Global Network

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Sumitomo SHI DEMAG

SE-EV-S

All-electric Small-sized Injection Molding Machine

The machines in this series have acquired JIS B 6711:2021 (equivalent to ISO 20430:2020) certification.

We support the enhancement of our customers' corporate value through providing high performance, high quality, and safe injection molding machines.

Lineup

SE30EV-S	(300kN)
SE50EV-S	(500kN)
SE75EV-S	(750kN)
SE100EV-S	(1000kN)
SE130EV-S	(1300kN)
SE180EV-S	(1800kN)

www.shi.co.jp/plastics/

● Photographs of machines and details may differ from actual products. ● Specifications subject to change without notice for performance improvement.

B031EN02-2406JD

Sumitomo Heavy Industries, Ltd.

Our plastic machinery business advocates
"act! SUSTAINABLY - Creating a future,"
and we would like to promote the sustainability of
the global environment and the entire industry involved in injection molding.

The SE-EV-S series of all-electric injection molding machines was
developed on the 3 S's – sustainability, smart management and safety –
concept to realize that.

SE-EV-S

act! SUSTAINABLY
Creating a Future

Sustainable Molding

Less defects and greater energy-savings realized by low injection pressure and low clamping force. Molding work supported by simple operation.

For more information, see pg. 04 – 09.

To reduce mold clamping force, technology to reduce injection pressure was developed.

Capable of filling with low injection pressure

FFC
— **F**low **F**ront **C**ontrol

Capable of molding with low clamping force

MCM
— **M**inimum **C**lamping **M**olding

Zero-molding

Less defects and greater energy-savings

Capable of simple operation

SPS
— **S**imple **P**rocess **S**etting

Comparison of power consumption per hour of our all-electric injection molding machines (1000kN class)

※Graph figures are for reference purposes only.
Actual power consumption will vary according to molding conditions.

1st generation SE-S — 4.768 kWh

2nd generation SE-DUZ — 2.667 kWh

- Improved drives and motors
- Our proprietary "Zero-molding" technology

3rd generation SE-EV-S — 1.729 kWh — -65%

- Structural changes to mold clamping and injection units (e.g. linear guide system)

The 3rd generation SE-EV-S series consumes **65**% less power than the 1st generation all-electric machine.

Smart Management

Stronger system integration feature allows users to build a more efficient production environment.

For more information, see pg. 10 – 11.

Safety

Compliant with international safety standards. Contributes to further improving safety.

For more information, see pg. 12 – 13.

Capable of filling with low injection pressure

Conventionally, in order to completely fill cavities, the screw was pressed forward and filling done at high injection pressure, but if the resin pressure is increased while the cavities are unevenly filled, burrs and short shots may occur.
The defects that resulted from these issues wasted both power and materials.

Benefits of low injection pressure

No more molding defects

Smooth filling prevents flashes and short shots, and widens the range of molding process window that produces good products.

Reduced CO_2 emission

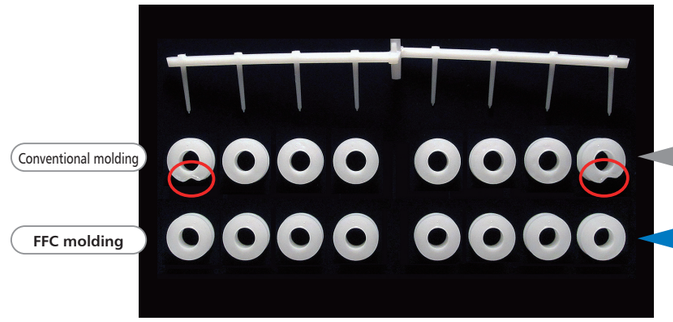
Eliminates the production of defective products and reduces the amount of wasted resin.

Energy-savings

Power consumption can be reduced thanks to the reduction of injection motor torque.

FFC — Flow Front Control

Comparison of filling capability



Coil bobbin
PBT / 8 cav. / Product weight : 4.8g

In molding, cavities farther from the sprue are typically harder to fill

FFC molding improves cavity balance with smooth filling

Support for low injection pressure

Flow Front Control (FFC)

**Cavities can be filled at low injection pressure by controlling the screw before and after V-P switchover, so that the viscosity of the resin itself promotes filling.
This approach improves cavity balance while also eliminating flashes and short shots at the same time.**

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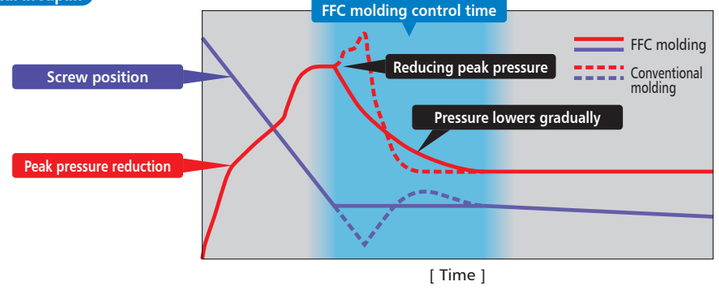
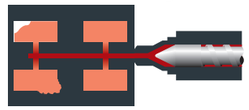


Conventional molding



FFC molding

New! FFC guidance

Machines are preinstalled with guidance that allows anyone to easily master FFC by simply following setup flows.

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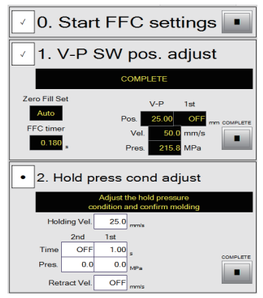
●Settings on screens 0 – 2 are accessed and completed by simply following the guidance.



Basic mechanical performance

Direct drive system

**Screw control is highly responsive thanks to a structurally original injection system and low inertia servo motor.
Moreover, plasticization, filling and pressure holding are precisely and stably controlled by an in-house developed algorithm, which helps to lower injection pressure and improve cavity balance.**

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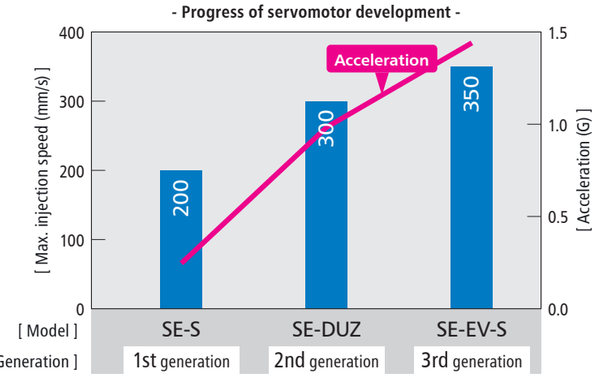
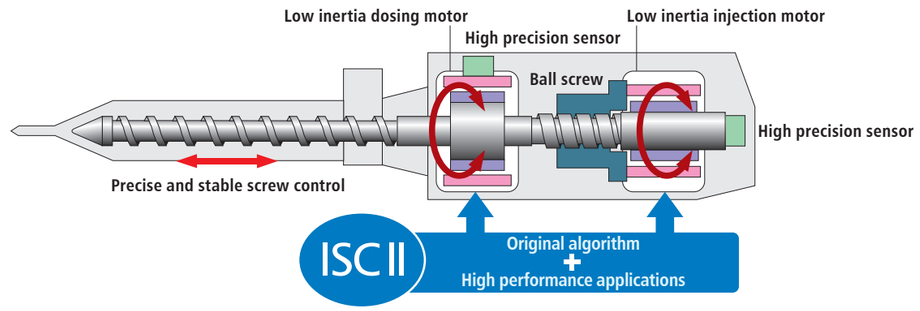
- Progress of servomotor development -



●The value of each model is based on the C360 injection unit.
●Acceleration is the evaluation result (rough indication) from 10% to 90% of the maximum injection speed.



Capable of molding with low clamping force

One thing that users can do to prevent flashes and other defects is to set a high mold clamping force. However, too much force inhibits the escape of gas, which leads to short shots and burning. It can also stress molds, which can impact mass-production in various ways. Also, it increases power consumption, which is not economically helpful.

Benefits of low mold clamping force

Unimpeded gas release

Since molds can smoothly release trapped gases, short shots and burning are prevented, and less mold deposits seen.

Longer lasting molds

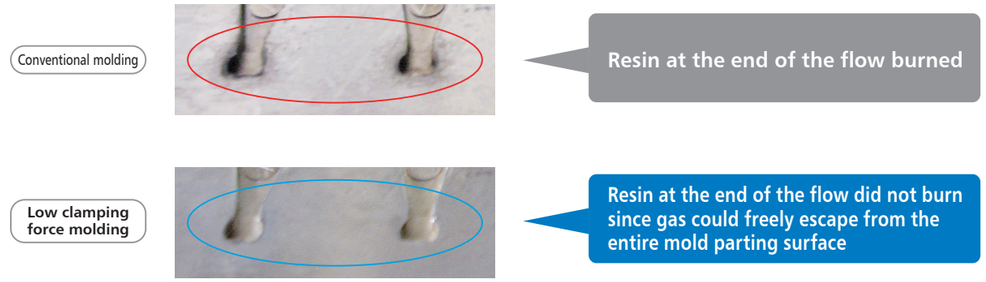
Low mold clamping force prevents deformation of mold, breakage of pins or galling of mold parts, and other damage to molds.

Energy-savings

Power consumption can be reduced thanks to the reduction of mold clamping motor torque.

MCM — Minimum Clamping Molding

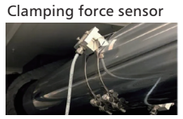
Comparison after 700 shots



Support for low mold clamping force

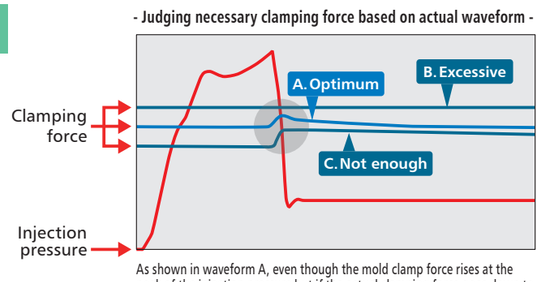
Clamping force monitor

Clamping force sensor



The monitor displays the mold clamping force as a waveform in real time during the molding process. Users can confirm whether the set clamping force is appropriate or not from the waveform.

- Judging necessary clamping force based on actual waveform -



As shown in waveform A, even though the mold clamp force rises at the peak of the injection pressure but if the actual clamping force goes down to the set clamping force during the holding pressure process, the set value of the mold clamping force can be judged sufficient.

Minimum clamping force detection

Clamping force sensors automatically detect the minimum force needed to completely seal mold parting surfaces. It gives users a good reference to easily determine the minimum force required.

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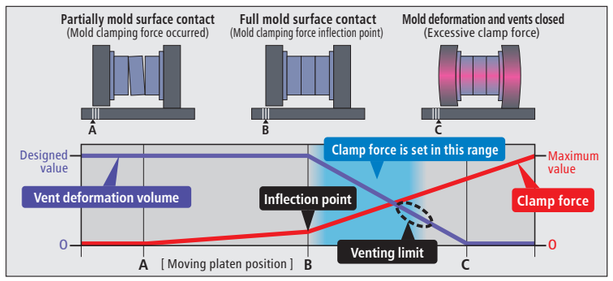

How mold clamping force is maintained during production

Mold clamping force feedback control

During mass-production, mold clamping force tends to rise because the mold expands under heat. With this function, the set clamping force is automatically maintained by using the detected clamping force to compensate for any changes in mold height.

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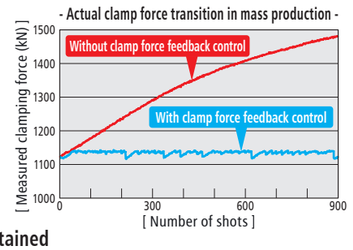
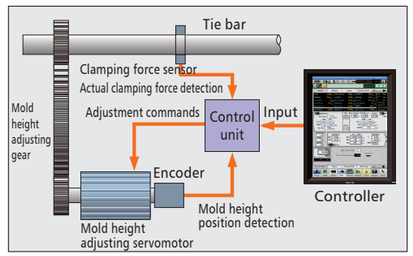
- Actual clamp force transition in mass production -

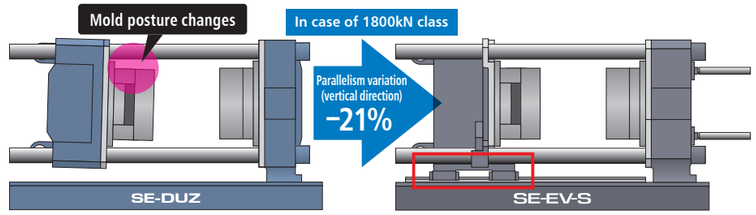




Basic mechanical performance

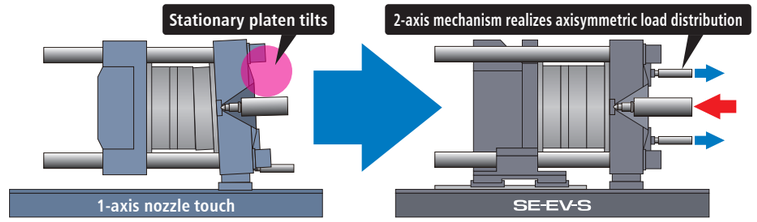
Platen support and bushless tie bars

The platen is supported to maintain a high degree of parallelism accuracy even when heavy molds are mounted. This prevents molds from warping and helps molding with the appropriate mold clamping force.



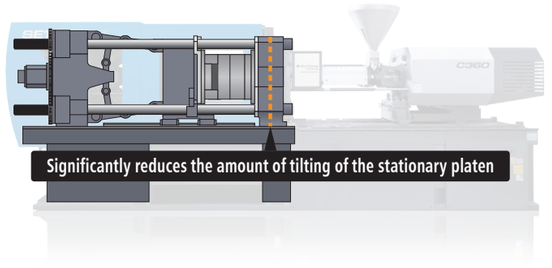
High precision nozzle contact mechanism

The 2-axis support mechanism provides an even load distribution centered on the nozzle. Thus, it is possible to prevent the stationary platen from tilting.



Highly rigid, low vibration frame

Designed and built with an emphasis on rigidity, it ensures smooth mold opening and closing while preventing galling of pins and other mold damages.



Capable of simple operation SPS — Simple Process Setting

Molding requires a wide range of knowledge and skill. Molding machine features must be set and used properly. Incorrect settings or operation can cause problems in mass-production that decrease work efficiency and cost users time, material and power. Moreover, complicated operations can only be performed by apt operator.

Benefits of user interface based on HCD (Human Centered Design)

Easy operation
The easy-to-understand displays prevent operational mistakes and enable anyone to master even high-performance features.

Waste elimination
An assistance feature designed to help users make the best settings promotes work efficiency while also reducing work time, resin waste and power consumption, which contributes to lower production costs.

Support for power-savings
Utilization of the power-saving support features promote the reduction of power consumption.

Operation screen based on HCD

Screens designed to facilitate operation

Mold mounting screen

Molds can be quickly and easily mounted by simply following the displayed workflow.

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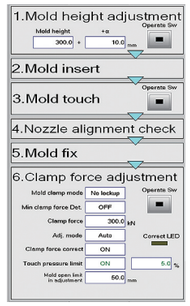
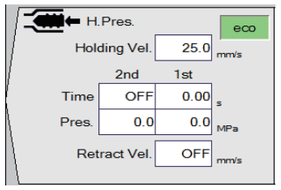


Automatic energy-saving control

New!

An “ECO” button has been added.



This feature reduces power consumption during the pressure holding stage. The low power mode can be set by just pressing a button.

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Support for time-efficient setup

Minimum melting time display

New!

Displays the minimum time required for the heating cylinder to complete heating up when returning from an interruption of molding. It reduces unnecessary waiting time and prevents resin from degrading in the interim.

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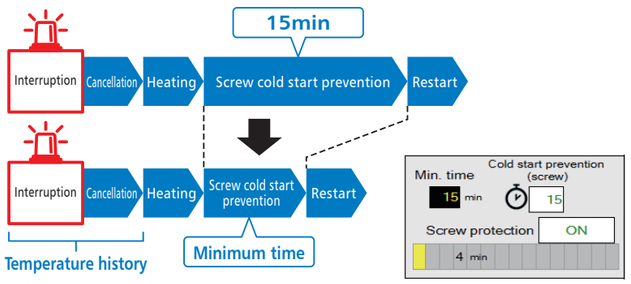
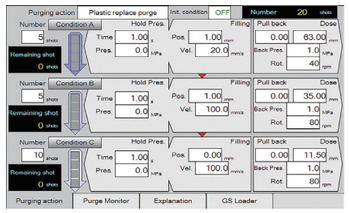


■Minimum time for screw cold start prevention

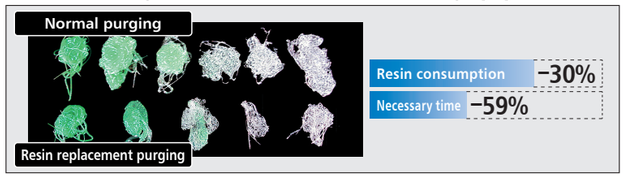
Purging function for resin replacement

An auto purging mode is provided to change the color or type of resin quickly and efficiently. It both shortens the amount of time required to change out resins and reduces the amount of resin consumed in the process.



The set purging process A to C are automatically switched.

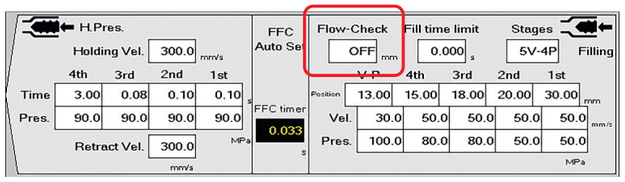
- Comparison of resin amount and time used for purging -



●The resin consumption and necessary time depend on purging process.

Flow front check

This feature helps users find the best V-P switchover position without altering production process.



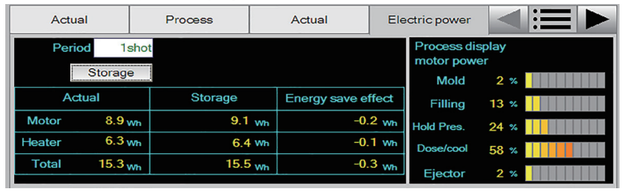
Support for power-savings

Power consumption display

New!

The SE-EV-S series makes it possible to monitor power consumption on a per-shot basis. That data can also be logged to visualize how much power is required for each molded product. Moreover, data including setup time and downtime, and can be displayed for half-day, daily, 7-day and 30-day timeframes, providing users with a useful tool for promoting power-saving efforts.

■Power consumption display screen



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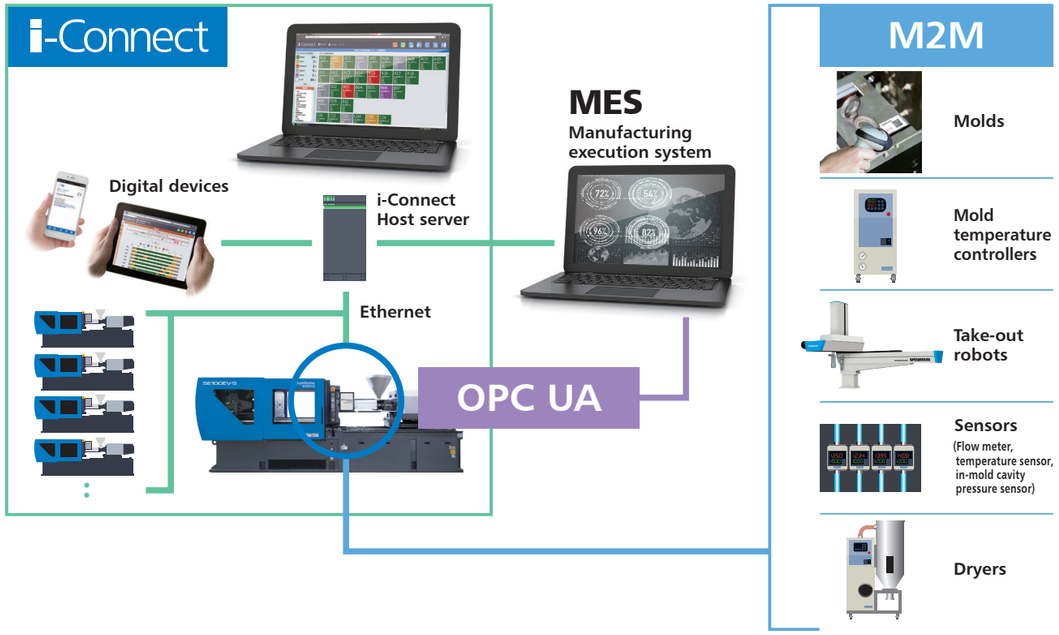
※This function does not measure the power consumption of the entire molding machine.

Smart Management

Convenient connections and cooperation

Manufacturers are increasingly looking to collect and utilize data to get around manpower shortages, reduce employee workloads and improve productivity.
So, the SE-EV-S series are now compliant with the international standard OPC UA as a standard feature for communication with MES.
Moreover, the i-Connect production quality control system that streamlines data collection from Sumitomo molding machines can also connect to MES.
When it comes to integration of molding machines and peripherals, we offer multiple M2M solutions that shorten the time spent calling up, monitoring and logging conditions from across production floors, and make production management a whole lot more efficient.



Production quality control system

i-Connect

i-Connect is a core application for IoT deployment at manufacturing sites. It was developed to give users a broader, deeper and easier grasp of information by integrating information from molding machines, peripherals and sensors.

Option

Less downtime

Multiple molding machines are monitored simultaneously. If trouble occurs, an alert is instantly issued, giving users a head-start on minimizing any downtime.

Accurate traceability

A wide range of molding data is accumulated, which allows users to track down trouble spots and improve issues across the whole molding environment.

Steppingstone to innovative production planning and production automation

By connecting to host systems like MES, i-Connect lets innovation-minded manufacturers step up to the plate.

Networking solutions for molding machines and MES

OPC UA compatibility as a standard feature

New!

The SE-EV-S series are compatible with the international protocol OPC UA which enables data exchanges across machines of differing manufacture and different OS, to provide data to host systems like MES (Manufacturing Execution System).
Sumitomo molding machines can feed MES some 200 types of data, including key data like operating status, turnout, product information and molding conditions.

M2M solutions for molding machines and peripherals

Verification by QR code

QR coding makes setup operations quick and mistake-free. Molding conditions can be called up and verified, as well as users verified, by assigning QR codes to molding conditions, take-out robot chuck plate, resins, user information, etc. and simply scanning the codes when setting up the line for production.

Option

※QR code is a registered trademark of DENSO WAVE INCORPORATED.

SPICCP communication for mold temperature controller

By connecting a molding machine and temperature controller over SPICCP, conditions can be shared between the two and the temperature controller operated from the molding machine. Besides shortening the time spent calling up conditions, this networking scheme is effective towards preventing careless mistakes that originate from human error.

Option

Take-out robot condition link

This configuration connects a molding machine and take-out robot, and saves take-out robot conditions in the molding machine, making it possible to call up take-out robot conditions together with molding conditions.
It spares users the expense of repairing damaged mold or chuck plate caused by mismatched conditions.

Option

Quality management package

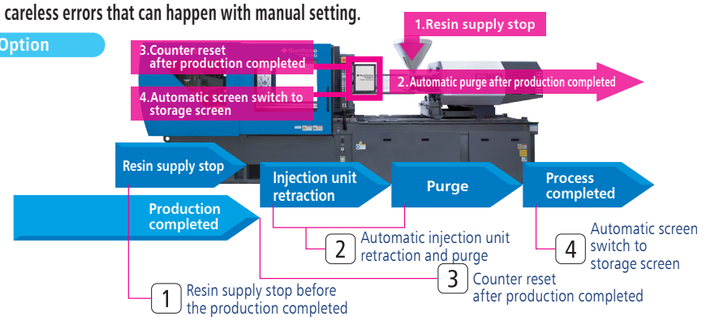
This package boosts quality management to a higher level by inputting analog readings (voltage and/or current) from external sensors that measure resin flowrate, mold internal pressure and other conditions, and making it possible to view and record measurements on waveform and logging screens.

Option

Production completion package

This package automates the processes performed at the end of a production run, such as the stoppage of resin supply system, injection unit retraction and purging. It reduces setup work prior to starting production and prevents careless errors that can happen with manual setting.

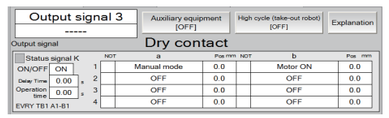
Option



Connection to peripherals

We have increased the number of status output signals from our molding machines to external units from a standard 5 channels to 20. Moreover, operation requests from peripherals for triggering injection, mold opening/closing, ejection and core pulling are listed on an easy-to-use input signals screen.
The acquired ability to control processes with reliable interlock signals not only enhances equipment protection and flexibility but also improves product quality and safety.

Option



Safety

Enables safe work

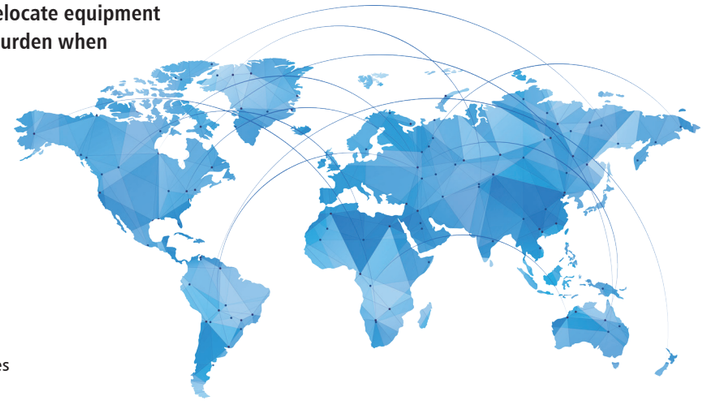
Compliant with the international safety standards ISO 20430:2020 (JIS B 6711:2021)

Safety is one of the biggest priorities of any manufacturing site anywhere in the world. Not long ago, Japan amended its national safety standards for injection molding machines (JIS B 6711:2021) to comply with international standards set forth in ISO 20430:2020.

Therefore, all Sumitomo injection molding machines now comply with ISO 20430:2020 and we are providing the same high level of safety across the globe.

Manufacture anywhere in the world

Even if you are looking to procure or relocate equipment across national/regional borders, the burden when changing specifications or remodeling will be reduced.
We assist businesses with globalizing their manufacturing activities.



※Safety requirements for molding machines differ according to the place of use.

Improved operator safety

More reliable safety doors

Since 2011, our molding machines have been equipped with ISO 20430:2020-compliant door locks that prevent access to internal areas of the machine until all moving parts come to a complete stop. Moreover, mechanisms that prevent monitoring sensors from being detached reduce the risk of accidents.

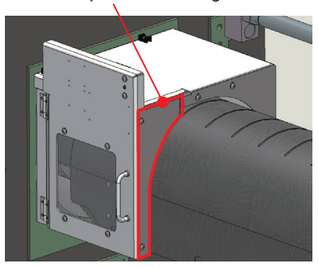
Safety has been further pursued through improvements to "Motion" mode status indications that make it easier to identify machine status.

Mechanisms that prevent monitoring sensors from being detached.

Improved shielding of purging covers

The shielding provided by purging covers has been improved to prevent unexpected resin splatter.
These improvements enhance operator safety by better protecting against burns and other accidents.

Area of improved shielding



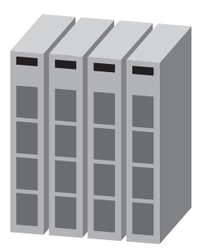
Improved hardware quality

Highly reliable control system

Safety PLC

A safety PLC is a piece of equipment complied with international safety standards to shut off and control power sources in response to input signals from safety devices.

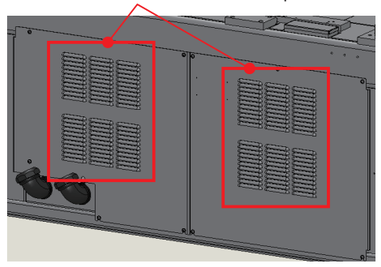
Duplication of the safety circuit with hardware increases the possibility of trouble due to increased number of parts, but we ensure a very high level of reliability with duplication through safety PLC based control software.



Enhanced waterproofing

Waterproofing has been enhanced to reduce the chance of trouble by adding packing to the control panel cover and adopting a louvre structure for vents, out of consideration of possible short-circuiting in a molding machine's electrical system that intruding water could cause.

Louvre-structured vent on the control panel cover



Capable of various molding

Performance requirements vary according to the molded product.
The SE-EV-S machines meet customer needs with various specifications for molding.

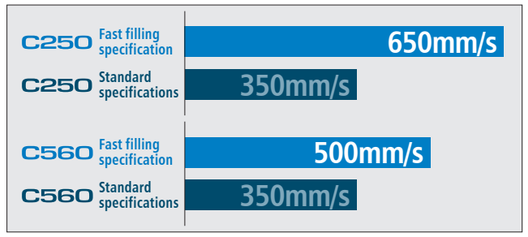
Fast filling spec injection unit

●C250, C560 injection unit (available only from SE75EV-S to SE180EV-S)

This injection unit enables molding of thin-walled, long and other kinds of problematic products by raising the maximum injection speed.

Option

- Comparison of maximum injection speed -

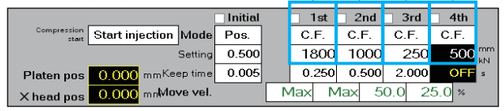


Mold clamping compression

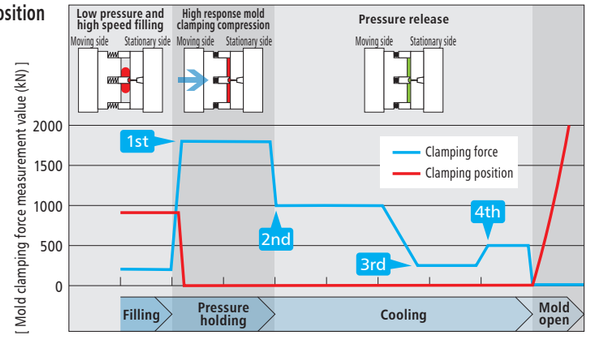
Compression operation can be performed by setting the mold position and clamping force in stages according to the product, even for thin-walled or thick-walled products. This meticulous approach to setting up production improves product quality and productivity by compensating for warping and deformation, reducing birefringence, etc.

Option

Mold clamping response time 0.1 sec or less



- Image of mold clamping compression operation -



Fast cycling package

●Available only from SE100EV-S to SE180EV-S

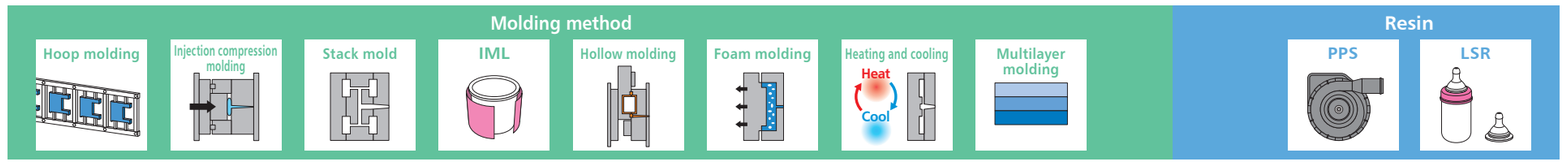
This package shortens the shortest molding cycle by previous 2/3 through a host of structural reinforcements to the molding machine. We have achieved high durability of sliding parts and optimal lubrication of grease. We also added a cooling mechanism and temperature monitoring function to the drive unit to solve the heat problem during fast cycles.

Option

Other options

Option

We can help molding other various types of products. Below are shown some examples. For more information, please feel free to contact us.



Screw lineup

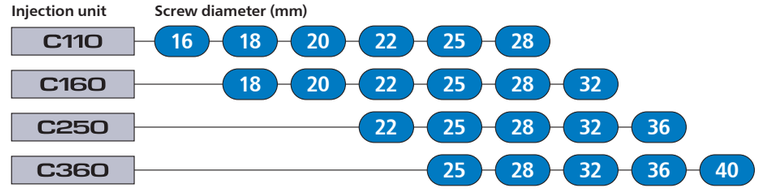
Our screws come in a wide range of diameters and assembly specifications.

Option

Screw diameter

Choosing the right diameter screw for a molded product is a good first step towards sustainable molding by reducing power consumption and CO_2 emissions.

●The table is a selection example of SE100EV-S (1000kN).



Screw assembly specifications

We have a vast lineup of screw assemblies with specifications designed for molding all sorts of products. They are instrumental to reducing defects and ensuring screw parts last longer.

Suitable resins		Non-abrasive (wear) and corrosive resins	Resins may burn, resins with poor thermal stability	Resins with less than 30% GF, flame retardant resins	Resin with 30% - 40% GF, resins with large amount of filler (GB, CF, MR)	Resin with 40% - 60% GF, highly corrosive resins	Resin with high melting temperatures
Wear resistance		★	★	★★	★★★	★★★	★★
Corrosion resistance		★	★	★★	★★	★★★	★★
Specifications		**Nitrided**	**Plated**	**Wear and Corrosion resistant A**	**Wear and Corrosion resistant B**	**Wear and Corrosion resistant C**	**High temperature**
Material	Screw	Nitrided	Plated	Wear and Corrosion resistant A	Wear and Corrosion resistant B	Wear and Corrosion resistant B	Wear and Corrosion resistant A
	Heating Cylinder	Nitrided	Nitrided	Wear and Corrosion resistant A	Wear and Corrosion resistant B	Wear and Corrosion resistant C	Wear and Corrosion resistant A
	Non return valve	Rotating type	Rotating type	Wear and Corrosion resistant A Non-rotating type	Wear and Corrosion resistant B Non-rotating type	Wear and Corrosion resistant C Non-rotating type	Wear and Corrosion resistant A Non-rotating type
Type	SD Screw	○	○	○	○	○	○
	SM Screw	○	○	○	–	–	–

★★★Most suitable ★★Suitable ★Usable

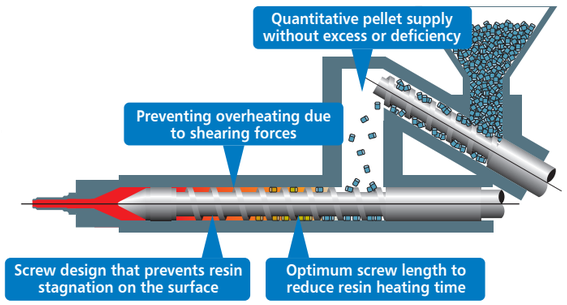
SL screw system

The SL screw system prevents resin stagnation and shearing. It was designed by visually analyzing resin melting behavior with respect to temperature and pressure.

※For more information, see the product catalog.

PAT. pend. in Japan

Option



SE-EV-S series development by application

Molded products are being segmented into smaller pieces, and demands for higher quality are increasing.
We offer a series with equipment compatible with each type of molding.

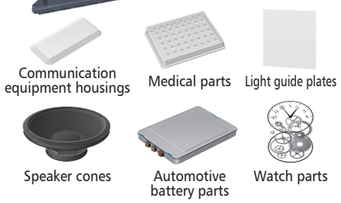
High-speed and high-response injection molding machine

SE-EV-S-SHR

This model improves high-speed injection performance and high-response acceleration/deceleration performance. The fast, quick-response filling it delivers better reproduces molding process with respect to settings and reduces defects seen in thin-wall molding.

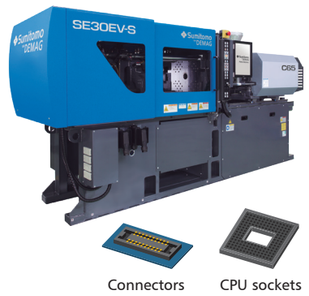
Zero-molding

SE50EV-S-SHR (500kN)
SE100EV-S-SHR (1000kN)
SE130EV-S-SHR (1300kN)
SE180EV-S-SHR (1800kN)
SE220EV-S-SHR (2200kN)
SE280EV-S-SHR (2800kN)
SE350EV-S-SHR (3500kN)
SE450EV-S-SHR (4500kN)



Injection molding machine for connector

SE-EV-S Connector



This connector-specific model comes with a more durable mold clamping unit and injection unit needed to mold small products at faster cycling pace than usual. Thanks to the machine's high-precision performance, users shorten the amount of time spent performing maintenance and decrease the amount of resin they waste, which reduces their running costs.

Zero-molding

SE30EV-S (300kN)

Injection molding machine for lens

SE-EV-S Lens

This model comes with features for ensuring the eccentricity accuracy, appearance and thin walls required in optical lens molding. Its high-performance mold clamping unit, screw assembly and injection unit are designed and built for molding ever-changing optical lenses.

Zero-molding

SE30EV-S (300kN)
SE50EV-S (500kN)

Injection molding machine for LGP

SE-EV-S-LGP

This model clears all of hurdles associated with molding lighter and smaller light guides for mobile devices, VR/AR devices, automotive parts and more. With quick-acceleration filling of 16G and ultra-high-speed, heavy-injection-pressure molding via a purpose-specific screw assembly, it realizes precision-stable molding of super-thin products and thin products made from high viscosity resins.

Zero-molding

SE180EV-S-LGP (1800kN)
SE315EV-S-LGP (3150kN)

Less economic loss with proper maintenance

Sudden interruptions during production runs result in wasteful downtime and production delays.
Plus, it might cost to get the system back up and running. These interruptions can be avoided with failure prevention.
That is why we propose making a switch from "repairing your equipment" to "keeping it from stopping".

High-performance maintenance and inspection service

Tomenai Service

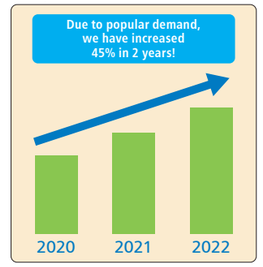
Regular maintenance service for each unit.
High performance can be maintained stably.

Maintenance menu

We have a long list of maintenance and service items. If we were to compare it to humans, what we can do for your equipment equates to a health checkup and immunizations.

Standard	Inspection and cleaning of control circuit, mold clamping circuit, heater temperature monitoring, and grease supply circuit.
Options	Mold clamping accuracy adjustment, belt tension adjustment, cylinder wear measurement, etc.

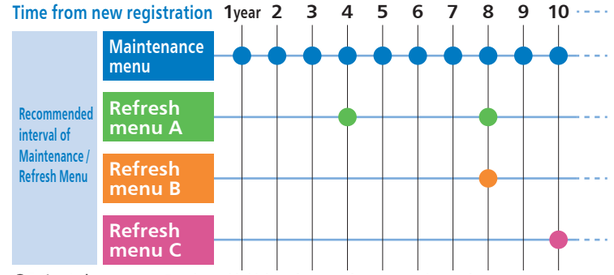
■Growth of our "Maintenance Menu" implementation



Refresh menu

Besides the annual maintenance menu, there is a menu of longer term refreshing options. When combined with regular maintenance, refreshing menu can realize more stable and secure production. The "Refresh Menu" has the effect of extending machine life.

Every 4 years	Refresh menu A
	Inspection and replacement of CPU fans, NC unit fans, motor fans and encoder batteries
Every 8 years	Refresh menu B
	Inspection and replacement of NC unit electrolytic capacitors and contacts for motor drive power
Every 10 years	Refresh menu C
	Replacement of CPU cards, etc.



●Estimated implementation time

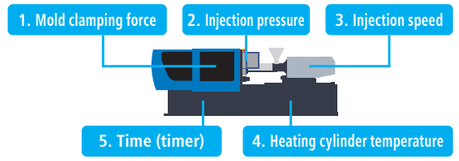
To enjoy stable high-performance from your equipment for years to come, it is strongly recommended to periodically have equipment serviced and refreshed.

※Daily inspections should be performed by the customer at the appropriate time based on operating hours and pre-operating conditions.

All-electric machine

Verification/calibration service

Specified items and parts are calibrated, which effectively enhances the accuracy of quality management efforts.



Member support service

Tomenai.net

Our information website for members is loaded with useful support content from operating guides and troubleshooting help to applications for honing one's production engineering skills.

www.tomenai-service.net/

●To sign up, contact your nearest our dealer.

Standard Equipment

Plasticizing and injection unit
1. Injection program control function (Multi-stage control)
2. Holding pressure program control function (Multi-stage control)
3. Screw pull back function (Before starting dosing/After dosing is completed)
4. Digital display function of screw position (0.01 mm setting)
5. Holding time 0.01 seconds setting function
6. V-P switchover function (Pressure/Position)
7. Filling delay timer function
8. Pursing device with interlock (Select the position where the interlock function is unused or the injection device is retracted)
9. Heating cylinder temperature control max. 5 zones *2
10. Heating cylinder temperature switching function (Molding/Lowered temperature/Pursing)
11. Standard capacity heater (More than C250)
12. Zone 1 high-capacity heater (Less than C160)
13. Screw cold start prevention function (With variable interlock timer and minimum melting time display)
14. Remote setting function for sprue break stroke (Reverse timing selection with delay timer, Nozzle contact detection, Movement time setting)
15. Screw rotation speed digital display function
16. Purging cover device (With limit switch)
17. Injection unit swivel device (With nozzle alignment adjustment mechanism)
18. Remaining cooling time display function
19. Dosing start delay timer function
20. Injection speed/Holding pressure rise speed selection function (10 modes)
21. Screw forward speed setting function during holding pressure
22. Screw pull back delay control function
23. Synchro dosing function
24. Screw reverse rotation control function
25. Independent temperature control device of nozzle
26. Standard energy saving heating cylinder cover (Two-layer structure)
27. Water cooling jacket temperature control device
28. Mold open operation function during dosing (Shut off nozzle drive control)
29. Filling pressure multi-stage control function
30. Resin residence prevention function
31. One-touch manual dosing function
32. High-precision, high-pressure nozzle contact device (Nozzle contact force 3-step variable)
33. Stainless steel purge resin saucer
34. SL Screw: Auto-tuning function of synchronization rate (SL Screw is a selection specification)
35. Deceleration pattern of V/P switchover (Slow landing) (Only for SE30EV-S)

Control unit
1. 15-inch TFT color LCD screen
2. Touch panel type setting input device
3. Molding condition storage function
4. Operation support function
5. Molding support function
6. Waveform display function (Waveform memory function, Display value reading function, Data storage by trigger, etc.)
7. Screen hard copy function
8. Take-out robot connection circuit device *1
9. Screen switching function in up to 15 languages
10. Maintenance management function (Inspection time, Grease greasing time, Item, Operation method display)
11. Automatic start/stop function (Lowered temperature/Heater start/Molding machine stop) *1
12. Process display function
13. SSR heater drive circuit device
14. Industrial unit input function (Speed, Position, Pressure and rotation speed)
15. Molding machine status output signal (5 CH) *1
16. USB connection circuit device (Memory)
17. Protection function of saved conditions
18. Abnormal processing selection function
19. Initial reject/Short stop reject function
20. Screen color change function
21. Numerical and character input keypad layout change function (Select from 2 types)
22. Take-out robot entry permission signal
23. Clean control cabinet (Only for SE30EV-S)
24. OPC UA server

Monitor unit
1. Actual value display function
2. Heater breakage monitoring device
3. Auxiliary equipment abnormality monitoring function (3 ch) *1
4. Abnormality monitoring function (Maximum cushion, Minimum cushion, Filling pressure, Mold protection, Cycle time, Dosing time)
5. Abnormality monitoring condition automatic setting function
6. Abnormal history display function (Abnormal item/Occurrence time display)
7. Quality control function (Statistical function of actual values, various graph functions, 100,000 shot storage and data confirmation function)
8. Production number management function (Molded product discrimination function, Automatic production completion, Stocker feed signal, Data logging, Production counter with reset)
9. Auto start function (Heater, External output signal)
10. Heating cylinder temperature monitoring function (All zones)
11. Self diagnosis function
12. Abnormal alarm buzzer
13. Shot counter
14. Processing function when cycle monitoring is abnormal (Heater processing mode change)
15. All process display screen function
16. Monitoring function to prevent forgetting to set monitoring
17. Ejector protrusion torque monitoring function
18. Maintenance time notification function (Maintenance time notification based on the number of shots / Elapsed time)
19. Injection pressure monitoring function (5 points)
20. Cycle analysis function

Clamp unit
1. Mold opening/closing position and speed program control function (5-stage/3-stage switching)
2. Mold protection function
3. Low pressure mold clamp function
4. Mold opening/closing pause function
5. Remote control function of clamp force
6. Remote control function of mold space
7. Ejector remote setting function (2-speed control, Pressure, Stroke, Delay timer, Multiple time protrusions)
8. Current value input function (Ejector protrusion position)
9. Current value input function (Mold open limit position)
10. Clamp mode selection function (Lockup)
11. Ejector protrusion interlock function (Ejector can be operated only at the mold opening completion position in manual mode)
12. Ejector protrusion function during mold opening
13. Ejector protrusion function during mold clamp
14. Mold plate return confirmation device (Input signal to molding machine) (Metal outlet connection) *1
15. Mold opening/closing signal (Spear control signal) *1
16. Valve gate drive circuit device (Control circuit only) *1
17. Stand by mode function for mold installation (Low mold opening/closing speed)
18. Toggle cover with polycarbonate window
19. Emergency stop push button switch (Operation side/Non-operation side)
20. Safety door with polycarbonate window
21. Screw holes for mounting the take-out robot
22. Grease centralized greasing device for mold clamp/injection unit
23. Mold clamp safety device (Electric/Mechanical)
24. Mold opening/closing low vibration or high speed mode selection function
25. Movable platen support device (Linear guide type)
26. Center Press Platen mechanism
27. Product drop confirmation connection circuit *1
28. Multi-toggle function (Multi-stage clamp force setting)
29. Tie bar plating specification
30. Ejector motor device with brake
31. S-MOVE function (Low vibration control)
32. Ejector standby position function
33. Control device for mold installation space with servo motor
34. Dust-proof cover on top of toggle (Fixed type)
35. Dry cycle mode function

Others
1. Auto grease supply unit (Cartridge grease type)
2. 3-way take-out frame
3. Mold cooling water block device (2 systems) (Flow indicator and valve are options)
4. Standard spare parts (Fuses, Air filters)

*1 All input and output signals are no-voltage contact signals. Power is not supplied with output signals.
*2 The number of zone varies depending on the screw diameter and screw type.
*3 The injection duty is 50%. The maximum injection speed of C35 unit and C160 unit change as follows. C35: 500 mm/s C160: 350 mm/s
*4 All input signals are no-voltage contact signals. All output signals are 24 V DC signals.
*5 All input and output signals are 24 V DC signals.
*6 The ejector stroke will be shortened, and maximum ejector speed slows down.
*7 The overall machine length is larger by 50 mm (SE100EV-S - SE180EV-S: 100 mm), and maximum mold thickness is larger by 50 mm.
*8 The overall machine length and maximum mold thickness are larger by 100 mm.
*9 You cannot choose this option with 100 mm mold thickness extension.
*10 The compression time with listed compression force is less than 20% of cycle time, and the ejector stroke will be shortened.
● Specifications are subject to change without notice for performance improvement.

Standard Equipment

Zero-molding features	
1. Zero-molding main screen: Simple process setting	18. Zero-molding: Clamp force feed back function
2. Zero-molding main screen : Production monitor (Production number/Process/Abnormality/Actual results)	19. Clamp force multi-stage control function (Cross-head position control)
3. Specifications/Function confirmation screen (Standard functions/Optional functions/Abnormality handling/Specification list/Monitoring device)	20. Multi-toggle function (Gas vent function/Deformation prevention function)
4. Minimum mold clamp force detection function (Automatic measurement)	21. Zero-molding: Molding condition support monitor function (Peak clamp force, Pack pressure, Status display)
5. Setup support: Mold installation screen (Mold height, Mold contact, Clamp force, Mold open/close in preparations, Ejector setting)	22. Actual value monitor switching function (Actual/Process/Power/Waveform/Temperature graph)
6. Setup support: Mold condition setting screen (Open/close, Ejector multi-stage setting)	23. Monitoring setting: Function to automatically set all at once
7. Setup support: Mold opening limit/Ejector protrusion position teaching function (Current value input)	24. Molding condition access restriction function (Condition range, Screen display, Password function)
8. Setup support: Protection setting screen (Mold protection, Ejector protection)	25. Automatic condition change function for molding start (By short shot method)
9. Setup support: Multi-purging function (Gate purging, Resin replacement purging, Slight time stop purging, Low-viscosity resin purging, Resin viscosity measurement)	26. Protection: Screw protection function
10. Setup support: Temperature condition reference/Calling function	27. Energy saving mode function of holding pressure (with automatic energy saving control function)
11. Setup support: Resin residence alarm/Monitoring function	28. Waveform display function: Simple display by process (Injection, Holding pressure, Dosing, Mold opening, Mold closing, Ejector, Mold height)
12. Setup support: Nozzle/Heating cylinder temperature rise mode function (Step/Nozzle delay/Process temperature control)	29. Waveform display function: Waveform save completion message
13. Zero-molding Molding condition setting screen: Z-Screen (Filling, Holding pressure, Dosing, time, Temperature, Mold clamp force)	30. Waveform display function: Automatic waveform save function (Always/Trigger/Abnormal)
14. Zero-molding: FFC control (with guidance function)	31. Quality control function: Waveform monitoring function
15. Zero-molding: FFC control, mode setting function	32. Quality control function: Molding process monitor logging function (Temperature, Temperature control output, Peak clamp force, Pack pressure)
16. Zero-molding: Function to check the filling position and short shot position by flow front check	33. Production control function: Function to set the number of cavities and manage the number of products
17. Screw reversal decompression control function	34. Production control function: Operation status management function (operating time, motor load factor, power consumption monitor)

Optional Equipment

Plasticizing selection
1. Ion-nitride screw assembly
2. Hard chromium plating screw assembly
3. Wear and corrosion resistant A screw assembly
4. Wear and corrosion resistant B screw assembly
5. Wear and corrosion resistant C screw assembly
6. High-temperature screw assembly (Max. temp. 450 °C)
7. SD Screw
8. SM Screw
9. SL Screw
10. Screw tip set Rotation type
11. Screw tip set Rotation type TiN coating
12. Screw tip Corrosion and wear resistant A Non-rotation type
13. Screw tip Corrosion and wear resistant B Non-rotation type
14. Screw tip Corrosion and wear resistant C Non-rotation type
15. Open nozzle
16. Needle nozzle (Needle is operated by pneumatic.)
17. FTCII nozzle (Open nozzle: ø18 mm- ø36 mm, Less than SE130EV-S)
18. Cylinder nozzle
19. Zone 1 high capacity heater (More than C250)
20. High capacity heater
21. Extension nozzle
22. High insulated cylinder cover

Plasticizing and injection unit
1. Resin temperature finder (Only for needle nozzle type)
2. Standard type hopper
3. V/P switchover by mold cavity pressure
4. Needle valve nozzle drive circuit
5. FTC nozzle electric control circuit (Built-in)
6. High temperature heater control circuit (Up to 499 °C)
7. Hopper swivel mounting plate
8. Plating resin inlet of cooling water jacket
9. High efficiency nozzle control (Depression of nozzle contact force)
10. High duty injection *3
11. GS Loader control circuit
12. Nozzle pressing force reduction (Nozzle pressing force: 14 kN) (Only for SE50EV-S C160)

Control and monitor unit
1. Leak circuit breaker (AC200V, 220V 3ø3W+E) (Japan and Asia only)
2. Mold temperature monitor (2 zones on movable platen, Without thermocouple, Type K)
3. Mold temperature monitor (1 zone on movable platen and 1 zone on fixed platen, Without thermocouple, Type K)
4. Mold temperature monitor (2 zones on movable platen and 2 zones on fixed platen, Without thermocouple, Type K)
5. Production control (2-directional rejection chute)
6. Mold temperature controller (K=CA, 2 zones on movable platen)
7. Mold temperature controller (K=CA, 1 zone on movable platen and 1 zone on fixed platen)
8. Mold temperature controller (K=CA, 2 zones on movable platen and 2 zones on fixed platen) (Only for SE75EV - SE180EV)
9. Automatic starting system (Heater+Water supply+External output signal) *1
10. Revolving alarm lamp
11. Multi function 3-color LED alarm lamp
12. 4-line closed circuit water connection lines (With flow detector, Stop valve, Cooling water stop valve, Filter)
13. 2-line closed circuit water connection lines (With flow detector, Stop valve, Cooling water stop valve, Filter)
14. Personal computer connection circuit, Ethernet
15. Spare power supply outlet selection

Control and monitor unit
16. Electric power supply receptacles (Operation side)
17. Name plate: Blue
18. Name plate: Black
19. Motion07
20. MotionGB
21. Korea Certification Mark
22. Addition of the motor breaker

Clamp unit
1. Core tractor control circuit 1 system (Control circuit+Piping) *4
2. Core tractor drive circuit (No hydraulic pump) (Only for SE50EV-S - SE180EV-S)
3. Core tractor drive circuit (The ie Hydraulic Pump is included.) (Only for SE50EV-S - SE180EV-S)
4. Pneumatic core pull control circuit 1 system (Control circuit+Piping) *4
5. Rotating core control circuit (Motor drive, Less than 1.5 kW)
6. SPI take-out robot connection circuit *1
7. SPI AN-146/EUROMAP67 take-out robot connection circuit
8. Product chute
9. High precision heat insulating plate (5 mm/10 mm, Cross type)
10. Mold clamp control unit *4
11. Valve gate drive circuit (Control circuit+Pneumatic circuit) *4
12. Valve gate drive circuit (The ie Hydraulic Pump is included.)
13. Full metallic toggle cover
14. Ejector compression device (SE50EV-S - SE180EV-S: 49 kN) *6
15. Mold space extension 50 mm *7
16. Mold space extension 100 mm (Only for SE100EV-S - SE180EV-S) *8
17. Slide core return signal *1
18. Double Center Press Platens (Only for SE100EV-S - SE180EV-S) *9
19. Ejector force power up (SE100EV-S - SE180EV-S: 59 kN) *10
20. Ejector stroke extension (SE50EV-S, SE75EV-S: 100 mm, SE100EV-S - SE180EV-S: 150 mm)
21. Pneumatic control circuit *5
22. Signal for hoop molding (Only for SE30EV-S)
23. High cycle specification (Only for SE30EV-S)

Spare parts and accessories
1. Spare parts A (Mechanical parts: Lub. parts)
2. Spare parts A (Electrical parts: Thermocouple)
3. Spare parts for export (Encoder, Limit switch, Inductive proximity sensors)
4. Leveling pads (For one machine)
5. Anchor bolts (For one machine)
6. Locating ring (Transition fit) Inner diameter: ø26 mm/Outer diameter: ø60 mm (Only for SE30EV-S)
7. Locating ring (Transition fit) Inner diameter: ø100 mm/Outer diameter: ø120 mm (Only for SE180EV-S)
8. Locating ring (Transition fit) Inner diameter: ø110 mm/Outer diameter: ø120 mm (Only for SE180EV-S)
9. Mechanical parts and hooks for hosting machine
10. Tool A
11. Ejector rods
12. Grease gun
13. Grease cartridge for automatic lub (700 cc)
14. Grease cartridge for manual lub (400 cc)
15. High precision heat insulating plate (5 mm/10 mm, Cross type)
16. Mold clamp
17. Box end wrench for open nozzles
18. Offset wrench for shut-off nozzle

Main Specifications

■ Clamping unit

Item	Unit	SE30EV-S	SE50EV-S	SE75EV-S
Clamping system		Double toggle (5 points)	Double toggle (5 points)	Double toggle (5 points)
Clamping force max.	kN	300	500	750
Clearance between tie-bars (H x V)	mm	310 x 290	360 x 360	420 x 420
Platen size (H x V)	mm	440 x 420	500 x 500	580 x 580
Daylight	mm	530	600	710
(Mold height extension 50 mm)		(580)	(650)	(760)
(Mold height extension 100 mm)		—	—	—
Mold opening stroke	mm	230	250	300
Platen speed max.	mm/s	1200	1200	1200
Mold height (min. - max.)	mm	130～300	160～350	160～410
(Mold height extension 50 mm)		(130～350)	(160～400)	(160～460)
(Mold height extension 100 mm)		—	—	—
Locating hole diameter	mm	ø60	ø100	ø100
(When the option is selected)		(ø26)	—	—
Ejector system (ejecting points)		Motor driven type (1 point)	Motor driven type (5 points)	Motor driven type (5 points)
Ejector ejection force	kN	7.8	21	26
(When ejector compression device is selected)		—	(49)	(49)
(When ejector force power up is selected)		—	—	—
Ejector speed (max.)	mm/s	333	333	333
(When ejector compression device/ejector force power up is selected)		—	(250)	(250)
Ejector stroke	mm	50	70	80
(When ejector stroke extension is selected)		—	(100)	(100)
(When ejector compression device/ejector force power up is selected)		—	(60)	(70)

■ Injection unit

		C35				C65			
		MN		S		S			
Screw diameter	mm	14 *6·*8	16 *6·*8	18	20	18	20	22	25
Injection pressure (max.) *1,*2	MPa	223	266	224	181	274	265	220	170
Holding pressure (max.) *1,*2	MPa	223	266	224	181	274	265	220	170
(When high speed filling specification is selected) *7		—				—			
Theoretical injection capacity	cm^3	6	11	14	18	19	24	29	38
Injection weight (GPPS)	g	5.8	11	13	17	18	23	28	36
Plasticizing rate *3, *4	kg/h	5.1	9.5	11	14	10	13	18	26
Injection rate	cm^3/s	92	120	152	188	139	172	209	269
(When high load filling specification is selected) *7		(76)	(100)	(127)	(157)	(139)	(172)	(209)	(269)
(When high speed filling specification is selected) *7		—				—			
Screw stroke	mm	40	58			78			
Injection speed (max.)	mm/s	600				550			
(When high load filling specification is selected) *7		(500)				(550)			
(When high speed filling specification is selected) *7		—				—			
Screw speed (max.)	min^{-1}	460	430			400			
Number of temperature control zone		5		4		4		5	
Heater capacity	kW	2.2	2.6	3.2	3.6	3.2	3.6	3.9	4.3
Nozzle contact force	kN	7.8				14			
(When low nozzle contact force is selected)		—				—			
Injection unit moving stroke	mm	135～185				135～210			
Nozzle protrusion	mm	30				30			
Hopper capacity (When the standard hopper is selected)	L	(6)		(15)		(15)			

C65						C110						C160						C110						C160						C250				
MN		S				MN		S				S						MN		S				S						S		M		
14 *6	16 *6	18	20	22	25	16 *6	18 *6	20 *6	22	25	28	18 *6	20 *6	22 *6	25	28	32	16 *6	18 *6	20 *6	22	25	28	18 *6	20 *6	22 *6	25	28	32	22 *6	25 *6	28	32	36
223	266	274	265	220	170	266	274	265	274	212	174	274	265	274	274	218	167	266	274	265	274	212	174	274	265	274	274	218	167	274	274	284	217	171
223	266	274	265	220	170	266	274	265	274	212	174	274	265	274	274	218	167	266	274	265	274	212	174	274	265	274	274	218	167	274	274	284	217	171
—						—						—						—						—						(274)	(274)	(284)	(217)	(171)
6	11	20	25	30	38	11	19	24	40	51	64	19	24	39	51	64	84	11	19	24	40	51	64	19	24	39	51	64	84	39	51	86	113	143
5.8	11	19	24	28	37	11	18	23	38	49	61	18	23	37	49	61	80	11	18	23	38	49	61	18	23	37	49	61	80	37	49	83	108	137
4.4	8.8	10	13	18	26	8.8	10	13	18	26	37	10	13	18	26	37	53	8.8	10	13	18	26	37	10	13	18	26	37	53	18	26	37	53	76
84	110	140	173	209	270	100	127	157	190	245	308	101	125	152	196	246	322	100	127	157	190	245	308	101	125	152	196	246	322	133	171	216	281	356
(84)	(110)	(140)	(173)	(209)	(270)	(100)	(127)	(157)	(190)	(245)	(308)	(89)	(109)	(133)	(171)	(215)	(281)	(100)	(127)	(157)	(190)	(245)	(308)	(89)	(109)	(133)	(171)	(215)	(281)	(133)	(171)	(216)	(281)	(356)
—						—						—						—						—						(247)	(319)	(400)	(522)	(661)
40	58	78				58	78	104				78	104					58	78	104				78	104					104	140			
550						500						400						500						400						350				
(550)						(500)						(350)						(500)						(350)						(350)				
—						—						—						—						—						(650)				
400						400						400						400						400						400				
4		5				4		5				4	5					4		5				4	5					5				
2.3	2.7	3.1	3.5	3.8	4.2	2.7	3.1	3.5	3.8	4.2	4.8	3.1	3.5	3.8	4.2	4.8	5.4	2.7	3.1	3.5	3.8	4.2	4.8	3.1	3.5	3.8	4.2	4.8	5.4	3.8	4.2	6.5	7.5	8.4
14						14						43						14						43						43				
—						—						—	(14)					—						—						—				
170～250						170～250						250						200～300						200～300						200～300				
30						30						30						30						30						30	45			
(15)						(15)						(15)						(15)						(15)						(30)				

■ Machine dimensions and weight

Machine dimensions (L x W x H) *5	mm	3185 x 1005 x 1491	3682 x 1113 x 1575	4260 x 1183 x 1575
(Fast cycle specification)		(3207 x 1116 x 1491)	—	—
(Mold height extension 50 mm)		(3235 x 1005 x 1491)	(3732 x 1113 x 1575)	(4310 x 1183 x 1575)
(Mold height extension 100 mm)		—	—	—
Machine weight	t	2.0	2.7	3.5

Machine dimensions (L x W x H) *5	mm	3682 x 1113 x 1575	4260 x 1183 x 1575
(Fast cycle specification)		—	—
(Mold height extension 50 mm)		(3732 x 1113 x 1575)	(4310 x 1183 x 1575)
(Mold height extension 100 mm)		—	—
Machine weight	t	2.7	3.6

Machine dimensions (L x W x H) *5	mm	3682 x 1113 x 1575	4260 x 1183 x 1575
(Fast cycle specification)		—	—
(Mold height extension 50 mm)		(3732 x 1113 x 1575)	(4310 x 1183 x 1575)
(Mold height extension 100 mm)		—	—
Machine weight	t	2.8	3.7

*1 The max. injection pressure and max. hold pressure are calculated values and represent machine output, not resin pressure.
*2 The max. injection pressure and max. hold pressure are not sustained pressure levels.
*3 The plasticizing rate is shown for a machine equipped with SD Screw. *4 50% of the value in the table is the threshold value when the SL Screw is selected.
*5 The total length of the machine is to the front end of the injection unit when mounting the screw of the smallest diameter.
The total height of the machine does not include the dimensions of leveling pads and hopper. *6 SL Screw cannot be selected.
*7 High load specification and high filling specification cannot be selected at the same time. *8 Only available for connector machine.
● Specifications are subject to change without notice for performance improvement.

Main Specifications

Clamping unit

Item	Unit	SE100EV-S	SE130EV-S	SE180EV-S
Clamping system		Double toggle (5 points)	Double toggle (5 points)	Double toggle (5 points)
Clamping force max.	kN	1000	1300	1800
Clearance between tie-bars (H x V)	mm	460 x 460	510 x 510	560 x 560
Platen size (H x V)	mm	650 x 650	720 x 720	800 x 795
Daylight	mm	800	850	950
(Mold height extension 50 mm)		(850)	(900)	(1000)
(Mold height extension 100 mm)		(900)	(950)	(1050)
Mold opening stroke	mm	350	400	450
Platen speed max.	mm/s	1200	1200	1200
Mold height (min. - max.)	mm	180～450	180～450	200～500
(Mold height extension 50 mm)		(180～500)	(180～500)	(200～550)
(Mold height extension 100 mm)		(180～550)	(180～550)	(200～600)
Locating hole diameter	mm	ø100	ø100	ø120
(When the option is selected)		—	—	(ø100 / ø110)
Ejector system (ejecting points)		Motor driven type (5 points)	Motor driven type (5 points)	Motor driven type (5 points)
Ejector ejection force	kN	32	32	45
(When ejector compression device is selected)		(49)	(49)	(49)
(When ejector force power up is selected)		(59)	(59)	(59)
Ejector speed (max.)	mm/s	333	333	333
(When ejector compression device/ejector force power up is selected)		(333)	(333)	(333)
Ejector stroke	mm	100	100	120
(When ejector stroke extension is selected)		(150)	(150)	(150)
(When ejector compression device/ejector force power up is selected)		(80)	(80)	(100)

Injection unit

		C110	C160	C250	C360	C160	C250	C360	C450	C250	C360	C450	C560
		MN	S	S	S	M	S	M	S	M	M	S	M	S	M	M	M
Screw diameter	mm	16 *6	18 *6	20 *6	22	25	28	18 *6	20 *6	22 *6	25	28	32	22 *6	25 *6	28	32	36	25 *6	28 *6	32	36	40	18 *6	20 *6	22 *6	25	28	32	22 *6	25 *6	28	32	36	25 *6	28 *6	32	36	40	28 *6	32 *6	36	40	45	22 *6	25 *6	28	32	36	25 *6	28 *6	32	36	40	28 *6	32 *6	36	40	45	32 *6	36 *6	40	45	50
Injection pressure (max.) *1,*2	MPa	266	274	265	274	212	174	274	265	274	274	218	167	274	274	284	217	171	274	284	273	215	175	274	265	274	274	218	167	274	274	284	217	171	274	284	273	215	175	284	273	259	209	165	274	274	284	217	171	274	284	273	215	175	284	273	259	209	165	273	259	274	216	175
Holding pressure (max.) *1,*2	MPa	266	274	265	274	212	174	274	265	274	274	218	167	274	274	284	217	171	274	284	273	215	175	284	273	259	209	165	274	274	284	217	171	274	284	273	215	175	284	273	259	209	165	273	259	274	216	175
(When high speed filling specification is selected) *7		—						—						(274)	(274)	(284)	(217)	(171)	—					—						(274)	(274)	(284)	(217)	(171)	—					—						(274)	(274)	(284)	(217)	(171)	—					—						(218)	(207)	(219)	(173)	(140)
Theoretical injection capacity	cm^3	11	19	24	40	51	64	19	24	39	51	64	84	39	51	86	113	143	51	86	129	163	201	19	24	39	51	64	84	39	51	86	113	143	51	86	129	163	201	86	128	163	201	254	39	51	86	113	143	51	86	129	163	201	86	128	163	201	254	128	162	201	254	314
Injection weight (GPPS)	g	11	18	23	38	49	61	18	23	37	49	61	80	37	49	83	108	137	49	83	124	156	193	18	23	37	49	61	80	37	49	83	108	137	49	83	124	156	193	83	123	156	193	244	37	49	83	108	137	49	83	124	156	193	83	123	156	193	244	123	156	193	244	302
Plasticizing rate *3, *4	kg/h	8.8	10	13	18	26	37	10	13	18	26	37	53	18	26	37	53	76	26	37	53	76	101	10	13	18	26	37	53	18	26	37	53	76	26	37	53	76	101	37	53	76	101	136	18	26	37	53	76	26	37	53	76	101	37	53	76	101	136	53	76	101	136	193
Injection rate	cm^3/s	100	127	157	190	245	308	101	125	152	196	246	322	133	171	216	281	356	171	215	281	356	440	101	125	152	196	246	322	133	171	216	281	356	171	215	281	356	440	215	281	356	440	557	133	171	216	281	356	171	215	281	356	440	215	281	356	440	557	281	356	440	557	687
(When high load filling specification is selected) *7		(100)	(127)	(157)	(190)	(245)	(308)	(89)	(109)	(133)	(171)	(215)	(281)	(133)	(171)	(216)	(281)	(356)	(171)	(215)	(281)	(356)	(440)	(89)	(109)	(133)	(171)	(215)	(281)	(133)	(171)	(216)	(281)	(356)	(171)	(215)	(281)	(356)	(440)	(215)	(281)	(356)	(440)	(557)	(133)	(171)	(216)	(281)	(356)	(171)	(215)	(281)	(356)	(440)	(215)	(281)	(356)	(440)	(557)	(281)	(356)	(440)	(557)	(687)
(When high speed filling specification is selected) *7		—						—						(247)	(319)	(400)	(522)	(661)	—					—						(247)	(319)	(400)	(522)	(661)	—					—						(247)	(319)	(400)	(522)	(661)	—					—						(402)	(508)	(628)	(795)	(981)
Screw stroke	mm	58	78	104	78	104	104	140	104	140	104	140	160	78	104	104	140	104	140	160	140	160	104	140	104	140	160	140	160	160																																		
Injection speed (max.)	mm/s	500			400			350			350			400		350		350			350			350			350			350																		