Energy Saving, Highly Performed, Most Reliable
AI Electric Injection Molding Machine

# FANUC ROBOSHOT S-2000*i*

## 5A/15A/30A/50A
## 100A/150A/250A/300A
## 50AR/100AR

## Energy Saving, Highly Performed, Most Reliable AI Electric Injection Molding Machine

# FANUC ROBOSHOT S-2000*i* series

**The FANUC ROBOSHOT S-2000*i* series is the AI electric injection molding machine for the 21st century that incorporates the new injection unit as well as the advanced control with dedicated servo system, so as to extend performance in precision molding.**


## New Injection Unit

**High response injection**
- High-response injection through the advanced mechanical unit with the up-to-date servo system

**Optimal screw cylinder**
- Optimum screw cylinder selection for a variety of molding materials

**High precision temperature control**
- Temperature variations within 0.2℃


## Advanced Control

**High precision molding with high-speed injection control**

**Superior operation**
- 12.1-inch large-size display with new MDI

## Advanced Intelligence

**AI mold protection**
- Highly secured mold protection

**AI ejector**
- Quality judgement & breakage prevention of ejector pin

**AI pressure profile trace control**
- Stable molding with quality

**AI metering control**
- Stability

## Integration with the Molding Part Unloader SR Mate S-2000*i*50AR/100AR

**Integration with the ROBOSHOT**
- Transport as a single unit/Back up settings with Roboshot settings

**High-speed unloading**
- Use of the double-speed mechanism on the upper or lower axis

**Outstanding operability**
- Special operator's panel using a touch panel

## Intelligence

Stable molding with molding knowhows

**Robotization**
Systematization of the molding process

**Networking**
Information and communication

### Expertise at FANUC

- Over 300 patents on electric injection molding machine

### Excellence of Reliability

- Rigid mechanical structure
- Controlled by the FANUC Series 180*i*s-IB
- Servo control system exclusively developed

### Superior Safety

- Conformance on the most safety standards for Japan, North America and Europe

### Management Conformance

- ISO9001 certified
- ISO14001 certified

### Outperformed Energy Saving

- Significant energy saving


賞状

The 16th MITI award on superior energy saving

# Robotization and Intelligence

**FANUC offers total solutions for injection molding through robotization, and intelligence.**

## Molding Part Unloader SR Mate Integrated with the S-2000*i*50AR/100AR

SR Mate 100*i*B

- SR Mate is an all axes servo driven unloader which is integrated in the ROBOSHOT. This unit is built into the ROBOSHOT before shipment, so mounting, wiring, and positioning are not required during installation of the unit.
- Height of the mechanical unit is minimized. SR Mate can be used at low ceiling place.
- Parts can be transferred to ROBOSHOT operation side.
- The double step acceleration mechanism at part unloading arm achieved high speed unload motion in the die.
- Exclusive teach pendant with touch panel is available. Communicative interface with graphical drawings enables easy setup.
- SR Mate operational settings and ROBOSHOT molding conditions can be collectively saved on a memory card.

Exclusive teach pendant with touch panel and screen

## Advanced intelligence

### AI mold protection

Upon detecting an abnormal load during clamping, this function brings clamping to an abrupt stop, thereby protecting the mold from breakage. With its three mold protection detection levels, this function can be applied to the detection of mold guide pins and slide core failures, in addition to the detection of remaining moldings.

### AI ejector

This function detects the molding parts separation force at ejected, and brings instant stop of the ejection in the circumstance error. In addition to protecting the eject pin from breakage, it can be used to monitor the quality of moldings.

### AI pressure profile trace control

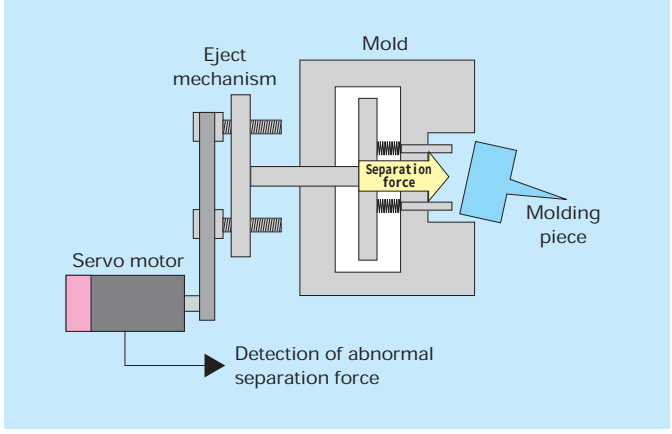
AI pressure profile trace control features to control injection packing process by tracing the recorded pressure profile on optimal molded piece. The exact profile tracing closer to the best profile realizes stable production of pieces under the same technical conditions.The pressure profile edit allows directly to edit pressure profile visually to modify molding conditions through the ROBOSHOT screen.

### AI metering control

The AI metering control stabilizes transferring resin with optimal metering through control of screw speed to enable smooth resin flow and to avoid excess pressure.The AI metering control together with the AI pressure profile trace control gives further stabilization on mold pieces.

| AI mold protection | Conventional |
|---|---|
| Instant stop of clamp closing at molding piece jammed | Conventional stop of clamp closing at molding piece jammed |

Paper cup




AI ejector

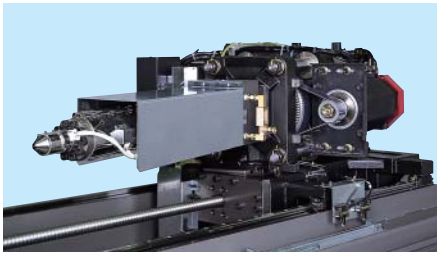
# New Injection Unit

**To meet the needs for higher precision of moldings, FANUC has considerably improved the performance of the injection unit. The new injection unit offers the highest molding performance through the advanced mechanical unit as well as the advanced control system with dedicated servo system.**

## High-response and high precision injection

### Low-inertia injection mechanism

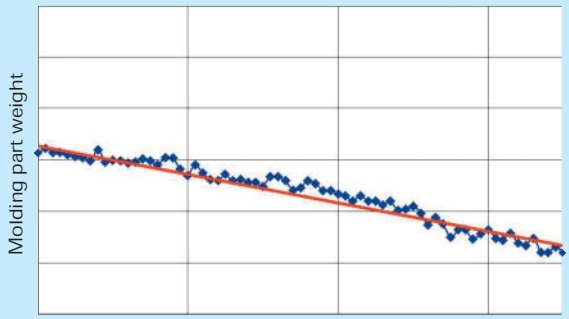
In the injection unit, FANUC's compact, high-output, and advanced servo motor **α*i*** series has been adopted. The new injection mechanism that reduces the inertia to half that of conventional ones has also been adopted. Quick response, combined with excellent stability from low-speed to high-speed range, ensures the highest performance in a wide variety of molding fields.



New injection mechanism

### High precision injection speed switching function

Sampling variations have been reduced by the use of a new algorithm for injection speed switching control. This function allows the switching of the injection speed with high precision throughout the entire speed range regardless of the set speed.




Injection speed switching position (setting)

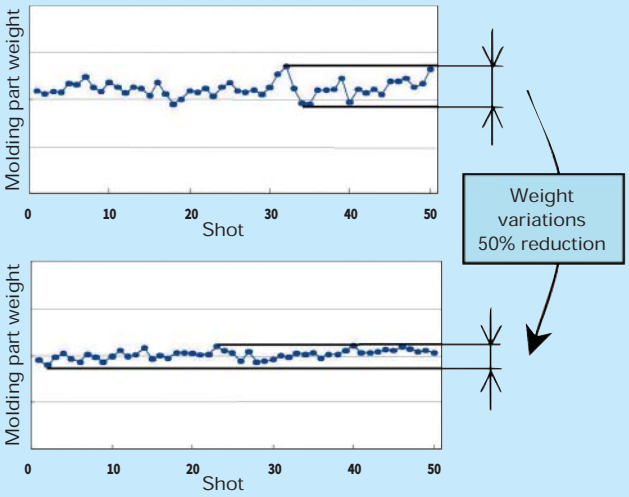
## High precision metering

**● Optimal screw cylinder**

The optimum combination of screw cylinder material and shape can be selected in accordance with the resin characteristics and the molding application. High precision optical components with transparent polyolefine and a screw cylinder nozzle for molding precision connectors have been newly added.

**● High precision metering control**

Suppresses variations of the resin pressure at the end of metering to stabilize the metering density. The control function is effective when metering is made at middle- or high-speed revolutions or when molding is performed using resin that is likely to cause metering variations.



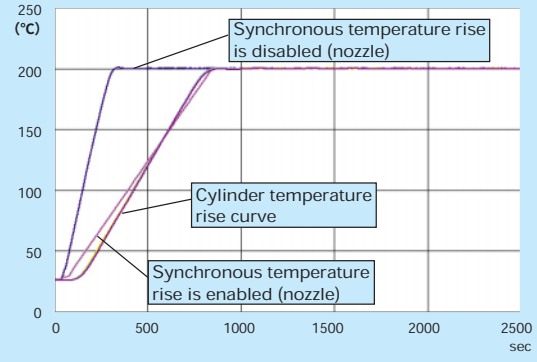

## High precision temperature control

**● High precision temperature control**

A newly developed high precision temperature control board can reduces temperature deviations within ±0.2℃ or less. Strict temperature control improves molding stability.

**● Synchronous temperature rise function**

This function prevents resin burning and hydrocarbon generation inside the nozzle during temperature rise by setting the temperature rise time for the heater zone in which temperature rise is likely to be completed soon, such as a nozzle. Improvement in temperature rise control has resulted in reduction in temperature rise time to 2/3 that of conventional machines.



# Advanced Control

## High precision molding with high-speed injection control

### Advanced CNC Series 180*i*s

● **High precision**
FANUC's advanced CNC Series 180*i*s-IB realizes high speed and high precision control. Stability of molding performance is enhanced by reducing deviation of peak injection pressure.

● **Various interfaces**
Interfaces for various peripheral devices come standard.

- Memory card slot
- Ethernet
- USB*
- RS232-C*

* Not standard interfaces for the S-2000*i*5A.

Advanced CNC Series180*i*s

## Superior operation

### 12.1-inch large-size display

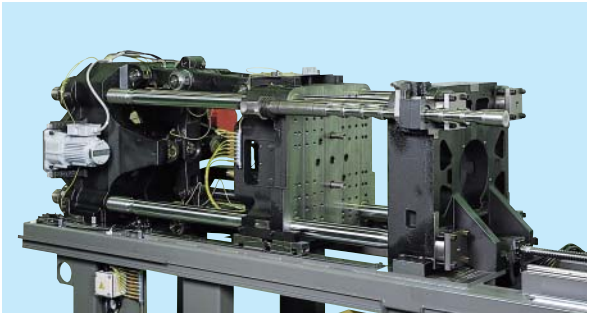
12.1-inch large-size LCD has been adopted. The soft background color and the clear Gothic character display improves the ease of viewing the screen. The quicker display four times over FANUC's conventional LCDs prompts ease of see, with quick switching with a new MDI keyboard.

12.1-inch large-size display with new MDI key board

# Support for high-precision molding

## High rigid toggle mechanism

The low-inertia and high torque servo motor with superior response is equipped with the new unique 5-point toggle mechanism (RDP 5-point toggle).
This configuration provides excellent performance for high cycle molding.



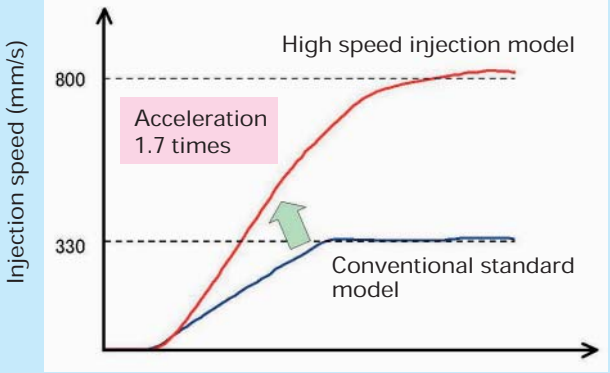
Clamp mechanism

## S-2000*i*50A$_P$ High precision clamping specification model

The S-2000*i*50A$_P$ is a model for high precision clamping specifications, which introduces a ball spline as the tie-bar of the clamping mechanism. By fully using state-of-the-art technologies such as a high-stiffness base frame and the nozzle touch bending prevention mechanism, the model realizes high precision die plate parallelism required for lens molding and other precise applications.

## S-2000*i*100A High-speed injection model

The S-2000*i*100A high-speed injection specification model provides a maximum speed of 800 mm/s (2.4 times higher than conventional model) and an acceleration 1.7 times higher than conventional model. This model delivers the maximum performance in high-speed, high-pressure molding such as thin-walled molding when used with a high-pressure-resistant cylinder.




## Recommended specifications for each molding type

● **Recommended specifications for lens molding**

- Special screw cylinder (for PC, PMMA/for COP)
- High precision temperature control
- Synchronous temperature rise function
- High precision clamping specifications

● **Recommended specifications for connector molding**

- Special screw cylinder (for PA, PBT, PPS/for LCP)
- High precision temperature control
- Synchronous temperature rise function
- High precision injection speed switching function
- High precision metering control
- Constant injection rise acceleration control

# Networking

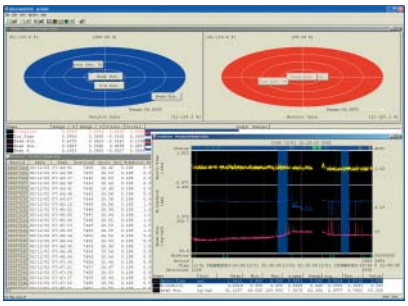
## MOLD24*i*

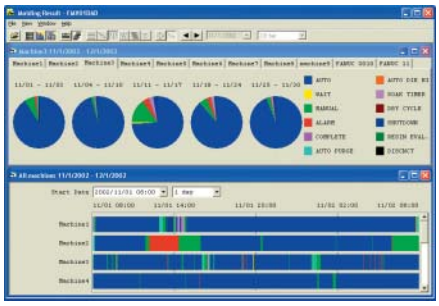
**Total data management system for molding factories, centering on quality control**

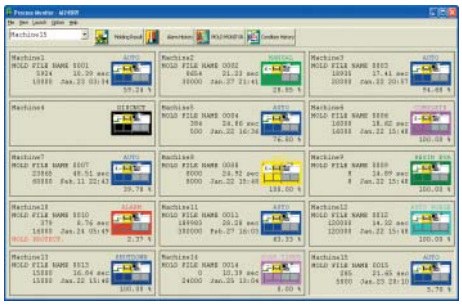
● **Quality radar**
Instant analysis for mold monitoring data of up to 1,200,000 shots (over 40 items) identify deviation by molding lots and gives visual display of technical factors of deviation.

● **Collection and analysis of operational performance**
Operational performance is automatically collected on a shift basis to monthly basis. In addition, the operational status can be analyzed in details.

● **Process monitor**
The operational status of the molding machine can be monitored by using a view in a form appropriate for the machine layout at a molding factory.


Quality monitor


Molding results


Process monitor

## Resin Characteristics Evaluation System

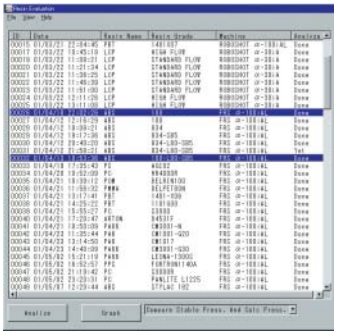
**Allowing the ROBOSHOT to measure the resin flow coefficient in cooperation with MOLD24*i***

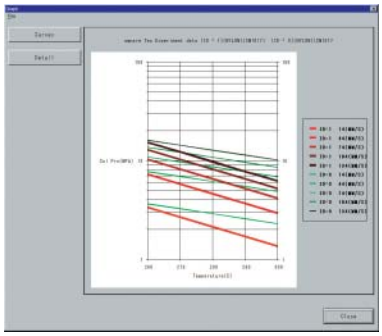
● **Resin flow coefficient measurement**
Resin flow coefficient measurement is automatically performed in the sequence programmed in ROBOSHOT in advance.

● **Resin database**
In the resin database, data for resin quality control, such as resin flow coefficient and molding temperature can be stored, and know-how for resin can be accumulated. (MOLD 24*i*)

● **Comparison of data for resin lots**
Any variation in flow coefficient among resin can be confirmed in a graph displayed. As significant variations, the graph can be used for the index to adjust molding conditions. (MOLD 24*i*)


Resin characteristic measurement

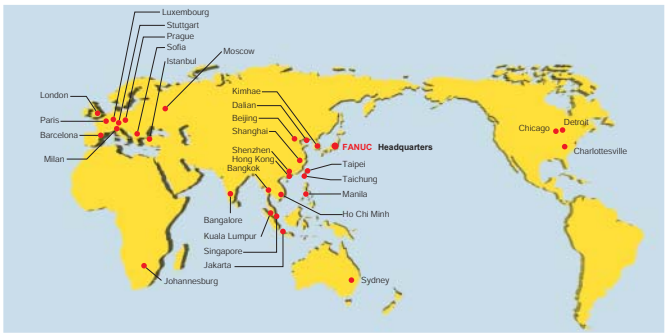

Resin database


Resin data analysis

# Maintenance and Customer Support

## Worldwide Customer Service and Support

FANUC operates customer service and support system anywhere in the world through subsidiaries and affiliates. FANUC provides the highest quality service with the quickest response at the location nearest you.




## FANUC Training Center

FANUC training center operates training programs on FANUC ROBOSHOT throughout the year, which focus on practical operations using various molding dies and setting method of molding conditions.


**Inquiries**: Yamanakako-mura, Yamanashi, Japan 401-0501
Phone : 81-555-84-6030
Fax : 81-555-84-5540

# Specifications

| Item | | | Unit | S-2000*i*5A | S-2000*i*15A | | | S-2000*i*30A | | | | | S-2000*i*50A/50AP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clamping unit | Tonnage | | kN | 50 (5tonf) | 150 (15tonf) | | | 300 (30tonf) | | | | | 500 (50tonf) | | | |
| | Max./Min. die height | | mm | 160/80 | 260/130 | | | 330/150 | | | | | 350/150 | | | |
| | Clamping stroke | | mm | 110 | 160 | | | 230 | | | | | 250 | | | |
| | Tie bar spacing (H×V) | | mm | 145×145 | 235×235 | | | 280×280 | | | | | 320×320 | | | |
| | Ejector point/Ejector stroke | | −/mm | 1/20 | 1/50 | | | 1/60 | | | | | 5/70 | | | |
| Injection unit | Screw diameter | | mm | 14 | 14(Note1) | 16 | 18 | 14(Note1) | 16 | 18 | 20 | 22 | 20(Note2) | 22 | 26 | 28 |
| | Theoretical capacity | | cm³ | 6 | 6 | 11 | 14 | 6 | 11 | 19 | 24 | 29 | 24 | 29 | 50 | 58 |
| | Std. | Max. injection pressure | MPa | 200 | 250 | 250 | 230 | 250 | 250 | 230 | 200 | 180 | 260 | 240 | 195 | 170 |
| | | Max. pack pressure | MPa | 180 | 250 | 230 | 190 | 250 | 250 | 210 | 180 | 160 | 260 | 200 | 170 | 150 |
| | | Max. injection speed | mm/s | 300 | 525 | | | 525 | | | | | 200 | | | |
| | | Max. screw rotation speed | min⁻¹ | 250 | 450 | | | 400 | | | | | 300 | | | |
| | High speed High press. | Max. injection pressure | MPa | — | — | — | — | — | — | — | — | — | 280 | 260 | 210 | 190 |
| | | Max. pack pressure | MPa | — | — | — | — | — | — | — | — | — | 280 | 240 | 190 | 160 |
| | | Max. injection speed | mm/s | — | — | | | — | | | | | 330 | | | |
| | | Max. screw rotation speed | min⁻¹ | — | — | | | — | | | | | 450 | | | |

Note1) Order the special cover option for the screw of φ14.
Note2) φ20 is available only with S-2000*i*50A.

| Item | | | Unit | S-2000*i*100A | | | | | S-2000*i*150A | | | | | S-2000*i*150A Small capacity injection | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clamping unit | Tonnage | | kN | 1000 (100tonf) | | | | | 1500 (150tonf) | | | | | 1500 (150tonf) | | | | |
| | Max./Min. die height | | mm | 450/150 | | | | | 490/200 | | | | | 490/200 | | | | |
| | Clamping stroke | | mm | 350 | | | | | 440 | | | | | 440 | | | | |
| | Tie bar spacing (H×V) | | mm | 410×410 | | | | | 510×510 | | | | | 510×510 | | | | |
| | Ejector point/Ejector stroke | | −/mm | 5/100 | | | | | 5/130 | | | | | 5/130 | | | | |
| Injection unit | Screw diameter | | mm | 22 | 26 | 28 | 32 | 36 | 32 | 36 | 40 | 44 | 48 | 22 | 26 | 28 | 32 | 36 |
| | Theoretical capacity | | cm³ | 29 | 50 | 58 | 103 | 147 | 121 | 153 | 188 | 268 | 318 | 29 | 50 | 58 | 103 | 147 |
| | Std. | Max. injection pressure | MPa | 250 | 250 | 230 | 200 | 170 | 250 | 210 | 170 | 150 | — | 260 | 260 | 240 | 220 | 190 |
| | | Max. pack pressure | MPa | 250 | 230 | 210 | 170 | 150 | 210 | 190 | 150 | 130 | — | 260 | 260 | 220 | 200 | 170 |
| | | Max. injection speed | mm/s | 200 | | | | | 200 | | | | | 330 | | | | |
| | | Max. screw rotation speed | min⁻¹ | 300 | | | | | 300 | | | | | 450 | | | | |
| | High speed High press. | Max. injection pressure | MPa | 260 | 260 | 240 | 220 | 190 | 280 | 280 | 260 | 220 | 190 | — | — | — | — | — |
| | | Max. pack pressure | MPa | 260 | 260 | 220 | 200 | 170 | 280 | 280 | 260 | 220 | 190 | — | — | — | — | — |
| | | Max. injection speed | mm/s | 330 | | | | | 330 | | | | | — | | | | |
| | | Max. screw rotation speed | min⁻¹ | 450 | | | | | 400 | | | | | — | | | | |

| Item | | | Unit | S-2000*i*250A | | | | | | S-2000*i*300A | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clamping unit | Tonnage | | kN | 2500 (250tonf) | | | | | | 3000 (300tonf) | | | | | | |
| | Max./Min. die height | | mm | 650/300 | | | | | | 650/300 | | | | | | |
| | Clamping stroke | | mm | 600 | | | | | | 600 | | | | | | |
| | Tie bar spacing (H×V) | | mm | 710×710 | | | | | | 710×710 | | | | | | |
| | Ejector point/Ejector stroke | | −/mm | 13/150 | | | | | | 13/150 | | | | | | |
| Injection unit | Screw diameter | | mm | 32 | 36 | 40 | 44 | 48 | 52 | 40 | 44 | 48 | 52 | 56 | 64 | 68 |
| | Theoretical capacity | | cm³ | 121 | 153 | 188 | 268 | 318 | 442 | 188 | 268 | 318 | 442 | 640 | 836 | 944 |
| | Std. | Max. injection pressure | MPa | 280 | 280 | 260 | 220 | 190 | 160 | 280 | 280 | 240 | 200 | 175 | — | — |
| | | Max. pack pressure | MPa | 280 | 280 | 260 | 220 | 190 | 160 | 260 | 240 | 220 | 180 | 160 | — | — |
| | | Max. injection speed | mm/s | 330 | | | | | | 200 | | | | | | |
| | | Max. screw rotation speed | min⁻¹ | 400 | | | | | | 300 | | | | | | |
| | High speed High press. | Max. injection pressure | MPa | — | — | — | — | — | — | 280 | 280 | 270 | 240 | 225 | 175 | 155 |
| | | Max. pack pressure | MPa | — | — | — | — | — | — | 280 | 260 | 240 | 220 | 195 | 150 | 130 |
| | | Max. injection speed | mm/s | — | | | | | | 240 | | | | | | |
| | | Max. screw rotation speed | min⁻¹ | — | | | | | | 400 | | | | | | |


**FANUC LTD**

Oshino-mura, Yamanashi 401-0597, Japan Phone:81-555-84-5555 Fax:81-555-84-5512
http://www.fanuc.co.jp





RSHOT-S2000*i*A(E)-05, 2005.2, Printed in Japan