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PLASTICS MACHINERY
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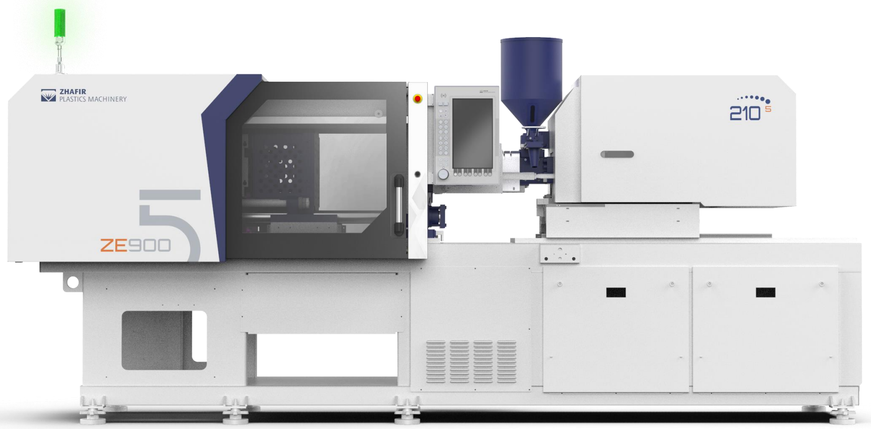
ZHAFIR Fifth Generation Electric Technology

The future of smart electricity, the ultimate exploration

After nearly 20 years of technical exploration and industry deep cultivation, Zhafir electric technology has now been fully upgraded to the fifth generation. The comprehensive upgrade of structure and control technology and the blessing of many intelligent functions are bound to bring a more extreme production and use experience.



2007

2012

2019

First Generation

- The VE series electric machine debuted at K-SHOW
- Entrying into the all-electric field

Second Generation

- Iterative upgrading of mechanical structure
- Reliability design continues to improve
- Three machine platform technology established

Third Generation

- Servo drive system comprehensive upgraded
- The industry special aircraft for market segments form a coverage system, and the solutions are constantly complete.

Fifth Generation

- Revolutionary improvements in control architecture and computing power
- Compact design of the machine
- Man-Machine interaction experience change
- Realize multi-dimensional display of intelligent functions

ZHAFIR Fifth Generation Highlights

1

Compact overall design

- Through design optimization, the overall size of the machine is greatly reduced compared with the original machine, and the plant utilization rate and the output per unit area are further improved.
- The manufacturing process is improved, the appearance quality of the machine and the dimensional accuracy of the parts are significantly improved.

2

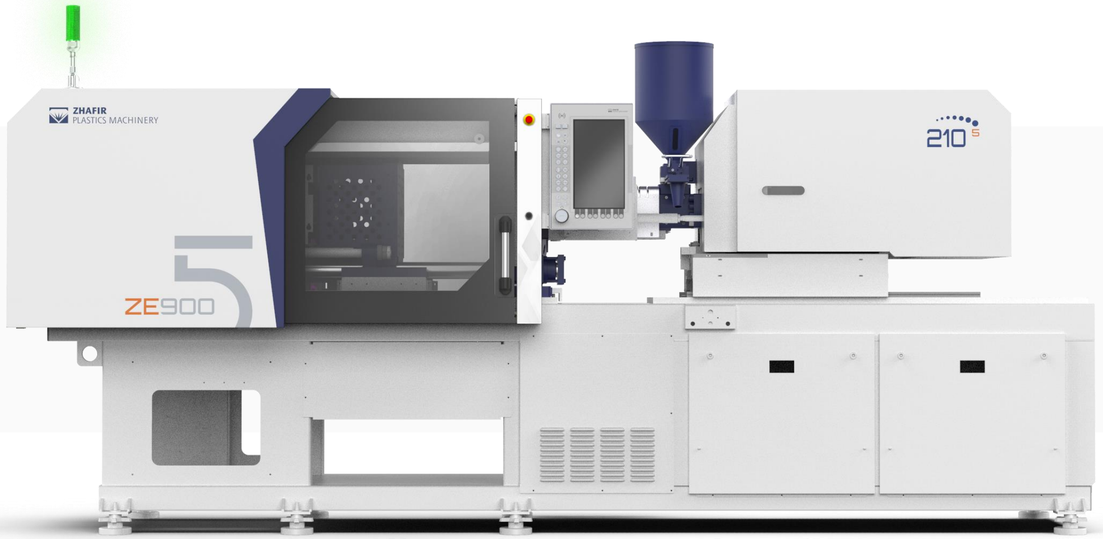
High efficiency clamping device

- Faster mold opening and closing speed, with low inertia, high response ejector mechanism. The operation efficiency of the machine is significantly improved .
- The high rigidity formwork and high rigidity fuselage provide better guidance support and clamping for the mold to meet various stringent process requirements.

3

High precision injection device

- The whole series adopts symmetrical integral displacement layout, and the fixed formwork is more balanced.
- Box type low friction sub-shooting platform structure, equipped with high precision pressure sensing module, provides a strong guarantee for ultra-high precision injection molding.



4

New control system

- Using multi-CPU control architecture, the computing and sampling speed is significantly improved.
- The new man-machine interface brings users a comfortable experience.

5

Excellent drive control performance

- More accurate clamping force, with a smoother opening and closing action.
- The optimized temperature control mode and injection control mode greatly improve the measurement accuracy and injection stability.

6

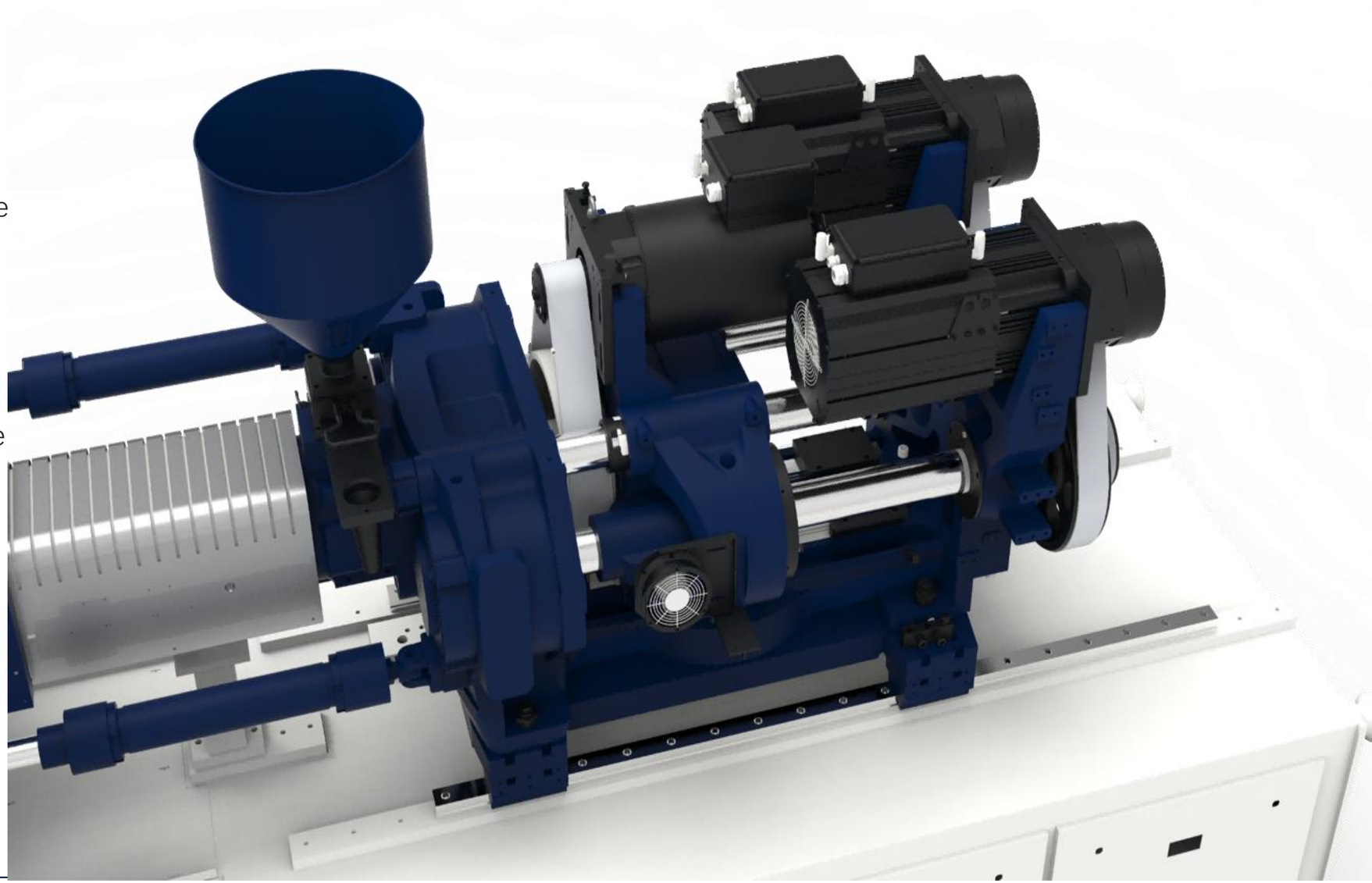
Excellent intelligence and internet capabilities

- Multi-dimensional display of intelligent functions
- Equipped with advanced Internet interface and peripheral equipment interaction tools

Injection Unit

- Main Characteristics

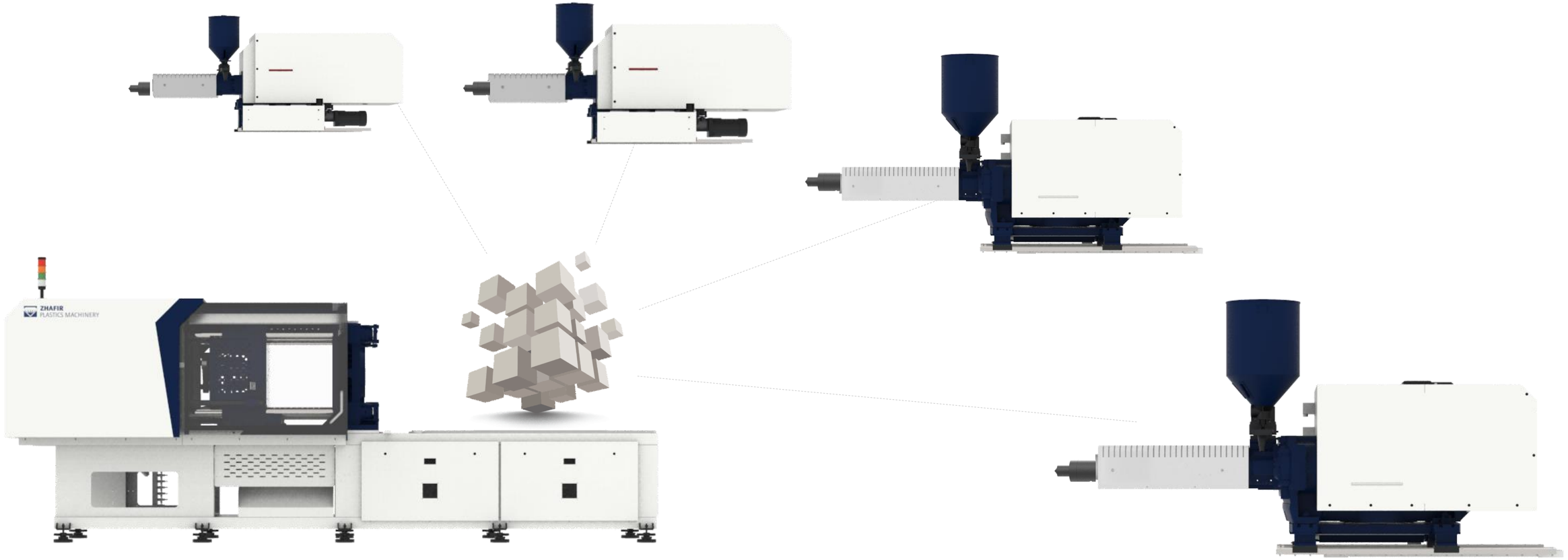
- Various combinations
- Injection structure diversification
- Optimization of plasticized parts
- The temperature control accuracy of the feed outlet is improved
- Box injection mechanism
- Precision wire rail support
- High precision pressure sensing module
- Diversified injection characteristics
- Injection stability
- Injection molding and pressure holding optimization
- The whole series adopts symmetrical double integral transfer structure
- Rotary injection unit



Injection Unit

- Various Combinations

- Diversified combination of clamping device and injection device is realized



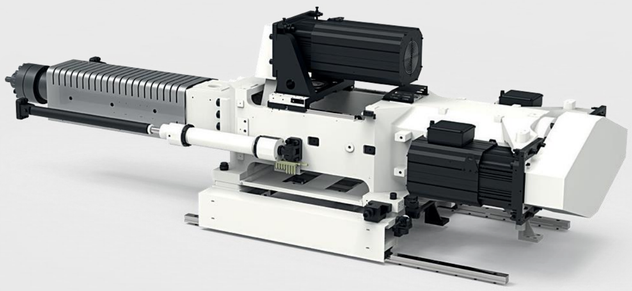
Injection Unit

-Injection Structure Diversification

Single axle drive

Box structure design
One line servo injection system layout
High precision and high efficiency

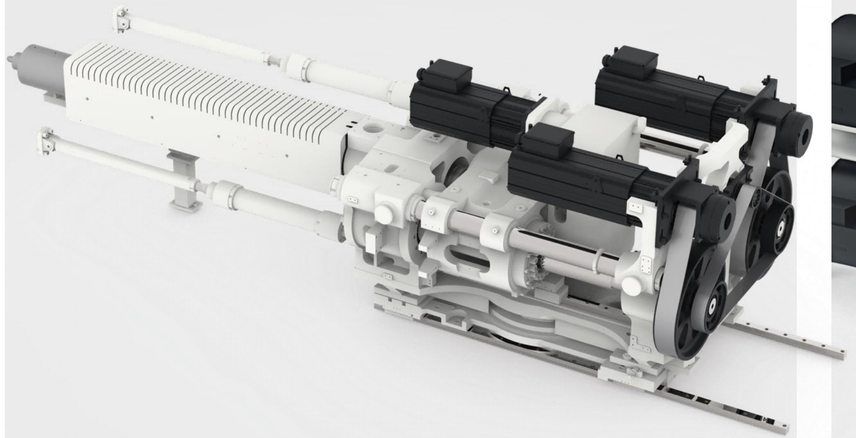
Injection unit：50 1700



Double-axis drive

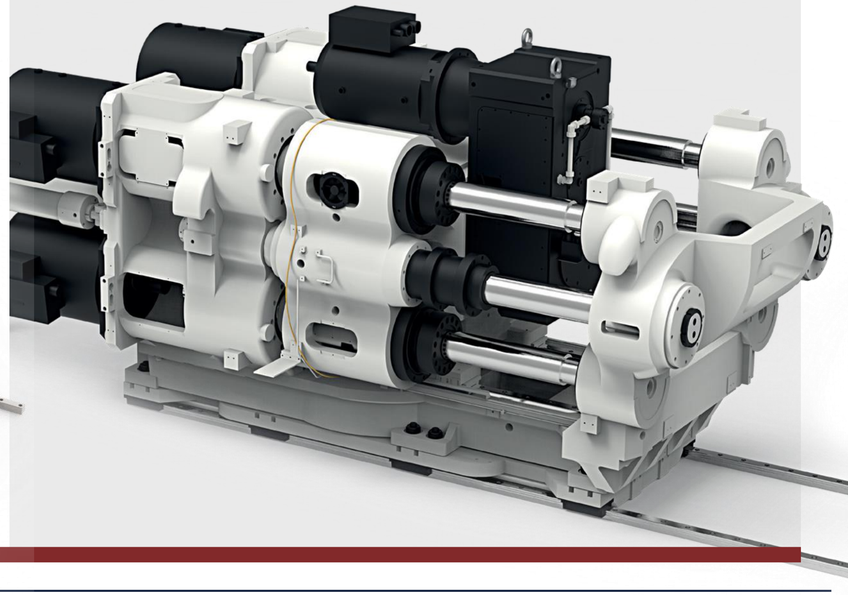
Dual servo synchronous injection system layout
Comes with balanced injection and correction protection function

Injection unit： 2250 ... 12800



Four-axis drive

Four ball screws, four motors direct drive layout design
Multi-servo shaft synchronous drive
High torque servo motor direct drive multi-axis control technology
Injection unit： 17800-22800

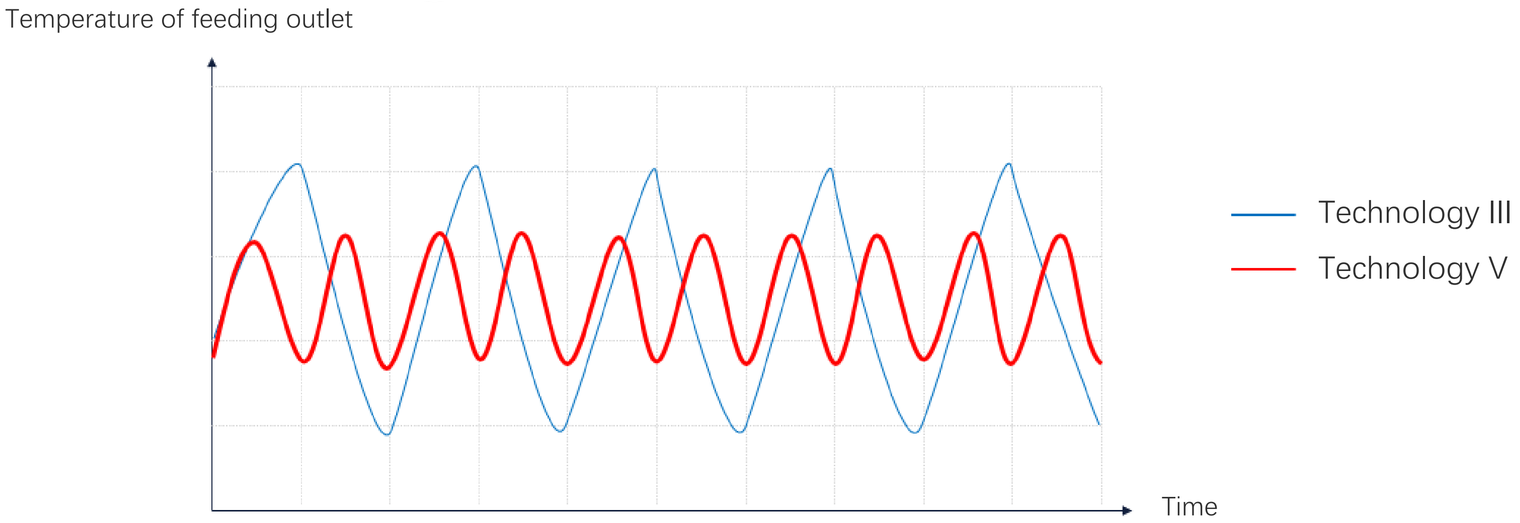


Injection Unit

- The horizontal precision of temperature control at the feeding opening is improved

- Through the optimization of the control model, the feed valve is accurately controlled, and the temperature fluctuation range of the feed outlet during the molding process is narrowed by more than 70%, and the temperature fluctuation range of most models is narrowed to within ±0.5℃, which greatly improves the stability of specific material storage.

The horizontal precision of temperature control at the feeding outlet is improved

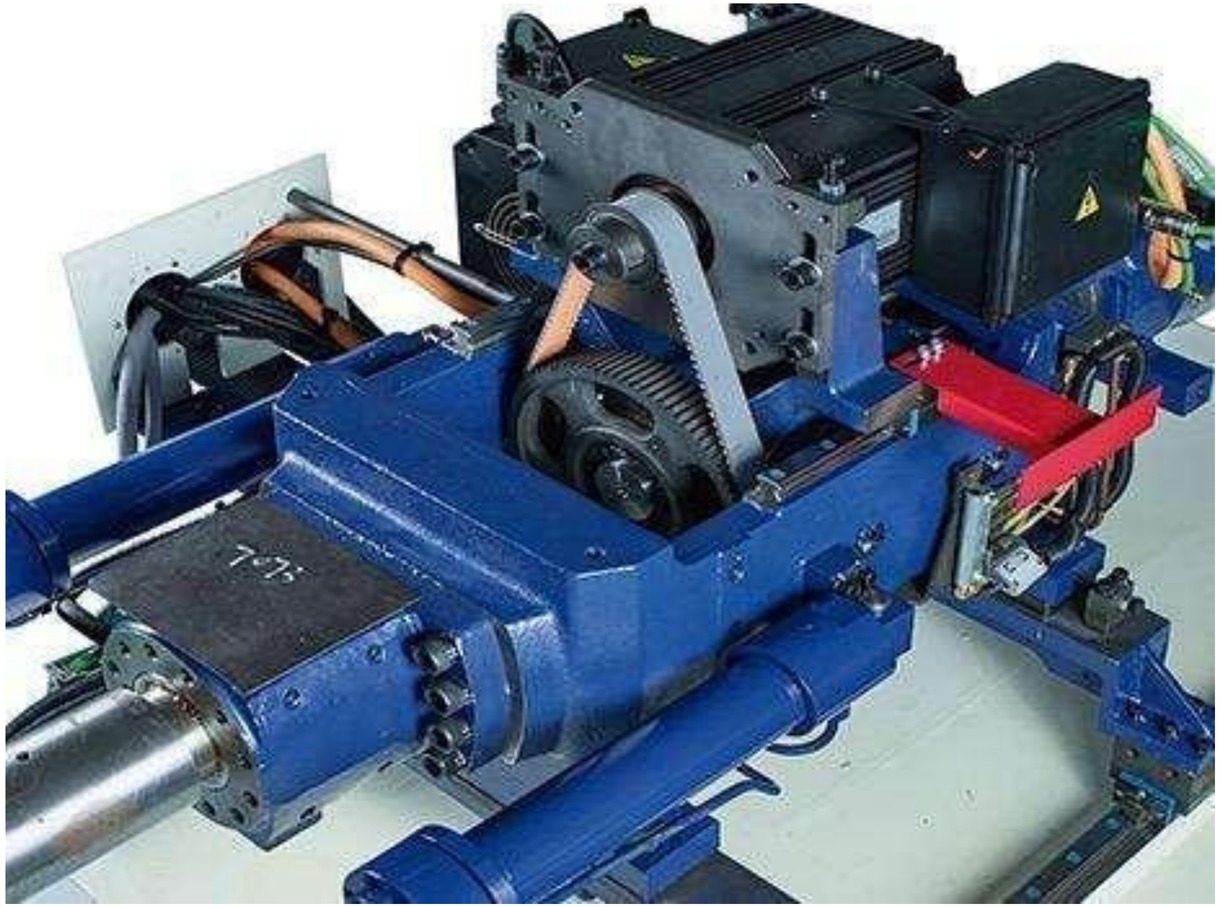


Injection Unit

- Box injection mechanism

- Box structure design, the whole one-time processing is completed, to avoid cumulative errors
- One line servo injection system layout
- High precision and high efficiency

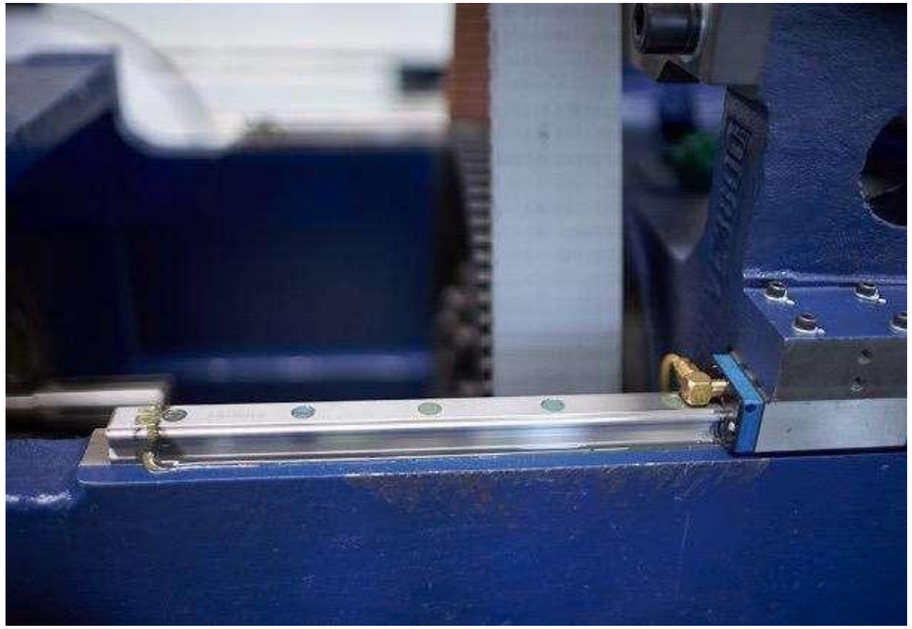
Box injection mechanism(50-1700)



Injection Unit

-Precision wire rail support

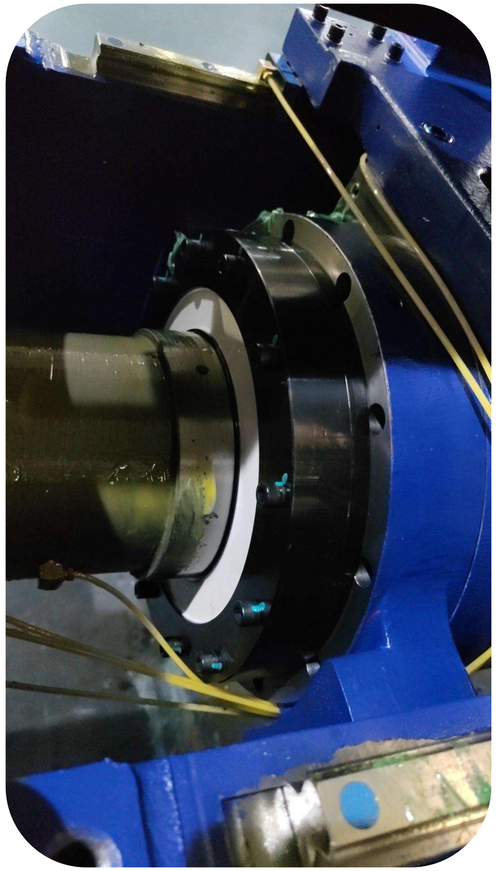
- High precision rail provides low friction injection guide, which establishes a good foundation for high precision back pressure control and injection control
- More stable
- Environmental cleanliness

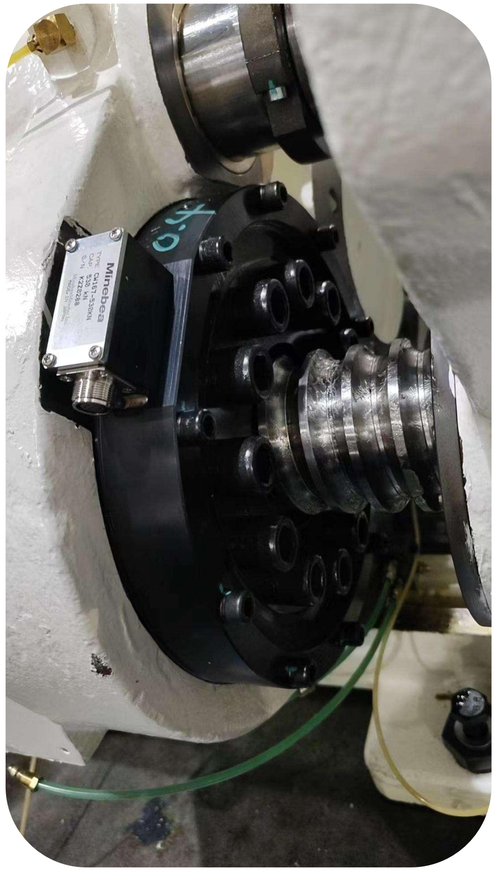


Injection Unit

- High precision pressure sensing module

- With the support of ZHAFIR latest EMC technology and anti-drift technology, the top pressure sensing module constitutes the core guarantee necessary for ultra-high precision molding.

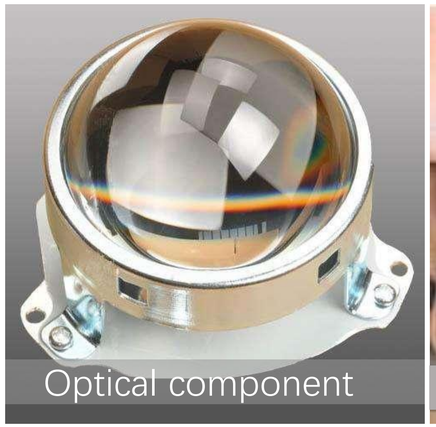




Injection Unit

-Injection diversity

Pressure Holding For Long Time	Standard	High Speed High Pressure Type
• For example： VE900V-210 • Suitable for most applications • It is especially suitable for thick wall parts that need to hold pressure for a long time, such as thick wall optical lenses, thick wall gears, etc	• For example: VE900V-210h • Suitable for thin-wall, precision technical parts, such as mobile phones, tablet computer housing, buttons, etc	• For example: VE900V-210hs • Suitable for ultra-thin or thin-wall multi-cavity applications, such as LED brackets, precision connectors, light guides, etc


Optical component


Thick-walled part


Thin-walled parts


Precision parts

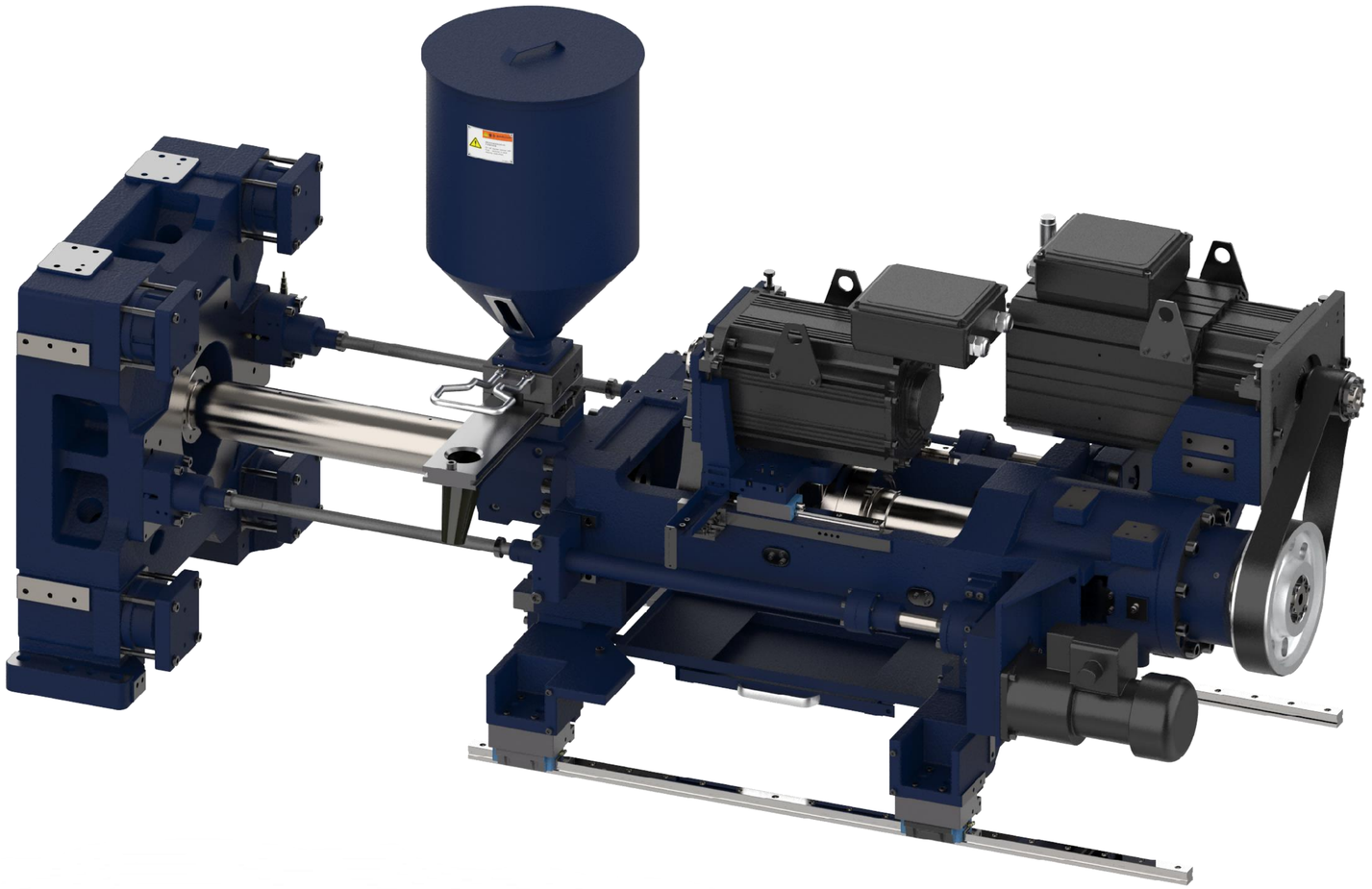

Cleaning room products


Precision connector

Injection Unit

- The whole series adopts symmetrical double integral transfer structure

- The symmetrical layout of the double tie bar integrated displacement structure makes the force of the fixed platen completely balanced, effectively avoiding the tilt of the fixed platen caused by the force imbalance, so as to ensure that the mold runs in the normal open and closed state, and ensure the stability of the nozzle contact force during the forming process.



Clamping Unit

- Detachable structure
- Moving platen optimization
- Moving platen support structure
- Compact curved elbow structure
- HT mold opening and closing 2.0
- Dry cycle lifting
- HT mold protection
- Smart ejection
- Ejection speed increased
- Closed-loop control of clamping force（Option）
- Automatic mold thickness measurement and precise mode-locking force control

Clamping Unit

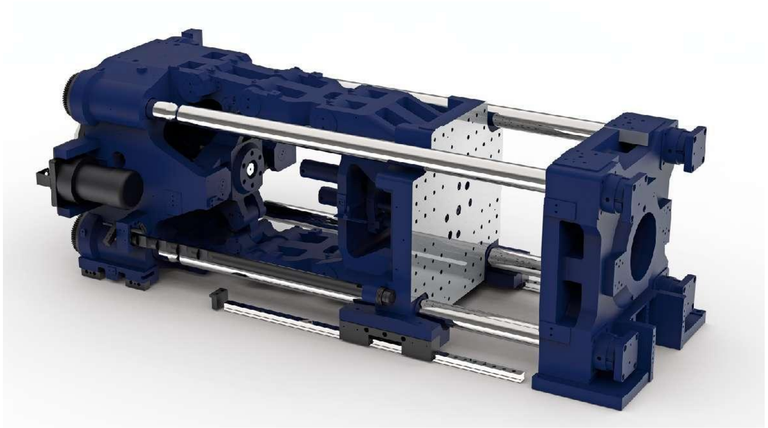
-Detachable structure

- Manipulator channel reserved above non-operating side (detachable structure)

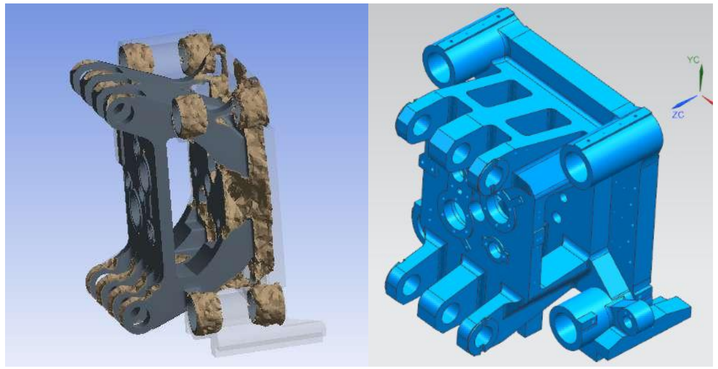
Clamping Unit

-Moving platen optimization

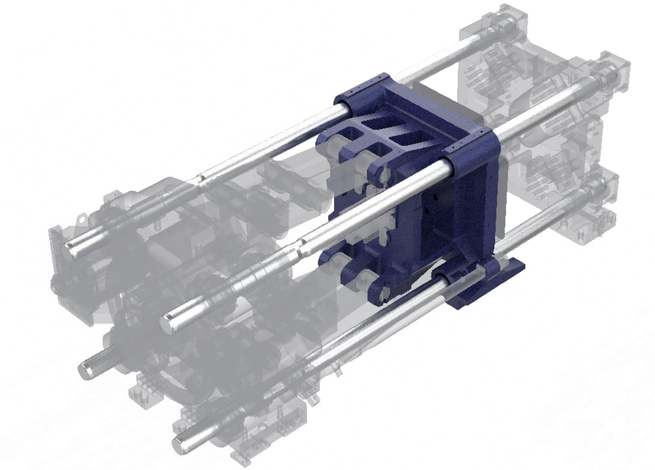
- Provide the choice of template support mode - line rail type/slide foot type (Below 650T models）;
- Combined with topological cloud image optimization, the platen parallelism maintenance performance is greatly improved.
- Through the application of high rigidity composite platen, the small deformation on the moving platen is controlled, so that the clamping force can be more evenly distributed on the mold, and the stable molding of precision injection products can be realized.



Linear guide



Topology optimization



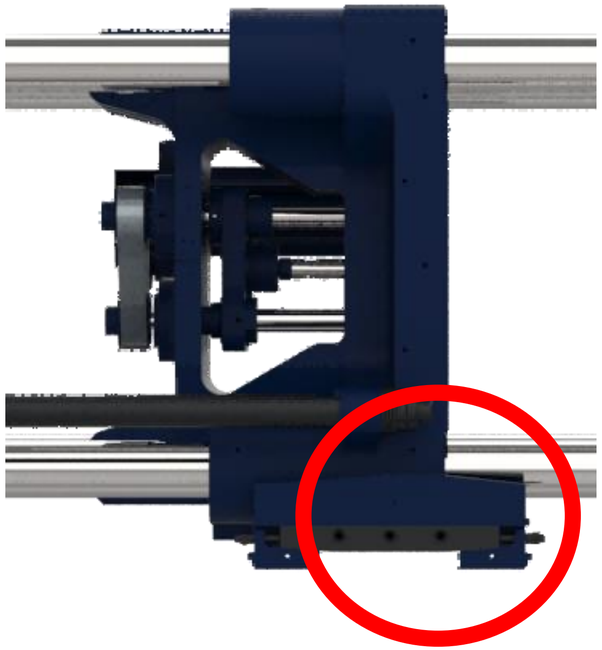
Composite platen application （option）

Clamping Unit

-Moving platen support structure

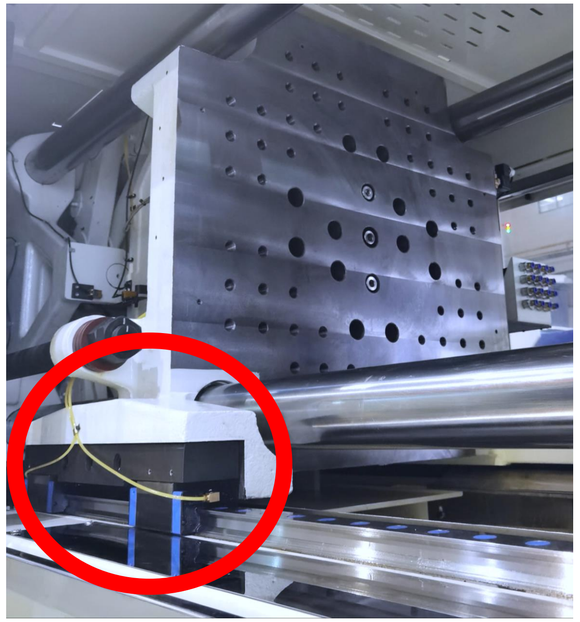
Standard support structure

- Balance and support the integrated structure
- The parallelism of the template is increased
- Mould bearing capacity increased



Mold opening and closing line rail support （Option）

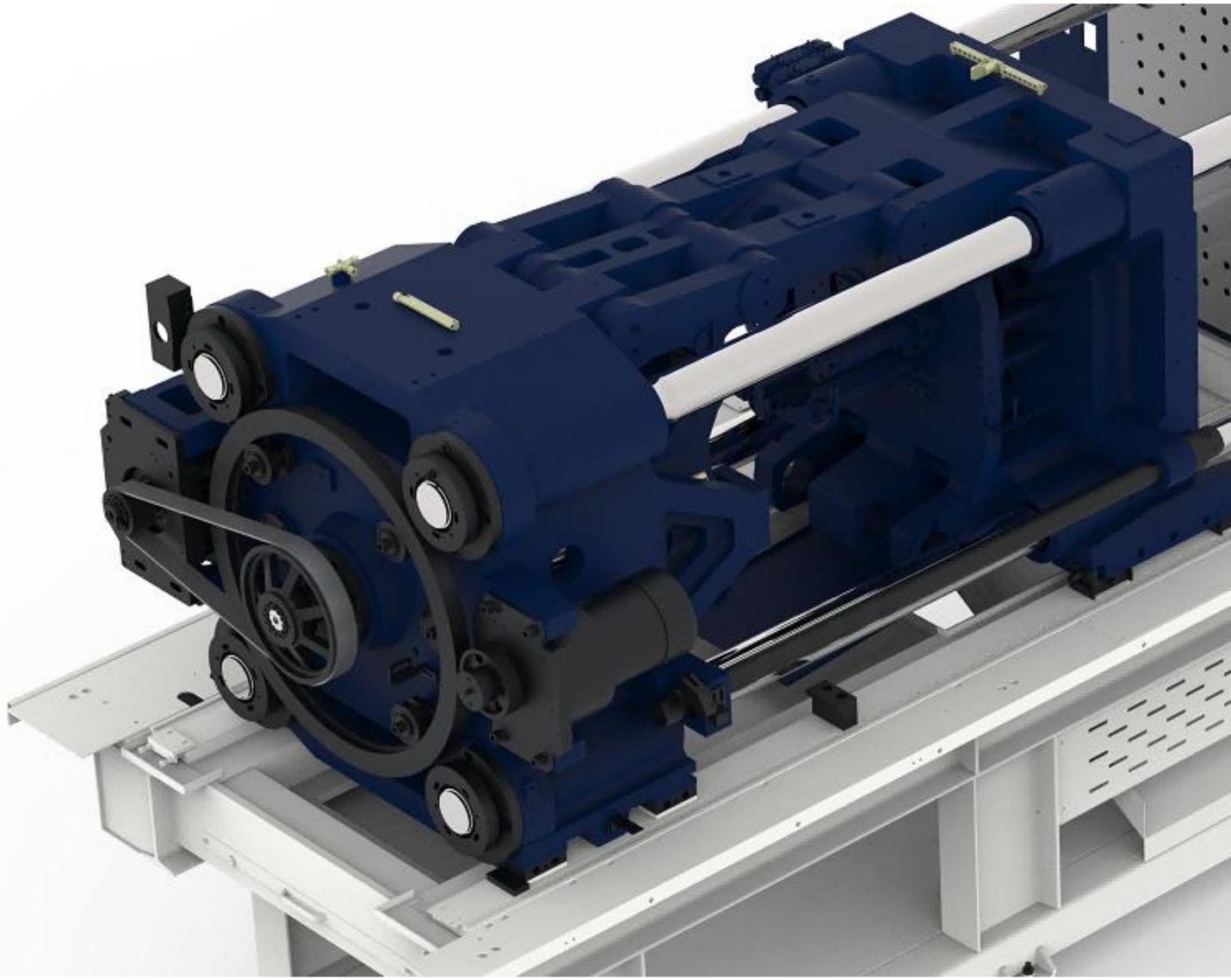
- The tie bar and form are of non-contact construction
- Ensure a clean mold environment and greatly improve the parallelism of the platen
- Effectively prevent mould tilt, mould durability and precision characteristics are protected



Clamping Unit

-Compact curved elbow structure

- New and optimized elbow bending system
- Improve system rigidity and template parallelism
- The speed of mold opening and closing is increased

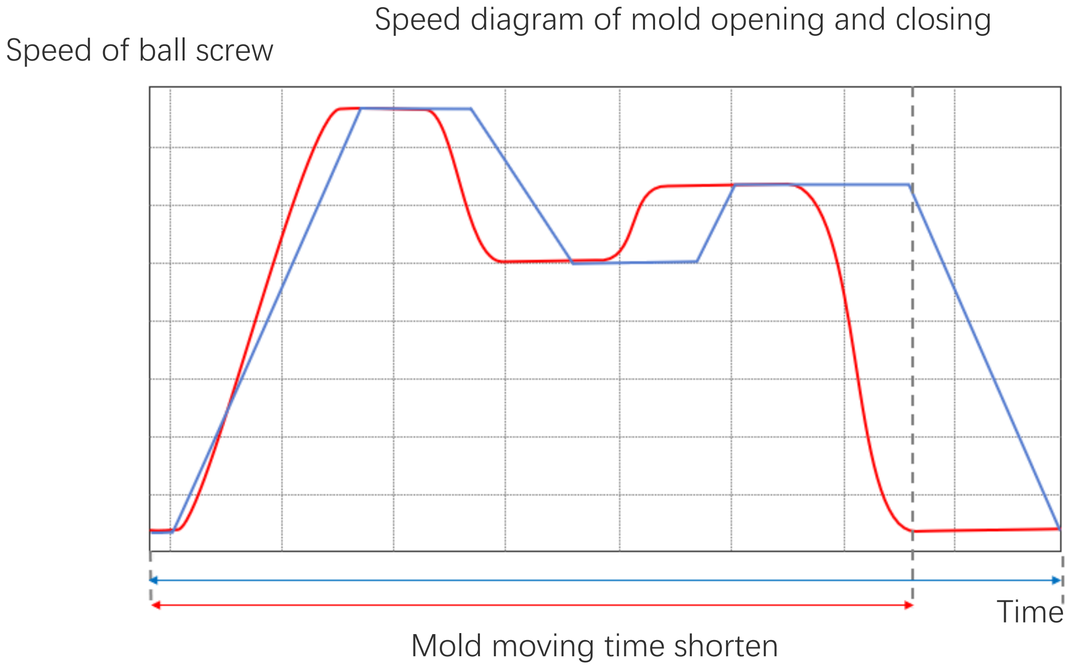


Clamping Unit

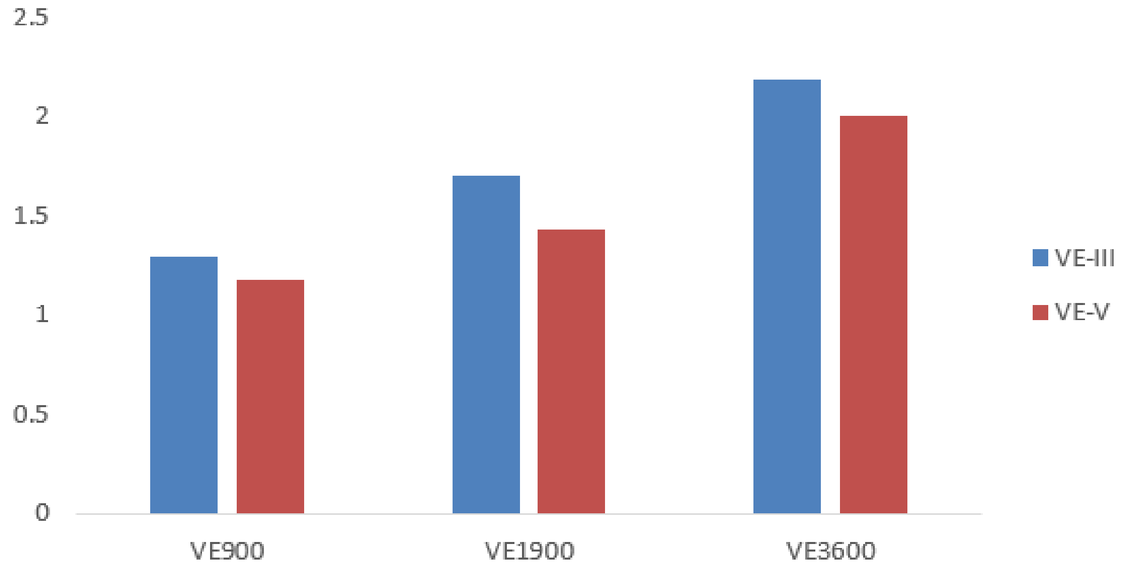
-HT mold opening and closing 2.0

- The maximum mold opening and closing speed is increased by about 20% on the basis of the three generation machine
- Mold opening and closing anti-vibration acceleration and deceleration control S-Curve function upgrade, generate smooth speed mode during acceleration and deceleration, can suppress vibration at the same time, more high-speed mold opening and closing, to achieve faster dry cycle.

Speed diagram of mold opening and closing



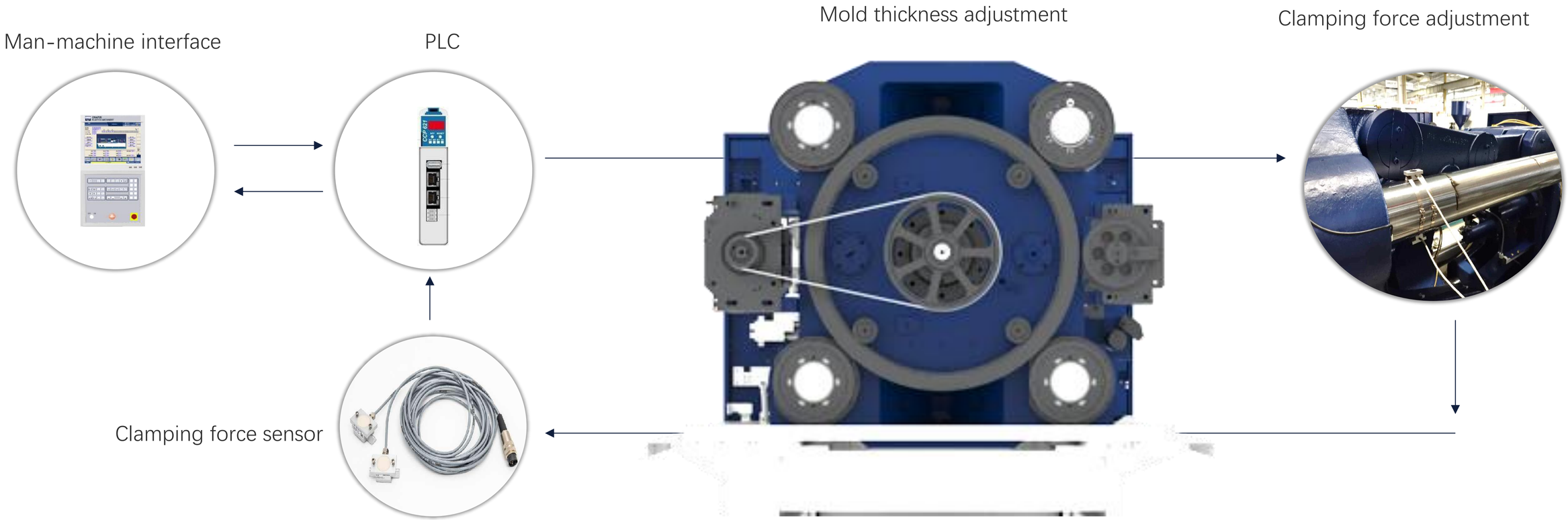
Drying Cycle Time



Clamping Unit

- Automatic mold adjustment and clamping force accuracy

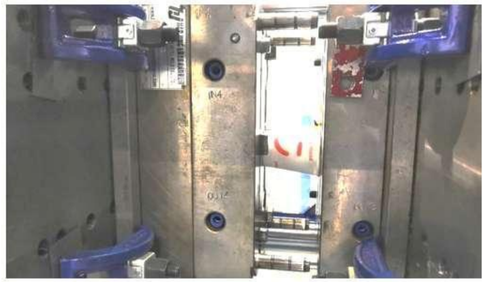
- Through the continuous optimization of automatic mode modulation algorithm, the linearity and repetition accuracy of mode-locking force are greatly improved.
- The closed-loop control of clamping force is optional, which is suitable for high precision clamping force control(Option).
- Thanks to the improvement of the control ability, the closed-loop online adjustment of the clamping force and the automatic optimization accuracy of the clamping force are significantly improved.



Clamping Unit

-HT mold protection

- Intelligent full-process mold protection function upgrade.
- Intelligent and highly sensitive active die protection that instantly detects small load deviations throughout the die closing stroke and minimizes mold protection response time.



Monitoring at all times

Monitor each molding cycle

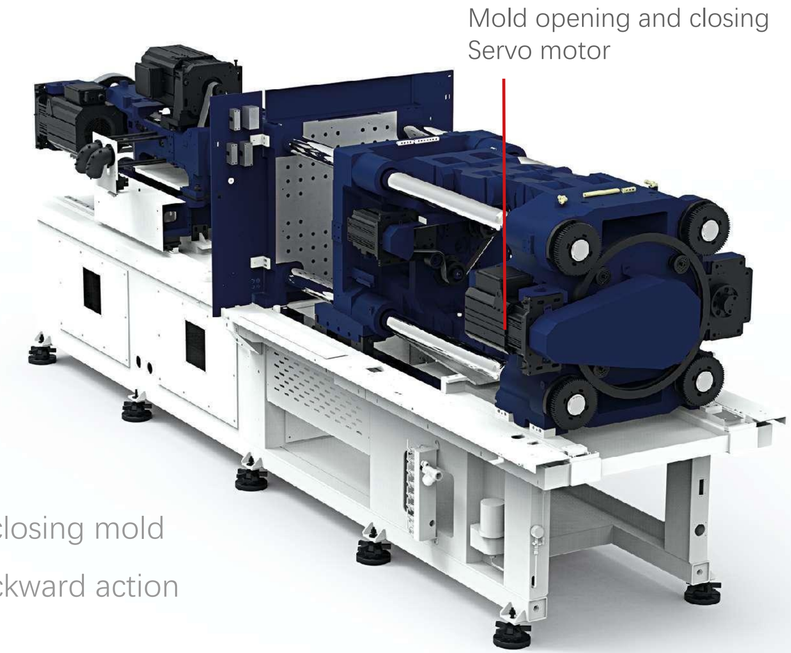
Servo motor load

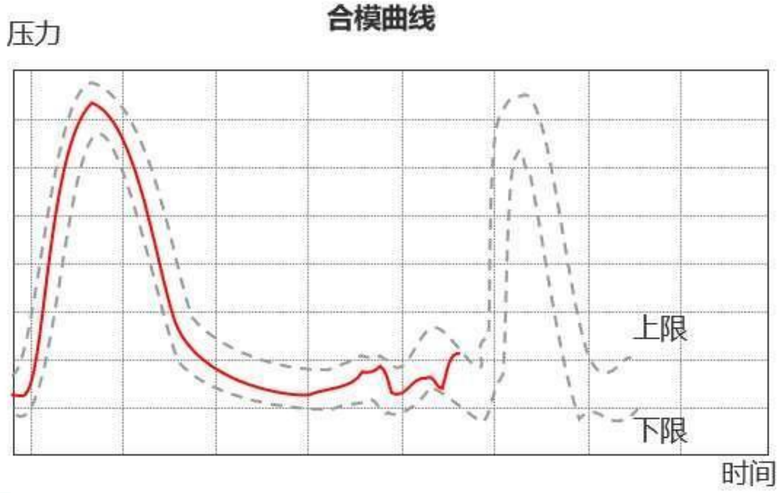
Detected anomaly

High precision detection of load changes caused by clamping of molded products

Protection

Immediately stop opening and closing mold and ejector rod forward and backward action

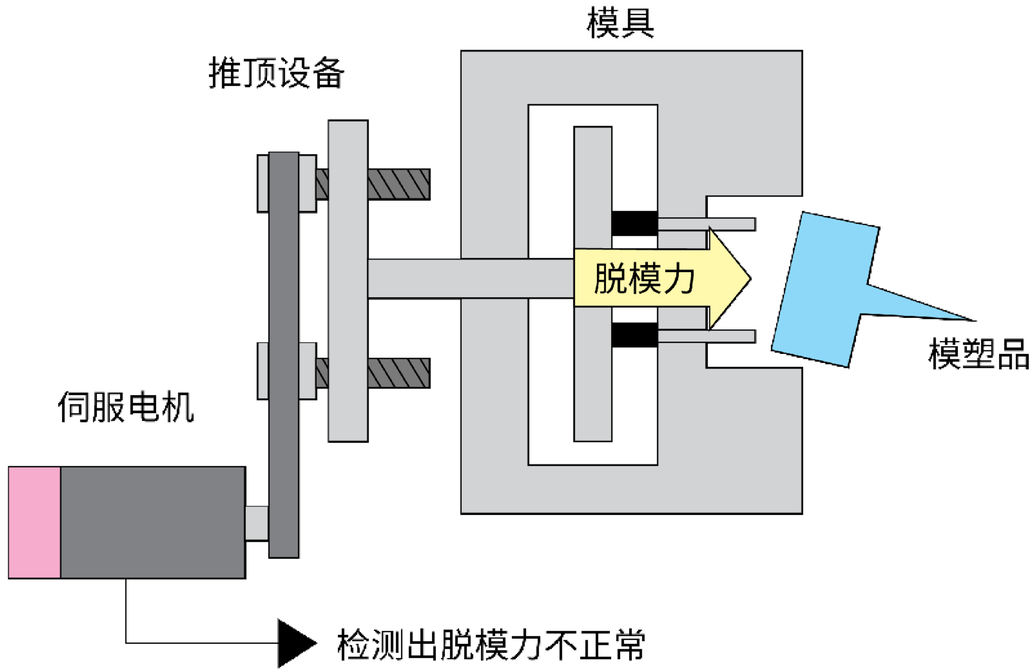




Clamping Unit

- Smart ejection （option）

- The motor torque when the product is pushed is detected, and the push action will be stopped in an emergency when an anomaly is found. This function protects the ejector from damage and can be used to monitor the quality of the product.
- Due to the adoption of high response servo motor and low inertia ejector mechanism, the ejector response speed of the 5th generation machine is significantly improved.

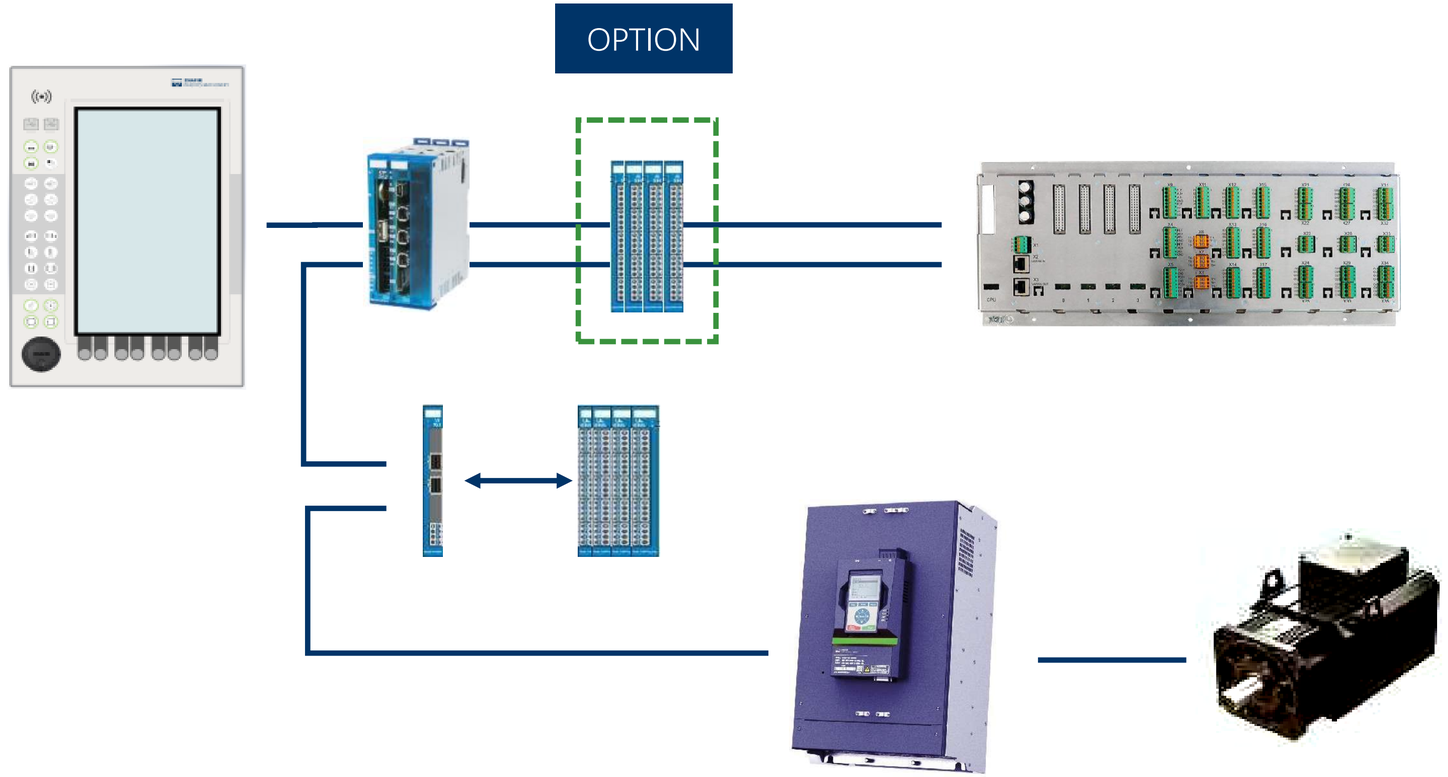


Smart Technology

- The control system is continuously upgraded

New control architecture

- Using distributed multi-CPU control architecture, the system's computing power is greatly improved, and it has good expansion ability
- The new communication protocol makes it possible to further improve the control computing power and control the sampling frequency, which is the basic guarantee of ultra-high precision molding.
- The newly developed servo control card not only further improves the control accuracy, but also enricheth many intelligent functions.



Smart Technology

- The control system is continuously upgraded

New human-machine interaction screen

- The display screen is equipped with a 15-inch ultra-high resolution true color display, and the touch capacitive screen is equipped with an independent image processing CPU, which makes the man-machine interface control more clear and smooth, and the operation experience is greatly improved.
- The new user-friendly page is intuitive and easy to learn, even for first-time users.
- The new shuttle knob design allows page and parameter operation through the shuttle
- The vertical design of the new screen makes the setting area and the monitoring area clearly distributed for easy observation.
- The buttons of the configuration design make it easy for customers to customize the function of the key arrangement.

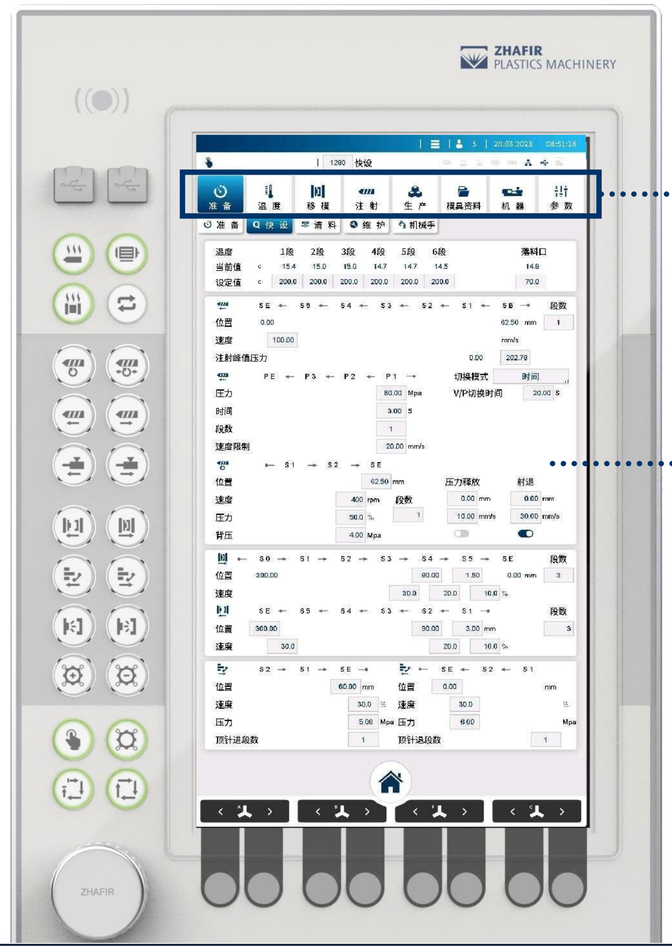
Smart Technology

-The control system is continuously upgraded

Convenient and intelligent operation screen

Production preparation

Equipped with the function of fast mold loading, just follow the mold installation steps in the picture, you can achieve fast and accurate mold installation and mold locking force adjustment.



The easy-to-understand ICONS continue the main visual image of the previous generation of products

Quick setup screen

After the mold installation is completed, all the basic process parameters can be set in a quick screen.

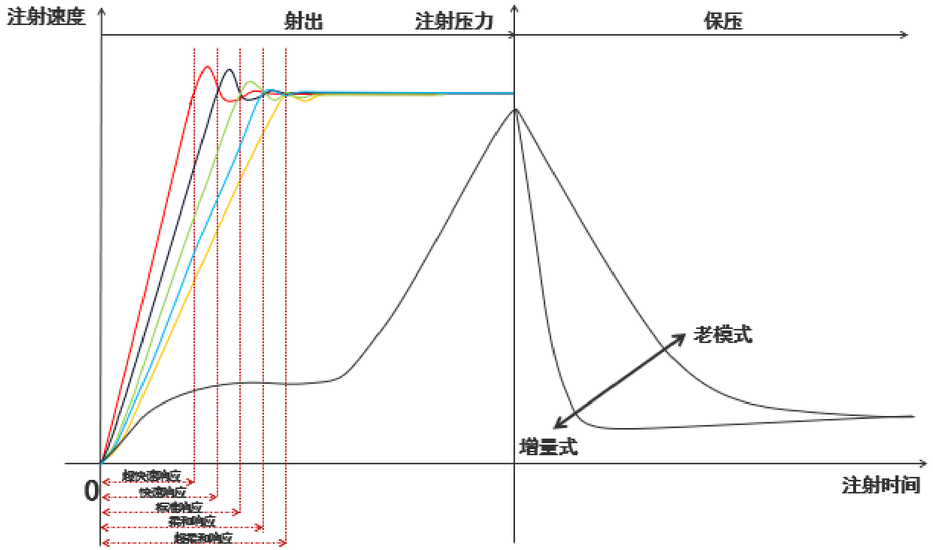
Smart Technology

- Controller performance continues to evolve

Injection acceleration and pressure response:

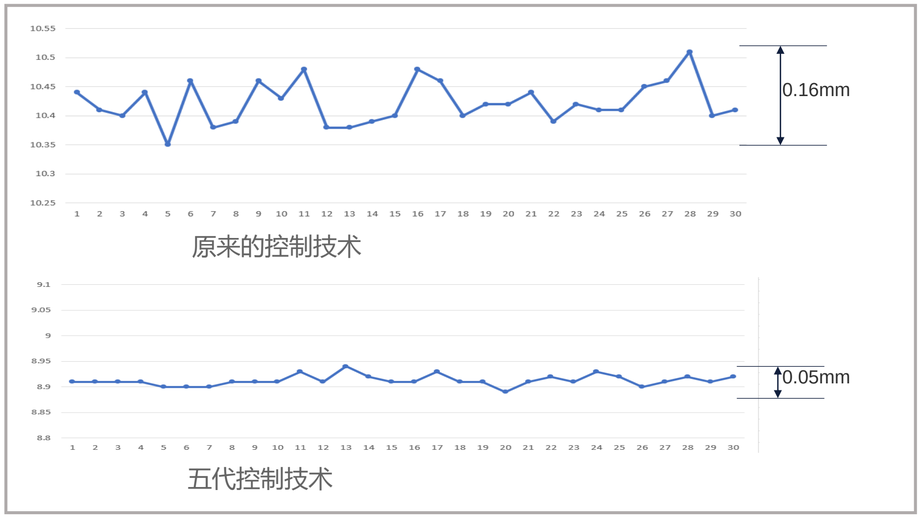
Filling stage: a variety of injection acceleration and deceleration modes are available ;

Pressure holding stage: Multiple pressure response modes are available. To adapt to a variety of characteristics of the molding process requirements, to achieve excellent stability



Injection stability greatly improved:

The all-round improvement of the fifth-generation control technology and the adoption of intelligent functions such as precision measurement have significantly improved the repeatability of the machine forming.

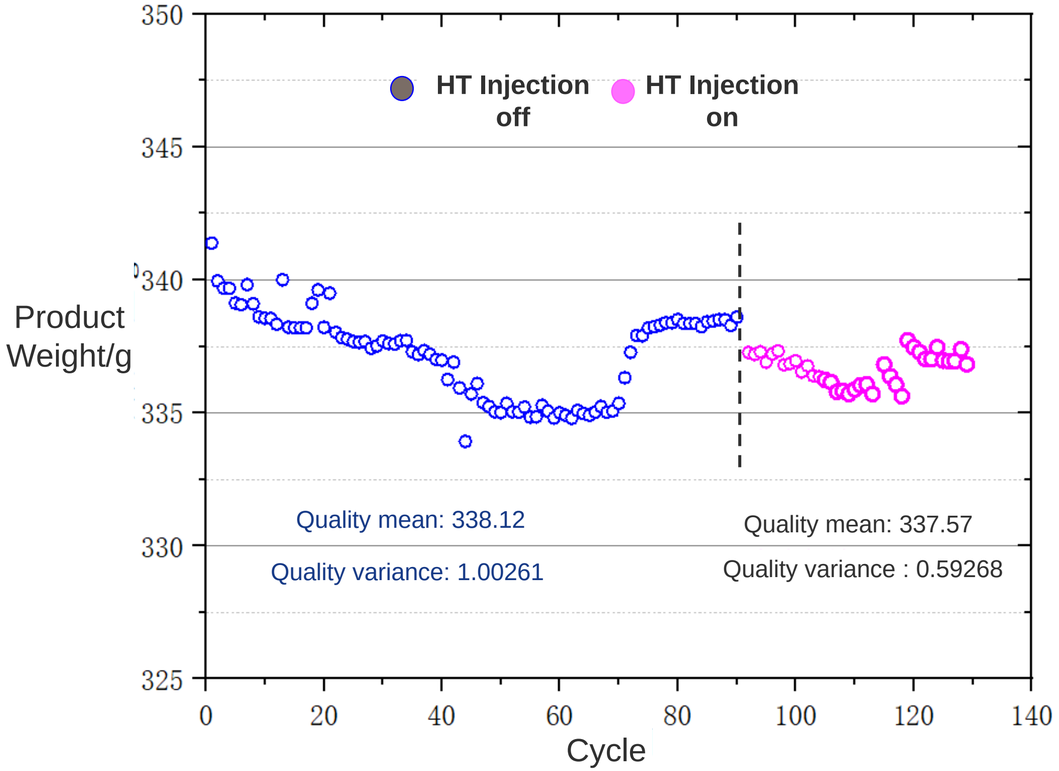


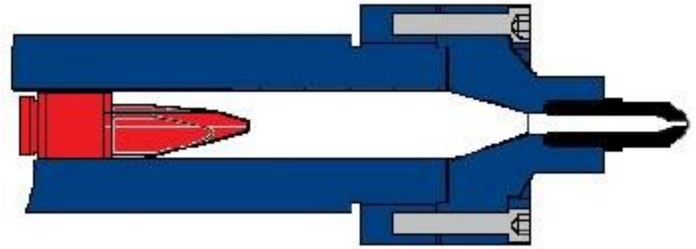
Residual fluctuation range

Smart Technology

HT injection （option）

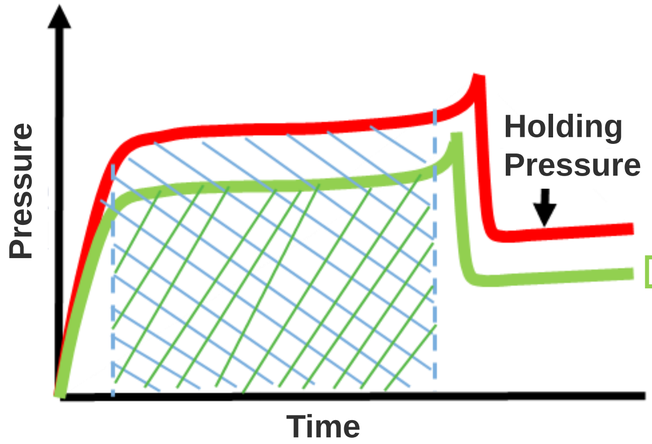
- Improving weight stability of injection molded products
- Some disturbance factors in the injection filling process are controlled in real time to achieve the weight stability control goal of the injection product





Mechanical control output

HT injection



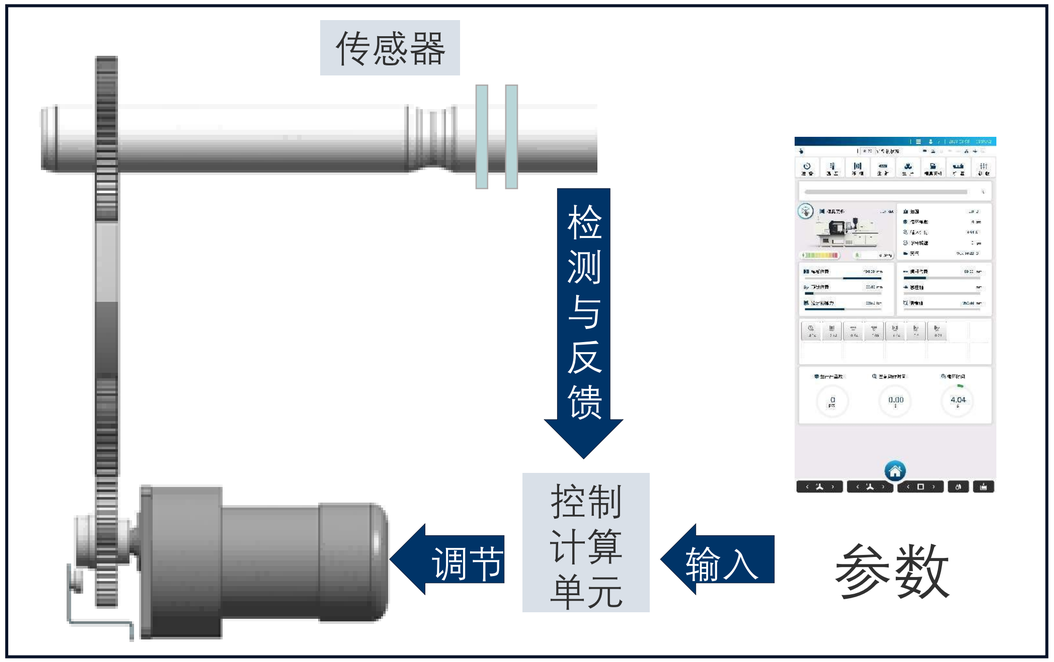
Key Algorithm

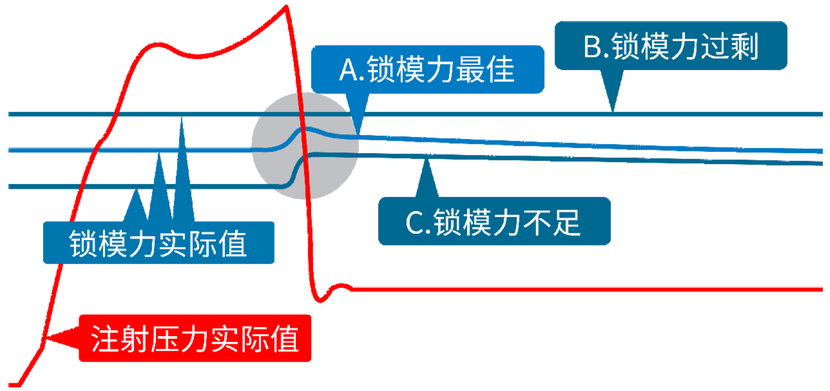
Data processing

Smart Technology

- HT injection(option)

- The function of intelligent clamping force adjustment, combined with simulation means, fits the response curve function, and intelligently matches the real clamping force required by different product production.
- It can automatically detect the minimum clamping force that can make the parting surface of the mold completely fit, which can greatly reduce the clamping force, reduce energy consumption and improve the service life of the mold.





如波形A所示，注塑压力为峰值时，即使锁模力上升，但如果在保压工序中锁模力降低至设定值，便可判断锁模力的设定值是足够了。

HT Energy consumption management 2.0

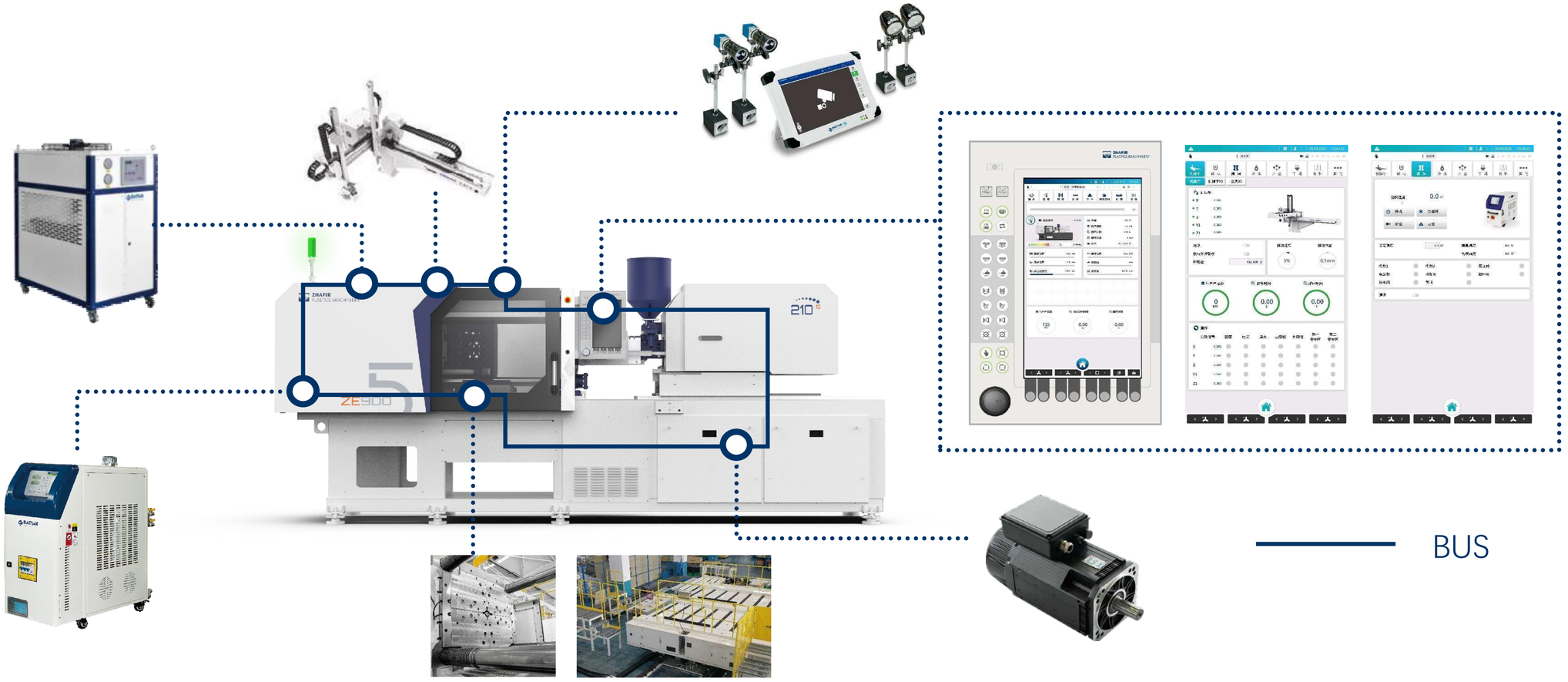
- Intelligent energy consumption analysis function without increasing the detection hardware, can use driver detection, electric heating power duty ratio analysis and standby energy consumption calculation and other functions to achieve accurate energy consumption estimation.
- With statistical analysis of energy consumption, abnormal reminder and other functions.

Smart Technology

-HT integration

As the core of automated production, the forming machine realizes the interconnection with the peripheral equipment

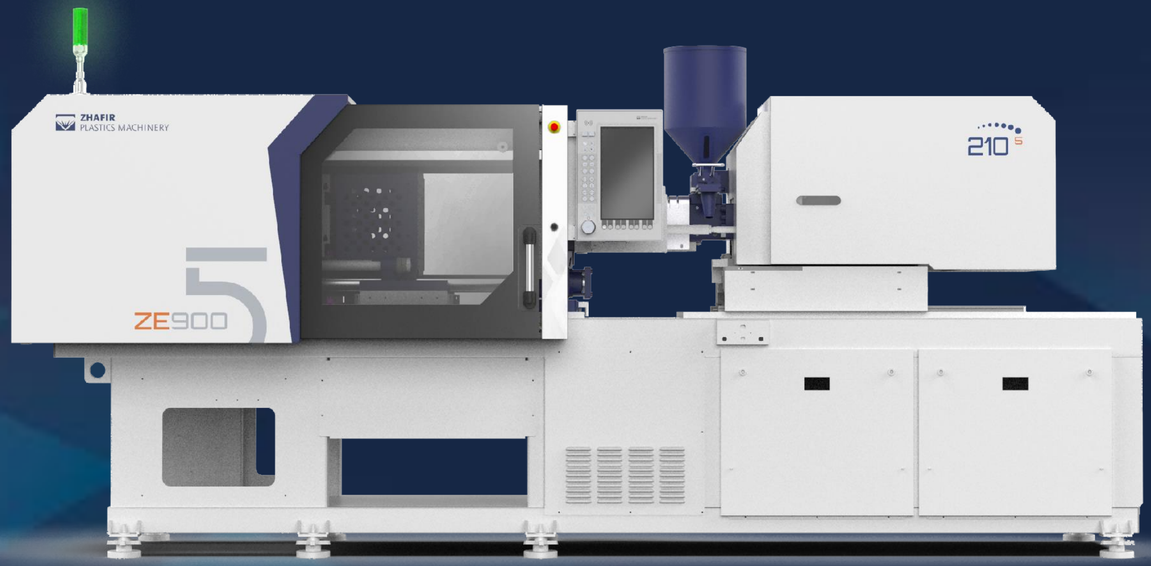
Through bus or other communication interface, realize the centralized control of peripheral equipment. The peripheral equipment can be easily observed and operated on the injection molding machine, so that the injection molding machine truly becomes the center of the entire molding system.



HT integration

Through the powerful information technology capability and the connection of global factories, the operation status of each injection molding machine in all factories in the world can be mastered in the central war situation control room.

谢谢!



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