THINK TECH FORWARD

Stock code: 300415

Designed by YIZUMI, November 2025

YIZUMI

FF 15T-30T

PRECISION ALL-ELECTRIC MICRO INJECTION MOLDING MACHINE

Precision Forward

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FF

PRODUCT DETAILS

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Designed for Precision Micro Injection Molding Choice for Optical Lenses and Precision Connectors

FF all-electric micro injection molding machine adopts YIZUMI's proprietary all-electric servo drive system. With advanced technical features, outstanding accuracy, stability, and intelligence, it enables micro-level injection molding precision, providing solutions for high-precision micro components in 3C, medical, aerospace, and laboratory industries.

Three Major Customer Value Propositions

Precise and Stable Reliable Intelligent

Unique Strengths

- Compact design
- Short mold opening cycle
- Low mold cost
- Quick and convenient mold change
- Significant energy savings
- High precision production
- Reduced water waste
- Stable, automation-friendly production
- Suitable for small-batch, multi-variety production and rapid setup

More Precise and Stable

① High-precision linear guide for mold moving
② Independent platen support
③ Electric double-lead-screw carriage
④ Micro control system
⑤ Servo direct control (SDC) technology
⑥ Dual-encoder feedback control

More Reliable

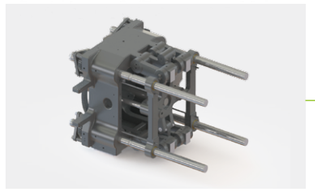
① High-rigidity platen design
② High-strength dual-square-tube frame structure
③ Fully-hardened alloy plasticizing component as standard
④ Dust-proof electrical cabinet for efficient heat dissipation
⑤ Innovative separate supports for crosshead guide rod
⑥ Dual-mold structure for movable platen (optional)

More Intelligent

High-performance and intelligent control system

※The data above are derived from YIZUMI's lab results and are for your reference only.

Overview

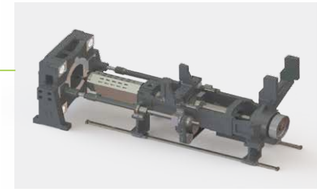


Separate supports for crosshead guide rod

Separating supports and the tail platen can avoid the impact of tail platen deformation on the crosshead, thus improving balance of toggle motion and minimizing deformation effects on products.

Optimized platen rigidity

Minimized platen deformation fully ensures balanced force distribution at the center of precision mold, guaranteeing product consistency. Platen parallelism ≤ 0.02mm.

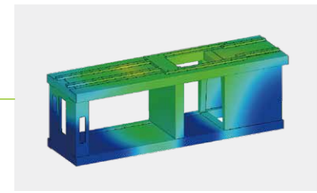


Double-ball-screw electric carriage structure

The nozzle maintains uniform and stable contact force against the mold surface, preventing material leakage while reducing minimizing deformation of the fixed platen caused by uneven force distribution, thereby ensuring stable products.

Separate platen supports

The separate supports design ensures more uniform stress distribution and thermal deformation on platen. The optional dual-mold structure for movable platen further reduces mold deformation, making it particularly suitable for precision molding applications.

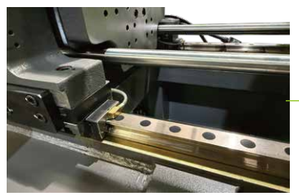


High-rigidity machine frame

Machine frame structure has been optimized through finite element analysis to improve rigidity and stability.

High-precision linear guides

- Superior platen parallelism and guiding accuracy for precision manufacturing applications.
- Straightness ≤ 0.01mm (for specific stroke)



Effective dust-proof electrical cabinet

- The driver cooling vents are externally mounted on the electrical cabinet, reducing internal heat sources and ensuring more stable and efficient heat dissipation.
- Featuring no air inlets/outlets, this design prevents dust entry and reliably protects the internal components, thereby extending their service life.

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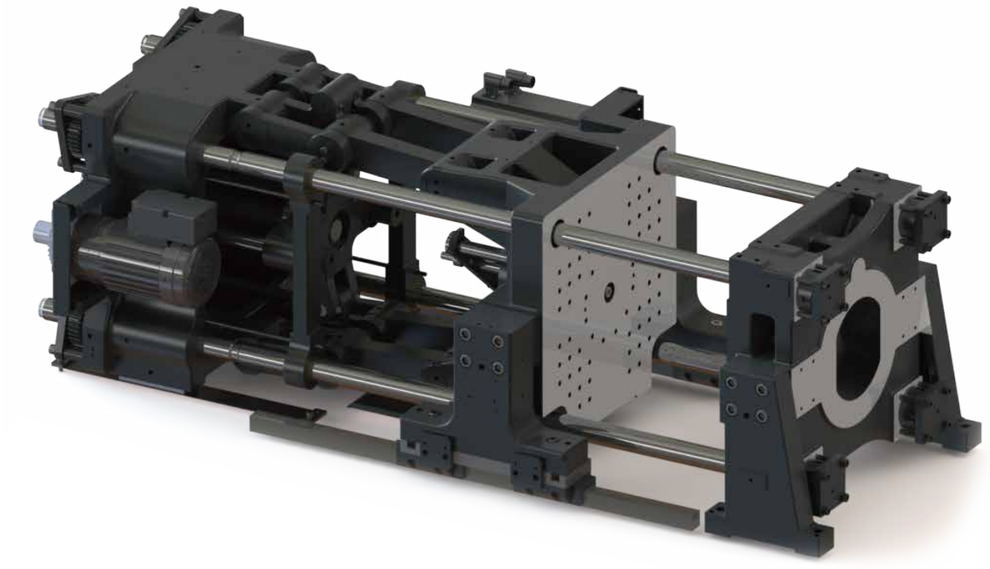
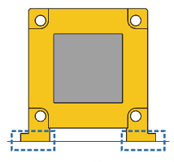
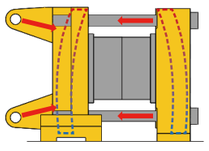
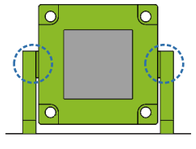
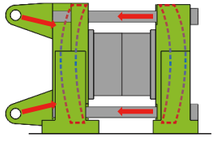
Clamping Unit



Independent platen support structure

The mold incorporates a central support structure, thus avoiding the vertically asymmetric deformation caused by fixing method. This innovation achieves a 17% reduction in deformation, more uniform platen pressure, and significantly higher clamping precision than conventional clamping unit.

	Platen fixation method	Deformation close-up
Conventional IMM	 Fixed through bottom support	 Vertically asymmetric platen deformation
FF Micro IMM	 Fixed through central support	 Vertically symmetric platen deformation for effective parallelism maintaining under high pressure

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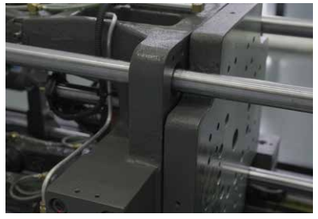
Advanced clamping unit

▸ High-stability Tie Bar Free (TBF) technology

The clamping unit adopts the TBF technology for easy operation and maintenance.

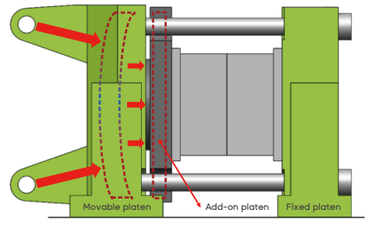


▸ High-precision linear guide for mold moving

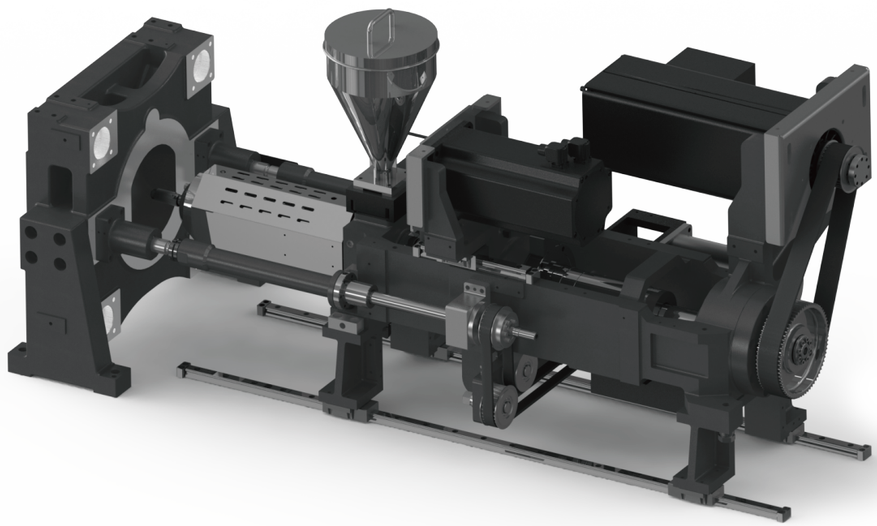
Guiding accuracy ≤ 0.01 mm; fast and stable mold opening, mold opening position repeatability ≤ 0.02 mm.

▸ High-rigidity platen design

- High-rigidity platen made of high-strength cast material, suitable for precision molds.
- The optional dual-mold structure for movable platen avoids platen surface deformation, reducing deformation in the mold area by 50% and making it ideal for high-precision molding.



Injection Unit



Micro injection control

Servo direct control (SDC) technology

Industry-leading servo direct injection control system achieves precise control of injection volume and pressure, ensuring consistency and stability for every injection.

Micro injection unit

- Screw diameter selectable from 14–22 mm, injection volume 7.5–29.3 cm³, meeting micro-product injection molding requirements.
- Optimized cushion stroke, check ring, and barrel gap ensure more precise and stable molding.
- Remaining resin prevention design effectively prevents resin residue in the nozzle.

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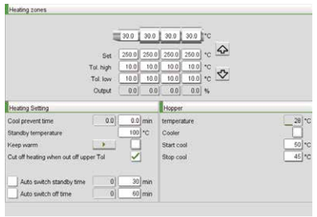
Special screw and barrel components for different materials

- The barrel assembly is made of imported fully-hardened alloy and features an optimized screw design with precision machining. The screw straightness reaches 0.02 mm/m, ensuring stable and efficient plasticizing performance.
- From general-purpose resins to engineering plastics, we offer customized solutions such as high-wear-resistant, high-corrosion-resistant, and low-shear screws for optical products, precisely matching diverse material molding requirements.

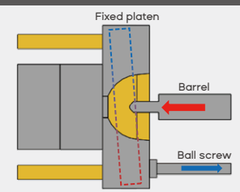
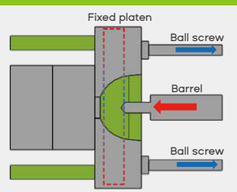
High-precision closed-loop temperature control

- The self-tuning PID algorithms and independent PID control deliver precise control to meet gradient temperature control requirements in the molding process.
- Static deviation ±0.2°C



Double-ball-screw nozzle contact device

- The nozzle contact force is evenly distributed, preventing fixed platen tilting and effectively preventing the risk of material leakage.

Single-ball-screw nozzle contact structure (side view)	Double-screw nozzle contact structure (top view)
	
Uneven contact force distribution, causing platen tilting	Even contact force distribution, preventing platen tilting

Control System

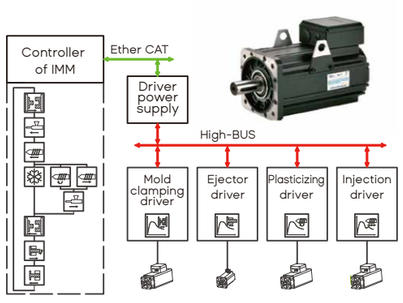
High-performance control system

High-end European KEBA i2985 controller

- The powerful system is easy to operate and ideal for the high-performance solutions for electric injection molding machines
- 15-inch HD color touchscreen display with clear and neat screen layout
- Standard Process quality control (PDP), and Statistical process control (SPC) features
- Auto-sorting function
- Oscilloscope with chart display function to record the curve of process data change
- Centralized (networked) real-time remote operation and control
- The flexible I/O expansion modules allow integration of more features as needed and are programmable
- Advanced HW and SW systems to support Industry 4.0
  1ms scan cycle
- 16 levels of user access management to ensure data security

Unique servo direct control (SDC) technology

- Process algorithm independently developed by YIZUMI for the servo drive.
- Four servo motors control injection, plasticizing, clamping, and ejection independently, allowing faster feedback, more responsive control, and improved control accuracy.
- More precise control of speed, position and pressure to meet the requirements of precision equipment, with a response speed of 0.125 ms.
- Micron-level injection control accuracy



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Dual-encoder feedback control

Embedded incremental rotary encoder for mold adjustment control

Traditional mold adjustment uses proximity switches to detect gear counts, resulting in low precision. The FF series adopts an embedded incremental rotary encoder, generating 400 pulses per revolution, greatly improving mold adjustment precision.

High-precision closed-loop control of injection pressure

- Injection control is more precise, ensuring stable and reliable molding.
- The injection and holding pressures maintain a stability accuracy of ±0.1 MPa.

Intelligent control system

- Intelligent weight control
- Intelligent equipment maintenance
- Intelligent clamping force management system (tail platen monitoring)
- Intelligent energy consumption monitoring and analysis
- Remote monitoring and maintenance (optional)

General

New appearance

- Outside sliding door design with high enclosure, ensuring strong safety.
- Large window glass provides a wide view for mold observation.
- Front safety door without upper rail design, for easier mold mounting.

New ventilation design of electrical cabinet

- Circulating air channel in the cabinet with exhaust outlets placed outside, ensuring more stable and efficient heat dissipation.
- Dust-proof enclosure for reliable component protection.

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FF15

Description	UNIT	FF15		
Clamping Unit				
Clamping force	kN	150		
Mold opening/closing stroke	mm	160		
Space between tie bars	mm	260×260		
Mold thickness	mm	130-260		
Ejector stroke	mm	50		
Ejector force	kN	7		
Number of ejectors	-	1		
Injection Unit				
Model of injection unit		IU32		
International specification		32		
		A	B	C
Screw diameter	mm	14	16	19
Screw L/D ratio	-	18	18	18
Screw stroke	mm	49	56	66
Stroke-bore ratio	-	3.5	3.5	3.47
Shot volume	cm³	7.5	11.3	18.7
Shot weight (PS)	g	6.9	10.4	17.2
Injection pressure	MPa	230	285	200
Holding pressure	MPa	200	260	160
Injection speed (Std.)	mm/s	300		
Injection rate (Std.)	g/s	42	55	78
Screw speed	rpm	400		
Nozzle contact force	kN	3/7		
Heating power	kW	1.5	1.9	2.5
Total power	kw	12.1		
Total current	A	31.2		
General				
Dry cycle	s	1.1		
Machine weight	kg	-		

* Injection speed 500mm/s for option

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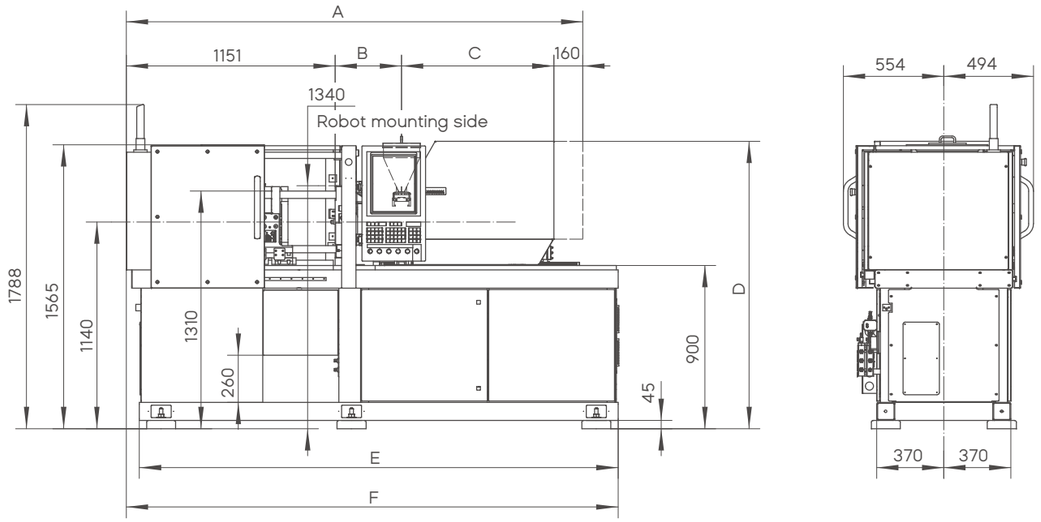
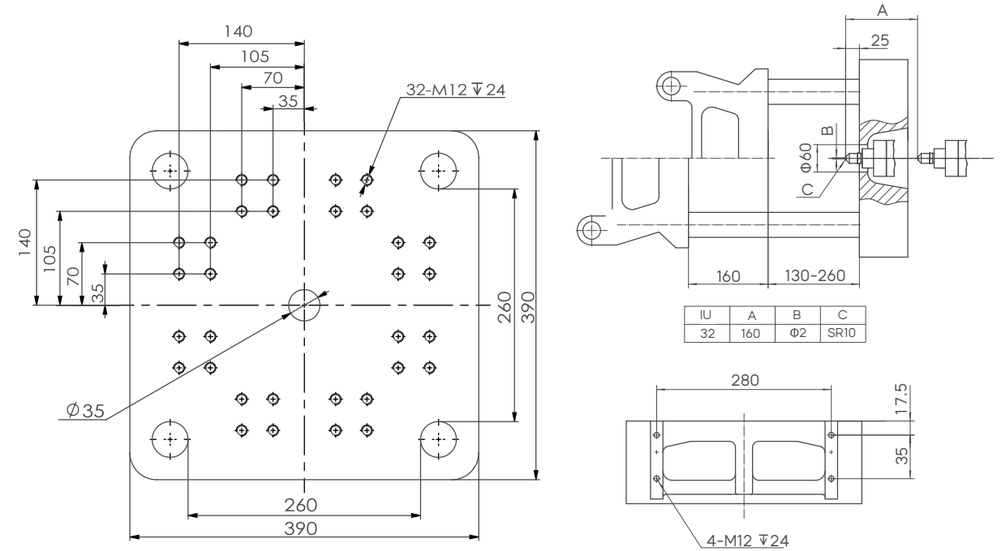
Machine Dimensions



Model	A(A/B/C Screw)	B(A/B/C Screw)	C	D	E	F
IU32	2476/2517/2577	325/366/426	840	1585	2640	2711

Platen Dimensions



IU	A	B	C
32	160	Φ2	SR10

FF30

Description	UNIT	FF30						
Clamping Unit								
Clamping force	kN	300						
Mold opening/closing stroke	mm	230						
Space between tie bars	mm	320×320						
Mold thickness	mm	150-360						
Ejector stroke	mm	60						
Ejector force	kN	10						
Number of ejectors	-	1						
Injection Unit								
Model of injection unit		IU32			IU53			
International specification		32			53			
		A	B	C	AA	A	B	C
Screw diameter	mm	14	16	19	14	16	19	22
Screw L/D ratio	-	18	18	18	18	18	20	20
Screw stroke	mm	49	56	66	49	56	66	77
Stroke-bore ratio	-	3.5	3.5	3.47	3.5	3.5	3.47	3.5
Shot volume	cm³	7.5	11.3	18.7	7.5	11.3	18.7	29.3
Shot weight (PS)	g	6.9	10.4	17.2	6.9	10.4	17.2	27
Injection pressure	MPa	230	285	200	230	285	285	212
Holding pressure	MPa	200	260	180	200	260	260	180
Injection speed (Std.)	mm/s	300			300			
Injection rate (Std.)	g/s	42	55	78	42	55	78	105
Screw speed	rpm	400			400			
Nozzle contact force	kN	3/7			3/10			
Heating power	kW	1.5	1.9	2.5	1.5	1.9	2.5	3.2
Total power	kw	12.1			16.2			
Total current	A	31.2			37.4			
General								
Dry cycle	s	1.3						
Machine weight	kg	2450						

* Injection speed 500mm/s for option

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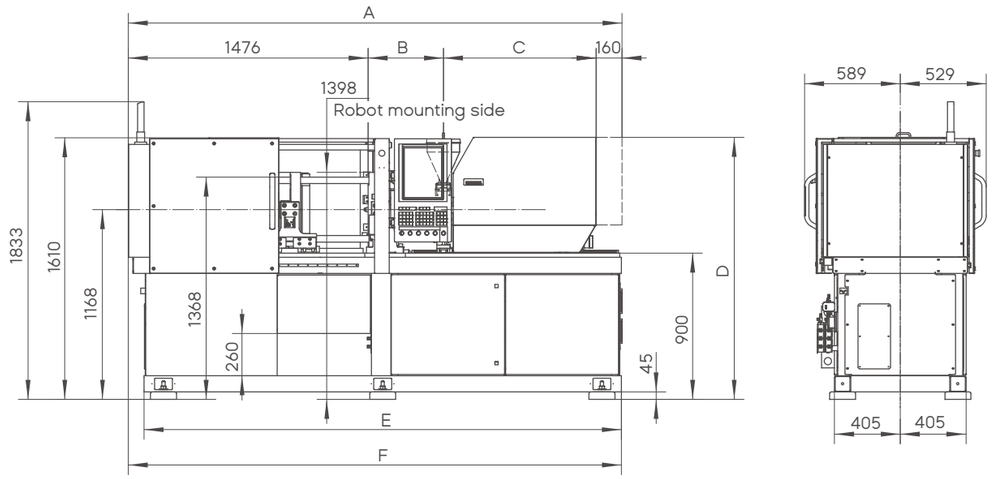
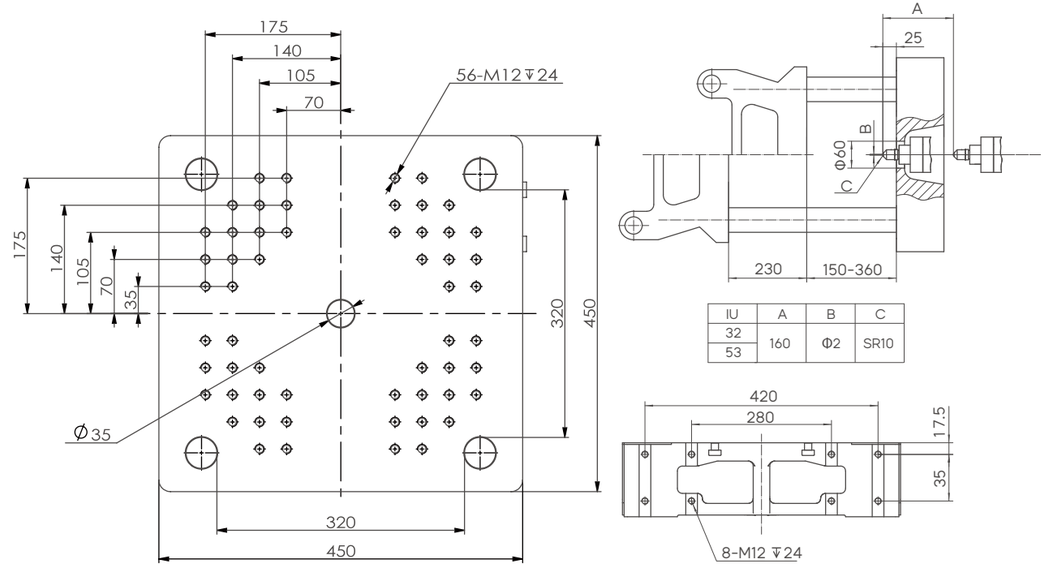
Machine Dimensions



Model	A(AA/A/B/C Screw)	B(AA/A/B/C Screw)	C	D	E	F
IU32	2802/2842/2903	325/366/426	840	1613	2940	3036
IU53	2902/2943/3041/3107	325/366/464/530	940			

Platen Dimensions



IU	A	B	C
32 53	160	Φ2	SR10

Standard and Optional Features

	Standard	Optional
Control and Monitoring Units		
Highly sensitive 15 inch color touchscreen display	●	
Memory of molding conditions (over 500 items)	●	
1 set of standard USB interface on the operation panel	●	
Multiple language (Chinese and English)	●	
Real-time display of injection molding data (200 items displayed 5000 items saved)	●	
Operation modification record	●	
Alarm record	●	
Electrical control circuit for simple robot	●	
Metric and English unit conversions	●	
I/O check display function	●	
Printer interface (USB17)	●	
Cycle time monitoring	●	
Production management	●	
PDP data and charts	●	
Injection quality check	●	
Cycle counter	●	
Molding temperature monitoring	●	
Drive cabinet temperature monitoring	●	
Tri-color alarm light	●	
Alarm buzzer	●	
Low-pressure mold protection curve checking	●	
Injection pressure protection	●	
Defect alert and handling	●	
Real-time display of injection and plasticizing servo motion curves	●	
Display of actual value	●	
Malfunction handling option selection	●	
Product quality monitoring	●	
Curves of mold opening/closing and ejector	●	
Injection processing curve monitoring	●	
EU 12 electrical interface for robot		○
EU 67 electrical interface for robot		○
Additional languages		○
Cooling water circuit		○
Heater burnout detection		○
External transformer		○

	Standard	Optional
Electrical interface for product sorting device		○
Electrical interface for gas assisted injection		○
Electrical interface for mold cavity pressure check		○
Mold temperature detection and control		○
OPC UA /DA		○
EU 73 electrical interface		○
Clamping Unit		
5-stage mold opening and closing control	●	
Needle valve/Sprue (2 sets)	●	
Multi-stage ejector forward	●	
Ejector backward delay time monitoring	●	
Automatic mold height adjustment	●	
Sprue timing control	●	
Curves of mold opening/closing and ejector	●	
Low pressure mold protection (Ai highly-sensitive mold protection)	●	
Low speed, low pressure mold opening/closing in mold adjustment mode	●	
Platen with mold mounting holes	●	
Ejection inside the mold (gate cutting inside the mold)	●	
Mold opening during ejector backward	●	
Ejector motion selection (4 modes)	●	
3-stage ejector control	●	
Ejector motion delay	●	
Mold cooling water distributor	●	
Mold locating holes (Φ60) in fixed platen	●	
Emergency stop function (on both operator side and non-operator side)	●	
EU standard threaded mounting holes for robot	●	
Central lubrication system	●	
Core puller/unsrew function (1 set of electrical interfaces)	●	
Air blast (2 sets of electrical interfaces)	●	
Servo motor for clamping and ejector brake	●	
Electric ejector	●	
Intelligent clamping force management system (tail platen monitoring)	●	
Locating rings		○
Needle valve/gate device (pneumatic)		○
Air blast device		○
Product chute		○

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Standard and Optional Features

	Standard	Optional
Mold thermal insulation plate		○
Glass-tube cooling water flowmeter		○
Pneumatic core puller device		○
Increased maximum daylight		○
Mold slide protection		○
Injection compression (clamping synchronized with injection)		○
Dual-mold structure for movable platen		○
Plasticizing and Injection Unit		
Injection safety device (test switch)	●	
5-stage injection control (pressure, speed, position)	●	
3-stage holding pressure control (pressure, speed, position)	●	
3-stage plasticizing control (back pressure, speed, position)	●	
Suck-back control (pre-suckback and post-suckback)	●	
Injection delay function	●	
Pre-plasticizing delay	●	
Holding pressure switching (6 modes)	●	
Injection speed response setting (high, medium, low)	●	
Mold opening during plasticizing	●	
Molding temperature closed-loop control	●	
Temperature holding	●	
Temperature optimization	●	
Synchronized temperature rise	●	
Appointed temperature rise	●	
Remaining resin prevention	●	
Screw cold start prevention	●	
Automatic material purge	●	
B-grade bi-metallic screw & barrel component	●	
Calibration of injection pressure zero point	●	
Real-time display of plasticizing speed	●	
Real-time display of plasticizing back pressure	●	
Injection unit shift settings (switch check, shift time)	●	
Two-stage nozzle contact (configurable)	●	
Nozzle center alignment adjusting device	●	
Stainless steel hopper (5L)	●	
Dedicated barrel unit		○
Extended nozzle		○

	Standard	Optional
Ceramic heater band		○
Heat-retaining and energy-saving barrel		○
Mold internal pressure V/P switching		○
Customized nozzle head		○
General		
Closed safety door	●	
Power outlet (220V x 1, on clamping unit frame)	●	
Power outlet (380V, 32A x 1, on rear side of clamping unit frame)	●	
Adjustable leveling pad	●	
Common tool kits and spare parts	●	
Vacuum air extractor		○
Quality control sorting device		○
Integrated multi-stage mold temperature control		○
Auxiliary electrical cabinet		○

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