## Sumitomo Global Network


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

SEEV-A

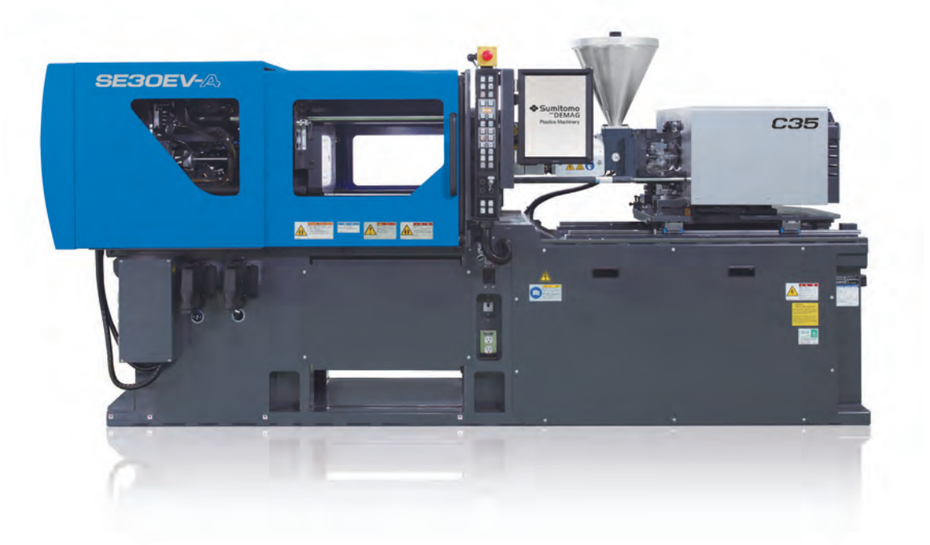
All-electric Injection Molding Machine for Lenses

SEEV-A All-electric Injection Molding Machine for Lenses

Sumitomo SHI DEMAG

# SEEV-A

## All-electric Injection Molding Machine for Lenses




### Lineup

SE30EV-A (300kN)

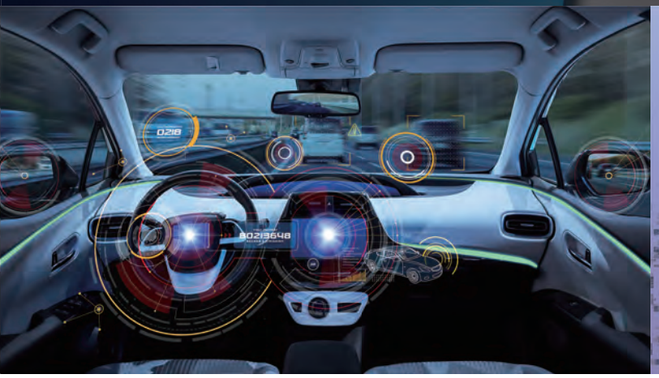
SE50EV-A (500kN)

Our products have acquired ISO9001 certification.

www.shi.co.jp/plastics/

B013EN01-2010HG

Sumitomo Heavy Industries, Ltd.



## Well-rounded R&D and customer support

At the Yokosuka Technology Labs, basic and elemental technologies are developed across divisional lines.

The Chiba Plant Technology Center is equipped with the latest measuring instruments in order to better assist customers with their product development.

Introductory and intermediate level training classes are periodically imparted at business sites in Chiba, Japan and Suzhou and Dongguan, China. All sites have the latest molding machines for learning mass-production technologies.



# Purpose-specific machines for leading the next generation in lens molding

**The SE30EV-A has been newly added to the SEEV-A series lineup that brought amazing innovation to precision molding. Welcome two new more-than-capable, purpose-specific machines SE30EV-A and SE50EV-A for molding optical lenses.**


## Lineage of lens molding machines

**With its molding machines,
Sumitomo has always stayed one step ahead of trends towards
smaller sized, higher precision and thinner profiled optical lenses.**

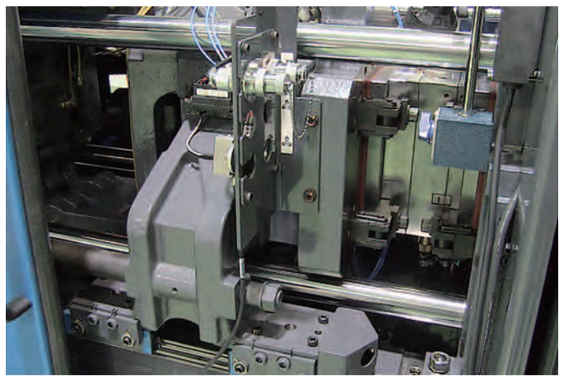
# Improving lens eccentricity

### Platens stay high parallelism

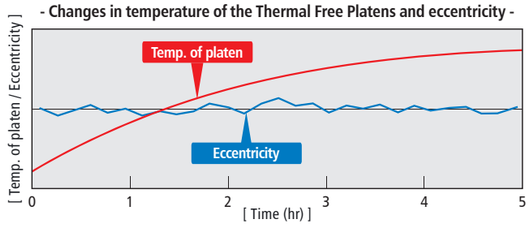
## Thermal Free Platens

**The SE30EV-A employs specially structured Thermal Free Platens that minimize any irregular deformation due to heat, resulting in a platen that stays flat and centered longer.**

PAT. pend. in Japan

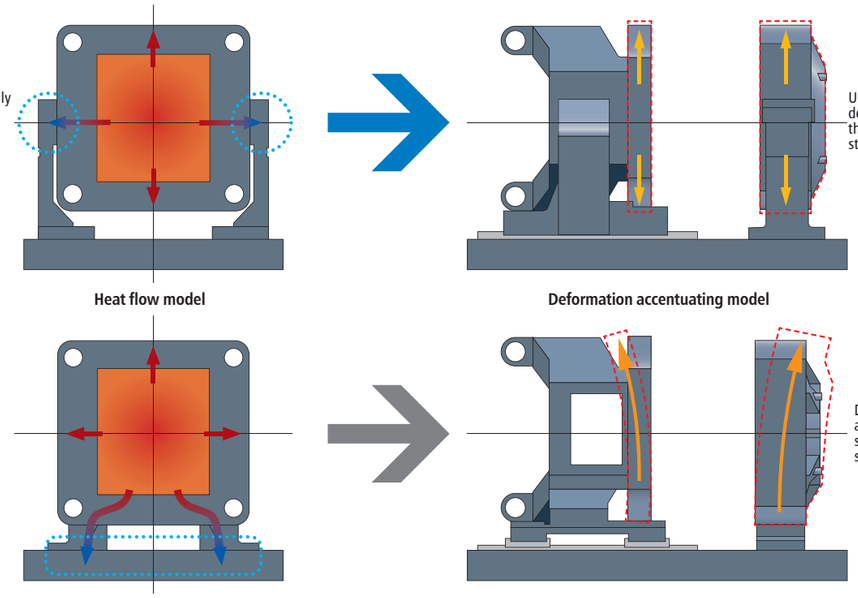


- Changes in temperature of the Thermal Free Platens and eccentricity -




### Themal Free Platens

Heat propagates symmetrically upwards/downwards. Temperature is the same above and below the platen.



Heat flow model



Deformation accentuating model

Upward/Downward deformation is even across the platen, so the platen stays flat.

### Conventioanl Platens

Temperatures differ above and below the platen because heat propagated to the frame.





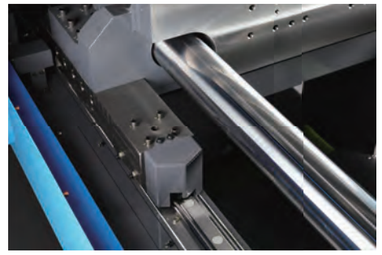
Deformation is uneven across the platen, so the platen does not stay flat.

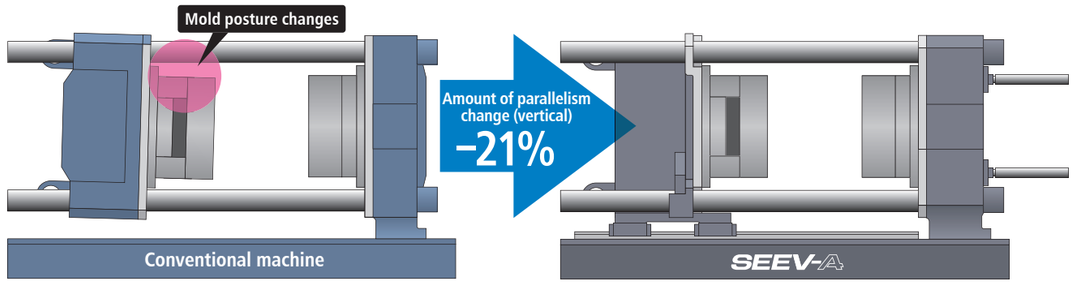


### Keeps linearity and parallelism of molds and prevents damages to the molds

## Platen support and bush-less tie bar

**SEEV-A provides smooth mold open/close at heavy mold with accurate platen parallelism. This function demonstrates the mold accuracy 100% and prevents mold damage, such as pin stuck, etc.**

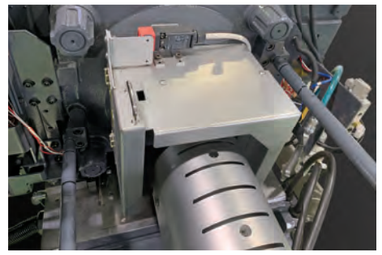


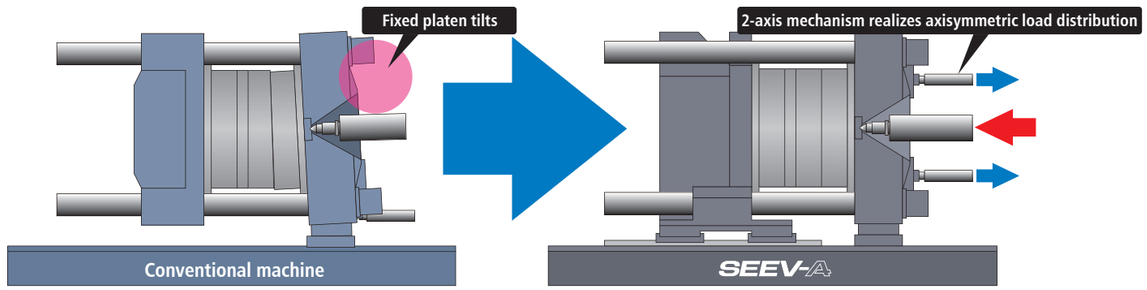



### Prevents tilting of fixed platen

## High precision nozzle touch mechanism

**The 2-axis support mechanism provides a load distribution centered on the nozzle. Thus, it is possible to prevent the fixed platen from tilting during filling and holding pressure.**



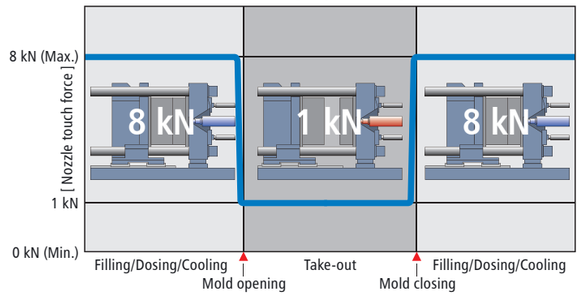



### Prevents misalignment and galling

## Nozzle touch force feedback control

**Nozzle touch boosting/depressurizing can be controlled along the molding process and both boosting and depressurizing pressure can be set numerically. It suppresses tilting of the fixed platen and deformation of the mold, and prevents misalignment and pin galling.**

- Nozzle touch boosting/depressurizing setting example -

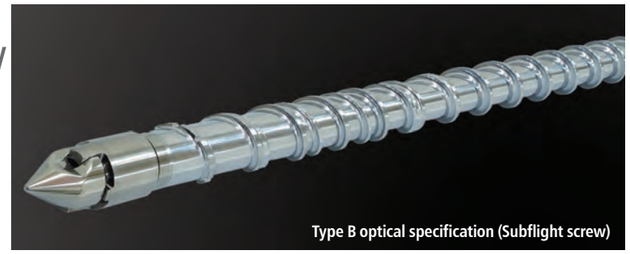


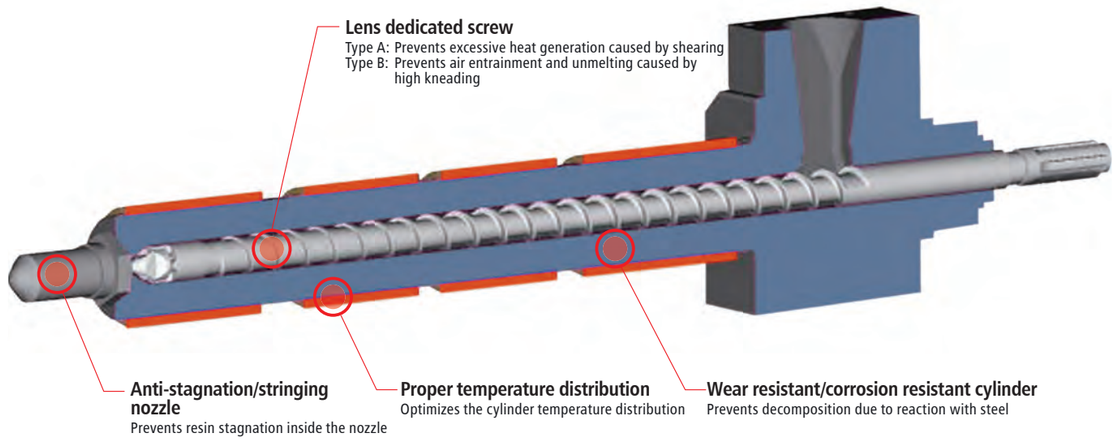
# Improving lens appearance accuracy

## Optimal design for optical molding

## Lens dedicated screw assembly

Sumitomo offers two types of screw assemblies designed specifically for optical molding.
Type A keeps shearing force low to prevent resin from carburizing. It works with all transparent resins but is particularly effective in COC molding.
Type B is configured for extensive kneading (subflight) to prevent air entrainment and incomplete melting. The benefits are seen in molding COP and PC lenses.

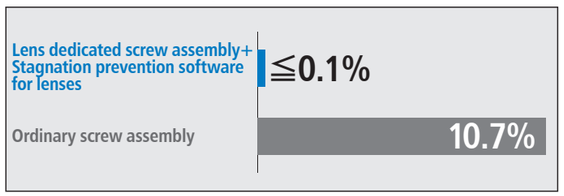

Type B optical specification (Subflight screw)




| Resin | COC | | COP, PC | |
|---|---|---|---|---|
| Defectiveness | Black spots | White spots/Blisters | Black spots | White spots/Blisters |
| Type A | ◎ | ○ | ○ | ○ |
| Type B | ○ | ◎ | ○ | ◎ |

◎ Excellent ○ Good

- Comparison of defective rates -




Plasticizing unit: C35 / Screw dia.: 18 mm / Resin: APEL 5514ML
According to the conditions set by Sumitomo when using type A



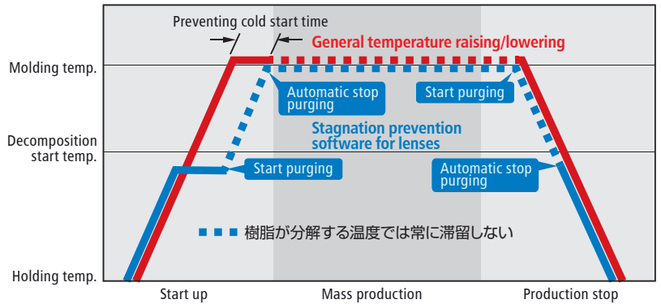
## Prevents defects caused by resin stagnation

## Stagnation prevention software for lenses

This is purge control software that resin does not stagnate in the cylinder during the temperature range when the resin decomposes.

PAT. pend. in Japan

- Model for raising/lowering temperature -

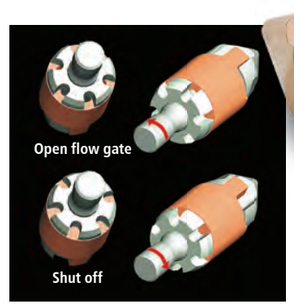


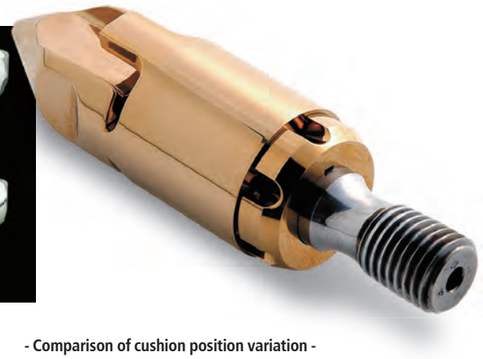

## Enables more stable filling

## SK Control+ Density correction

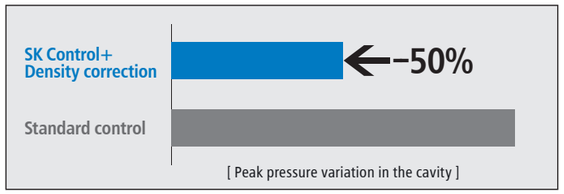
With a screw head equipped with a high-precision backflow prevention mechanism, performs density correction after dosing. In addition to suppressing variations in mold internal pressure and improving stability, it is also effective in preventing blisters.

PAT. pend. in Japan (SK Control) Option

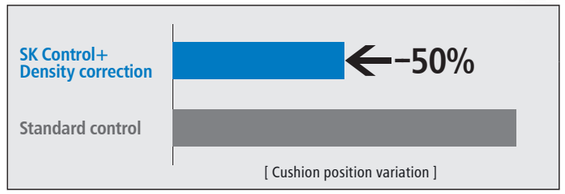


- Comparison of peak pressure variation in the cavity -




- Comparison of cushion position variation -

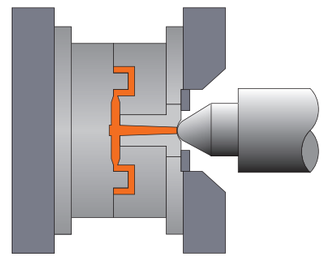


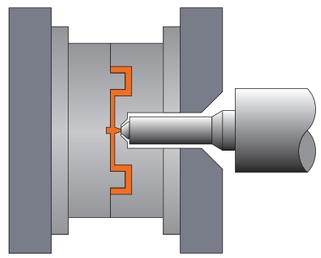

## Eliminates stringing and nozzle clogging

## FTC II Nozzle for lens

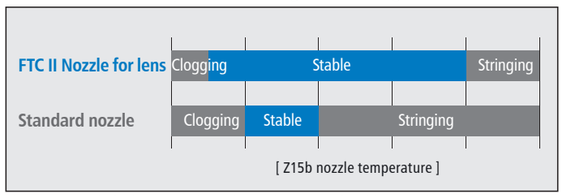
The FTC II Nozzle for lens has a stable temperature distribution thanks to 2-zone temperature control. By optimizing the temperature of the nozzle, the range of molding conditions can be expanded. It is easy to adjust the nozzle temperature condition, which can eliminate stringing and clogging the nozzle simultaneously.

Option


Standard nozzle


FTCII Nozzle for lens

- Comparison of molding condition range -




The FTC II Nozzle for lenses works with a wider scope of molding conditions that do not cause stringing or clogging.
It lessens the difficulty of setting workable molding conditions.

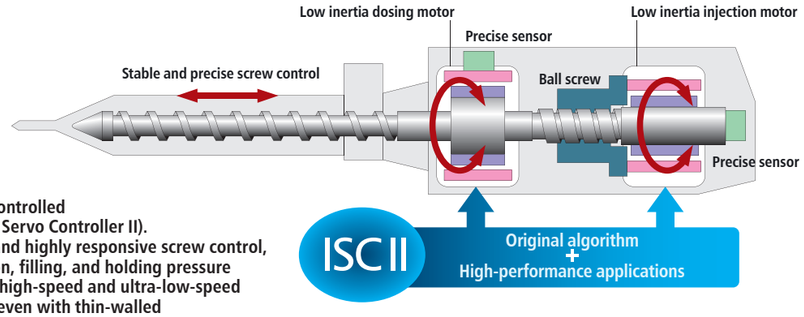
# Improving lens thinning

## Excellent low-speed injection control

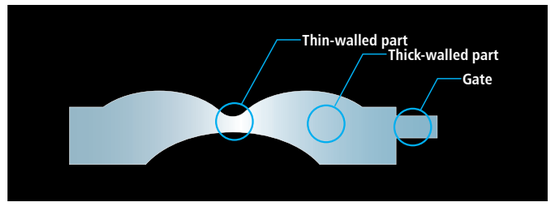
## Direct drive system

Originally-developed low-inertia servomotor is controlled by an up-to-date control system ISCII (Intelligent Servo Controller II).
The direct drive system enables highly accurate and highly responsive screw control, and realizes more precise and stable plasticization, filling, and holding pressure processes. It has excellent controllability in both high-speed and ultra-low-speed ranges, and precision stable molding is possible even with thin-walled and thick-walled mixed lenses.

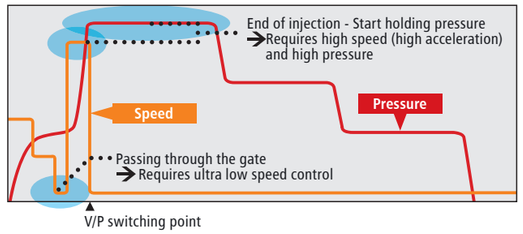
PAT. pend. in Japan




- Thin-walled and thick-walled mixed lens example (Cross section) -




- Injection controllability of lens molding -



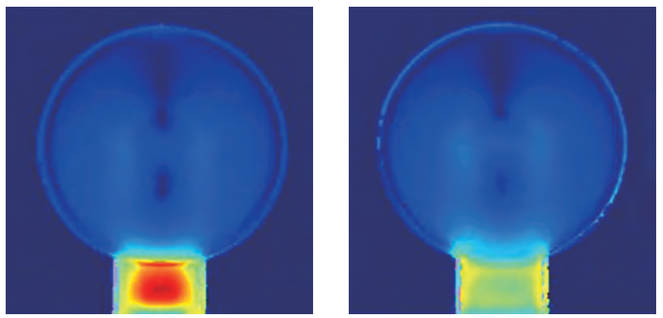

## Compatible with thinner lenses

## High precision ejector compression

During the filling process, cavities are compressed by the ejector so that cavities are more evenly filled.
This makes it possible to mold low double refraction lenses with minimal residual stress.
Moreover, high-precision positioning in units of 1 $\mu$m ensures stable surface accuracy and supports thinner profiles.

Option

- Comparison of residual stress using polarized photography -



Ordinal molding　　Ejector compression

### Supporting next-generation lens molding

# Various quality control functions

## Enables higher quality control

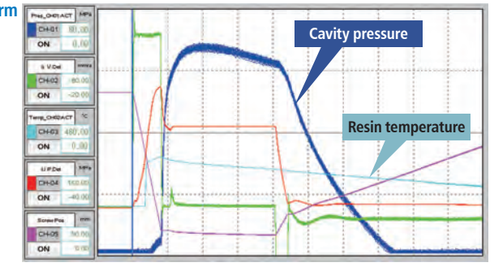
## Quality Control Package

Through the dedicated connectors, the analog readings (voltage and current) that external sensors generate for cooling water flowrate, mold internal pressure or other quality-pertinent conditions can be monitored and recorded from the operating panel's waveform viewing and logging windows.
This application package provides superior quality control.

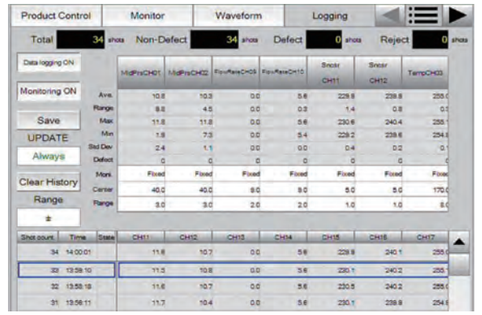
- Waveforms and logging can be delected from "Cavity Pressure", "Flowrate", "Temperature" and "Sensor".

Option

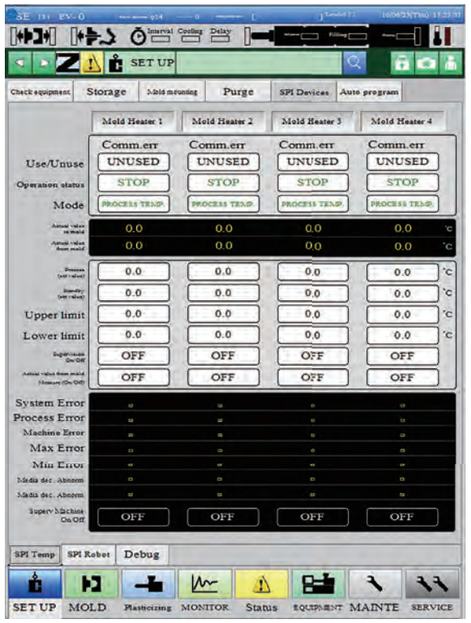
Waveform




Logging




成形機で温調機を制御・監視




## Control and monitor mold temperature controller with IMM

## SPICCP Communication for Mold Temperature Controller

By connecting molding machine and mold temperature controller through SPICCP, mold temperature controller can be operated from the molding machine.
Not only does this quicken the setup retrieval but it also prevents careless mistakes.

- Please inquire about the manufacturers of temperature controllers and the types of cables used.

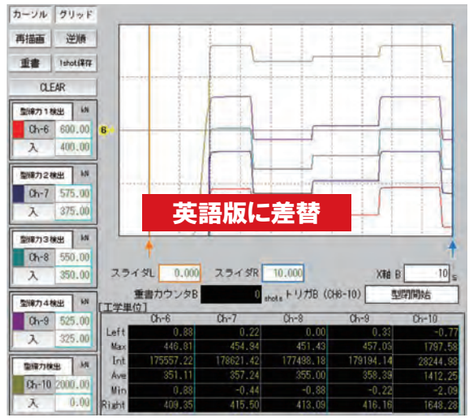
Option

## Further improving quality control

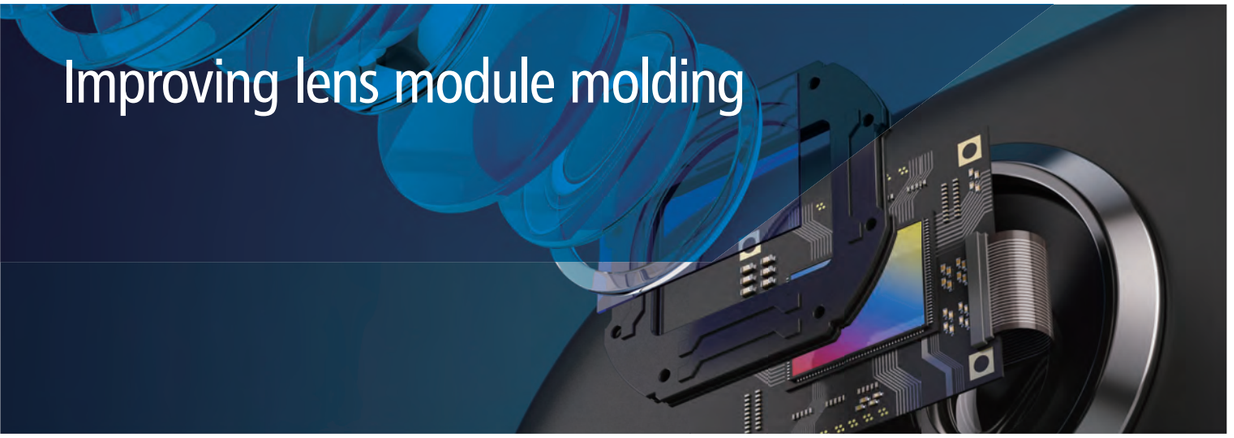
## Tie bar force balance monitor

Equipped with a clamp force sensor on every tie bars and each axial force is displayed in real time.
It can be combined with waveform display/logging/monitoring functions to improve the accuracy of quality control.
You can check changes over time, which is effective for maintenance management.

PAT. pend. in Japan (Clamp force censor)　Option

# Improving lens module molding

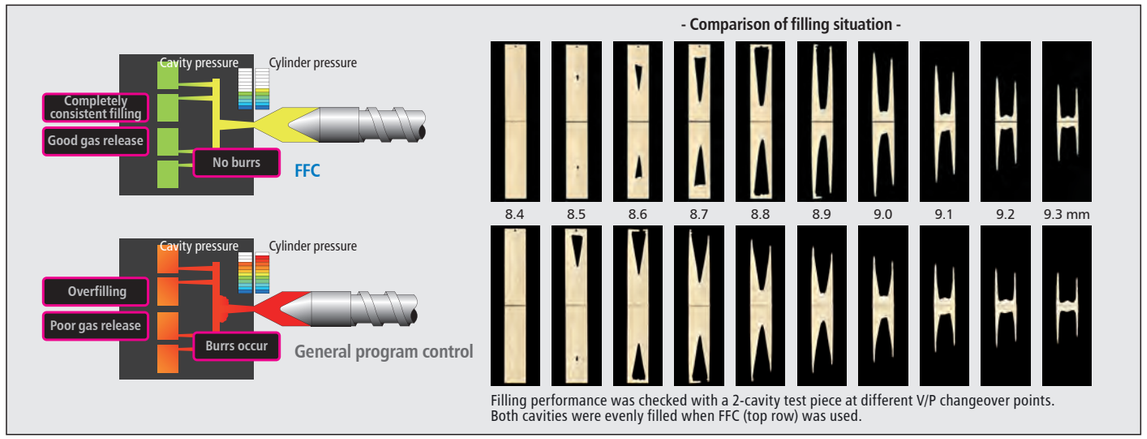


## Superior cavity balance

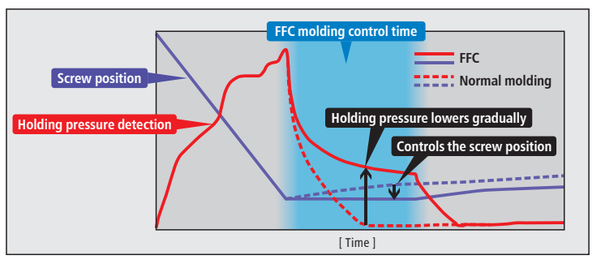
## FFC Flow Front Control

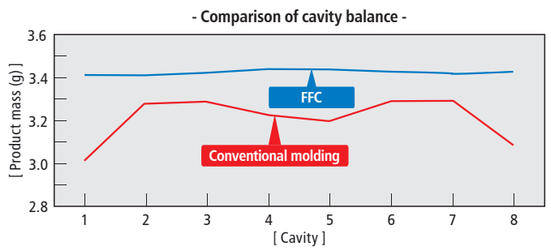
**Meticulous screw control before and after V-P changeover smoothly and assuredly fills cavities at low pressure.
This improves cavity balance and eliminates burrs and short shots at the same time.**

PAT. pend. in Japan




Filling performance was checked with a 2-cavity test piece at different V/P changeover points.
Both cavities were evenly filled when FFC (top row) was used.

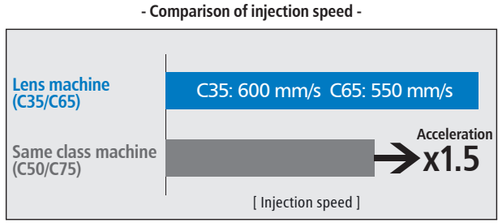



## Supports advanced lens molding

## High-speed, high-response injection unit

**The lens machine is equipped with a dedicated injection unit that has excellent ultra-low speed controllability, which is indispensable for precision lens molding, and high-speed, high-response injection performance.
It is superior performance unique to direct drive that enables precise screw control.**



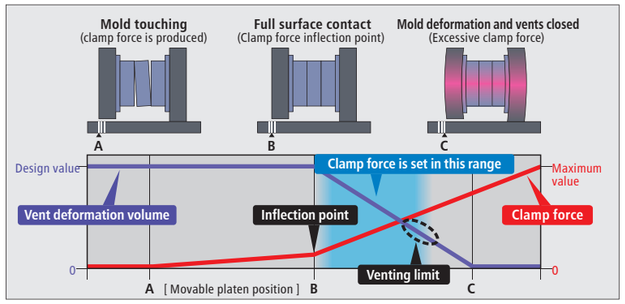



## Venting effect available thanks to a lower mold clamp force

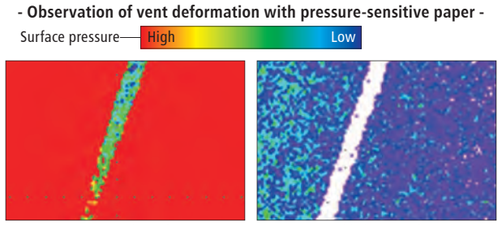
## MCM Minimum Clamping Molding

**Technology that improves mold clamping accuracy and surface tension distribution ensures mold halves are clamped with the minimum force required and the same amount of pressure is applied evenly to all contacted surfaces.**

PAT. pend. in Japan




- Observation of vent deformation with pressure-sensitive paper -




Excessive clamp force | Appropriate mold clamping force by MCM

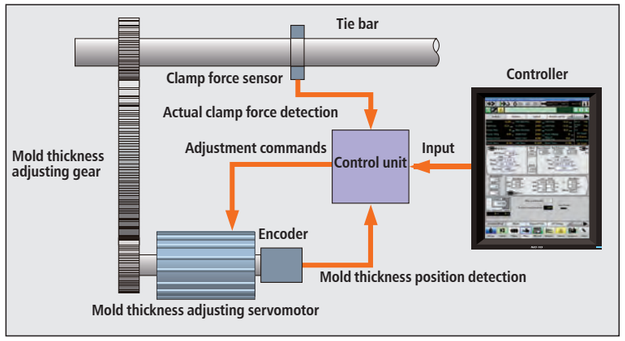
A high clamp force seals the vents thus preventing air and gas from escaping.

## Keeping mold clamp force constant in mass production

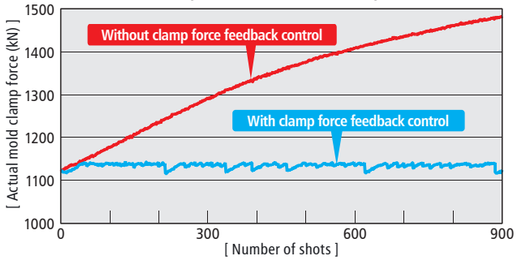
## Mold clamp force feedback control

**The mold clamp force tends to increase due to thermal expansion of molds in mass production.
The lens machine provides constant mold clamp force by correcting the mold thickness based on the actually value.**

PAT. pend. in Japan




- Actual clamp force transition in mass production -

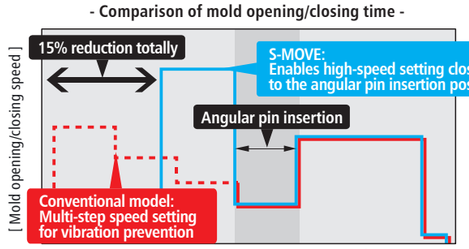



## More higher cycle molding

## Damping acceleration/deceleration control S-MOVE

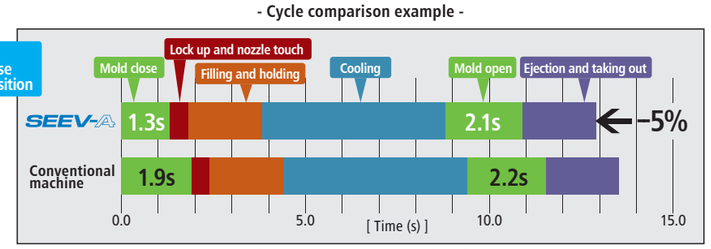
**The lens machine can open and close the mold more quickly with low vibration by generating smooth speed patterns in acceleration and deceleration.**

- Comparison of mold opening/closing time -




Example of mold with angular pins

- Cycle comparison example -




S-MOVE reduces the mold open/close time.

## Standard Equipment

| Plasticizing and injection unit |
|---|
| 1. Type A optical spec screw assembly (Open nozzle, optical molding spec) |
| 2. Zone 0 high capacity heater (Only for C35) |
| 3. Programming control of injection |
| 4. Programming control of holding pressure |
| 5. Screw pull back (Before dose start/after dose end) |
| 6. Screw position digital display (Setting 0.01 mm) |
| 7. Holding pressure time 0.01 sec setting |
| 8. V-P switchover controller (Pressure, position) |
| 9. Filling delay timer |
| 10. Auto purging with IJ unit status confirmation (Nozzle touch or IJ unit retract end) |
| 11. Cylinder temperature control 5 zones (ø18-ø20: 4 zones) |
| 12. Cylinder temperature mode setting (Molding / Lowered / Purge) |
| 13. Screw cold start prevention with variable timer |
| 14. Sprue break stroke remote setting (With Detection of nozzle touch, moving time and delay timer) |
| 15. Digital indicator of screw rotation speed |
| 16. Purging cover (With limit switch) |
| 17. Swivel injection unit (With nozzle center adjust device) |
| 18. Remaining cooling time indicator |
| 19. Dose delay timer |
| 20. Injection/Holding response 10-mode |
| 21. Holding pressure speed setting |
| 22. Pull back delay control |
| 23. Synchro dose |
| 24. Reverse control software |
| 25. Temperature control for nozzle |
| 26. Standard heated cylinder cover |
| 27. Water cooling jacket temperature control device |
| 28. Mold open operation during dose (Needle nozzle drive control) |
| 29. Filling pressure multi-level control |
| 30. Resin residence protection |
| 31. One touch dose |
| 32. High nozzle touch force and precision unit (Nozzle touch force: SE30EV-A: 4 stages variable, SE50EV-A: 3 stages variable) |
| 33. Stainless purge resin receiving tray |
| 34. SL screw: Automatic synchronization ratio tuning (SL screw is option) |
| 35. Softwear for lens molding |
| 36. Velocity reduction pattern of V/P switchover (Slow landing) (Only for SE30EV-A) |
| 37. High function nozzle touch (Nozzle touch pressure release) |

| Control unit |
|---|
| 1. 15 inch TFT Color LCD screen |
| 2. Touch panel setting input device |
| 3. Internal memory of molding conditions (200 conditions) |
| 4. Operation support function |
| 5. Forming support function |
| 6. Molding profiles display function (Mold profiles storage, cursor, display and so on) |
| 7. Screen snap shot function |
| 8. Take-out robot connection circuit *1 |
| 9. 15 languages selection |
| 10. Maintenance guide (Screen display of inspection timing, grease application timing, item, method) |
| 11. Auto start/stop function (Lowered temp, heater on, machine shut down) *1 |
| 12. Process display function |
| 13. SSR heater drive circuit |
| 14. Input of industrial unit for speed, position, pressure and rotation rate |
| 15. Machine status output signal (5ch) *1 |
| 16. USB connection circuit (Memory) |
| 17. Protection for molding condition |
| 18. Abnormal processing selection |
| 19. Initial reject and interruption reject function |
| 20. Screen color change |
| 21. Number & character entry key layout change (Selection from two types) |
| 22. Economical use of energy mode: Energy saving control |
| 23. Signal for takeout robot during mold opening *1 |
| 24. Clean control cabinet (Only for SE30EV-A) |

| Monitor unit |
|---|
| 1. Actual value display function |
| 2. Heater breakage monitor |
| 3. Auxiliary facility monitor (3ch) *1 |
| 4. Abnormal monitor (Max. cushion, min. cushion, filling pressure, mold protection, cycle time, dosing time) |
| 5. Automatic setting for abnormality monitoring condition |
| 6. Abnormality history display (Abnormal item, occurrence time display) |
| 7. Quality control function (Actual value statistics function, various graphing function, 100,000 shots stored data check function) |
| 8. Product control (Product quality control device, automatic production stop, stocker signal, logging, counter) *1 |
| 9. Auto start device (Heater, external output signal) *1 |
| 10. Cylinder heater temperature monitor (All zones) |
| 11. Self diagnosis function |
| 12. Alarm buzzer |
| 13. Shot counter |
| 14. Processing at cycle monitor abnormality (Heater processing mode change) |
| 15. List setting screen |
| 16. Function to prevent use of monitor |
| 17. Ejector torque monitoring |
| 18. Maintenance time notification (Shot number/Elapsed time) |
| 19. Injection pressure monitoring function (5 points) |
| 20. Cycle analysis |

| Clamp unit |
|---|
| 1. Programming control of opening/closing speed (5 stages/3 stages) |
| 2. Mold protection |
| 3. Low pressure clamp unit |
| 4. Mold opening/closing pause |
| 5. Remote control of clamp force |
| 6. Remote control of mold space |
| 7. Ejector remote setting (2 speed control, pressure, stroke, delay timer, multiple time protrusions) |
| 8. Current value input (Ejector protrusion limit position) |
| 9. Current value input (Mold open limit position) |
| 10. Mold clamp mode (Lock up) |
| 11. Ejector protrusion interlock (Possible only at mold open limit during manual operation) |
| 12. Ejector protrusion during mold opening |
| 13. Ejector protrusion during mold closing |
| 14. Ejector plate return signal (Input signal to machine) Connected by metal consent *1 |
| 15. Mold opening/closing signal (Spear control signal) Dry A contact *1 |
| 16. Valve gate drive circuit (Control circuit only) *1 |
| 17. Stand by mode for mold installation (Low mold opening/closing speed) |
| 18. Clamp cover with polycarbonate window |
| 19. Emergency stop push button (Operation side and non operation side) |
| 20. Safety door with polycarbonate window |
| 21. Threaded holes for takeout robot mounting |
| 22. Grease central lubrication for injection and clamp unit |
| 23. Mold close interlock device (Electrical, mechanical type) |
| 24. Mold opening/closing with low vibration or high speed mode |
| 25. Moving platen support device – liner guide type |
| 26. Center press platen |
| 27. Ejected products sensor circuit *1 |
| 28. Multi-toggle |
| 29. Tie bar plating |
| 30. Ejector unit with brake |
| 31. S-MOVE (Low vibration control) |
| 32. Ejector stand by |
| 33. Mold space control by servo motor |
| 34. Dust prevention cover above toggle (Fixed type) |
| 35. Dry cycle mode |
| 36. Thermal Free Platen (Only for SE30EV-A) |
| 37. High rigidity fixed platen (Only for SE30EV-A) |
| 38. Support for side entry take-out robot (Only for SE30EV-A) |

| Others |
|---|
| 1. Auto grease supply unit (Cartridge grease type) |
| 2. Three-directional ejection frame |
| 3. Mold cooling water block (2 systems) (Flow indicator and valve are options) |
| 4. Standard spare parts (Hook for hosting machine, fuse, air filter) |

*1 All input and output signals are no-voltage contact signals. (Power is not supplied with output signals.)
*2 All input signals are no-voltage contact signals. All output signals are 24 V DC signals.
*3 All input and output signals are 24 V DC signals.
*4 The ejector stroke will be shortened, and maximum ejector speed slows down.
SE30EV-A cannot be equipped with a motor with a brake.
*5 The overall machine length and maximum mold thickness are larger by 50 mm.
● Specifications are subject to change without notice for performance improvement.



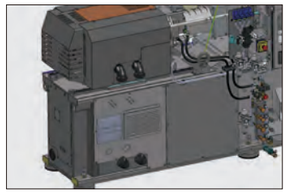
## Standard Equipment

| Zero-molding features | |
|---|---|
| 1. Zero-molding main screen: Simple process setting | 17. Decomp. by Revers after plasticizing |
| 2. Zero-molding main screen : Product molding monitor (Product count, process, abnormal, detect) | 18. Zero-molding: Clamp force feed back |
| 3. Screen for confirm spec. and functions (Standard, option, abnormal transaction, specification list, monitoring system) | 19. MULTI clamp force control (X_head pos. control) |
| 4. Minimum clamp force detect (Automatic) | 20. Multi-toggle by objective (Gas release, deformation prevention) |
| 5. Setup guidance: Mold installation screen (Mold thickness, mold contact, clamp force, mold open/close in preparations, ejector) | 21. Zero-molding: Molding condition guidance monitor (Peak clamp force, pack press., situation monitor) |
| 6. Setup guidance: Mold condition setting screen (Open/close, ejector multi-step) | 22. Detect monitor change (Detect, detail, detect+real time, wave, temp. graph) |
| 7. Setup guidance: Teaching of mold opening limit and ejector protrusion point (Actual value input) | 23. Protection for molding condition |
| 8. Setup guidance: Mold protection setting screen (Mold protection, ejector protection) | 24. Initial molding by auto change (Condition) |
| 9. SET-UP guidance: Multi purge | 25. Protection: Screw protection |
| 10. SET-UP guidance: Reference & call temp. condition | 26. Wave: Display by process (Injection, holding press., plasticizing., mold open, mold close, ejector) |
| 11. SET-UP guidance: Supervise & warning remain resin | 27. Wave: Wave preservation message |
| 12. SET-UP guidance: Nozzle/Heating cylinder heated up mode (Step/Nozzle delay) | 28. Quality Control: Wave distinction |
| 13. Zero-molding: Molding condition setting screen Z-Screen (Filling, holding press., plast.time, temp.,clamp force) | 29. Quality Control: Molding process monitor logging |
| 14. Zero-molding: Flash control | 30. Production control: Production count control (Cavity count setting) |
| 15. Zero-molding: Flash control auto setting | 31. Production control: Operation status control (Operation time, motor over load monitor, electricity consumption monitor) |
| 16. Zero-molding: Short shot mode by Flash control | |

**Control unit 24**

### Clean control cabinet

The control console is equipped with IP54-equivalent dust lockout capabilities. The console is kept internally pressurized to prevent dust infiltration so that instrumentation components last longer.



## Optional Equipment

| Plasticizing selection |
|---|
| 1. Type B optical spec screw assembly |
| 2. Extension nozzle |

| Plasticizing and injection unit |
|---|
| 1. Standard type hopper |
| 2. V/P switchover by mold cavity pressure |
| 3. FTC nozzle electric control circuit (Built-in type) |
| 4. High temperature heater control circuit (Max. temp. 499°C) |
| 5. Hopper swivel mounting plate |
| 6. Plating resin inlet of cooling water jacket |

| Control and monitor unit |
|---|
| 1. Leak circuit breaker (AC200V, 220V 3ø3W+E) (Japan and Asia only) |
| 2. Mold temperature monitor 2 zone (Without thermocouple and type K) |
| 3. Mold temperature monitor 4 zone (Without thermocouple and type K) |
| 4. Production control (2-directional rejection chute) |
| 5. Mold temp. controller (K=CA, 2 zone on Moving Platen) |
| 6. Automatic starting system (Heater+water supply+external output signal) *2 |
| 7. Revolving alarm lamp |
| 8. Multi function 3 colors LED alarm lamp |
| 9. Closed circuit type cooling water pipe 4 lines (With flow detector, stop valve) |
| 10. Closed circuit type cooling water pipe 2 lines (With flow detector, stop valve) |
| 11. Spare power supply outlet selection |
| 12. Electric power supply receptacles (Installed on operation side) |
| 13. i-Connect |
| 14. Motion07 |
| 15. MotionGB |
| 16. Korean KC Mark |

| Clamp unit |
|---|
| 1. Product chute |
| 2. High precision heat insulating plate (5 mm/10 mm, cross type) |
| 3. Valve gate drive circuit (Control circuit+pneumatic circuit) *2 |
| 4. Full metallic toggle cover |
| 5. Ejector compression device (SE30EV-A: 29kN, SE50EV-A : 49kN) *4 |
| 6. Mold space extension 50 mm *5 |
| 7. Ejector Stroke Extension (SE50EV-A: 100 mm) |
| 8. Pneumatic control circuit *3 |

| Spare parts and accessories |
|---|
| 1. Spare parts (Mechanical parts: Lub. parts) |
| 2. Spare parts (Electrical parts: Thermocouple) |
| 3. Spare parts for export (Encoder, limit switch, and Inductive proximity sensors) |
| 4. Leveling pads (For one machine) |
| 5. Tool A |
| 6. Ejector rods |
| 7. Grease gun |
| 8. Grease cartridge for automatic lub (700 cc) |
| 9. Grease cartridge for manual lub (400 cc) |
| 10. Easy clamp |
| 11. Box end wrench for open nozzles |

## Main Specifications

| Item | Unit | SE30EV-A |
|---|---|---|
| **■Clamp unit** | | |
| Clamp system | | Double toggle (5 points) |
| Clamp force | kN | 300 |
| Clearance between tie-bars (WxH) | mm | 310 x 290 |
| Platen size (WxH) | mm | 440 x 420 |
| Daylight | mm | 530 |
| (When mold thickness extension 50 mm is selected) | | (580) |
| Mold opening stroke | mm | 230 |
| Platen speed | mm/s | 1200 |
| Mold thickness (min. - max.) | mm | 130～300 |
| (When mold thickness extension 50 mm is selected) | | (130～350) |
| Locating ring diameter | mm | ø60 |
| Ejecting points | | Motor driven type (1 point) |
| Ejector force | kN | 7.8 |
| (When ejector compression device is selected) | | — |
| Ejector speed | mm/s | 333 |
| (When ejector compression device/ejector force power up is selected) | | — |
| Ejector stroke | mm | 50 |
| (When ejector stroke extension is selected) | | — |
| (When ejector compression device/ejector force power up is selected) | | — |

| Item | Unit | SE50EV-A |
|---|---|---|
| **■Clamp unit** | | |
| Clamp system | | Double toggle (5 points) |
| Clamp force | kN | 500 |
| Clearance between tie-bars (WxH) | mm | 360 x 360 |
| Platen size (WxH) | mm | 500 x 500 |
| Daylight | mm | 600 |
| (When mold thickness extension 50 mm is selected) | | (650) |
| Mold opening stroke | mm | 250 |
| Platen speed | mm/s | 1200 |
| Mold thickness (min. - max.) | mm | 160～350 |
| (When mold thickness extension 50 mm is selected) | | (160～400) |
| Locating ring diameter | mm | ø60 |
| Ejecting points | | Motor driven type (5 points) |
| Ejector force | kN | 21 |
| (When ejector compression device is selected) | | (49) |
| Ejector speed | mm/s | 333 |
| (When ejector compression device/ejector force power up is selected) | | (250) |
| Ejector stroke | mm | 70 |
| (When ejector stroke extension is selected) | | (100) |
| (When ejector compression device/ejector force power up is selected) | | (60) |

| Item | Unit | C35 | | C65 | | | |
|---|---|---|---|---|---|---|---|
| **■Injection unit** | | | | | | | |
| Plasticizing capacity | | S | | S | | | |
| Screw diameter | mm | 18 | 20 | 18 | 20 | 22 | 25 |
| Injection pressure max. *1,*2 | MPa | 224 | 181 | 274 | 265 | 220 | 170 |
| Holding pressure max. *1,*2 | MPa | 224 | 181 | 274 | 265 | 220 | 170 |
| Theoretical injection capacity | $cm^3$ | 14 | 18 | 19 | 24 | 29 | 38 |
| Injection mass (GPPS) | g | 13 | 17 | 19 | 23 | 28 | 36 |
| Plasticizing rate *3,*4 | kg/h | 11 | 14 | 10 | 13 | 18 | 26 |
| Injection rate | $cm^3/s$ | 152 | 188 | 139 | 172 | 209 | 269 |
| Screw stroke | mm | 58 | | 78 | | | |
| Injection speed max. | mm/s | 600 | | 550 | | | |
| Screw rotating speed max. | $min^{-1}$ | 430 | | 400 | | | |
| Number of temperature control zone | | 4 | | 4 | | 5 | |
| Heater capacity | kW | 2.8 | 3.3 | 2.8 | 3.3 | 3.6 | 4.1 |
| Nozzle contact force | kN | 7.8 | | 14 | | | |
| Injection moving stroke | mm | 185 | | 185 ～ 210 | | | |
| Protrusion | mm | 30 | | 30 | | | |
| Hopper capacity (When the standard hopper selected) | L | (15) | | (15) | | | |
| **■Machine dimensions and mass** | | | | | | | |
| Machine dimensions (LxWxH) *5 | mm | 3185 x 958 x 1470 | | 3185 x 958 x 1470 | | | |
| (When mold thickness extension 50 mm is selected) | | (3235 x 958 x 1470) | | (3235 x 958 x 1470) | | | |
| Machine mass *6 | t | 2.0 | | 2.2 | | | |

| Item | Unit | C65 | | | | C110 | |
|---|---|---|---|---|---|---|---|
| **■Injection unit** | | | | | | | |
| Plasticizing capacity | | S | | | | S | |
| Screw diameter | mm | 18 | 20 | 22 | 25 | 22 | 25 |
| Injection pressure max. *1,*2 | MPa | 274 | 265 | 220 | 170 | 274 | 212 |
| Holding pressure max. *1,*2 | MPa | 274 | 265 | 220 | 170 | 274 | 212 |
| Theoretical injection capacity | $cm^3$ | 20 | 25 | 30 | 38 | 40 | 51 |
| Injection mass (GPPS) | g | 19 | 24 | 28 | 37 | 38 | 49 |
| Plasticizing rate *3,*4 | kg/h | 10 | 13 | 18 | 26 | 18 | 26 |
| Injection rate | $cm^3/s$ | 140 | 173 | 209 | 270 | 190 | 245 |
| Screw stroke | mm | 78 | | | | 104 | |
| Injection speed max. | mm/s | 550 | | | | 500 | |
| Screw rotating speed max. | $min^{-1}$ | 400 | | | | 400 | |
| Number of temperature control zone | | 4 | | 5 | | 5 | |
| Heater capacity | kW | 2.8 | 3.3 | 3.6 | 4.1 | 3.6 | 4.1 |
| Nozzle contact force | kN | 14 | | | | 14 | |
| Injection moving stroke | mm | 250 | | | | 250 | |
| Protrusion | mm | 30 | | | | 30 | |
| Hopper capacity (When the standard hopper selected) | L | (15) | | | | (15) | |
| **■Machine dimensions and mass** | | | | | | | |
| Machine dimensions (LxWxH) *5 | mm | 3682 x 1113 x 1575 | | | | | |
| (When mold thickness extension 50 mm is selected) | | (3732 x 1113 x 1575) | | | | | |
| Machine mass *6 | t | 2.8 | | | | 2.8 | |

*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 given for a machine mounted with the 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.
*6 The machine mass is subject to change depending on mounting optional equipment.
● Specifications are subject to change without notice for performance improvement.