SINCE 1958

Technology Creates the Future

60 Years of Focus, Determined to Continue Innovating

MK6

SERVO DRIVE

INJECTION MOULDING SERIES

DESIGNED BY JAPAN EXPERTS

New Generation

Precision

Stability

Pursuit of Perfection

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202011

CHEN HSONG

JM-MK6

MK6

❶ Superb energy-saver

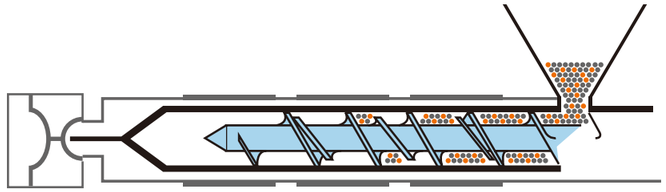
- Grade 1 in national energy efficiency scale

中国节能型注塑机能耗标记识
China energy saving injection molding machine identification

耗能高 high　中等 middle　耗能低 low　1

❷ Superior stability and reliability

- Patented circular platen reduces platen deformation and evenly distributes stress
- World-class servo-driven hydraulic system



❸ Excellent screw with good plasticizing and mixing properties

- Result of more than 20 years of accumulated Japanese expertise

❹ Super quiet operation

- Average noise level 75.4dB for JM168MK6

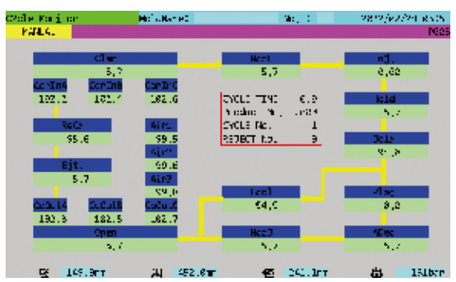
❺ High speed, short cycle time:

- The fastest clamping, injection and ejection movements among competition
- Suitable also for thin-walled products with mass volume production

❻ Super high precision

- Accurate pressure and speed control
- Quick and easy automatic mould height adjustment

❼ CPC-6.0 – The new standard in intelligent computer controller



* Product images are for reference only and subject to change without notice.

1. Grade 1 in national energy efficiency scale

❶ Highly optimised hydraulics design leverages advanced servo control system and German pump technology, resulting in reduced energy consumption.

❷ Lower energy consumed compared with major competitor in identical production environment

Grade 1 energy efficiency certification

中国节能型注塑机能耗标记识

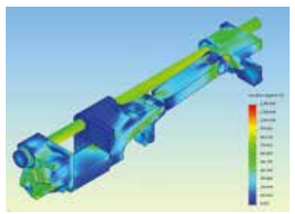
China energy saving injection molding machine identification

耗能高 high　中等 middle　耗能低 low　1

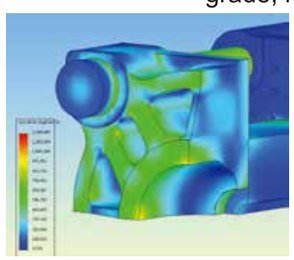
Servo motor and gear pump

2. Superior stability and reliability

❶ Unique patented circular platen design, highest rigidity and lowest deformation.

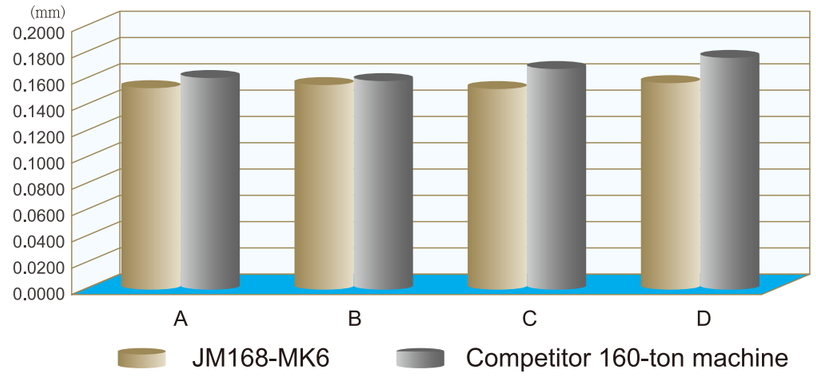


Tie-bars made with high grade, high tensile steel



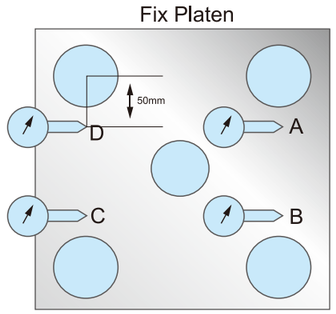
Circular platen design evenly distribute stress

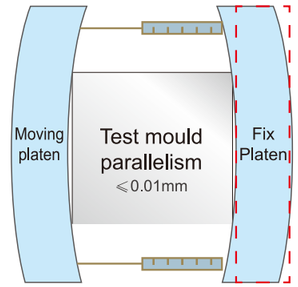
Platen deformation comparison with major competitor under similar clamping force



Less deformation
higher product quality

Deformation comparsion





Benefits:
- Stable part dimensions
- Less burrs and flashes

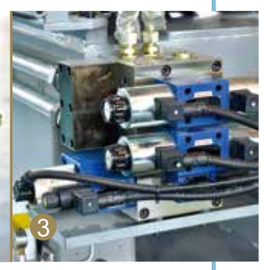
❷ Optimised lubrication design

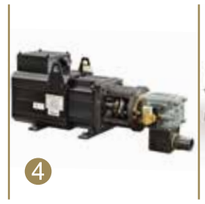
❸ Named-brand hydraulic components from Rexroth & Yuken etc.

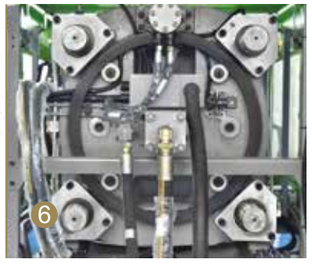
❹ Named-brand servo control system

❺ Optimized machine frame structure

❻ High-precision gear-based mould adjustment mechanism ensures stability and part quality

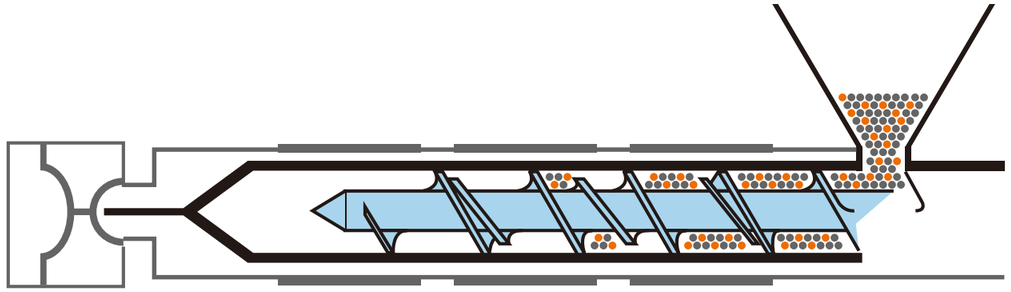






3. High-performance and versatile screw designs

❶ Japanese screw technology



❷ Variations based on process requirements

Standard nitrided screw - versatile, all-purpose single-flight

PVC screw (optional) - hard-chrome-plated, corrosion-resistant, high quality finish for PVC and other corrosive resins

Specialized PC barrier screw (optional) - hard-chrome-plated, 42CrMoAl steel

❸ Mixing screws for high-demand mixing requirements

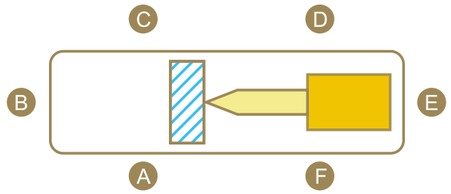
Standard mixing head (optional)

High-mixing barrier screw (optional)

4. Super quiet operation

❶ Advanced servo control system contributes to extremely low noise.

❷ Enhanced ejector control system enables lightning-fast but virtually-silent ejector movements.



JM168-MK6						
Measurements	1st	2nd	3rd	4th	5th	Average (dB)
A	71.7	73.1	71.9	74.8	71.2	72.5
B	70.7	71.2	71.2	69.9	70.9	70.8
C	76.2	75.3	76.1	77.1	76.5	76.2
D	80.2	79.5	80.2	80.1	80	80.0
E	77.1	77.0	76.6	77.6	77.2	77.1
F	75.2	75.4	77.5	76.1	75.2	75.9
Ambient	53.0				Average	75.4dB
Competitor 160-ton machine						
A	79.3	79.3	79.5	78.8	79.4	79.3
B	77.2	77.1	76.6	77.5	77.0	77.1
C	81.4	79.6	80.8	80.1	80.7	80.5
D	80.9	80.8	81.8	81.3	81.2	81.2
E	73.7	75.5	73.5	74.7	73.3	74.1
F	78.9	77.5	78.5	77.3	77.4	77.9
Ambient	52.0				Average	78.4dB

Measurements conducted according to national standards; results may be different if conditions differ

5. Higher speed, lower cycle time

❶ Advantage of shorter cycle time

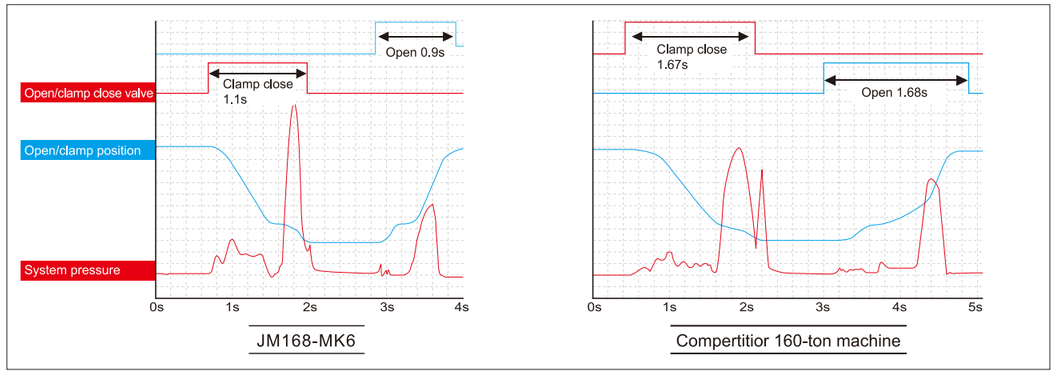
- Increased production efficiency
- Higher energy efficiency
- Smoother and more stable motions

❷ The timing chart of a dry cycle compared with major competitor:

Average	Close	Open	Total	Stroke
JM168-MK6	1.10s	0.90s	2.0s	330mm
Competitor	1.67s	1.68s	3.35s	330mm

Test Part specifications
Weight: 1000g
Size: 300 x 400x 300mm (L x W x H)

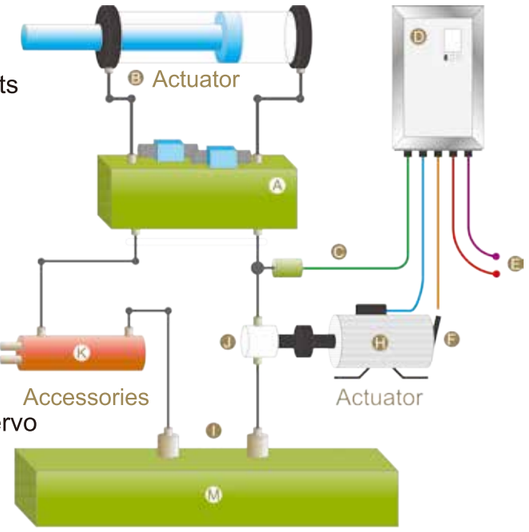
Cycle time reduced by 37.3%
Speed: 60% faster (1.6x)



6. Enduring high precision

❶ New proprietary servo pressure regulation technology, exclusive for the MK6 series

- Most servomotor-driven injection moulding machines on the market regulate pressure through reversing the pump for brief moments for fast pressure relief. The caveat is risking undue wear and tear to the pump, gradually degrading performance.
- The MK6 series employs a proprietary, patented, advanced pressure regulation technology that ensures fast pressure relief while never reversing the pump.
- This unique technology matches the high-speed intelligent computer controller with a specialised feedback loop from the servo control system driving a special relief valve to achieve this difficult task.
- Service life of the pump is greatly preserved, eliminating performance degrades.



Ⓐ Hydraulic block (use new preesure relief technology)
Ⓑ Actuator
Ⓒ Power train
Ⓓ Servo drive
Ⓔ Command
Ⓕ Rotray encoder
Ⓖ Actuator
Ⓗ Servo motor
Ⓘ Oil filter
Ⓙ Pump
Ⓚ Oil cooler
Ⓛ Accessories
Ⓜ Oil tank

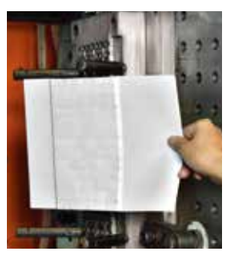
❷ A new industry benchmark for low-pressure mold protection

High precision linear potentiometers are used for the clamping, injection and ejector axes which, when combined with highly-optimised algorithms, enables superior low-pressure mould protection - effective even with obstacles thinner than 0.1mm (or the thickness of a sheet of paper)!

Before mould close, put in a sheet of standard A4 paper

Almost closing detecting paper

Low-pressure mould protection causes clamp to open

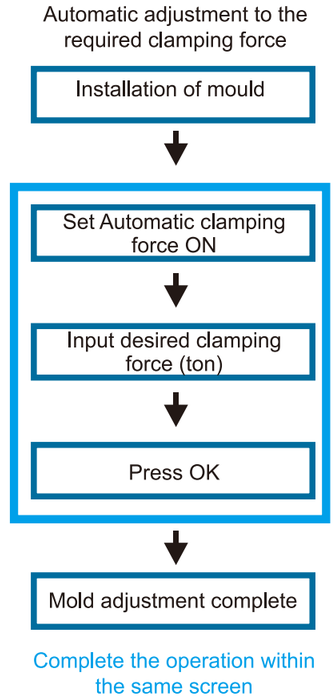


A4 Paper is not even punctured through!

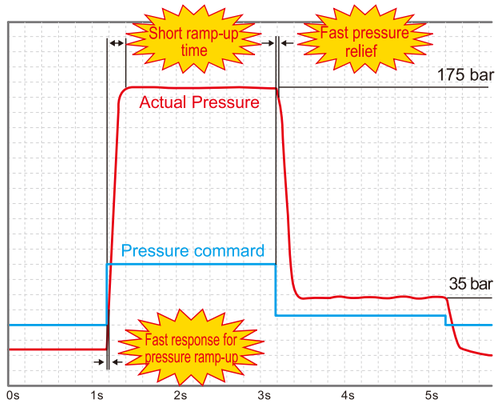
❸ Automatic mould-height/clamping force adjustment

Fully-automatic mould-height adjustment process is fool-proof and simple to use. You no longer need to measure the thickness of the mould, or manually adjust clamping force. With the new algorithm you simply puts on a new mould, enters the desired clamping force, then press "OK". The machines does the rest, speedily and accurately, without mistakes. Complexity is greatly reduced and operating personnel training is mostly eliminated.

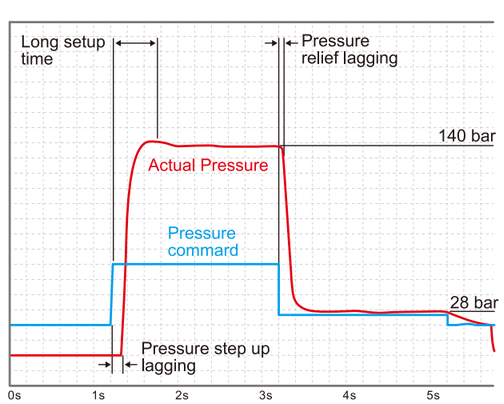
- Very little time required (can be as short as 15 seconds)
- Clamping force is accurate
- Fool-proof, single-screen, one-click operation
- No training required



❹ Fast response, short ramp-up time, precise pressure control. Suitable for producing precision part with superior, weight and dimensional stability.



JM168-MK6-two-stage holding pressure



Major competitor 160-ton machine-two-stage holding pressure

7. All new intelligent computer controller: CPC-6.0

❶ Characteristics

1. Designed and developed in Japan
2. Complies with JIS and IEC testing standards
3. Named-brand high-definition 7" TFT color LCD screen
4. Wide power range: AC110V~AC280V, 50/60Hz
5. LED backlight with high brightness and long life
6. Advanced SMT technology with highest stability and reliability
7. Multiple languages
8. Intelligent fault diagnostics
9. Online operational instructions
10. Full suite of networking features as per Industrie 4.0

The Industrie 4.0 environment[2]

❷ Features Set

1. Storage for 150 sets of mold data
2. Multi-stage authorisation allows fine-grained access control
3. 8 sets of high-accuracy PID barrel temperature control (30°C-500°C)
4. Cold start prevention, automatic pre-heat, blocked nozzle alarm, overflow detection
5. Temperature range detection and broken thermocouple detection
6. 6-stage injection, 6-stage holding
7. 20 channels of sequential injection control (valve gates) by position and time
8. 6-stage plasticising, 6-stage back pressure
9. Up to 6 core pulls and 6 air blows
10. Alarms history storage for maintenance and troubleshooting
11. Production quantity and batch control settings; automatically stops production when quantity reached.
12. Automatic toggle lubrication with alarms
13. Cycle time monitor
14. Injection speed/pressure curves, compare with standard, and injection end position statistics.
15. Status monitor screens show all inputs, outputs, outputs, timers and counters, convenient for maintenance and troubleshooting
16. Retrieval and storage of mould data internally or on external SD card (optional)
17. Intelligent fault diagnostics and online operating instructions
18. Hot-runners control (up to 60 zones) (optional)
19. Networking features for Industrie 4.0 shop-floor integration (optional)

Standard Features	
Clamping unit	
1.	Automatic toggle lubrication
2.	Adjustable mechanical safety lock
3.	Hydraulic safety device
4.	Automatic mould thickness and clamping force adjustment
5.	High tensile chrome-plated tie bars
6.	See-through window and safety door with hydraulic and electrical safety interlock protection.
7.	Differential boost for high-speed clamping
8.	EUROMAP standard ejector
Injection unit	
1.	Nitrided screw and barrel
2.	Automatic PID temperature control
3.	Screw RPM display
4.	Back pressure control
5.	Nozzle guard
6.	Cold start prevention
7.	Broken thermocouple detection alarm
8.	Blocked nozzle and overflow detection
9.	Barrel safety cover
Hydraulics Unit	
1.	Speed and pressure control via servo drive
2.	Low noise internal gear pump
3.	AC servomotor
4.	High efficiency oil cooler
5.	Removable oil tank, easy to clean and service
6.	Suction and return line filter
Controller	
1.	See operation manual

Optional features	
Clamping Unit	
1.	Core pulls
2.	Robot mounting plates
3.	EUROMAP 67 robot interface with connectors
4.	T-slot
5.	EUROMAP/ SPI holes pattern
6.	Air blows
7.	Oil less bushings for toggles system
8.	Ejection-on-fly/ core-pull-on-fly
9.	Increase ejector stroke
Injection Unit	
1.	Barrel thermal insulation cover
2.	Reduced/ enlarged injection unit
3.	Feeding zone temperature control
4.	Bimetallic screw/ barrel
5.	Movable hopper
6.	Stainless-steel hopper
7.	Extended nozzle
8.	Chrome plated nozzle
9.	PVC and UPVC-specialized injection units
10.	Ceramic heater bands
11.	Locking type screw head set
12.	Mixing head
Hydraulics Unit	
1.	Oil temperature control, with or without alarm
2.	Oil level alarm
3.	Unscrews
4.	3R by-pass filter
5.	External return line filter
6.	External suction filter
7.	Enlarge/ reduced plasticising motor
8.	Enlarge oil cooler
9.	Enlarge/reduced servo pump
10.	Hydraulic oil preheat
Controller	
1.	Voltage stabilizer
2.	Beckhoff CBmold controller
3.	Multi-zone hot-runners control