FANUC
ROBOSHOT $\alpha$-SiA series
High Precision Electric Injection Molding
ROBOSHOT $\alpha$-SiA series

Innovative Technology, Superior Results

**New iHMI Controller**
- User friendly control with new help function and onboard manuals
- New VNC capabilities

**Improved Clamp Design**
New toggle design allowing for faster and more fluid movements

**Advanced Artificial Intelligence (AI)**
Cutting-edge mold protection using AI Mold Protect and AI Eject guard
Flexible Injection Capabilities
Precise and stable molding with easily interchangeable screws and barrels

Superior Motion Control Technology
Industry leading energy efficiency and repeatability

Adaptive Clamping
2 piece platen and extended tie bars option allowing for maximum versatility
Electrically driven axes

Every ROBOSHOT comes with 4 servomotors as standard. Additional servomotors can be added as options. This enables separate control of ROBOSHOT’s movements – clamp opening and closing, ejector, screw, and injection – and results in a highly precise and stable process.

CNC reliability

Drawing on 60 years of continuous development, the centerpiece of the ROBOSHOT is its industry leading reliable control. User friendly and featuring all the standard interfaces, it delivers fast processing times and consistent parts quality.

Servo technology makes the difference

ROBOSHOT’s movements are entirely controlled by FANUC designed and built controlled servo drives. This not only results in maximized acceleration but, it ensures ultimate accuracy and exceptional reliability across all processes as well as highly precise motion, position and pressure control.

Extremely consistent injection molding

with minimal weight deviation thanks to:
- Precise V-P switchover
- Precise pressure control in 1 step
- Precise temperature control in 0.1 °F steps
- Precise AI pressure profile control
- Precise metering control functions

Very low maintenance costs –

Proven design and product optimization result in maximum machine uptime, fewer components and less wear
Versatile clamp unit

ROBOSHOT’s versatile clamp unit features generous tie bar spacing as well as auto die-height and optional extended die height functions. The automatic clamp force optimization checks and automatically adjusts minimum clamp force, giving you increased security and eliminating the need to adjust the clamp force manually.

Other clamp unit features include:
- 5 point toggle mechanism
- Rigid platens
- Ball-screw driven eject and clamp system
- Precise clamp and ejector repeatability
- High speed clamp options available

High-performance injection unit

ROBOSHOT’s injection unit features an AI Metering Control that uses torque rather than speed control to achieve a variable screw rotation speed. Its AI Backflow Monitor shows what is happening inside the non-return valve, so you can monitor the closing characteristics as well as the wear status of the check ring. The AI Pressure Trace controls the pressure curve to ensure stable injection molding when unknown variation occurs.

Other ROBOSHOT injection unit features include:
- Position control in 1 micro steps
- Flexible range of screws and barrels
- High duty and high pressure filling options available
- Unparalleled repeatability and precision

Sensitive FANUC CNC controlled pre-injection

ROBOSHOT’s pre-injection functionality enables the time between the beginning of injection molding and clamping force build-up to be determined freely.

- Just right for sophisticated tasks such as the production of lens molding
- Provides a reliable solution for air venting over the parting line
- Multiple forms of pre-inject available
- Great for cycle time reduction by overlapping injection with clamping

Cycle Time Savings

Optimize your cycle time using Simple Pre-injection function. Typical cycle reduction of 0.3 – 0.7 seconds.
Versatile machinery for all applications

With models capable of exerting clamping forces from 17 to 385 US tons, ROBOSHOT is ideally suited to a diverse range of straightforward as well as sophisticated injection molding tasks. Offering huge versatility, ROBOSHOT’s unique strength is the freedom it provides you to produce almost anything using just one machine – whether that be delicate items such as camera lenses to products, such as battery cases, that require high levels of dynamic force to produce. Thanks to it’s high level of specification, even standard ROBOSHOT machines can be used to produce specialized items such micro components, casings and even metal and ceramic parts.
ROBOSHOT for the Automotive industry

With a host of functions designed specifically to resolve the issues – such as gas venting or variations in plasticizing time and volume – that can impact the production of automotive parts ROBOSHOT is ideally suited the large scale manufacture of automotive parts. ROBOSHOT will continue producing flawless parts over the long term, delivering excellent cycle times and requiring minimum maintenance. Repeatability is also in a class of its own, with the machine delivering exactly the same quality after 50,000 cycles as it did on the first shot. What is more, because production runs in the automotive industry change frequently, ROBOSHOT comes with 6 different screw sizes, providing you with the power to adapt and enjoy outstanding versatility from a single machine.

Ultimate Flexibility

The Roboshot allows molders the maximum amount of application flexibility with its increased daylight option, single or double platen options on certain sizes, and easily interchangeable barrels and screws. The Roboshot also provides extreme repeatability when moving molds from machine to machine even when changing models or tonnages.

Integrated Additional Axis Capabilities

By using Fanuc motors and drives, the Roboshot can fully integrate multiple additional axis all through one control. From Milacron designed rotary tables to servo cores and now additional injection units, the Roboshot has the capability to easily integrate and maintain precise control and movement repeatability.
Hydraulic and fully integrated servo cores

Automotive parts frequently require cores. For these kinds of applications, ROBOSHOT is also available with hydraulic and fully CNC controlled servo cores.

Optimal networking using Euromap 63 & 77

Euromap 63 and 77 are quality information management systems for globalized and larger scale of molding plants.

- Central production monitoring
- Process data capture & extraction
- Machine status visualization
- Customised reports
**Precise dosing**

ROBOSHOT Precise Metering 3 provides the exact dosing required to produce small high-precision parts such as liquid crystal polymer connectors for PCB boards. This function checks the volume after plasticizing, automatic V-P and decompression adjustment. Product quality is improved thanks to constant plasticizing volume for low viscosity materials, reduced parts weight variation and the avoidance of bubbles and silver strings.

**High Speed Molding Capabilities**

The Roboshot excels in high speed applications with its high speed clamping offerings to maximize your molding efficiencies. High speed clamp is available for various size machines that can allow up to 32% dry cycle time improvements.

**ROBOSHOT for the Electrical industry**

Producing high numbers of small electrical components requires excellent cycle times and maximum repeatability. This is where ROBOSHOT comes into its own with its smart functions designed to compensate for changes in material viscosity such as Precise Metering 2+3 or AI metering control. The excellent acceleration delivered by ROBOSHOT’s electric servomotors is also ideally suited for thin walls applications. Active gas venting also further enhances the quality of these components.
Precise insert molding

For processes requiring inserts, ROBOSHOT can be supplemented with a 6-axis Robot fitted with iRVision, the product of 30 years of experience in intelligent vision systems. Equipped with this technology, the robot picks and places inserts with an amazing degree of accuracy and repeatability. Perfect for small parts, this solution does not require an external guide or fixing.

Made for micro molding

Only ROBOSHOT offers a 17 ton fully electric injection-molding machine. Designed to save precious floor space, this solution is ideal for use with very small molds and to produce micro parts.
ROBOSHOT for the Medical industry

Quality, reliability and repeatability are critical to the production of medical products. Products molded for medical applications are also often transparent, making gas venting and changes in viscosity important issues. ROBOSHOT’s highly sensitive pre-injection process resolves these issues, with ROBOSHOT’s smart AI Metering Control function compensating for variations in viscosity to ensure consistent results whatever the process. Because ROBOSHOT is equipped with up to 7 different screws as standard, manufacturers can easily alter production to accommodate different types of product.

Integrated hot runner control

Featuring up to 96 channels, this function saves time uploading new molds by allowing machine operators to use data and parameters stored in the central monitoring control.

Quality assurance and traceability made easy

For full transparency and superior quality management, ROBOSHOT comes with up to 16 Multi Cavity Pressure Channels, cavity balance monitoring and historical data collection. To save money, ensure easier operation and minimize external components, monitoring is done directly through the control. You just select the required part quality.
Historical traceability

Given the nature of medical products, acquiring and processing data is critical. To make this easy ROBOSHOT is available with smart features – such as Euromap 63 and LINK – designed to capture and store data on a central server and provide complete part traceability.

Enhanced Processing Information

Just what you need for setting up, validation and on-going monitoring.

- Reference data curve storage
- Quality control outputs
- Multiple curve display
- Ideal Process optimization tool
High-duty injection units for long holding times

The production of components for the optical industry often demands machines are capable with the long holding times and high pack pressures necessary to produce thick walls. ROBOSHOT is available with high-duty injection units that are ideally suited to the production of these kinds of components.

Increase the quality of your optical parts

For optical parts, control of the mold temperature is critical for surface quality. Integrating this functionality into the control saves time and helps prevent errors. Sensitive pre-injection and active gas venting resolves venting issues resulting from high material volumes and faster compression. Consistent molding is enabled by the clamp and ejector compression function.
Sensitive handling solutions

Avoiding surface defects is crucial when loading and unloading delicate optical parts. FANUC robots provide the dexterity to handle this kind of sensitive handling requires.

Screw Variation and Flexibility

Not only does the Roboshot allow up to 8 easily interchangeable screw and barrel combinations all on one frame, but Milacron also offers a variety of different screw and barrel materials specifically designed to fit your application. From our Klearstar kits to our Wearstar offerings we can the Roboshot can be customized to meet your application requirements.
Lowest energy consumption worldwide

Superior servo technology and intelligent energy recovery reduce ROBOSHOT’s energy consumption by 50–70% compared to hydraulic machines and by up to 10–15% compared to other manufacturers’ electrical machines. Given very low maintenance costs, fewer components and less wear, ROBOSHOT provides the lowest Total Cost of Ownership on the market.
Power consumption screen
Fitted as standard and including an energy analysis page, this function identifies where energy is consumed during the cycle, enabling you to optimize consumption and identify regenerative power.

Hydraulic machines
Save up to 50–70%

Electrical machines
Save up to 10–15%
Roboshot AI Mold and Ejector Protection provides the best mold protection on the market. Built to minimize downtime, it even indicates when greasing is required or the mold is worn.

**Mold and ejector protection in both directions**

Should an event occur, ROBOSHOT protects your mold during the full opening and closing cycle - Its unique Mold Protection function, measures the motor torque and stops the machine immediately if there is a restriction. The same technology also protects the ejector’s forward and reverse movement.

**Reliable protection at no cost to speed**

Unlike the protection on hydraulic systems, ROBOSHOT’s Mold Protection functionality has zero impact on clamp closing speeds. This kind of high-speed responsiveness is provided by its electric drives and superior motion control technology. Clamp tolerances are also programmable across the entire mold movement.

**Your benefits with Roboshot AI Mold and Ejector Protection:**

- Protects your mold from damage
- Minimal repair costs
- Reduces costly downtime
- Very easy set-up – just turn on and set sensitivity level
- No loss in clamp speed
Optimized clamp force setting and fewer part defects

Roboshot Clamp Force Adjustment checks and automatically adjusts the minimum clamp force, providing increased security and eliminating the need to adjust the clamp force manually.

Your benefits with Roboshot Clamp Force Adjustment:
- Reduced mold wear
- Increased machine life
- Reduced part defects
- Less energy consumption
- Reduced start-up time
Transparency and stability for your processes

Unique process control and wear monitoring

Roboshot Backflow Monitor shows you what is happening inside the valve, allowing you to monitor the closing characteristics as well as the wear status of the check ring. The injection process is also shown as a curve on the screen, enabling you to check and change your parameters should any irregularities occur. This allows the user to see the effect of process condition changes against the behavior of the check valve. It even helps identify the onset of valve wear without disassembly of the barrel assembly.

Your benefits with Roboshot Backflow Monitor:
- Constant process monitoring
- More transparent injection process
- Easy detection of irregularities
- Early scheduling of maintenance task
- Predictable timing for exchanging the check ring

The Roboshot Backflow Monitor. On the left: stable back-flow. On the right: evidence that material is leaking and that valve slider closing times are inconsistent.
Remote monitoring with ROBOSHOT-LINKi

LINKi is a product and quality information management tool that manages up to 128 ROBOSHOT machines in real time from remote PCs or smart devices.

Status monitor
- Achieves lower cost and higher operation rate
- Monitors power consumption

Quality information
- Provides traceability and advanced quality analysis
- Investigate cause of failure and molding repeatability

Diagnosis
- Alarm history
- Operation and parameter change history
- Remote operation functions

Constant parts weight – no need for decompression

Roboshot Precise Metering 2+3 is an additional function designed to avoid uncontrolled volume flow between the end of plasticizing and decompression. Precise Metering 2 provides advanced decompression control with reverse rotation of the screw after plasticizing, while Precise Metering 3 checks the volume after plasticizing, automatic V-P and decompression adjustment. Set to automatic mode there is no need to set various different parameters – all you need do is switch on!

Your benefits with Roboshot Precise Metering 2+3:
- Constant plasticizing volume for low viscosity materials
- Reduced part weight variations
- Avoidance of bubbles and silver strings
- Automatic V/P adjustment (PMC)
- Automatic decompression adjustment
- Higher parts quality – fewer bad parts

Integrates with Milacron 4.0

Roboshot is fully compatible with the Milacron 4.0 offering:
- Remote Monitoring
- Advanced Analytics
- Downtime Tracking
Multi-component injection molding

You can use ROBOSHOT for multi-component injection molding by adding versatile and easy-to-integrate vertical and horizontal injection units. This advanced molding technique allows you to inject three different components simultaneously. The vertical SI-20A unit fits on top of the ROBOSHOT, the horizontal SI-300HA unit slots onto the side. These additional injection units make it possible to inject two or three different components in one production run. Powered by our powerful CNC, the injection units offer the same levels of accuracy and repeatability as ROBOSHOT.

Your benefits
- Fully integrated CNC
- Easy to integrate
- Flexible configuration
- Turnkey solutions
- Cost efficient

Easy switching between operation screens

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<th>Unit</th>
<th>ROBOSHOT SI-20A</th>
<th>ROBOSHOT SI-300HA</th>
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ROBOSHOT efficiency highlights
The ROBOSHOT SI-300HA horizontal injection unit

This horizontal injection unit can be fitted to the side of the ROBOSHOT α-SiA models. Optional FANUC servomotors are available to control rotary tables from the ROBOSHOT SI-300HA. It is flexible and easy to integrate into your ROBOSHOT cell.

Features and benefits
• Controlled by FANUC’s latest CNC
• Same accuracy and repeatability as any other ROBOSHOT
• Exchangeable between different ROBOSHOT models
• Can be installed on current ROBOSHOT models, including the S2000iB series
• Integrated screen on ROBOSHOT operation screen*

* Available only with ROBOSHOT α-SiA series

The ROBOSHOT SI-20A vertical injection unit

This vertical injection unit can be installed on top of the 55 ton to the 385 ton ROBOSHOT machine. Fitted with the latest CNC, the unit offers stable, precision molding and is encased in a space-saving electrical cabinet.

Features and benefits
• Controlled by the latest CNC
• Same accuracy and repeatability as any other ROBOSHOT
• Exchangeable between different ROBOSHOT models
• Can be installed on current ROBOSHOT models, including S2000iB series
• Integrated screen on ROBOSHOT operation screen*

* Available only with ROBOSHOT α-SiA series
Designed for easy automation

The ROBOSHOT Quick & Simple Startup Package (QSSP) enables you to install tending robots in just a few steps. Easy robot access unloading components as well as an ergonomically designed work area ensures easy access to the machine. For more demanding automation scenarios, a comprehensive network of dedicated partners possess the know-how and technical expertise you need to create the ideal solution for your production facility.

Ready to integrate: Thanks to new interfaces and smart functions such as integrated hot runner and mold temperature controls, ROBOSHOT facilitates flexible integration into existing production systems. Unlike any other machine of its kind, ROBOSHOT includes an extensive package of functions for the most common injection molding applications.
Create your Molding Cell

The product of almost 30 years of experience in vision systems, iRVision fitted to a 6 axis Robot makes an extremely productive alternative to a gantry.

Quick and easy insert placement
- Reliable visual picking and quality control prior to insertion
- Very exact and highly repeatable insert placement without the need for mechanical guides
- Positional accuracies of +/- 0.02mm

Visual error proofing
- Integrated vision system, iRVision, identifies part errors according to cavity
- Visual identification of part defects or tiny faults such a single dot in a group of parts
- No revalidation of the production process necessary
- Saves a considerable amount of time
- Only 1 camera required for multiple cavities

Part placement and orientation
- FANUC’s iRVision provides a simple part placement solution
- Inspection of each part on a conveyor
- Identification of the cavity automatically
- An immediate decision is made
World Leading Control

Drawing on 60 years of continuous development, the centerpiece of the ROBOSHOT is the most reliable CNC control in the world. User friendly and featuring all the standard interfaces, it delivers fast processing times and consistent parts quality.

Simple maintenance – early detection

The intuitive visual maintenance interface on FANUC's control facilitates faster recoveries after servicing. The integrated early warning system identifies errors before they occur, ensuring maximum precision and consistent quality standards.

- 15” color touchscreen display
- Intuitive iHMI home screen
- Quick and easy data input
- Ethernet and USB interfaces

NEW Virtual Network Computing (VNC) Capabilities

VNC allows molders to easily integrate their system with:

- Mold Masters Hot Runner
- Milacron Robot
- Other auxiliaries equipped with VNC
• 15” color touchscreen display
• Intuitive iHMI screen
• Easy data input and minimal keypad entry
• Improved interface to robot operation screen
• Precise predictive maintenance
• Easy-to-use control screen
• Supports multiple languages
With over 35 years of continuous development, the Roboshot is the machine of choice for energy efficiency, repeatability, and long term reliability. Which model is right for you?

<table>
<thead>
<tr>
<th>Model</th>
<th>Tonnage</th>
<th>Max/Min. Incl. Form Height (Tonnage)</th>
<th>Closing stroke</th>
<th>Location Ring Diameter</th>
<th>Tie Bar Spacing (HxV)</th>
<th>Platen Size (HxV)</th>
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