Sumitomo SHI DEMAG

SE-DUZ2

All-electric small-sized injection molding machine

Lineup

SE18DUZ2 (170kN)

Sumitomo Heavy Industries, Ltd.

Less defects and greater energy-savings realized

Capable of filling with low injection pressure (FFC : Flow Front Control)

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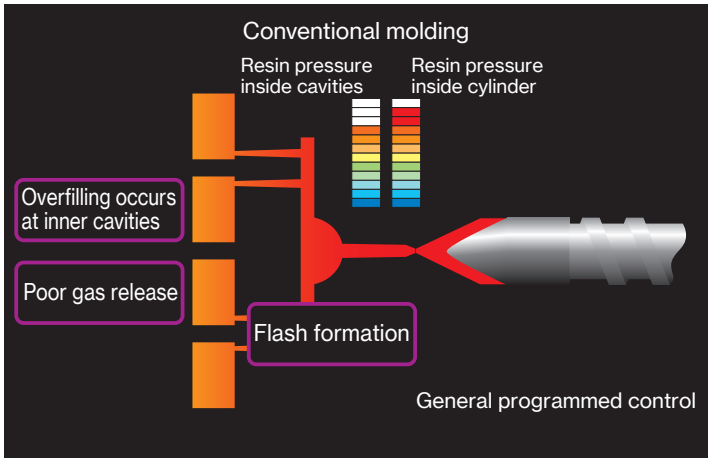
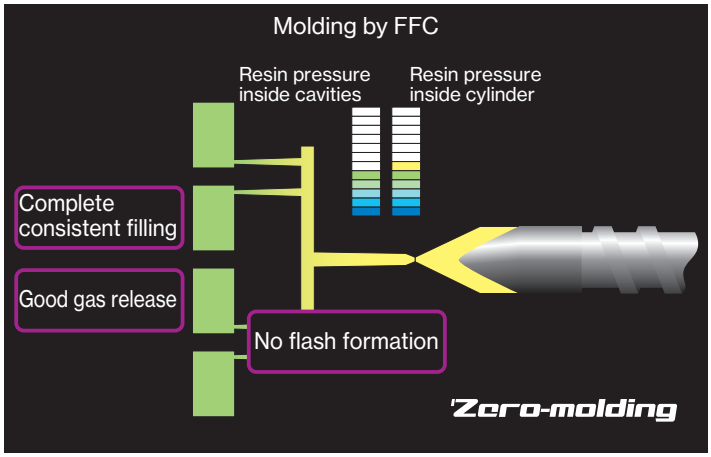
Stable molding conditions via smooth filling



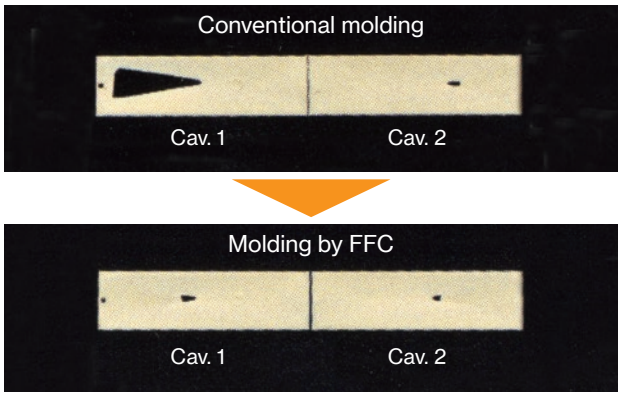
In conventional molding systems, resin is fully charged into mold cavities and consequently is apt to suffer excessive compression.



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.

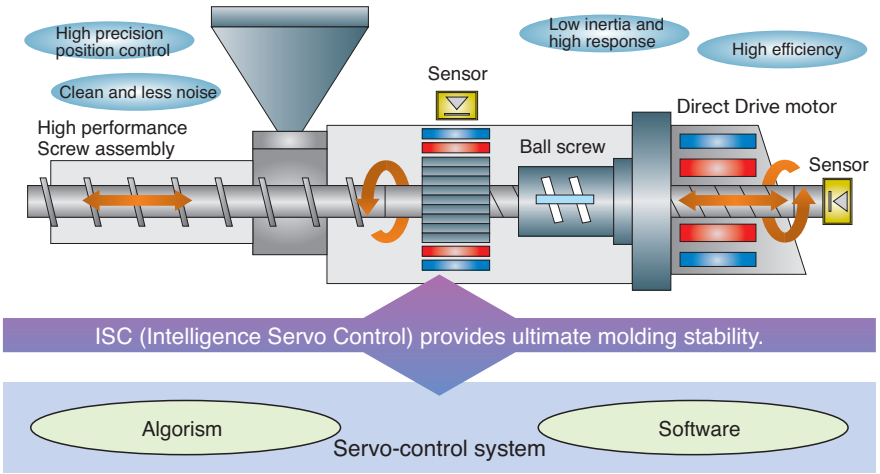
Example improvement in cavity balance



Molding by FFC improves cavity balance. All cavities face the same conditions that would lead to short shots and flash.

ISC system to support FFC molding

The ISC system provides a filling method that takes advantage of the characteristics of all-electric machines. The low-inertia direct drive motor and proprietary algorithm control system ensure stable molding.



by low injection pressure and low clamping force.

Capable of molding with low clamping force (MCM : Minimum Clamping Molding)

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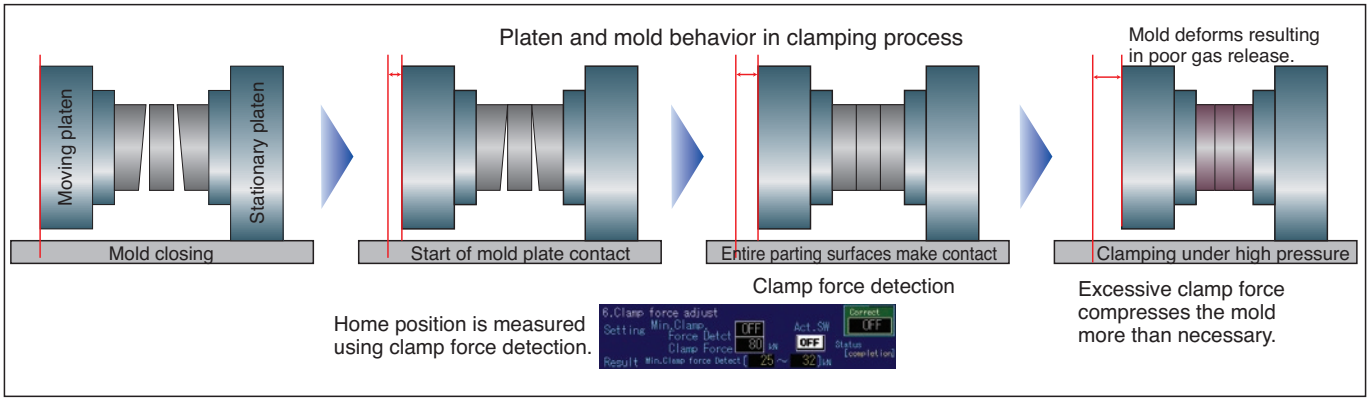
Low pressure clamping without unnecessary force

The SE-DUZ 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.



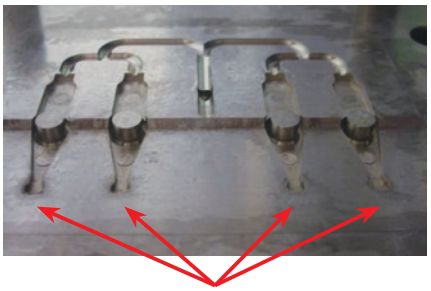
Mold comparison after 700 shots

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

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

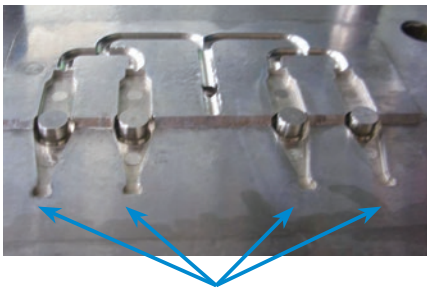
By reducing the mold clamp force, users can expect reductions in power consumption and shorter cycles, besides avoiding damage such as broken pins.

Conventional molding (Moving side)



Gas burning occurs in flow end.

Molding at low clamp force (Moving side)

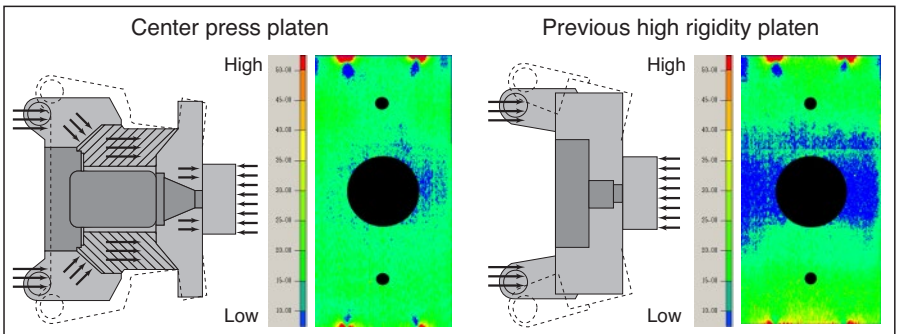


Gas burning is avoided because gas is released from entire parting surfaces.

Originally developed mold clamping system to support MCM molding

CPP (Center Press Platen) for balanced clamp force around molds

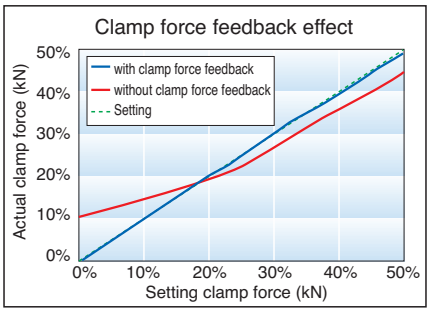
Sumitomo's CCP is proven technology that evenly applies clamp force to balance the surface pressure acting on molds.

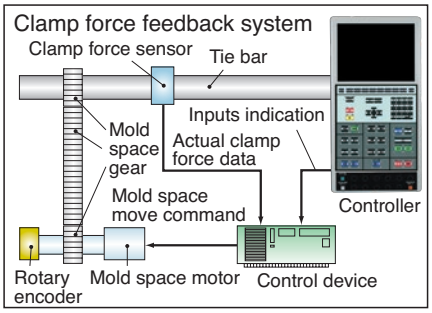


Distributions of clamp force are measured by pressure measurement film.

Clamp force feedback control optimizes clamp force

Force detecting sensors are employed to appropriately control clamp force to that needed for molding from 0 kN to the maximum applied load. Key to Zero-molding, this feature delivers sound accuracy even at low force settings.





Zero-molding, Zero-molding is a registered trademark of Sumitomo Heavy Industries, Ltd. in Japan.

Molding work supported by simple operation.

Capable of simple operation (SPS : Simple Process Setting)

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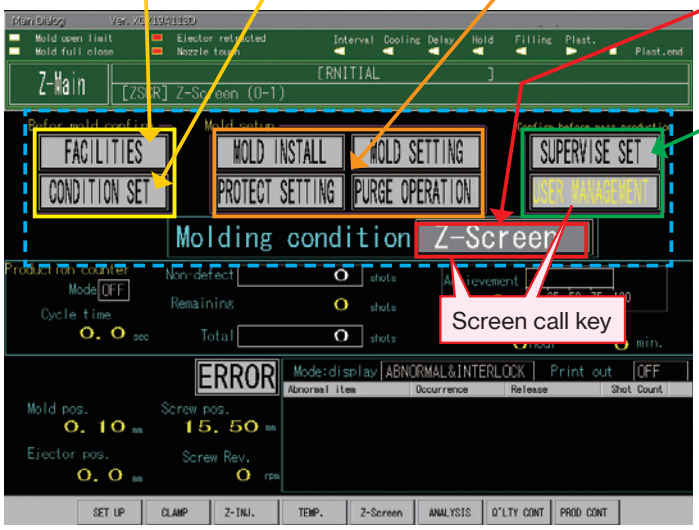
SPS simplifies operation while eliminating mistakes and oversights

Process up to mass-production start

Equipment checks → Conditions setting → Mold preparations and purging → Mass-production setup → Monitoring/ Control setting → Mass-production start

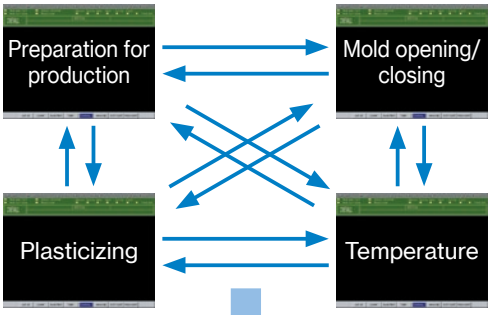


SPS (Simple Process Setting) arranges settings by process from the operator's position.

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.

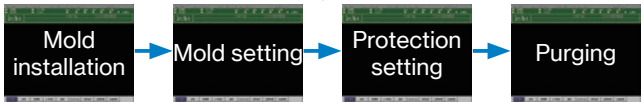
Comparison of screen operation 1 (Mold preparations and purging)

Conventional operation (Screens arranged by function)



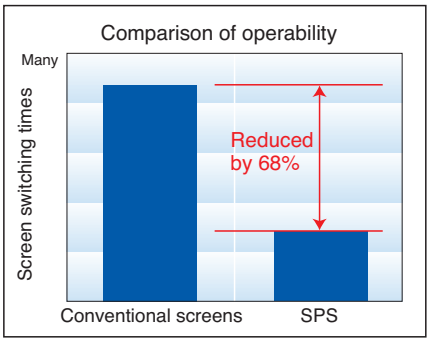
Whereas the conventional screens that were arranged by function required frequent switching between screens, SPS reduces operations to a minimum by arranging setting parameters according to process.

SPS (Screens arranged by process)



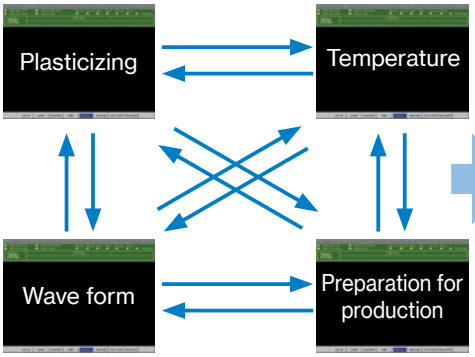
Example of improved operability

SPS reduces screen switching for mold preparations and purging by 68%.

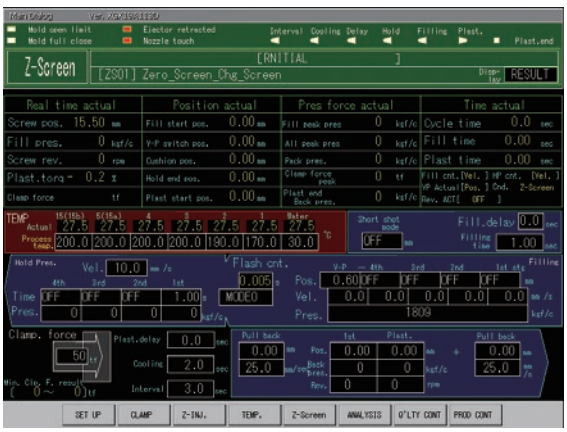


Comparison of screen operation 2 (Mass-production setup)

Conventional screens



Z-Screen
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.



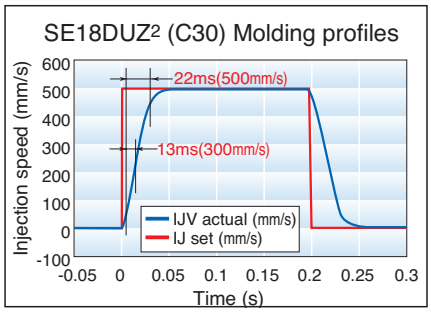
'Zero-molding backed by list of functions

1	Main	Zero-molding Main Screen : Simple Process Setting
2		Zero-molding Main Screen : Product Molding monitor (Product count,Process, Abnormal,Detect)
3	Check before molding	Mold condition change (Screw dia.,Unit, Add IL display)
4		Screen for comfirm Spec.Function (Main, Standard, Option, Abnormal transaction, Peripheral device signal)
5	Molding preparation	Minimum Clamp force detect
6		Setup guidance : Mold installation screen (Mold thickness, Mold contact, Clamp force, Mold open/close in preparations, Ejector)
7		Setup guidance : Teaching of mold opening limit and ejector protrusion point (Actual value input)
8		Setup guidance : Mold condition setting screen (Open/close, Ejector multi-step)
9		Setup guidance : Mold protection setting screen (Mold protection, Ejector protection)
10		Setup guidance : Multiple purge (Gate purge, Resin exchange, Moment stop, Low viscosity resin, Resin evaluation)
11		Setup guidance : Reference and calling for temperature conditions
12		Setup guidance : Supervise and warning for resin remaining
13		Setup guidance : Nozzle and heating cylinder heating-up mode (Step/Nozzle delay)
14		Setup guidance : Nozzle, heating cylinder, water cooling jacket temp. profile graphic display
15	Mold setups	Zero-molding : Molding condition setting screen Z-Screen (Fill.,HP, Plast.Time, TEMP, Clamp force)
16		Zero-molding : Flash Control <Mode setting: 10-mode>
17		Zero-molding : Flash Control <Mode setting: Thick-wall>
18		Zero-molding : Flash Control <Automatic setting: Filling time ratio>
19		Zero-molding : Flash Control <Automatic setting: Following to holding pressure>
20		Zero-molding : Flash Control <Time setting>
21		Zero-molding : Short shot mode (Confirmation of filling and short shot position by Flash Control)
22		Decomp. by Revers after plasticizing
23		Zero-molding : Clamp force feed back
24		Multiple clamp force control (Cross head position control)
25		Multi-toggle by objective (Gas release, Warping prevention)
26		Zero-molding : Molding condition guidance monitor (Peak clamp force, Clamp force at hold pressure end, Clamp force at cooling end, Pack Pres., Status display)
27		Detection monitor change (Detect, Detail, Process, Detect and real time, Wave form, Temp. graph)
28	Check before mass production	Monitor setting : Automatic group setting
29		Protection for molding condition (Condition range, Production support, Screen display, password)
30		Startup condition automatic change (By short shot mode)
31		Protection: Screw protection (Torque monitoring, Temp. output monitoring)
32		Process temperature control : Nozzle
33		Energy saving mode : Holding pressure
34	Aid to mass production	Wave form : Display by process (Injection,Hold prssure, Plasticizing,Mold open, Mold close, Ejector)
35		Wave form : Wave form preservation message
36		Quality Control : Wave form distinction
37		Quality Control : Molding process monitor logging (Temp., Temp. cont. output, Peak clamp force, Pack pres.)
38		Production control : Product amount (Number of cavities setting)
39		Production control : Operation status control (Operation time, Motor over load, Power consumption)

Accuracy stability to improve productivity

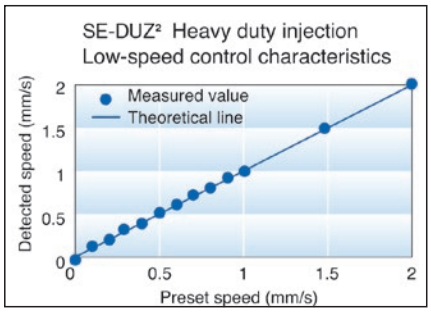
High response performance

Direct drive has the same injection power as a hydraulic machine with accumulator.
Direct drive is suitable for thin wall parts, high viscosity resin and long flow length parts.



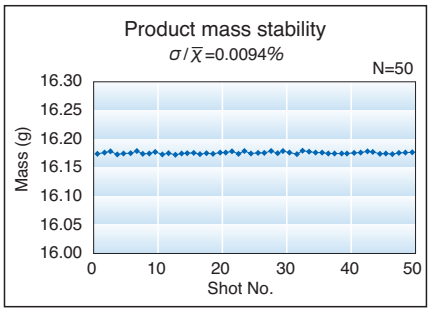
Low speed injection control performance

The injection unit of the SE-DUZ² has a linear speed control profile. This enables a stable molding even for thick walled products.



Product mass stability

ISC and the direct drive system provide an excellent accuracy to molding steps including mold opening/closing steps, implementing highly stable and accurate molding solutions.



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Standard Equipment

Plasticizing & injection unit	
1	Standard screw assembly (ion-nitride)
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	Injection start delay timer
9	Automatic purging program Interlock attaching (Select between nozzle touch and plasticizing unit withdraw limit)
10	Heating cylinder temperature control 4 zones *1
11	Zone 1 high capacity heater
12	2-modes temperature control (production/standby)
13	Cold screw startup protection (Interlock variable timer attaching)
14	Injection unit retraction delay selector (with delay timer)
15	Sprue break stroke remote setting (Detection of nozzle touch, Moving time)
16	Screw speed digital indicator
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	Synchro-plast control
25	SK-control
26	Temperature controlier for nozzle
27	Stepped heat-up operation
28	Energy-saving heating cylinder cover (2-layer structure)
29	Water cooling jacket temperature control device
30	Screw centering mechanism
31	Multi-step filling pressure control
32	Resin staying protection
33	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	Take-out robot connection circuit *2
9	Three languages screen changeover (Japanese/English/Chinese)
10	Operation guide for maintenannce
11	Automatic starting system (heater warming, heater start, machine stop)
12	Molding process indication
13	SSR control circuit for heater bands
14	Input expressed in industrial units of velocity, position, pressure & screw revolution
15	Signal output for machine condition (5ch)
16	USB connection circuit (memory)
17	PC connection circuit (RS232C) *2
18	Molding condition protection
19	Alarm sequence selection
20	Initial rejection + short stop rejection

Monitor unit	
1	Actual operating values indicator
2	Heater band burnout monitor
3	Auxiliary facility monitor (1ch)
4	Alarm monitor (6 items)
5	Automatic setting of monitor high/low value
6	Abnormal history (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) *2
10	Cylinder heater temperature monitor (all zones)
11	Self-diagnosis
12	Audible alarm
13	Shot counter
14	Molding cycle time monitor (attended/unattended selection)
15	All-in-one setting screen
16	Monitor setting fail protection

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 *2
15	Mold close and mold opening signals (Spear control signal) No-voltage dry contact *2
16	Valve gate drive circuit (control circuit only) *2
17	Standby mode for mold mounting (low mold closing/opening speed)
18	Safety door with polycarbonate window
19	Emergency stop switch (on both sides)
20	Clamp cover with polycarbonate window
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	Center press platen
27	Ejected products sensor circuit *2
28	Multi-toggles

Miscellaneous	
1	Automatic centralized greasing device
2	3-way open space frame
3	Mold cooling water block (2 lines) (Sight flow indicator & valve are optional)
4	Standard spare parts (touchup paint, sling bolt, fuse)

Optional Equipment

Plasticizing selection
1 Wear & corrosion resistant screw assembly Ⅱ
2 High-temperature screw assembly (Max. temp. 450℃)
3 SF screw assembly
4 SK screw tip (Material : STD, MK)
5 FTC Ⅰ nozzle
6 High capacity heater
7 Extension nozzle
Plasticizing & injection selection
1 Standard type hopper
2 V/P switchover by mold cavity pressure
3 FTC nozzle electric control circuit (φ 18 ～φ 36 screw)
4 High temperature heater control circuit (Max. temp. 499℃)
5 Plating resin inlet of cooling water jacket
6 Heavy duty injection
7 High response injection
Control & monitor unit
1 Leak circuit breaker (AC200V, 220V 3 φ 3W+E Japan and Asia only)
2 Mold temperature monitor 2 zone (without thermocouple and type K)
3 Auxiliary facility monitor (STD.+2ch)
4 Analog circuit output for molding profile
5 Production control (2direction rejection chute)
6 Mold temp. controller (2 zone)
7 Automatic starting system (Heater+water supply+external output signal) *2
8 Revolving alarm lamp
9 Multi fanction 3 colors LED alarm lamp
10 4-Lines closed circuit cooling water piping connection (with flow detector, stop valve)
11 2-Lines closed circuit cooling water piping connection (with flow detector, stop valve)
12 Electric power supply socket
13 Electric power supply socket for tools (with transformer)
14 Lock-up key-switch for data input
15 Motion 07

Clamp unit
1 Pneumatic ejector
2 Cavity ventilator
3 Hydraulic core pull control circuit 1 lines (control circuit+Piping)
4 Pneumatic core pull circuit 1 lines
5 SPI take-out robot connection circuit *2
6 Products chute
7 High precision heat insulating plate (5mm, cross type)
8 Valve gate drive circuit (control circuit & pneumatic circuit)
9 Cassette mold holder (Standard type)
10 Cassette mold holder (Side type)
11 φ 60 attachment metal fitting correspondence
12 Full metallic toggle cover
13 Hydraulic driving unit (for core-pull & valve gate)
14 Tie-bar plating
15 Ejector unit with brake
Spare parts & accessories
1 Spare parts (Mechanical parts : Brake lining, Lub. parts)
2 Spare parts (Electrical parts : Thermocouple)
3 Spare parts for export. (Encorder,Limit switch, and Inducjive proximity sensors)
4 Leveling pads (for one machine)
5 Anchor bolts (for one machine)
6 Tools A
7 Ejector rods
8 Grease gun
9 Grease cartridge for Automatic Lub (700cc)
10 Grease cartridge for Manual Lub (400cc) Plasticizing

*1 The number of zones varies depending on the screw diameter and screw type.
*2 Input / output signals are provided with dry contact (zero voltage).
(If signal required voltage, please request for such option)

- Specifications may subject to change without notice for performance improvements.
- 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.

Screw assembly (Option)

Specification	Resin	Additives	Screw type				Material						Example
			SD Screw	SF screw	SM screw	Screw for connector	Plating	Optical spec	W/R II	Connector spec.1 W/R II	Connector spec.2	High temperature spec.	
Engineering resin	PA・PBT・PP・ABS・POM・PC	Glass fiber less than 30%,flame retardant	◎	△	△	○	●	●	◎	◎	◎	○	Mechanical parts, Electrical parts etc.
Super Engineering resin	LCP・PA9T	Glass fiber less than 35%,flame retardant	○	△	△	◎	●	●	○	◎	◎	○	Connector, Electrical parts etc.
	PA6T・PPS・PA46	Glass fiber more than 30%,flame retardant, Highly corrosion	○	△	△	◎	●	●	△	○	◎	△	Connector, Electrical parts etc.
Optical resin	Ring polyolefin、PMMA、PC	Without glass	△	◎	△	△	○	◎	△	△	△	△	Optical parts etc.
High temperature spec	LCP、PEI、PEEK	With/Without glass	◎	△	△	○	●	●	△	△	△	◎	Mechanical parts etc.

◎ : Combination of screw type and Assemblt material ○ : Applicable △ : Limited use ● : Impossible to choose
* These specification is not available for some machines.

Global Network

Sumitomo Heavy Industries, Ltd.

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SE-DUZ²

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.

www.shi.co.jp/plastics/

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

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B049EN02-2408AT

All-electric small-sized injection molding machine

SE18DUZ2

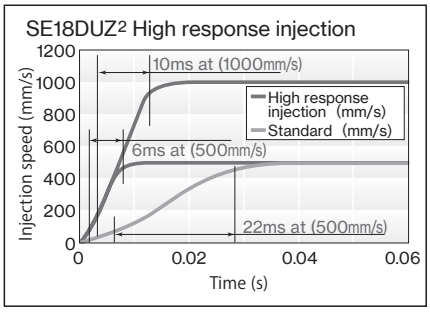
Sumitomo SHI DEMAG

Items	Unit	SE18DUZ2
●Clamping unit		
Clamping system		Double toggle (5 point)
Clamping force (max.)	kN	170
Clearance between tie-bars (H×V)	mm	260×235
Platen size (H×V)	mm	355×355
Daylight	mm	410
Mold opening stroke	mm	160
Platen speed max.	mm/s	1200
Mold height (min. - max.)	mm	130 - 250
Locating hole diameter	mm	φ26〔φ60〕
Ejector system (ejecting points)		Electric (1 point)
Ejector ejection force	kN	7.8
Ejector speed (max.)	mm/s	333
Ejector stroke	mm	50

●Injection unit		Standard				Heavy duty injection				High response injection			
		C30				C30				C30			
Screw diameter	mm	14	16	18	20	14	16	18	20	14	16	18	20
Injection pressure (max.) *1 *2	MPa	223	266	210	170	223	266	210	170	223	266	210	170
Holding pressure (max.) *1 *2	MPa	223	212	168	136	223	266	210	170	223	212	168	136
Theoretical injection capacity	cm^3	6.2	11	14	17	6.2	11	14	17	4.6	6.0	7.6	9.4
Injection weight (GPPS)	g	5.9	11	13	17	5.9	11	13	17	4.4	5.8	7.3	9.0
Plasticizing rate	kg/h	5.1	9.5	13	16	5.1	9.5	13	16	5.1	9.5	13	16
*3	(min-1)	(460)	(430)	(430)	(430)	(460)	(430)	(430)	(430)	(460)	(430)	(430)	(430)
Injection rate	cm^3/s	77	101	127	157	77	101	127	157	154	201	254	314
Screw stroke	mm	40	55			40	55			30			
Injection speed (max.)	mm/s	500				500				1000			
Screw speed (max.)	rpm	460	430			460	430			460	430		
Number of temperature control zone		4				4				4			
Heater capacity	kW	2.3	2.7	2.7	3.1	2.3	2.7	2.7	3.1	2.3	2.7	2.7	3.1
Nozzle contact force A	kN	2.9				2.9				2.9			
Injection unit moving stroke	mm	175				175				175			
Nozzle protrusion	mm	65				65				65			
Hopper capacity	L	6				6				6			

●Machine dimensions and weight				
Machine dimensions (L×W×H) *4	mm	2438×821×1531		2738x821x1531
Machine weight	t	1.2	1.2	1.2

*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 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.
● Specifications are subject to change without notice for performance improvement.
● The dimensions are japanese specification.
◇ This series originally comply to safety standards of japan, the US and Europe, in addition China GB22530 and KC mark.



List of Preparation Items

Main breaker size

Machine	SE18DUZ2
Main breaker size	60A (20.8kVA)

●Voltage and frequency of main power source is applicable to the areas of AC200V-50Hz/ AC200V-60Hz/AC220V-60Hz.
●Connect to the mating of 3-phases 3-wires, & grounding cable.

Spare sockets (Optional)

Machine	SE18DUZ2
Maximum Amperage	40A

The increased number of power sockets are available for auxiliary equipment such as auto loader and mold temperature controller to flexibly meet the requirement for customer's molding systems, to which a necessary number of sockets can be added to connect their peripheral equipment.
●Selection of power outlet can be made from 4 locations, with maximum number of 7 units for SE18DUZ2.
●Amperage of outlets in each area as follows:Each area of SE18DUZ2 has allow only one outlet.
※The table shows the limit of total Amperage available at the same time when each type of molding machine runs.

Primary side in-line size, grounding cable size

Machine	SE18DUZ2
Wire size of primary power	$14mm^2$
Screw size of primary power terminal	M8
Wire size of ground	above$14mm^2$
Screw size of ground terminal	M8

●The size of electric cables listed above is based on the allowable current when the ambient temperature of piping of a single core polyvinyl cable is 40℃.
●The values listed above are calculated base on the sum of load current listed in the item of main breaker capacity. When the power must be supplied in large quantities to auxiliary equipment from the molding machine, it is required to use a large size cable. However, there may be enough room for the size of the cable currently used depending on the selection of the options.
●Voltage fluctuation of the power source must be within ±10% of the rated voltage at the power source contact point (main breaker) on the molding machine side.
●Protection network against service interruption is not provided for the control circuit of the molding machine. When the instant interruption time exceeds one cycle, the molding machine may stop running in some cases. In an area where instant service interruptions are frequent due to thunderbolts, be sure to install

Required cooling water volume (cooling water jacket)

■Cooling water line of water jacket

Machine	SE18DUZ2
Band heater capacity	2.7kW
Required cooling water	0.6L/min

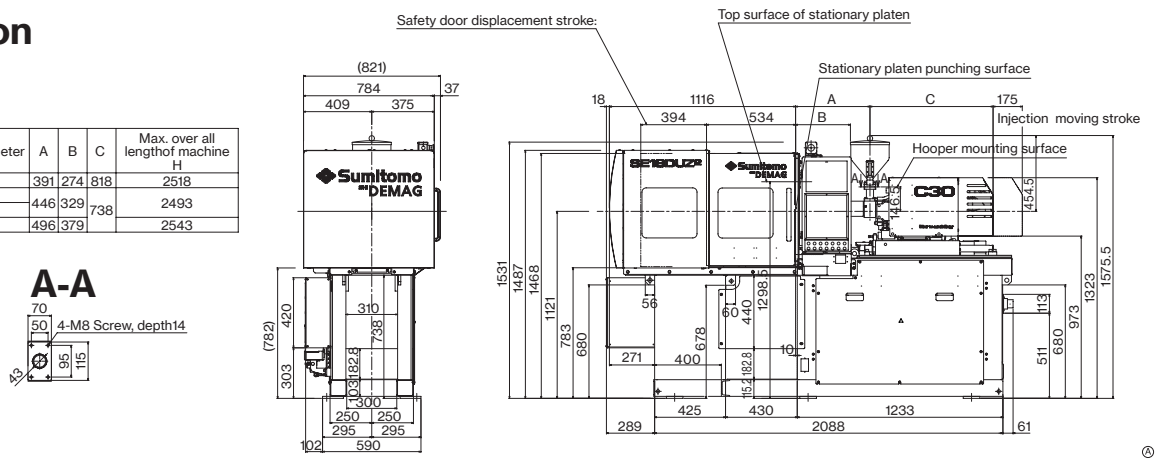
■Mold cooling water line

All models	SE18DUZ2
Total cooling water required for 2 lines.	10L/min

＊Cooling water required for 1 line is approx 5L/min.

Dimension

Injection unit	Screw diameter	A	B	C	Max. over all lengthof machine H
C30MN	14	391	274	818	2518
	16	446	329	738	2493
	18				
	20	496	379		2543



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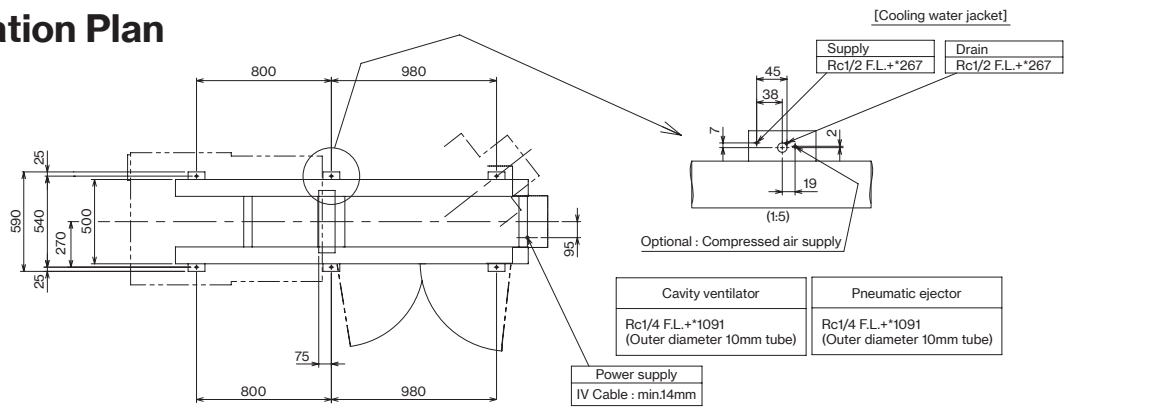
Foundation Plan



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

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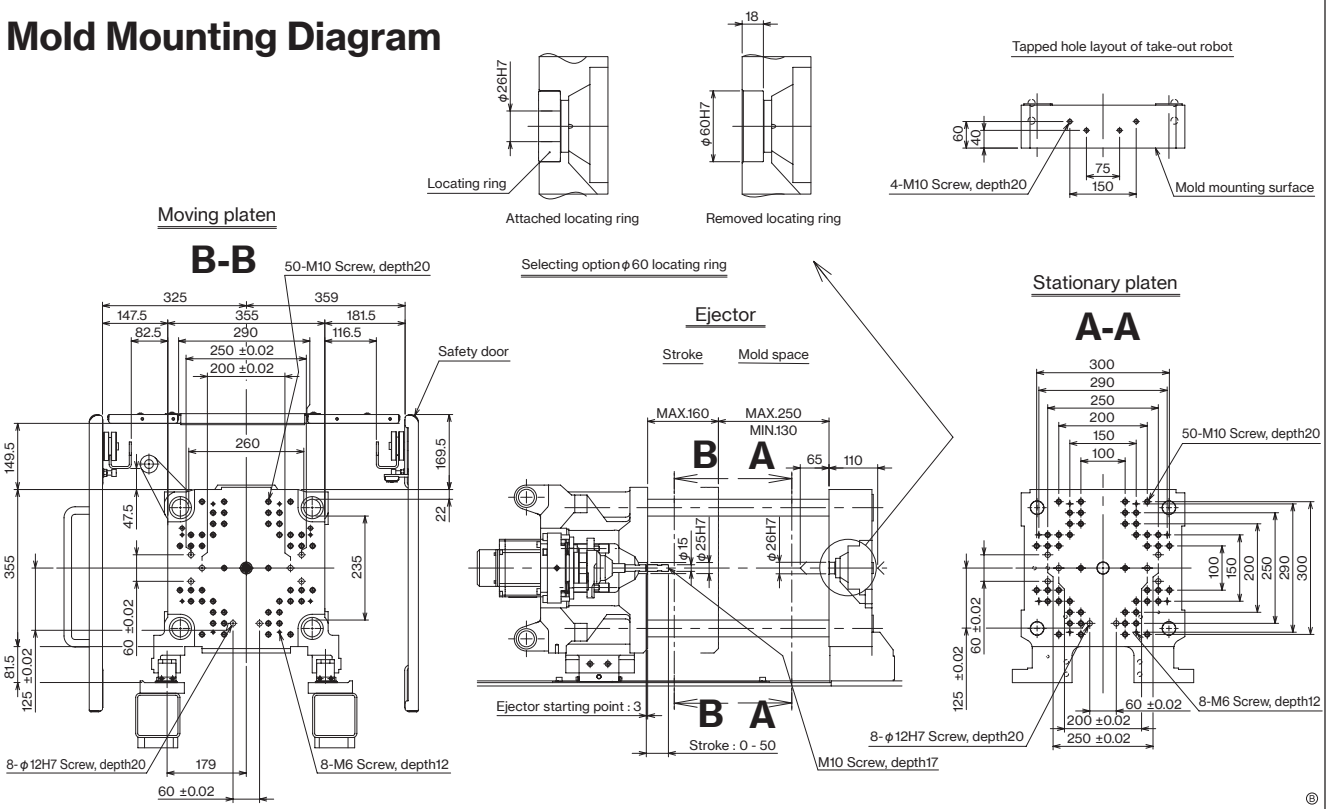
Mold Mounting Diagram



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