

Fully Electric Injection Molding Machine

Si-IV



Molding Revolution

Shop Floor Needs of Today and Visions for the Future are Embodied

PLASTAR
Si-110IV
Fully Electric Injection Molding Machine



Packed with solutions, the Si-IV revolutionizes your shop floor



Uncompromising quality

New V-Shaped Clamp Unit

- Innovative V-shaped clamp jointly developed with Kyoto University, for high cycle operation
- Slim and yet high-rigidity die plates designed by optimization analysis method
- High-speed ejector for high cycle operation



Assuring high quality

New Injection Unit for Stable Molding

- Extremely sharp injection acceleration for high-speed molding
- High-precision injection mechanism for more precise plasticizing pressure control
- Double nozzle-touch mechanism preventing the stationary die plate from inclining



User-Friendly New Control System

- Advanced production control system integrating T-station function
- Shock-less programming for smooth constant operation
- All-in-one menu screen for instant access to any screen
- Flexible adaptability to your quality control management



New Clamp Unit

New Injection Unit

New Control System

Screws

Environmentally-Friendly Features

Specifications

Standard/Optional Features



Capable of Handling a Variety of Resins

- Abundant types of screws best suitable for your specific resins
- The SRC-II metering system ensures uniform melt density after metering.
- The SRC-III metering system prevents melt backflow.



Environmentally-Friendly Features

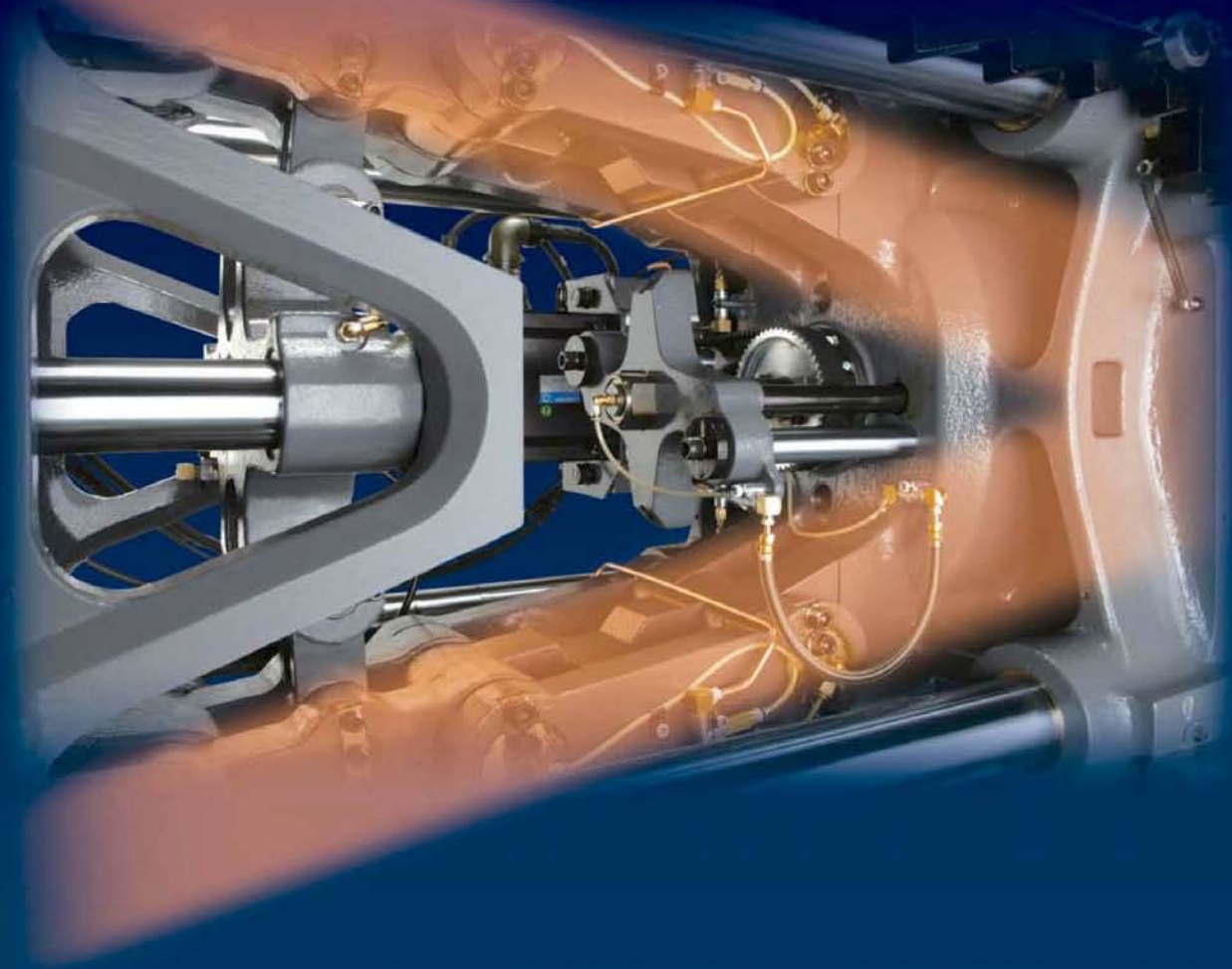
- Originally-developed PLASTAR GREASE and lubricant-saving design
- Easy disposal of waste grease
- Dramatically reduced power consumption
- Low-noise operation for comfortable work environment



You can choose the best suitable injection unit for your specific needs

Uncompromising quality ———

Joint R&D with an Academic Institute Achieves the Ultimate Machinery

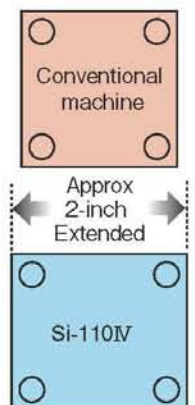


Wide-platen design in response to market demand

The SI-IV platen design with extended tie-bar spacing allows the mounting of larger molds that would otherwise require larger molding machines. (for SI-55IV to SI-150IV)

Wide die plates and the V-shaped clamp combined together contribute to enhanced molding versatility.

The extended tie-bar spacing design leads to increased efficiency in mold setups as well as freedom in the mold design. The versatility is further enhanced by the V-shaped toggle mechanism, directing the clamping force toward the center of the movable die plate. In addition, the optimized design of the die plate allows applying uniform clamping pressures over the mold.

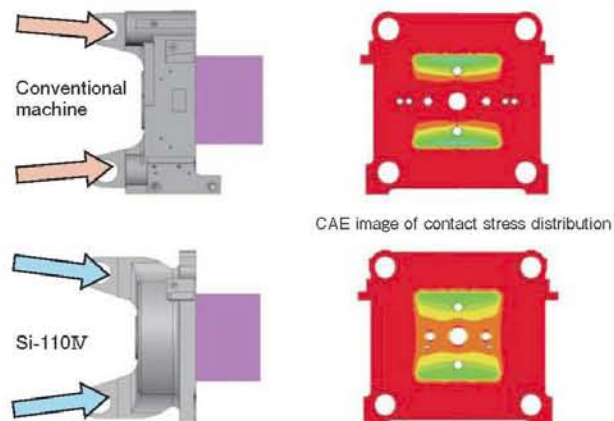


The clamping mechanism brought to a new dimension by the V-shaped toggle design and fat-cut slim die-plate jointly-developed with prestigious Kyoto University

Innovative V-shaped toggle clamp is the solution to apply clamping force in the center of mold.

Collaboration with Kyoto University has brought TOYO toggle clamp systems, one of our core technologies, to a new dimension. As a result of kinetic analysis conducted by Kyoto University, the toggle link mechanism is given a steeper angle than that of conventional mechanisms, so that the clamping force can be directed to the center of the mold. This allows uniform distribution of clamping pressure along the entire surface of the mold contributing to high quality molding and efficient production with minimized defect rate.

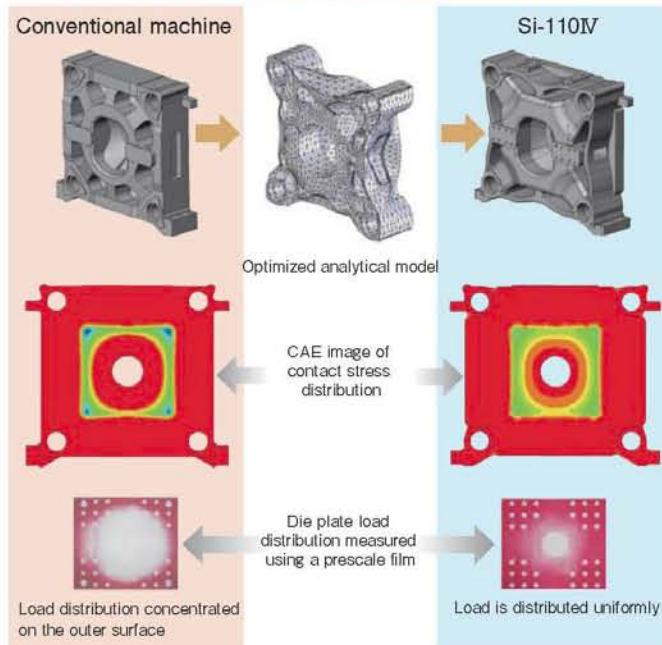
Movable plate analysis



Highly-rigid, slim die plate design based on optimization analysis of conventional machines.

Optimization of die plates was realized utilizing an optimization analysis model developed by Kyoto University. The die plates are given wider tie-bar spacing and even higher rigidity despite the fat-cut slim design, thus contributing to higher kinetic efficiency and energy-saving. In addition, the die plate delivers uniform clamping pressures over the mold surface for ideal molding.

Stationary plate analysis



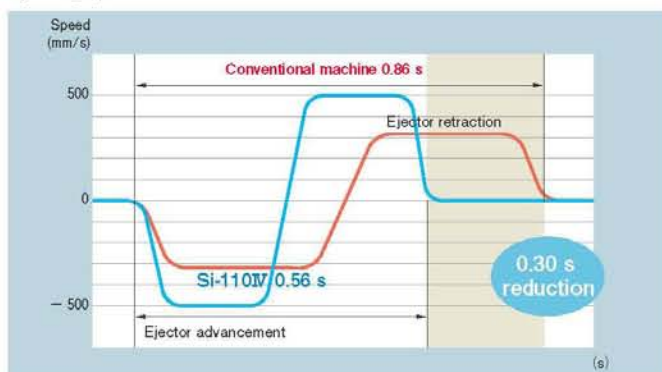
V-shaped clamp contributes to high cycle operation.

Since the V-shaped clamp unit requires a shorter link length and shorter ball screw strokes, the overall mold opening/closing time can be reduced.



High speed ejector also helps high cycle operation.

The Si-IV series employs a newly-developed high-speed ejector by which the acceleration and breaking times are minimized while top ejecting speed is increased.



Ultra-Rigid RASMA machine frame

TOYO's own RASMA machine frame features the most outstanding rigidity and vibration resistance ever found in conventional machines in the industry. Thanks to CAE analysis, the frame is given even higher rigidity while its weight is lessened.

Features

- Die plate parallelism is maintained.
- Heavy stress is dispersed through the box structure.
- Machine vibration is suppressed to a minimum.

Advantages

- High accuracy is maintained for many years of machine use.
- Small impact on other equipment.
- With four-point support, frame deflection is reduced to one-third compared to conventional frame.



Assuring high quality ———

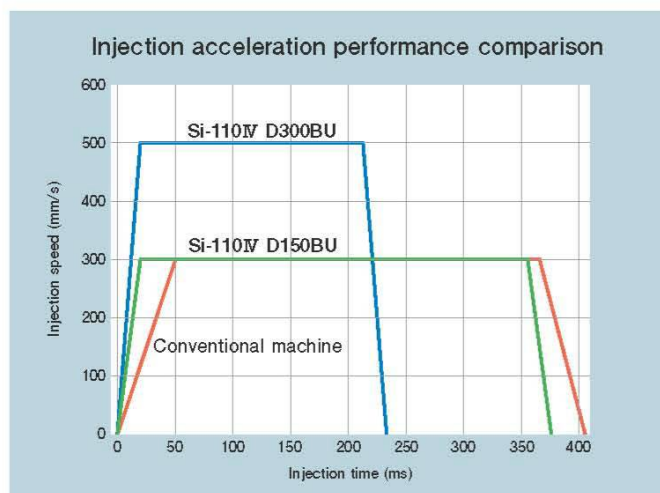
High-Speed and High-Precision Injection Makes a Difference in Quality Molding



Extremely sharp acceleration facilitates high-speed molding and super thin-wall molding

The D150BU injection unit is equipped with a low-inertia servomotor as standard, so that the acceleration time can be shortened by 60%. The twin-motor-mounted D300BU injection unit is also available. It features the sharpest acceleration capability in its class in the industry.

Model name	Highest injection speed	Acceleration time	Deceleration time	Acceleration speed
Si-110Ⅳ D300BU	500 mm/s	20 ms	20 ms	2.55 G
Si-110Ⅳ D150BU	300 mm/s	18 ms	17 ms	1.70 G
Conventional machine	300 mm/s	47 ms	38 ms	0.65 G



High-precision injection mechanism and precise plasticizing pressure control

The injection unit is equipped with low-friction linear guides, so that the variation of back-pressure can be reduced to a half that of the conventional injection unit.

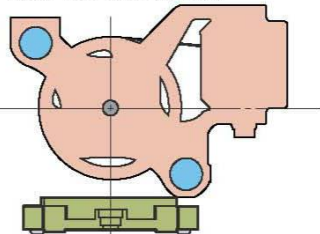


Low-friction linear guide

With the bearing case just placed on the linear guides, its motion is less susceptible to the machining accuracy of component parts or their assembly condition compared to conventional mechanism.

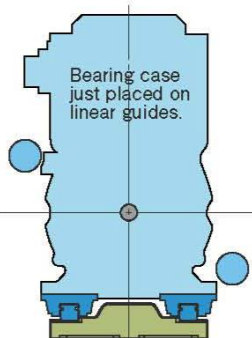
As a result, the screw and barrel alignment can be improved, and plastication/metering can be stable due to low friction between the bearing case and linear guide.

Bearing case is supported by guide bars and bushings.



Conventional machine

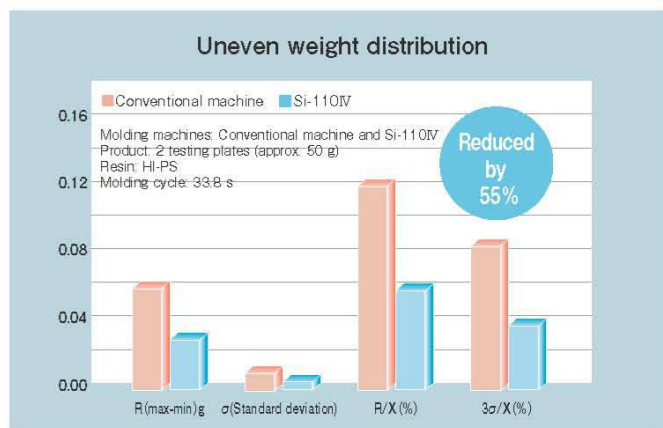
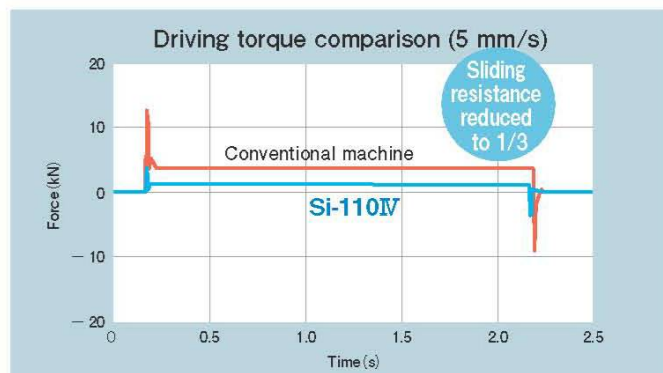
Bearing case just placed on linear guides.



Si-110IV

Comparison of sliding resistance in injection axis.

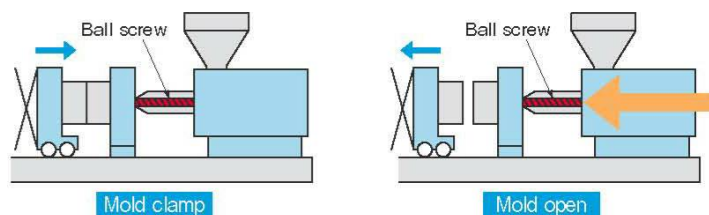
A test was conducted to compare the sliding resistances by driving the bearing case at a low speed along the injection axis. The test result shows the sliding resistance of Si-IV was reduced to one-third compared to the conventional model.



Double nozzle-touch mechanism preventing stationary die plate from inclining

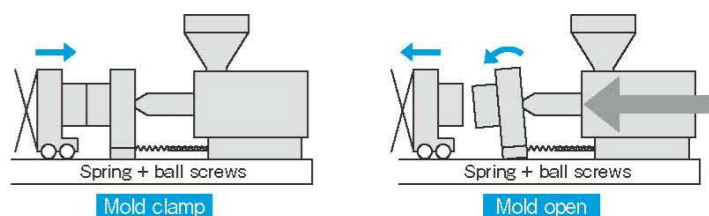
This mechanism eliminates inclination of the stationary die plate and minimizes tie-bar balance fluctuation due to mold open/close motion. As the nozzle-touch force is generated by TOYO'S own unique mechanism without using a spring, stable nozzle reciprocating motion can be maintained even in short stroke.

●TOYO (double nozzle-touch system)



* In all-electric machines, the nozzle-touch force is applied to the mold all the time.

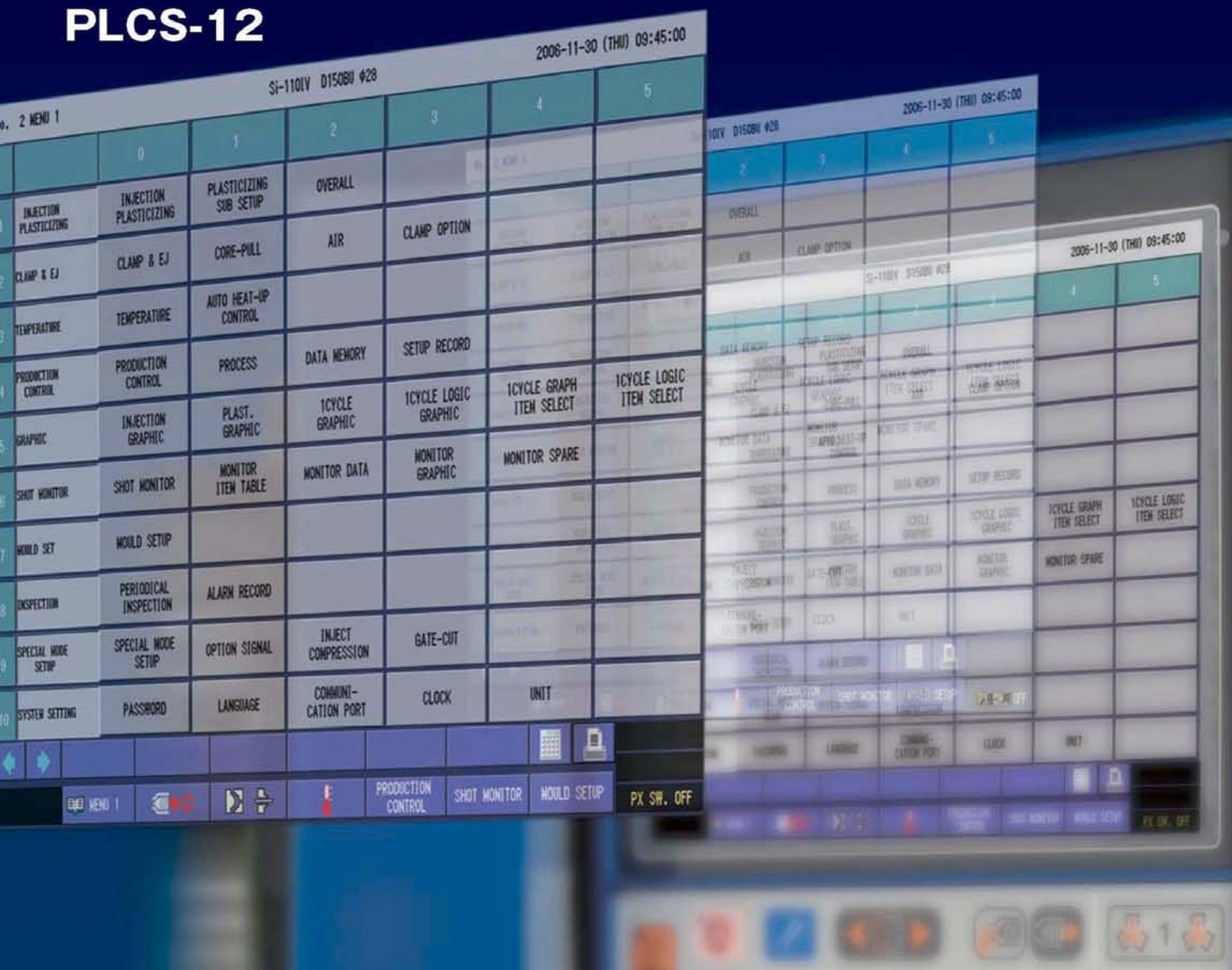
●General all-electric machines (single nozzle-touch system)



* In all-electric machines, the nozzle-touch force is applied to the mold all the time.

Easy operation

Next-Generation Human-Machine Interface: PLCS-12

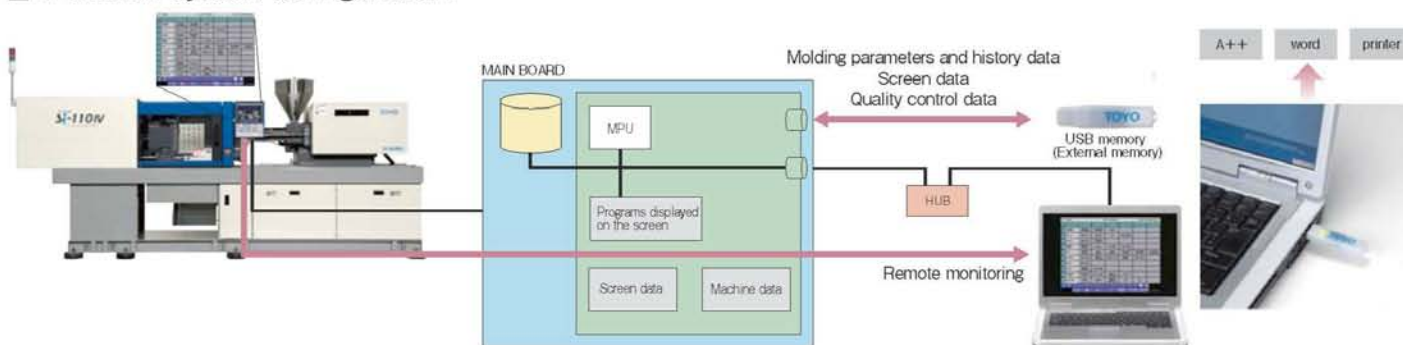


T-Station network control system brings your production control to new stage

The T-Station is TOYO's original new network control system that can remotely monitor as many as 32 injection molding machines using a server. The Si-IV series has necessary software and interface for the T-Station as standard. (Software on the server side is optional.) With the

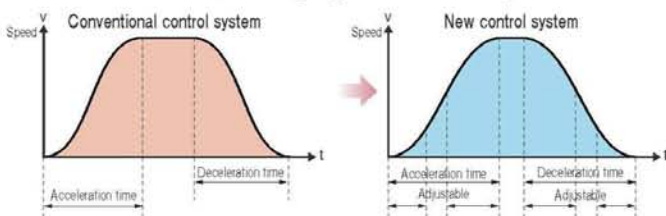
T-Station, the current machine operating status can be monitored real-time no matter where you are via the internet or a wireless LAN. The PLCS-12 control system tremendously improves the efficiency of your production control regardless of a place or a time.

■ T-Station system configuration



Constant smooth molding thanks to shock-preventing motion control

The new control system precisely controls the speeds at the acceleration and deceleration stages so that fast mold movement can be made with no shock, showing a gentle mound-like speed curve.



All-in-one menu screen from which any screen can be accessed



Customer-satisfying PLCS-12 control

The PLCS-12 controller accommodates all the features that fulfill needs and wishes given from customers to our previous PLCS-11 controller.

Frustration-free, instant access to any screen

Any desired screen can be accessed directly from the main menu screen. In addition, one screen can be shifted to another much quicker than previous controller.

Screen-storing function

Maximum five screens can be stored in the internal memory. Stored screens can be called up by just touching FORWARD or BACK buttons. This function is just one of the unique features you can find only in PLCS-12 control.

Adjustable screen direction for comfortable operation

The control panel can be tilted upward by about 10°, and turned horizontally by about 90°. This structure promises operators to get better view of the screen and easier key operation. In addition, enough room is secured when necessary by turning away the screen, which is convenient when mold changing work is made, for example.

Octa-lingual screen

The screen language can be chosen just at the touch of a language shifting key. Eight characters are ready: English, Japanese, Chinese(traditional, simplified), Thai, Korean, Hebrew and Spanish.

PC-touch easy entry operation



Entry with 10-key screen

The popped up screen can be dragged to a convenient place for easy entry operation.



Software Keyboard

The keyboard appears as a pop-up, allowing key inputs similar to a personal computer keyboard.

Security features



Password function

The PLCS-12 controller is provided with a 4-step security protection using respective passwords for each authority level. If an upper level screen is left unattended for a certain time, it is automatically shifted to a default level screen.

Level	Job category	Permitted operation
Administration	Factory or division manager	User registration Password allocation
Maintenance	Maintenance engineer	Change or setting of machine model codes, semi-fixed values and environment screen.
Process	Process engineer	Change of molding parameters.
Operation	Operator	Machine start/stop Screen display only

Easy-to-see screen design



Injection/Plasticizing operation screen

Specified screens can be popped up.



I/O monitor screen

All the input/output condition can be observed at one glance.

Enhanced flexibility in quality control management

	Conventional control system	New PLCS-12 control system
Data storage and download to a personal computer	Parameters only (Memory card)	Parameters, constants, graphs and monitor data Screen hard copy Download from USB memory to a personal computer •Internal: 400 setups •External: 400 setups (1 GB USB memory) •Graphics: Internal 40 patterns
Printer compatibility	ESC/P control code compatible printers	•ESC/P control code compatible printers •USB printers (specified by TOYO)

Handling a variety of resins

Originally Designed Screws and Barrels Dedicated to Your Specific Applications

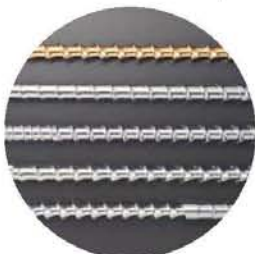


A variety of screws developed utilizing TOYO's see-through heat barrel technology meet your diversified resin-processing needs

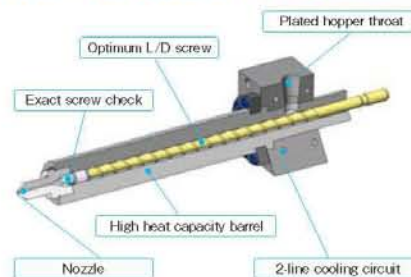
A variety of TOYO's screws dedicated to specific uses

Screw type	Application
Sub-flight	High mixing performance and uniform melt temperature
Mixing	High mixing performance and uniform coloring
LOT	For resin with high viscosity
HIT	For resin with low viscosity

In addition, screw units for optical products and connectors are available.



Fully utilizing TOYO's own see-through heat barrels technology, screws and barrels for the Si-IV series have evolved further. The new heat barrels give ideal flow rate, thermo-stability, heat volume and temperature for respective resin processing needs. You can find the best one for your specific needs from our abundant designs.



Plasticizing test using the see-through heat barrel



TOYO's first-in-the-industry see-through heat barrel allows observation of the plasticating condition in the barrel.

Plasticizing condition in the heat barrel (PP with 0.5wt% of Red Master Batch)
Mixing condition is easily observed as the melt color turns to uniform red over plastication process.

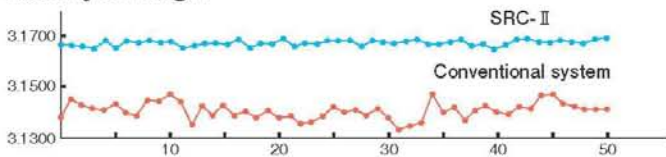


The SRC-II metering system ensures uniform metering density

PAT. No. 3534990

The Si-IV series is provided with the SRC-II metering system as standard. With the SRC-II system, the screw imposes optimum pressure on the melt immediately after metering. This process makes the melt density even and brings about constant product weight in every molding cycle.

Stability of weight



Product: Small gear
Material: PA-66
No. of cavities: 4 pcs.

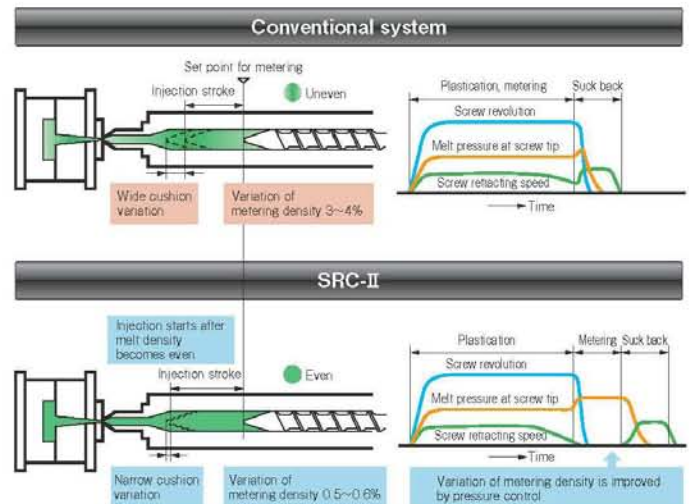
SRC-II

$\bar{X}=3.1666g$ $R=0.0044g$ $\sigma=0.0010g$
 $3\sigma/\bar{X}=0.094\%$

Conventional system

$\bar{X}=3.1423g$ $R=0.0137g$ $\sigma=0.0031g$
 $3\sigma/\bar{X}=0.295\%$

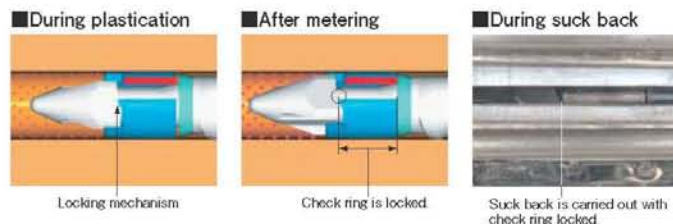
The above values include the weight of the sprue and the runner.



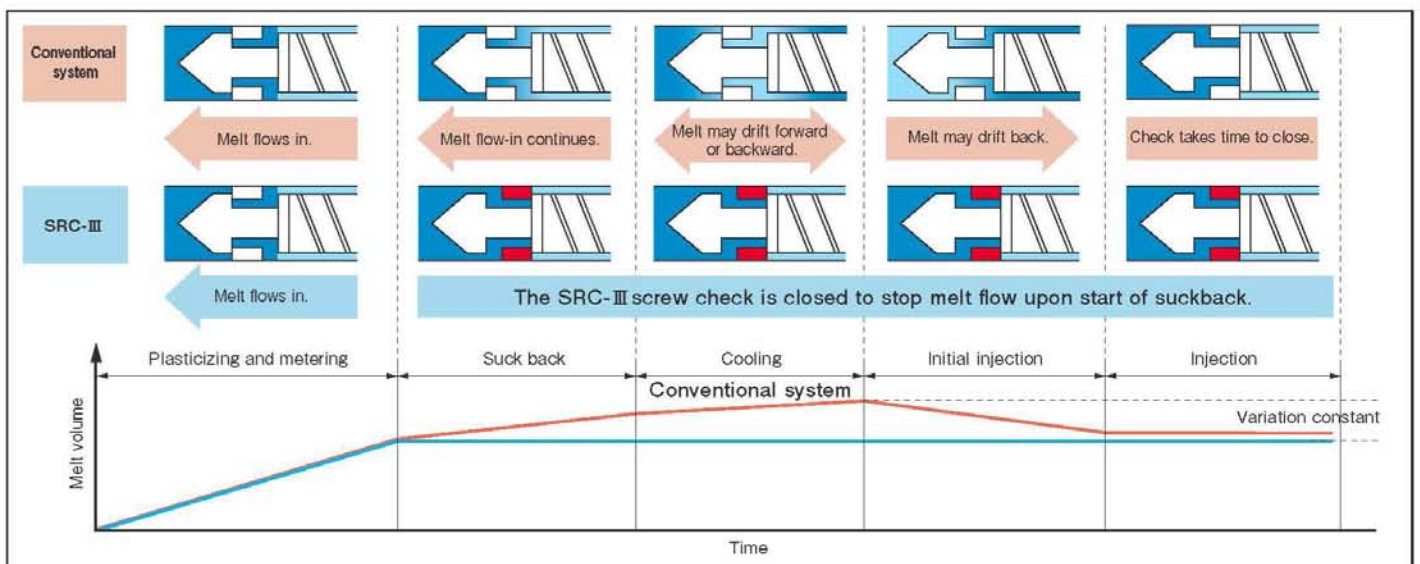
The SRC-III metering system prevents melt backflow

The SRC-III metering system (optional) locks the check upon completion of metering.

- Structure is simple.
- Check seat is standard.
- Standard metering is available even with SRC-III screw check fitted.



PAT. No. 3432776/No. 3432782

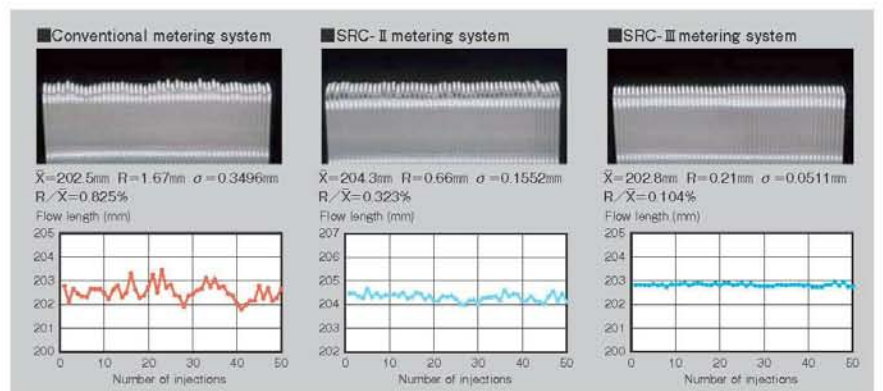


Stability of metered melt density

Melt density variation after metering was compared among three metering systems. The fluctuation of the melt density can be shown with the variation of the bar length in the molding given constant injection stroke without holding pressure control.



Product: Bar flow
Resin: GP-PS



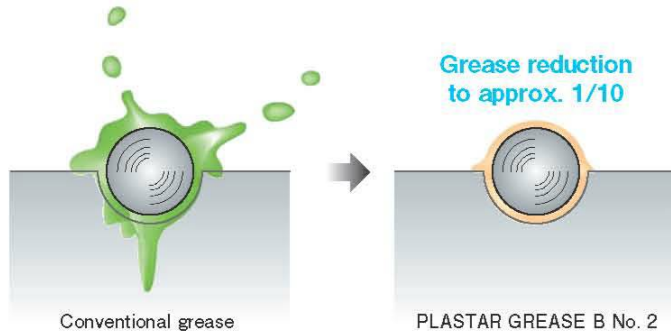
Environmentally-friendly features

Facilitating Quiet, Ecology-Conscious Working Environment

Originally-developed PLSTAR GREASE and lubricant-saving design reduces grease consumption by 90%

The TOYO-developed PLSTAR GREASE B3 No.2 has superior features in heat-resistance, adhesivity, water-resistance and wear-resistance. As a result, overall grease consumption can be reduced to 10% compared with that of conventional machines.

- Cost reduction by reducing grease consumption
- Easy maintenance with less greasing frequency
- Minimized grease spill and cause of product failure
- Improved working environment



RoHS-compliant lead-free control boards

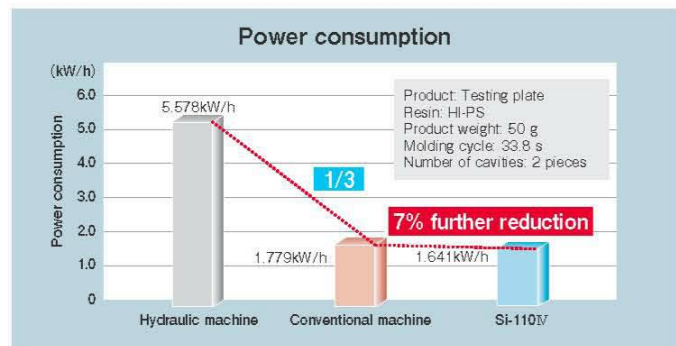
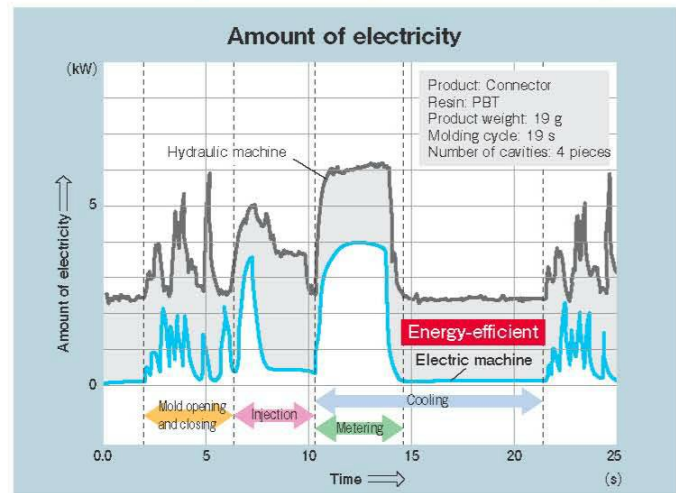
In compliance with RoHS directive, the Si-IV series uses lead-free control boards only. This is one of the TOYO's eco-friendly activities from material procurement to production causing less impact on the environment.



Easy disposal of waste grease

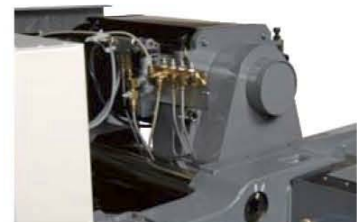
The grease pan equipped as standard under the clamping unit collects the waste grease and is removable to facilitate cleaning work.

Dramatically reduced power consumption



Low-noise operation for comfortable work environment

Quiet machine operation is possible thanks to the use of a sealed belt-drive unit. The noise level is reduced by a maximum 8.1 dB (measured at the operation area in front of the safety door).



Operation noise reduction at each process

	Conventional machine	Si-IV	Noise reduction
Injection	71.9 dB	65.5 dB	-6.4 dB
Plastication	69.5 dB	63.0 dB	-6.5 dB
Mold opening/closing	80.5 dB	72.4 dB	-8.1 dB

>> Specifications

			Si-55IV										Si-110IV																																																																
INJECTION	Injection system		—		in-line screw										in-line screw																																																														
	Injection unit type		—		B		CH		D		CH				D			F																																																											
	Injection stroke		in		2.51	2.83	2.83	3.77	3.77	2.83	3.77	4.40	2.83	3.77	3.77	3.77	2.83	3.77	4.40	4.40	5.03	5.66	6.29	5.03	5.66	6.29																																																			
	Screw diameter		in(mm)		0.62(16)	0.70(18)	0.78(20)	0.78(20)	0.94(24)	1.10(28)	0.78(20)	0.94(24)	1.10(28)	1.25(32)	0.78(20)	0.94(24)	1.10(28)	1.25(32)	1.10(28)	1.25(32)	1.41(36)	1.57(40)	1.25(32)	1.41(36)	1.57(40)	1.81(46)																																																			
	Theoretical injection capacity		in³		0.79	1.09	1.40	1.40	2.62	3.60	1.40	2.62	4.21	5.49	1.40	2.62	3.60	2.62	1.40	2.62	4.21	6.28	8.97	12.26	6.28	8.97	12.26	16.23																																																	
	Injection capacity(PS)		oz		0.43	0.60	0.77	0.77	1.44	1.97	0.77	1.44	2.31	3.01	0.77	1.44	1.97	1.44	0.77	1.44	2.31	3.01	2.31	3.45	4.92	6.73	3.45	4.92	6.73	8.91																																															
	Standard	Injection unit		—		—		—		D75BU				—				D75BU				F75BU				—																																																			
		Injection rate		in³/s		—		—		573				8.30				11.29				—				573				8.30				11.29				—				561				7.38				9.33				11.47				—																			
		Max. injection speed		in/s		—		—		—				11.81				—				—				—				11.81				—				5.90				—				—																															
		Max. injection pressure		psi		—		—		39812				34141				26440				—				—				39812				34141				27716				22741				—				—																											
		Max. injection holding pressure		psi		—		—		39812				28427				21320				—				—				39812				28427				21320				—				39812				31270				24874				19899				—				—											
High speed	Injection unit		—		B75BU		—		D150BU				—				D150BU				F200HBU				F200BU																																																				
	Injection rate		in³/s		3.66	4.63	5.73	—		—				8.30				11.29				14.70				—				11.29				14.70				18.61				23.00				10.31				13.06				16.11				21.30																			
	Max. injection speed		in/s		11.81		—		—				11.81				—				—				—				11.81				—				8.26				—				—																																
	Max. injection pressure		psi		36970	36970	34112	—		—				39812				34112				26295				—				—				39812				34112				26295				39812				36259				28427				23452				38290				36259				31270				24163			
	Max. injection holding pressure		psi		36970	36970	34112	—		—				39812				25584				21320				—				—				39812				25584				21320				39812				32706				25584				20609				38290				36259				27006				21320			
Super high speed	Injection unit		—		B110BU (BH150BU)		CH150BU (CH300BU)		D300BU				CH150BU (CH300BU)				CH450BU				D300BU				—																																																				
	Injection rate		in³/s		6.16	7.75	9.58	9.58	13.79	18.79	—		13.79	18.79	24.53	9.58	13.79	18.79	27.58	—		13.79	18.79	24.53	—				—																																																
	Max. injection speed		in/s		19.68		19.68(27.55)		19.68				19.68				19.68	19.68	19.68	39.37	19.68				—				—																																																
	Max. injection pressure		psi		36970 (36970)	36970 (36970)	34112 (34127)	34127 (36970)	31284 (34127)	22756 (26454)	—		39812	34112	26295	34127 (36970)	31284 (34127)	22756 (26454)	42655	—		39812	34112	26295	—				—																																																
	Max. injection holding pressure		psi		36970 (36970)	36970 (31284)	34112 (28441)	31284 (34127)	28441 (28441)	20824 (21335)	—		39812	25584	21320	31284 (34127)	28441	20824 (21335)	32706	—		39812	25584	21320	—				—																																																
Recovery rate (PS)		oz/s		0.10	0.14	0.17	0.13	0.24	0.40	0.13	0.24	0.40	0.60	0.13	0.24	0.40	0.24	0.13	0.24	0.40	0.60	0.40	0.60	0.87	1.10	0.60	0.87	1.10	1.68																																																
Screw revolution speed		min ⁻¹		500		350		350				350				350				350				350																																																					
Nozzle pressing force		U.S.ton		1.1		2.2		2.2				2.2				2.2				2.7																																																									
CLAMPING	Clamping system		—		Double toggle										Double toggle																																																														
	Clamping force		U.S.ton		55										110																																																														
	Clamping stroke		in		10.62										14.17																																																														
	Min. mold height		in		5.90										5.90																																																														
	Max. mold height		in		14.96										20.07																																																														
	Tie bar clearance (H×V)		in		14.17×12.79										18.11×16.14																																																														
	Die plate size (H×V)		in		19.68×18.11										24.80×22.83																																																														
	Ejector force		U.S.ton		2.15										2.75																																																														
	Ejector stroke		in		2.75										3.93																																																														
	OTHERS	Heater capacity		kW		2.05	2.275	2.575	2.575	3.45	5.50	2.57	3.45	5.50	5.85	2.575	3.45	5.50	3.45	2.575	3.45	5.50	5.85	5.50	5.85	6.50	7.95	5.85	6.50	7.95	11.20																																														
Mold height motor output		kW		0.1										0.2																																																															
Nozzle touch motor output		kW		0.1		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2		0.2																																															
Machine dimension (L)		in		134.92		134.92	137.55	141.33	134.92	137.55	141.33	145.35	163.77	163.77	163.77	167.63	163.77	163.77	163.77	166.65	177.16	181.14	184.40	189.05	181.14	184.40	189.05	191.88																																																	
Machine dimensions (W×H)		in		39.40×61.81										43.89×64.64 (CH450BU : 43.89×65.70)														45.23×64.64																																																	
Power source		—		Three-phase AC 200V/200, 230V±10% 50Hz/60Hz										Three-phase AC 200V/200, 230V±10% 50Hz/60Hz																																																															
Main breaker capacity		A		75 (CH300BU/D300BU : 150)										125 (CH300BU/D300BU : 150, CH450BU : 225)																																																															
Total electric capacity		kVA		B75BU : 10 B110BU : 14 BH150BU : 19		CH150BU : 20 CH300BU : 31		D75BU : 13 D150BU : 20 D300BU : 35		CH150BU : 20 CH300BU : 31 CH450BU : 50				D75BU : 13 D150BU : 20 D300BU : 35				F75BU : 14 F200HBU : 27 F200BU : 29																																																											
Cable size: 230V Class【460V Class ※1】		in²		0.02[0.01]		CH150BU : 0.02[0.01] CH300BU : 0.05[0.02]		D150BU : 0.02[0.01] D300BU : 0.05[0.02]		CH150BU : 0.03[0.02] CH300BU : 0.05[0.02] CH450BU : 0.09[0.03]				D75BU : 0.03[0.02] D150BU : 0.03[0.02] D300BU : 0.05[0.02]				0.03[0.02]																																																											
Machine weight		U.S.ton		2.2		2.4		2.4		4.1				4.1				4.4																																																											

			Si-150M												Si-200M															
INJECTION	Injection system	—	in-line screw												in-line screw															
	Injection unit type	—	D				F								F								G							
	Injection stroke	in	2.83	3.77	4.40		4.40	5.03	5.66	6.29	5.03	5.66	6.29		4.40	5.03	5.66	6.29	5.03	5.66	6.29		6.29	7.24	7.87					
	Screw diameter	in (mm)	0.78(20)	0.94(24)	1.10(28)	1.25(32)	1.10(28)	1.25(32)	1.41(36)	1.57(40)	1.25(32)	1.41(36)	1.57(40)	1.81(46)	1.10(28)	1.25(32)	1.41(36)	1.57(40)	1.25(32)	1.41(36)	1.57(40)	1.81(46)	1.57(40)	1.81(46)	1.96(50)	2.16(55)				
	Theoretical injection capacity	in ³	1.40	2.62	4.21	5.49	4.21	6.28	8.97	12.26	6.28	8.97	12.26	16.23	4.21	6.28	8.97	12.26	6.28	8.97	12.26	16.23	12.26	18.67	23.98	28.99				
	Injection capacity(PS)	oz	0.77	1.44	2.31	3.01	2.31	3.45	4.92	6.73	3.45	4.92	6.73	8.91	2.31	3.45	4.92	6.73	3.45	4.92	6.73	8.91	6.73	10.25	13.16	15.91				
	Standard	Injection unit	—	—				F75BU				—				F75BU				—				—						
		Injection rate	in ³ /s	—				5.61	7.38	9.33	11.47	—				5.61	7.38	9.33	11.47	—				—						
		Max. injection speed	in/s	—				5.90				—				5.90				—				—						
		Max. injection pressure	psi	—				39812	34141	27716	22741	—				39812	34141	27716	22741	—				—						
		Max. injection holding pressure	psi	—				39812	31270	24874	19899	—				39812	31270	24874	19899	—				—						
High speed	Injection unit	—	D150BU				F200HBU				F200BU				F200HBU				F200BU				G300BU							
	Injection rate	in ³ /s	—	8.30	11.29	14.70	11.29	14.70	18.61	23.00	10.31	13.06	16.11	21.30	11.29	14.70	18.61	23.00	10.31	13.06	16.11	21.30	16.11	21.30	25.14	30.45				
	Max. injection speed	in/s	11.81				11.81				8.26				11.81				8.26				8.26							
	Max. injection pressure	psi	—	39812	34112	26295	39812	36259	28427	23452	38290	36259	31270	24163	39812	36259	28427	23452	38290	36259	31270	24163	35389	31270	27006	22741				
	Max. injection holding pressure	psi	—	39812	25584	21320	39812	32706	25584	20609	38290	36259	27006	21320	39812	32706	25584	20609	38290	36259	27006	21320	35389	28427	24163	19899				
Super high speed	Injection unit	—	D300BU				—				—				—				F400BU				G450BU							
	Injection rate	in ³ /s	—	13.79	18.79	24.53	—				—				—				19.65				24.84	30.69	40.58	23.00	30.45	35.94	43.51	
	Max. injection speed	in/s	19.68				—				—				—				—				15.74				11.81			
	Max. injection pressure	psi	—	39812	34112	26295	—				—				—				38290				36259	31270	24163	35389	31270	27006	22741	
	Max. injection holding pressure	psi	—	39812	25584	21320	—				—				—				38290				36259	27006	21320	35389	28427	24163	19899	
CLAMPING	Recovery rate (PS)	oz/s	—	0.24	0.40	0.60	0.40	0.60	0.87	1.10	0.60	0.87	1.10	1.68	0.40	0.60	0.87	1.10	0.60	0.87	1.10	1.68	0.95	1.53	1.95	2.22				
	Screw revolution speed	min ⁻¹	350				350								350								300							
	Nozzle pressing force	U.S. ton	2.2				2.7								2.7								2.7							
	Clamping system	—	Double toggle												Double toggle															
	Clamping force	U.S. ton	150												200															
	Clamping stroke	in	15.74												18.50															
	Min. mold height	in	5.90												7.87															
	Max. mold height	in	21.65												23.62															
	Tie bar clearance (H×V)	in	20.07×18.11												22.04×22.04															
	Die plate size (H×V)	in	27.16×25.19												30.70×30.70															
	Ejector force	U.S. ton	3.85												3.85															
Ejector stroke	in	3.93												4.72																
OTHERS	Heater capacity	kW	2.575	3.45	5.50	5.85	5.50	5.85	6.50	7.95	5.85	6.50	7.95	11.20	5.50	5.85	6.50	7.95	5.85	6.50	7.95	11.20	7.95	11.20	13.50	16.70				
	Mold height motor output	kW	0.2												0.2															
	Nozzle touch motor output	kW	0.2												0.2															
	Machine dimension (L)	in	175.90				181.81	185.74	189.01	193.66	185.74	189.01	193.66	200.47	209	209	209.1	213.70	208.97	209.05	213.70	220.51	218.89	225.70	228.46	237.16				
	Machine dimensions (W×H)	in	48.62×66.73												51.29×70.86															
	Power source	—	Three-phase AC 200V/200, 230V±10% 50Hz/60Hz												Three-phase AC 200V/200, 230V±10% 50Hz/60Hz															
	Main breaker capacity	A	125 (D300BU : 150)												175 (F400BU, G450BU : 225)															
	Total electric capacity	kVA	D150BU : 20 D300BU : 35				F75BU : 14 F200HBU : 27 F200BU : 29								F75BU : 22 F200HBU : 27 F200BU : 29, F400BU : 49								G300BU : 43 G450BU : 58							
	Cable size 230V Class [460V Class ※1]	in ²	D150BU : 0.03[0.02] D300BU : 0.05[0.03]				0.03[0.02]								F75BU : 0.03[0.02] F200HBU : 0.05[0.03] F200BU : 0.05[0.03]								G300BU : 0.05[0.03] G450BU : 0.09[0.03]							
	Machine weight	U.S. ton	5.3				5.8								7.8								8.1							

NOTES

- The figures are subject to change without any legal obligation on the part of the manufacture.
- The maximum injecting pressure and the maximum holding pressure are attainable maximum set values. There values may be limited by molding conditions and cycle time.
- The injection rate and the maximum injecting speed are calculated values. These values may be limited by set injecting pressures.
- When a screw in large diameter is used, some resins may not be processed.
- When the machine is attached with an option, the capacity of the breaker may be changed.

※ 1. A transformer(option) is necessary on the machine side.

■ The highlighted specifications are recommended injection units.

>> Specifications

			SI-250IV												
INJECTION	Injection system	—	in-line screw												
	Injection unit type	—	F				G				H				
	Injection stroke	in	5.03	5.66	6.29		6.29	7.24	7.87		7.87	8.66			
	Screw diameter	in (mm)	1.25 (32)	1.41 (36)	1.57 (40)	1.81 (46)	1.57 (40)	1.81 (46)	1.96 (50)	2.16 (55)	1.96 (50)	2.16 (55)	2.36 (60)		
	Theoretical injection capacity	in ³	6.28	8.97	12.26	16.23	12.26	18.67	23.98	28.99	23.98	31.85	37.96		
	Injection capacity (PS)	oz	3.45	4.92	6.73	8.91	6.73	10.25	13.16	15.91	13.16	17.49	20.84		
	Standard	Injection unit	—	—				—				—			
		Injection rate	in ³ /s	—				—				—			
		Max. injection speed	in/s	—				—				—			
		Max. injection pressure	psi	—				—				—			
		Max. injection holding pressure	psi	—				—				—			
	High speed	Injection unit	—	F200BU				G300BU				H370BU			
		Injection rate	in ³ /s	10.31	13.06	16.11	21.30	16.11	21.30	25.14	30.45	23.98	28.99	34.48	
		Max. injection speed	in/s	8.26				8.26				7.87			
		Max. injection pressure	psi	38290	36259	31270	24163	35389	31270	27006	22741	34083	28427	24163	
		Max. injection holding pressure	psi	38290	36259	27006	21320	35389	28427	24163	19899	31270	25584	21320	
	Super high speed	Injection unit	—	F400BU				G450BU				—			
		Injection rate	in ³ /s	19.65	24.84	30.69	40.58	23.00	30.45	35.94	43.51	—			
		Max. injection speed	in/s	15.74				11.81				—			
		Max. injection pressure	psi	38290	36259	31270	24163	35389	31270	27006	22741	—			
		Max. injection holding pressure	psi	38290	36259	27006	21320	35389	28427	24163	19899	—			
Recovery rate (PS)	oz/s	0.60	0.87	1.10	1.68	0.95	1.53	1.95	2.22	1.95	2.22	2.37			
Screw revolution speed	min ⁻¹	350				300				300					
Nozzle pressing force	U.S.ton	2.7				2.7				3.3					
CLAMPING	Clamping system	—	Double toggle												
	Clamping force	U.S.ton	250												
	Clamping stroke	in	21.65												
	Min. mold height	in	9.84												
	Max. mold height	in	26.77												
	Tie bar clearance (H×V)	in	24.01 × 24.01												
	Die plate size (H×V)	in	32.28 × 32.28												
	Ejector force	U.S.ton	5.82												
	Ejector stroke	in	5.90												
OTHERS	Heater capacity	kW	5.85	6.50	7.95	11.20	7.95	11.20	13.50	16.70	13.50	16.70	19.50		
	Mold height motor output	kW	0.4												
	Nozzle touch motor output	kW	0.2								0.4				
	Machine dimension (L)	in	225.47	227.67	234.48	232.87	239.68	242.44	251.10	244.05	250.86	257.63			
	Machine dimensions (W×H)	in	54.84 × 71.92												
	Power source	—	Three-phase AC 200V/200, 230V±10% 50Hz/60Hz												
	Main breaker capacity	A	200 (F400BU, G450BU : 225)												
	Total electric capacity	kVA	F400BU : 49 F200BU : 29				G300BU : 43 G450BU : 58				52				
	Cable size 230V Class [460V Class ※1]	in ²	0.09 [0.03]												
	Machine weight	U.S.ton	12.1				12.4				13.2				

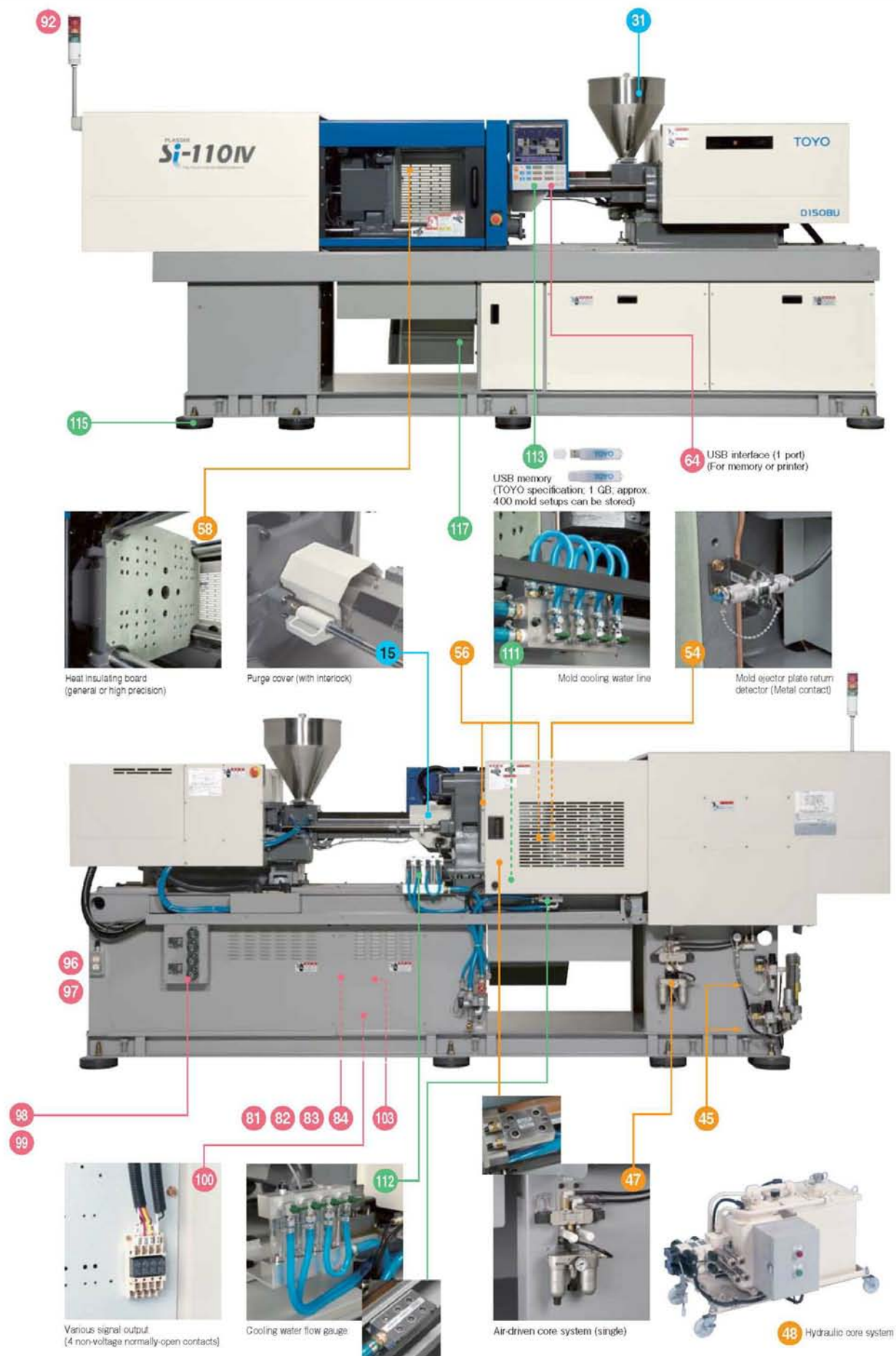
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- When a screw in large diameter is used, some resins may not be processed.
- When the machine is attached with an option, the capacity of the breaker, may be changed.

※ 1 A transformer(option) is necessary on the machine side.

The highlighted specifications are recommended injection units.

>> Standard/Optional Equipment



>> Standard/Optional Features

	Number	Feature	Standard	Optional
Injection	1	SRC- II metering system	●	
	2	SRC- III metering system		○
	3	SNF control	●	
	4	Closed-loop control of Injection speed, position and pressure	●	
	5	Programmable control of injection (2 to 7 steps)	●	
	6	Programmable control of metering (1 to 3 steps)	●	
	7	Holding pressure changeover via position, time and pressure	●	
	8	Slope control of injection	●	
	9	Suck-back control (before and after metering)	●	
	10	No-back pressure metering in manual mode (Setting possible)	●	
	11	Injection during high-pressure clamping	●	
	12	Injection unit swiveling mechanism (with nozzle alignment mechanism)	●	
	13	Melt run-out detection system	●	
	14	Automatic purging system	●	
	15	Purge cover (with interlock)	●	
	16	Non-standard diameter screw and barrel		○
	17	Wear-resistant screw (for diameter $\phi 40$ or smaller) and barrel (for diameter $\phi 46$ or larger)		○
	18	Specially designed screw *1		○
	19	Nozzle reciprocating function	●	
	20	Air-operated check nozzle		○
	21	Long nozzle/Small diameter long nozzle		○
	22	Dual-line nozzle temperature control		○
	23	Small diameter nozzle (for diameter $\phi 20$ or smaller) (for diameter $\phi 24$ or larger)	●	○
	24	Separable nozzle (for diameter $\phi 36$ or smaller) (for diameter $\phi 40$ or larger)	●	○
	25	Hopper throat temperature control (PID)	●	
	26	Heater SSR control	●	
	27	Heater temperature holding control	●	
	28	Melt remaining monitor function	●	
	29	5-zone heater (4-zone heater for $\phi 24$ or smaller screw unit) *2	●	
	30	High temperature use heater band (up to 500°C)		○
	31	Hopper (with shutter)	●	
	32	Hopper swiveling device	●	
Clamping	33	Closed-loop control of speed and position for mold opening and closing	●	
	34	Closed-loop control of ejection speed and position	●	
	35	Programmable control of mold opening (2 to 5 steps)	●	
	36	Programmable control of mold closing (3 to 5 steps)	●	
	37	Mold exchanging mode (low pressure, low speed)	●	
	38	Automatic clamping force adjustment system		○
	39	Automatic clamping force setup system *3	●	
	40	Low pressure mold protection system	●	
	41	Mold protection in mold opening and ejecting	●	
	42	Movable die plate supported by double rollers	●	
	43	Double safety system (electrical and mechanical)	●	
	44	Emergency stop pushbutton (for operation and non-operation sides)	●	
	45	Air ejector (single or dual lines)		○
	46	3-way valve for air ejector (single or dual lines)		○
	47	Air-driven core system (single)		○
	48	Hydraulic core system (single or dual; independent hydraulic unit)		○
	49	Ejector center pull For Si-55IV to 200IV back specification For Si- 250IV	●	○
	50	Ejector pull back control		○
	51	Programmable control of ejector forwarding (1 to 3 steps)	●	
	52	2-step ejector	●	
	53	Ejecting during mold opening (by position setting)	●	
	54	Mold ejector plate return detector (metal contacts)		○
	55	Mold temperature display (2 lines; with magnet sensor)		○
	56	Mold temperature control (2 lines; with magnet sensor)		○
	57	T-slotted die plate *4 For Si-150IV to 250IV	●	○
	58	Heat insulating board (General or high precision)		○
	59	Mold height extension For Si-55IV : 60mm For Si-110IV : 60mm For Si-150IV and up : 100mm	●	
	60	Reversible chute (Si-110IV and smaller models only)		○

In the above table:

● Standard

○ Options which can be fitted after shipment

◎ Options which should be fitted at TOYO

	Number	Feature	Standard	Optional
Control	61	PLCS-12 microprocessor-aided control (TFT color LCD with full touch panel)	●	
	62	Digital setting of all the parameters	●	
	63	Internal memory of 400 mold setups	●	
	64	USB interface (1 port) (For memory or printer)	●	
	65	Graphic display of injection, metering and meter waves (with memory function)	●	
	66	Monitor graph indication	●	
	67	Statistical processing of monitored data	●	
	68	Manned/Unmanned mode switching function	●	
	69	Hour meter (operated hours indication)	●	
	70	Multi-counter (injection, lot, repeating lot, warning bell, initial rejection, continuous failures, and operation)	●	
	71	Monitoring function (Up to 32 items selectable; including positions, speeds, pressures, times, and revolutions)	●	
	72	Alarm function (cycle, up-down tolerance, heater disconnection, thermocouple disconnection, safety door, etc.)	●	
	73	Machine conditions display (operating mode, completion of clamping, and ejector retraction limit)	●	
	74	Production control function (job completion ratio, prospective time of job completion, etc.)	●	
	75	Maintenance function (1-cycle graphic, alarm history, grease timing display, and servo amplifier communication)	●	
	76	Self-diagnostic function	●	
	77	Screw cold-start prevention system (with countdown time display)	●	
	78	Fine PID temperature control (with soft-start function)	●	
	79	PID automatic tuning function	●	
	80	One week automatic heater on-off calendar	●	
	81	Vacuum device interface		○
	82	Valve gate interface		○
	83	Conveyor starting interface		○
	84	Automatic mold clamping device interface		○
	85	Quality control system (A++)		○
	86	Molding parameter control soft		○
	87	Molding machine monitor system (T-Station)		○
	88	Injection compression system (Standard specification)	●	
	89	Pre-gating system	●	
	90	Holding pressure vibration system		○
	91	Indicator light in one color (Red)		○
	92	Indicator light in three colors (Red, yellow, and green; with mode selection function)		○
	93	Unscrewing motor connecting circuit (with socket)		○
	94	Printer output terminal with ESC/P control code compatibility		○
	95	100 V plug socket for printer (1 port)	●	
	96	100 V plug socket (2 ports, power source by customer)		○
	97	100 V plug socket (2 ports, with transformer of 5 A each)		○
	98	200 V plug socket (4 ports, 2 lines of 30 A)		○
	99	200 V plug socket (4 ports, 2 lines of 30 A, with breaker)		○
	100	Various signal outputs (4 non-voltage normally-open contacts)		○
	101	Kanji character printer		○
Other	102	Local-language display (English, Chinese (Simplified/Traditional), Thai, Spanish, Korean, or Hebrew)	●	
	103	Compatibility with various voltage source (with transformer)		○
	104	Setting value history	●	
	105	Security function	●	
	106	Ejector advance core action mode changeover specifications	●	
	107	SPI interface		○
	108	HELP indication	●	
	109	Automatic greasing device	●	
	110	Automatic entire grease lubricating device		◎
	111	Mold cooling water line		○
	112	Cooling water flow gauge		○
	113	USB memory (TOYO specification; 1 GB) (400 mold setups) *5	●	
	114	Unloader interface	●	
	115	Rubber pads	●	○
	116	Accessories (mold clamp, tool, backup grease and hand grease pump)	●	
	117	Chute	●	
	118	Auxiliary step		○

*1. For further details on the specially designed screw, contact us.

*2. The standard band heater can be used for temperatures up to 350°C.

For higher temperatures, use the high temperature band heater.

*3. When a specially designed mold is used, consult us.

*4. Contact us for the Si-100IV or smaller models.

*5. The mold setup capacity when only the molding parameters are stored.