High Precision Electric Injection Moulding

Roboshot

30 years of Roboshot technology

DMLieferant Тел. (Россия): +7 (499) 990-05-50; +7 (800) 775-29-59. Сайт: www.dmliefer.ru
100% FANUC experience

A track record that tells: the embodiment of over 30 years of continuous development and 60 years of knowhow at the cutting edge of CNC, every single Roboshot machine and all its core components – controls, amplifiers and motors – are developed, manufactured and tested to perfection by FANUC. The result: higher performance, higher productivity and the highest reliability in the industry.
CNC precision for higher productivity

With some 15 million servomotors and 3 million CNC controls installed worldwide, we are not only the world's biggest producer of motors but also experts in servo technology and tooling. Long proven in FANUC machining centres, FANUC employs this same state-of-the-art CNC technology in Roboshot to provide an unrivalled electric injection moulding solution. The results are huge versatility, utmost precision of movement and extremely short cycle times to produce larger quantities of consistently high-quality parts.

Your benefits with FANUC Roboshot:
- maximum precision
- proven reliability
- excellent repeatability
- ultimate process control
- very low maintenance
In-house servo technology makes the difference

Extremely consistent injection moulding

- Very low maintenance costs – minimal time spent on repairs, high capacity, low energy costs.
- Extremely consistent injection moulding with minimal weight deviation thanks to:
  - precise V-P switchover in 10 micro steps
  - precise pressure control in 1 bar steps
  - precise temperature control in 0.1 °C steps
  - precise AI pressure profile control
  - precise metering control functions

Very low maintenance costs – maximum uptime, less wear

World-beating CNC reliability

- Highly precise positioning, maximum accuracy and reliability across all processes.
- High-precision motion, position and pressure control as well.

Electrohydraulically driven axes

- Extensively calibrated with full software support.
- Precise vector control in 10 micro steps.
- Precise pressure control in 1 bar steps.
- Precise temperature control in 0.1 °C steps.
- Precise metering control functions.

Very low maintenance costs – maximum uptime, fewer components and less wear

Sensitive FANUC CNC controlled pre-injection

- Just right for sophisticated tasks such as the production of light guides and providing a reliable solution for air venting over the parting line.
- Roboshot’s pre-injection functionality enables the time between the beginning of injection moulding and clamping force build-up to be determined freely.

Versatile clamp unit

- Generous tie bar spacing.
- Auto die-height adjustment.
- Optional extended die height.
- 5 point toggle mechanism.
- Automatic clamp force optimisation.
- Very rigid platens.
- Ball drive ejector system.
- Linear guide rails as option.

Flexible range of screw and barrels.

Central to the FANUC Roboshot is the most reliable CNC control in the world.

Electrically driven axes

- Roboshot’s movements are entirely controlled by FANUC designed and built CNC controlled servo drives.
- This not only results in the highest control quality on the market but is also a result of the highest accuracy and robustness consistently across all processes.
- High-precision motion, position and pressure control as well.

Sensitivity and precision

- Fastest acceleration on the market.
- High-precision motion, position and pressure control as well.
- Exceptional reliability across all processes.

World-beating CNC reliability

- Electrically driven axes.
- Roboshot comes with 4 servomotors as standard.
- Additional servomotors can be added as options.
- This enables separate control of clamp opening and closing, screw, and injection – and results in direct inertia-free control for maximum precision.

In-house servo technology

- Centrepiece of the FANUC 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.

High-performance injection unit

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Versatile machinery for all applications

With models capable of exerting clamping forces from 150 kN to 3500 kN, FANUC Roboshot is ideally suited to a diverse range of straightforward as well as sophisticated injection moulding 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 exertive force to produce. What is more, thanks to its high level of specification, even standard Roboshot machines can be used to produce specialised items such micro components, casings and even metal and ceramic parts.
FANUC Roboshot for the Automotive industry

With a host of functions designed specifically to resolve the issues – such as gas venting or variations in plasticising time and volume – that can impact the production of automotive parts, FANUC Roboshot is ideally suited to the large scale manufacture of automotive parts. The most reliable machine on the market, Roboshot will just keep on 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.

High-duty injection units for long holding times

The production of thick-walled automotive parts, such as POM components for vehicle safety systems, often requires machines to be capable of long holding times. Roboshot is available with high-duty injection units that are ideally suited to the production of these kinds of components.

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 minimise external components, monitoring is done via the CNC. You just select the required part quality.

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/FANUC Link

FANUC Roboshot Link is a quality information management system for globalised and larger scale of moulding plants. Roboshot is also available with Euromap 63.

- Central Production monitoring
- Process Data capture & extraction
- Machine status visualisation
- Customised reports & Remote monitoring
FANUC 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, given 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 to creating the thin walls that these parts often demand. Active gas venting also further enhances the quality of these components.

Absolutely constant dosing

FANUC 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 plasticising, automatic V-P and decompression adjustment. Product quality is improved thanks to constant plasticising volume for low viscosity materials, reduced parts weight variation and the avoidance of bubbles and silver strings.

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Very precise insert moulding

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

Made for micro moulding

Only FANUC offers a 15t electric injection-moulding machine. Designed to save precious floor space, this solution is ideal for use with very small moulds and to produce very small parts.
FANUC Roboshot for the Medical industry

With human lives sometimes at stake, quality, reliability and repeatability are critical to the production of medical products. Products moulded for medical applications are also often transparent, making gas venting and changes in viscosity important issues. FANUC’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. What is more, because Roboshot is equipped with 6 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 moulds 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 minimise external components, monitoring is done via the CNC. You just select the required part quality.

**Historical traceability**

Given the nature of medical products, acquiring and storing process data is critical. To make this easy Roboshot is available with smart features – such as FANUC Mould i and Euromap 63/FANUC Link – designed to capture and store data on a central server and provide complete part traceability.

**Process graphics as standard**

Just what you need for setting up, validation and on-going monitoring.
- Reference data curve storage
- Quality control outputs
- Multiple curve display
- Ideal Process optimisation tool

DMLieferant | Tel. (Россия): +7 (499) 990-05-50; +7 (800) 775-29-59. | Site: www.dmliefer.ru
High-duty injection units for long holding times
The production of components for the optical industry often demands machines are capable of long holding times 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 mould temperature is critical for surface quality. Integrating this functionality into the control saves time and helps prevent errors, while sensitive pre-injection and active gas venting resolves venting issues resulting from high material volumes and faster compression. Consistent moulding is enabled by the clamp ejector 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.

Made for micro moulding
Only FANUC offers a 15t electric injection-moulding machine. Designed to save precious floor space, this solution is ideal for use with very small moulds and to produce very small parts.

FANUC Roboshot for the Optical industry
Injection moulding products for the optical industry involves some unique challenges. In contrast to standard injection moulding processes, injection speeds tend to be very slow and walls often thick. Capable of controlling slow processes with the utmost of precision, Roboshot offers manufacturers huge benefits in this regard. High-pressure and precise injection speed control to as low as 0.5 mm per second as well as high-duty injection provide additional advantages. As does, optimised screw and barrel technology for transparent materials.
Lowest energy consumption worldwide

FANUC's superior servo technology and intelligent energetic 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, very high levels of uptime, fewer components and less wear, FANUC 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 optimise consumption and identify regenerative power.

FANUC
Save up to 50–70%

Hydraulic machines

FANUC
Save up to 10–15%

Electrical machines

No additional power required to cool the motors
Maximum mould and ejector protection

FANUC AI Mould and Ejector Protection provides the best mould protection on the market. Built to minimise downtime, it even indicates when greasing is required or the mould is worn.

Mould and ejector protection in both directions
Should an event occur, Roboshot protects your mould during the full opening and closing cycle - its unique Mould 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 Mould Protection functionality has zero impact on clamp closing speeds. This kind of high-speed responsiveness is provided by its electric drives. Clamp tolerances are also programmable across the entire mould movement.

Your benefits with FANUC AI Mould and Ejector Protection:
- no damage to moulds
- no repair costs
- no costly downtime
- very easy set-up – just turn on and determine a min/max percentage of the torque
- no loss in moving speed

Optimised clamp force setting and fewer part defects

FANUC 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 FANUC Clamp Force Adjustment:
- reduced mould wear
- increased machine life
- reduced part defects
- less energy consumption
- reduced start-up time

For more information:
Scan the code to see FANUC’s unique mould protection system in action.
**Consistent output – less maintenance**

Using the FANUC Servo Feeder function the extruding time is automatically controlled and optimised by the servomotor. Your benefits: stable metering thanks to reduced gas inside the mould, less contamination of the screw and more consistent plasticising times.

**Your benefits with FANUC 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 FANUC 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 behaviour of the check valve. It even helps identify the onset of valve wear without disassembly of the barrel assembly.

**Constant parts weight – no need for decompression**

FANUC Precise Metering 2+3 is an additional function designed to avoid uncontrolled volume flow between the end of plasticising and decompression. Precise Metering 2 provides advanced decompression control with reverse rotation of the screw after plasticising, while Precise Metering 3 checks the volume after plasticising, 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 FANUC Precise Metering 2+3:**
- constant plasticising 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

The FANUC Backflow Monitor. On the left: stable back-flow. On the right: evidence that material is leaking and that valve slider closing times are inconsistent.
Your benefits:
- seamless loading and unloading or insert placing
- parts discharge in all directions
- easy robot-accessibility from side, top and bottom
- ready-to-use automation packages
- turn-key solutions
- integrated robot operation and program storage

Ready to integrate
Thanks to new interfaces and smart functions such as integrated hot runner and mould temperature controls, FANUC Roboshot facilitates flexible integration into existing production systems. Unlike any other machine of its kind, FANUC Roboshot includes an extensive package of functions for the most common injection moulding applications.

Create your FANUC Moulding Cell

The product of almost 30 years of experience in vision systems, FANUC iRVision fitted to a FANUC 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
- FANUC’s 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

Fast linear handling

with unique FANUC motion control

Use FANUC CNC Power Motion i-A to create highly productive 3-axis linear robot systems. Ready to use and easy to customise, it comes with a complete package of software and is ideally suited to creating fast, precise, reliable and versatile production cells that deliver short cycle times.
FANUC Roboshot series

Choose the right model for your application

### Data Table

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### Dual pl. (injection volume 1500 mm³)

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### Machine dimensions

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### Notes

- For more information, visit www.dmliefer.ru
- Contact: DMLiefer, Text (Poccen): +7 (499) 990-05-50; +7 (800) 775-29-59.
FANUC Technical support
Perfection from your mould!

Mould validation represents an essential part of FANUC’s extensive range of services and is conducted in our especially equipped technical centres. Just show us your mould and we will show you what Roboshot can do with it. Always there where you need us, passionate and committed, we are your partner of choice when it comes to a wide range of injection moulding applications. That’s the Yellow Spirit.

Strong partners

Comprising a team of over 200 experienced system partners throughout Europe, FANUC’s tight-knit network of specialists is dedicated to providing you with the best possible solutions and robot-equipped automated production cells whatever your production scenario.

Always at hand

With a global network covering every continent and more than 210 local offices, we are always there to meet your needs quickly and effectively whenever you need us. In Europe, a comprehensive FANUC network with 28 subsidiaries provides sales, technical, logistics and service support throughout the continent. That way you can be sure to have a local contact that always speaks your language.
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