

USA Version

ET SERIES

Fully Electric Vertical type Injection Molding Machine



Customer's Value Up

A Hitachi Group Company

ET SERIES

Fully Electric Vertical type Inj Wide range W

A Full Lineup and Variations of the Industry's Top Electric Vertical

VR

Vertical Clamping / Vertical Injection
Rotary table

45VR
90VR



HR

Vertical Clamping / Horizontal Injection
Rotary table

45HR
90HR
150HR



Height performance

Maneuverable Machine Height

The machine height was reduced without sacrificing the largest daylight in the industry.

Model	ET-VR series		ET-HR series			ET-V series	
	45VR	90VR	45HR	90HR	150HR	45v	90v
Machine height (in)	114.33	125.12	78.74	83.46	95.83	118.70	129.49
Machine daylight size (in)	21.65	24.80	21.65	24.80	32.09	21.65	24.80

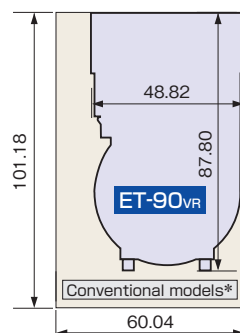
*The table shows the machine height with a $\phi 1.57(40)$ screw. The heights of the ET-150VR change depending on screw sizes.

Compact

Extensive downsizing

The machine size was extensively reduced by adopting a circular machine configuration and re-designing control panel ideal for ET models. Particularly, the width of the machine is one of the smallest in the industry, which secures a great degree of freedom in installing peripheral equipment.

*TTseries(2003 model)



High Speed

High-speed mold opening and closing

With VR and V models, the nozzle-touch mechanism using triple ball-screws that are also serving as guide bars themselves realizes swaying-free mold opening/closing motion at high speed. The movable plate opens and closes supported by the frame-fixed guide rails so that the vibration can be reduced to a minimum. As a result, precision molding can be obtained even under the high speed operation.



Injection Molding Machine

Wide variation



Only products that have passed Hitachi's strict "Environmental compliance design assessment (DfE)" can carry this Logo and are certified as "Eco-Products".
Our electric injection molding machine ET series has been registered as "Eco-Products".

Eco-products are products that meet eight assessment criteria, including weight reduction, resource recycling, energy efficiency, and environmental conservation, as in the Assessment for DfE (Design for Environment) unique to the Hitachi Group.

Injection Molding Machines, Ranging from 45 to 150 Tons in Clamping Force

V

Vertical Clamping/Vertical Injection
Single station

45v
90v



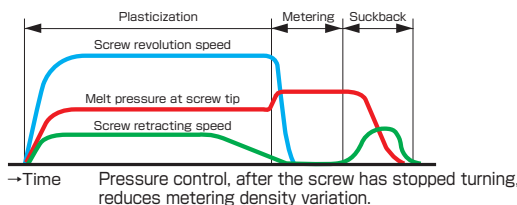
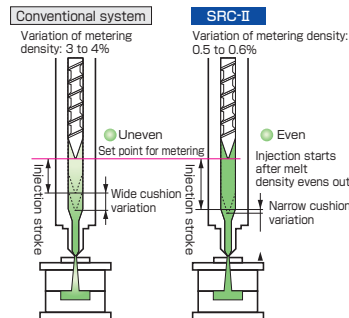
Series		ET-VR	ET-HR	ET-V
Specifications	Injection	Vertical	Horizontal	Vertical
	Clamping	Vertical	Vertical	Vertical
	Table	Rotary	Rotary	Single
Lineup (Clamping force ton)	45	●	●	●
	90	●	●	●
	150		●	

High Quality

High precision metering system

The ET series utilizes the SRC-II metering system [PAT]. This system provides optimum pressure control of the melt after the metering screw has stopped in order to stabilize melt density. And this process then contributes to a remarkable reduction in product weight variation caused by uneven density.

Extremely consistent metering with the SRC-II metering system



Anti-backflow metering system

The SRC-III metering system [PAT] is also available as an option. This system eliminates any destabilizing factors relating to the check ring.

- Simple structure
- Standard injection is possible even when the screwcheck triplet for the SRC-III is fitted.
- Standard check seat is used.

Easy Operation

Customer-satisfying SYSTEM500 control

The ET series is equipped with the latest user-oriented controller SYSTEM500 that incorporates desires and suggestions from the customers who are accustomed to our previous controller PLCS11.

Security features



Password function

The SYSTEM500 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.

Improved visibility and easier maintenance



I/O monitor screen
The input and output conditions can be checked at one glance.

PC-touch easy operation



Entry with 10-key screen and drag function
The popped up screen can be dragged to a convenient place for easy entry operation.

Job title	Job title example	Operation authority
Manager	Plant general manager, manager	User management and addition, password assignment
Maintenance	Maintenance staff	Change of machine models, board replacement semi-fixed values, environment screen
Molding operator	Molding staff	Change of molding conditions
Operator	Operation staff	Operation start/stop, screen display only

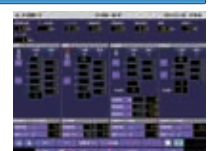
Screen layout for vertical model



Table Rotation Setting Screen



Setting screen for injection and plasticization



Setting screen for mold opening and closing

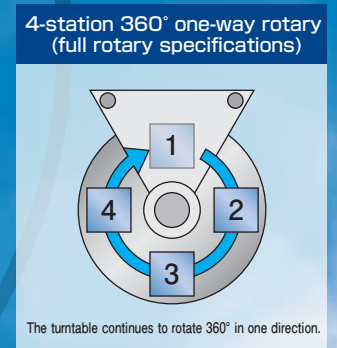
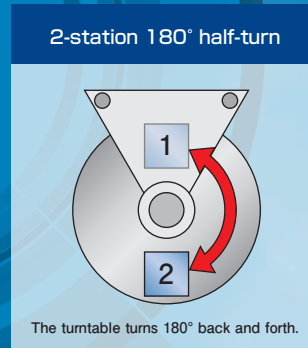
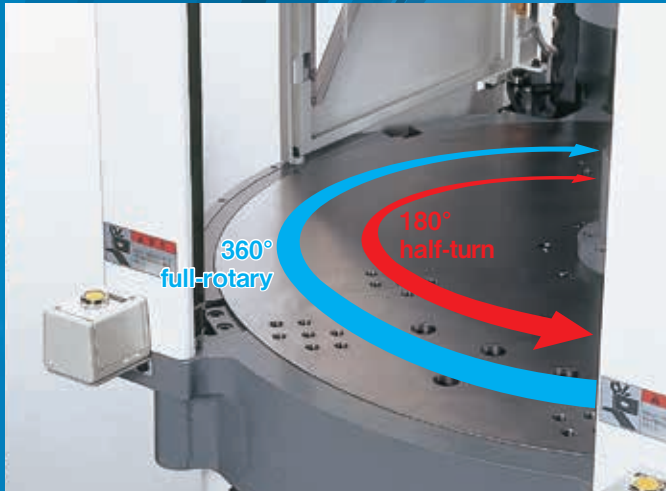
Vertical Rotary Type

(VR/HR series)

The TOYO-original 360° rotary table delivers high-efficiency production

You can choose either 180° 2-station reversible table motion or 360° one-way fully rotating table depending on your job.

* Any number of stations is available as option.



Each molding condition can be set for each mold.

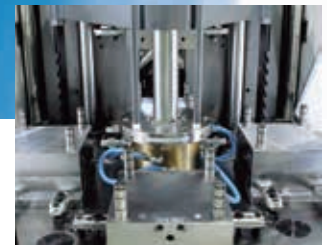
The ET series has added one-way 360° full-rotary type models (optional) in its line-ups. The rotary table stops at an infinite number of positions according to the setting. You can set independent molding parameters to each mold.



The technology behind one-way rotation



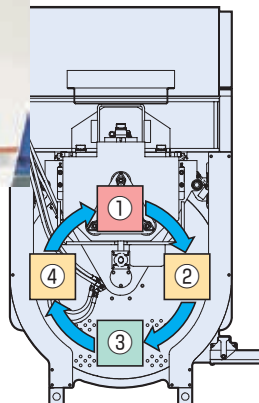
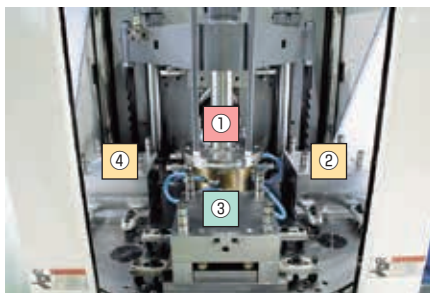
Multi-pole slip ring system (for rod heaters)



Rotary joint system (for water-cooling)

Molding examples using 360° full rotary system

Full rotary ① 4-station with one upper mold half

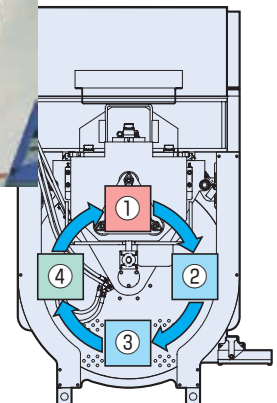
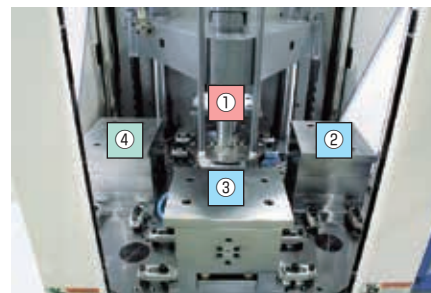


- ① Injection/Holding pressure
- ②④ Free-use
- ③ Taking out

(For example, work insertion is possible at station ④.)

Other processes can be allocated at stations ② and ④.

Full rotary ② 4-station with four upper mold halves



- ① Injection/Holding pressure
- ②③ Cooling
- ④ Taking out (Ejecting)

High speed molding is possible by cooling the product at stations ② and ③.

Product quality can be stabilized by decreasing the number of cavities per mold.

Top class "Fast turn table" in the industry

High-speed turn table (1 sec*)

The ET-VR2 has achieved high-speed rotation and stepless stop positioning of the turntable via a servomotor drive.

*ET-90VR2/HR2 180° half-turn time.

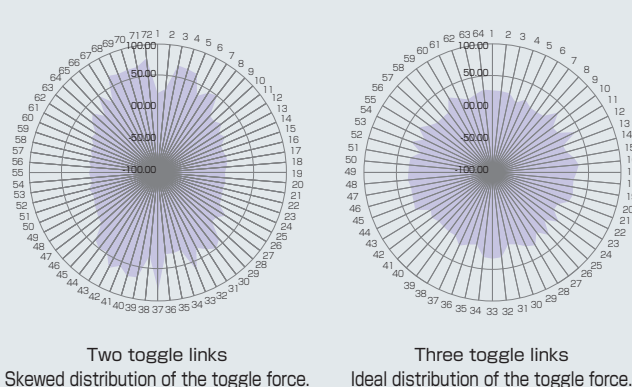


Precision molding with three toggle links (*)

Unlike conventional machines that use only two sets of toggle links, the ET series unitizes three sets for more stable clamping. The result is more precise molding owing to improved distribution of clamping pressures over the mold surface.

*ET-v Two toggle links.

Comparison of simulated pressure distribution

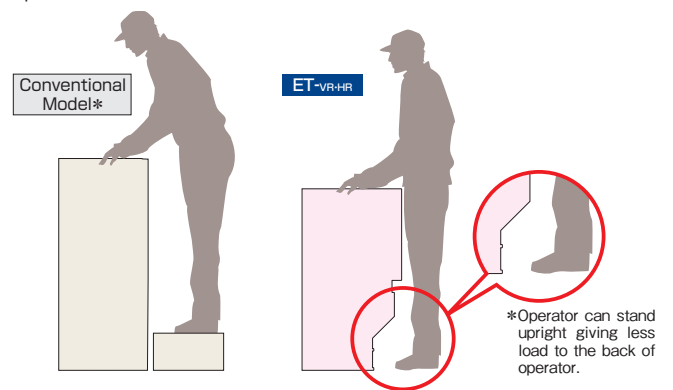


Ergonomic low-height table has better operability

The working height is much lower than that of conventional vertical machines, leading to safer operation as well as improvements in user-friendliness and operability. The ET-90VR (45VR)'s table height is just 37.76 (35.43) in, thus eliminating the need for a step. In addition, the foot space provided under the table allows an operator to keep an erect posture, so that the operator can work comfortably concentrating on his work.

Ergonomic design

Ergonomically designed machine structure with enough room for operator's toes.



*Poor operating efficiency and safety result from an unstable slouched posture on the stool.

*High operating efficiency results from a safe, natural erect posture with no need of the stool.

*TT series (2003 model)

ET-VR

Vertical Clamping
Vertical Injection
Rotary table

45VR2

90VR2/4

VR2(2 station)

VR4(4 station)*

TOYO's VR models have every feature required for electric vertical rotary molding machines. In addition, they achieve highest-ever productivity with the 360°full one-way rotating function.

Screw diameter variations

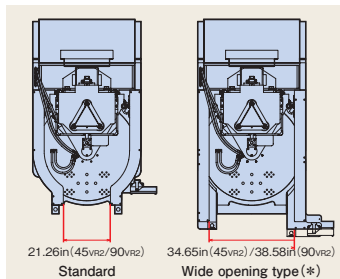
※Each ET-VR model has one injection unit only.

	Screw diameter in(mm)		
ET-45VR	0.78(20)	0.94(24)	1.10(28)
ET-90VR	0.94(24)	1.10(28)	1.25(32)

● Standard screw diameter

Ultimate ease of use

You can choose the opening size according to your molding job situation.



(*)Wide opening type is optional.

*Any number of stations is available as option.



ET-v

Vertical Clamping
Vertical Injection
Single station

45v

90v

The most common vertical model became much easier to use.

The ET-v models are more flexible to automation in the molding shops.

Screw diameter variations

※Each ET-v model has one injection unit only.

	Screw diameter in(mm)		
ET-45v	0.78(20)	0.94(24)	1.10(28)
ET-90v	0.94(24)	1.10(28)	1.25(32)

● Standard screw diameter

Wide lower die plate suits a variety of molding processes

The ET-v has a built-in wide lower die plate, thus flexibly supporting increasingly complex and upsized molds. This wide lower die plate is suitable not only for the various kinds of molding processes, including hoop molding, but also for the smooth installation of peripheral equipment such as unloaders. This allows the ET-v to meet the demands of injection molding in an age of high-mix low-volume manufacturing.

The largest tie-bar clearance in the class

The ET-90v(45v)'s tie-bar clearance is as wide as 23.22×17.71 (21.25×14.96)in, the largest in the class, and can accommodate various large as well as specially configured molds. The wide tie-bar clearance also provides excellent operability for mold changes and installation of peripheral equipment.



Barrier-free front door

The ET-v is provided with a rail-less sliding type front door. This gives large room for mold-changing activity.

ET-HR

Vertical Clamping
Horizontal Injection
Rotary table

45HR2

90HR2/4

150HR2

HR2(2 station)

HR4(4 station)*

TOYO's HR model units bring together the convenience of vertical rotary units and the outstanding operability of horizontal injection, thus expanding the possibilities of automation.



*Any number of stations is available as option.

Selectable injection units and screws

	Standard injection unit	High-speed (*High-pressure) injection unit	Screw diameter in (mm)
ET-45HR	C55	C75	0.94(24) 1.10(28)
ET-90HR	D75	D150	1.10(28) 1.25(32)
	E75	E200	1.25(32) 1.41(36) 1.57(40)
ET-150HR	F150	F200	1.57(40) 1.81(46)

● Standard screw diameter

Easily adjustable nozzle center height

A nozzle center height adjuster is available. By using the adjuster, the nozzle center height can be easily adjusted in accordance to the size of the mold.

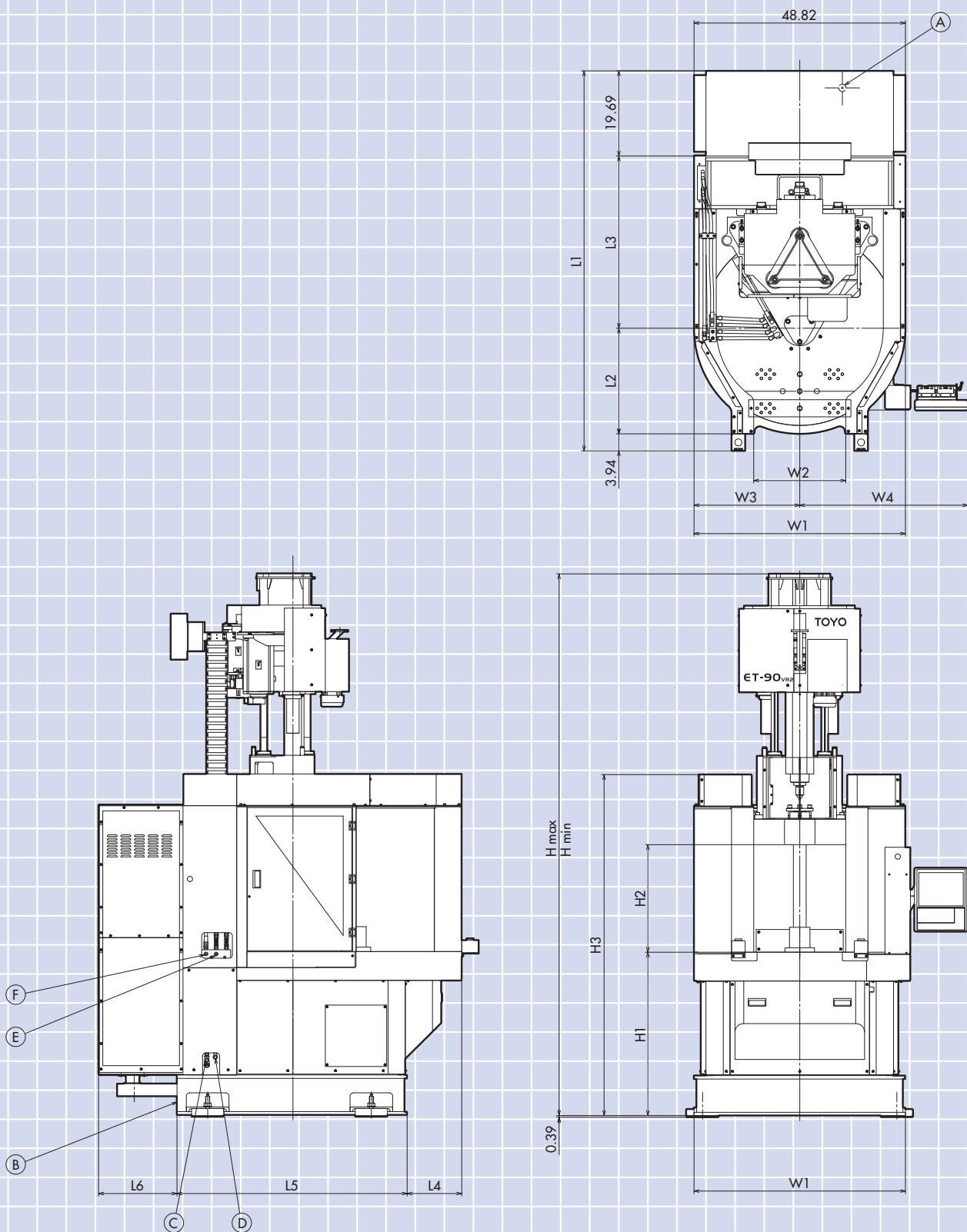


Nozzle-touch operation while keeping an eye on the molds

By taking advantage of horizontal injection, the injection unit can be controlled with special switches while keeping an eye on the molds. This contributes to easier mold setup.



ET-VR2 Overall Machine Dimensions



ⒶPower inlet200V(φ2.36).

Breaker capacity(factory), Class:125A(90VR2),75A(45VR2)

ⒷGrounding M8

ⒸWater for hopper throat IN:Rc3/8 with Y-type strainer
(Nomal water volume:1.3~2.6gal./min.)

ⒹWater for hopper throat OUT:Rc3/8

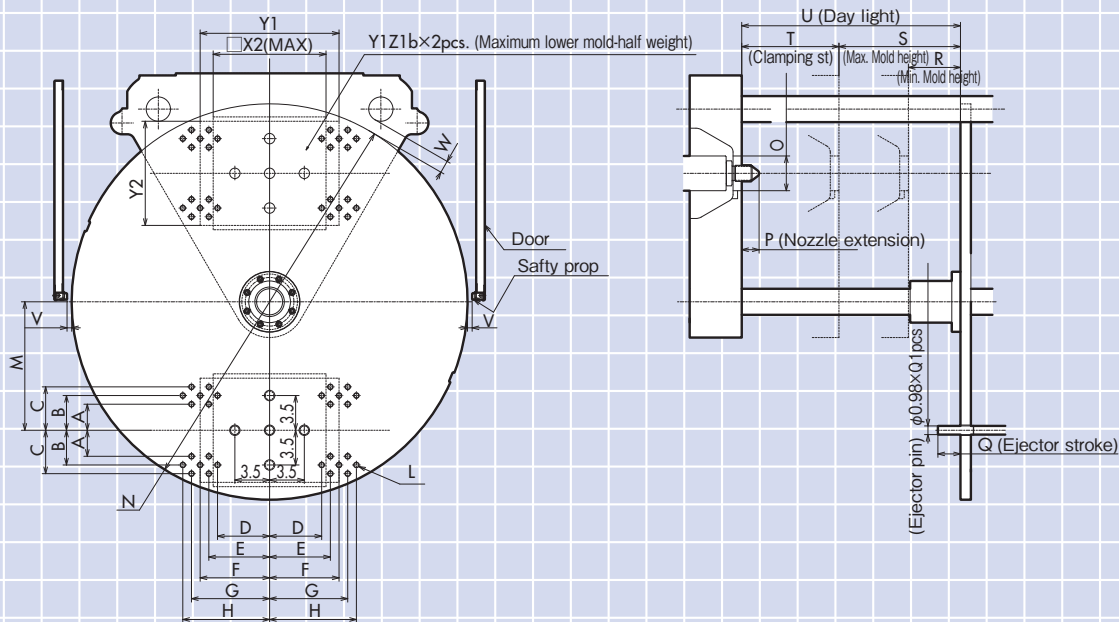
ⒺMold pipe IN Rc1/2

ⒻMold pipe OUT Rc1/2

※Overall machine height increases by approx.
0.39in with optional rubber pads attached.

	Hmax	Hmin	H1	H2	H3	W1	W2	W3	W4	L1	L2	L3	L4	L5	L6
ET-45VR2	114.33	98.58	35.43	21.65	78.74	44.88	21.26	22.44	37.78	83.86	22.44	37.80	11.02	49.02	19.88
ET-90VR2	125.12	106.22	37.76	24.80	78.74	48.82	21.26	24.41	38.76	87.80	24.41	39.76	12.60	53.15	18.11

ET-VR2 Mold Fixing Dimensions



	A	B	C	D	E	F	G	H	L	M	N	V	W	X2	Y1	Y2	Z
ET-45VR2	3	4	5	5	6	7	8	—	5/8-11UNC	13.19	φ40.94	0.53	1.19	11.81	13.78	10.83	379
ET-90VR2	3	4	5	6	7	8	9	10	5/8-11UNC	14.57	φ44.88	0.53	1.41	12.8	15.75	11.81	560

	O	P	Q	Q1	R	S	T	U
ET-45VR2	φ4	1.97	1.57	1	5.91	11.81	9.84	21.65
ET-90VR2	φ4	1.97	2.55	5	5.91	13.78	11.02	24.80

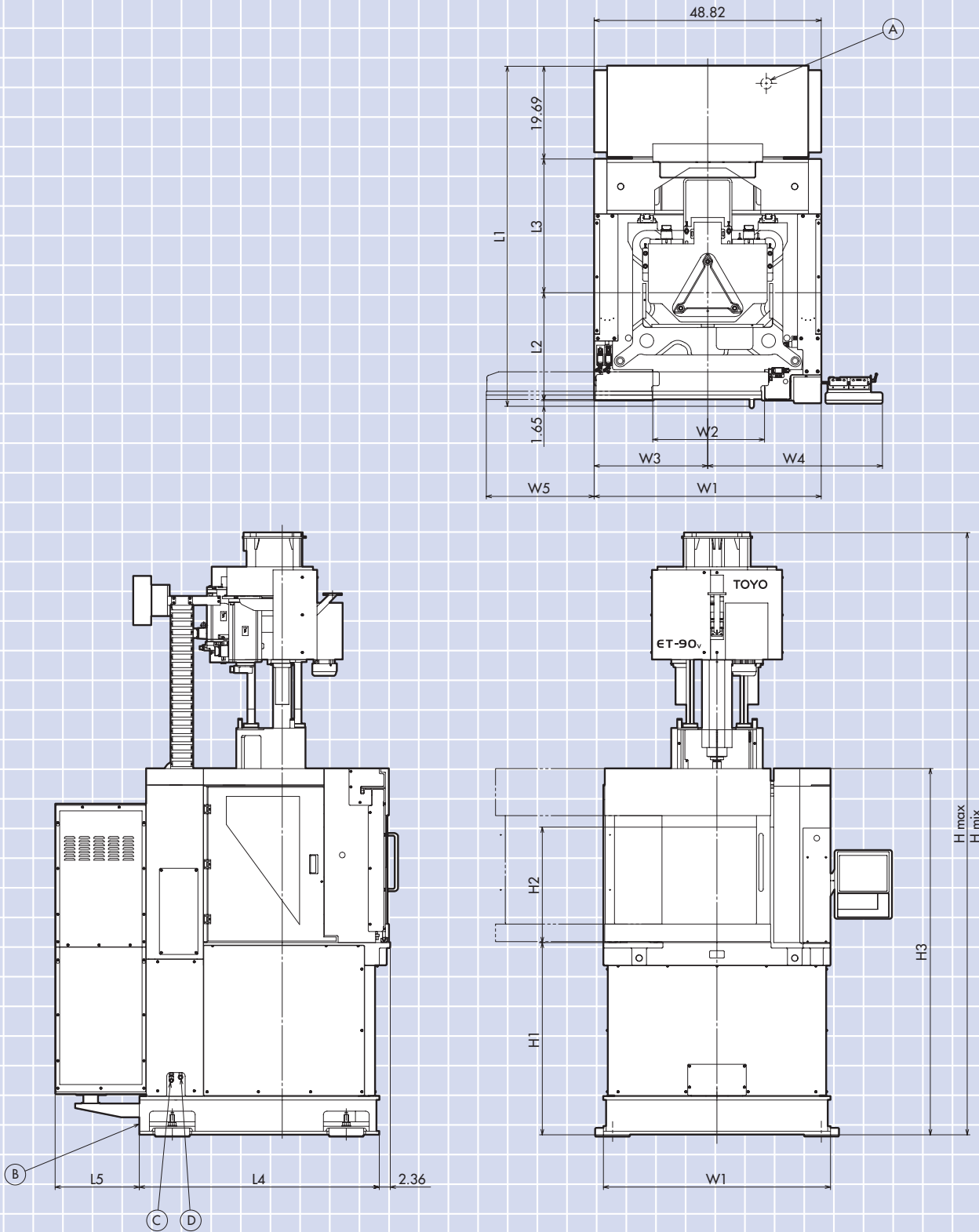
ET-VR2 Specifications

			ET-45VR2			ET-90VR2		
Injection	Injection system	—	In-line screw			In-line screw		
	Injection stroke	in	⟨3.77⟩	5.11	⟨4.40⟩	⟨4.40⟩	5.78	⟨5.03⟩
	Screw diameter	in(mm)	⟨0.78(20)⟩	0.94(24)	⟨1.10(28)⟩	⟨0.94(24)⟩	1.10(28)	⟨1.26(32)⟩
	Theoretical injection capacity	in ³	⟨1.83⟩	3.60	⟨4.21⟩	⟨3.0⟩	5.5	⟨6.3⟩
	Theoretical injection capacity(PS)	oz	⟨0.99⟩	1.96	⟨2.30⟩	⟨1.63⟩	2.99	⟨3.43⟩
	Injection rate	in ³ /s	⟨5.74⟩	8.24	⟨11.23⟩	⟨8.2⟩	11.2	⟨14.7⟩
	Max.injection speed	in/s	⟨11.81⟩	11.81	⟨11.81⟩	⟨11.8⟩	11.8	⟨11.8⟩
	Max.injection pressure	psi	⟨34113⟩	34113	⟨25596⟩	⟨34113⟩	34113	⟨25596⟩
	Max.injection holding pressure	psi	⟨34113⟩	28428	⟨21330⟩	⟨34113⟩	28428	⟨22752⟩
	Recovery rate(PS)	oz/s	⟨0.66⟩	0.95	⟨1.29⟩	⟨0.28⟩	0.39	⟨0.53⟩
Clamping	Screw revolution speed	min ⁻¹	500			350		
	Nozzle pressing force	U.S.ton	1.1			1.1		
	Clamping system	—	Toggle			Toggle		
	Clamping force	U.S.ton	45			90		
	Clamping stroke	in	9.84			11.02		
	Min.mold height	in	5.91			5.91		
	Max.mold height	in	11.81			13.78		
	Max.mold dimensions(WxD)	in	11.81×11.81 13.78×10.83			12.80×12.80 15.75×11.81		
	Max.bottom mold weight	lb	379×2pcs			560×2pcs		
	Table diameter	in	40.94			44.88		
Others	Ejector force	U.S.ton	2.2			2.8		
	Ejector stroke	in	1.57			2.55		
	Heater capacity	kW	⟨2.575⟩	3.45	⟨5.50⟩	3.45	5.50	5.85
	Mold height motor output	kW	0.2			0.4		
	Nozzle touch motor output	kW	0.2			0.2		
	Machine dimensions(W×H×L)	in	48.82×114.33×83.86			48.82×125.12×87.80		
	Power source	—	Three-phase AC200V/200.220V±10% 50Hz/60Hz			Three-phase AC200V/200.220V±10% 50Hz/60Hz		
	Main breker capacity	A	75[40]			125[75]		
	Total electric capacity	kVA	11			20		
	Cable size 200V Class[400V Class※1]	in ²	0.02[0.01]			0.03[0.02]		
Machine weight		U.S.ton	4.2			5.0		

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.
These values may be limited by molding conditions and cycle time.
- Figures in ⟨ ⟩ are optional. Non-standard diameter screws are made on order.
- The injection rate and the maximum injecting speed are calculated values.
These values may be limited by set injecting pressures.
- When the machine is attached with an option, the capacity of the breaker may be changed.
- Figures in [] are optional.
- ※ 1.A transformer(option)is necessary on the machine side.

ET-v Overall Machine Dimensions

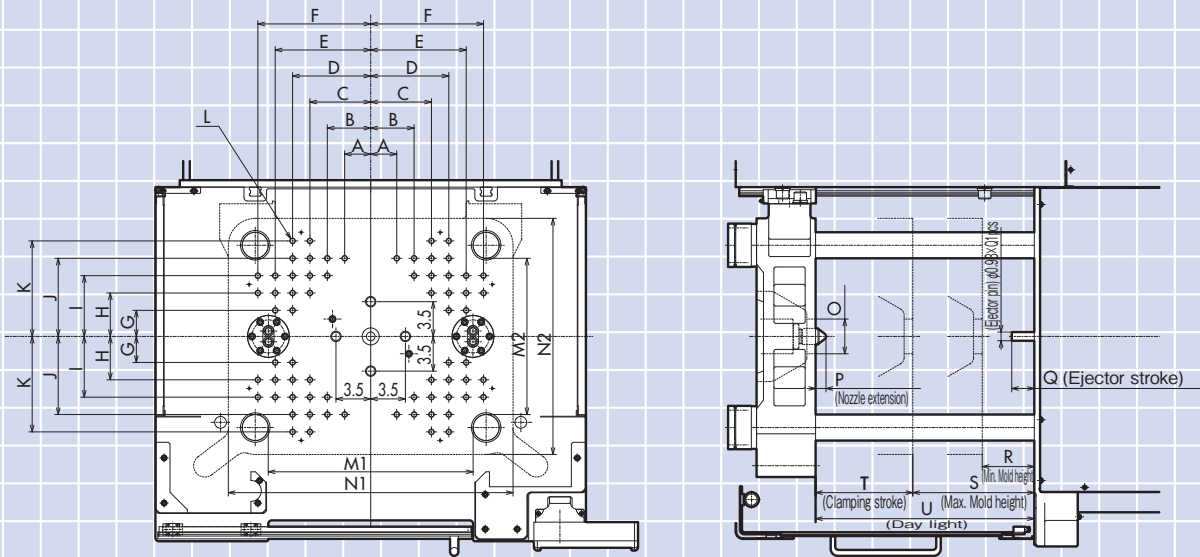


ⒶPower inlet200V(ø2.36).
Breaker capacity(factory). Class:125A(90V). 75A(45V)
ⒷGrounding M8
ⒸWater for hopper throat IN:Rc3/8 with Y-type strainer
(Nomal water volume:1.3~2.6gal/ min.)

ⒹWater for hopper throat OUT:Rc3/8
※Overall machine height increases by approx.
0.39in with optional rubber pads attached.

	Hmax	Hmin	H1	H2	H3	W1	W2	W3	W4	W5	L1	L2	L3	L4	L5
ET-45v	118.70	102.96	38.98	21.65	78.74	46.06	21.65	23.03	36.20	21.22	71.34	21.06	28.94	47.44	19.88
ET-90v	129.49	110.59	41.34	24.80	78.74	48.82	23.62	24.41	37.58	23.19	73.70	23.23	29.13	51.57	18.11

ET-v Mold Fixing Dimensions



	A	B	C	D	E	F	G	H	I	J	K	L	M1×M2	N1×N2
ET-45v	3	5	7	9	11	—	3	5	7	9	—	5/8"-11UNC	21.26×14.96	29.13×22.83
ET-90v	3	5	7	9	11	13	3	5	7	9	11	5/8"-11UNC	23.23×17.72	32.28×26.77

	O	P	Q	Q1	R	S	T	U
ET-45v	φ4	1.18	2.36	5	5.91	11.81	9.84	21.65
ET-90v	φ4	1.18	2.55	5	5.91	13.78	11.02	24.80

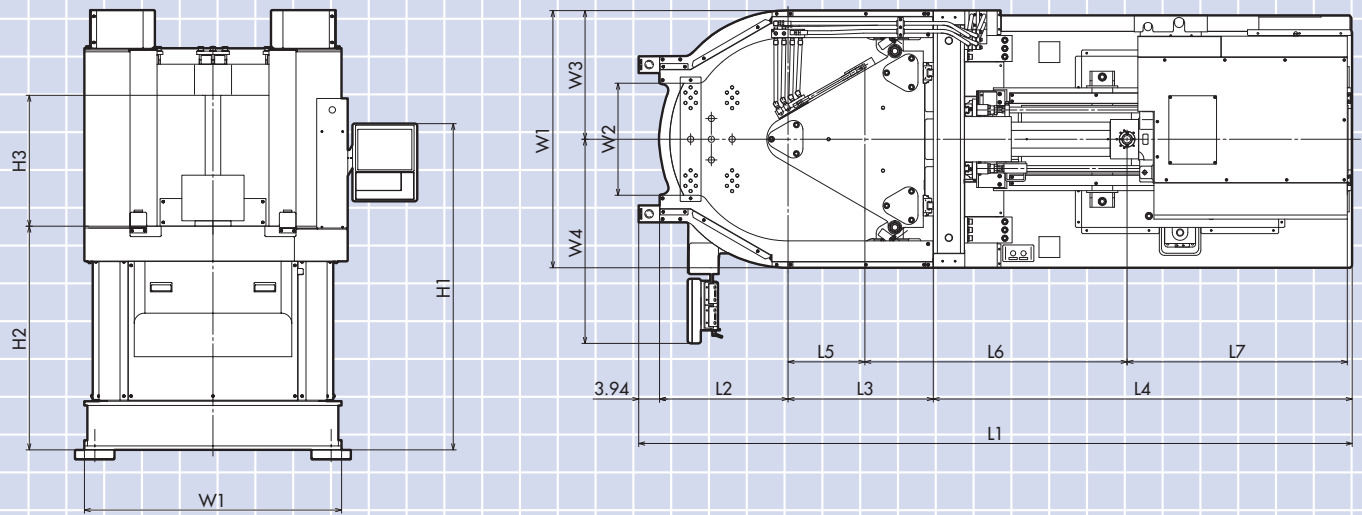
ET-v Specifications

		ET-45v			ET-90v		
		In-line screw			In-line screw		
Injection	Injection system	—			—		
	Injection stroke	in	⟨3.77⟩	5.11	⟨4.40⟩	5.78	⟨5.03⟩
	Screw diameter	in(mm)	⟨0.78(20)⟩	0.94(24)	⟨1.10(28)⟩	1.10(28)	⟨1.26(32)⟩
	Theoretical injection capacity	in ³ /s	⟨1.83⟩	3.60	⟨4.21⟩	3.0	⟨6.3⟩
	Theoretical injection capacity(PS)	oz	⟨0.99⟩	1.96	⟨2.30⟩	1.63	⟨3.43⟩
	Injection rate	in ³ /s	⟨5.74⟩	8.24	⟨11.23⟩	8.2	⟨14.7⟩
	Max.injection speed	in/s	⟨11.81⟩	11.81	⟨11.81⟩	11.8	⟨11.8⟩
	Max.injection pressure	psi	⟨34113⟩	34113	⟨25596⟩	34113	⟨25596⟩
	Max.injection holding pressure	psi	⟨34113⟩	28428	⟨21321⟩	34113	⟨22752⟩
	Recovery rate(PS)	oz/s	⟨0.17⟩	0.35	⟨0.58⟩	0.28	⟨0.53⟩
Clamping	Screw revolution speed	min ⁻¹	500			350	
	Nozzle pressing force	U.S.ton	1.1			1.1	
	Clamping system	—	Toggle			Toggle	
	Clamping force	U.S.ton	45			90	
	Clamping stroke	in	9.84			11.02	
	Min.mold height	in	5.91			5.91	
	Max.mold height	in	11.81			13.78	
	Tie bar clearance(H×V)	in	21.25×14.96			23.22×17.71	
	Die plate size(H×V)	in	29.13×22.83			32.28×26.77	
	Ejector force	U.S.ton	2.2			2.8	
Others	Ejector stroke	in	2.36			2.55	
	Heater capacity	kW	⟨2.575⟩	3.45	⟨5.50⟩	3.45	5.50
	Mold height motor output	kW	0.4			0.4	
	Nozzle touch motor output	kW	0.2			0.2	
	Machine dimensions(W×H×L)	in	48.82×118.70×71.34			48.82×129.49×73.70	
	Power source	—	Tree-phase AC200V/200.220V±10% 50Hz/60Hz			Tree-phase AC200V/200.220V±10% 50Hz/60Hz	
	Main breker capacity	A	75[40]			125[75]	
	Total electric capacity	kVA	11			20	
	Cable size	in ²	0.02[0.01]			0.03[0.02]	
	Machine weight	U.S.ton	4.5			5.2	

NOTE

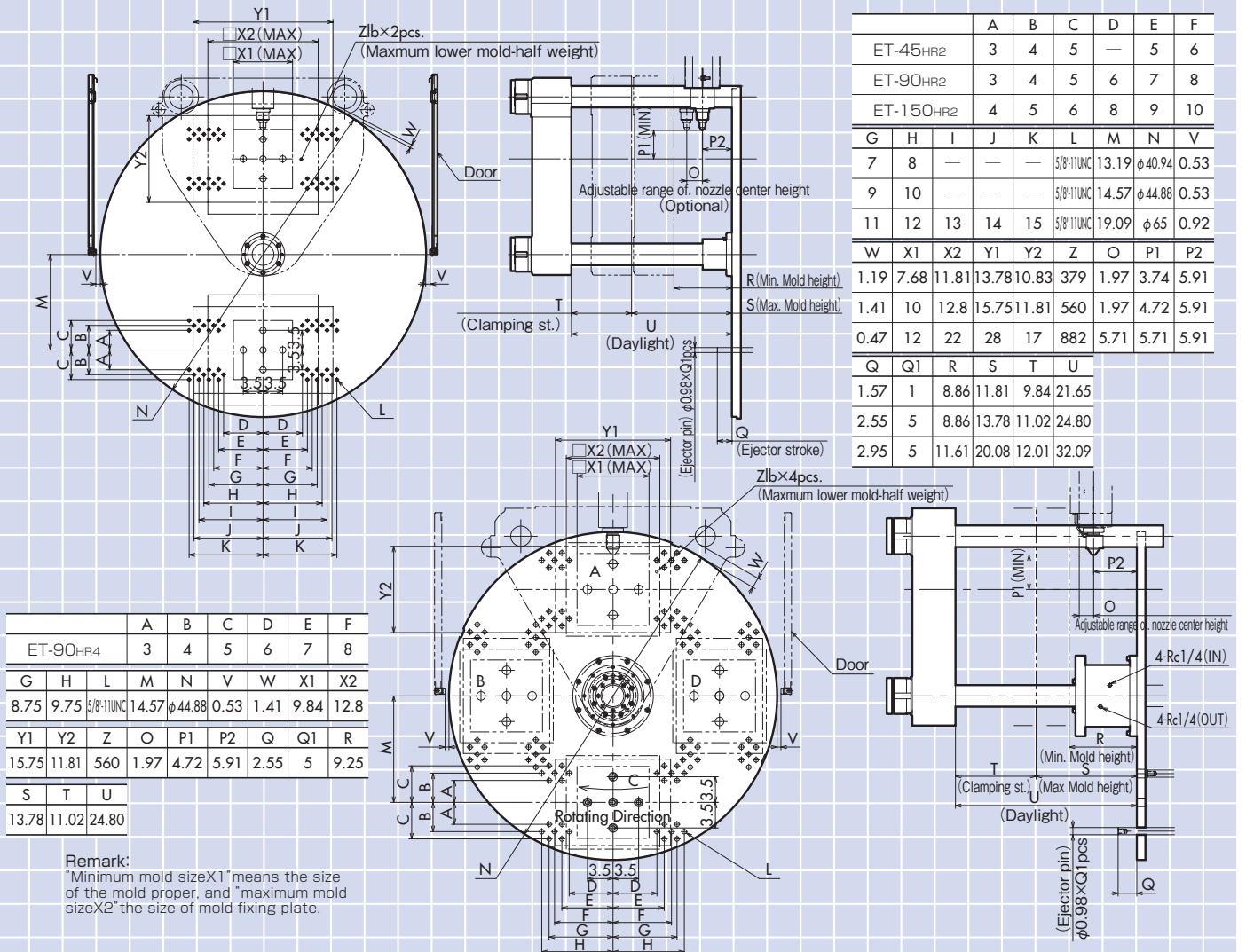
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- The injection rate and the maximum injecting speed are calculated values. These values may be limited by set injecting pressures.
- When the machine is attached with an option, the capacity of the breaker may be changed.
- Figures in [] are optional.
- ※ 1.A transformer(option)is necessary on the machine side.

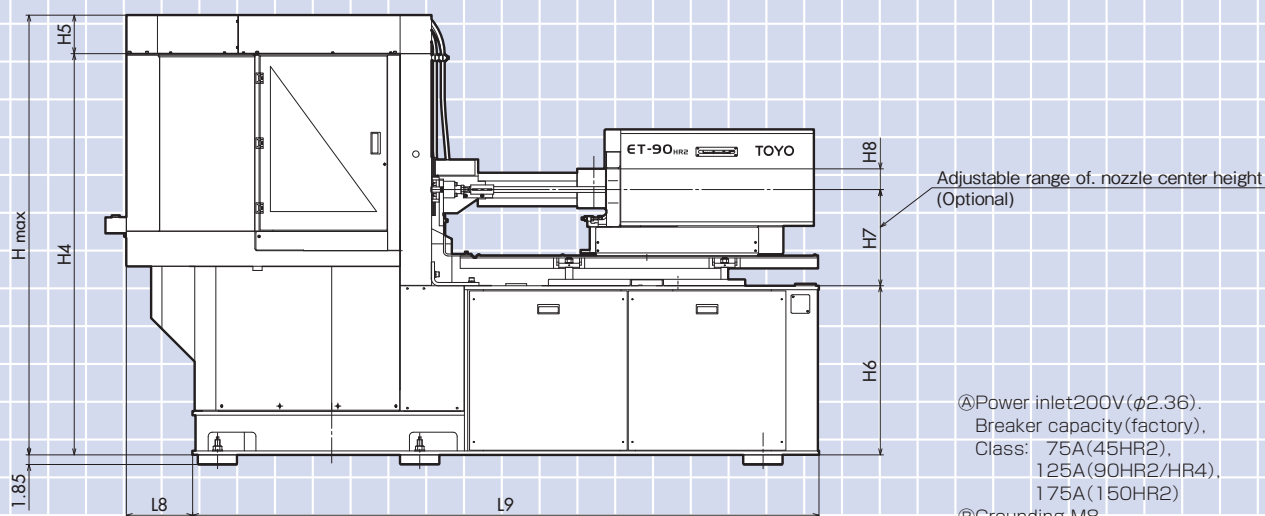
ET-HR2/HR4 Overall Machine Dimensions



	Injection unit	Hmax	H1	H2	H3	H4	H5	H6	H7	H8	W1	W2	W3	W4	L1	L2
ET-45HR2	C55U ϕ 0.94(24)	78.74	58.76	39.33	21.65	68.46	10.28	31.30	13.94-15.91	3.94	44.88	21.26	22.44	37.78	131.50	22.44
ET-90HR2/HR4	D75U ϕ 1.10(28)	83.46	61.91	42.48	24.80	76.14	7.32	32.09	16.30-18.26	3.94	48.82	21.26	24.41	38.76	135.43	24.41
ET-150HR2	F150U ϕ 1.57(40)	95.83	67.46	48.03	32.09	89.13	6.69	34.25	19.69-25.39	4.92	69.69	40.16	34.84	48.21	187.80	34.84

ET-HR2/HR4 Mold Fixing Dimensions





- ⒶPower inlet200V(φ2.36).
Breaker capacity(factory).
Class: 75A(45HR2).
125A(90HR2/HR4).
175A(150HR2)
- ⒷGrounding M8
- ⒸWater for hopper throat IN:Rc3/8
with Y-type strainer
(Nomal water volume:1.3~2.6gal./min.)
- ⒹWater for hopper throat OUT:Rc3/8
- ⒺMold pipe IN Rc1/2
- ⒻMold pipe OUT Rc1/2
- ※Overall machine height increases by approx.
1.85in with optional rubber pads attached.

L3	L4	L5	L6	L7	L8	L9
25.59	79.53	13.19	27.70-45.02	41.81	11.02	116.54
27.56	79.53	14.57	32.46-49.78	41.81	12.60	118.90
38.39	110.63	20.28	43.58-72.13	56.43	18.50	165.35

ET-HR2/HR4 Specifications

			ET-45HR2				ET-90HR2/HR4								ET-150HR2		
Injection	Injection system	—	In-line screw												In-line screw		
	Injection Unit	—	C		D		C		D		E				F		
	Injection stroke	in	3.77		[4.4]		[3.77]		4.4		[5.03]		[5.66]		6.29		
	Screw diameter	in(mm)	0.94(24)	[1.10(28)]	[1.10(28)]	[1.25(32)]	[0.94(24)]	[1.10(28)]	1.10(28)	[1.25(32)]	[1.25(32)]	[1.41(36)]	[1.57(40)]	1.57(40)	[1.18(46)]		
	Theoretical injection capacity	in³	2.62	[3.6]	[4.21]	[5.49]	[2.62]	[3.6]	4.21	[5.49]	[6.28]	[8.97]	[11.04]	12.26	[16.23]		
	Theoretical injection capacity (PS)	oz	1.43	1.96	2.29	2.99	1.43	1.96	2.29	2.99	3.84	4.89	6.03	6.69	8.86		
	Standard	Injection Unit	—	C55U		[D75U]		[C55U]		D75U		[E75U]				F150U	
		Injection rate	in³/s	5.5	[7.5]	[7.5]	[9.8]	[5.5]	[7.5]	7.5	[9.8]	[7.4]	[9.3]	[11.5]	11.5	[15.2]	
		Max.injection speed	in/s	7.9	[7.9]	[7.9]	[7.9]	[7.9]	[7.9]	7.9	[7.9]	[5.9]	[5.9]	[5.9]	5.9	[5.9]	
		Max.injection pressure	psi	34114	[26442]	[34114]	[26296]	[34114]	[26442]	34114	[26296]	[31271]	[27718]	[22743]	31284	[24174]	
	High speed	Max.inj holding pressure	psi	28429	[21321]	[25596]	[21321]	[28429]	[21321]	25596	[21321]	[28429]	[24875]	[19900]	27018	[21330]	
		Injection Unit	—	[C75U]		[D150U]		[C75U]		[D150U]		[E200U]				[F200U]	
		Injection rate	in³/s	[8.2]	[11.2]	[11.2]	[14.7]	[8.2]	[11.2]	[11.2]	[14.7]	[14.2]	[18]	[22.2]	[16.1]	[21.3]	
		Max.injection speed	in/s	[11.8]	[11.8]	[11.8]	[11.8]	[11.8]	[11.8]	[11.8]	[11.8]	[11.4]	[11.4]	[11.4]	[8.3]	[8.3]	
		Max.injection pressure	psi	[34114]	[26442]	[34114]	[26296]	[34114]	[26442]	[34114]	[26296]	[31271]	[27718]	[22743]	[31271]	[24164]	
		Max.inj holding pressure	psi	[28429]	[21321]	[25596]	[21321]	[28429]	[21321]	[25596]	[21321]	[28429]	[24875]	[19900]	[27007]	[21321]	
Recovery rate (PS)		oz/s	[0.26]	[0.35]	[0.38]	[0.52]	[0.26]	[0.35]	0.38	[0.52]	[0.52]	[0.71]	[0.95]	1.11	[1.69]		
Screw revolution speed		min ⁻¹	500		[350]		[500]		350		[350]				350		
Nozzle pressing force	U.S.ton	1.64		[2.19]		[1.64]		2.19		[2.74]				2.74			
Clamping	Clamping system	—	Toggle				Toggle				Toggle						
	Clamping force	U.S.ton	45				90				150						
	Clamping stroke	in	9.84				11.02				12						
	Min.mold height	in	8.86				ET-90HR2 : 8.86 ET-90HR4 : 9.25								11.61		
	Max.mold height	in	11.81				13.78								20.08		
	Max.mold dimensions(W×D)	in	11.81×11.81 13.78×10.83				12.80×12.80 15.75×11.81								22×22 28×17		
	Max.bottom mold weight	lb	379×2pcs				ET-90HR2 : 560×2pcs ET-90HR4 : 280×4pcs								882×2pcs		
	Table diameter	in	40.94				44.88								65		
	Nozzle center height	in	5.91 (from table surface) [5.91~7.85]				5.91 (from table surface) [5.91~7.85]								6.89 (from table surface) [6.89~9.84]		
	Ejector force	U.S.ton	2.2				2.8				3.85						
Ejector stroke	in	1.57				2.55				2.95							
Others	Heater capacity	kW	3.45	[5.50]	[5.50]	[5.85]	[3.45]	[5.50]	5.90	[5.90]	[5.90]	[6.50]	[7.95]	7.95	[11.2]		
	Mold height motor output	kW	0.2				0.4								0.75		
	Nozzle touch motor output	kW	0.4				0.2								0.2		
	Machine dimension(L)	in	131.5				135.43		135.43		[153.37]				187.8	[193.3]	
	Machine dimensions(W×H)	in	44.88×86.18				44.82×93.86								75.8×108		
	Power source	—	Tree-phase AC200V/200.220V ±10% 50Hz/60Hz				Tree-phase AC200V/200.220V ±10% 50Hz/60Hz								Tree-phase AC200V/200.220V ±10% 50Hz/60Hz		
	Main breker capacity	A	75				125								175		
	Total electric capacity	kVA	C55-C75:11		D75:11 D150:20		C55U-C75U:11		D75U:11 D150U:20		E75U:11 E200U:29				F150U:24 F200U:29		
	Cable size 200V Class[400V Class※1]	in²	0.03[0.02]		0.03[0.02]		0.03[0.02]		0.03[0.02]		E75U:0.03[0.02] E200U:0.06[0.02]				F150U:0.03[0.02] F200U:0.05[0.02]		
	Machine weight	U.S.ton	6.4		6.6		6.4		6.6		6.8				13.5		

NOTE

- 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 the machine is attached with an option, the capacity of the breaker may be changed.
- The values in brackets are applied to machines with options.
- Figures in [] are optional.
- ※1.A transformer(option)is necessary on the machine side.

ET SERIES Features

Feature		VR2		V		HR2		HR4	
		Standard	Options	Standard	Options	Standard	Options	Standard	Options
Injection	SRC-II metering system	●		●		●		●	
	SRC-III metering system		○		○		○		○
	SNF control	●		●		●		●	
	Closed-loop control of Injection speed, position and pressure	●		●		●		●	
	Programmable control of injection (2 to 7 steps)	●		●		●		●	
	Programmable control of metering (1 to 3 steps)	●		●		●		●	
	Holding pressure changeover via position, time and pressure	●		●		●		●	
	Slope control of injection	●		●		●		●	
	Suck-back control (before and after metering)	●		●		●		●	
	No-back pressure metering in manual mode	●		●		●		●	
	Injection during high-pressure clamping	●		●		●		●	
	Melt run-out detection system	●		●		●		●	
	Automatic purging system	●		●		●		●	
	Purge cover (with interlock)	●		●		●		●	
	Non-standard diameter screw and barrel		○ ※1		○ ※1		○		○
	Wear-resistant screw and barrel		○		○		○		○
	Specially designed screw ※2		○		○		○		○
	Nozzle reciprocating function	●		●		●		●	
	Air-operated check nozzle		○		○		○		○
	Long nozzle		○		○		○		○
	Standard and long nozzle in Small diameter (for diameter $\phi 32$ or smaller)		○		○		○		○
	Hopper throat temperature control (PID)	●		●		●		●	
	Heater SSR control	●		●		●		●	
	Heater temperature holding control	●		●		●		●	
	5-zone heater (4-zone heater for $\phi 0.94(24)$ screw unit or smaller)	●		●		●		●	
	High temperature use heater band (up to 842°F) ※3		○		○		○		○
	Hopper (with shutter)		○		○		○		○
	Hopper adapter	●		●		—	—	—	—
	Hopper swiveling device	—	—	—	—	●		●	
	Nozzle center height adjuster	—	—	—	—	●		●	
Clamping	Closed-loop control of speed and position for mold opening and closing	●		●		●		●	
	Closed-loop control of ejection speed and position	●		●		●		●	
	Programmable control of mold opening (2 to 5 steps)	●		●		●		●	
	Programmable control of mold closing (3 to 5 steps)	●		●		●		●	
	Mold exchanging mode (low pressure, low speed)	●		●		●		●	
	Automatic clamping force setup system ※4	●		●		●		●	
	Low pressure mold protection system	●		●		●		●	
	Mold protection in mold opening and ejecting	●		●		●		●	
	Mobile Platen Guide Support.	●		●		●		●	
	Double safety system (electrical and mechanical)	●		●		●		●	
	Emergency stop pushbutton	●		●		●		●	
	Rotary Table Speed Closed Control	●		—	—	●		●	
	Opto-electrical Safety Equipment	●		—	—	●		●	
	Air ejector (single or dual lines)		○		○		○		○ ※5
	3-way valve for air ejector (single or dual lines)		○		○		○		○ ※5
	Air-driven core system (single)		○		○		○		○ ※5
	Programmable control of ejector forwarding (1 to 2 steps)	●		●		●		●	
	Linked operation of mold closing and ejector action	●		—	—	●		●	
	Mold ejector plate return detector (metal contacts)		○		○		○	—	—
	Mold temperature display (2 lines ; with magnet sensor)		○		○		○		○ ※5
	Mold temperature control (2 lines ; with magnet sensor)		○		○		○		○ ※5
	Locating ring (60/100)		○		○	—	—	—	—
	Heat insulating board (General or high precision)		○		○		○		○

※1 Non standard diameter screws and barrels are made on order.

※2 For further details on the specially designed screw, contact us.

※3 The standard band heater can be used for temperatures up to 662° For higher temperatures, use the high temperature band heater.

※4 When a specially designed mold is used, consult us.

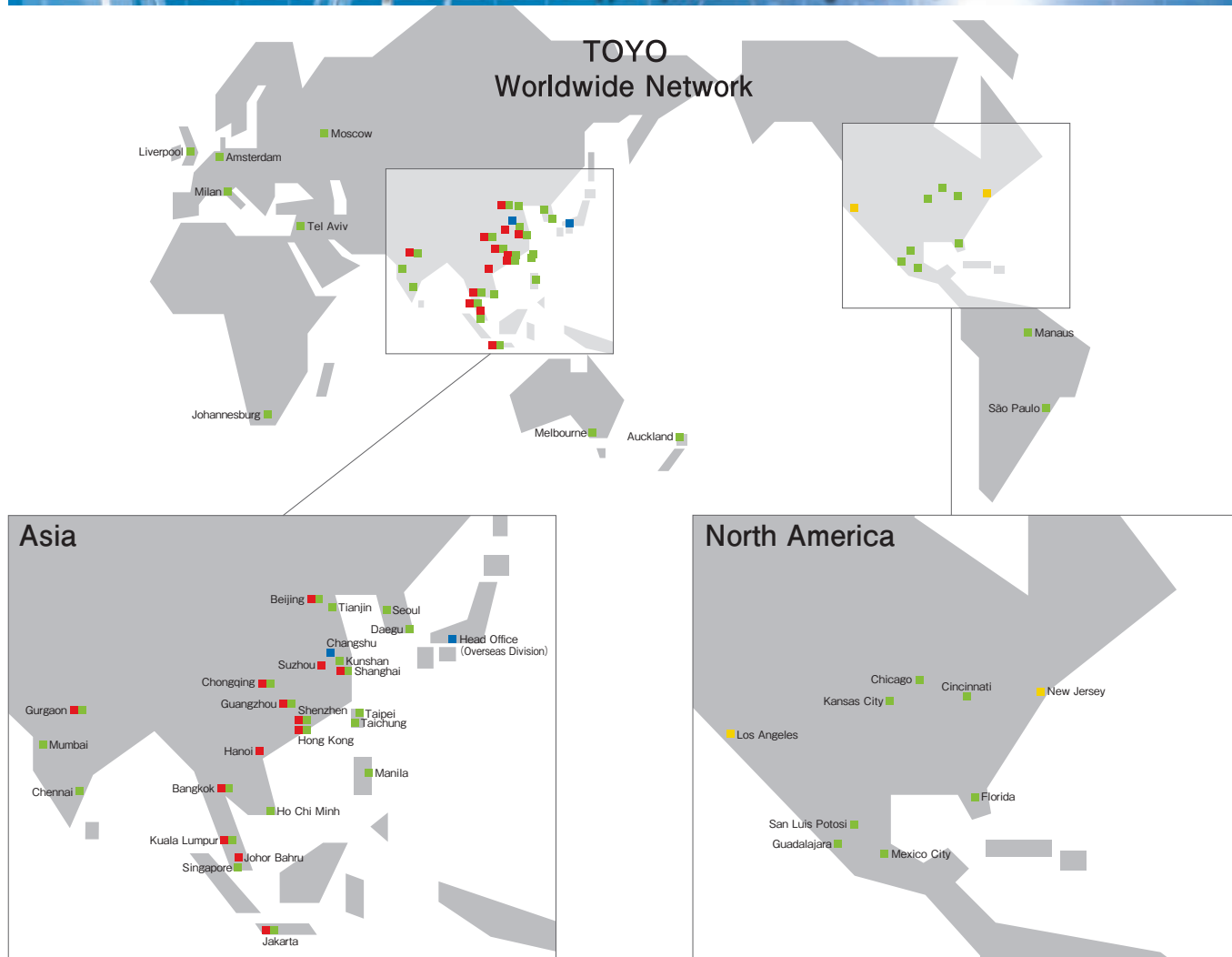
※5 For upper mold only.

Feature		VR2		V		HR2		HR4	
		Standard	Options	Standard	Options	Standard	Options	Standard	Options
Control	SYSTEM 500 microprocessor-aided control (TFT color LCD with full touch panel)	●		●		●		●	
	Digital setting of all the parameters	●		●		●		●	
	Independent molding conditions settable for two bottom mold halves	●		—	—	●		—	—
	Independent molding conditions settable for four bottom mold halves	—	—	—	—	—	—	●	
	Internal memory of 400 mold setups	●		●		●		●	
	Graphic display of injection and metering motion	●		●		●		●	
	Monitor graph indication	●		●		●		●	
	Statistical processing of monitored data	●		●		●		●	
	Manned/Unmanned mode switching function	●		●		●		●	
	Hour meter (operated hours indication)	●		●		●		●	
	Multi-counter (injection, lot, repeating lot, warning bell, initial rejection, continuous failures, operation)	●		●		●		●	
	Monitoring function (32 items selected from a total of 43 tems including positions, speeds, pressures, times, revolutions)	●		●		●		●	
	Alarm function (cycle, up-down tolerance, heater disconnection, thermocouple disconnection, safety door, etc.)	●		●		●		●	
	Machine conditions display (operating mode, completion of clamping, ejector retraction limit)	●		●		●		●	
	Production control function (job completion ratio, prospective time of job completion, etc.)	●		●		●		●	
	Maintenance function (1-cycle graphic, alarm history,grease timing display, servo amplifier communication)	●		●		●		●	
	Self-diagnostic function	●		●		●		●	
	Screw cold-start prevention system	●		●		●		●	
	Fine PID temperature control (with slope ramp up)	●		●		●		●	
	One week automatic heater on-off calendar	●		●		●		●	
	Vacuum device interface		○		○		○		○
	Valve gate interface		○		○		○		○
	Conveyor starting interface		○		○		○		○
	Quality control system (A++)		○		○		○		○
	Quality control system		○		○		○		○
	Production control system		○		○		○		○
	Indicator light of one color (in red)		○		○		○		○
	Indicator light of three colors (selectable : red, yellow, blue)		○		○		○		○
	Printer output (molding conditions, monitoring data, screen)	●		●		●		●	
	100 V plug socket for printer (1 port)	●		●		●		●	
	100 V plug socket (2 ports, power source by customer)		○		○		○		○
	100 V plug socket (2 ports, with transformer of 5 A each)		○		○		○		○
	200 V plug socket (4 ports, 2lines of 30 A)		○		○		○		○
	200 V plug socket (4 ports, 2lines of 30 A, with breaker)		○		○		○		○
	Various signal outputs (4 non-voltage normally-open contacts)		○		○		○		○
	Kanji character printer (monochrome)		○		○		○		○
	Local-language display		○		○		○		○
	(Japanese, Chinese, Thai, Korean, Spanish, Turkish)		○		○		○		○
	Bilingual display (2 languages selectable)		○		○		○		○
	Setting value history	●	○	●	○	●	○	●	○
Others	Automatic greasing device	●		●		●		●	
	Automatic entire grease lubricating device		⊙		⊙		⊙		⊙
	USB memory (for 400 mold setups)	●			○	●		●	
	Mold cooling water line	●		●		●		●	
	Unloader interface	●		●		●		●	
	Rubber pads	●		●		●		●	
	Accessories (mold clamp, tool, backup grease, hand grease pump)	●		●		●		●	
	Auxiliary step	—	—	—	—	—	○		○

In the above table:

- Standard
- Options which can be fitted after shipment
- ⊙ Options which should be fitted at TOYO
- Not available

TOYO Worldwide Network



TOYO MACHINERY & METAL CO., LTD.

URL <http://www.toyo-mm.co.jp/>



The products are produced at the factory certified with ISO-14001.

Overseas Division

523-1 Fukusato, Futami-cho, Akashi City, Hyogo 674-0091 Japan
(Tel) +81-78-943-7474 (Fax) +81-78-943-7222

Hong Kong / China

Unit 806 Prosperity Center, 25 Chong Yip Street, Kwun Tong, Hong Kong, China
(Tel) +852-2591-0512 (Fax) +852-2591-9022

Shanghai / China

1903, Xiandai Plaza No.369, Xianxia Road, Shanghai China
(Tel) +86-21-6192-1000 (Fax) +86-21-6192-1006

Beijing / China

Unit 14E1, Block A, CITIC Building, No.19 Jianguomenwai Street, Chaoyang District, Beijing China
(Tel) +86-10-8595-2240 (Fax) +86-10-8580-4378

Suzhou / China

1F-B-1, No.198, Jinshan Road, Gaoxin District, Suzhou City, Jiangsu Province China
(Tel) +86-512-6805-0649 (Fax) +86-512-6805-0426

Guangzhou / China

Room 612-613, Tianhe Commercial Building, Linhe Rd., Tianhe, Guangzhou China
(Tel) +86-20-3888-0271 (Fax) +86-20-3888-0272

Chongqing / China

11-3 Zhongxin Building, No.1 Jianxin South Road, Jiangbei District, Chongqing City China
(Tel) +86-23-6707-4207 (Fax) +86-23-6707-4226

Shenzhen / China

No.141, Block3, Kaifeng Huayuan, Kaifeng Rd, Futian, Shenzhen, China
(Tel) +86-755-8270-3726 (Fax) +86-755-8270-3279

Changshu / China

56#, Xiangjiang Road, Southeast Economic Development, Changshu, Jiangsu Province China
(Tel) +86-512-5235-8688 (Fax) +86-512-5235-8509

Kuala Lumpur / Malaysia

E-G-49, Jalan Pju 1/45, Aman Suria Damansara, 47301 Petaling Jaya, Selangor, Malaysia
(Tel) +60-37880-5921 (Fax) +60-37880-5922

Johor Bahru / Malaysia

No.14, Jalan Riag 22/3, Taman Gembira, 81200 Johor Bahru Johor, Malaysia
(Tel) +60-7-3355921 (Fax) +60-7-3355931

Jakarta / Indonesia

Kompleks Ruko Graha Mas Blok AA No.1, 3rd floor Jl Pemuda, Rawamangun Jakarta Timur 13220 Indonesia
(Tel) +62-21-47860235 (Fax) +62-21-47860315

Bangkok / Thailand

662/17 Rama 3 Road Bangpompang, Yannawa Bangkok 10120 Thailand
(Tel) +66-2-358-0101 (Fax) +66-2-358-0106

Hanoi / Vietnam

Room 808, 205 Giang Vo Str., Dong Da Dist., Hanoi Viet Nam
(Tel) +84-4-512-1082 (Fax) +84-4-512-1084

Gurgaon / India

601 6th Floor, JMD Regent Square, MG road, Gurgaon, Haryana, 122002, India
(Tel) +91-124-471-1801 (Fax) +91-124-471-2001



Precaution

For safe use of the machine, please read the respective manual carefully, especially sections for operation and maintenance, and follow all the safety precaution instructions specified in the manual.

① Photographs in the catalog include optional devices.

② For the improvement of the product, the appearance and specification are subject to change without notice.

③ If these products and technologies (including programs) are subject to the Japanese export control laws, including the Japanese Foreign Exchange and Foreign Trade Law, the products and technologies are required to obtain an export license of the Japanese government, when exported from Japan.

④ Some machine pictures and images on the controller screen are superimposed.