

High Precision
Electric Injection
Moulding

FANUC

Roboshot

FANUC
ROBOSHOT
CI-51001A

30 years of
Roboshot
technology



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

Roboshot's movements are entirely controlled by FANUC designed and built CNC controlled servo drives. This not only results in the fastest acceleration on the market but – in order to ensure ultimate accuracy and exceptional reliability across all processes – highly precise motion, position and pressure control as well.

Electrically driven axes

Every FANUC 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 direct inertia-free control for maximum precision.

World-beating CNC reliability

Drawing on 60 years of continuous development, the 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.

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 machine uptime, fewer components and less wear

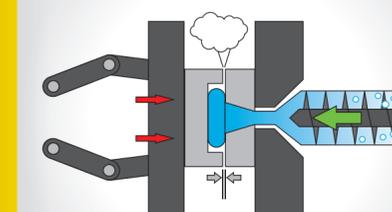


Versatile clamp unit

- 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

High-performance injection unit

- flexible range of screws and barrels
- sensitive pre-injection
- AI metering control
- precise metering control functions
- AI pressure weight control
- unique backflow monitor
- position control in 1 micro steps



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 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.



High precision
moulding



Thin wall moulding



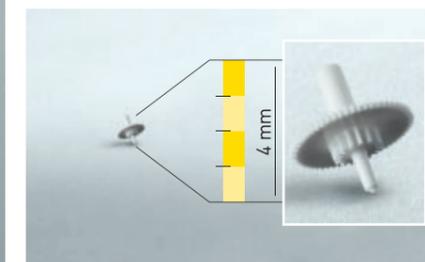
2K moulding



Precise moulding



MIM/CIM



Micro-injection
moulding



LSR moulding

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 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 Linki

FANUC Roboshot Linki 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.

Quality assurance and traceability made easy

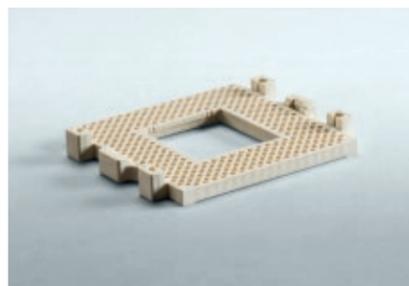
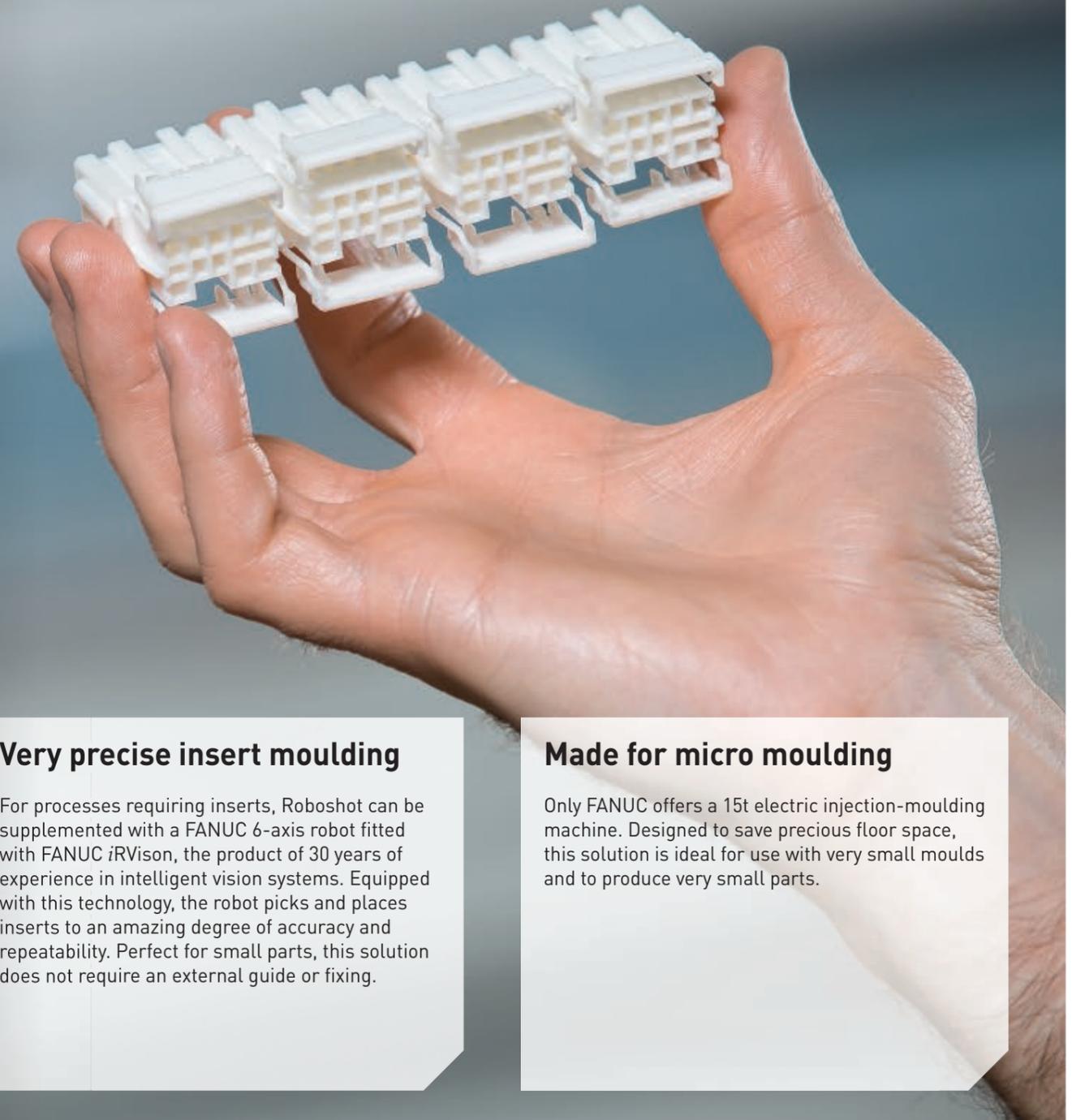
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Very precise insert moulding

For processes requiring inserts, Roboshot can be supplemented with a FANUC 6-axis robot fitted with FANUC iRVison, 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

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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 *i* – 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



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.

High-duty injection units for long holding times

The production of components for the optical industry often demands machines are capable the 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.

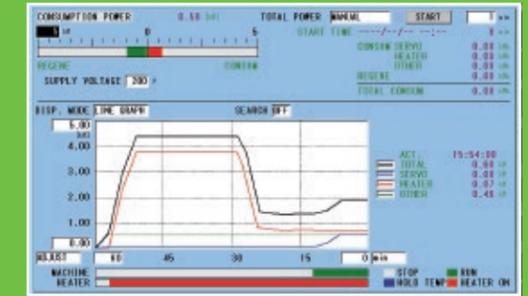
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Lowest energy consumption worldwide

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.

Hydraulic machines

FANUC

Save up to 50–70%

Electrical machines

FANUC

Save up to 10–15%



No additional power required to cool the motors

Protect your valuable moulds!



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

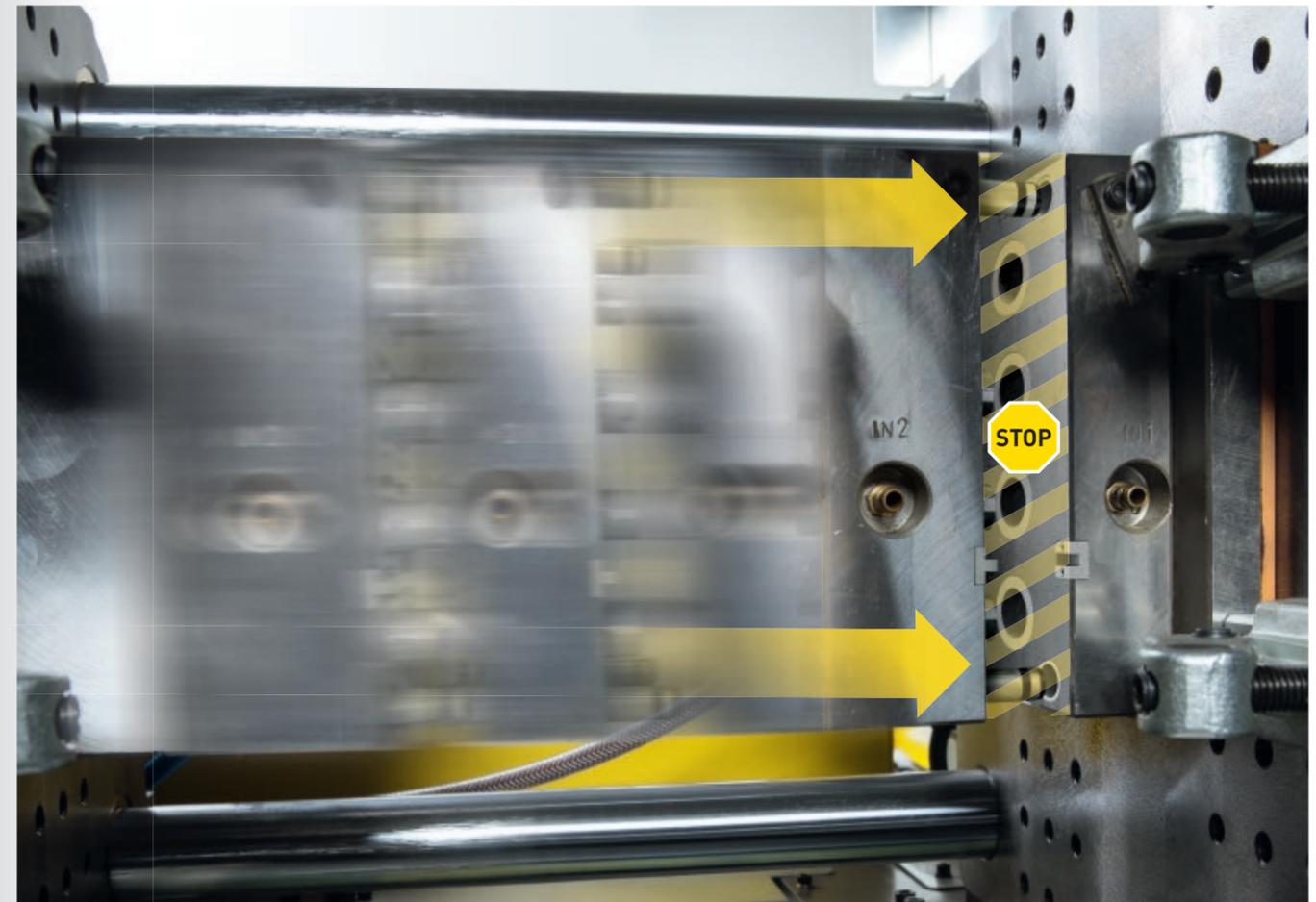
Should an event occur, Roboshot protects your mould during the full opening and closing cycle - Its unique Mould Protection function, measures the motor torque and stops the machine immediately if there is a restriction. The same technology also protects the ejector's forward and reverse movement.

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.

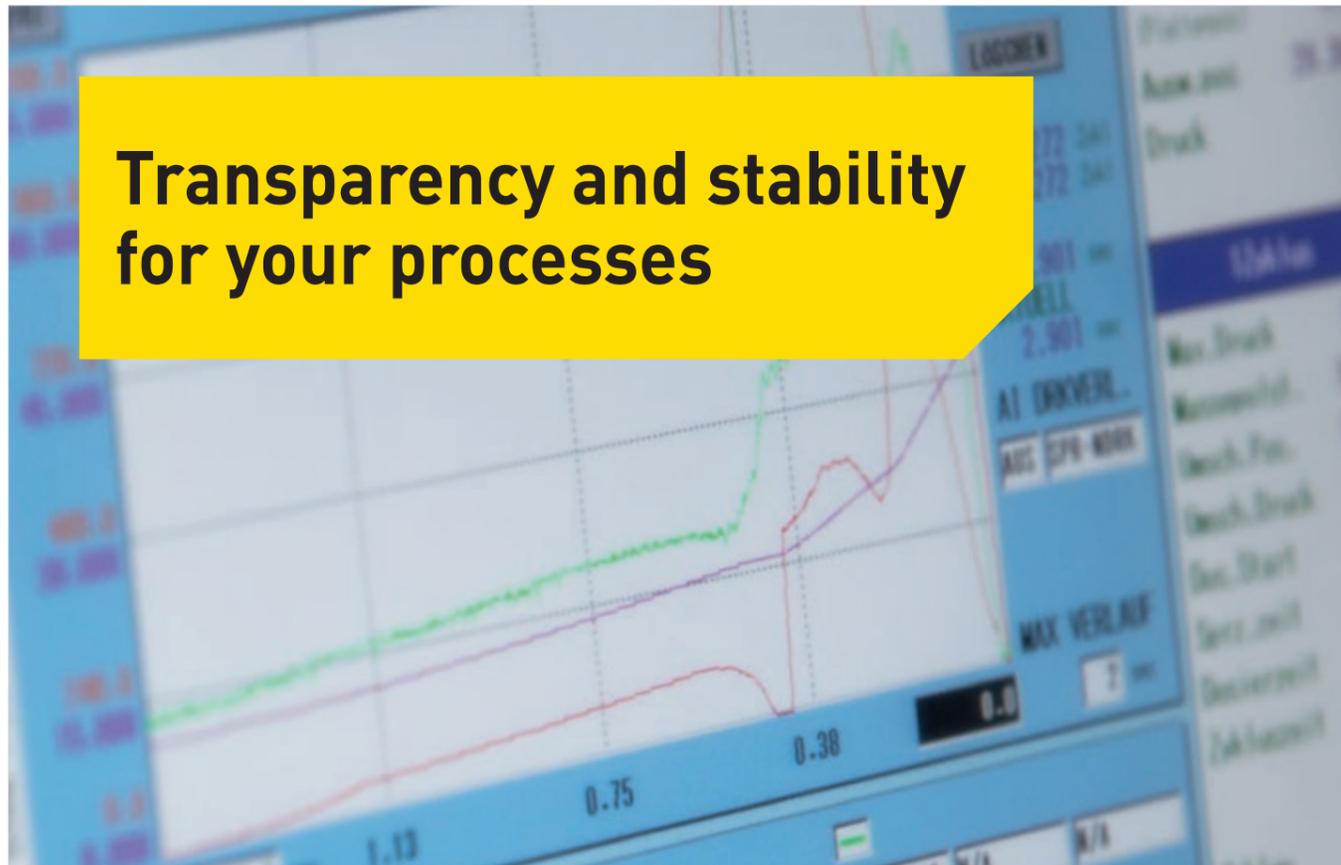
Your benefits with FANUC Clamp Force Adjustment:

- 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.

Transparency and stability for your processes

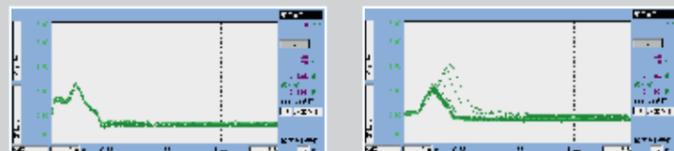


Unique process control and wear monitoring

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.

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. On the left: stable back-flow. On the right: evidence that material is leaking and that valve slider closing times are inconsistent.



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.

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



Precise metering for maximum precision and stability

Roboshot and FANUC robots Designed for easy automation

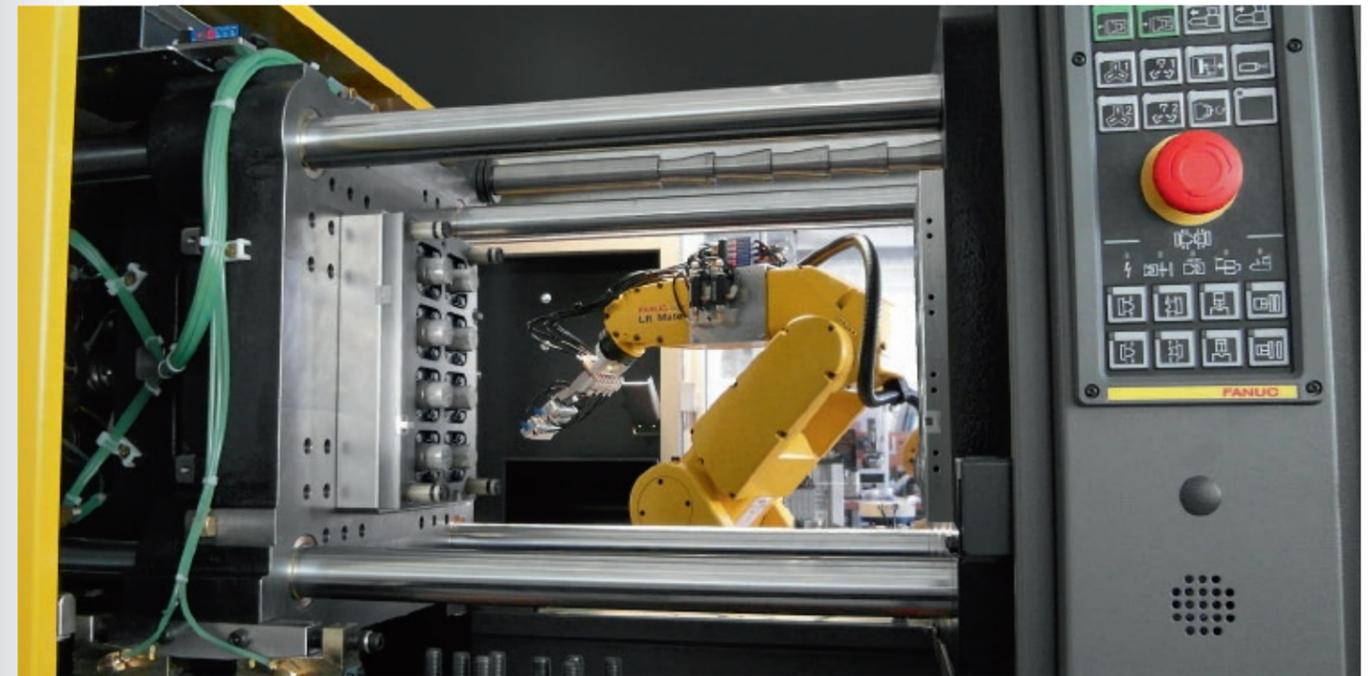
Thanks to its versatile design and easy all-round accessibility, FANUC Roboshot offers all the benefits of smart automation on a small footprint. All FANUC products share a common control platform and speak the same language. Very easy to integrate and operate, Roboshot's extreme compatibility also makes creating highly productive moulding cells incredibly straightforward.

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.

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



Create your FANUC Moulding Cell

The product of almost 30 years of experience in vision systems, FANUC *iR*Vision 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, *iR*Vision, 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 *iR*Vision 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

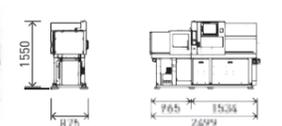
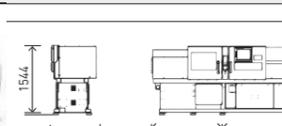
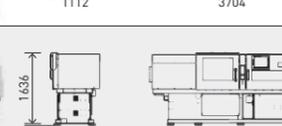
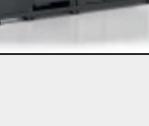
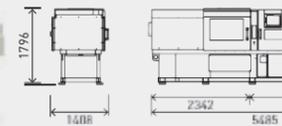
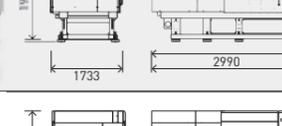
with unique FANUC motion control

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

	Clamping unit							Injection unit											Machine weight kg				
	Tonnage kN	Max./min. form height mm	Closing stroke mm	Location Ring Diameter mm	Tie Bar Spacing (HxV) mm	Platen Size (HxV) mm	Ejector stroke mm	Screw diameter mm	Injection stroke mm	Max. injection volume cm³	IS200		IS525 / IS330 / IS240			IS700 / IS500				Nozzle Contact force kN			
											Max. injection pressure bar	Max. injection speed mm/s	Max. injection pressure (high-pressure injecting) bar	Max. injection pressure bar	Max. injection speed mm/s	Max. injection pressure (high-pressure injecting) bar	Max. injection pressure bar	Max. injection speed mm/s					
α-S15iA			150	260-130	160	∅ 60	260 x 235	355 x 340	50	14	56	9				2500	525		2500	800	5	IS525 - 1380 IS800 - 1430	
α-S30iA			300	330-150	230	∅ 100	310 x 290	440 x 420	60	14	56	9				2500	525		2500	800	9	IS525 - 1880 IS800 - 1950	
α-S50iA			500 / 650	Double pl. 350-150 400-200 Single pl. 410-210 460-210	250	∅ 125	360 x 320	500 x 470	70	20	75	24			3600	2800	330	3600	2800	500	15	IS300 Double pl. - 2900 IS300 Single pl. - 2850 IS500 Double pl. - 3100 IS500 Single pl. - 3050	
α-S100iA			1000 / 1250	Double pl. 450-150 550-150 Single pl. 520-220 620-220	350	∅ 125	460 x 410	660 x 610	100	22	75	29			3400	2600	330	3400	2600	500	15	IS200 Double pl. - 4300 IS200 Single pl. - 4150 IS330 Double pl. - 4300 IS330 Single pl. - 4150 IS500 Double pl. - 4450 IS500 Single pl. - 4300	
NEW α-S130iA			1300	570-200	400	125	530 x 530	730 x 730	100	32	128	103	220				200					15	4900
α-S150iA			1500 / 1800	Double pl. 500-200 600-200 Single pl. 575-275 675-275	440	∅ 160	560 x 510	800 x 750	150	32	150	121	2800		3800	2800	330					30	IS200 Double pl. - 7050 IS200 Single pl. - 6800 IS330 Double pl. - 7200 IS330 Single pl. - 6950
α-S150iA (small capacity)			1500 / 1800	Double pl. 500-200 600-200 Single pl. 575-275 675-275	440	∅ 160	560 x 510	800 x 750	150	22	75	29			3400	2600	330					15	Small Capacity IS330 Double pl. - 6500 IS330 Single pl. - 6250
NEW α-S220iA			2200	650-250	550	160	650 x 650	900 x 900	150	44	176	268	220				200					30	10800
α-S250iA			2500 / 3000	650-300 750-400	600	∅ 160	710 x 635	1030 x 960	200	32	150	121			2800		330					30	IS330 - 13700
α-S300iA			3000 / 3500	650-300 750-400	600	∅ 160	810 x 710	1130 x 1030	200	44	176	268			2800		240					30	IS240 - 14600



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.

**Push
the
button**



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