

Global Network

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Plastics Machinery Div.

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

SE-HS2 SERIES



ALL ELECTRIC INJECTION MOLDING MACHINE

SE-HS2
'Zero-molding'



Our products have acquired ISO9001 certification.

www.shi.co.jp/plastics/



B006EN03-2105KP

Sumitomo Heavy Industries, Ltd.

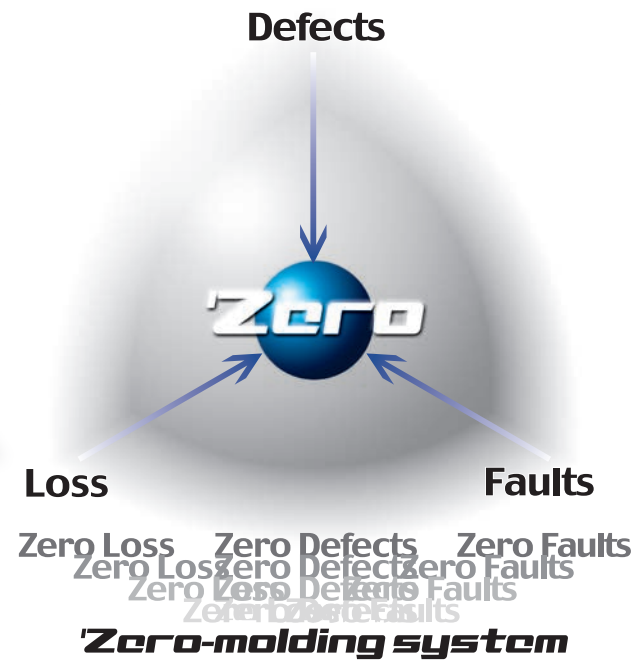
Restart from the origin.

Break & Breakthrough ... the Zero-molding

Complicated molding made simple !

Innovative molding processes

Imagine no defects, loss or faults, Zero.

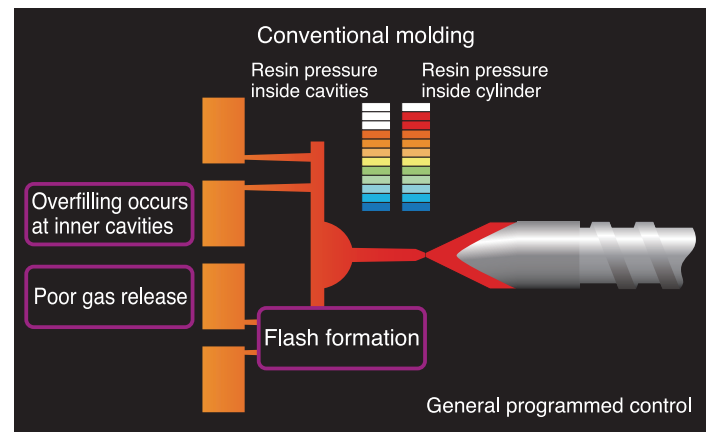


'Zero-molding by FFC (Injection system)

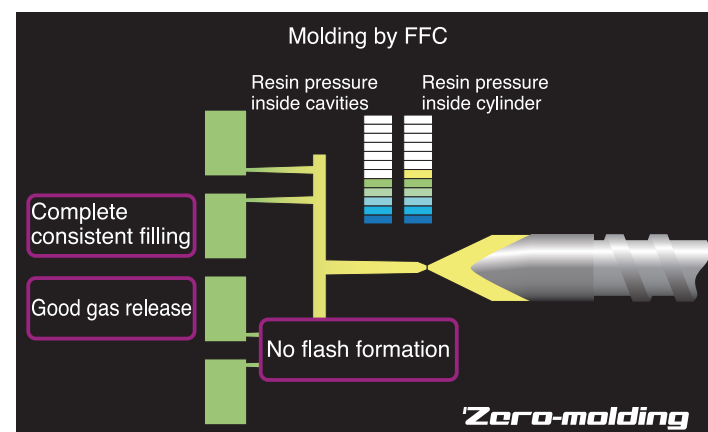
Patent pending

New functions

Stable molding conditions via smooth filling

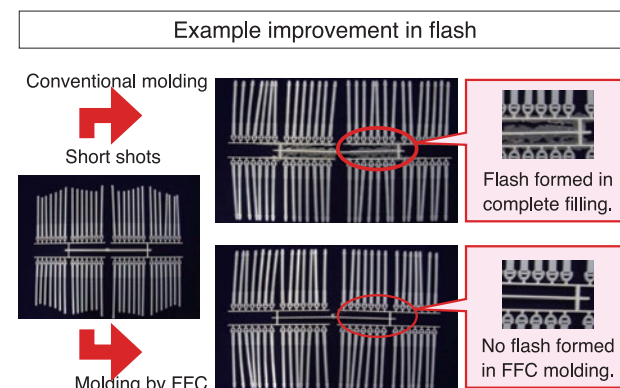


In conventional molding systems, resin is fully charged into mold cavities and consequently is apt to suffer excessive compression.



FFC is a viscoelasticity-assisted injection molding scheme where resin is not exposed to high pressures.

In FFC (Flow Front Control), screw movement is restricted by Flash Control to optimize the flow front. This enables molding at low internal pressures inside cavities, which, besides preventing flash, eliminates short shots by effectively releasing gases when filling.



With conventional molding, flash forms because of complete filling. FFC molding offers good cavity balance, therefore complete filling can be done without raising peak pressure, hence preventing flash from forming.



Product : Table disc
Resin : PC

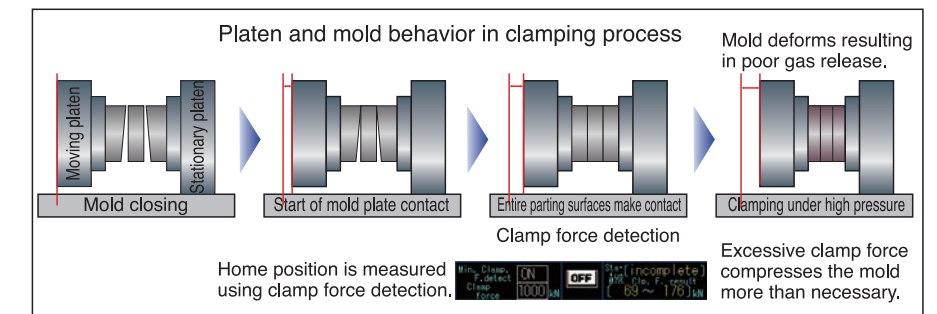
'Zero-molding by MCM (Mold clamping system)

Patent pending

New functions

Low pressure clamping without unnecessary force

The SE-HDZ, SE-HSZ builds in detection capabilities for sensing the minimum force (home position) required to clamp the mold. Even with molds for the complicated profiles of heat shields, springs, sliding cores or angular pins, the clamp force required for actual molding can be set by measuring the home position, so molding is performed effectively without applying unnecessary force. Moreover, the difference in mold sitting before and after maintenance can be easily identified.

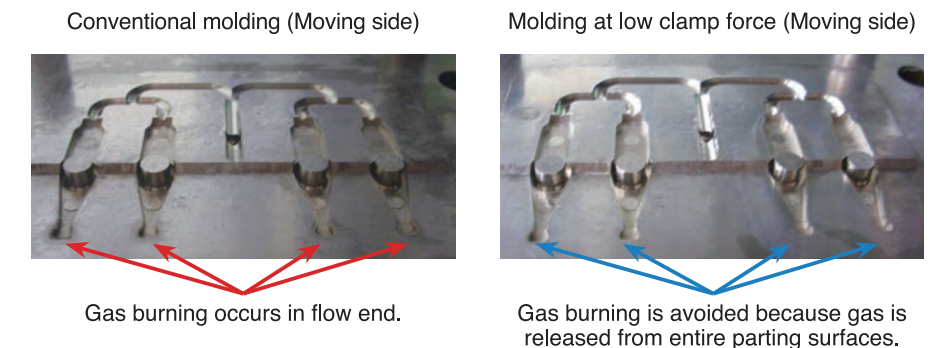


Mold comparison after 1000 shots

MCM enables molding with the detected minimum required clamp force. Gas is greatly reduced to the following benefits.

- Burning and short shots are eliminated
- Mold maintenance is required less frequently

By reducing the mold clamp force, users can expect reductions in power consumption and shorter cycles, besides avoiding damage such as broken pins.



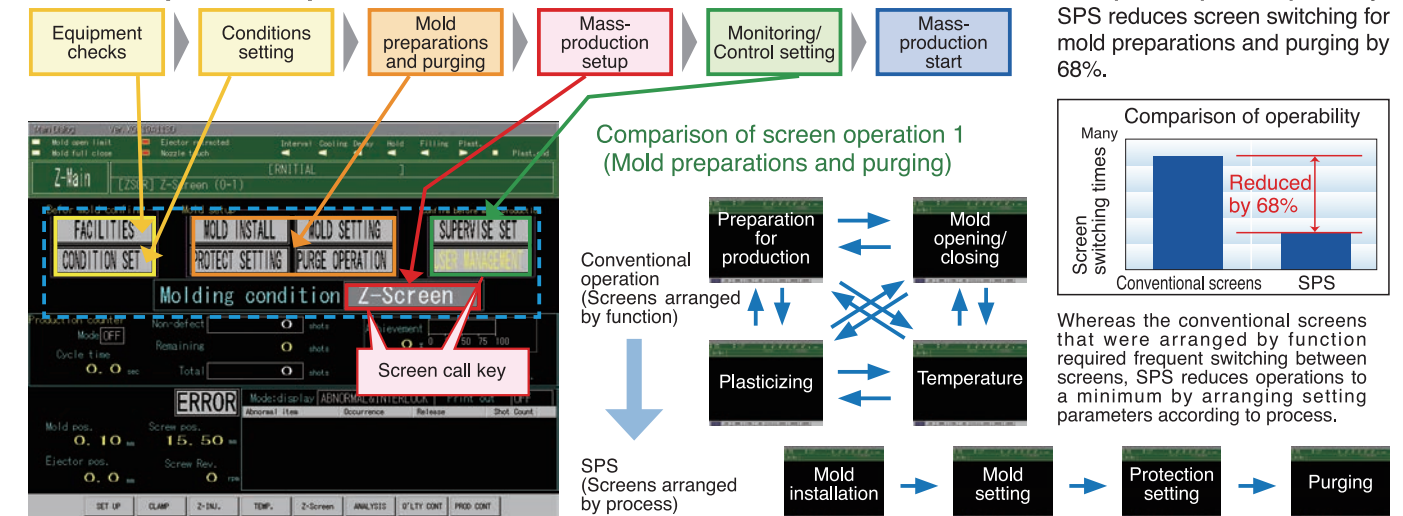
'Zero-molding by SPS (Setting system)

Patent pending

New functions

SPS simplifies operation while eliminating mistakes and oversights

Process up to mass-production start



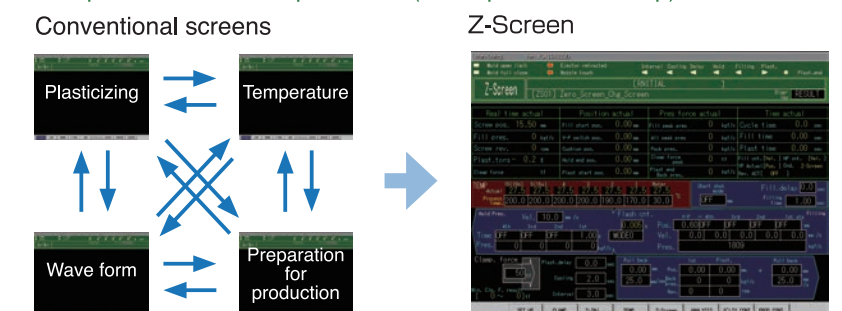
SPS (Simple Process Setting) arranges settings by process from the operator's position.

Setting screens have been created according to process operations rather than the conventional setup of functions. A series of setting operations can be completed on a single screen.

1 process
ONE

1 screen
ONE

Comparison of screen operation 2 (Mass-production setup)



Even the fine-adjustments used in mold changeover and parameter setting for production launches with new molds can be handled with this one Z-Screen.

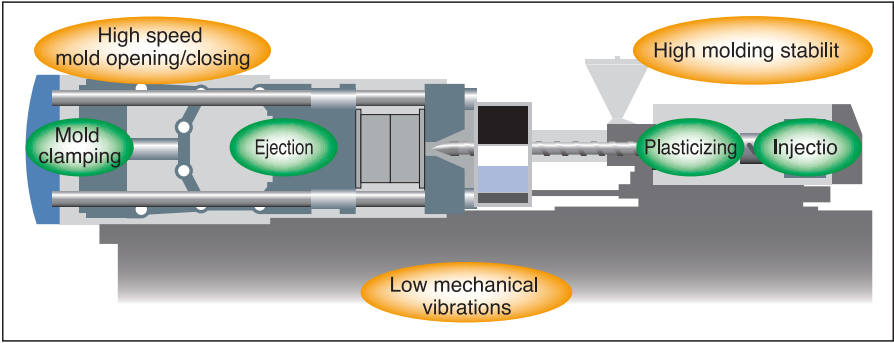
New ISC for improved productivity

Intelligent Servo Control System

Standard EquipmentNew functions

The ISC (Intelligent Servo Control) system employed by the SE-DUZ series has been newly incorporated into the SE-HSZ series. It comes standard on all drive shafts regardless of the type of drive system.

The corresponding servo control card that was newly developed for this system delivers 4 times the processing capacity of earlier cards. Moreover, a new algorithm has sped up mold opening and closing, reduced mechanical vibrations and improved molding stability.

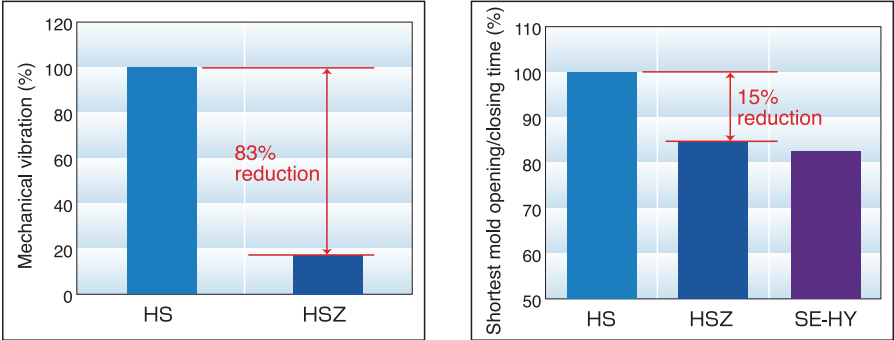


High speed, low vibrations

Standard Equipment

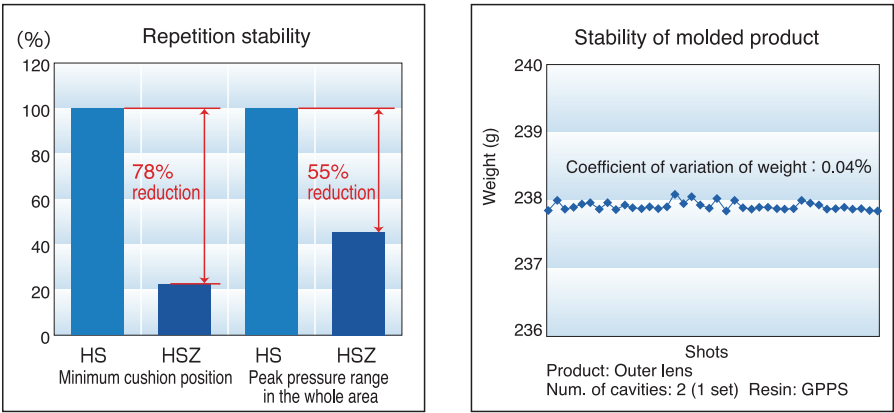
A new control algorithm reduces mechanical vibrations during mold opening and closing by 83%.

It additionally improves both mold opening/closing speed and duty by 10% over conventional systems, thus shortening the shortest mold opening/-closing time by 15%. the shortest mold opening/closing time can be shortened an additional 5% as an option.



Improved molding stability

Because of the improved processing capacity in servo control, the fluctuations in cushion position and peak pressure have been minimized, which translates as improved molding stability.

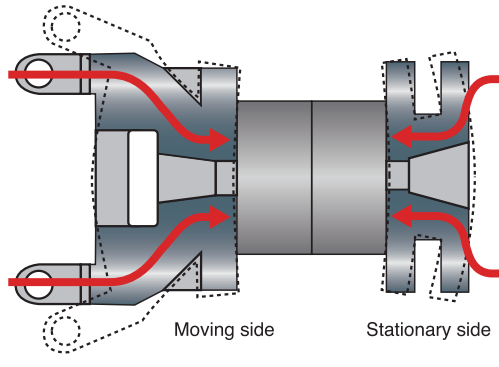


Basic configuration for delivering both capabilities and rigidity

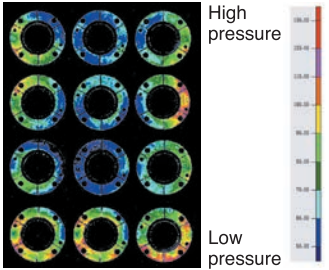
DCPP (Double Center Press Platen)

Standard Equipment

The SE-HDZ and SE-HSZ series are equipped with Center Press Platens known for their extremely low warping, on both the stationary and mobile sides. Because surface pressure on the mold is kept consistent, flash at the center and short-shots around the perimeter are eliminated at the same time. Furthermore, molding is possible with 20 ~ 30% less the clamp force of earlier machines.



Surface pressure is kept consistent



High pressure

Low pressure

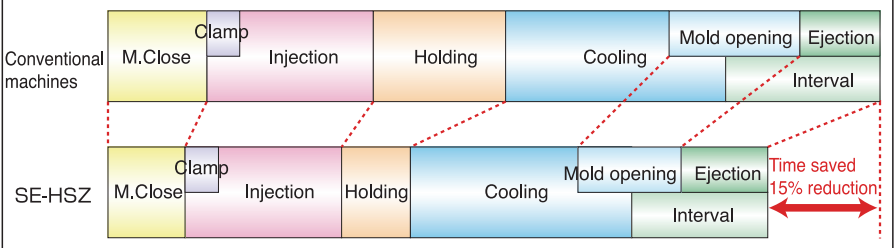
Example of surface pressure distribution (Surface pressure measurement of 12-cavity mold for container)

Pursuing lower production costs via ultra-precision high speed molding of thin-walled products

Shortened cycles

Standard Equipment

Compared to conventional machines, the maximum injection speed of the SE-HSZ series is 17% faster. Furthermore, cycle time has been shortened by about 15% because of the shorter holding times made possible by FFC molding and the shorter mold opening/closing times that result from ISC.



Machine	M.Close	Clamp	Injection	Holding	Cooling	Mold opening	Ejection	Interval
Conventional machines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SE-HSZ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Time saved 15% reduction

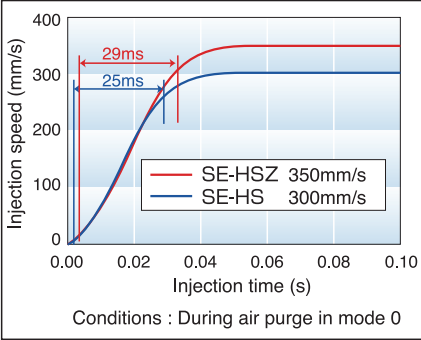


No pressure holding

Conventional molding FFC molding

Injection characteristics

Injection speed is a standard 350 mm/sec.



Series	Injection speed (mm/s)
SE-HSZ	350
SGM	250
SE-S	700

Comparison in 300 mm/s injection speed

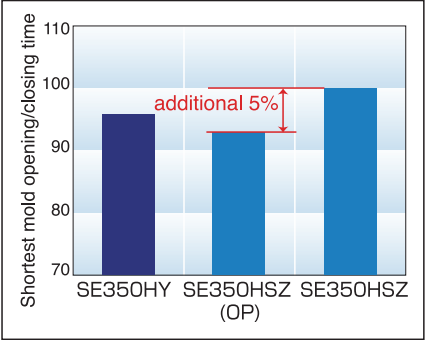
Injection speed response

Injection speed response is about 2.5 times that of electric belt drive mechanisms and delivers the same performance as a hydraulic machine that uses servo valves with built-in accumulators.

High speed mold opening/closing

Optional Equipment

An option is available to shorten the shortest mold opening/closing time by an additional 5%. The same shortest mold opening/closing time as the SE-HY series is obtained.

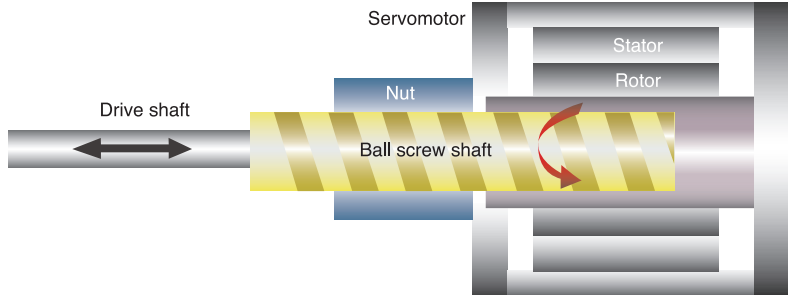


Series	Shortest mold opening/closing time (ms)
SE350HY	95
SE350HSZ	92
SE350HSZ (OP)	97

additional 5%

Direct drive system

The SE-HSZ series adopts direct drive mechanism of low inertia and high response for the injection system. Because it can instantly control speed and pressure, it is suited for a higher degree of precision high cycle molding. The C1250 and C1700 injection units incorporate a high-powered dual-axis synchronized direct drive mechanism that delivers high response in a compact structure.





Zero-molding system list of new functions

1. Zero-molding Main Screen : Simple Process Setting
2. Zero-molding Main Screen : Product Molding monitor (Product count,Process, Abnormal,Detect)
3. Mold condition change (Screw dia.,Unit, Add IL display)
4. Screen for comfirm Spec.Function (STD, Option, Abnormal transaction, Peripheral device signal)
5. Minimum Clamp force detect
6. SET-UP guidance : Mold install Screen
7. SET-UP guidance : Mold condition setting
8. SET-UP guidance : Mold protection setting screen
9. SET-UP guidance : MULTI parge
10. SET-UP guidance : Reference & Call TEMP condition
11. SET-UP guidance : Supervise & warning remain resin
12. SET-UP guidance : Nozzle/Heating cylinder heated up mode (STEP/Nozzle delay)
13. SET-UP guidance : Nozzle/heating cylinder/water cooling jacket TEMP profile graphic display
14. Zero-molding : Molding condition setting screen Z-Screen (Fill.,HP, Plast.Time, TEMP, Clamp force)

Standard Equipment

Plasticizing & injection unit
1. Standard SM screw assembly (open exclusive nozzle, plated screw, ion-nitride cylinder) (unavailable for C900)
Standard SD screw assembly (open exclusive nozzle, ion-nitride) (Only for C560)
2. Programming control of injection
3. Programming control hold pressure
4. Screw pull back (after screw rotating/after holding pressure)
5. Screw position digital indicator (0.01mm)
6. Step timer for hold pressure to 0.01 sec.
7. V-P switchover controller (pressure, position)
8. njection start delay timer
9. Automatic purging program Interlock attaching (Select between nozzle touch and plasticizing unit withdraw limit)
10. Heater 6 division control (φ45~50 (M) : 5division)
11. 2-modes temperature control (production/standby)
12. Cold screw startup protectio (Interlock variable timer attaching)
13. Injection unit retraction delay selector (with delay timer)
14. Sprue break stroke remote setting (Detection of nozzle touch, Moving time)
15. Screw speed digital indicator
16. Flow indicator for water cooling jacket
17. Protective purge shield (with limit switch)
18. Swivel injection unit (with nozzle core adjuster)
19. Remaining cooling timer indicator
20. Plasticizing start delay timer
21. Injection/Holding response 10-mode
22. Hold pressure speed setting
23. Pull back delay control
24. Flash Speed Mode
25. Temperature controlier for nozzle
26. Stepped heat-up operation
27. Energy-saving heating cylinder cover (2-layer structure)
28. Water cooling jacket temperature control device
29. High-precision, high-output nozzle touch system
30. Screw centering mechanism
31. Mold open operation during plasticizing (needle nozzle drive control)
32. Multi-step filling pressure control
33. Resin staying protection
34. Manual one-touch plasticizing
Control unit
1. 12.1 inch TFT Color LCD screen
2. Input setting device : Sheet-key and touch panel
3. Internal memory of mold conditions (200 conditions)
4. Operation guide for beginners
5. Production guide for beginners
6. Molding profiles display functions (mold profiles storage, cursor, display and so on)
7. Screen hard copy
8. Printer connection circuit

15. Zero-molding : Flash mode control
16. Zero-molding : Short shot mode by Flash control
17. Decomp. by Revers after plasticizing
18. Zero-molding : Clamp force feed back
19. MULTI clamp force control (X_head pos. control)
20. Zero-molding:Molding condition guidance monitor (Peak clamp force,Pack Press.,Situation monitor)
21. Detect monitor change (Detect, detail, Detct+real time, wave, TEMP graph)
22. Protection for molding condition
23. Initial molding by auto chage (condition)
24. Protection : Screw protection
25. Wave : Display by process (IJ,HP,Plast.,Mold open,Mold close,EJ)
26. Wave : Wave preservation message
27. Quality Control : Wave distinction
28. Quality Control: Molding process monitor logging
29. Production control : Production count control (Cavity count setting)
30. Production control : Operation status control (Operation time,Motor over load monitor,Electricity consumption monitor)

9. Take-out robot connection circuit ※3
10. Three languages screen changeover (Japanese/English/Chinese)
11. Operation guide for maintenannce
12. Automatic starting system (heater warming, heater start, machine stop)
13. Molding process indication
14. SSR control circuit for heater bands
15. Input expressed in industrial units of velocity, position, pressure & screw revolution
16. Signal output for machine condition (5ch) ※3
17. Automatic startup function (heater + external output signal)
18. Space II card unit (card: option)
19. PC connection circuit (RS232C)
20. Molding condition protection
21. Alarm sequence selection
22. Initial rejection + short stop rejection
Clamp unit
1. Programmed control of mold opening/closing speed (5-step/3-step)
2. Mold protection
3. Low pressure mold clamp
4. Temporary stop of mold opening/closing
5. Remote control of clamp force
6. Remote control of mold space
7. Ejector (with selective multi-functions & return check)
8. Ejector protrusion delay timer
9. Ejector remote control (speed, stroke and pressure)
10. Ejector 2-speed control
11. Interlock for ejector (In manual operation, only the mold open limit is available)
12. Ejector protrusion during mold opening
13. Ejector protrusion during mold closing
14. Ejector plate retun signal (Input signal for molding machine) Connecting by metal concent ※3
15. Mold close and mold opening signals (Spear control signal) No-voltage dry contact ※3
16. Valve gate drive circuit (control circuit only ※3
17. Standby mode for mold mounting (low mold closing/opening speed)
18. Safety doors with clear PMMA windows
19. mergency stop switch (on both side)
20. Toggle covers with clear PMMA windows sides
21. Tapped hole for take-out robot installation
22. Grease central lubrication
23. Safety doors (interlocked electrically/mechanically)
24. Mold op/cl selection low vibration or high speed mode
25. Moving platen support (Sliding type)
26. Double center press platen
27. Ejected products sensor circuit ※3
28. Multi-toggles
29. Ejector unit with brake

Monitor unit
1. Actual operating values indicator
2. Heater band burnout monitor
3. Auxiliary facility monitor (1ch)
4. Monitor (6 items)
5. Automatic setting of monitor high/low value
6. Monitor record display (item and time)
7. Statistics product quality control (Actual value control, Quality transition graph)
8. Production control
9. Automatic starting system (heater + external output signal) ※3
10. Cylinder heater temperature monitor (all zones)
11. Self-diagnosis
12. Audible alarm

Optional Equipment

Plasticizing selection
1. Hard chromium plating screw assembly (C560 only)
2. Wear & corrosion resistant screw assembly II & III (C560 only)
3. Needle valve nozzle (pneumatic nozzle actuating cylinder)
4. Extension nozzle
5. Cylinder nozzle
6. Zone 1 high capacity heater
Plasticizing & injection unit
1. Resin temperature finder (only for needle type with thermecou)
2. Standard type hopper
3. V/P switchover by mold cavity pressure
4. Needle valve nozzle drive circuit (pneumatic cylinder)
5. Hopper swivel mounting plate
6. Plating resin inlet of cooling water jacket
7. Assist of pneumatic of the swiveling of plasticizing unit
8. Purging saucer (Stainless steel)
Control & monitor unit
1. Leak circuit breaker (AC200V, 220V 3φ3W+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. Auxiliary facility monitor (STD.+2ch)
5. Analog data output connection circuit
6. Mold temp. controller (2 zone) 3kW
7. Mold temp. controller (4 zone) 3kW
8. Automatic starting system (Heater+water supply+external output signal) ※3
9. Revolving alarm lamp (non-operation side)
10. Revolving alarm lamp (operation side)
11. Multi fancement 3-color LED alarm lamps (non-operation side)
12. Multi fancement 3-color alarm lamps (operation side)
13. 4-Lines closed circuit water connection lines with flow indicator and stop valve, and filter for cooling water
14. 2-Lines closed circuit water connection lines with flow indicator and stop valve, and filter for cooling water
15. Electric power supply sockets (area 1 to 4 x type 1 to 4) 100A in total
16. Electric power supply socket for tools (1kWA on operation side)
17. Electric power supply socket for tools (1kWA on non-operation side)
18. Electric power supply socket for tools (1kWA on operation side + 1kW on non-operation side)
19. Key-lock switch for molding setup
20. iii-System Standard Edition
21. Main power supply for US, 460V Trans built-in
22. Motion 07

13. Shot counter
14. Molding cycle time monitor (attended/unattended selection)
15. All-in-one setting screen
16. Low fluid level monitor
17. Monitor setting fail protection
Miscellaneous
1. Automatic centralized greasing divice
2. 3-way open space frame
3. Mold cooling water block (2 lines) (Sight flow indicator & valve are optional)
4. Standard tools (nozzle ring spanner)
5. Standard spare parts (touchup paint, fuse)
6. File folder (Inside control panel)

Clamp unit
1. Pneumatic ejector
2. Cavity ventilator
3. Hydraulic core pull control circuit 1 lines (control circuit+pipng cnnexion)
4. Hydraulic core pull control circuit 2 lines (control circuit+pipng cnnexion)
5. Pneumatic core pull circuit 1 lines
6. Pneumatic core pull circuit 2 lines
7. Core rotation control circuit (motor drive:1.5kw or less)
8. SPI take-out robot connection circuit ※3
9. Heat insulating plate (10mm, cross type)
10. Mold clamp control unit
11. Auto grease lubrication selection on liner guide
12. Valve gate drive circuit (control circuit & pneumatic circuit)
13. Valve gate drive circuit (control circuit & hydraulic circuit)
14. Full metallic toggle cover
15. Hydraulic package (for core-pull & valve gate) (SE220HSZ・SE350HSZ : built-in type)
16. Tie-bar support
17. Tie bar plating (Hard chromium)
18. Locating ring for cooling fit I.D.φ110／O.D.φ150
19. Locating ring for cooling fit I.D.φ120／O.D.φ150
20. Automatic opening/closing of safety door (operation side)
21. Tie-bar grease adherence prevention
22. Additional frame supports
Spare parts and accessories
1. Spare parts A (Mechanical parts : Brake lining, Lub. parts)
2. Spare parts A (Electrical parts : Thermocouple)
3. Spare parts for export. (Encoder, Limit swich, and Inducive proximity sensors)
4. Leveling pads (for one machine)
5. Anchor bolts (for one machine)
6. Locating ring (Transition fit) (I.D.φ110／O.D.φ120) (Only for SE220HSZ)
7. Locating ring (Transition fit) (I.D.φ110／O.D.φ150) (Only for SE280HSZ)
8. Locating ring (Transition fit) (I.D.φ120／O.D.φ150) (Only for SE280HSZ)
9. Mechanical parts and hook for hoisting machine
10. Tools A
11. Ejector rods
12. Grease gun
13. Grease cartridge for Automatic Lub (700cc)
14. Grease cartridge for Manual Lub (400cc)
15. Plasticizing unit rotation handle (Larger than on C1250)
16. Special tool for removing Screw head set

※1 Specifications may subject to change without notice for performance improvements.
※2 The export of this product for use for or in development and/or production of massive destruction arms and weapons(nuclear weapons, biological weapons, missiles) or the export of this product to any person, party or corporation engaged or involved in the development and/or production of above described goods is subject to the authorization of the Japanese government pursuant to Foreign Exchange and Foreign Trade Control Law.
※3 Input / output signals are provided with dry contact (zero voltage).
(If signal required voltage, please request for such option)

Items		unit	SE220HSZ	SE280HSZ	SE350HSZ
●Clamp unit					
Clamp system			Double toggle (5 point)	Double toggle (5 point)	Double toggle (5 point)
Clamp drive type			Direct drive	Direct drive	Direct drive
Clamp force		kN {tf}	2150 {220}	2740 {280}	3430 {350}
Clearance between tie-bars (L×H)		mm	610×560	685×635	760×710
Clamp platens max. (L×H)		mm	880×830	950×885	1070×1020
Daylight		mm	1130	1220	1370
Mold opening stroke		mm	550	600	700
Mold installation height	Min	mm	300	350	400
	Max	mm	580	620	670
Locating ring diameter		mm	φ 120	φ 150	φ 150
Ejector type			Electric (13 point)	Electric (13 point)	Electric (13 point)
Ejector force		kN {tf}	58 {6.0}	58 {6.0}	58 {6.0}
Ejector stroke		mm	150	150	150
Ejector drive type			Belt drive	Belt drive	Belt drive

- Injection unit

Plasticizing capacity		C560						C900			C900			C1250			C1250			C1700	
Injection drive type		Direct drive						Direct drive			Direct drive			Direct drive			Direct drive			Direct drive	
Screw diameter		M						L			L			L			L			L	
	mm	28	32	36	40	45	50	45	50	56	45	50	56	50	56	63	50	56	63	63	71
Injection pressure max.	MPa	289	275	272	274	215	174	267	216	172	267	216	172	274	218	172	274	218	172	215	169
[Note1, Note2]	{kgf/cm²}	{2950}	{2810}	{2770}	{2800}	{2200}	{1780}	{2730}	{2210}	{1760}	{2730}	{2210}	{1760}	{2800}	{2230}	{1760}	{2800}	{2230}	{1760}	{2200}	{1730}
Hold pressure max.	MPa	289	275	272	220	172	139	213	172	137	213	172	137	219	174	137	219	174	137	172	135
[Note1, Note2]	{kgf/cm²}	{2950}	{2810}	{2770}	{2240}	{1760}	{1424}	{2180}	{1760}	{1400}	{2180}	{1760}	{1400}	{2240}	{1780}	{1400}	{2240}	{1780}	{1400}	{1760}	{1380}
Theoretical injection capacity	cm³	86	129	163	201	254	314	329	406	510	329	406	510	448	562	711	448	562	711	773	982
Max. injected mass (GPPS)	g	83	124	156	193	244	302	316	390	489	316	390	489	430	539	682	430	539	682	742	943
	OZ	2.9	4.4	5.5	6.8	8.7	10.7	11.2	13.8	17.3	11.2	13.8	17.3	15.2	19.1	24.2	15.2	19.1	24.2	26.3	33.4
Plasticizing rate max. (GPPS) [Note3]	kg/h	37	53	76	101	136	193	149	202	246	149	202	246	202	246	290	202	246	290	290	327
() Denotes screw rotation speed	(rpm)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(360)	(400)	(400)	(360)	(400)	(360)	(320)	(400)	(360)	(320)	(320)	(280)
Injection rate max.	cm³/s	216	281	356	440	557	687	557	687	862	557	687	862	687	862	1091	687	862	1091	1091	1386
Screw stroke	mm	140	160	160	160	160	160	207			207			228			228			248	
Injection speed max.	mm/s	350						350			350			350			350			350	
Maxmun screw rotation speed	rpm	400						400	400	360	400	400	360	400	360	320	400	360	320	320	280
Number of temperature control zone		5						6			6			6			6			6	
Heater capacity	kW	6.6	7.6	8.5	10.4	11.1	11.3	23.3	26.8	31.2	23.3	26.8	31.2	26.8	31.2	37.1	26.8	31.2	37.1	37.1	42.7
Nozzle touch force	kN {tf}	58 {6.0}						58 {6.0}			58 {6.0}			58 {6.0}			58 {6.0}			58 {6.0}	
Moving stroke (protrusion)	mm	430 (65)						450 (65)			450 (65)			450 (65)			450 (65)			450 (65)	
Hopper capacity	ℓ	50						100			100			100			100			100	

●Machine dimension & mass

Machine dimension (L×W×H) [Note4]	mm	6436×1580×2065	6436×1580×2254	7217×1680×2254		7511×1770×2254		7522×1770×2254
Machine mass	t	10.1	10.9	13.0	13.7	17.9	18.1	

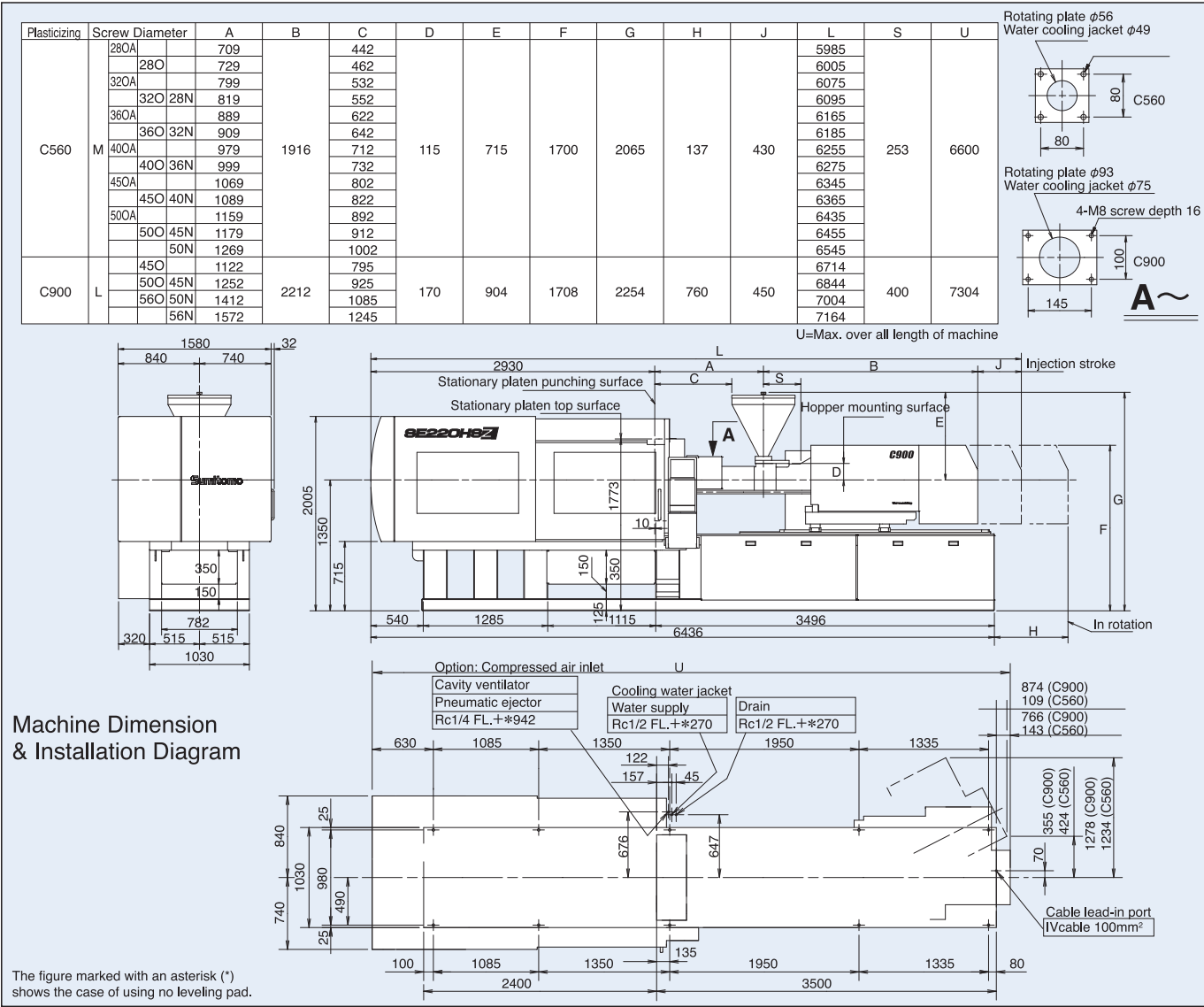
Note1. The maximum injection pressure and hold pressure are calculated values, which are the outputs of the machine, but not the resin pressures.
 Note2. The maximum injection pressure and hold pressure are no pressures that can be generated continuously.
 Note3. The injection capacity is a value with the SD screw installed.

Note4. The total length of the machine is the value measured up to the advance position of the injection unit with a smallest screw installed.
 Note5. The value in { } is given for reference.
 Note6. Specifications subject to change without notice for performance improvement
 Note7. The dimensions are Japanese specification.

◇This series originally comply to safety standards of Japan, the US and Europe, in addition, also China GB22530 and KC mark.

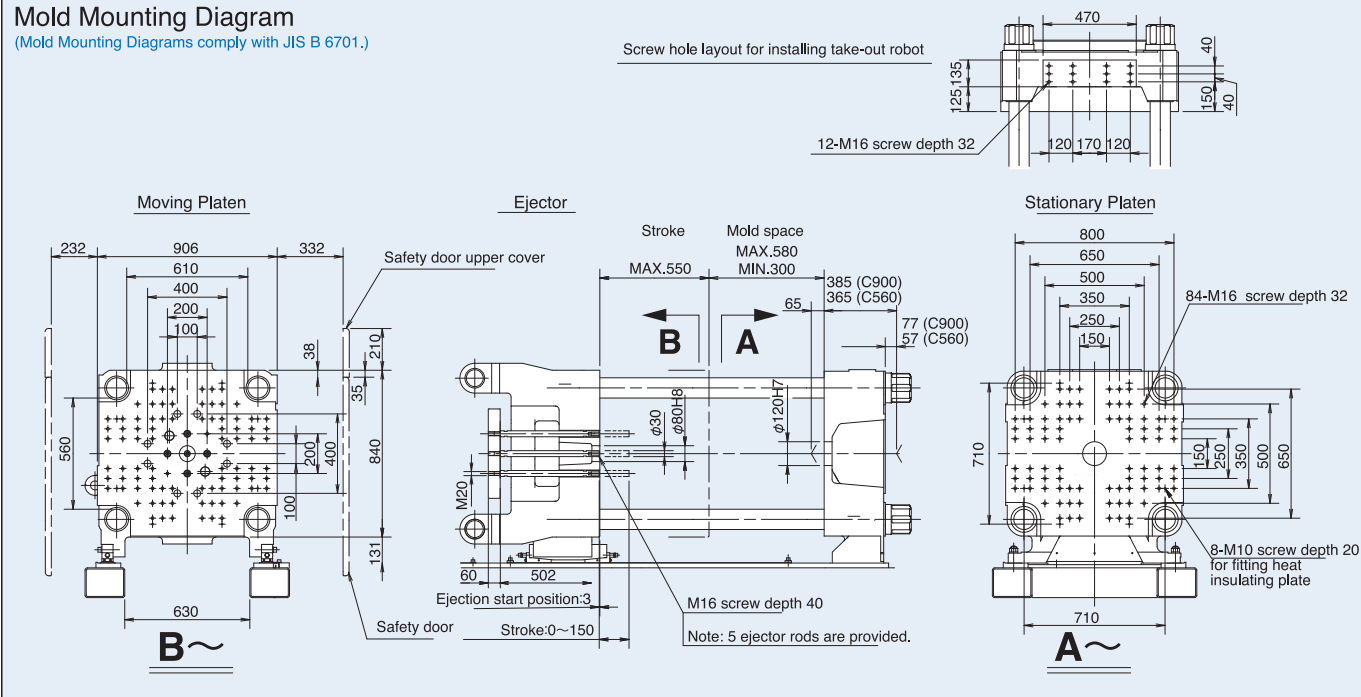
SE-HSZ Screw assemblies

Plasticizing capacity		C560				C900 ~ C1700
Specification		Standard	Wear/corrosion-resistant (Ⅱ)	Wear/corrosion-resistant (Ⅲ)	Plated	Plated
Material	Screw	Ion-nitride	Wear/corrosion-resistant (Ⅱ)	Wear/corrosion-resistant (Ⅲ)	Plated	Plated
	Heating cylinder	Ion-nitride	Wear/corrosion-resistant (Ⅱ)	Wear/corrosion-resistant (Ⅲ)	Ion-nitride	Ion-nitride
	Screw tip	STD (Rotating check ring)	Wear/corrosion-resistant (Ⅱ) (Non rotating check ring)	Wear/corrosion-resistant (Ⅲ) (Non rotating check ring)	STD (Rotating check ring)	STD (Rotating check ring)
Screw type	SD screw	Standard specified	Optional	Special option	Optional	—
	SF screw	—	Optional	—	Optional	—
	SM screw	—	—	—	—	Standard specified
Applicable resin		Resin containing no ware or corrosive compound agents	Contain wear and corrosion additives less than 30%.	Contain wear additive more than 30% or strong corrosion additives.	Weak for long residence time resin. Not contain wear and corrosion additives.	Weak for long residence time resin. Not contain wear and corrosion additives.



Mold Mounting Diagram

(Mold Mounting Diagrams comply with JIS B 6701.)



Rotating plate $\phi 93$
Water cooling jacket $\phi 75$
4-M8 screw depth 16

100
145

A~

U=Max. over all length of machine



The figure marked with an asterisk (*) shows the case of using no leveling pad.

(Mold Mounting Diagrams comply with JIS B 6701.)



Rotating plate $\phi 93$
Water cooling jacket $\phi 75$
4-M8 screw depth 16

145
100

A~

$$U = \text{Max. over all length of machine}$$


The figure marked with an asterisk (*) shows the case of using no leveling pad.

(Mold Mounting Diagrams comply with JIS B 6701.)

