

**Vertical
Injection Molding Machine**

Vertical Type (Single-acting & Rotary) Injection Molding Machine vol.3



V-LINE®
creates the value of the next generation.



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Sodick has concentrated on the development of the precision injection molding machine featuring the "V-LINE® & electric hybrid direct pressure mold clamping," and has practiced impressive "stable molding" and "high quality."

The vertical projection molding machine, which has received high evaluations from its users, has a full line-up of 3 types of single acting model machine (EHV) and 7 types of rotary machines (VRE).

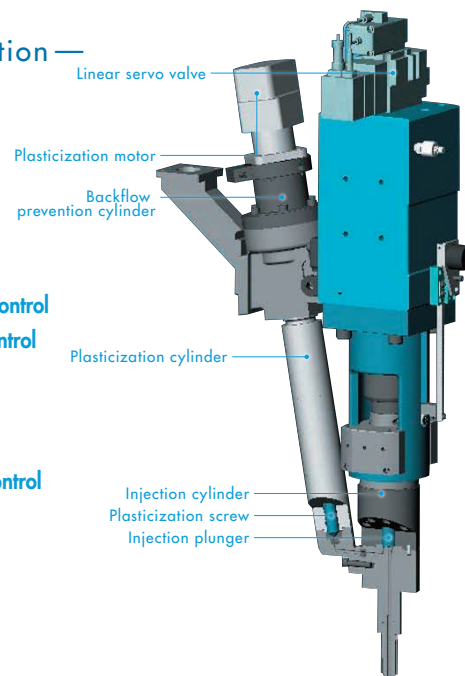
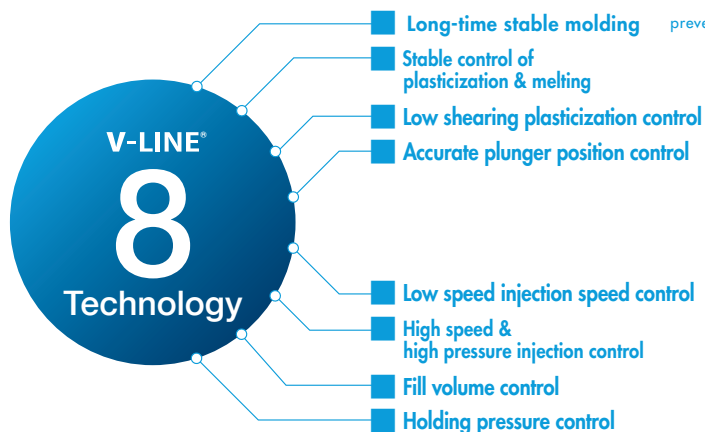
Sodick's vertical type injection molding machine contributes to the further pursuit of high-value added products of customers who perform precision insert molding in a wide range of fields, such as electrical, electronics, automobiles, medical equipment, etc.

Vertical Injection Molding Machine Lineup

Single-action Models (EHV)	Rotary Models (VRE)
	HC03VRE
TR20EHV	TR20VRE
TR40EHV	TR40VRE
TR75EHV	TR75VRE
	TR100VRE
	TR150VRE
	TR200VRE

Impressively accurate filling and stable plasticization —

V-LINE®





▶ HC03VRE

This super high cycle small size rotary machine realizes a dry run within 1 second.



▶ TR40EHV

This vertical injection molding single acting machine is equipped with a proprietary counter balance mechanism and achieves high safety performance.



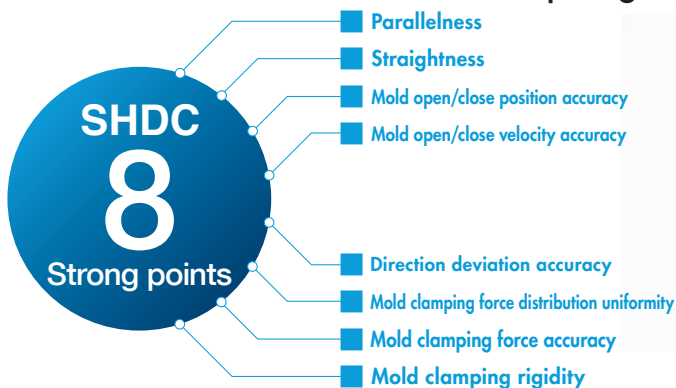
▶ TR150VRE

The vertical rotary machine realizes lower platform specifications by offsetting the mold clamping shaft and the mold open/close shaft.



Reproduces accurate and uniform mold clamping force — Sodick's Electric Hybrid Direct Pressure Mold Clamping SHDC

Sodick Hybrid
Direct Mold Clamp



Impressively accurate filling and stable plasticization —

V-LINE®



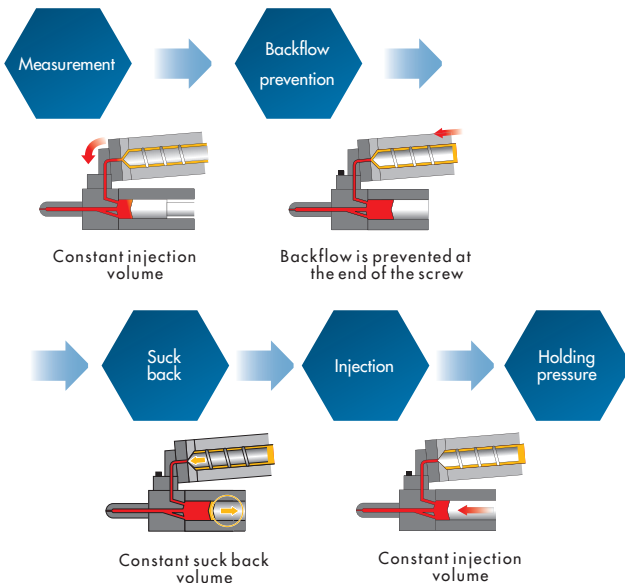
Realizes "3 stabilities," by independently controlling the entire process of the injection and plasticization.

Melting condition of resin

Density of weighed resin

Actual filling volume

V-LINE®, simply and accurately controllable



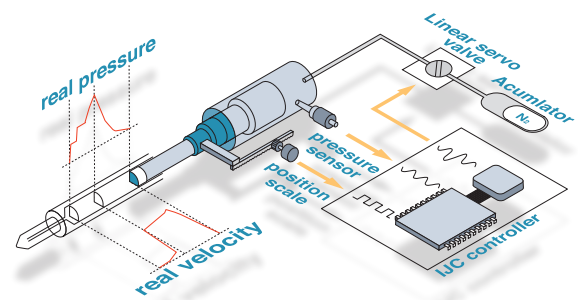
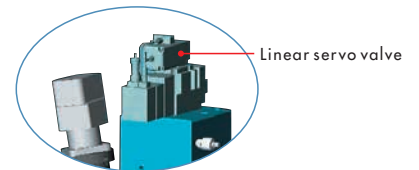
Controls each process of injection and plasticization in order
→ Controls behavior of resin as well

Screw only performs plasticization
→ Constant heat history of resin during plasticization

No portion slides or shears of the resin
→ No excessive shearing heat or over shearing applied to resin

Linear servo valve that optimizes molding

Equipped with a linear servo valve that controls with an optimal injection controller.



Realizes the faithful implementation capacity of the injection speed and pressure waveform intended by the operator by further adding injection performance to V-LINE® through control of the light weight and low inertial plunger using a linear servo valve.

Quick acceleration and accurate acceleration/deceleration tracking
→ Quick achievement of the preset speed, improved high speed filling capability

Sharp stopping
→ Reduced unnecessary injection pressure, more stable filling volume

Reproduces accurate and uniform mold clamping force — Sodick's Electric Hybrid Direct Pressure Mold Clamping SHDC

Sodick Hybrid
Direct Mold Clamp

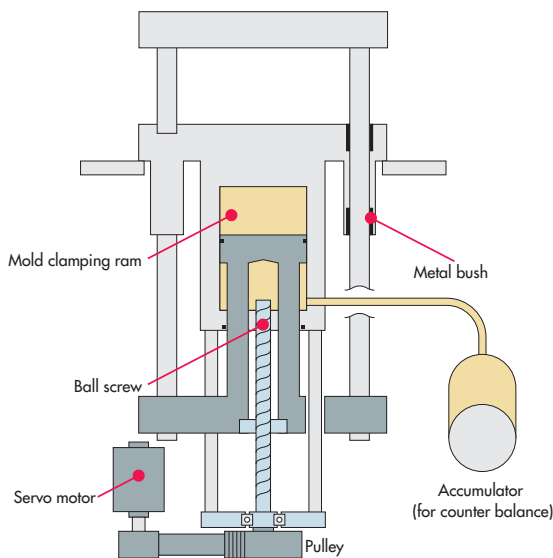
SHDC 8 Strong points

- Parallelness
- Straightness
- Mold open/close position accuracy
- Mold open/close velocity accuracy
- Direction deviation accuracy
- Mold clamping force distribution uniformity
- Mold clamping force accuracy
- Mold clamping rigidity

Advantages of direct pressure mold clamping mechanism

- Maintains movable platen position
- No occurrence of unbalanced load
- Not affected by disturbances, such as mold temperature

Single-action model



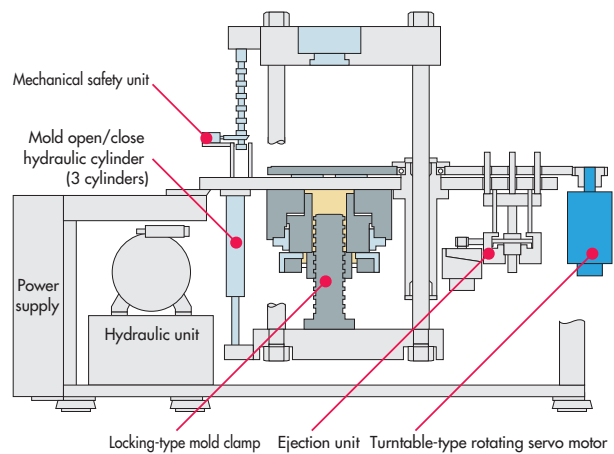
Electric servo motor mechanism which allows for accurate position control in the mold open/close process

+

Hydraulic cylinder mechanism which reproduces a uniform mold clamping force in the mold clamping process

- Sodick's original counter balance mechanism cancels out the gross weight of the moving portions, such as the injection plasticization unit, movable platen unit, etc.
High-speed operation of the mold open/close unit was realized; this also functions as a safety device to prevent the movable platen unit from falling.

Rotary model



The mold open/close unit is structured with high linearity by three hydraulic cylinders arranged in positions uniformly around the center.

+

The mold clamping unit generates a uniform and highly repeatable mold clamping force by a hydraulic cylinder mechanism

+

In the table rotation unit, the turn table rotates and stops in an accurate position by controlling the turn table with perimeter gear teeth by an electric servo motor.

- Offsetting the mold clamping shaft and the mold open/close shaft, realized a lower platform.

Operability which improves productivity — Operation System

IMC7 Controller developed in-house

Improved visibility with 15 inch operation screen



Realizes easy operation by allowing the entering the three settings of injection, mold open/close, temperature, which are the basics of a molding machine, in one screen.

Adoption of a pictograph panel that offers excellent intuitiveness



The operation buttons are displayed in pictographs which show the molding operation, to simplify the operation of the molding machine.

Features of IMC7 Controller



Injection performance
50µ second



Troubleshooting function
Displays defect area



Analysis support
Saves historical operation data



Maintenance support
Maintenance timing reminder



5-language support
Japanese, English, Chinese
(traditional and simplified) and Korean



Image saving feature
Saves screen displays and molding
conditions as images



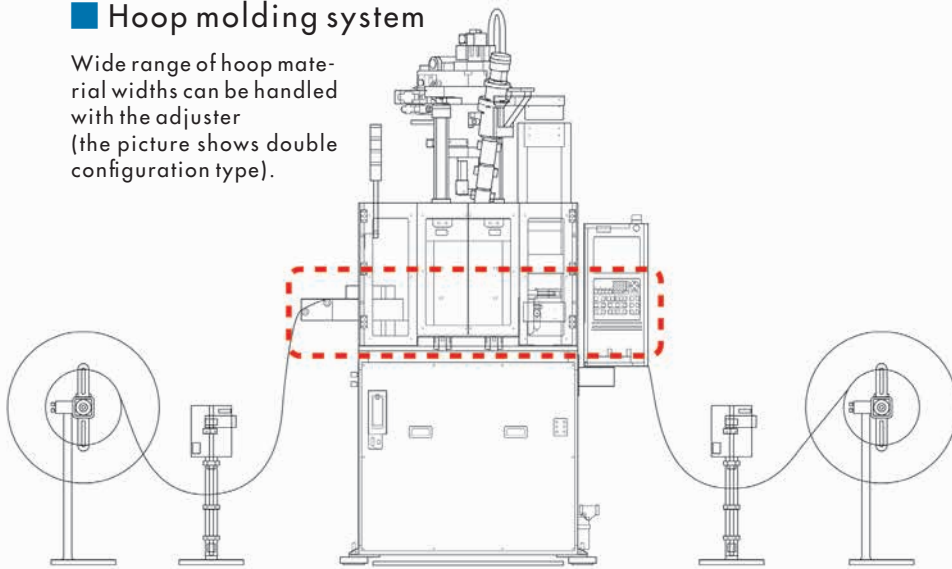
USB memory upgrade
Mounts USB ports

Customize

Customization

Hoop molding system

Wide range of hoop material widths can be handled with the adjuster (the picture shows double configuration type).



View from hoop material ejection side (side view of the molding machine)



Front view of the molding machine

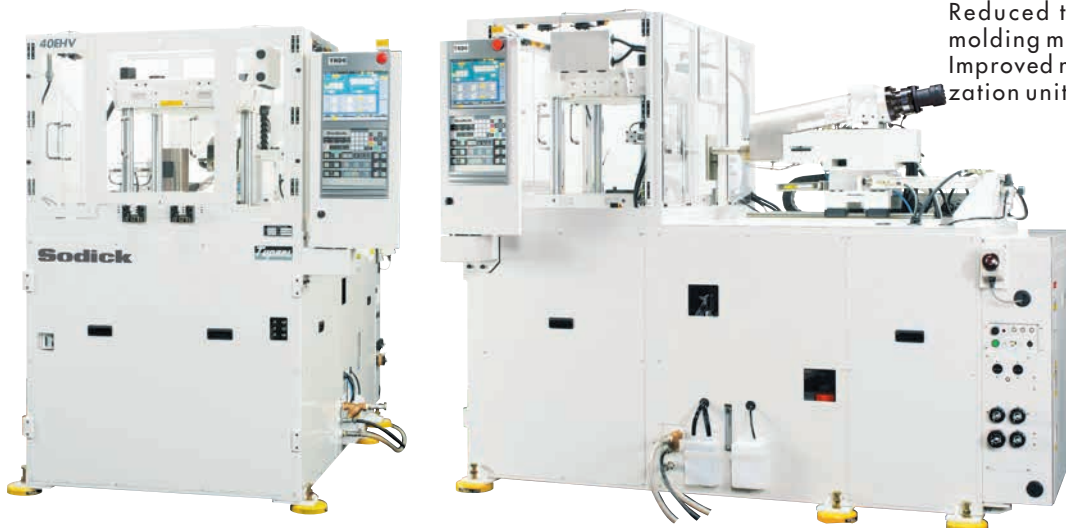
Sliding table

Improves efficiency of insert work



Parting injection molding machines

Reduced total height of the vertical molding machine
Improved maintenance for the plasticization unit



Specification List

		Single-action Models							Rotary Models					
		TR20EHV		TR40EHV			TR75EHV		HC03VRE		TR20VRE			
Clamping Unit	Mold open / close system	AC servo motor control		AC servo motor control			AC servo motor control		AC servo motor control		Hydraulic cylinder			
	Clamping system	Direct pressure		Direct pressure			Direct pressure locking type		AC servo motor control		Direct pressure			
	Max. clamping force	kN	196		392			735		29.4		196		
	Tie-bar interval (W x L)	mm	300 x 260		360 x 360			450 x 450		-		-		
	Platen dimension (W x L)	mm	460 x 420		520 x 520			670 x 670		-		-		
	Maximum mold size (W x L)	mm	-		-			-		200 x 150		250 x 250		
	Turntable size (φ)	mm	-		-			-		460		800		
	Open daylight	mm	450		500			550		300		400		
	Minimum mold thickness	mm	250		250			250		150		200		
	Mold open / close force	kN	9.9 / 19.8		12.0 / 24.0			17.6 / 35.1		17.6 / 29.4		(close) 14.7 / (open) 29.4		
	Ejecting system		AC servo motor control		AC servo motor control			AC servo motor control		AC servo motor control		AC servo motor control		
	Ejecting force / Ejection retention force	kN	8.2 / 4.9		8.2 / 4.9			21.5 / 12.7		1.47 / 0.88		7.3 / 4.3		
	Ejector stroke	mm	40		40			60		30		60		
Plasticization & Injection Unit	Plasticization & injection system	Screw Pre-plasticizing		Screw Pre-plasticizing			Screw Pre-plasticizing		Screw Pre-plasticizing		Screw Pre-plasticizing			
	Screw diameter	mm	14	18	18	22	28	28	32	14		14	18	22
	Plunger diameter	mm	12	16	16	22	28	28	32	8	12	12	16	22
	Max. injection pressure	MPa	288	262	262	256	252	252	234	197		288	262	256
	Theoretical injection volume	cm ³	4.5	14	14	27	83	83	108	2	4.5	4.5	14	27
	Injection rate	cm ³ /s	45	80	80	114	123	184	241	25	45	45	80	114
	Plunger stroke	mm	40	70	70		135	135		40		40	70	
	Max. injection speed	mm/s	400		400	300	200	300		500	400	400		300
	Plasticizing capacity	kg/h	5	7	7	14	30	30	44	5		5	7	14
	Max. screw revolution	rpm	400		400		280	280		420		400		
	Rated screw torque	N.m	59	98	98	147	235	235	310	33.4		59	98	147
	Number of temperature control zone		5		5		6	6		5		5		
	Heater capacity	kW	4.9	5.0	5.0	6.1	9.7	9.7	10.4	4.9		4.9	5.0	6.1
	Nozzle pressing force	kN	4.9		9.0			17.6		4.9		9.0		
	Unit traveling stroke	mm	220		255			255		255		255		
Hydraulic Pressure / Air	For hydraulic pump motor capacity	kW	3		3	4.4	4.4		2.2		4.4			
	Hydraulic circuit pressure	MPa	MAX. 20.6		MAX. 20.6			MAX. 20.6		MAX. 12.7		MAX. 20.6		
	Tank capacity	ℓ	65		90.2			130		35		60 (Required amount of oil 65)		
	Motor capacity for AC servo	kW	3.9		3.9			5.6		10.5		5.3		
Machine Dimension / Weight	Machine dimension (L x W x H)	mm	1698 x 1503 x 3018	1934 x 1583 x 3175	1934 x 1583 x 3402	2138 x 1811 x 3622		1625 x 1178 x 2600		2090 x 1479 x 2750				
	Machine weight	kg	2000		3000	3150	4800		1900		2700			

■ Please note that the specifications are subject to change without prior notice due to ongoing research.

Rotary Models

Rotary Models											
TR40VRE			TR75VRE		TR100VRE			TR150VRE		TR200VRE	
Hydraulic cylinder			Hydraulic cylinder		Hydraulic cylinder			Hydraulic cylinder		Hydraulic cylinder	
Direct pressure			Direct pressure locking type		Direct pressure locking type			Direct pressure locking type		Direct pressure locking type	
392			735		980			1470		1960	
-			-		-			-		-	
-			-		-			-		-	
300 x 300			400 x 400*1		500 x 500*1			525 x 525*1		525 x 525*1	
1016			1200		1400			1500		1500	
400			500		600			650		650	
200			250		300			350		350	
(close) 17.3/(open) 37.7			(close) 29.4/(open) 49.0		(close) 32.3/(open) 53.9			(close) 32.3/(open) 68.6		(close) 32.3/(open) 68.6	
AC servo motor control			AC servo motor control		AC servo motor control			AC servo motor control		AC servo motor control	
13.2 / 7.8			21.5 / 12.7		21.5 / 12.7			21.5 / 12.7		21.5 / 12.7	
60			60		60			60		60	
Screw Pre-plasticizing			Screw Pre-plasticizing		Screw Pre-plasticizing			Screw Pre-plasticizing		Screw Pre-plasticizing	
18	22	28	28	32	28	32	40	40	50	40	50
16	22	28	28	32	28	32	40	40	50	40	50
262	256	252	252	234	252	234	204	219.5		219.5	
14	27	83	83	108	83	108	150	251.2	392	251.2	392
80	114	123	184	241	184	241	377	376.8	589	376.8	589
70		135	135		135		120	200		200	
400	300	200	300		300			300		300	
7	14	28	32	46	32	46	65	85	100	85	100
400		280	280		280		200	300	200	300	200
98	147	235	235	310	235	310	539	411	705	411	705
5		6	6		6			6		6	
5.0	6.1	9.7	9.7	10.4	9.7	10.4	16.5	16.5	20.1	16.5	20.1
9.0			17.6		17.6			17.6		17.6	
255			300		300			400		400	
4.4			6		6			7.5		7.5	
MAX. 20.6			MAX. 20.6		MAX. 20.6			MAX. 20.6		MAX. 20.6	
60 (Required amount of oil 65)			100 (Required amount of oil 105)		100 (Required amount of oil 105)			164.5 (Required amount of oil 175)		164.5 (Required amount of oil 175)	
7.2			7.2		4.2			4.2		4.2	
2353 x 1346 x 2750	2353 x 1346 x 2900	2934 x 1446 x 3194		3154 x 1600 x 3206	3154 x 1600 x 3440	3329 x 1854 x 3984	3329 x 1854 x 4217	3329 x 1854 x 4034	3329 x 1854 x 4267	3329 x 1854 x 4267	3329 x 1854 x 4267
3300		3450		5000		6600		9400		10300	
9700		10600		9700		10600		9700		10600	

*1 Maximum mold weight: Lower mold 400 kg x 2 blocks
 *2 Maximum mold weight: Lower mold 500 kg x 2 blocks

Major Standard Components/Optional Parts List

	Item Name	EHV		VRE			
		STD	OP	STD	OP		
Standard Specification	Plasticization Injection Unit	Wear and Corrosion Resistance (Type 1)	●		●		
		Heater Plasticizing and Injection Components for High Temperature (60-420°C)	●		●		
		Nozzle Temperature Control Heater & Thermocouple (60 - 420°C)	●		●		
		Accumulator	●		●		
		Simultaneous Heater Temperature Rise Function	●		●		
		Heater Temperature Rise Failure (heater disconnection) Alarm Package	●		●		
		Under-hopper Independent Temperature Control Unit	●		●		
		Injection Setting Unit Selection Package (% or SI)	●		●		
		Pressure Retention Unit Selection Package (0.1s, 0.01s or 0.001s)	●		●		
		Injection Ejection Synchronized Multiple Tasks Package (gate cut system)	●		●		
		Injection Response Change (Injection 5, pressure retention 4)	●		●		
		Unit Fall Prevention Safety Device	●		●		
		Purge Guard			20~200		
		PDT Setting (Pressure Drop Time)			●		
		IPPUK Molding			●		
	Mold Clamping Ejection Unit	Plunger Retention Function after Measurement		●	●		
		Vibration-isolating Level Pads	●		●		
		Ejecting Function While the Mold Is Closed (VRE only)			●		
		Ejecting Function While the Mold Is Open (EHV only)	●				
		Mold Cooling Water Manifold (2-Channel)	●		●		
	Control Units and Others	Ejector 2-Speed Setting			●		
		Ejector Ejection Retention Function	●		●		
		CR Setting (mold clamping depressurization after pressure retention)	●		●		
		Ground-fault Interrupter (200 mA)	●		●		
		Data Logging Interface Unit	●		●		
		Carbide Generation Prevention Function (alarm & automatic heat retention switching)	●		●		
		Pick-up Unit Connection Circuit	●		●		
		Next Cycle Start Retention Circuit with Two-Hand Start Buttons			20~200		
		Icon Display	●		●		
		Thumbnail Display Function	●		●		
		Wave Log(SMDL)			●		
		Condition Change Disable Password		●	●		
		Case Counter (Signal Output is Special Equipment)		●	●		
		Resin Stagnation Alarm (Compulsive Purge Function)		●	●		
		Optional	Plasticization Injection Unit	Hopper Bracket with a Material Punch Hole		●	
	Cylinder Heat Retention Cover				●		●
	ZJ Heater				●		●
	ZH Heater Temperature Control Unit				●		●
	LCP Nozzle (L30/L60mm)				20/40		03/20/40
	Mold Clamping Ejection Unit		Backflow Prevention Compulsive Back		71		71
			Automatic Lubrication Unit		●	20~200	03
			Insulating Plate (5 mm thick) - Heat Resistance Temperature Options 200/400°C		●		●
			Mold Clamping Force 50tf (40EHV/VRE only)		40		40
			Mold Clamping Force 5tf (03VRE only) *This option is not available for some models. For details of each specification, please contact Sodick.			03	
			Open Daylight Extension (50/100 mm) (mold open/close stroke fixed)		●		●
Mold Ejection Plate Return Check Connection Circuit & Metal Connector Ejection ^{1,2}				●		●	
Mold Slide Return Check Connection Circuit & Metal Connector Ejection ^{1,2}				●		●	
Mold Clamping Interlock Connection Circuit for Camera Monitor Unit (Terminal Block)				●		●	
Upper Mold or Lower Mold Platen Additional Process (mold positioning holes, pins, etc.)				●		●	
Control Units and Others	Upper Mold Ejection Mechanism (hydraulic/pneumatic A/pneumatic B) Options		40/75				
	Table Stop Position Selection 270° Machine Right Side or Left Side Space (Including Pre-roller Base, Without Carrier Bar) ³				20~200		
	Locating Ring Adapter		●		●		
	Mold Clamping & Depressure ACC (High Cycle Specifications)		20/40				
	Nozzle Touch ACC (High Cycle Specifications)		20/40				
	ACC Charge Pump (High Cycle Specifications)		20/40				
	Mold Open/Close Motor Capacity Increased (High Cycle Specifications)		20/40				
	Measurement and Mold Open Synchronized Multiple Tasks Software (High Cycle Specifications)		20/40				
	Pickup During Mole Opening (High Cycle Specifications)		20/40				
	Tricolor Signal Light		●		●		
External Receptacles A ⁴ 200V30A①/200V20A③/100V10A②	●			●			
External Receptacles B ⁴ (interlocking/non-interlocking batch switching type) 200V30A①/200V20A③/100V10A②		●		●			
External Receptacles C ⁴ 200V60A①/200V30A①/100V10A②		●		●			
External Receptacles D ⁴ (interlocking/non-interlocking batch switching type) 200V60A①/200V30A①/100V10A②		●		●			
External receptacles E ⁴ (for the left side) 200V20A②		●		●			
Table Tap Type Receptacle (3m) (200V30A②/200V20A②)		●		●			
Ground-fault Interrupter for External Receptacles		●		●			
Case Counter Package (case changing signal & production complete signal terminals)		●		●			
Alarm & Counter Reminder Package		●		●			

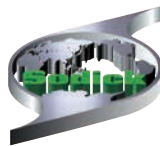
	Item Name	EHV		VRE	
		STD	OP	STD	OP
Mold Clamping Ejection Unit	Timer That Stops Only the Hydraulic Motor After Error Stop		●		●
	Forced Purge Function		●	75~200	03~40
	Condition Change Disable Key		●		●
	Condition Change Lock (password)		●	75~200	03~40
	Color (overall/for safety door only) Selection		●		●
	Auxiliary Units 1.2.3 Abnormal tri-input stop signal		●		●
	Water Unavailable, Air Unavailable Alarm		●		●
	Connection Circuit for Hoop Feeding Unit	●			
	IF & Interlock Lift-up for Star/KT-Spirits Hoop Feeding Unit		●		
	Connection Circuit for KT-Spirits Pick-up Unit			03	
	Connection Circuit for Insert Robot			●	
	Stand-alone Operation Panel (including two-hand start buttons)				●
	Operation Panel (rotation-allowed specifications)	●		03/20	40~200
	Hoop Feeding Unit Interlocking Lift-up (interlocking with ejector)		●		
	Multi ETDL		●		●
	SMDL (USB Flight Recorder)		●		●
	Power Indication Screen		●		●
	Carrier Bar (2 pieces/set) *5		●		20~200
	Step (footstool)		75		
	Free Bear	75	20/40		
	Semi-Auto Cycle Equalization Function		●		●
	Logic I/O				75~200
Mold Internal Pressure Control Function (8 Channels)				75~200	
Auxiliary Units	Mold Cooling Water Piping (2 Channels) (piping to under the table)			03	
	Mold Cooling Water Piping (2 Channels, 3 Circuits) A/B			20~200	
	All-round Cover	●		03	20~200
	Table Surroundings (Semicircle) Cover			20~200	
	Rear Safety Door (with I/L)		●		●
	Side Safety Door (with I/L)	●		20~200	03
	Front area sensor *6			03	
	Mold Heater Temperature Control Connection Circuit (2/4kW x 2/3/4 circuit x number of receptacles / terminal block) Selection with Current Detection and Disconnection Alarm *1		●		●
	Mold (Hot Runner) Temperature Monitoring Thermocouple Connection Circuit		●		●
	Hot Runner Temperature Control Connection Circuit (2kw x 2 circuits) with Current Detection and Disconnection Alarm		●		●
	Mold Thermocouple (non-grounded): Select from Ø 2.3/4.8x2000/3000mm		●		●
	Mold Thermocouple Metal Holder (Ø2.3) flat type / (Ø4.8) round type		●		●
	Hot Runner & Valve Gate Signal (Contact 1 Output)		●		●
	Valve Gate Signal & Air Drive Circuit		●		●
	Air Ejector Connection Circuit (1/2 Channel selection) (terminal block)		●		●
	Air Ejector Connection Circuit & Drive Unit (Solenoid Valve) 1 Channel		●		●
	Core Tractor Connection Circuit (Common for Hydraulic/Pneumatic): Select from 1 *7/2 Channel		●		●
	Hydraulic / Pneumatic Core Tractor Connection Circuit & Drive Unit (Solenoid Valve): Select from 1/2 Channel		●		●
	Core Tractor Connection Circuit Metal Connector Ejection Options Upper Mold / Lower Mold: Select from 1/2 Channel		●		●
	Machine Body Height Increase Spacer 100mm		●		●
	Oil Pan (mold clamping unit)		●		●
	RJG Interface		●		●
Special Support	High-speed Injection Control Specifications: Select from 1000mm/sec		●		20~100
	Resin Cut-Off Unit		●		●
	High Wear and Corrosion Resistance (Type 2)		●		●
	Super High Wear and Corrosion Resistance (Type 3)		●		●
	1 Stage Dulmadge Screw (without coating) (Ø18-Ø50L)		●		●
	GB Specifications (China)/KC-S (Korea)/USA Specifications (US) Options		●		●
	LP Valve Specifications (LDDV Valve + Digital Ruler Change)			03	
Pre-shipment Items from Other Vendors	Mold Clamp (8/12 pieces/set) Selection		●		●
	Hydraulic Oil (S3VE46/S4ME46) Selection		●		●
	Hopper (10L)		●		●
	ETDL2006 (without cable) (compatible for both WIN-XP and WIN-7)		●		●
	Cable for Data Logging		●		●

*1: 03VRE: Terminal block, 2 Channels *2: VRE: 2 Channels *3: 90° is supported by standard *4: AMERICAN DENKI receptacles selectable

*5: Includes free bear + pre-roller base *6: Front door specifications by standard *7: EHV only for Channel 1

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Vertical Injection Molding Machine



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- Options may be included in the photos of this catalog.
- Due to ongoing research, specifications are subject to change without prior notice.
- The contents of this catalog is current as of May, 2018