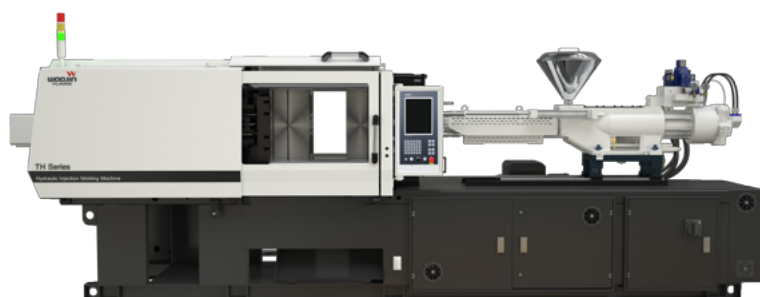


Dynamic, Precise, Energy efficient

TH^{D&B} series
European hydraulic injection molding machine



TH series ^{D&B}

TH (D&B) series is European type hydraulic injection molding machine featuring fast cycle time, precise molding and energy efficiency developed in WOJIN PLAIMM's R&D center located in Austria.

The machine movement accuracy is equivalent to All Electric type IMM which enables in excellent molding preciseness and stability. In addition, it is very economical because of its low maintenance cost.



이미지는 실제 제품과 다를 수 있습니다.

Main characters of TH ^{D&B}

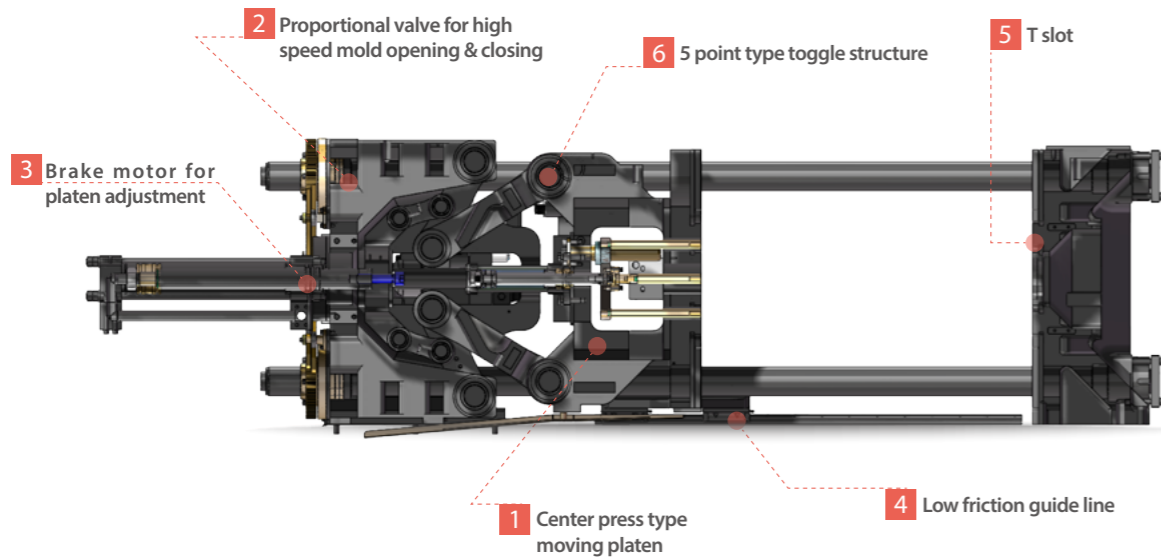
- Wide range of availability**
The machine is optimum for molding products in various size and weight due to wide range of clamping force from 50ton up to 450ton with unitized injection unit.
- Energy saving effect**
Hydraulic device is equipped with servo-pump system that minimizes the energy loss, hence, reduces energy consumption of the machine up to 80% and provides better working condition due to low noise and vibration.
- Reduce cycle time**
The optimal combination of hydraulic valves for high speed mold opening/closing with independent hydraulic oil circulation system shorten total production time because of reduction in mold opening/closing time and injection reaction time.
- Perfect degree of parallelization in platens**
Moving platen equipped with high quality LM Guide which maintains parallelization of platen constantly despite of fast mold opening & closing. In addition it prevents platen's abrasion and damage of mold. Also it helps to enhance preciseness of clamping position and reduce cycle time.
- Efficient controller system**
Equipped with 15 inches touch screen type user friendly color monitor that includes multi-lingual function along with very easy to use operations.
- Easy to replace of screw & barrel**
Easy maintenance is possible for screw & barrel owing to QBC(Quick Barrel Change) structure that screw & barrel can be lifted up for replacement by simple disassembling without moving injection unit.
- Various options available**
Accumulator system for high speed injection for thin wall molding and hybrid system for energy saving and fast cycle time are available for high-tech injection molding.

TH series Matrix ^{D&B}

Model	Clamping force	Tie-bar distance(HxV)	Unit No.	Injection unit [Screw diameter in mm]												
				22	25	28	32	36	40	45	50	55	60	65	70	80
TH50	490kN	360x360	IH 1.7	S	O	A	B									
TH80	785kN	410x410	IH 2.1		O	A	B	C								
TH110	1079kN	410x410	IH 2.1		O	A	B	C								
TH130	1275kN	460x460	IH 5.2			S2	S	O	A	B	C					
TH170	1667kN	510x510	IH 5.2			S2	S	O	A	B	C					
TH220	2157kN	560x560	IH 9.2							O	A	B				
TH280	2746kN	610x610	IH 10							S	O	A	B			
TH350	3432kN	720x720	IH 17									O	A	B		
TH350W	3432kN	820x820	IH 17									O	A	B		
TH450	4413kN	870x820	IH 23										O	A	B	

Clamping unit

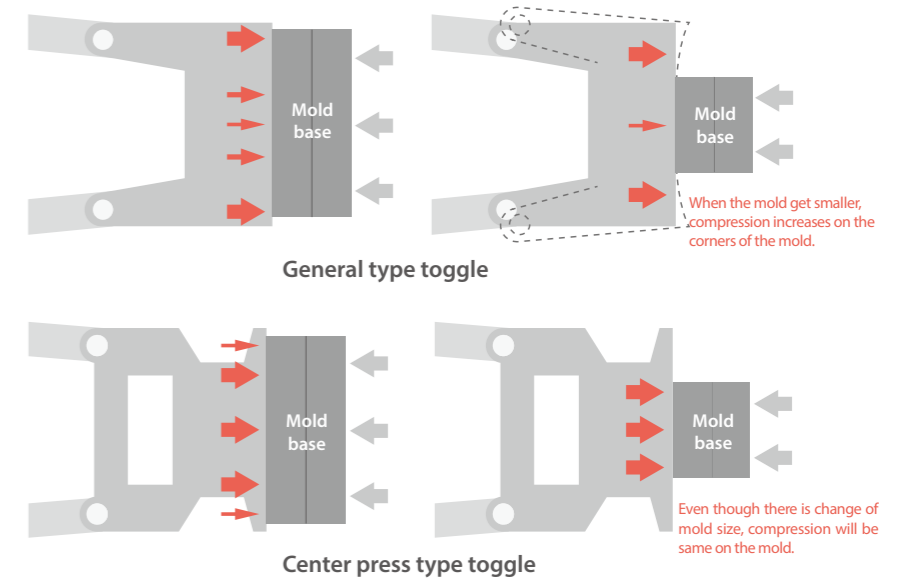
5 points type new advanced toggle design gives complete control of the exact accuracy of mold open/close positions. Hydraulic system for clamping unit is equipped in a dynamic way to reduce the production time and energy consumption in order to provide the best solution for cost saving to our users.



1. Center press moving platen

Center press type moving platen delivers equal clamping force into the mold and prevent deformations of molding and damage of platen.

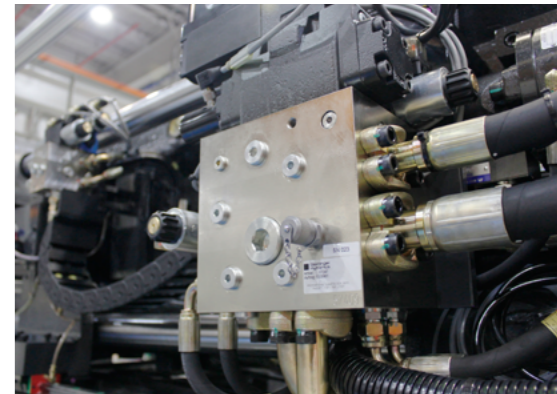
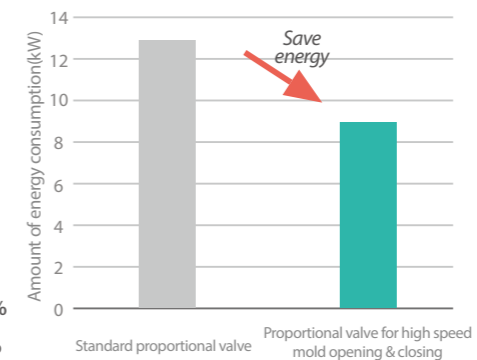
- Equal delivery of clamping force
- Extend the mold's life time
- Enhance the quality of molding



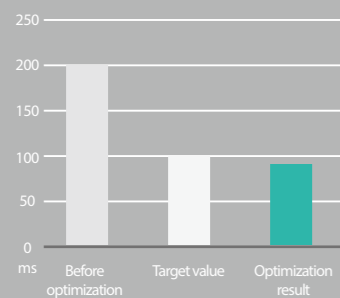
2. Proportional valve for high speed mold opening & closing D&B

High performance hydraulic valve enables rapid and precise operation, minimizes energy consumption for clamp movement and reduces cycle time with dynamic movements.

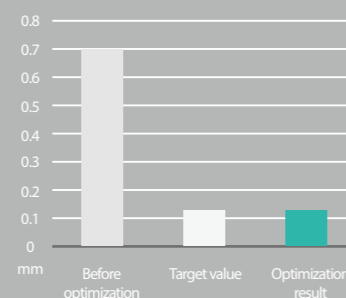
- Effect of reducing energy consumption
- Energy consumption while rapid movement : -13%
- Energy consumption while slow movement : -31%



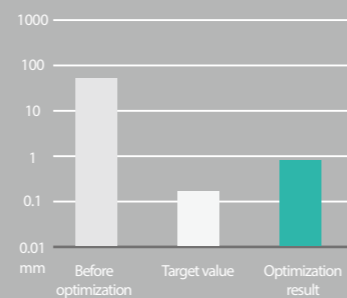
Your advantages



■ Reaction time of clamping
Before : 200ms
After : 80ms



■ Precision of clamping position
Before : ±0.7mm
After : ±0.1mm

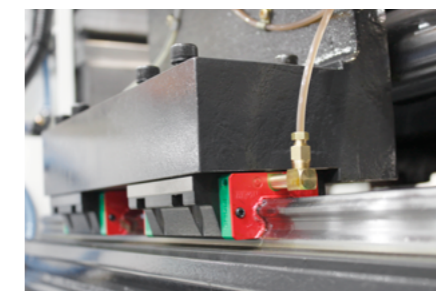


■ Variation of mold closing position
Before : ±90mm
After : ±0.2mm



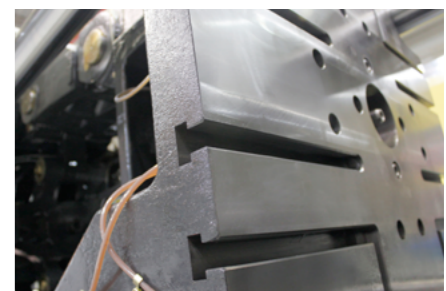
3. Clamping positioning motor

Brake motor prevents clamping position backwarding because of constant clamp movement which in result increases the preciseness of repeated molding.



4. Low friction linear guidance

By maintaining constant parallelization of platen, precision of platen's movement is enhanced and mold's damage is minimized and cycle time is reduced.



5. T shaped clamp mounting holes

T shaped slots on the platen make it easier to install and change the mold.

Hydraulic unit

Energy efficient servo pump system, oil circulation system which extends life time of hydraulic oil, butterfly valve and seamless pipe system for hydraulic flow which prevent inflow of contaminant and designed in a way to change pipes easily provide users maximum benefit within minimum cost.

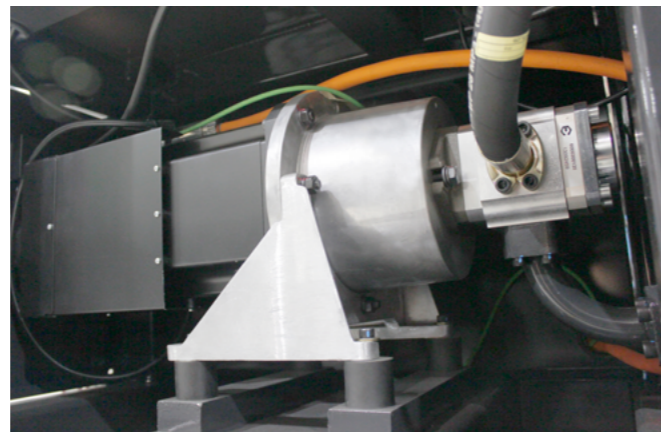
1.Servo pump system ^{D&B}

There is no unnecessary power loss because servo pump system precisely controls RPM of servo motor as per each section of injection molding's required condition.

In the section of hold pressure and cooling, the temperature of hydraulic oil and noise level are very low because the motor almost stops its rotation.

This system has excellent responsiveness and stability when operating with low & high speed owing to direct controlling system of pump's RPM by AC servo motor.

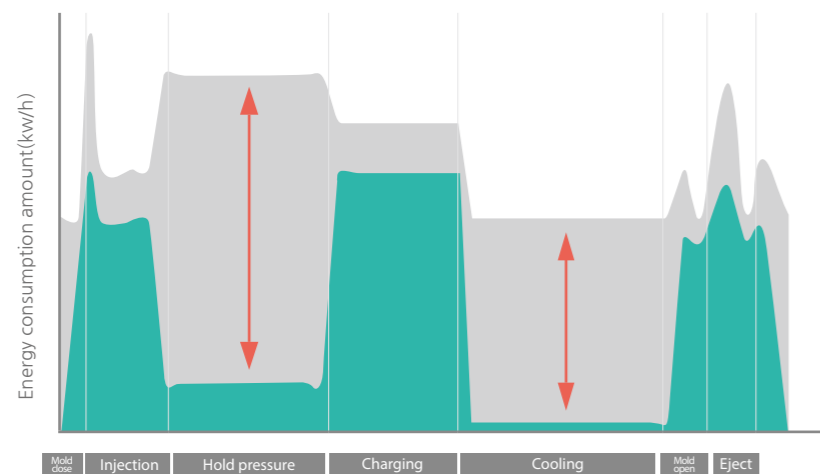
- Energy consumption: 60%~80% less
- Cooling water consumption: 25% less
- Capacity of oil tank: 33% less



Servo motor & pump system

Comparison of energy consumption

General type pump vs Servo pump system



General pump

Huge amount of energy consumption in the section of hold pressure & cooling.

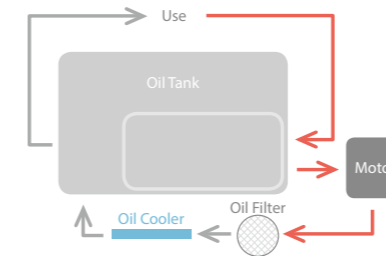
Servo pump system

Low level of energy consumption in the section of hold pressure & cooling.

2.Hydraulic oil circulation system ^{D&B}

Oil circulation line and independently equipped line filter with oil cooler system maintain cleanliness and its temperature constantly. So it is possible to extend oil change and oil's life time.

- Prevent oil leakage
- Enhance product's durability
- Enhance injection reproducibility
- Shorten cooling & filtering time



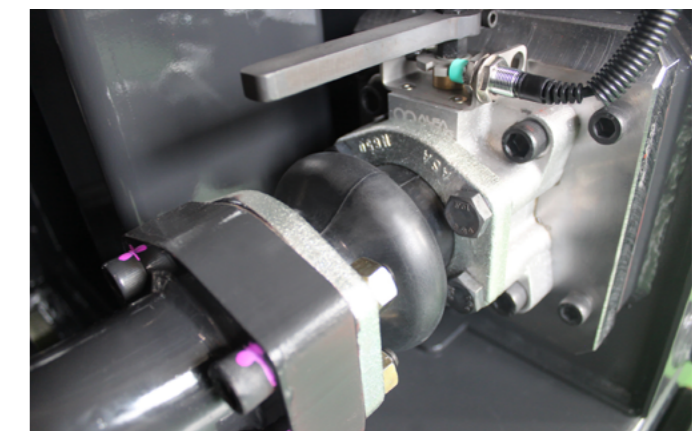
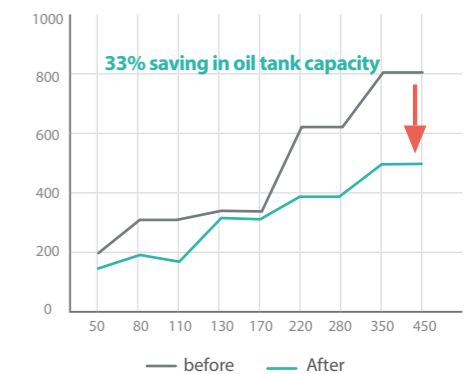
Independent filtering & cooling system

3.Long-lasting hydraulic pipeline & oil tank structure ^{D&B}

Hydraulic pipe line adopted seamless type structure. Seamless pipe type makes it easy to change the pipe by connecting flange without welding. It is excellent in durability and preventing broken pipes and oil leakage.

Specially coated inside of oil tank prevent corrosion and abrasion by inflow of humidity & alien substances helps to extend oil's life time.

- Up to 33% saving (compared with typical tank)

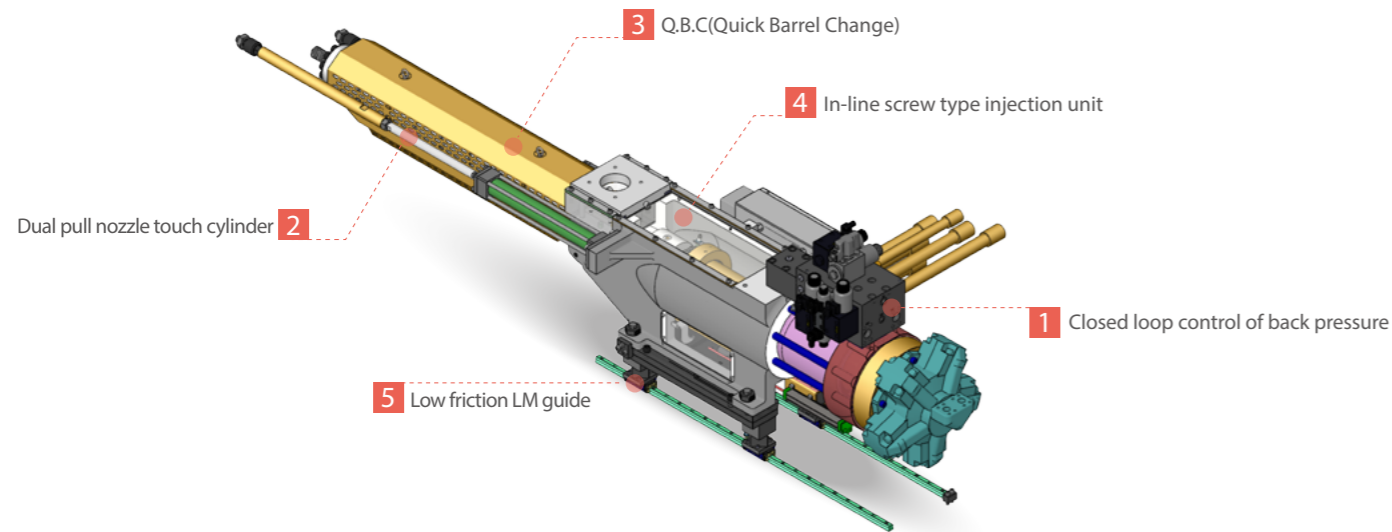


Butterfly valve

Injection unit

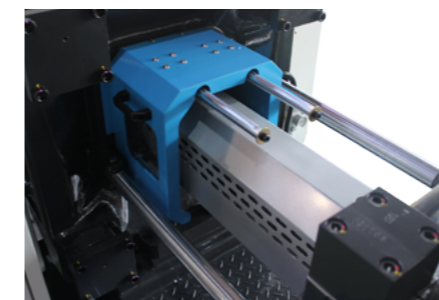
Optimized injection unit and hydraulic system for high speed and precise molding makes it possible to have prompt injection responsiveness and stability.

Various options in sizes and materials of screw / barrel make it simple to produce many kinds of plastic products. Accumulator system for high speed injection in order to produce thin wall products and Hybrid system for simultaneous operating are available as machine's option.



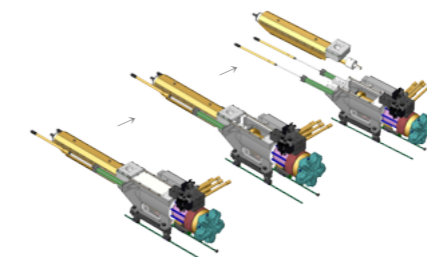
1. Closed-loop back pressure control ^{D&B}

High performance back pressure controlling valves are equipped on hydraulic blocks in injection unit. D&B back pressure closed-loop controlling system makes back pressure maintain constantly setting by the user through pressure sensor and it helps to manage the back pressure precisely and stably by electric signal. The blocks are coated by Nickel so that clean inside & outside also it features anti-wear & anti-corrosion.



2. Dual pull nozzle touch cylinder

Bilateral symmetry designed dual nozzle touch cylinder delivers same force to the platen while nozzle touching so that it can prevent platen's damage. Also it is realized to touch the nozzle precisely to solve decreasing reproducibility.



3. Q.B.C (Quick Barrel Change)

Structural innovation in Barrel & Screw design and Plug in Play method are applied in heater Terminal Block's to save time while lifting the injection unit to replace Barrel without rotating around to assemble and disassemble.

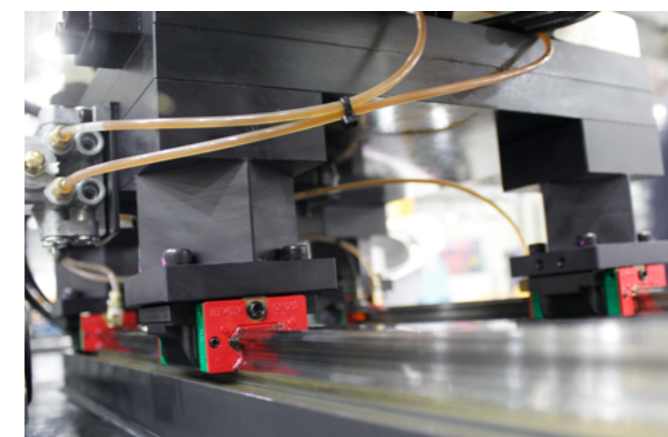
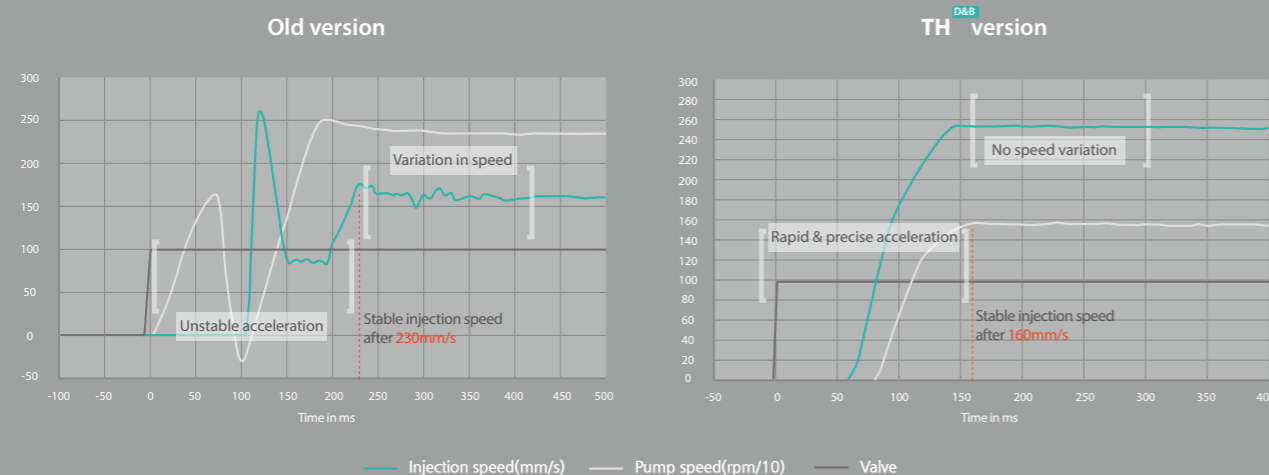


4. In-line screw type injection unit

In-line screw type injection unit designed to charge and inject simultaneously makes rapid and precise injection molding along with efficient energy consumption.

Comparison graph of injection function

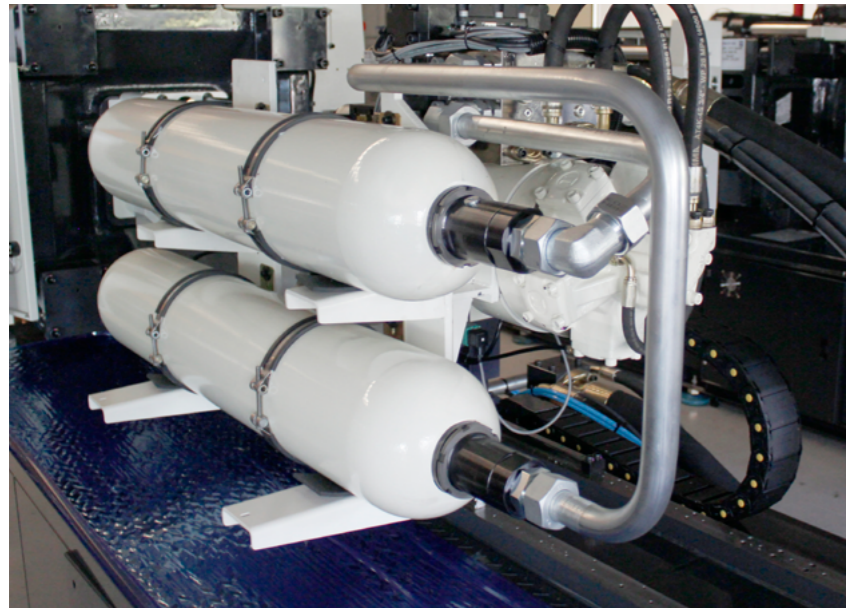
The comparison of function between TH220S and TH220S ^{D&B}



5. Low friction linear guidance

LM Guide is equipped in injection RAM part lowers the mechanical resistance and enhances precision, offering the optimal structure for high quality molding.

Option



1. Accumulator system

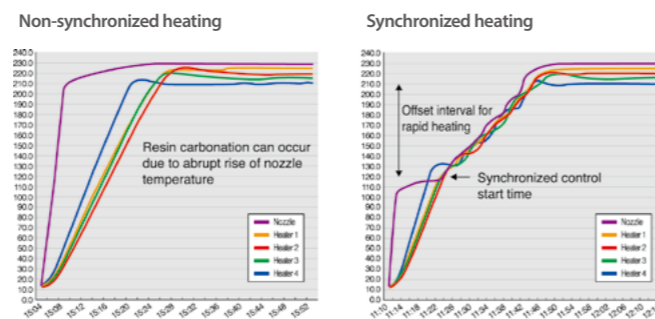
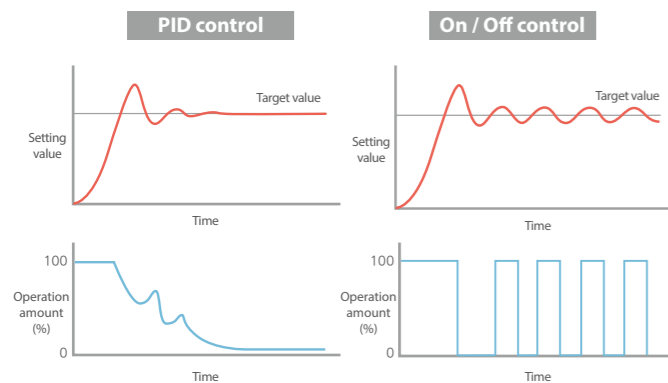
High speed injection molding for thin wall products is available by accumulator featuring momentary increasing outflow. Equipped closed-loop servo valve has excellent in controlling position & pressure and there are two available options for high speed injection mode and typical injection mode for many purposes.

- Injection speed : 1,000mm/sec
 - Responsiveness : 60ms
 - Coefficient for weight change level : 0.02%
 - System representation : 0.1%
- (※ Based on IH5.2)

2. PID temperature and Synchronized heating control

PID temperature control method is installed to manage the temperature on the barrel remain exactly the same or the most nearest parameter set by the user so that temperature variation can be minimized and constant temperature rising on the each heating section can be achieved. As a result, there will be no carbonization of resin and fault molding.

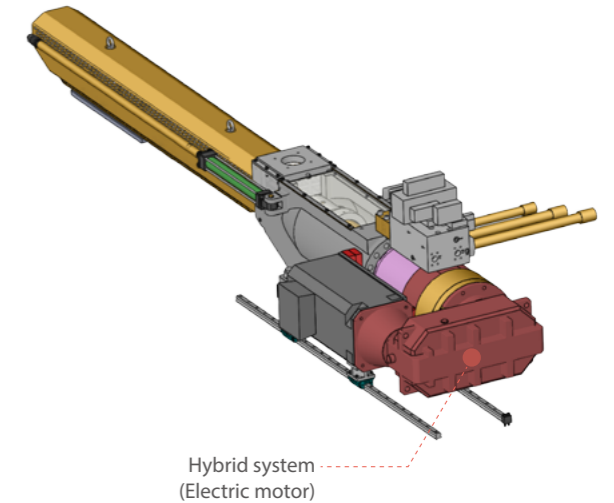
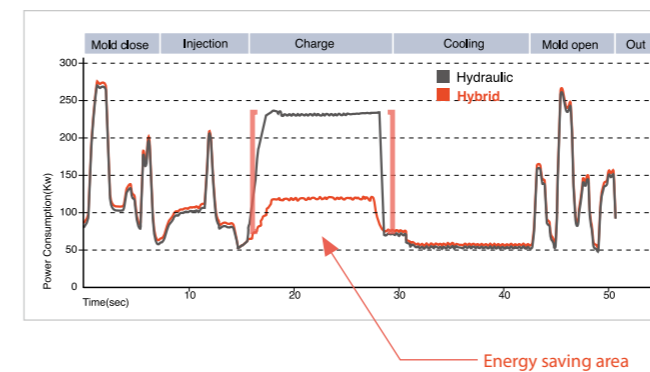
In comparison with PID function, the simple On/Off controlling has huge variation in temperature.



3. Hybrid system

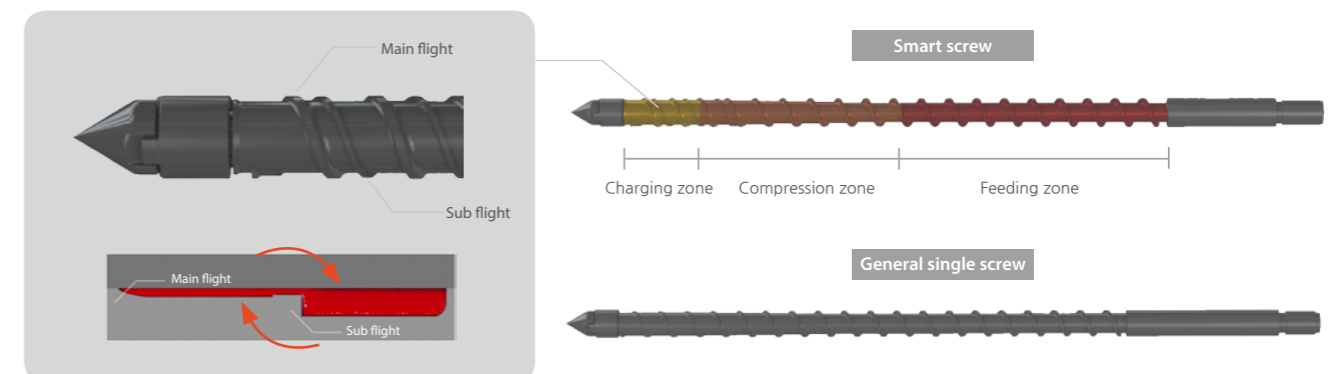
Energy saving by maximum 30% and reduced processing time due to the electric motor controlled screw movements & combined operation of opening / closing of mold during charging.

Increased screw rotation number by high powered electric motor and screw rotation can be controlled accurately through hybrid system.



4. Smart screw

The double flight (blade) has applied to screw on charging zone featuring increased in productivity through improved plasticizing capacity and stabilized molding. Due to this design, the plasticizing capacity & resin melting process and color dispersion effect have been improved.



Controller D&B



System features

- Geode LX800 500MHz
- 128MB DRAM, 512KB SRAM
- 0.4ms scan time
- 15 inch TFT color monitor (768×1024)
- PID automatic temperature control
- In & Out put module type
- 1×USB2.0
- Touch screen type

Built-in VNC Servo Function for Dual Display

Remote access for a same display of controller

Intuitive design

15 inch TFT color monitor attached to the controller is easy to control and manage the information.

Central command program interface

Compatible interface program is equipped in the system which is available to manage automation robot and auxiliary devices.

Dual display

Real time remote monitoring of controller display is available anytime and anywhere.

USB interface

External mold data storage system by USB memory

Multilingual support

It supports multilingual services.

Central monitoring system program (Option)

Central Monitoring Computer can access up to 100 injection molding machines at the same time to facilitate the data transmission and management. Such injection related data will be converted into excel files for easier data management and retrieval.

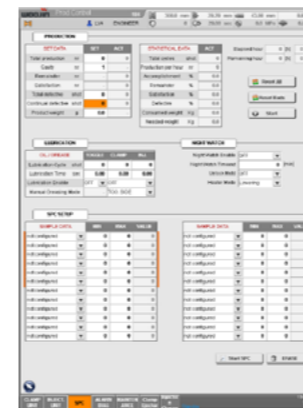
Functions

- Various core drive
- Production data storage
- Production data analysis
- Molding condition alterations and changes or alert details stored
- Injection speed graph print
- Transporter interface circuit
- Automatic control of motor and heater for unmanned operation
- Rotation injection for large volume of injection
- Weekday heater reservation
- Heat insulation mode for cylinder to prevent carbonization of resin carbide
- System state monitoring : communications state, module operation state, etc
- Internal mold data storage : 1000 data files
- External mold data storage system : USB memory storage
- Display storage : converts the current display into a hard copy to store the data in USB memory
- Injection speed, holding pressure closed-loop (Optional)
- Back pressure closed-loop (Optional)
- Injection pressure graph display (Optional)



Alarm function

All the information is provided on possible errors and glitches during operation for accurate maintenance and repair. In addition, it can be printed.



Production management

The user can set up targeted production amount and time. Also user can check the total production amount, current production amount, total production time, remaining production time through monitor.



Mold setting management

Up to 1,000 mold data can be stored in the controller and USB memory. The mold data can easily retrieved and used from controller for convenient molding information setting.



Quality management

Selective data storage and management for quality assurance under maximum 7 categories and 2,000 process information.



Graph display

The user can find out production status easily through graph on the monitor such as injection speed and pressure, detailed information about charging stage as well.



Energy consumption display (Option) NEW

The total production time, energy consumption amount can be displayed on the monitor so that the user can find out cycle time and electric consumption amount easily.

Specification

TH 50S	TH 80S	TH 110S	TH 130S
IH 1.7	IH 2.1	IH 2.1	IH 5.2

Injection Unit

Screw & Barrel Type	S	O	A	B	O	A	B	C	O	A	B	C	S2	S	O	A	B	C	
Screw Diameter	mm	22	25	28	32	25	28	32	36	25	28	32	36	28	32	36	40	45	50
Injection pressure	kg/cm ²	3616	2800	2232	1709	3388	2701	2068	1634	3388	2701	2068	1634	3620	3593	2839	2300	1817	1472
	MPa	355	275	219	168	332	265	203	160	332	265	203	160	355	352	278	226	178	144
Theoretical injection volume	cm ³	49	64	80	105	64	80	105	132	64	80	105	132	111	145	183	226	286	353
Injection weight (PS)	g	46	59	74	96	59	74	96	122	59	74	96	122	102	133	169	208	264	326
Injection rate	cm ³ /s	47	61	76	99	67	84	109	139	67	84	109	139	78	102	130	160	202	250
Screw stroke	mm	130	130	130	130	130	130	130	130	130	130	130	130	180	180	180	180	180	180
Injection speed	mm/s	124	124	124	124	136	136	136	136	136	136	136	136	127	127	127	127	127	127
Plasticizing capacity (PS)	kg/h	18	25	34	48	33	44	63	87	33	44	63	87	34	48	65	87	119	157
Screw speed	rpm	280	280	280	280	370	370	370	370	370	370	370	370	280	280	280	280	280	280

Clamping Unit

Clamping force	ton(kN)	50 (490)	80 (785)	110 (1079)	130 (1275)
Distance between tie-bar (H x V)	mm	360 x 360	410 x 410	410 x 410	460 x 460
Platen dimension (H x V)	mm	530 x 530	630 x 630	630 x 630	690 x 690
Daylight	mm	250	350	350	400
Max. daylight	mm	600	700	750	850
Min. thickness of mold	mm	130	140	150	180
Max. thickness of mold	mm	350	350	400	450
Ejector force	ton(kN)	2.7(26)	3.4(34)	3.4(34)	4.2(41)
Ejector stroke	mm	60	100	100	120
Dry cycle	sec·mm	1.6 • 250	1.6 • 285	1.6 • 285	1.6 • 320

Generals

Heat capacity	kW	5.7	7.7	8.6	8.2	7.7	8.6	8.2	9.4	7.7	8.6	8.2	9.4	8.7	8.8	9.8	10.9	12.6	14.3
Electric motor power capacity	kW	6.8				9.1				9.1				12.1					
Total electric power capacity	kW	12.5	14.5	15.4	15.0	16.8	17.7	17.3	18.5	16.8	17.7	17.3	18.5	20.8	20.9	21.9	23.0	24.7	26.4
Hydraulic oil volume	ℓ	150				200				200				300					
Machine weight	ton	2.7				4.5				4.5				5.6					
Machine dimension(L x W x H)	m	4.4 x 1.3 x 1.6				5.1 x 1.4 x 1.7				5.1 x 1.4 x 1.7				5.4 x 1.4 x 1.7					
Coolant consumption amount	ℓ /min	40				40				40				40					

1. Theoretical injection volume : Screw cross section X Screw stroke
2. Min. mold dimension should be over 60% of tie bar distance
3. Coolant consumed for molds are not counted in coolant consumption amount.
4. Specifications are subjected to change without notice for quality upgrade.

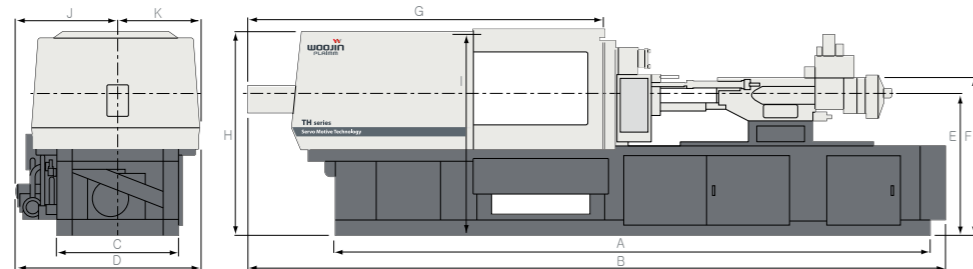
TH 170S	TH 220S	TH 280S	TH 350S	TH 350WS	TH 450S
IH 5.2	IH 9.2	IH 10	IH 17	IH 17	IH 23

S2	S	O	A	B	C	O	A	B	S	O	A	B	O	A	B	O	A	B	O	A	B
28	32	36	40	45	50	45	50	55	45	50	55	60	60	65	70	60	65	70	65	70	80
3620	3593	2839	2300	1817	1472	2647	2144	1772	2958	2396	1980	1664	2353	2005	1729	2353	2005	1729	2191	1889	1447
355	352	278	226	178	144	260	210	174	290	235	194	163	231	197	170	231	197	170	215	185	142
111	145	183	226	286	353	350	432	523	350	432	523	622	735	863	1001	735	863	1001	1062	1231	1608
102	133	169	208	264	326	322	398	482	322	398	482	573	677	795	922	677	795	922	978	1135	1482
78	102	130	160	202	250	182	224	271	191	236	286	340	289	339	393	289	339	393	310	359	469
180	180	180	180	180	180	220	220	220	220	220	220	220	260	260	260	260	260	260	320	320	320
127	127	127	127	127	127	114	114	114	120	120	120	120	102	102	102	102	102	102	93	93	93
34	48	65	87	119	157	106	140	181	97	129	166	210	173	214	261	173	214	261	181	221	315
280	280	280	280	280	280	250	250	250	230	230	230	230	190	190	190	190	190	190	160	160	160

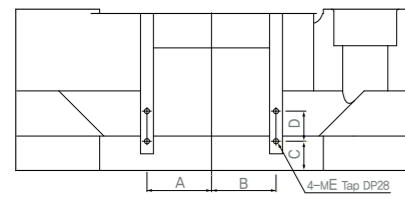
170 (1667)	220 (2157)	280 (2746)	350 (3432)	350 (3432)	450 (4413)
510 x 510	560 x 560	610 x 610	720 x 720	820 x 820	870 x 820
750 x 750	840 x 840	900 x 900	1090 x 1090	1180 x 1180	1260 x 1260
460	490	540	650	730	730
960	1090	1190	1400	1480	1530
180	200	250	300	300	350
500	600	650	750	750	800
4.2 (41)	5.8 (57)	5.8 (57)	8.8 (86)	8.8 (86)	13.7 (135)
140	150	170	200	200	200
1.7 • 355	1.7 • 390	2.6 • 420	2.3 • 500	2.8 • 500	3.9 • 600

8.7	8.8	9.8	10.9	12.6	14.3	13.5	15.1	16.6	14.0	15.0	16.6	19.0	23.0	24.9	26.8	23.0	24.9	26.8	24.9	26.8	33.2
12.1						23.2			25.1			31.0			31.0			31.0			
20.8	20.9	21.9	23.0	24.7	26.4	36.7	38.3	39.8	39.1	40.1	41.7	44.1	54.0	55.9	57.8	54.0	55.9	57.8	55.9	57.8	64.2
300						400			400			500			500			500			
6.2						9.1			12.0			15.8			16.8			23.0			
5.7 x 1.5 x 1.7						6.6 x 1.7 x 1.9			6.9 x 1.9 x 2.1			8.1 x 2.0 x 2.1			8.3 x 2.0 x 2.2			8.8 x 2.2 x 2.3			
40						40			65			65			65			65			

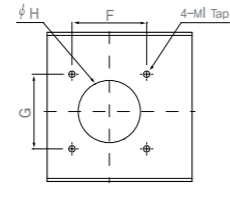
Machine Dimensions



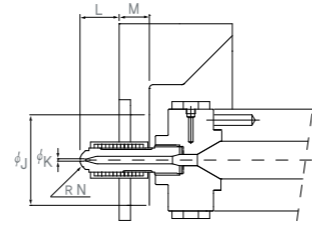
	A	B	C	D	E	F	G	H	I	J	K
TH 50	3890	4433	881	1308	1092	1225	1973	1531	1367	704	604
TH 80	4535	5068	1016	1380	1207	1340	2318	1636	1532	708	673
TH 110	4535	5118	1016	1380	1207	1340	2368	1636	1532	708	673
TH 130	4780	5396	1081	1447	1237	1385	2531	1700	1590	741	706
TH 170	4950	5622	1134	1503	1265	1413	2757	1759	1650	769	734
TH 220	5770	6560	1300	1712	1362	1542	3200	1897	1792	891	821
TH 280	5965	6827	1350	1762	1372	1552	3462	1972	1837	916	846
TH 350	6630	7710	1540	1974	1412	1622	4222	2098	1980	1032	942
TH 350W	6710	7851	1630	2066	1462	1672	4363	2192	2067	1078	988
TH 450	7280	8290	1740	2176	1505	1702	4555	2237	2112	1133	1043



Automatic extractor installation



Hopper installment drawing

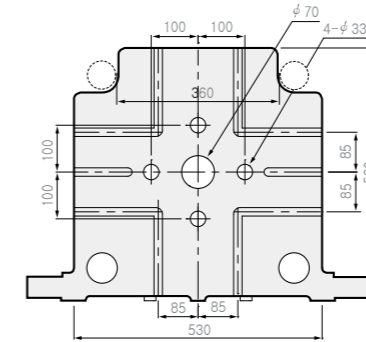


Nozzle dimension

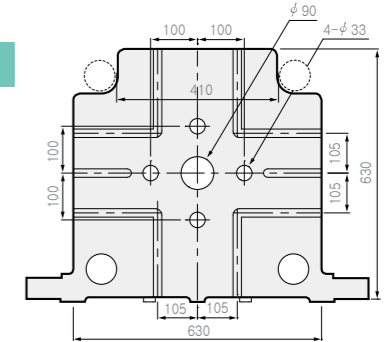
	A	B	C	D	E	F	G	ØH	I	ØJ	ØK	L	M	N
TH 50	85	85	50	35	12	100	100	85	12	90	2.0	30	25	10
TH 80	105	105	47	40	12	100	100	85	12	100	2.5	50	30	10
TH 110	105	105	47	40	12	100	100	85	12	100	2.5	50	30	10
TH 130	125	125	62	70	14	120	120	90	12	100	3.0	50	30	10
TH 170	150	150	62	70	14	120	120	90	12	100	3.0	50	30	10
TH 220	150	150	70	70	14	120	120	100	12	100	3.0	50	30	15
TH 280	150	150	68	70	14	120	120	100	12	120	3.5	50	40	15
TH 350	190	190	67	100	20	127	127	115	12	120	3.5	50	40	15
TH 350W	210	210	67	100	20	127	127	115	12	120	3.5	50	40	15
TH 450	210	210	67	100	20	127	127	115	12	200	4.0	50	60	19

Platen Dimensions

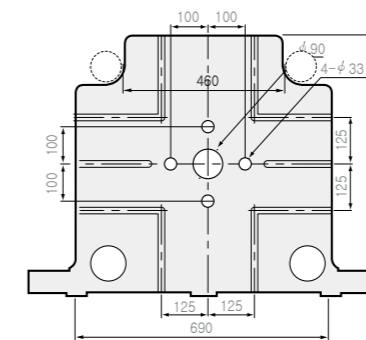
50 ton



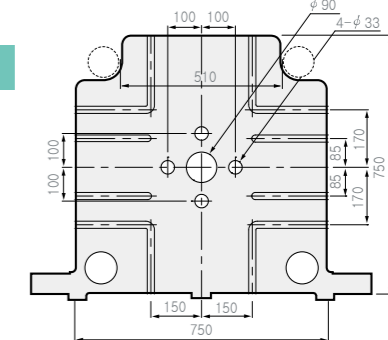
80/110 ton



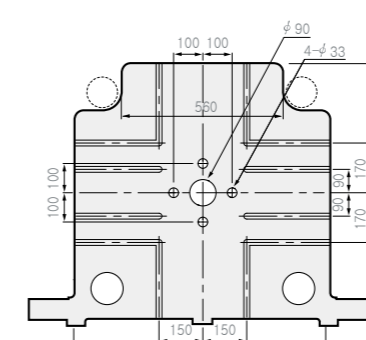
130 ton



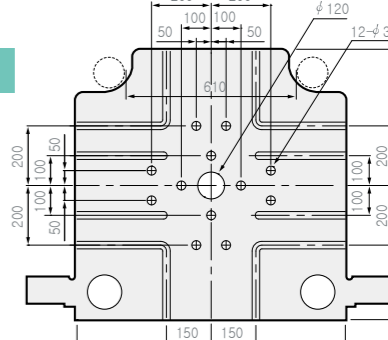
170 ton



220 ton

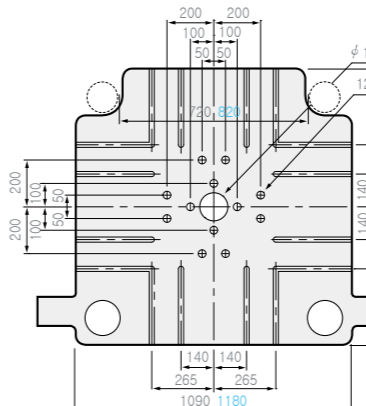


280 ton

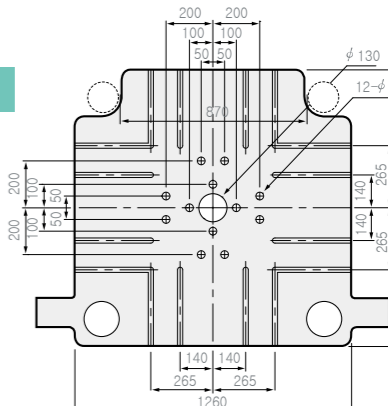


350 ton

350 W



450 ton



Option List

S : Standard
O : Option

Injection Unit		Clamping Unit		General	
1. Injection process control stage(Speed/Pressure)	10	1. Mold opening speed/pressure control	5	1. Molding data memory capacity (Internal / External)	1000/usb
2. Holding process control stage(Speed/Pressure)	5	2. Mold closing speed/pressure control stage	5	2. Alarm history display & saving	S
3. Charging process control stage(Speed/Pressure)	3	3. Ejector speed/pressure control stage	2	3. Changed value saving option	S
4. Back pressure control stage(Speed/Pressure)	3	4. Clamping position display	S	4. Statistical function	S
5. Suck-back control(before injection)	1	5. Automatic mold height adjustment	S	5. I/O circuit display	S
6. Suck-back control(after injection)	1	6. Ejector position display	S	6. Multi language display (Korean, English, Chinese, Turkish, Czech)	S
7. Injection position display	S	7. Hydraulic core puller(1 stage)	S	7. Robot interlock circuit	S
8. Injection speed graph display	S	8. Air ejector device	S	8. Hydraulic oil temperature abnormal alarm	S
9. Injection pressure graph display	S	9. Safety device(by electric or hydraulic)	S	9. Hydraulic oil temperature rise control device	S
10. Cushion amount display & graph	S	10. Unscrewing core puller	O	10. Hydraulic oil temperature control device	S
11. Screw RPM display	S	11. Daylight extension	O	11. Number of reserved molding & alarm	S
12. Auto purge circuit	S	12. Mold opening during core operation	O	12. Automatic lubricating device	S
13. Alarm of over time charging process	S	13. Mold opening during ejecting	O	13. Shot data file saving by external way	S
14. Screw cold start prevention device	S			14. Leveling pads	S
15. Weekly pre-heating timer	S			15. 3 stage alarm lamp	S
16. Heater temperature abnormal display & alarm	S			16. Maintenance tools	S
17. PID heater temperature control device	S			17. Spare parts	S
18. Cylinder temperature keeping mode	S			18. Robot interlock interface(Euromap 12/ SPI)	O
19. Valve gate(1 stage)	S			19. Hydraulic oil level check and alarm	O
20. Injection closed loop system	O			20. Hopper throat temperature control device	O
21. Mold opening during charging	O			21. Product good or bad check device	O
22. Shut-off Nozzle (Hydraulic, Pneumatic, Spring type)	O			22. Auto safety door opening & closing	O
23. Anti wear screw / barrel	O			23. Hopper moving device	O
24. Anti wear & corrosion screw / barrel	O			24. Product chute	O
25. Double barrier screw	O			25. Hydraulic oil cleaner	O
				26. Lubricator recycling device	O
				27. Auto clamping device(Q.D.C System)	O
				28. Insulation plate for mold	O
				29. Product drop confirmation device	O

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* Please ask our service team for additional required options.

