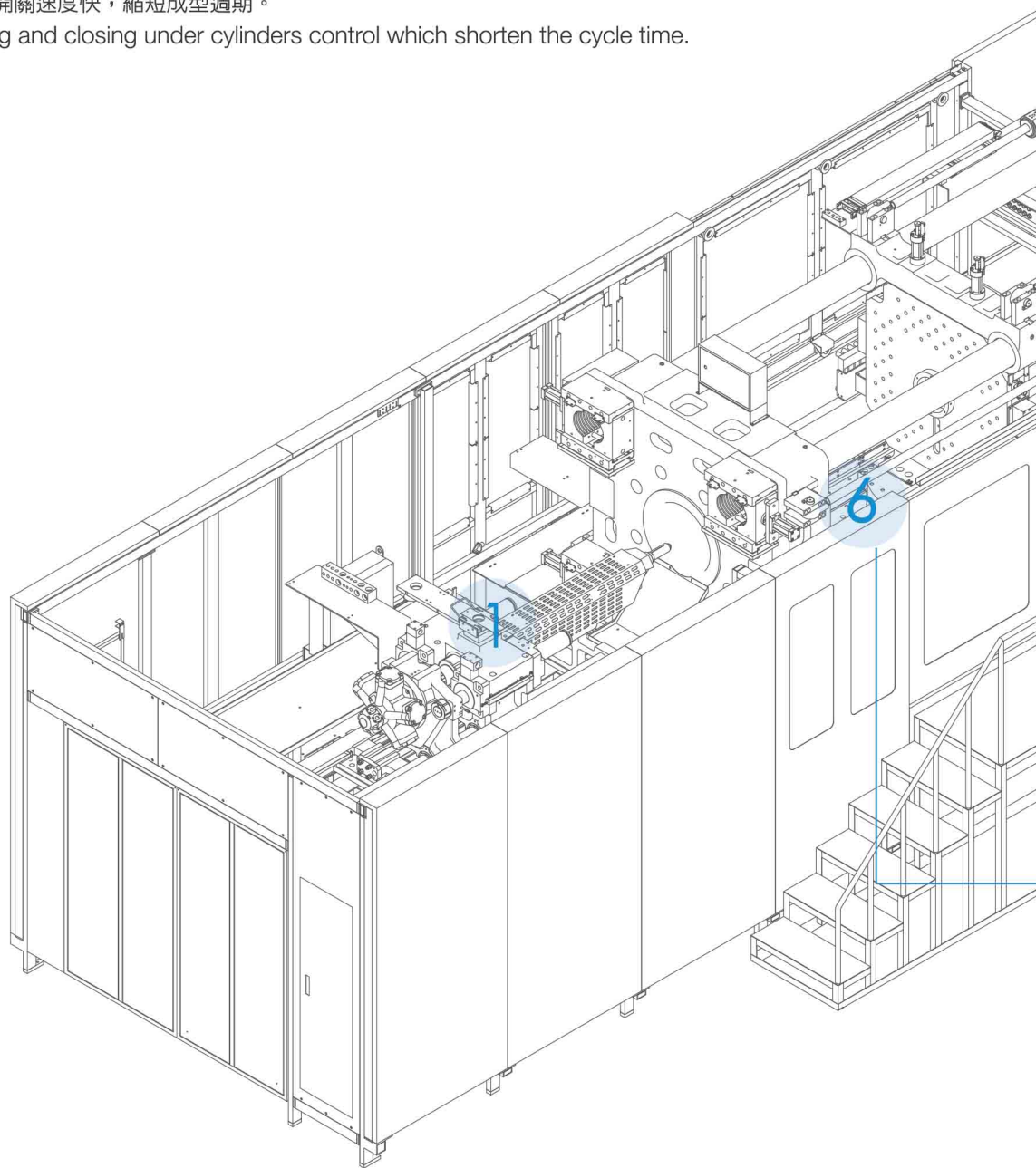
具兩組對射式射出單元，射出精準穩定。  
Two opposing injection units to provide precise and stable injection.  
射出單元規格配置彈性，容易客製化。  
Flexible injection unit specification for easy customization.

2

同步加壓缸補壓，可對稱提供準確穩定之閉模力。  
Synchronized pressure-filled cylinders providing accurate and symmetrical clamping force.  
高壓鎖模系統，閉模力設定簡單且精準，可有效提升機器壽命。  
The high-pressure clamping system is both easy to set and is very precise, thus, enhancing the mold and the machine's lifespan.

3

開關模汽缸控制，開關速度快，縮短成型週期。  
Fast mold opening and closing under cylinders control which shorten the cycle time.



4

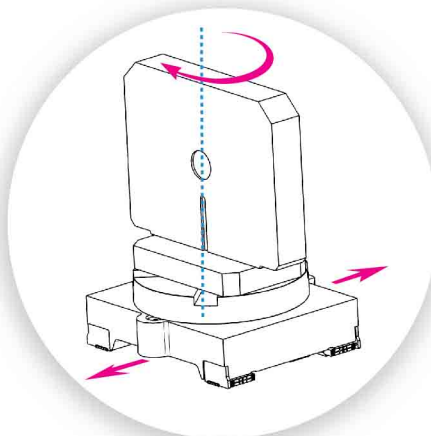
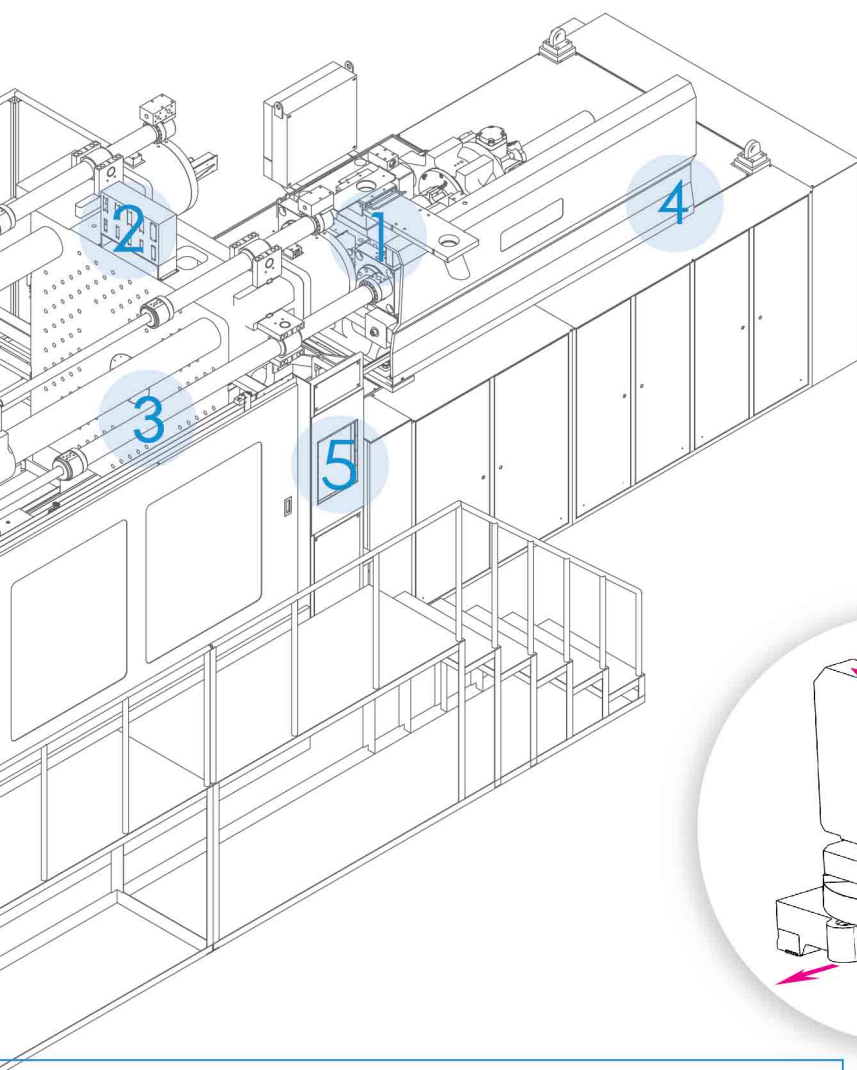
採用FCS大功率伺服節能省電系統，平均節省能源40%以上。

If equipped with FCS' highly efficient, servo power saving system, the machine can save energy of up to 40%!

5

新式電控設計，整合SPC和遠端監控系統，提升機台的生產與管理效率。模具低壓保護，確保模具壽命。

Equipped with a newly designed control panel with integrated SPC and Remote Monitoring System to increase productivity and management efficiency. Equipped with a low pressure protection system to increase a mold's lifespan.



180° 旋轉車壁  
180° Rotary platen

6

高乘載模具旋轉車壁設計，適用雙色中、大型產品，特別是汽車外觀零組件。  
High loading capacity and self-supporting swivel. Suitable for two-colored, large products like automotive exterior components.

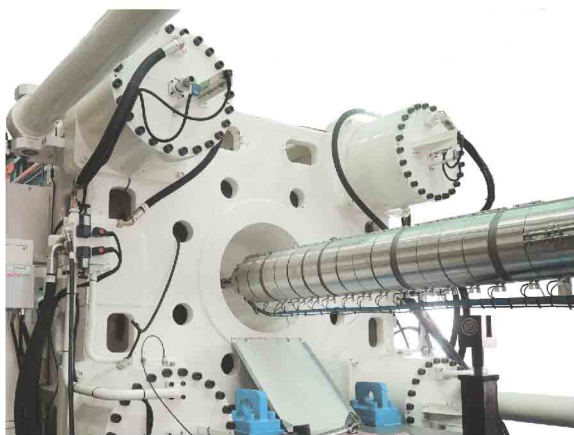
模具轉盤定位快速，設有安全定位裝置。

Its swivel unit provides quick positioning and is equipped with numerous safety features.

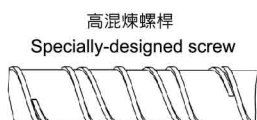
## 射出單元 Injection Unit (Optional)

高混煉螺桿設計，配合高吐出量需求，塑料混煉更均勻。

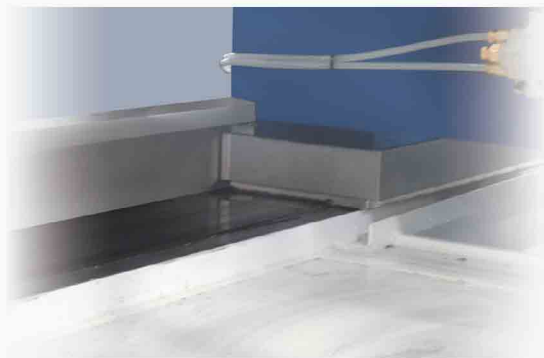
A specially-designed screw for better mixing.



一般螺桿  
Normal screw



高混煉螺桿  
Specially-designed screw



### 射出滑塊

第二組射出機構採用滑塊支撐，可搭配大射出量之射出結構。

#### Injection Unit Sliding Support

Second injection unit is equipped with a sliding support which can be used for large injection volume structures.

## 油路單元 Hydraulic Unit

採用節能油壓迴路設計，具有以下特色：

HB-R IMM adopted energy-saving hydraulic loop design. It provide features including:

- 模具真空解除高壓開模迴路。
- 射出增速再生省能源設計，可節省能源並提升射出速度。
- 搭配伺服節能油泵迴路，相較射出機傳統定量泵，節能效果最大可達40%。
- 獨立過濾系統，冷卻效率提升。
- High pressure to break the mold vacuum situation.
- Also it's patented regeneration loop, can save energy and increase injection speed.
- With the Energy-Saving Servo Pump Loop (compared with traditional quantitative pump injection molding machine), energy saving can reach up to 40%.
- It has an independent filtration system for efficient cooling.





## 夾模單元 Clamping Unit

### 高剛性車壁

採用有限元素分析協助設計，確保機台及模具受力均勻，延長使用壽命並提昇產品品質。

### 高壓油缸

採用知名品牌油壓閥，控制精準，確保大柱受力均勻，並可在射出過程中提供充足的鎖模力。

### 活動壁滑腳

三板機專用活動壁支撐結構，可確保車壁動作平行度及準確度。

### 水平轉盤

- 轉盤採伺服馬達作動，運轉平順、定位更精準，並可做90度與180度旋轉定位，方便成品取出。
- 轉盤定位安全插銷設計，確認轉盤到達定位再做關模動作，防止模具損壞。

### 大柱夾持

精確大柱夾持結構，與大柱在正確位置抱合，確保足夠的鎖模力。

#### High-Rigidity Platen

The platen is designed with FEM analysis to ensure the machine and the molds sustaining force balance. It will extend the machine life and also increase the product quality.

#### High-Pressure Cylinder

Equipped with a famous brand valve to control the high pressure cylinder, and ensures the tie bar would sustain a balance force. In addition, it can provide enough clamping force during injection.

#### Moving Platen Guide

Moving platen support with exact guiding design to ensure precise movements even when heavy molds are mounted.

#### Horizontal (Standing) Rotary Table

- Powered by a servo motor for a smooth and precise 90°/180° rotary positioning for easy product removal.
- It validates the rotary platen's position before clamping action takes place to prevent any damage to the mold.

#### Tie Bar Locking Mechanism

A tie bar locking system with split nut mechanism for accurate clamping force and position.



高壓油缸  
High-Pressure Cylinder



活動壁滑腳  
Moving Platen Guide



水平轉盤  
Horizontal Rotary Table



轉盤定位安全插銷  
Rotary Platen's Position



大柱夾持  
Tie Bar Locking Mechanism

## 電控單元 Control Unit

### FCS-6500 控制器

- 10-12吋超大TFT顯示螢幕、1600萬色真彩顯示及800 x 600像素分辨率，並可選購觸控式操作面板，為一操作簡易的控制器。
- 採用功能強大的CPU其時脈為1.1~1.6GHz，系統反應時間至快可達1ms。
- 採多重通訊介面 (USB、串行接口、Ethernet、EtherCAT、Sercos III)。
- 共有多種語言可供客戶選擇。
- 加熱採PID控制，有效分段控制加熱以提升塑化能力。溫度控制的精度達 $\pm 0.1^{\circ}\text{C}$ ，並有斷線檢測的功能。
- 具多階密碼保護功能、可依不同的授權等級更改設定，及資料硬體鎖功能，可防止成型參數被任意更改。
- 提供統計製程控制及射出波形圖，使成品有高效的品質保證以及提高生產效率。
- 提供EasyNet遠端控制系統。
- 所有程序都儲存在CF卡，更換控制器及程式均相當便利。
- 該控制器支援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。



### FCS-6500 controller

- A 10"~12" TFT LCD screen display, with 16 million color palettes, 800x600 pixel resolution and a touchscreen operation (Optional), the controller is easy to operate.
- It is a Powerful CPU (1.1GHz~1.6GHz). The controller's rate of system reaction is only 1ms. It can promote the sensibility and stability of motion.
- Multiple communication interfaces (e.g. USB, RS232, Ethernet, EtherCAT, Sercos III)
- Multiple optional operation languages available for customers to choose from. (e.g. Chinese, English, German and Japanese....)
- Heating with PID control function, enhancing plasticizing capacity. The temperature's accurate control can reach  $\pm 0.1^{\circ}\text{C}$ . It can detect the abnormal temperature and electrical wire disconnection.
- A multi-level authorization with password protection to prevent anyone from changing parameters arbitrarily.
- The operating surface contains integrated software such as statistic process control (SPC) and injection diagram for efficient quality assurance and increased productivity.
- In addition to EasyNet, the easy and cost effective host computer, FCS6500 also offers interfaces to a high end production factory computer system.
- All software is stored on just one exchangeable compact flash drive. This makes it very easy to replace the controller in case of service. Just take the compact flash, exchange the module, plug in CF card again and continue production. Downtime will be reduced and service is much easier.
- This controller also supports the open industry standard OPC. The controller was designed according to IEC-61131, featured together with a module, thus saves time maintenance.



## 產品規格 Product Specifications

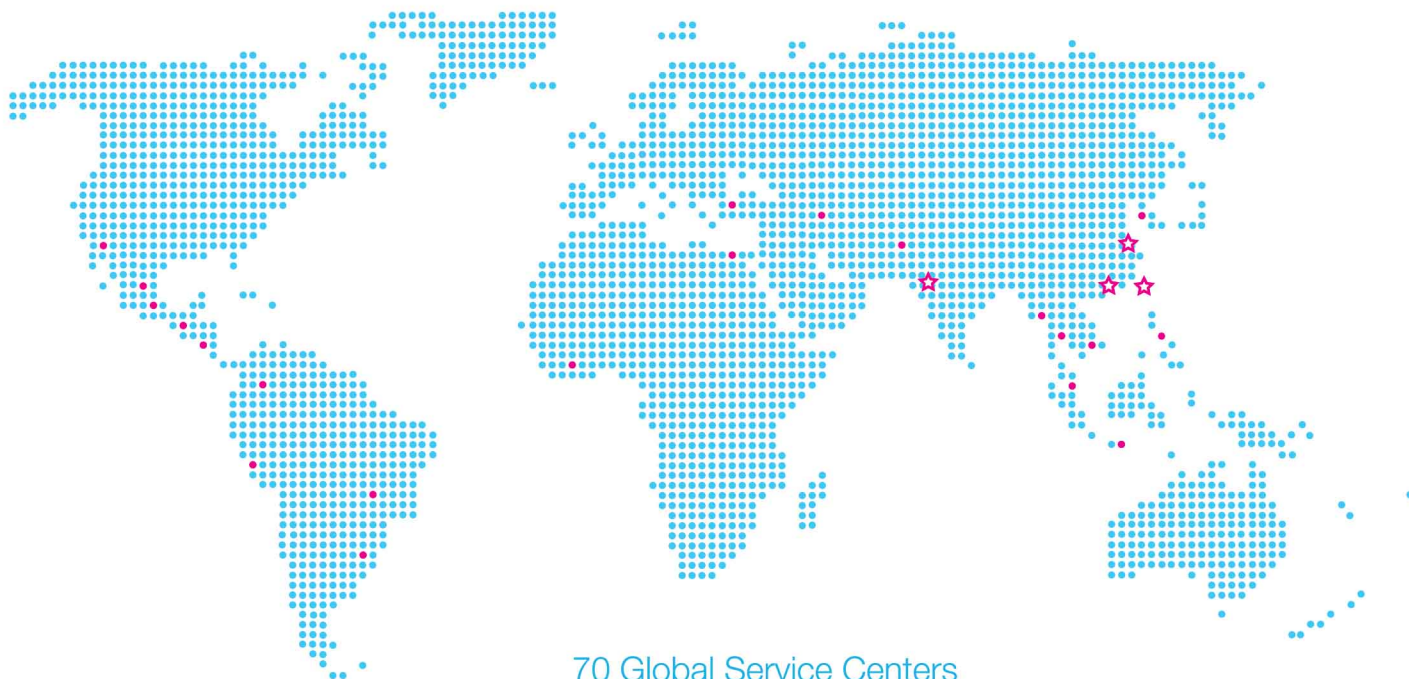
	ITEMS	UNIT	HB-350R		HB-550R		HB-900R	
射出單元 Injection unit	螺桿標記 Screw type	—	A	B	A	B	A	B
	螺桿直徑 Screw diameter	mm	54	54	62	54	75	54
	射出行程 Screw stroke	mm	280	280	306	280	420	280
	理論射出容積 Theoretical shot volume	cm <sup>3</sup>	641	641	923	641	1855	641
	理論射出量 Shot weight of injection(PS)	gram	583	583	840	583	1688	583
	射出壓力 Injection pressure	kgf/cm <sup>2</sup>	2497	2497	2387	2497	2466	2497
	射出速度 Injection speed	mm/sec	94	94	98	116	111	116
	射出率 Injection rate	cm <sup>3</sup> /sec	215	215	295	264	490	266
夾模單元 Mold clamping unit	閉模力 Mold clamping force	tonf	350		550		900	
	夾模行程 Mold clamping stroke	mm	1600		1600		2400	
	模厚 Mold thickness	mm	400~600		600~750		600~1000	
	模壁最大間距 Daylight	mm	2550		3000		3800	
	大柱內距 Tie bar spacing (H×V)	mm	680x680		910x810		1120x1120	
	模盤尺寸 Mold platen (H×V)	mm	1030x1030		1380x1280		1650x1650	
電氣單元 Electrical equipment	最大油泵動力 Max.pump driving motor	kW(380V)	36.7	36.7	65	65	81.7	81.7
	電機馬達 Pump driving motor	HP(kW)	10(7.5)		10(7.5)		20(15)	
	溫度控制器 Temperature controller	set	6	6	6	6	8	6
	電熱容量 Heater capacity	kW	19.86	19.86	23.2	19.86	34.55	19.86
其 他 Others	機械尺寸 Machine dimensions(L×W×H)	mm	11000x3000x2200		13450x3650x2700		14400x3650x3500	
	油箱容量 Oil tank capacity	liter	600		800		1200	
	機械重量 Machine weight	ton	25		35		70	
	最高系統壓力 Max. system pressure	kgf/cm <sup>2</sup>	140		140		140	

	ITEMS	UNIT	HB-1400R		HB-1900R	
射出單元 Injection unit	螺桿標記 Screw type	—	A	B	A	B
	螺桿直徑 Screw diameter	mm	85	54	85	54
	射出行程 Screw stroke	mm	430	280	430	280
	理論射出容積 Theoretical shot volume	cm <sup>3</sup>	2439	641	2439	641
	理論射出量 Shot weight of injection(PS)	gram	2219	583	2219	583
	射出壓力 Injection pressure	kgf/cm <sup>2</sup>	2445	2497	2445	2497
	射出速度 Injection speed	mm/sec	97	116	97	116
	射出率 Injection rate	cm <sup>3</sup> /sec	549	266	552	266
夾模單元 Mold clamping unit	閉模力 Mold clamping force	tonf	1400		1900	
	夾模行程 Mold clamping stroke	mm	3650		4000	
	模厚 Mold thickness	mm	600~1600		650~1650	
	模壁最大間距 Daylight	mm	5100		5600	
	大柱內距 Tie bar spacing (H×V)	mm	1550x1350		1800x1550	
	模盤尺寸 Mold platen (H×V)	mm	2200x2010		2600x2340	
電氣單元 Electrical equipment	最大油泵動力 Max.pump driving motor	kW(380V)	90	90	135	135
	電機馬達 Pump driving motor	HP(kW)	20(15)		20(15)	
	溫度控制器 Temperature controller	set	8	6	8	6
	電熱容量 Heater capacity	kW	40.92	19.86	40.92	19.86
其 他 Others	機械尺寸 Machine dimensions(L×W×H)	mm	16400x4000x4000		17900x4300x4300	
	油箱容量 Oil tank capacity	liter	1600	1200	2100	1700
	機械重量 Machine weight	ton	100		140	
	最高系統壓力 Max. system pressure	kgf/cm <sup>2</sup>	140		140	

- 因本產品不斷研究改良，設計變更時，恕不另行通知。
- 本規格僅供參考，如有客製化需求請洽本公司 (例：料管組選搭或特殊製程)。
- Due to continuous improvements, we reserve the right to amend any of the above specifications without prior notice.
- The specifications are for reference only, please contact us for any customized request.



## 【全球行銷服務網】Global Marketing Network



## 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 臺灣台南市關廟區埤頭里保東路269號

No.269, Baodong Road, Pitou 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.

中國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: +86-769-83313753 • 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.

中國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 Chancharvadi Vasna,

Sarkhej Bavla Road, Taluka Sanand, Ahmedabad, Gujarat - 382213

TEL: +91-99-98897768 • E-mail: fcsco@fcs.com.tw

