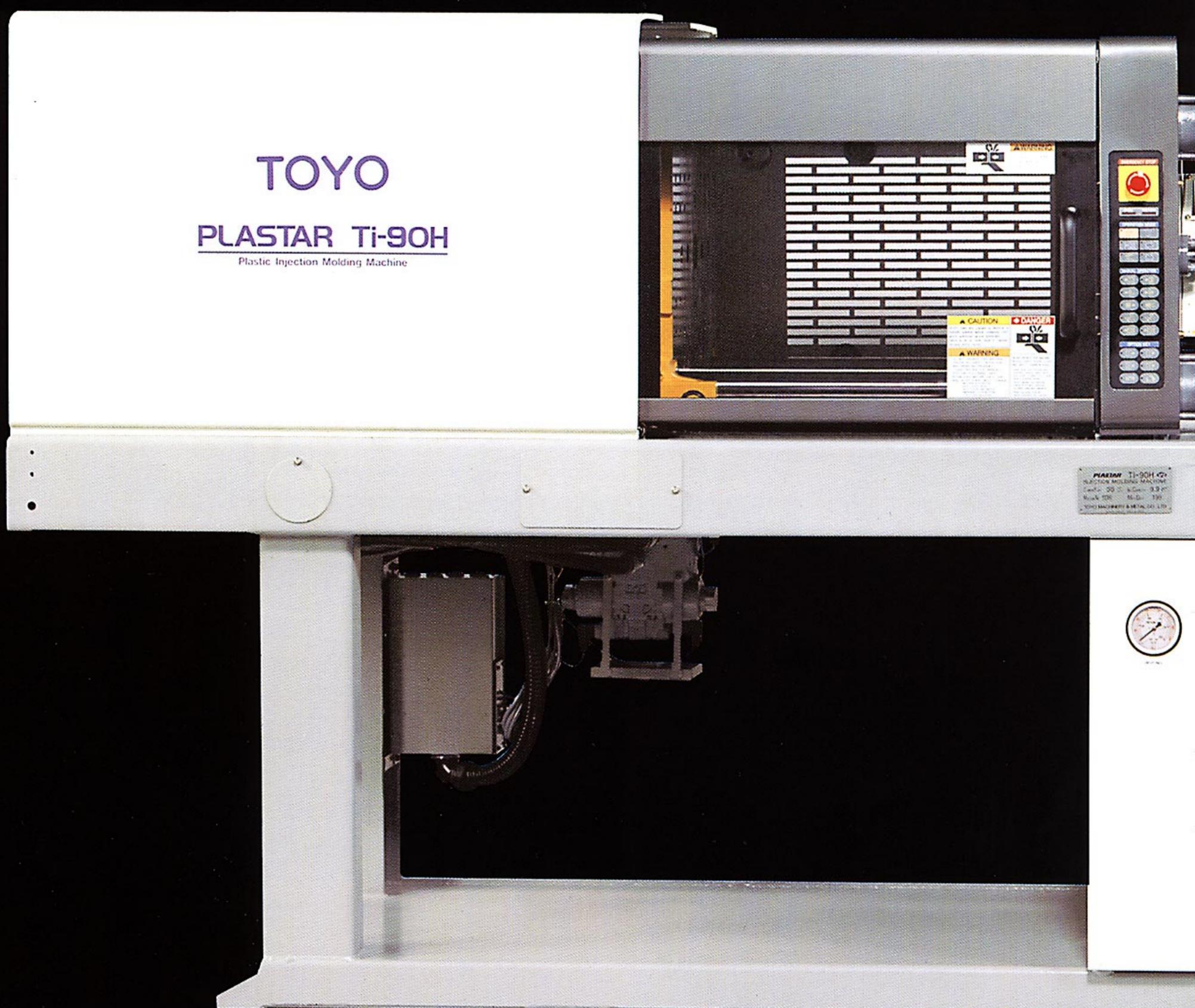


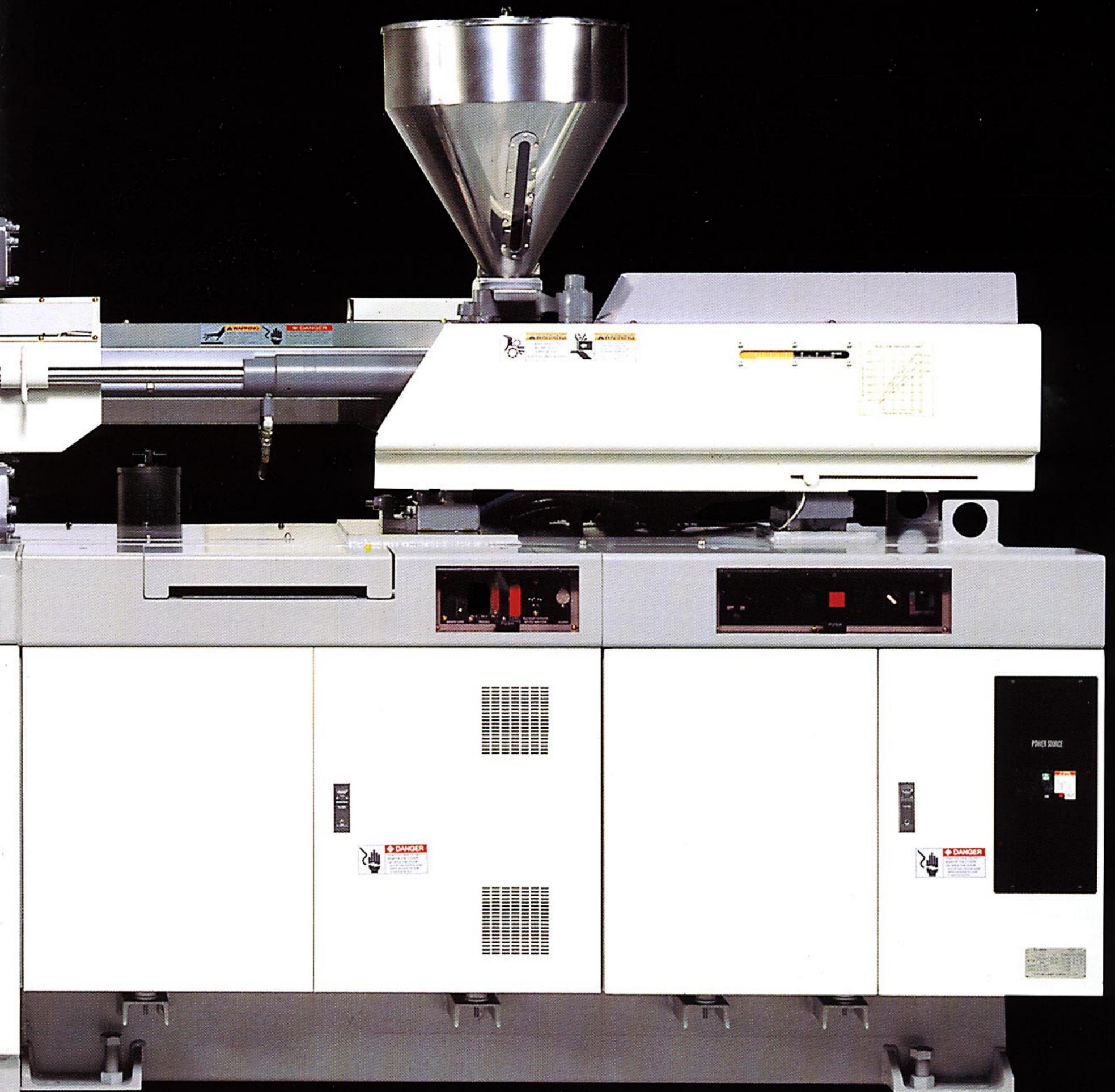
The H series are totally intelligent but still operator fr

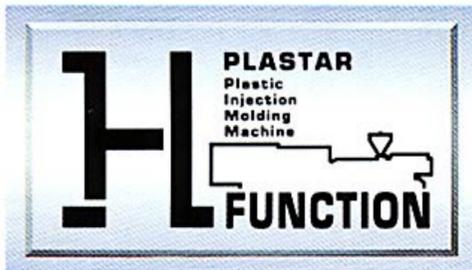
The H-series injection molding machines employ TOYO's newest control system, the PLCS-9. The new controller uses new high speed microprocessors for improved accuracy and a TFT color LCD screen having a window and touch panel for better communication with the machine.

On the mechanical side, the screw design is improved, and the tie-bar spacing and ejector stroke increased on some models. Also, the footprint is reduced for higher space efficiency at your factory.



riendly machines.

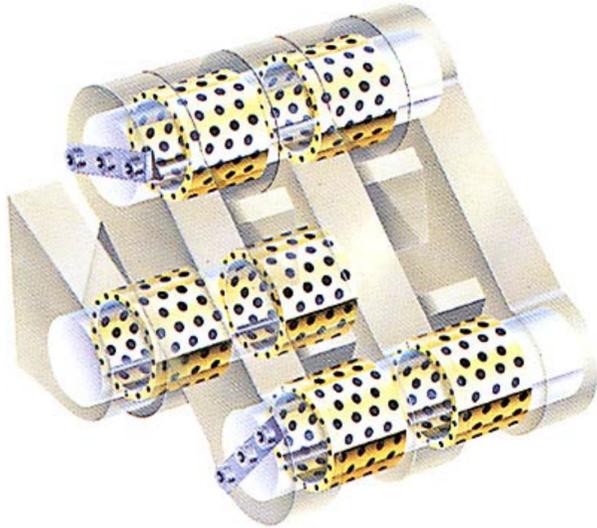




Soft Feedback System Enhances Precision and

LUBRICATION-FREE TOGGLE MECHANISM

The lubrication-free toggle mechanism eliminates the need for daily greasing and the possibility of products being stained by excess grease.
(USA PAT. No. 4773845)

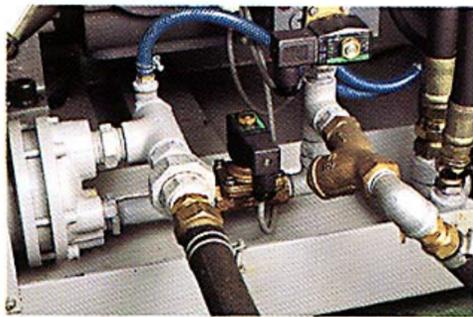


DOUBLE NOZZLE PULL-IN CYLINDERS AND DOUBLE SUPPORTING ROLLERS

To handle heavy molds, the movable die plate is supported by double rollers, and the nozzle is sealed by two cylinders to maintain precision alignment.

HYDRAULIC TEMPERATURE CONTROL

Combining a hydraulic fluid pre-heat system and a hydraulic fluid temperature control system, the hydraulic fluid temperature is quickly brought up to the preset level and is kept constant.



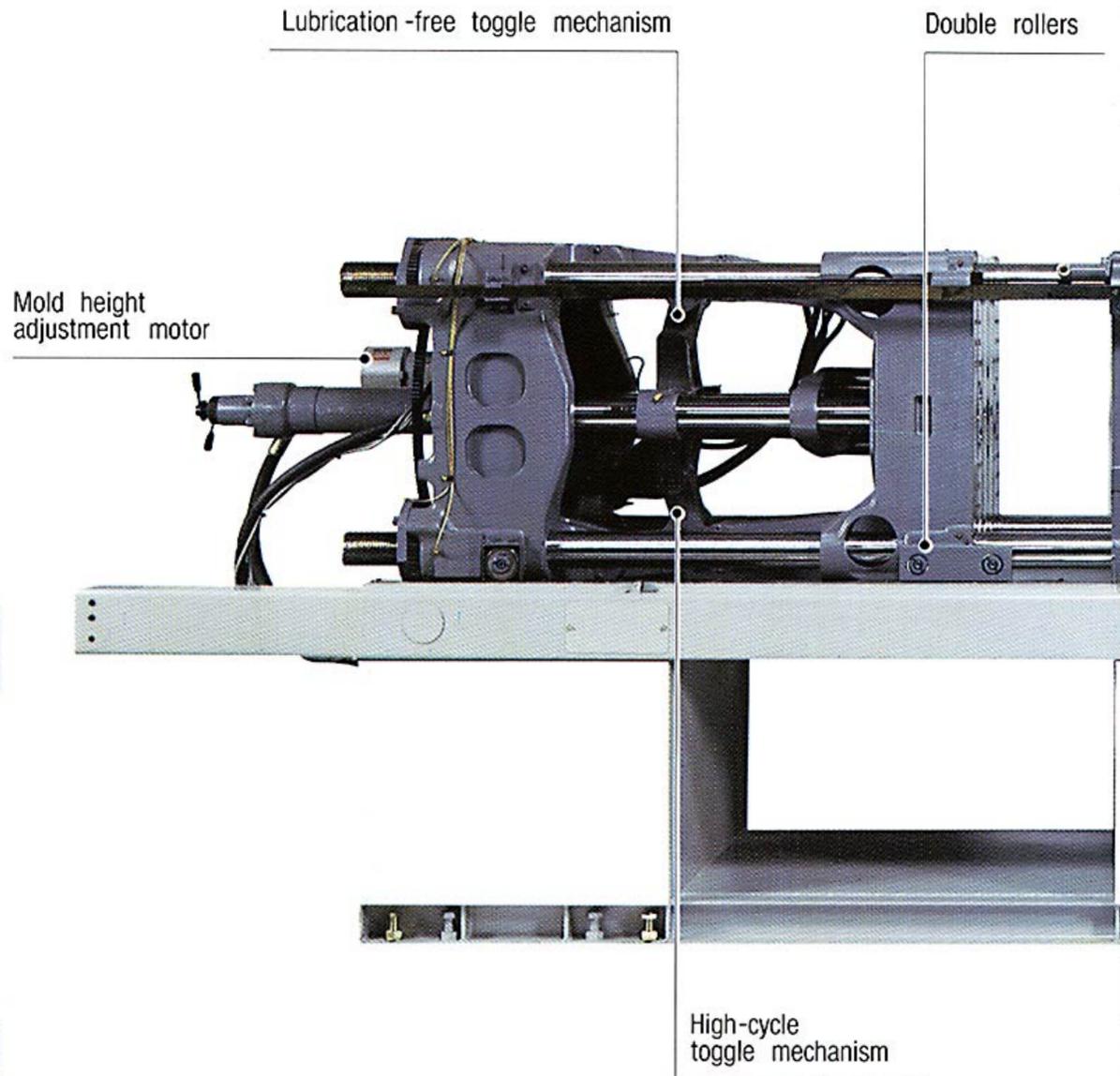
OIL CLEANER

H-series is equipped with an oil cleaner. It filters oil eliminating fine particles.



AUTOMATIC CLAMPING FORCE SETUP

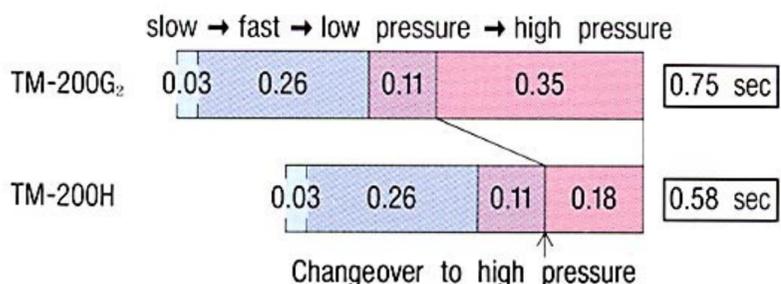
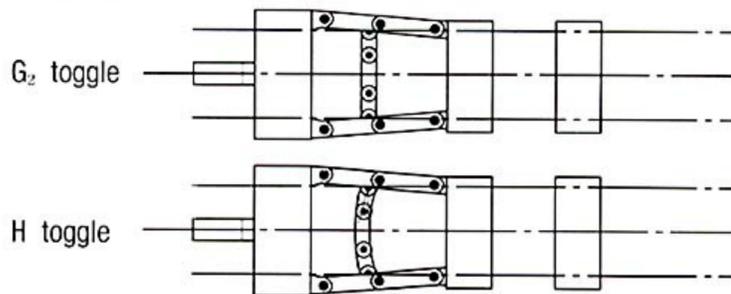
All you have to do is enter the tonnage you need.



HIGH CYCLE TOGGLE MECHANISM

Based on the proven five-point slant toggle mechanism, the high-cycle toggle is new for the H-series.

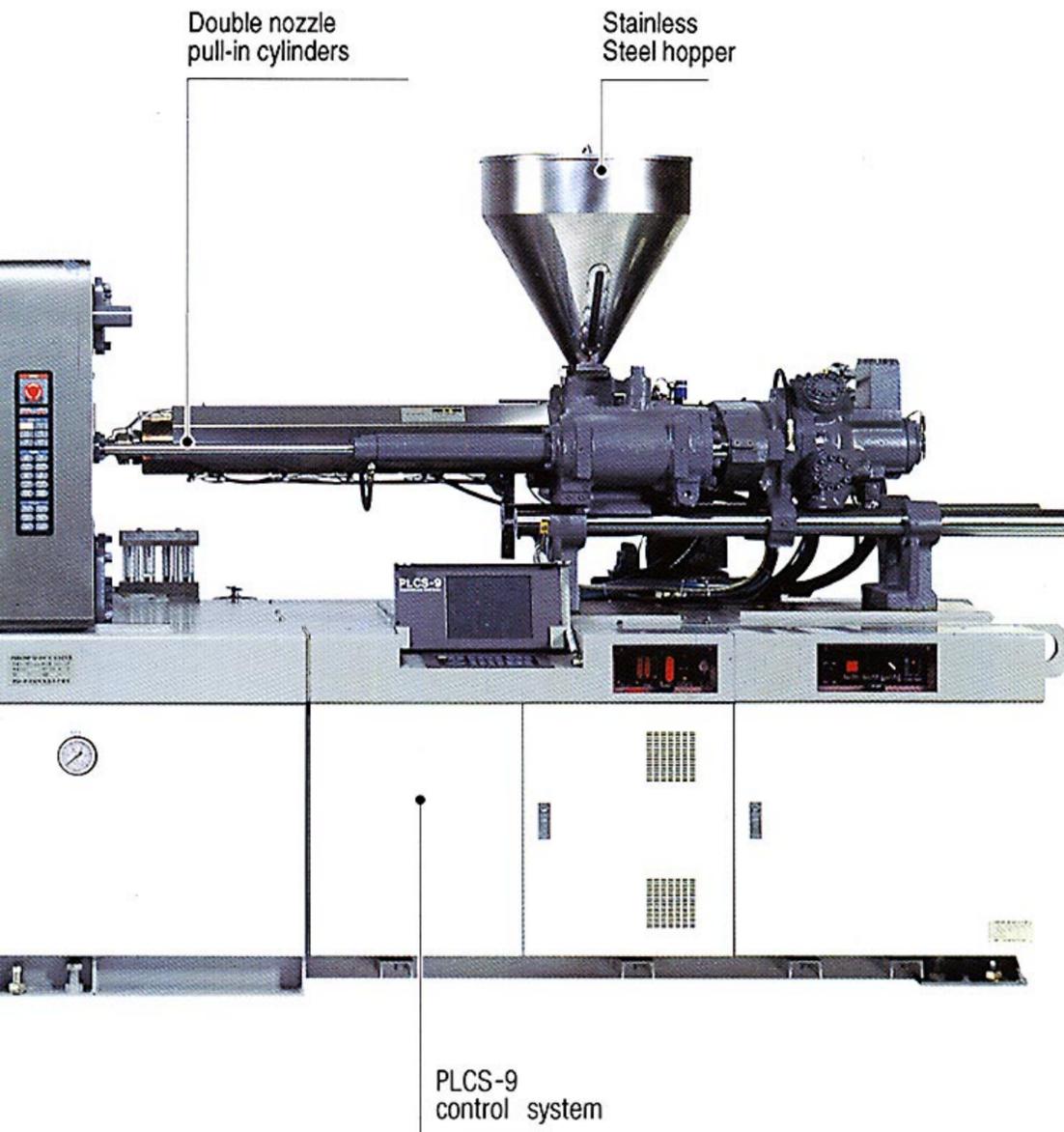
(TM-150H, TM-200H, TM-245H)



d Stability

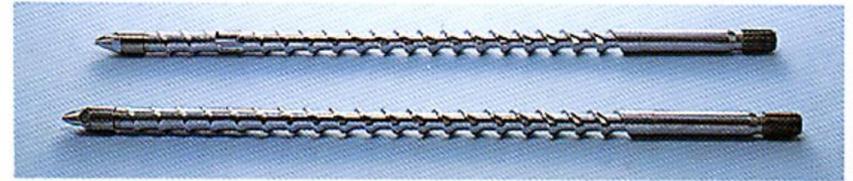
HOPPER THROAT TEMPERATURE CONTROL

Hopper throat temperature control contributes to stable molding, even using recycled material.



WIDE VARIETY OF SCREWS

H-series have a variety of screw designs for specific molding requirements for industries such as automotive, medical, optical and electronic.



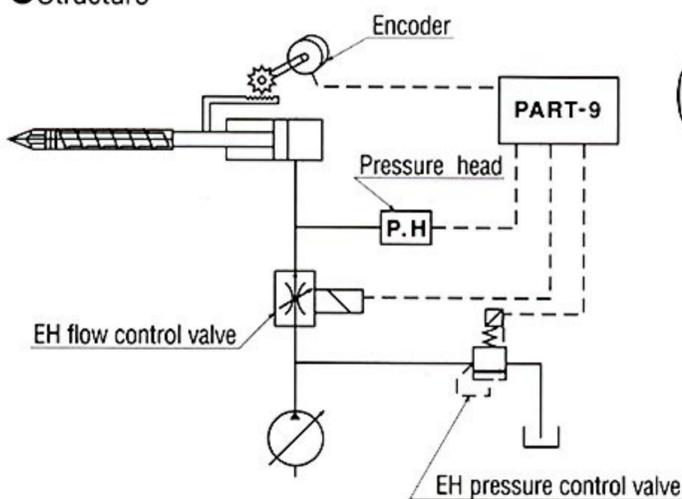
SCREW APPLICATIONS

	Application
Standard NT-3	General use
Acrylic LT-4	Molding at low temperatures Preventing screeching during metering
Nylon PAT-1	Improving metering in use of recycled materials
Wear-resistant, Anti-corrosion	Glass-filled material and corrosive material
Mixing MT-3	Improving plastication and color mixture (slightly higher compression configuration)
Mixing MT-4	Improving plastication and color mixture (slightly lower compression configuration)
Sub-flight ST-2	Improving plastication and color mixture (sub-flight configuration)

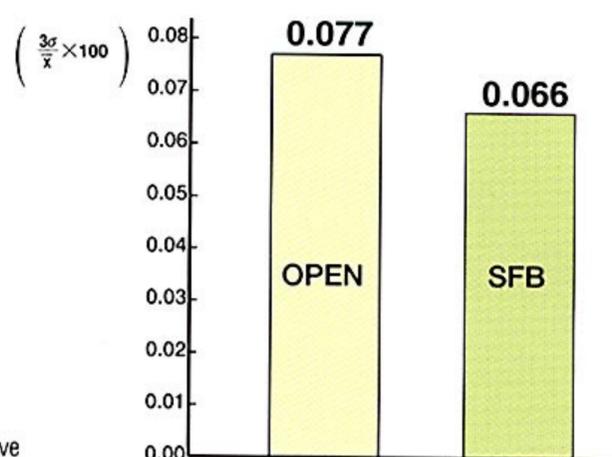
SOFT FEEDBACK SYSTEM

Injection speeds and pressures are fed back to the PLCS-9 control and any variations between actual and setup values are corrected. Initial speeds and pressures are based on calibration (Electro-Hydraulic auto adjustment) settings, so deviations are held to a minimum.

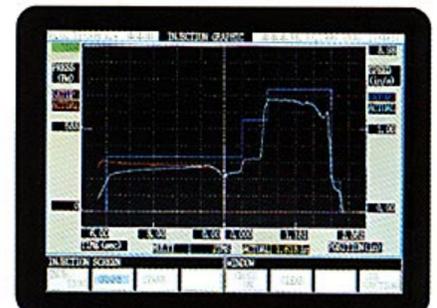
● Structure



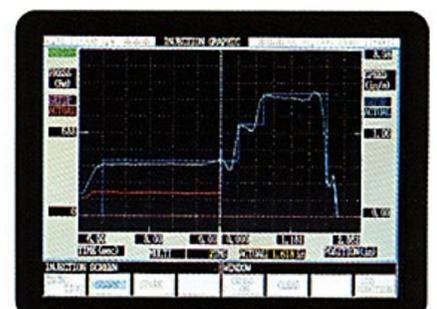
● Weight variation



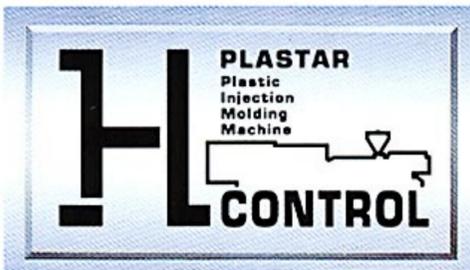
● Injection graphics



▲ Standard injection



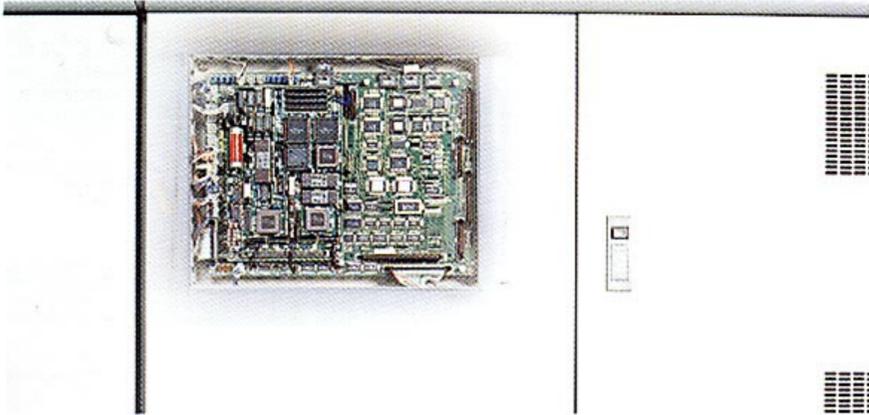
▲ SFB injection



High Resolution TFT Color LCD with Window

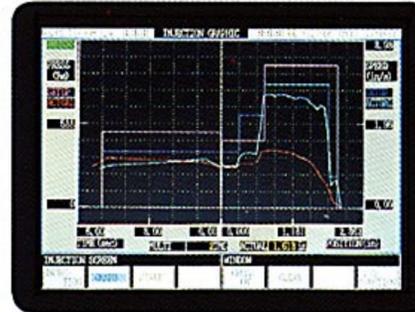
PLCS-9 CONTROL SCREEN

The PLCS-9 control system features new high speed microprocessors and a high resolution TFT color liquid crystal display. All the H-series molding machines come with the PLCS-9 control system.

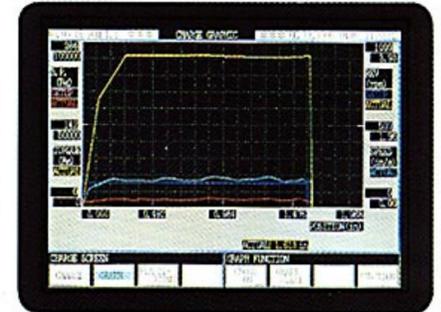


GRAPHIC SCREEN

The screen graphically compares your injection setups with the actual injection speed and pressure. In addition, metering (plasticating), mold opening and closing and ejection are displayed.



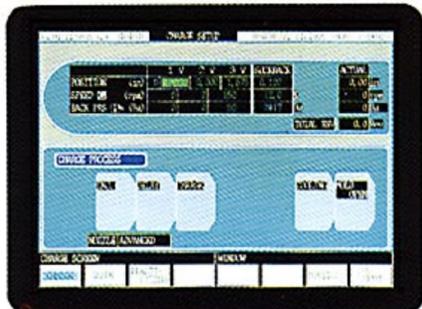
▲Injection graphic



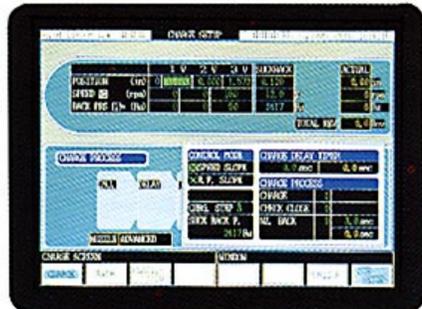
▲Metering graphic

TOUCH-PANEL AND WINDOW DISPLAY

Touch-panel and window displays are provided for easy access to each screen.



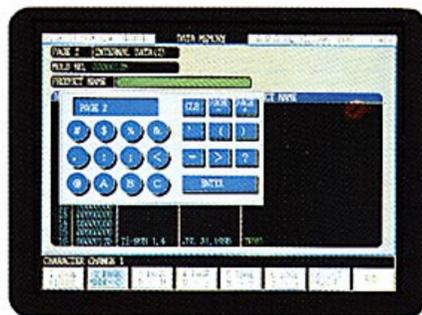
▲Normal setup screen



▲Setup screen with a window opened

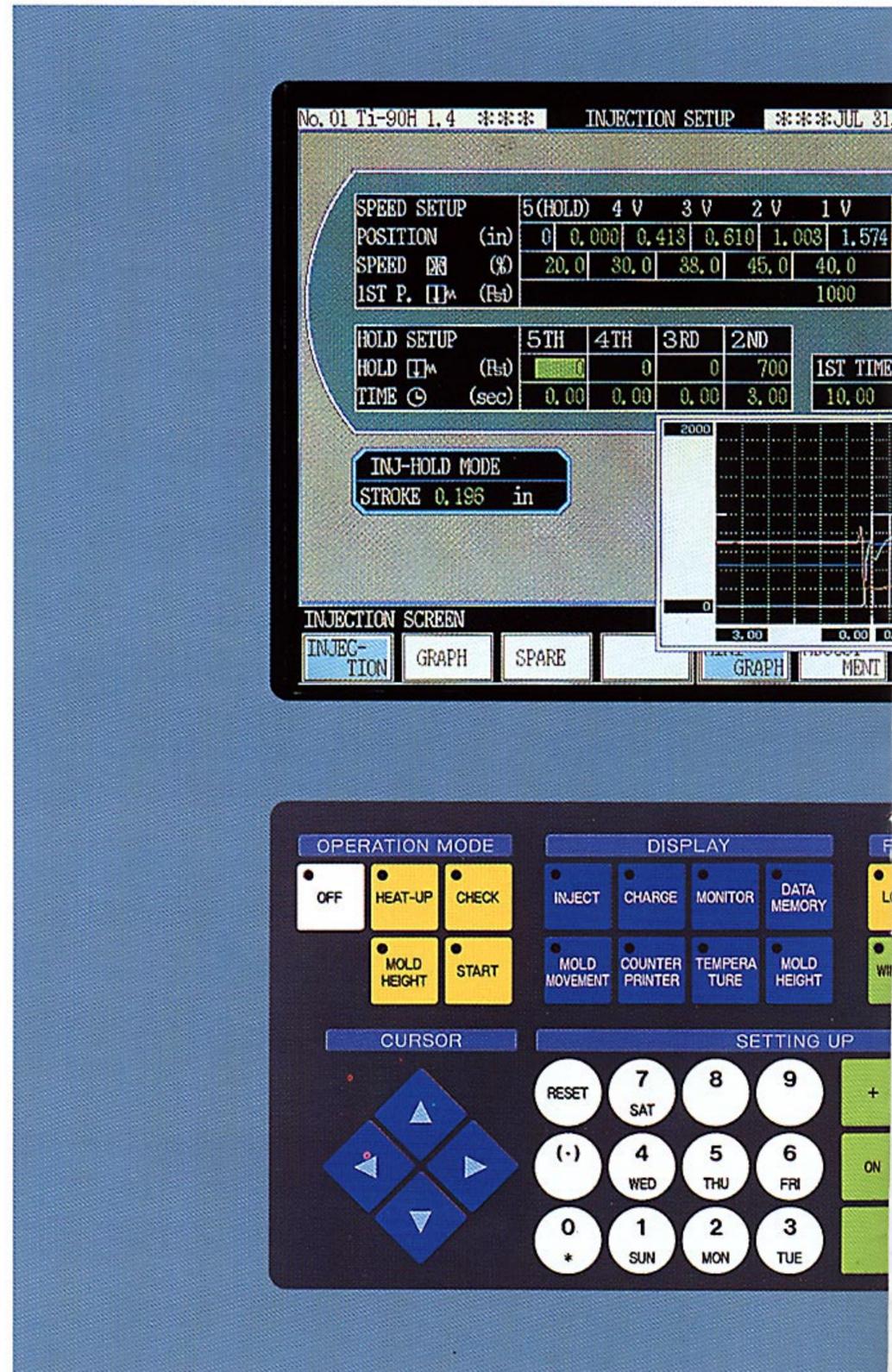
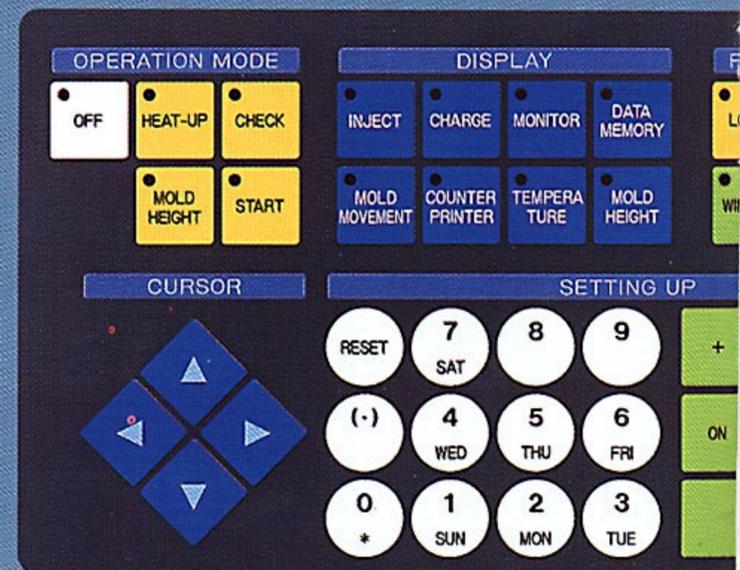
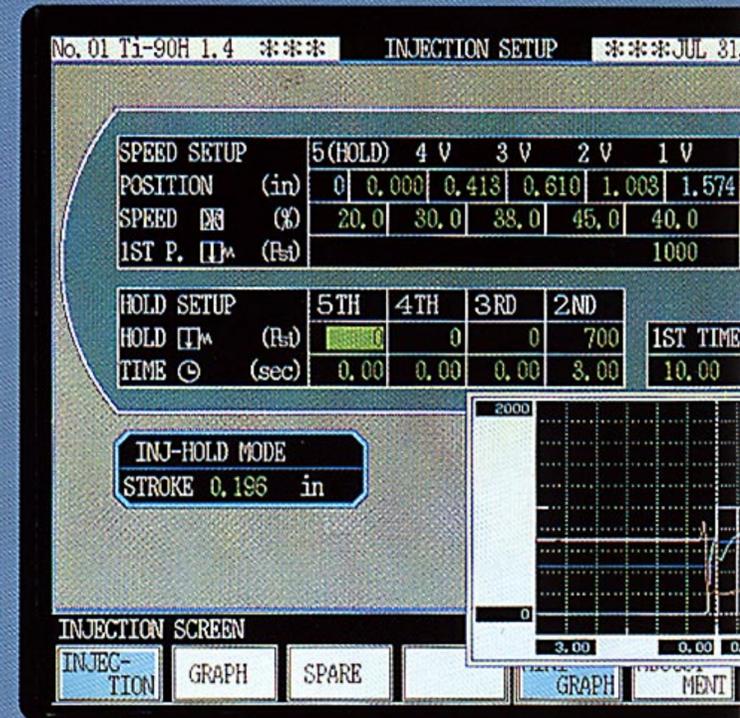
ALPHA ENTRY OF MOLD NAME

The mold name is entered using the alpha keys.



MONITORING OF 87 MOLDING PARAMETERS

The monitoring system covers a total of 87 machine parameters.



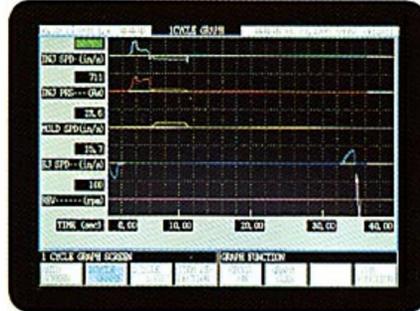
ow Display

SCREENS FOR PREVENTIVE MAINTENANCE

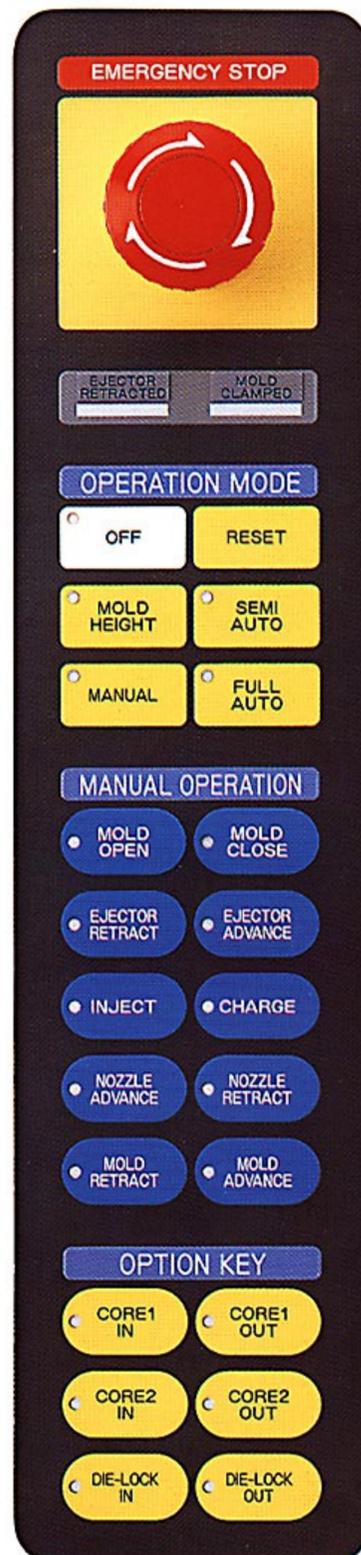
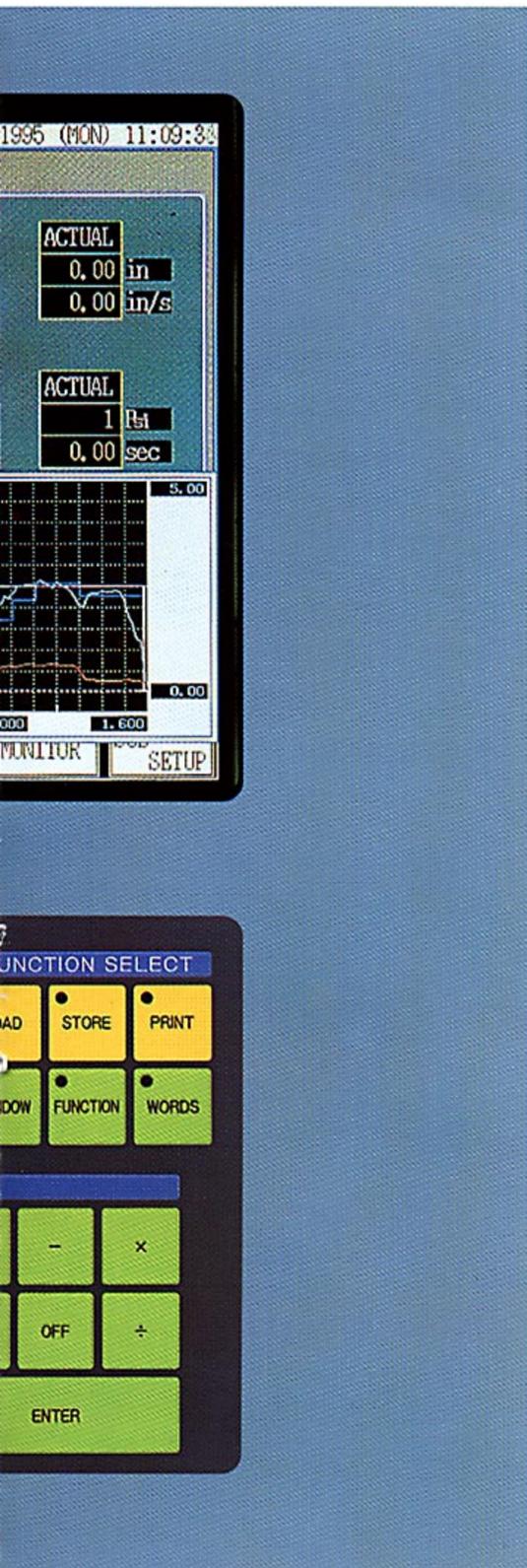
Many screens such as the alarm history screen with up to 300 alarms, check screen, one cycle screen and one cycle logic screen are provided for preventive maintenance.



▲ Check screen



▲ One-cycle screen



INTERNAL MEMORY

The H-series control is equipped with an internal memory board in which a maximum of 32 setups can be stored.

DATA MEMORY CARD

The data memory card can store up to 128 mold setups.

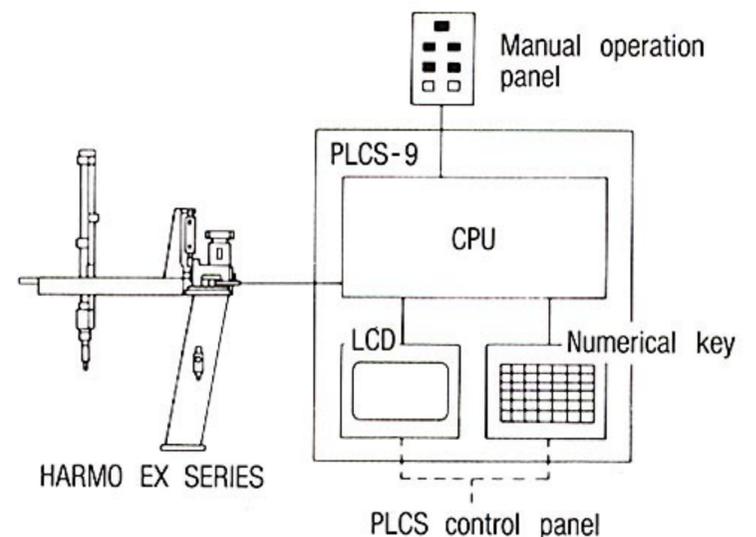


PERSONAL COMPUTER INTERFACE

The H-series is equipped with an RS-232C interface for your personal computer. (Software is not included.)

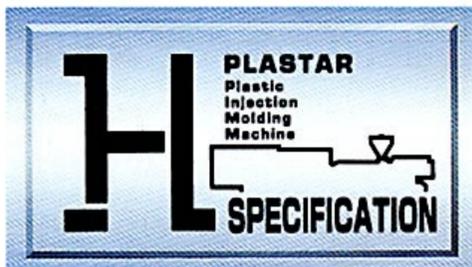
PICK-UP ROBOT CONTROL (OPTION)

Pick-up robots can be controlled from the PLCS-9 control panel. Eight types of motion modes can be chosen and all time settings are made on the screen.



SYSTEM EXPANDABILITY FOR FMS PRODUCTION

The PLCS-9 controller is designed with flexible manufacturing system (FMS) in mind. Production control and quality control as well as machine-in-group control can be made through the PLCS-9 controller. (Software is optional.)



Main Specifications

	Unit	Ti-35H			Ti-55H			Ti-90H			TM-110		
▼Injection Unit													
System		In-line screw			In-line screw			In-line screw			In-line screw		
Injection stroke	in	3.35			3.94			5.12			5.70		
Screw diameter	in	(0.79)	0.94	(1.10)	(1.10)	1.26	(1.42)	(1.26)	(1.42)	1.57	(1.26)	(1.42)	
Nominal Injection capacity	in ³	(1.6)	2.3	(3.1)	(3.7)	4.9	(6.2)	(6.3)	(8.1)	9.9	(7.1)	(9.0)	
*Injection capacity (PS)	oz	(0.9)	1.3	(1.8)	(2.0)	2.7	(3.4)	(3.5)	(4.4)	5.5	(3.9)	(4.9)	
Injection rate	High pressure	in ³ /sec	(2.3)	3.3	(4.6)	(5.4)	7.1	(9.0)	(6.7)	(8.4)	10.4	(6.7)	(8.4)
	High velocity	in ³ /sec				(6.3)	8.3	(10.5)	(7.4)	(9.3)	11.5		
Injection pressure	High pressure	psi	(35,763)	30,843	(22,652)	(34,128)	28,767	(22,667)	(34,128)	(29,748)	24,088	(34,128)	(29,748)
	High velocity	psi				(31,938)	24,458	(19,325)	(33,886)	(26,776)	21,686		
Recovery rate (PS)	oz/sec	(0.1)	0.2	(0.3)	(0.4)	0.5	(0.7)	(0.5)	(0.6)	0.7	(0.5)	(0.6)	
Screw revolution	r. p. m.	15~320			10~350			10~320			10~320		
Nozzle pressing force	U. S. ton	2.4			6.3			6.3			6.3		
Hopper capacity	gal	5.3			10.6			10.6			10.6		
Screw drive system		Hydraulic motor			Hydraulic motor			Hydraulic motor			Hydraulic motor		
▼Clamping Unit													
Clamping system		Double toggle			Double toggle			Double toggle			Double toggle		
Clamping force	U. S. ton	35			55			90			110		
Clamping stroke	in	9.06			10.60			12.60			14.17		
Min. mold height	in	4.72			5.91			5.91			5.91		
Max. mold height	in	9.84			12.6			13.78			16.93		
Tie bar clearance (H × V)	in	10.24 × 10.24			12.80 × 12.80			14.76 × 14.76			16.14 × 16.14		
Die plate size (H × V)	in	14.69 × 14.69			18.11 × 18.11			21.26 × 20.67			22.83 × 22.83		
Ejector force	U. S. ton	1.8			3.6			4.5			4.5		
Ejector stroke	in	1.97			2.36			3.15			3.15		
Mechanical stopper adjustable range	in	-			-			-			10.0 ~ 14.0		
▼Others													
Heater capacity	kw	3.05			5.1			6.15			6.15		
Pump motor	kw (hp)	7.5 (10)			15.0 (20)			18.5 (25)			18.5 (25)		
Mold height adjust motor	kw (hp)	0.1 (1/8)			0.1 (1/8)			0.1 (1/8)			0.2 (1/4)		
Oil tank capacity	gal	22.5			42.3			42.3			42.3		
Machine dimension (L × W × H)	in	111.0 × 34.6 × 65.4			140.3 × 38.5 × 71.9			148.1 × 41.0 × 73.0			167.3 × 42.4 × 73.0		
Machine weight	U. S. ton	1.7			2.9			4.2			5.2		

Specifications are subject to change without any legal obligation on the part of the manufacturer.

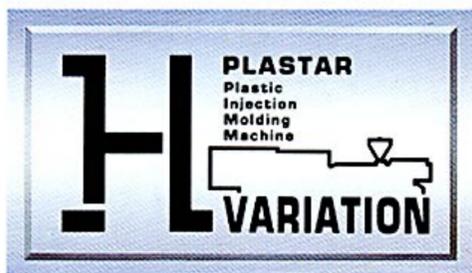
H	TM-150H	TM-200H	TM-245H	TM-300H	TM-400H	TM-500H
w	In-line screw	In-line screw	In-line screw	In-line screw	In-line screw	In-line screw
	6.30	7.87	8.66	10.63	12.05	14.76
1.57	1.57 (1.81)	(1.81) 1.97 (2.17)	(2.17) 2.36 (2.68)	(2.36) 2.68 (2.95)	(2.68) 2.95 (3.27)	(2.95) 3.27 (3.54)
11.1	12.2 (16.2)	(20.3) 24.0 (29.0)	(31.9) 38.0 (48.7)	(46.6) 59.8 (72.6)	(67.8) 82.4 (101.0)	(101.0) 123.7 (145.5)
6.1	6.7 (8.8)	(11.1) 13.1 (15.9)	(17.5) 20.8 (26.7)	(25.5) 32.8 (40.0)	(37.2) 45.3 (55.5)	(55.5) 67.9 (80.0)
10.4	9.0 (12.0)	(9.3) 11.0 (13.2)	(15.7) 18.7 (24.1)	(18.4) 23.7 (28.8)	(23.4) 28.4 (34.8)	(30.6) 37.4 (44.0)
24,088	27,971 (21,145)	(31,995) 27,075 (22,382)	(25,724) 21,614 (16,833)	(26,847) 20,903 (17,178)	(25,397) 20,875 (17,050)	(24,714) 20,178 (17,164)
0.7	0.8 (1.1)	(1.1) 1.5 (1.9)	(1.9) 2.0 (2.3)	(1.9) 2.4 (2.9)	(2.4) 2.8 (2.9)	(2.4) 2.9 3.4
	10~280	10~199 10~285	10~183 10~261	10~181 10~257	10~203 10~260	10~162 10~202
	6.3	6.3	6.3	8.7	8.7	8.7
	14.5	14.5	14.5	33.0	33.0	33.0
tor	Hydraulic motor	Hydraulic motor	Hydraulic motor	Hydraulic motor	Hydraulic motor	Hydraulic motor
gle	Double toggle	Double toggle	Double toggle	Double toggle	Double toggle	Double toggle
	150	200	242	300	400	500
	15.75	18.50	20.47	22.83	27.55	33.50
	5.91	7.87	9.84	9.84	11.81	13.78
	17.72	19.69	25.59	25.60	29.52	36.22
.14	18.11×18.11	22.05×22.05	24.02×24.02	28.74×28.74	31.89×31.89	34.25×34.25
.83	25.20×25.20	30.71×30.71	32.28×32.28	37.00×37.00	41.34×41.34	43.90×43.90
	4.5	6.2	7.2	8.3	10.6	14.7
	3.94	4.72	5.12	5.51	6.30	7.09
17	11.42~15.75	13.39~18.50	16.12~20.47	14.76~22.83	—	—
	7.2	11.2	15.8	19.2	25.6	31.6
)	18.5(25)	22.0(30)	30.0(40)	37.0(50)	45.0(60)	55.0(75)
)	0.2(1/4)	0.2(1/4)	0.4(1/2)	0.4(1/2)	0.75(1)	0.75(1)
	47.6	52.8	79.3	118.9	132.0	171.7
72.7	177.9×46.1×77.2	211.7×50.4×78.0	233.6×54.6×82.1	260.0×68.3×87.8	275.6×72.8×95.3	319.6×74.0×95.4
	5.8	7.7	10.5	14.3	17.6	23.1

*Injection capacity (PS) vary according to molding conditions.

Figures in () are optional.

Consult the manufacturer before choosing for the screw in [], because applicable raw materials are limited.

Consult the manufacturer when abrasive, corrosive or erosive material is used.



A Complete Combination of Components for Greater Flexibility

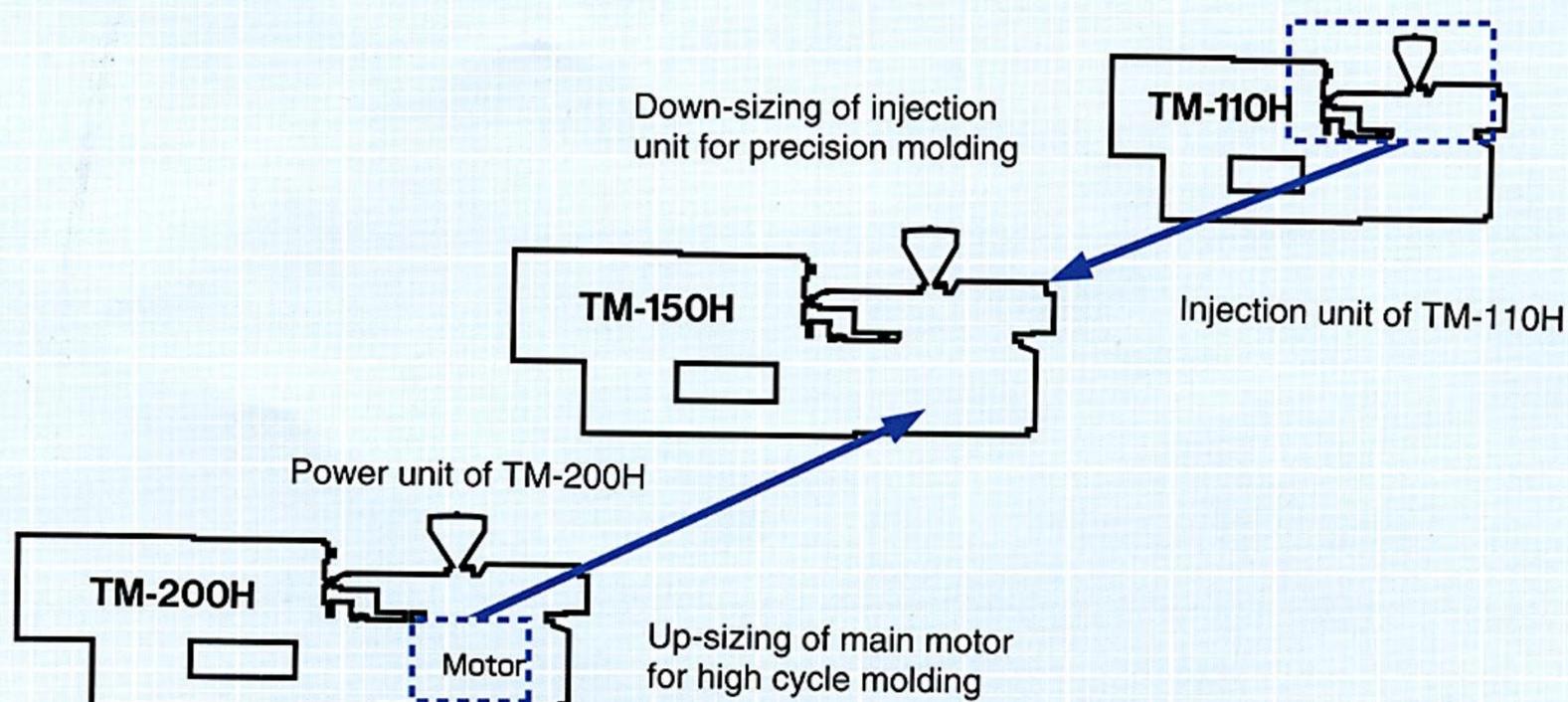
MODULAR FLEXIBILITY

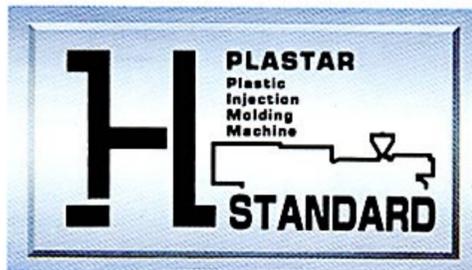
In addition to the standard specifications, a machine can be configured by combining a basic clamp unit and injection unit to the specific demand of the users.

The capacity of the main motor can be increased by one size.

Model	Injection Unit	Screw diameter (in)															Motor capacity		
		0.63	0.71	0.79	0.94	1.10	1.26	1.42	1.57	1.81	1.97	2.17	2.36	2.68	2.95	3.27	3.54	Standard	High power
Ti-35H	●H1			○	●	○												10.0HP	—
																			—
Ti-55H	●H3					○	●	○										20.1HP	24.8HP
	○H1			○	○	○												20.1HP	
Ti-90H	●H4						○	○	●									24.8HP	29.5HP
	○H3					○	○	○										24.8HP	—
TM-110H	●H5						○	○	●									24.8HP	29.5HP
	○H3					○	○	○										24.8HP	—
TM-150H	●H6								●	○								24.8HP	29.5HP
	○H4						○	○	○									24.8HP	—
TM-200H	●H10									○	●	○						29.5HP	40.2HP
	○H6									○	○							29.5HP	—
TM-245H	●H16											○	●	△				40.2HP	—
	○H10									○	●	○						40.2HP	—
TM-300H	●H25											○	●	△				49.6HP	—
	○H16										○	○	○					49.6HP	—
TM-400H	●H35												○	●	△			60.3HP	—
	○H25												○	○	△			60.3HP	—
TM-500H	●H50													○	●	△		73.7HP	—
	○H35													○	○	△		73.7HP	—

●...Standard ○...Option △...Applicable raw materials are limited.
Consult the manufacturer.





Substantial Standard Features for Sophisticated Molding

▼ Injection

Open nozzle
 High/Low Screw torque (TM-200H and up)
 Screw cold start prevention
 Programmable automatic melt purging
 Sprue break
 Melt decompression
 Hopper throat temperature control
 Hopper swiveling mechanism
 Soft feedback control on injection speed, injection pressure and back pressure
 Programmable for injection speed (2~10 steps)
 injection pressure (2~10 steps)
 back pressure (1~6 steps)
 screw rotation speed (1~6 steps)
 injection holding pressure (2~9 steps)
 Holding pressure changeover via stroke, time and hydraulic cylinder pressure
 FF control for metering completion
 Slope control of speed and pressure
 PID control for barrel temperature
 Barrel temperature setting at 0.1° F intervals
 Barrel temperature slope start-up control
 5-zone barrel temperature control (Ti-90H and up)
 Proportional period setting for each heater zone
 Digital display for injection pressures, back pressures, screw revolutions, screw positions and barrel temperatures
 Purge cover

▼ Clamping

Lubrication-free toggle mechanism
 Double roller support for movable die plate (Ti-90H and up)
 High cycle toggle mechanism (TM-150H, 200H, 245H)
 Automatic clamping force setup system
 Digital display for mold open/close speeds, positions and pressures.
 Digital display for ejector speeds, positions, pressures and ejecting numbers
 Slope control for mold opening and closing
 Electric motor-driven mold height adjusting mechanism
 Monitoring for clamping force upper limit
 Holding at ejector advanced position
 Mechanical stopper on clamping cylinder (TM-110H ~ TM-300H)
 Low pressure mold protection (slope control)
 Tapping for robot mounting
 Triple safety interlock (electric, hydraulic, mechanical)
 Chute (Ti-35H ~ TM-200H)

Programmable for mold open/close movement (3~4 steps)
 Tapping for heat insulation board mounting (Ti-35H ~ TM-245H)
 Tapping for ejector rod connection
 Ratchet type safety bar

▼ Hydraulic

Variable pump system (Ti-35H ~ TM-245H)
 Hydraulic fluid temperature control
 Hydraulic fluid preheat system
 Oil cleaner
 Oil level alarm
 Oil cleaner clogging alarm
 Glycerin-enclosed type pressure gauge

▼ Control

PLCS-9 microprocessor control
 Internal memory for 32 mold setups
 Memory card for 128 mold setups
 TFT 16-color LCD display
 Manned-unmanned mode selection
 Printer interface
 Color printer capability
 1 page screen for setup
 Auto screen
 Self-diagnosing function
 Clock function
 Calculator function
 Wiring preparation for pick-up robot
 Measured data indication
 Mold temperature indication (program only)
 Window screen
 Alpha entry of mold name
 Touch panel type function key
 High speed screen indication
 Unit conversion
 Process-in-motion indication
 Enlarging, reduction and transfer of screen
 Selection of decimal place
 Automatic adjusting of setpoint
 Interface with weighing scale
 SSR heater control (35H~200H)

▼ Molding assistance

Graphic display of injection pressure and speed
 Graphic display of metering pressure and speed
 Graphic display of mold movement
 Graphic display of ejector movement
 Wave overlapping in graphics
 Graphics in window screen

Automatic scale setting in graphics
 Monitored value indication between cross hairs
 Parameter setting history
 Process troubleshooting guide

▼ Monitoring

Heater power ON/OFF indication
 Heater disconnection alarm
 Barrel temperature high/low limit alarm
 Abnormal alarm buzzer
 Error message
 Eighty-seven (87) monitoring parameters
 Statistical processing of monitored data (SPC)
 Monitored data indication on screen
 Printing of monitored data
 Automatic setting of max./min. value by range setting in SPC
 Automatic setting of max./min. value by 3 σ setting in SPC
 Automatic setting of max./min. value due to setting value

▼ Production control

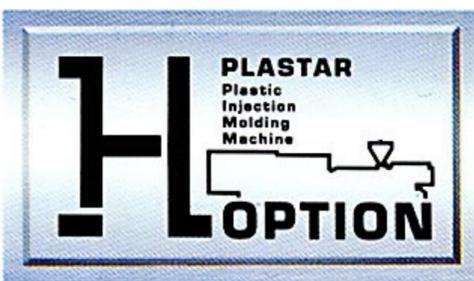
Production lot number counter
 Divided lot number counter
 Continuous defect counter
 Start reject counter
 Record number counter
 In-spec product counter
 Expected time of production completion
 Production ratio indication
 Defect ratio indication
 On-time ratio indication
 Production progress indication
 Delivery control function
 Interface for machines-in-group control

▼ Maintenance

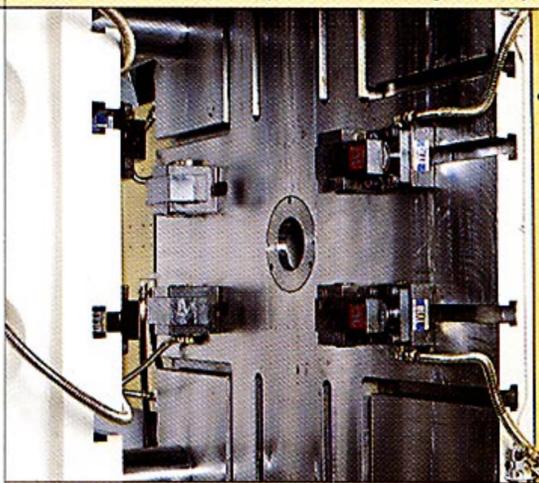
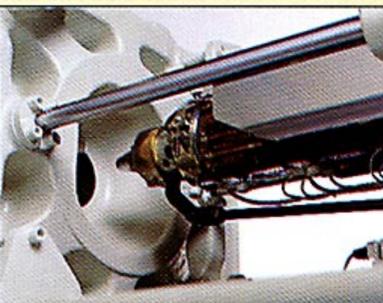
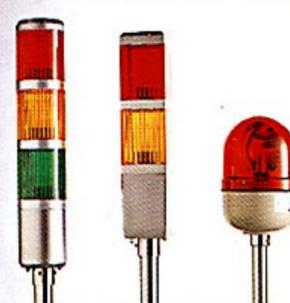
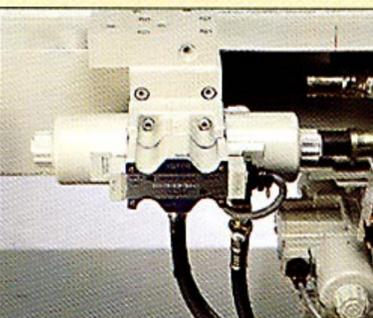
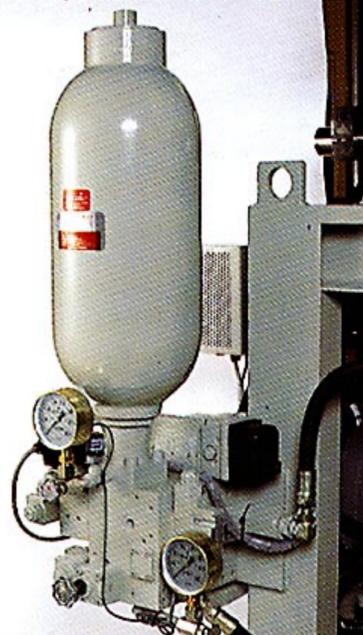
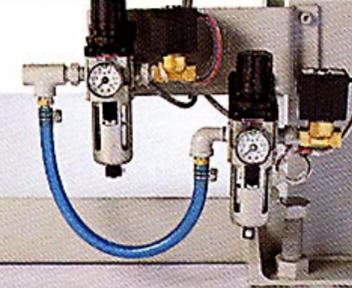
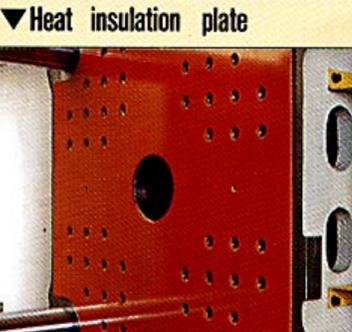
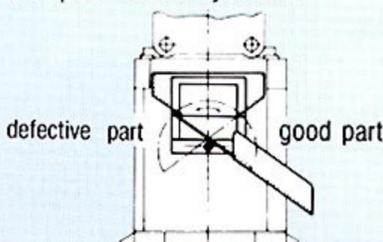
One cycle graph
 One cycle logic graph
 Periodical checkup screen
 Greasing timing indication
 Alarm history
 Alarm compiling function
 Printing out of alarm history

▼ Others

Mold fittings
 Hopper
 Installation rubber pad



Many Options for Customization to Your Needs

<p>▼ Separate control panel</p> 	<p>▼ T-slotted die plate (with die locking device)</p>  <p>▼ Printer</p> 	
<p>▼ Hydraulic check nozzle</p> 	<p>▼ Flash light</p> 	<p>▼ Hydraulic core unit</p> 
<p>▼ Accumulator-aided Injection system</p> 	<p>▼ Air ejector, dual lines</p>  <p>▼ Heat insulation plate</p> 	<p>▼ Hydraulic ejector during mould opening</p> 
<p>▼ Monitored data statistical analysis</p> <p>The monitored data can be immediately analyzed, and seven kinds of calculated results are printed out.</p> <p>Maximum value : MAX Minimum value : MIN Deviation : $R = \text{MAX} - \text{MIN}$ Average value : $\bar{X} = (\sum X_i) / N$ Distribution : $\sigma = \sqrt{[\sum X^2 - (\sum X)^2 / N] / (N-1)}$ Average dispersion : $R / \bar{X} \doteq R / X \times 100$ $3\sigma / \bar{X} = 3\sigma / X \times 100$</p>	<p>▼ Reversible chute</p> <p>When the monitoring system detects a defective part, the reversible chute eliminates the part after ejection.</p> 	

▼ Optional features

▼ Injection

- Pneumatic check nozzle
- Signal (mold open/close) for hot runner
- Accumulator-aided high speed injection system
- Screw-head and barrel-head for PVC
- High wattage heater
- Ceramic heater
- Dedicated screws for specific materials
- Extended nozzle
- Five-zone heater temperature control (Ti-35H, 55H)
- Heater temperature holding control
- SSR heater control (245H ~ 500H)

▼ Mold clamping and ejector

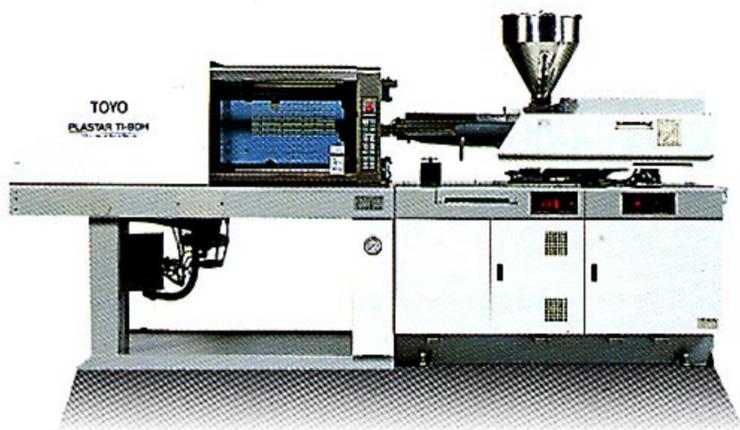
- Air ejector, single or dual line (activated at any part of mold opening)
- Pre-gate system
- Product fall-away detector via limit switch (CP-02)
- Hydraulic core
- Pneumatic core
- Cavity pressure sensor
- Automatic mold locking device
- Wiring for unscrewing motor
- Ejector plate (in mold) returned confirmation
- T-slotted plate fitted on die plate (Ti-35H ~ TM-200H)
- Reversible chute
- 2-step mold opening for robot

▼ Control

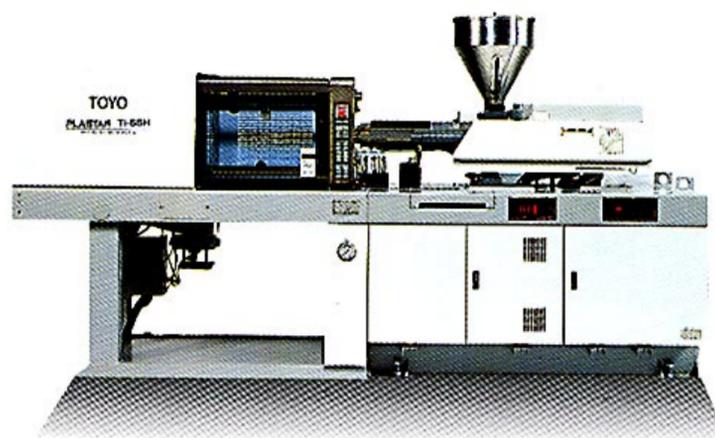
- Flash light
- Hour meter
- Suction filter clogging alarm
- Printer
- Separate control panel

▼ Others

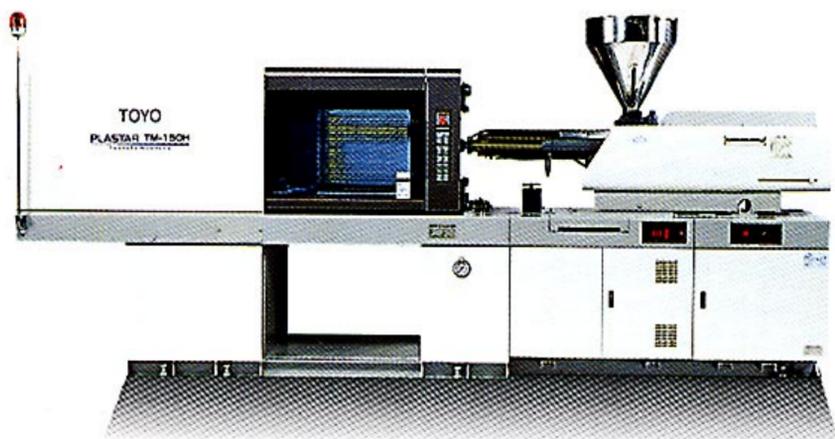
- Heat insulation plate fitted on die-plate
- Cooling water flow gauge
- Specific colors for customer requirement



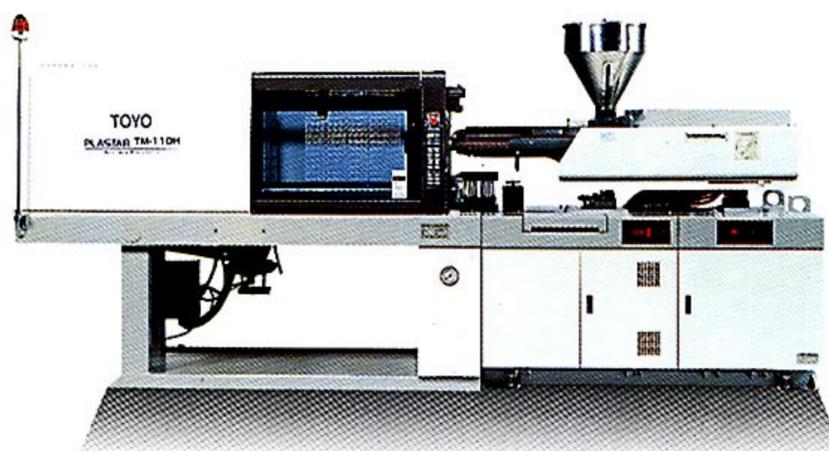
Ti-90H



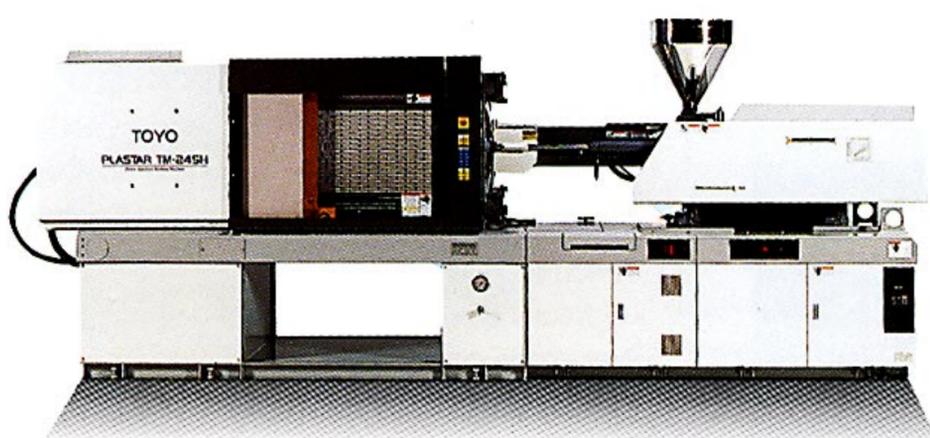
Ti-55H



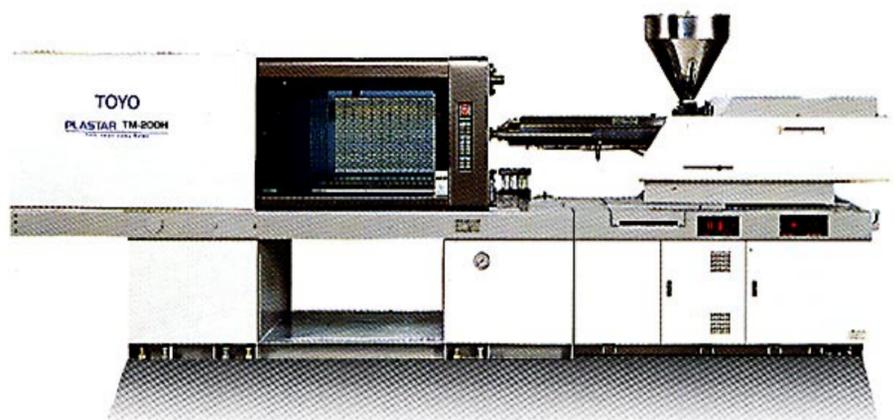
TM-150H



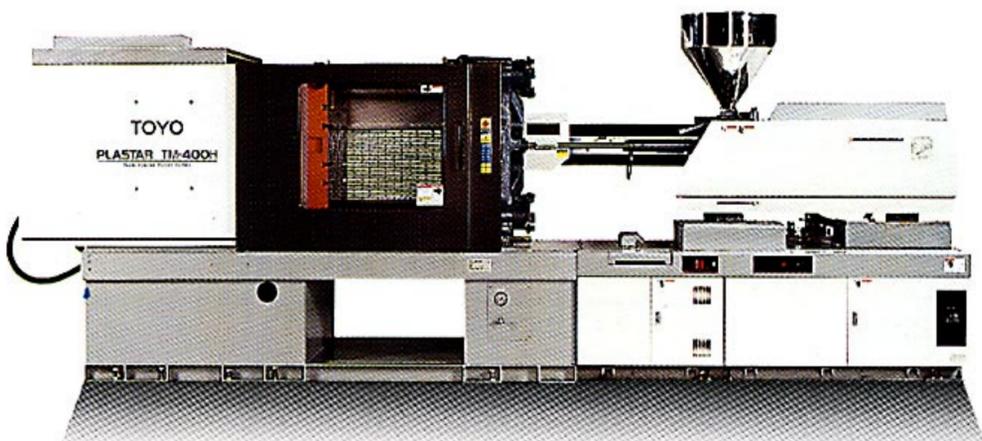
TM-110H



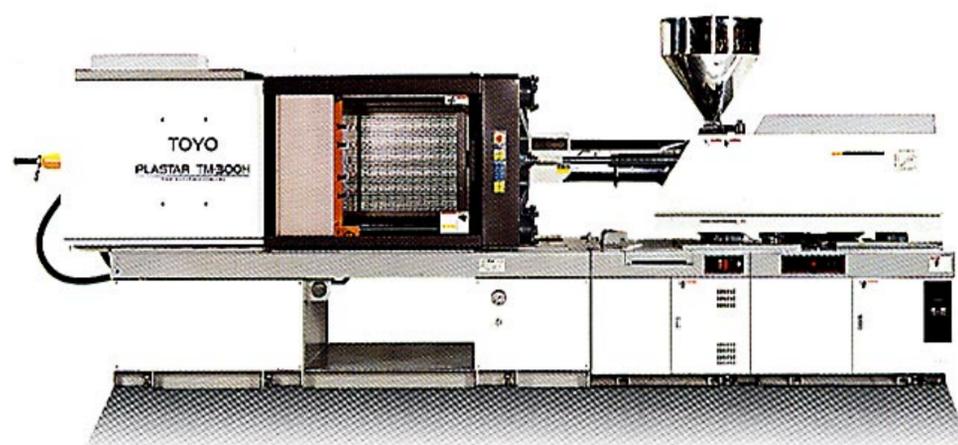
TM-245H



TM-200H



TM-400H



TM-300H



TM-500H

Remark : The pictures include optional items.