High-performance, high-reliability and high-productivity electric injection molding machine, with FANUC standard CNC installed

FANUC ROBOSHOT

α-S50iA/α-S100iA/α-S150iA
FANUC standard CNC and servo system installed
Electric injection molding machine achieves high quality, high

FANUC ROBOSHOT α-SiA series

High-Performance
- FANUC Standard CNC
- Highly-Rigid and Low-Friction Mechanism
- Additional Servo Axis Control

High-Reliability
- Fully Enclosed Cover Style
- Higher Operation Rate
- Conformity to Safety Standards

High-Productivity
- Energy Saving
- Cycle Time Shortening

ROBOSHOT-LINK+i
reliability and high productivity

High-Performance

FANUC standard CNC achieves superior molding repeatability
Highly-rigid and low-friction mechanism achieve precision molding
Additional servo axis control achieves extra value in molding

High-Reliability

Fully enclosed cover style achieves both safety and accessibility
High-precision AI protect function achieves higher operation rate
Conformity to safety standards supports molding plant globalization

High-Productivity

FANUC standard servo system saves energy consumption
High-speed, high-precision and simultaneous motion shortens cycle time
ROBOSHOT-LINK+ manages product and quality information

The outer view and operation differ in specifications.
High-Performance

FANUC standard CNC achieves superior molding repeatability

Backflow monitor
- Detects backflow precisely at injection start, Displays injection repeatability in graph

Precise metering
- Controls screw movement during metering optimally, Prevents string and silver streaking
- Eliminates backflow of resin, Stabilizes injection volume and reduces weight variation of molded products

Highly-rigid and low-friction mechanism achieves precision molding

Clamping unit
- Selectable two types of moving platen
- Low-friction linear guided support*

Injection unit
- Adopts low-friction linear guides, Achieves smooth injection and metering motion

*Optional. Available options differ in region and model.

[Single platen]
Expands mold area

[Double platen]
Pursuits high rigidity

Magnetic clamping system
Three plates mold etc.

Multi cavities
Thin wall molding etc.

Low-friction linear guides

Conventional

Precise metering

Conventional

Precise metering

Backflow monitor screen

Weight variation

Stable

Unstable

Resin : PA66

75%
Additional servo axis control achieves extra value in molding (Option)

Additional axis control advances ROBOSHOT further

[Suitable feeding device]
- Achieves optimal amount of resin supply by feedback control, Achieves long term molding repeatability

[Servo nozzle touch]
- Controls nozzle touch force during molding cycle optimally

Promotes gas ventilation
- Reduces residue on mold surface
- Prevents wearing of screw and cylinder

Suitable feeding device

Reduces shear heating
- Prevents molding defects such as burn

Servo nozzle touch mechanism

Superior platen parallelism
- Achieves precise molding and longer life of mold

Additional axis control achieves versatile applications
- High-speed and accuracy positioning by FANUC servo technology
- No additional control equipment required, Integrated into ROBOSHOT operation

[Unscrewing molding]
- Servo motor
- Container with screw
  Resin : PS

[Hoop molding]
- Lead frame
- LED parts
  Resin : LCP

*Only additional servo system will be offered
High-Reliability

Fully enclosed cover style achieves both safety and accessibility

High-level safety
• Fully enclosed cover style prevents contact with moving part and high temperature part with high-level safety
• Achieves compact machine dimensions

Superior accessibility
• Wide opened hopper maintenance area, Enhances accessibility

High-precision AI protect function achieves higher operation rate

AI mold protection
• Detects remaining molded products during mold closing or abnormal sliding core motion during mold opening with high-accuracy
• Interrupts motion immediately after abnormal status detected, Protects mold and ejector pin from damage

1. Realtime monitoring
Monitors load of servo motors in every cycle

2. Problem detection
Detects load deviation precisely caused by remaining molded products etc.

3. Protection
Interrupts clamp and ejector motion immediately

Experimental example of AI mold protection by using paper cup
Conformity to safety standards supports molding plant globalization

Regional safety standards and multiple languages support

Multiple languages support
Japanese / English / Chinese simplified / Chinese traditional / Korean / Thai / German / French / Italian / Spanish (Mexican) / Portuguese / Czech / Finnish / Dutch

Safety requirements differ in region
Please confirm the latest safety requirements of the region where ROBOSHOT is installed.

Control technology achieves high-quality and stable molding

Precise clamping force control*

- Lowers clamping force gradually, Adjusts clamping force automatically to be optimal for the molding
- Prevents molding defects such as burn and burr, Reduces frequency of mold maintenance

![Diagram of clamping force control]

Optimal clamping force

*: Optional. Available options differ in region and model.
High-Productivity

FANUC standard servo system saves energy consumption

- High-efficiency servo system reuses regenerated power during deceleration of motors, Excellent energy saving performance
- Displays consumption power and regenerated power on operation screen
- Monitors power consumption including auxiliary equipments*

![High-performance servo motors and amplifiers & series](image)

![Consumption power monitor screen](image)

*:Optional. Available options differ in region and model.

High-speed, high-precision and simultaneous motion shortens cycle time

Cycle chart

- Displays duration and timing of each molding process clearly
- Shortens cycle time efficiently
- Displays comparison before and after shortening, Evaluates shortening result instantly

![Cycle chart screen](image)

*:Optional. Available options differ in region and model.
FANUC ROBOSHOT-LINKi manages product and quality information (optional)

- Production and quality information management tool supports larger-scale and globalization of molding plant
- “Visualization” of ROBOSHOT data

Product information management
- Achieves lower cost and higher operation rate
- Monitors consumption power including auxiliary equipments

Quality information management
- Achieves traceability and advanced quality
- Investigates cause of failure and molding repeatability

Visualization of production amount and operating rate

Visualization of cause of failure
# Application to a range of molding fields

<table>
<thead>
<tr>
<th>Thin wall light guide panel</th>
<th><img src="image" alt="Light guide panel for cellular phone" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Decompression control at injection to packing (8 modes)</td>
<td></td>
</tr>
<tr>
<td>ㆍPrevents sink marks and warpage, Achieves uniformed thickness distribution</td>
<td></td>
</tr>
<tr>
<td>High pressure resistance cylinder and High pressure filling mode*</td>
<td>ㆍAchieves thinner wall molding by injection with ultra high pressure</td>
</tr>
</tbody>
</table>

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<tr>
<th>Precise lens</th>
<th><img src="image" alt="Camera lens for cellular phone" /></th>
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<tbody>
<tr>
<td>Moving platen support by linear guides*</td>
<td><img src="image" alt="Camera lens for cellular phone" /></td>
</tr>
<tr>
<td>ㆍSuperior platen parallelism and straightness of clamp motion</td>
<td>ㆍOptimized screw design and surface treatment achieves high-quality molding</td>
</tr>
</tbody>
</table>

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<tr>
<th>Screw and cylinder for lens molding</th>
<th><img src="image" alt="Precise fine-pitch connector" /></th>
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<td>ㆍOptimized screw design and surface treatment achieves high-quality molding</td>
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<td>Precise metering</td>
<td><img src="image" alt="Precise fine-pitch connector" /></td>
</tr>
<tr>
<td>ㆍReduces weight variation and eliminates stringy, Achieves long term molding repeatability</td>
<td>ㆍOptimized screw design and surface treatment achieves high-quality molding, Prevents resin carbonization</td>
</tr>
</tbody>
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<tr>
<th>Nozzle for Liquid Crystal Polymer*</th>
<th><img src="image" alt="Syringe" /></th>
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<tbody>
<tr>
<td>ㆍOptimized nozzle and temperature control for LCP achieves high-quality molding, Prevents resin carbonization</td>
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<th>Automotive parts</th>
<th><img src="image" alt="Syringe" /></th>
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<tbody>
<tr>
<td>Single platen</td>
<td><img src="image" alt="Syringe" /></td>
</tr>
<tr>
<td>ㆍExpanded mold installation area, Supports magnetic clamping system</td>
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</tr>
<tr>
<td>Hot runner controller (Built-in)*</td>
<td><img src="image" alt="Syringe" /></td>
</tr>
<tr>
<td>ㆍIntegrated into ROBOSHOT operation, Achieves precise temperature control</td>
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</tbody>
</table>

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<tr>
<th>Medical parts</th>
<th><img src="image" alt="Syringe" /></th>
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</thead>
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<tr>
<td>Fully enclosed cover style</td>
<td><img src="image" alt="Syringe" /></td>
</tr>
<tr>
<td>ㆍClean and quiet, Ideal for molding in clean room</td>
<td>ㆍClean and quiet, Ideal for molding in clean room</td>
</tr>
<tr>
<td>Suitable feeding device*</td>
<td><img src="image" alt="Syringe" /></td>
</tr>
<tr>
<td>ㆍPrevents burn and carbonization, Suitable for molding with transparent resin</td>
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*:Optional. Available options differ in region and model.
Options

Maintenance and customer support

Worldwide customer service and support

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

Optional. Available options differ in region and model. Refer to the “specification list” for details on the options.

Training

FANUC Training Center operates training programs on FANUC ROBOSHOT which focus on practical operations and molding know how and maintenance.

References:

- "specification list"

- air connector for air ejector
- terminal box (I/O for mold)
- purge cover
- thermal insulation cover
- 100V outlet
- multi color signal tower (LED type)
- manifold for piping
- hot runner controller (Built-in)
- mold heater controller
- interface for auxiliary equipments
- 200V outlet
- optional. Available options differ in region and model.
- refer to the “specification list” for details on the options.

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### Specifications

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<tr>
<th>Item</th>
<th>Unit</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonnage</td>
<td>kN</td>
<td>500 (150 tonf)</td>
</tr>
<tr>
<td>Maximum and minimum point/kN/mm</td>
<td></td>
<td>350/150</td>
</tr>
<tr>
<td>Maximum and minimum point/kN/mm</td>
<td></td>
<td>410/210</td>
</tr>
<tr>
<td>Clamping stroke</td>
<td>mm</td>
<td>250</td>
</tr>
<tr>
<td>Tie bar spacing (H x V)</td>
<td>mm</td>
<td>360 x 320</td>
</tr>
<tr>
<td>Tie bar spacing (H x V)</td>
<td>mm</td>
<td>500 x 470</td>
</tr>
<tr>
<td>Platen size (H x V)</td>
<td>mm</td>
<td>220</td>
</tr>
<tr>
<td>Ejector point / Ejector force / Ejector stroke point/kN/mm</td>
<td>5/20 (2.0 tonf) / 70</td>
<td>5/25 (2.5 tonf) / 100</td>
</tr>
<tr>
<td>Injection specification</td>
<td></td>
<td>Injection speed 330 mm/s</td>
</tr>
<tr>
<td>Screw diameter</td>
<td>mm</td>
<td>20</td>
</tr>
<tr>
<td>Maximum injection volume</td>
<td>cm³</td>
<td>24</td>
</tr>
<tr>
<td>Maximum injection pressure</td>
<td>MPa</td>
<td>360</td>
</tr>
<tr>
<td>Maximum pack pressure</td>
<td>MPa</td>
<td>280</td>
</tr>
<tr>
<td>Maximum screw rotation speed</td>
<td>min⁻¹</td>
<td>450</td>
</tr>
<tr>
<td>Injection specification</td>
<td></td>
<td>Injection speed 500 mm/s</td>
</tr>
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<td>Screw diameter</td>
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Note: When high filling mode is used, a special cylinder is needed. Molding conditions may be restricted depending on the screw diameter.

For details, see a separate list of specifications.

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RSHOT α-SIA(E)-01, 2012.8, Printed in Japan