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Group  
**TOYO**

TOYO MACHINERY & METAL CO., LTD.

**SINTAI** 新台通商

壓鑄機 · 製品 · 自動化周邊 · 技術連鎖服務

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Die Casting Machine

# BD-V5 EX series



**Customer's Value Up**

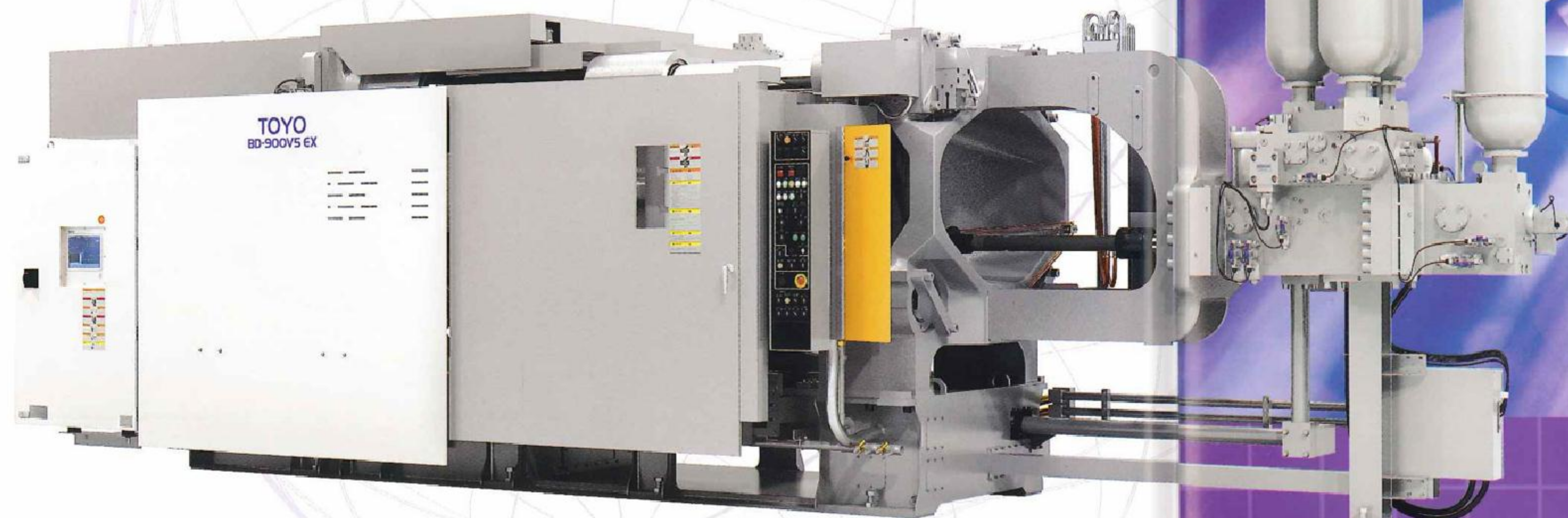
A Hitachi Group Company



Die Casting Machine

# BD-V5 EX series

High-end Die-casting Machine  
Employing Renovated Control  
Based on the Proven BD-V Series



**The Latest Control  
SYSTEM 500**

**High-cycle compound  
movement.**

*(compound movement of peripheral devices is a standard feature)*

**Only Toyo offers an  
integrated system design that  
includes peripheral equipment.**

■ Low injection speed

**0.03~1.0m/s**

BD-1250V5 EX: 0.05~0.7m/s

maximum 9 point setting

■ High injection speed

**1.0~9.0m/s**

BD-900V5 EX · BD-1250V5 EX: 1.0~8.0m/s

■ Sharp acceleration capability

**7m/s/0.01s (70G)**





# M Multi Injection System

Accurate injection at will,  
from super-low speed to super-high speed.

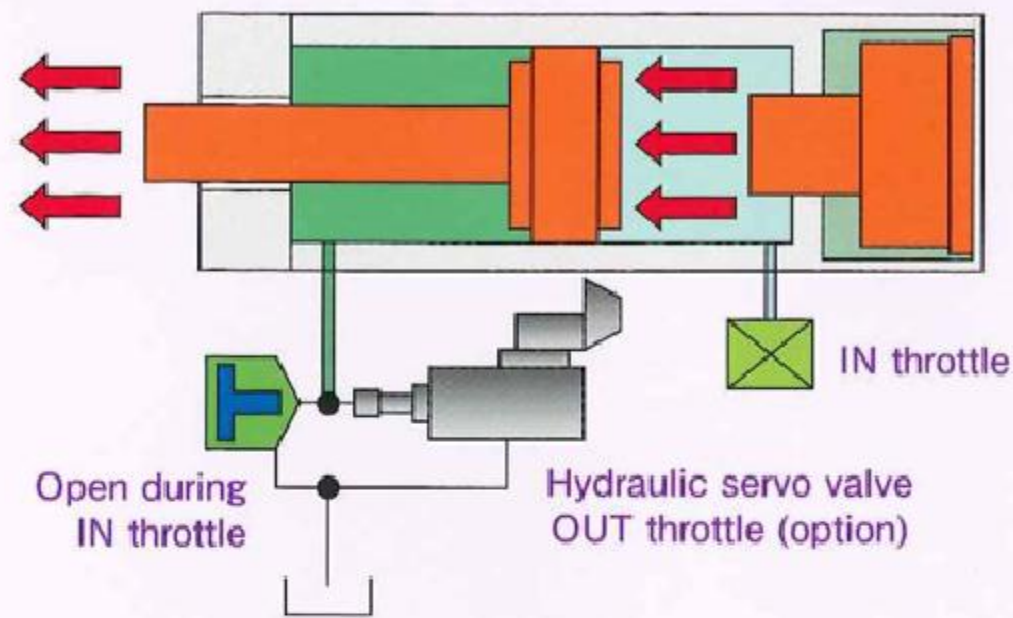
This system aims at feeding molten metal in its active state into the die, while achieving super-low and super-high speeds. To accomplish this feat as only Toyo could, we gathered our ideas and know-how backed by our familiarity of every possible casting condition to create a unique system called the new multi-injection system.

## Features

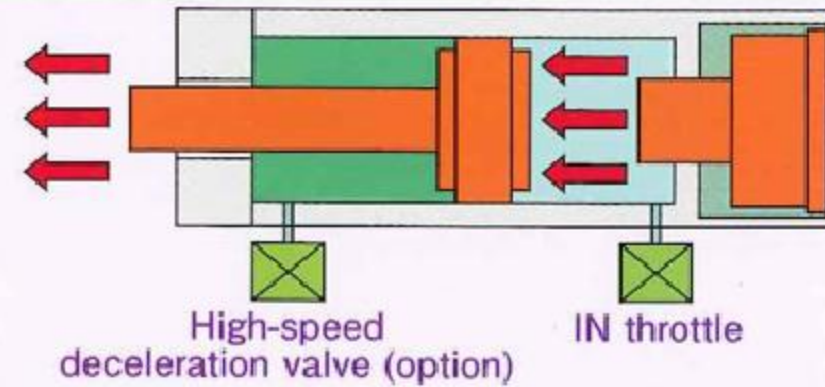
1. Equipped with a dedicated EH valve for low speed use - Improved stability in the super-low speed range
2. Made the dedicated EH valve for low speed use compact - Improved speed response
3. Can be equipped with a hydraulic servo valve (option)
  - ① Improved deceleration stability in the high-speed deceleration function
  - ② Speed control selection possible in the high-speed range (meter-in, meter-out selection possible)
  - ③ Multi-stage (maximum 5 points) injection possible in the high-speed range

### ● New injection system

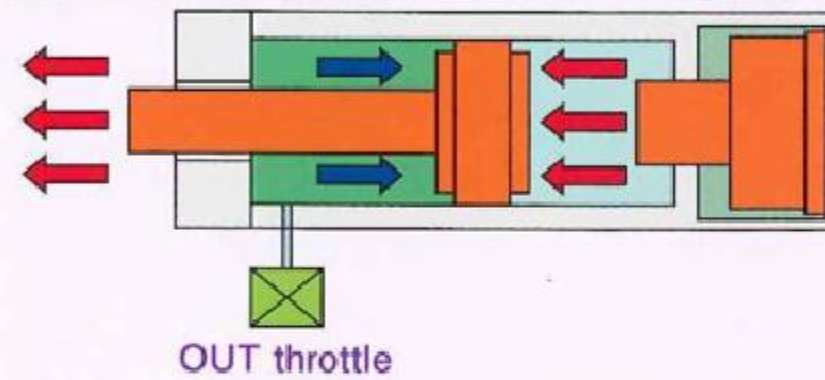
#### Meter-IN, Meter-OUT(selectable)



#### Toyo system (meter IN)



#### Meter out system



**Low speed EH valve**  
Exerts powers during ultra-low speed casting.  
Realizes ultra-low speed stability.



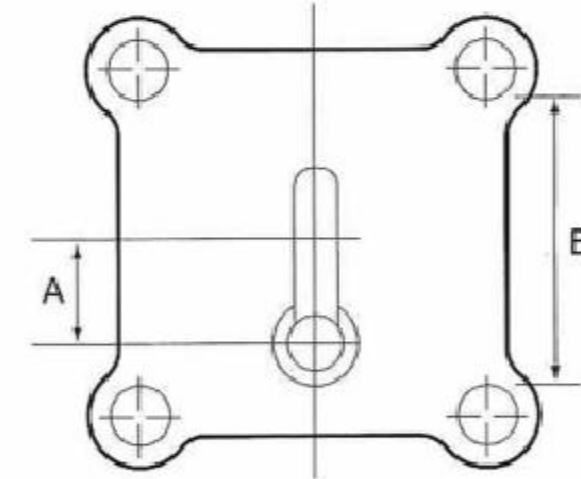
**Hydraulic servo valve (option)**  
Exerts powers in the high-speed injection range.  
Realizes improved deceleration stability.  
Realizes speed control selection.



**Electric injection flow control valve**  
Effects remote control of the injection speed adjustment.  
Also automatically corrects speed and pressure rise time.

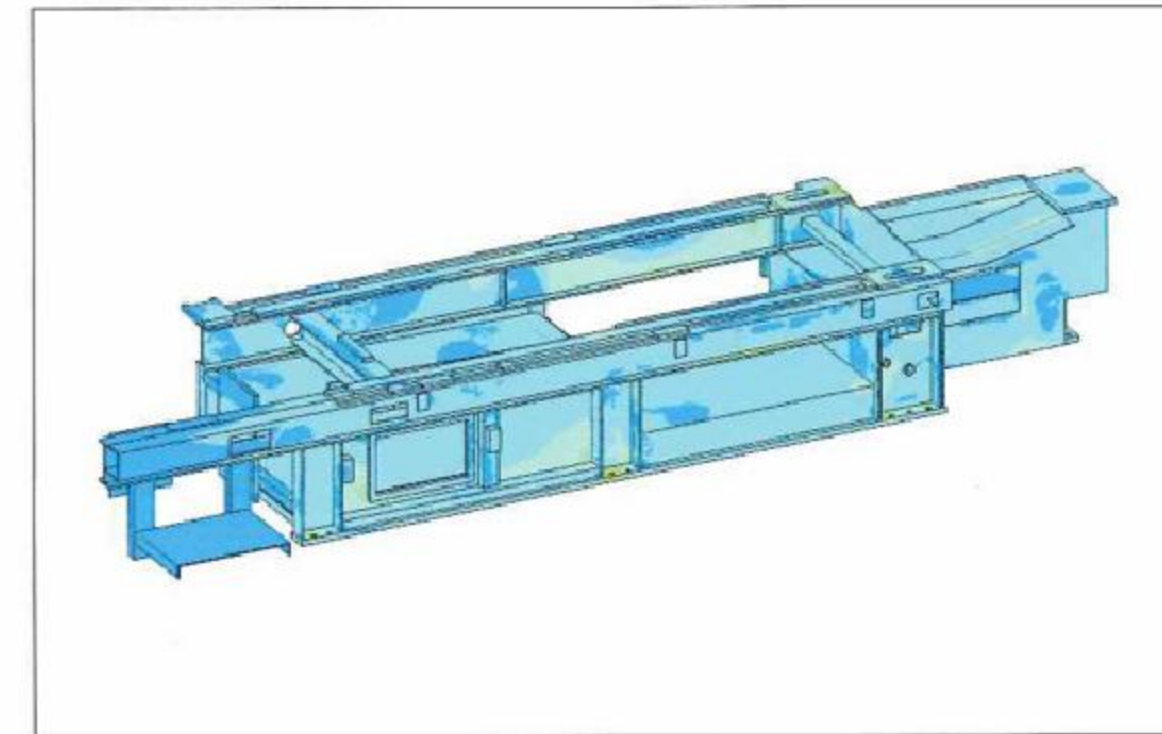
# C Clamping System

The high-precision, high-rigidity die clamping unit can be handled one size larger die mold.



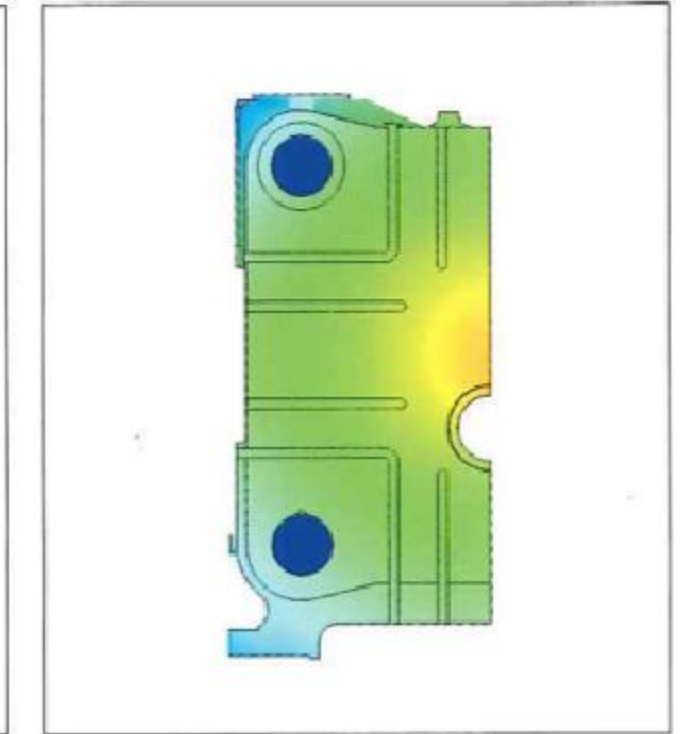
The rigidity of the tail stock, the criteria that determines the precision of the die mount and toggle, has been increased, thus achieving high-precision, high-rigidity clamps. Furthermore, the dimension between platen center and injection position has been increased to handle dies of one size larger model.

	BD-350	BD-500	BD-650	BD-800	BD-900	BD-1250
A	125→150	150→175	175→225	250→275	250→275	350
B	530→652	660→748	750→852	850→941	850→931	1150



#### High rigidity machine frame

- Highly rigid machine frame optimally designed with CAE analysis.
- High rigidity machine frame sustains rigorous die opening and closing motions and assures stable operation.
- Tough die-casting machine withstanding rough use in harsh operating environment.



#### High rigidity die-plates

- Highly rigid die-plates optimally designed with CAE analysis to minimize deflection reduces burr generation.
- Die-clamping force is evenly distributed over the parting surface of the die, realizing ideal casting.



#### Automatic lubrication unit toggle

The high-precision, high-rigidity clamp has adopted a "quantitative distribution automatic oil lubrication system". This feature further improves the reliability and durability of the system.



#### Injection C frame

A high-strength C frame has been adopted at the injection unit. Center of the injection cylinder and the sleeve hole have been machined together to improve the reliability of the injection unit.

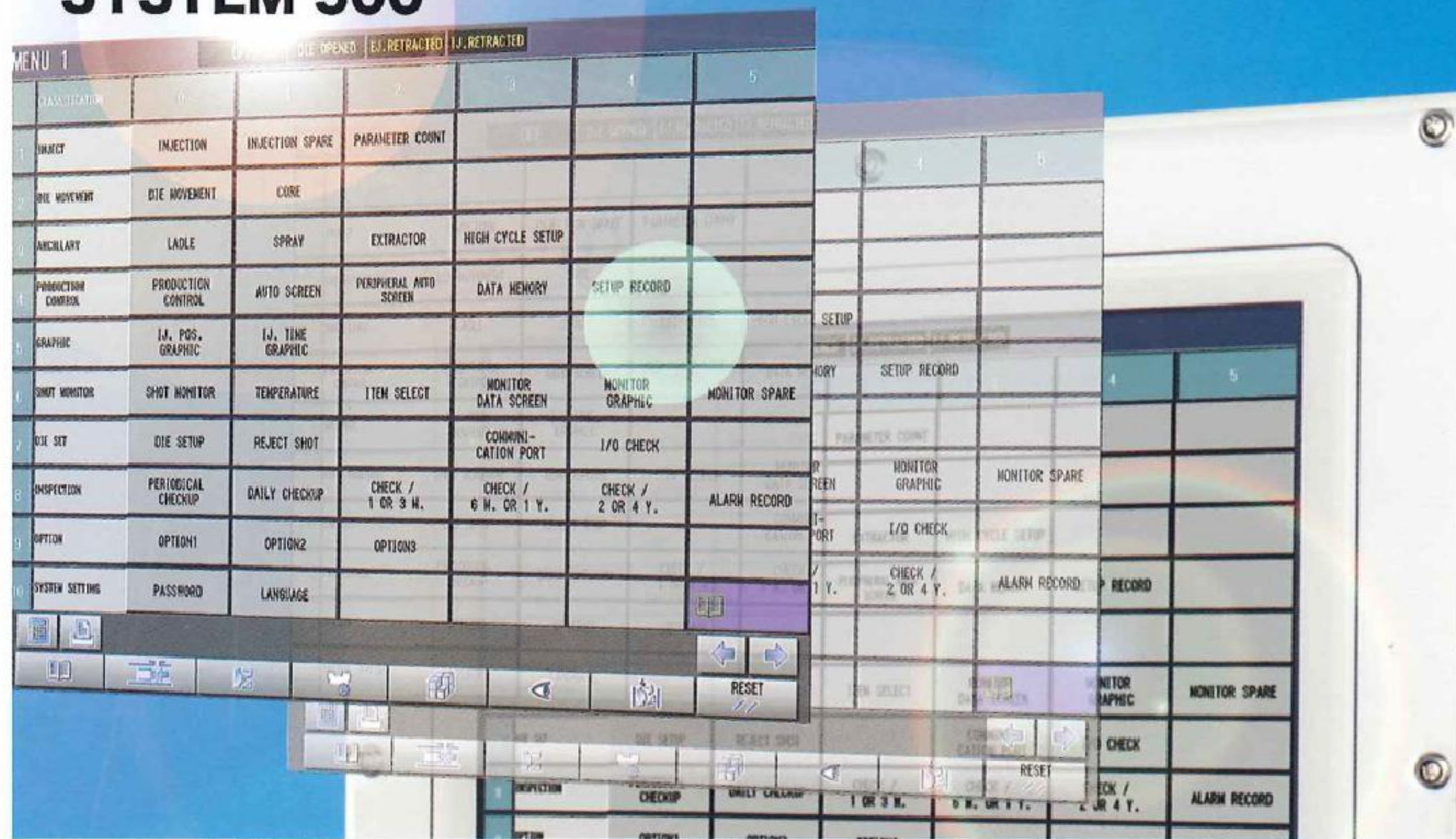


# Control System

The latest electronic control system brings machine performance into full play.

## Easy operation

### Next-Generation Human-Machine Interface: SYSTEM 500

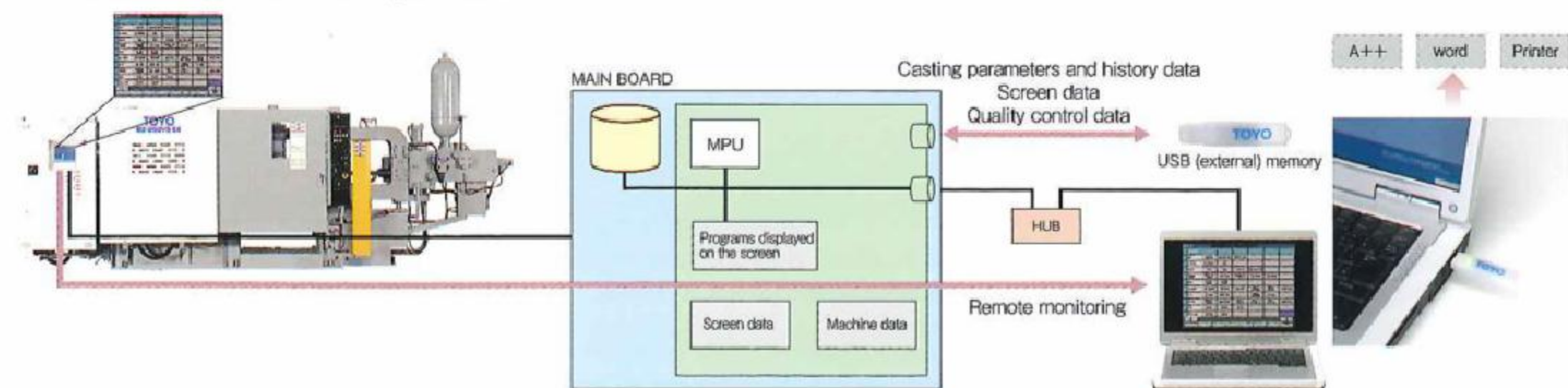


## T-Station network control system brings your production control to new stage

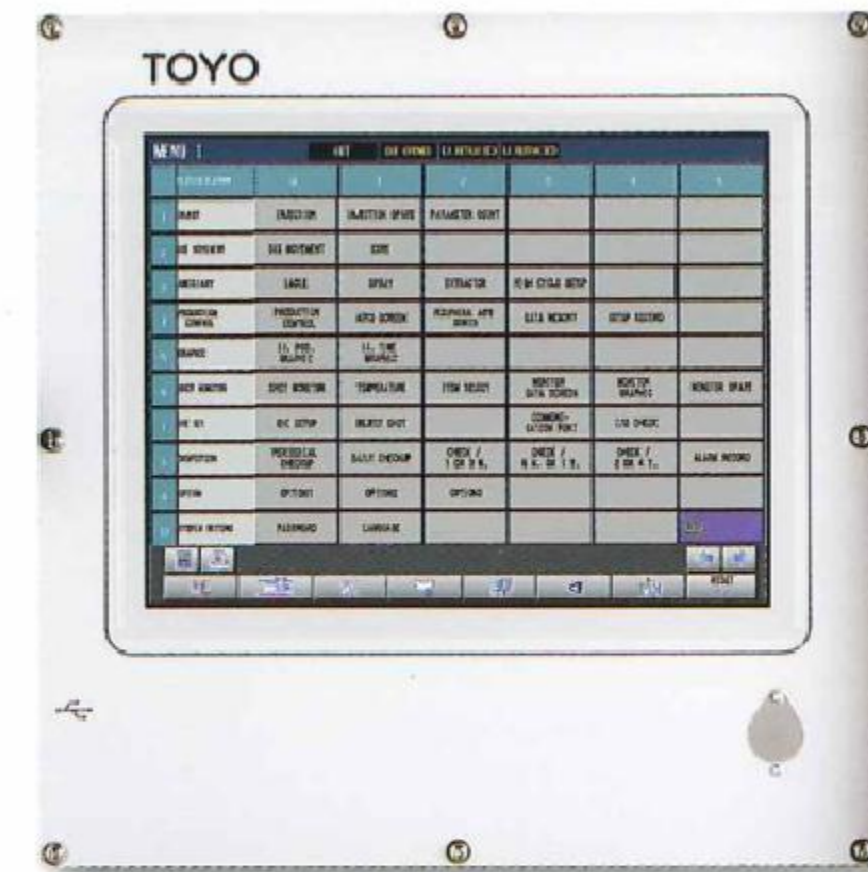
The T-Station is TOYO's original new network control system that can remotely monitor as many as 32 die-casting machines using a server. The BD-V5 EX series has necessary software and interface for the T-Station as standard. (Software on the server side is optional.) With the T-Station, the current machine operating status

can be monitored real-time no matter where you are via the internet or a wireless LAN. SYSTEM 500 control system tremendously improves the efficiency of your production control regardless of a place or a time.

### T-Station system configuration



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



### Customer-satisfying SYSTEM 500 control

The SYSTEM 500 controller accommodates all the features that fulfill needs and wishes given from customers to our previous PLCS-12 controller.

### Frustration-free, instant access to any screen

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

### Screen-storing function

Maximum five screens can be stored in the internal memory. Stored screens can be called up by just touching FORWARD or BACK buttons. This function is just one of the unique features you can find only in SYSTEM 500 control.

### SYSTEM 500 supports the overseas operations of the customers.

- Language selection function (4 languages included in standard specifications)
  - Japanese, English, Chinese (traditional & simplified), and Korean

### Parameter count screen



## PC-touch easy entry operation



### Entry with 10-key screen

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



### Software Keyboard

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

## Security features



### Password function

The SYSTEM 500 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.

Job title	Job title example	Operation authority
Manager	Plant general manager, manager	User management and addition, password assignment
Maintenance	Maintenance staff	Model changes, board replacement semi-fixed values, environment screen
Technician	Technical staff	Casting condition changes
Operator	Operation staff	Start/stop operation, screen display only

## Easy-to-see screen design



### Ladle screen

Pops up the selection contents.



### I/O monitor screen

The input and output conditions can be checked at one glance.

## Enhanced flexibility in quality control management

	Previous control system	New SYSTEM 500 control system
Transferring data to PC	Only conditions can be stored on a memory card	Conditions, constants, graphs, monitor data, screen hardcopies USB memory (Toyo specified) → transferring to PC • Internal 400 type • External 400 type (USB memory) • 40 internal graphic patterns *1
Printer support	ESC/P control code support printer	• ESC/P control code support printer (option) • USB printer support (Toyo specified)

\*1 The number of the graphic is limited by the number of casting condition data.



# Graphic function

Easily visible, the diverse graphic functions help improve operation efficiency.

The 12.1-inch color touch panel screen guides you easily and smoothly to all operations, including the various setup, adjustment, checking, and inspection functions.

## Condition Settings

### Injection screen



Sets up the injection change position, speed, and accumulator pressure.

### Ladle screen



Sets up the ladle arm, ladle change position, speed, and timer.

### High cycle setup screen



Sets up high-cycle related functions.

### Die movement and ejection screen



Sets up the die movement and ejection change position, speed, and ejection force.

### Extractor screen



Sets up the extractor mode.

### Reject shot screen



Sets up the actions related to reject shots during a startup.

### Core setup screen



Sets up the core movement sequence, speed, and pressure.

### Spray screen



Sets up the spray timer and mode.

### Injection spare screen



Sets up the models related to injection.

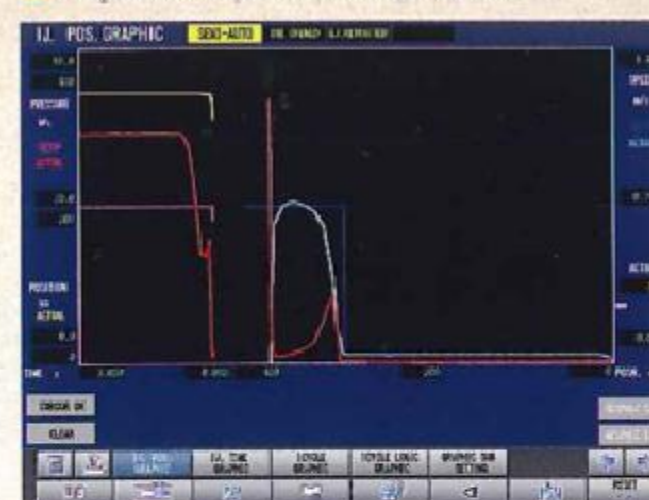
## Monitoring Conditions

### Shot monitor screen



Displays the measurement value for every shot.

### Injection position graphic



Displays an injection graph for the horizontal axis stroke.

### Monitor data screen

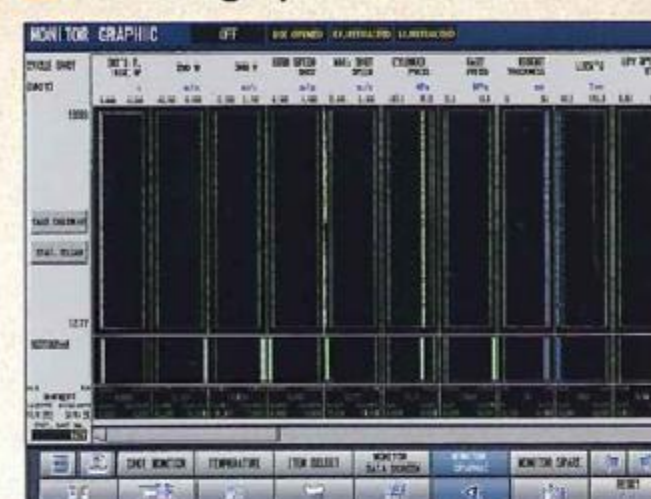
Displays data for 200 shots.

### Injection time graphic



Displays an injection graph for the horizontal axis time.

### Monitor graphics screen



Displays data for 200 shots on a monitor graph.

### Alarm record screen

Stores alarm messages that have been created (400 pieces).

## Management

### Production control screen

Displays a simplified production control function.

### Data memory screen

Stores casting conditions for 400 dies and graphic data for 40 dies in memory.

### Communication port screen



The conditions can be printed on a printer and stored on USB memory.

## Condition Support

### Parameter count screen

Calculates the injection parameters. The results can be checked visually.

### Setup record screen

Stores 300 items of setup records in memory.

### Password screen



Prevents the conditions from being changed unless a password is entered.



# Line-up

Toyo's die-casting machines meet all possible needs

## BD-125V5 EX

An array of technological features are condensed into a compact body!  
It's a very popular compact machine.



## BD-250V5 EX

Available with a wide range of options,  
it improves productivity!



## BD-350V5 EX

Significant advances in ease of use,  
multi-functionality, and productivity!



## BD-500V5 EX

Productivity-conscious  
high-performance  
medium-sized machine.



## BD-650V5 EX

Medium-sized machine boasting of high versatility.



## BD-800V5 EX

Provides superior cost performance to every diecaster.



## BD-900V5 EX

Top class medium-sized machine capable of handling high level casting requirements.



## BD-1250V5 EX

High speed and high power, new generation large-sized machine.





# Die-Casting Machine Main Specs

Performance to lead the die-casting machines of the future.



Model name	BD-125V5 EX	BD-250V5 EX	BD-350V5 EX	BD-500V5 EX	BD-650V5 EX	BD-800V5 EX	BD-900V5 EX	BD-1250V5 EX	
Control system	SYSTEM 500			SYSTEM 500					
Injection system	New Multi Injection			New Multi Injection					
Clamping	Clamping force [kN]	1250	2500	3500	5000	6500	8000	9000	12500
	Die plate (H×W) [mm]	700×700	850×904	935×1008	1070×1070	1230×1230	1400×1400	1400×1400	1800×1800
	Tie-bar distance (H×W) [mm]	460×460	584×584	652×652	748×748	852×852	941×941	931×931	1150×1150
	Die stroke (Max. Min.) [mm]	350~200	380~250	420~300	560	660	760	760	900
	Die thickness (Max. Min.) [mm]	500~250	600~250	700~300	850~350	900~350	950~400	950~400	1500~600
	Tie-bar diameter [mm]	85	110	125	150	160	180	190	230
Injection	Injection force [kN]	139~177	221~281	264~335	383~491	410~525	472~605	537~688	797~1020
	Intensity ratio	1 : 2.04	1 : 2.16	1 : 2.16	1 : 2.3	1 : 2.5	1 : 2.5	1 : 2.5	1 : 2.37
	Plunger stroke [mm]	305	370	425	580	670	750	750	950
	Tip jog-out stroke [mm] (from fixed die plate surface)	125	150	165	250	300	325	325	400
	Injection position [mm]	-100	-125	-150	-175	-225(※)	-275(※)	-275(※)	-350
	Tip diameter [mm] (○:Standard)	45 · 50 · 55 · 60	50 · 55 · 60 · 65 · 70	60 · 65 · 70 · 75 · 80	70 · 75 · 80 · 85 · 90	70 · 75 · 80 · 85 · 90	80 · 85 · 90 · 95 · 100	80 · 90 · 100 · 110 · 120	100 · 110 · 120 · 130
	Injection pressure [MPa] (standard tip diameter)	90.6	99.5	87	97.7	104.9	95.1	95.1	90.2
	Low injection speed [m/s] (maximum 9 point setting)	0.03~1.0	0.03~1.0	0.03~1.0	0.03~1.0	0.03~1.0	0.03~1.0	0.03~1.0	0.05~0.7
High injection speed [m/s]	1.0~9.0	1.0~9.0	1.0~9.0	1.0~9.0	1.0~9.0	1.0~9.0	1.0~8.0	1.0~8.0	
Ejection	Ejection force [kN]	80	123	193	254.4	294.5	342	342	586
	Ejection stroke [mm]	0~75	0~80	0~100	0~110	0~125	0~125	0~125	0~200
Core	Core hydraulic outlet [Rc×sets]	1/2×1	3/4×3	3/4×3	3/4×2	3/4×2	3/4×2	3/4×2	1×2
	Number of hydraulic core (sets)	1	1	1	2	2	3	3	3
Coolant	Coolant inlet pipe diameter [Rc]	1	1	1	1.1/4	1.1/4	1.1/4	1.1/4	1.1/2
	Coolant drain pipe diameter [Rc]	2	2	2	2.1/2	2.1/2	2.1/2	2.1/2	3
	Oil cooler coolant inlet [Rc]	3/4	3/4	3/4	1	1	1	1	1
	Oil cooler coolant outlet [Rc]	3/4	3/4	3/4	1	1	1	1	1
	Die coolant adjustment valve (fixed side) (size x quantity)	3/8×5	3/8×7	3/8×7	3/8×9	3/8×9	3/8×11	3/8×11	3/8×15
	Die coolant adjustment valve (movable side) (size x quantity)	3/8×5	3/8×7	3/8×7	3/8×12	3/8×15	3/8×15	3/8×15	3/8×15
	Required coolant volume (oil cooler) [L/min]	40	40	40	80	80	100	100	100
	Required coolant volume (die cooling)	25~50	30~70	30~70	50~90	50~90	150	150	150~240
Electrical	Motor (hydraulic pump) [kW]	15	22	22	37	37	45	45	45/37
	Motor (die height) [kW]	0.2	0.4	0.75	1.5	1.5	2.2	2.2	3.7
	Motor (lubrication pump) [kW]	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	Power supply capacity [kVA]	25	40	40	60	60	70	70	102
	Power supply voltage [V] (50Hz/60Hz)	AC200/220(±10%)	AC200/220(±10%)	AC200/220(±10%)	AC200/220(±10%)	AC200/220(±10%)	AC200/220(±10%)	AC200/220(±10%)	AC200/220(±10%)
Air	Air connection port [Rc]	1	1	1	1.1/2	1.1/2	1.1/2	1.1/2	2
Other	Machine dimensions (L×W×H) [mm]	4519×1549×2197	5770×1942×2601	6395×2021×2814	7517×2445×2944	7722×2600×2940	9618×2750×3439	9618×2750×3439	13003×3273×4542
	Machine weight [t]	5.0	8.5	13.0	19.0	26.0	33.0	33.0	71.0
	Hydraulic fluid tank capacity [L]	280	360	400	600	600	750	750	1290+400(1690)

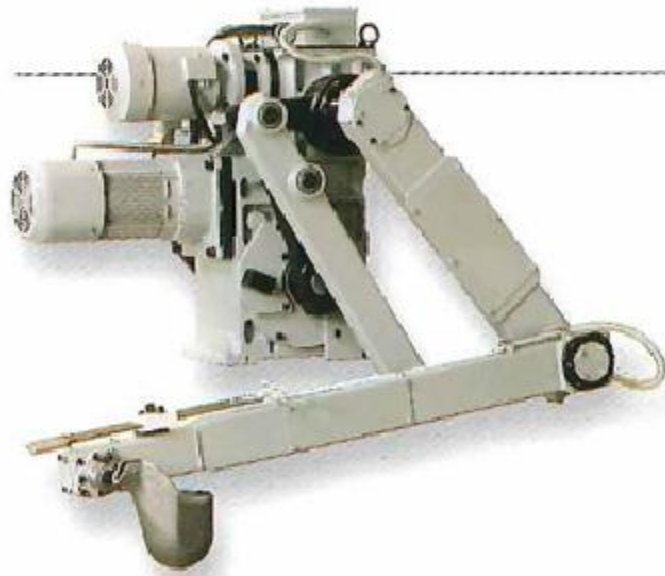
※There are also the special dimension. These specifications are subject to change without notice.



# P

## eripheral Equipment

A robot system is controlled together with a die-casting machine.



### Automatic Ladle KD1-M5 series

With a linkage and full-bearing structure adopted to the driving unit, the automatic ladle can be operated smoothly with a minimum secular change. (\*1)

Model	KD1-15M5	KD1-35M5	KD1-65M5	KD1-100M5	KD1-120M5	
Installed die-casting machine	125V5 EX	250, 350V5 EX	500, 650V5 EX	800, 900V5 EX	1250V5 EX	
Pouring capacity	kg	1.6	3.5	6.0	10.0	20.0
Pouring accuracy	%	±1 (*2)		±2 (*2)		
Ladle	kg	0.4·0.8	250·0.8·1.6·2.5 350·1.6·2.5·3.5	2.5·4.0·6.0	4.0·6.0·8.0	10.0·15.0·20.0
Min-diameter of crucible	mm	450	550	750	750	800
Arm driving motor	kW	0.75		1.5	3.7	
Ladle driving motor	kW	0.4				
Control unit		Integrated control by die-casting machine control panel				
Ladling adjustment system		Digital setting				

(\*1) The chain mechanism is adopted in some area of the equipment.  
(\*2) Under conditions without molten metal runs or ladling residues

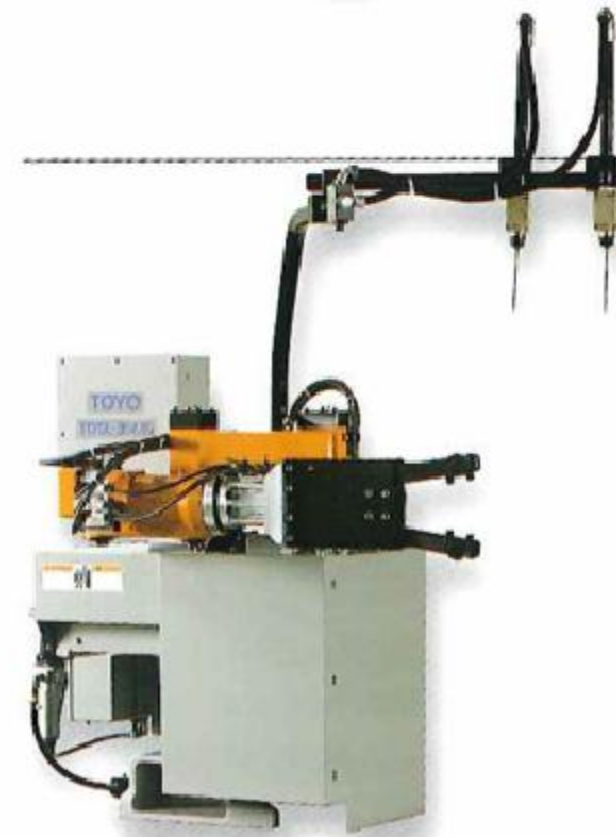


### Automatic Spray SD2-M5 series

The spray control devices are integrated in a dedicated valve box to facilitate maintenance and adjustment.

Model	SD2-15M5	SD2-35M5	SD2-65M5	SD2-80M5	SDM-120M5	
Installation die-casting machine	125V5 EX	250, 350V5 EX	500, 650V5 EX	800, 900V5 EX	1250V5 EX	
Up/down stroke	mm	600	750	950	1050	2255
Back & forth adjustment stroke (*3)	mm	150	200	350	250	300
Swivel angle (helper side)	°	90				—
Spray nozzle copper pipe quantity	pieces	36	32×2	37×2		35×2
Dedicated air blow nozzle copper pipe quantity	pieces	12	20			
Air consumption	NI/min	2500 (*4)				3000 (*4)
Primary air connection size/pressure		Rc1 0.5MPa minimum		Rc1.1/4 0.5MPa minimum		Rc2 0.5MPa minimum
Primary die release agent connection size/pressure		Rc1/2 0.3~0.5MPa				Rc1 0.3~0.5MPa
Control unit		Integrated control by die-casting machine control panel				
Spray time adjustment system		Digital setting				

(\*3) Adjusted by a manual lever (\*4) Measured under Toyo's spray setting conditions



### Automatic Extractor TD5L-M5 series

Smooth and high cycle operation by adoption of a dedicated inverter motor for driving arm.

Model	TD5L-15M5	TD5L-35M5	TD5L-65M5	TD5L-80M5		
Installation die-casting machine	125V5 EX	250, 350V5 EX	500, 650V5 EX	800, 900V5 EX		
Extraction stroke	mm	1020	1400	1800	2089	
Pulling stroke	mm	150	250	250	350	
Pull-out force	N	490				
Clamp diameter	mm	40~60	50~80	60~95	80~120	
Finger turning angle	°	90				
Product detection		Limit switch detection, standard 2 pieces				
Arm actuation	kW	0.4				
Air consumption	l/cycle	6.9	9.8	10	10	
Primary air pressure	MPa	0.4~0.5				
Control unit		Integrated control by die-casting machine control panel				

## Standard and Optional Specifications

●Standard ○Option

Machine name	125	250	350	500	650	800	900	1250
Standard Sleeve length	215	257	292	365	405	445	445	605
Tip joint system	○	○	●	●	●	●	●	●
Specified sleeve diameter	○	○	○	○	○	○	○	○
Bladder type accumulator	●	●	●	●	●	●	●	●
Tip lubrication device	●	●	●	●	●	●	●	●
Tip lubrication mixing system	○	○	○	○	○	○	○	●
Injection area cover (helper side)	●	●	●	●	●	●	●	●
Injection graphic screen display	●	●	●	●	●	●	●	●
Injection monitor function	●	●	●	●	●	●	●	●
Injection condition screen setup	●	●	●	●	●	●	●	●
Injection electric flow control	●	●	●	●	●	●	●	●
Injection condition feedback function	●	●	●	●	●	●	●	●
Low-speed injection device	●	●	●	●	●	●	●	●
Hot sleeve device	○	○	○	○	○	○	○	○
Multi-injection (high-response EH ratio valve)	●	●	●	●	●	●	●	●
Injection force adjustment	●	●	●	●	●	●	●	●
Intensifying time adjustment	●	●	●	●	●	●	●	●
Intensifying accumulator	—	○	○	○	○	○	○	●
Intensifying relief installation (Intensifying force adjustment)	○	—	—	—	—	—	—	—
Intensifying cylinder system	●	●	●	●	●	●	●	●
FL injection system	—	●	●	●	●	●	●	●
High-speed servo valve specification (maximum 5 point setting)	—	○	○	○	○	○	○	○
Automatic lubrication device (toggle area)	●	●	●	●	●	●	●	●
Slide plate system for movable-platen reciprocation	●	●	●	●	●	●	●	●
Die-height adjustment device	●	●	●	●	●	●	●	●
Automatic clamp force setup	●	●	●	●	●	●	●	●
Clamping force automatic adjustment	●	●	●	●	●	●	●	●
Clamping force monitoring function	●	●	●	●	●	●	●	●
Digital load meter (1 piece)	●	●	●	●	●	●	●	●
Tie-bar pull out device (on operation side)	—	○	○	○	○	○	○	●
Chrome-plated tie-bar and guide bar	●	●	●	●	●	●	●	●
Steel plate over die plates	○	○	○	○	○	○	○	○
T-slot on die-plates	●	●	●	●	●	●	●	●
Low pressure die protection system	●	●	●	●	●	●	●	●
Operation side manual safety door	●	●	●	●	●	●	●	○
Operation side automatic safety door	○	○	○	○	○	○	○	●
Helper side safety fence	○	○	○	○	○	○	○	○
Toggle side cover (operator side, helper side)	●	●	●	●	●	●	●	●
Squeeze pin specifications	○	○	○	○	○	○	○	○
Vacuum casting VCS	○	○	○	○	○	○	○	○
Core 1 installation	●	●	●	●	●	●	●	●
Core 2 installation	○	○	○	●	●	●	●	●
Core 3 installation (fixed die plate, helper side)	—	○	○	○	○	○	○	●
Core motion selectable circuit	●	●	●	●	●	●	●	●
Core speed adjustment function	●	●	●	●	●	●	●	●
Core state display function	●	●	●	●	●	●	●	●
Core unit pressure reducing valve	○	○	○	○	○	○	○	○
Taiwa connector	●	●	○	○	○	○	○	○
Nanahoshi metal connector.	○	○	○	●	●	●	●	●

\*The specifications are subject to change without notice.

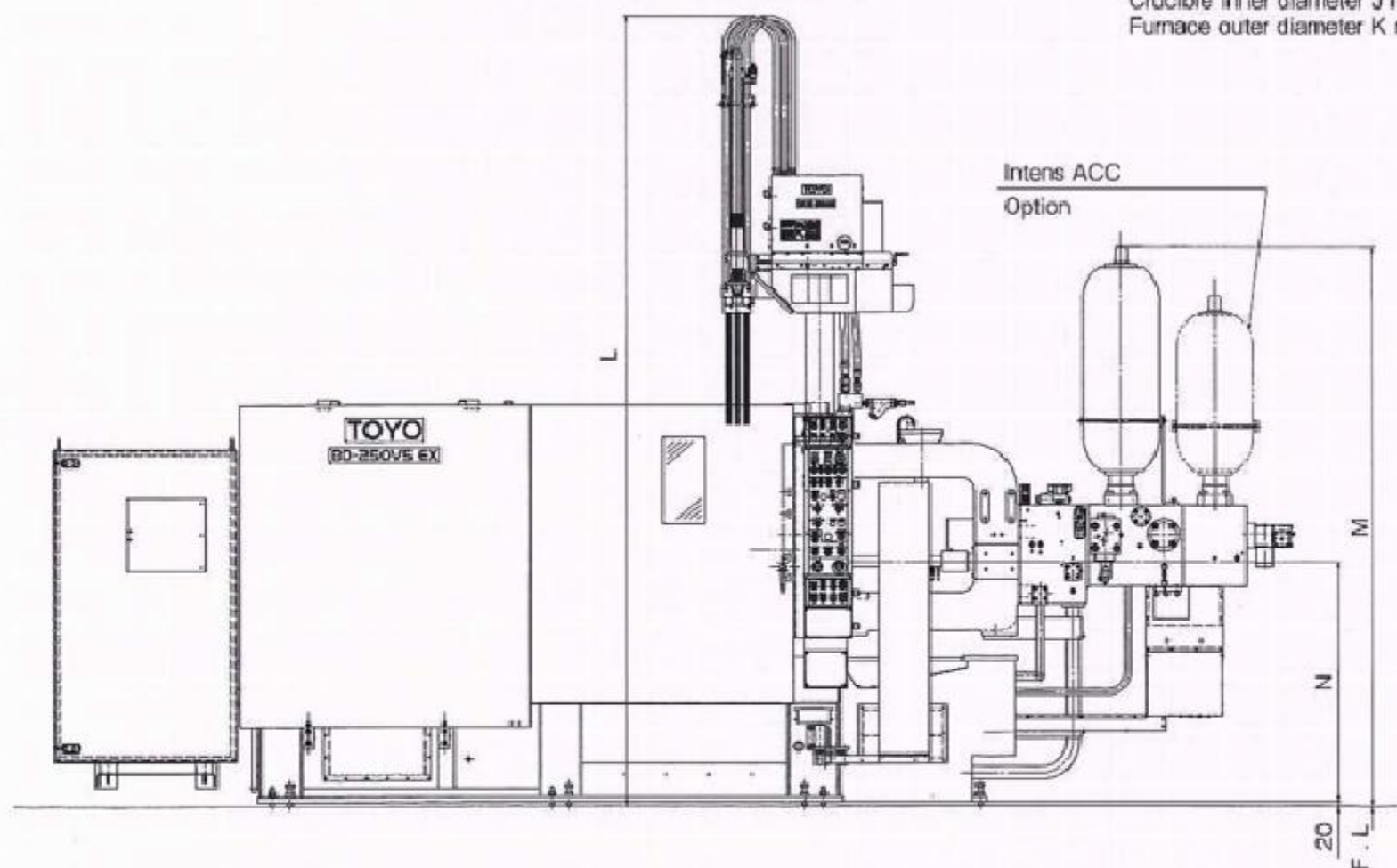
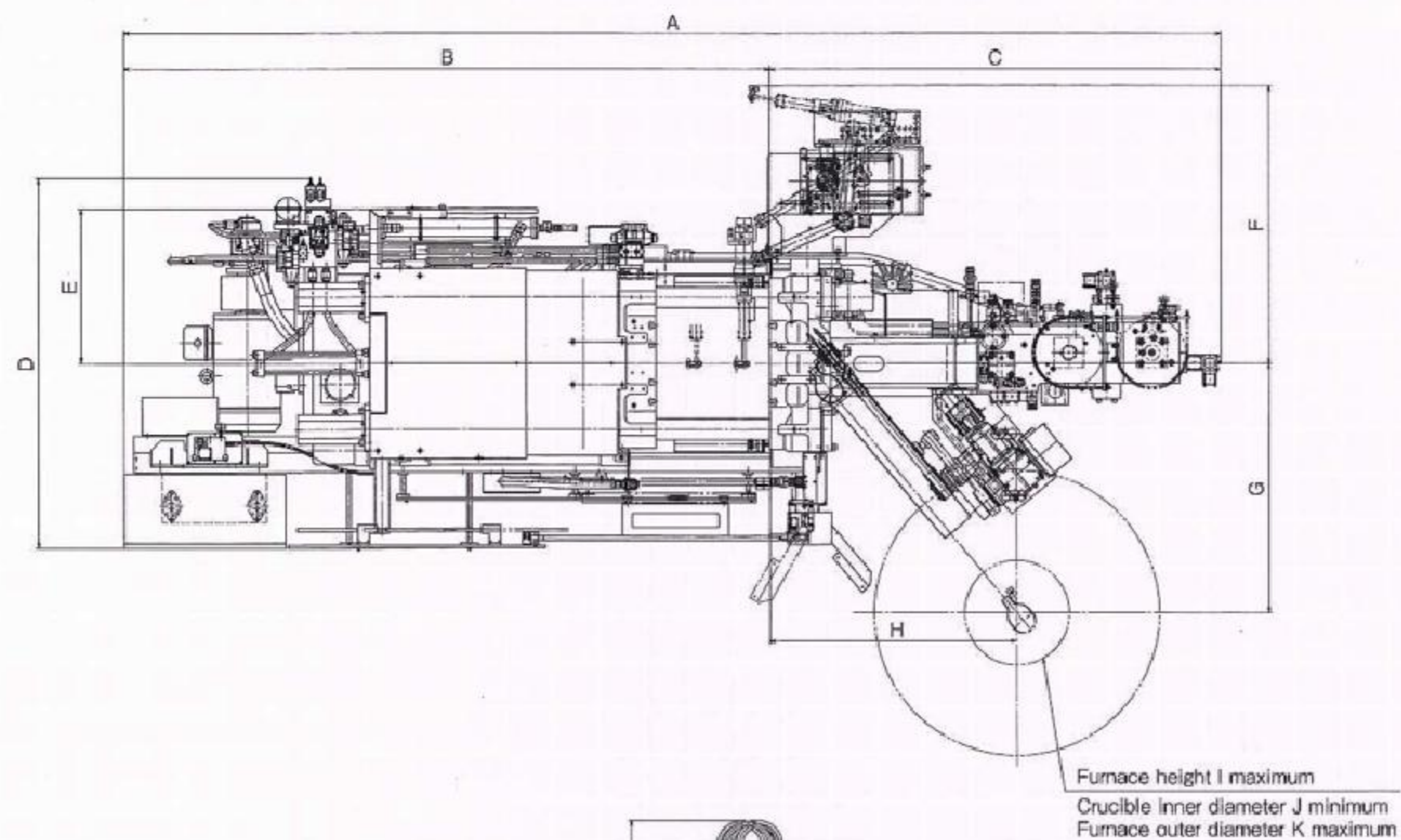
\*1 : In case only casting conditions are stored in Toyo-specified USB memory  
\*2 : For screen display, maximum 32 items can be selected from 64 monitorable items



# Dimensions

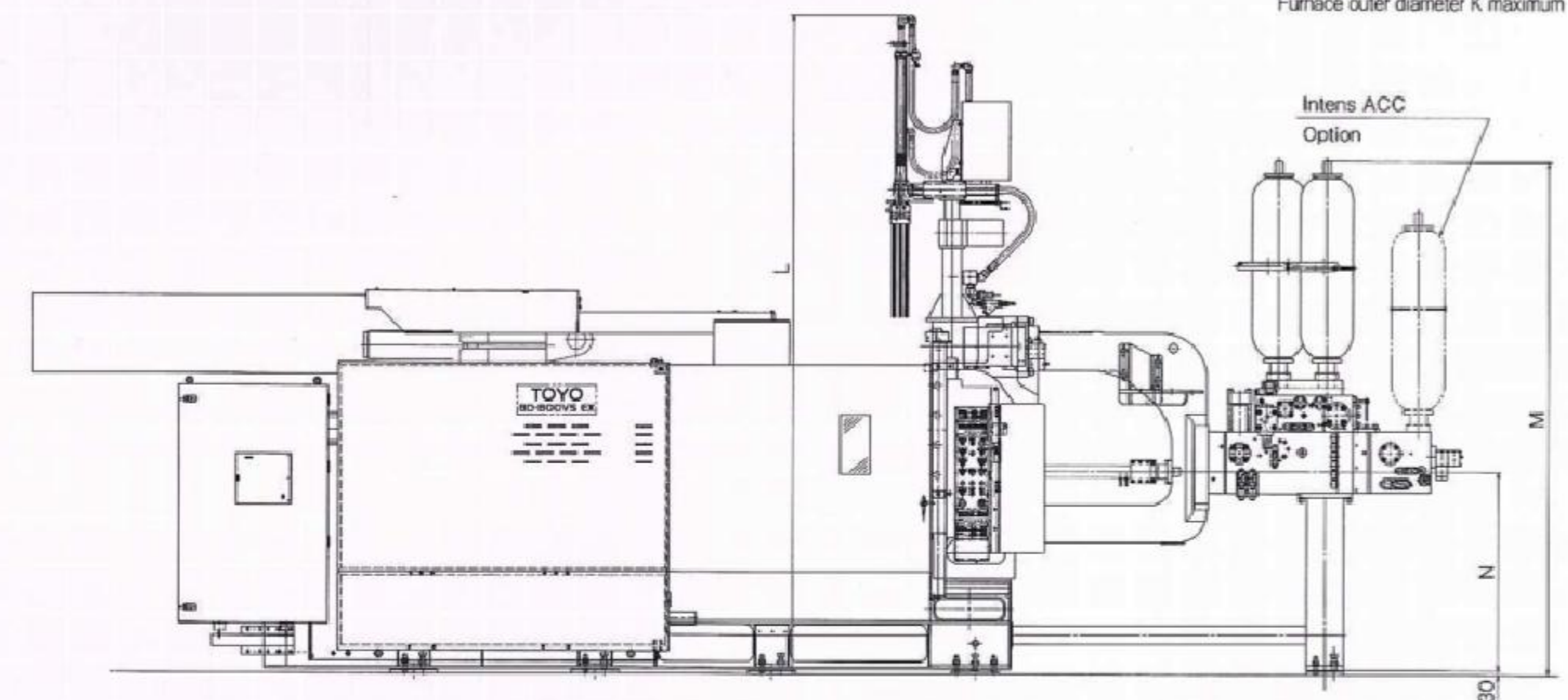
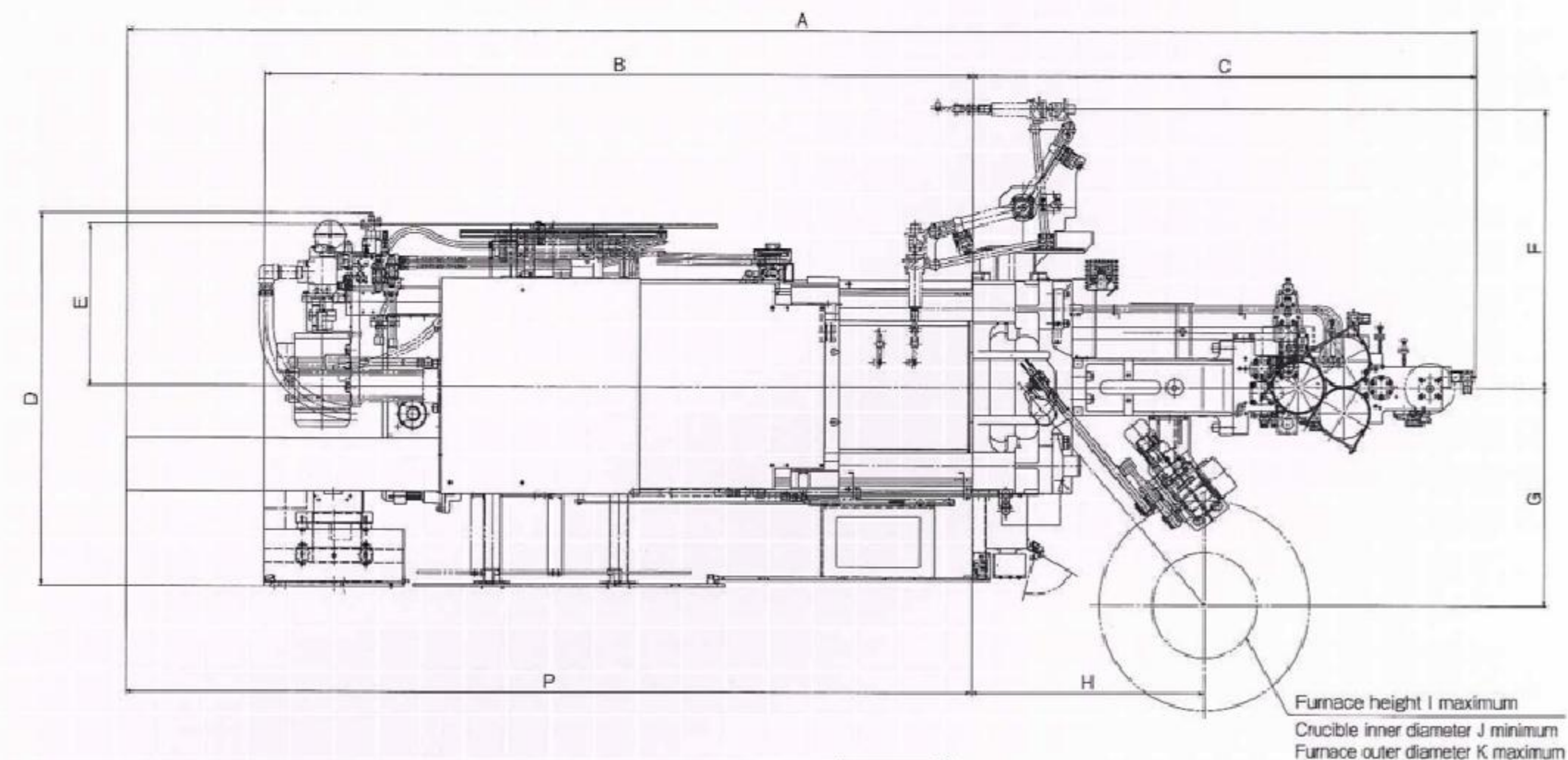
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## BD-V5 EX outside drawing



Machine name	A	B	C	D	E	F	G	H	I	J	K	L	M	N
BD-125V5 EX	4551	2840	1711	1546	701	1073	1190	976	1075	450	1200	3214	2187	1055
BD-250V5 EX	5770	3395	2375	1942	811	1457	1280	1280	1125	550	1500	3672	2601	1117
BD-350V5 EX	6395	3775	2620	2016	873		1280	1310	1150			3785	2814	1142

- The value unit is mm, unless indicated otherwise. ●The specification values are subject to change without notice.
- This diagram shows BD-250V5 EX.

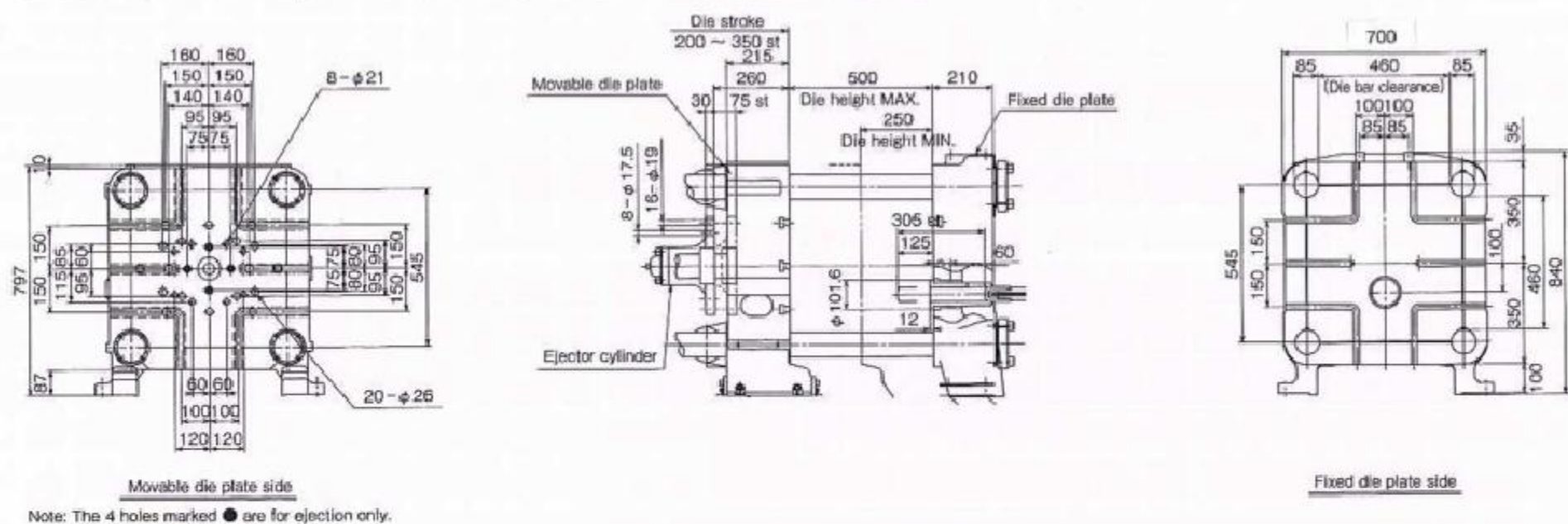


Machine name	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
BD-500V5 EX	7517	4320	3197	2445	1100	1801	1433	1497	1190	750	1400	4198	2944	1170	-
BD-650V5 EX	7722	4520	3202	2600	1115	1801	1433	1537	1186	750	1400	4299	2940	1166	-
BD-900V5 EX	9618	5040	3592	2750	1142	1982	1550	1662	1300	750	1500	4409	3439	1330	6026
BD-900V5 EX															
BD-1250V5 EX	13003	6400	5536	3273	1396	-	1740	2240	1400	800	1700	5623	4542	1410	7467

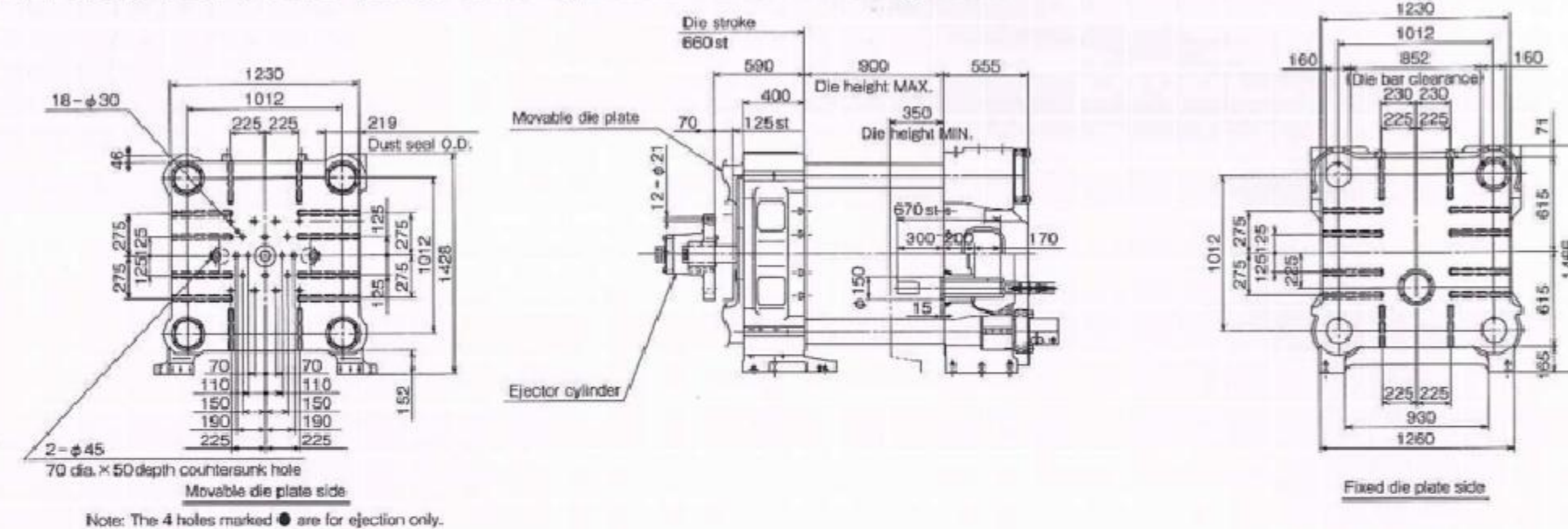
- The value unit is mm, unless indicated otherwise. ●P is the dimension with the tie-bar pull device.
- The specification values are subject to change without notice. ●This diagram shows BD-800V5 EX.



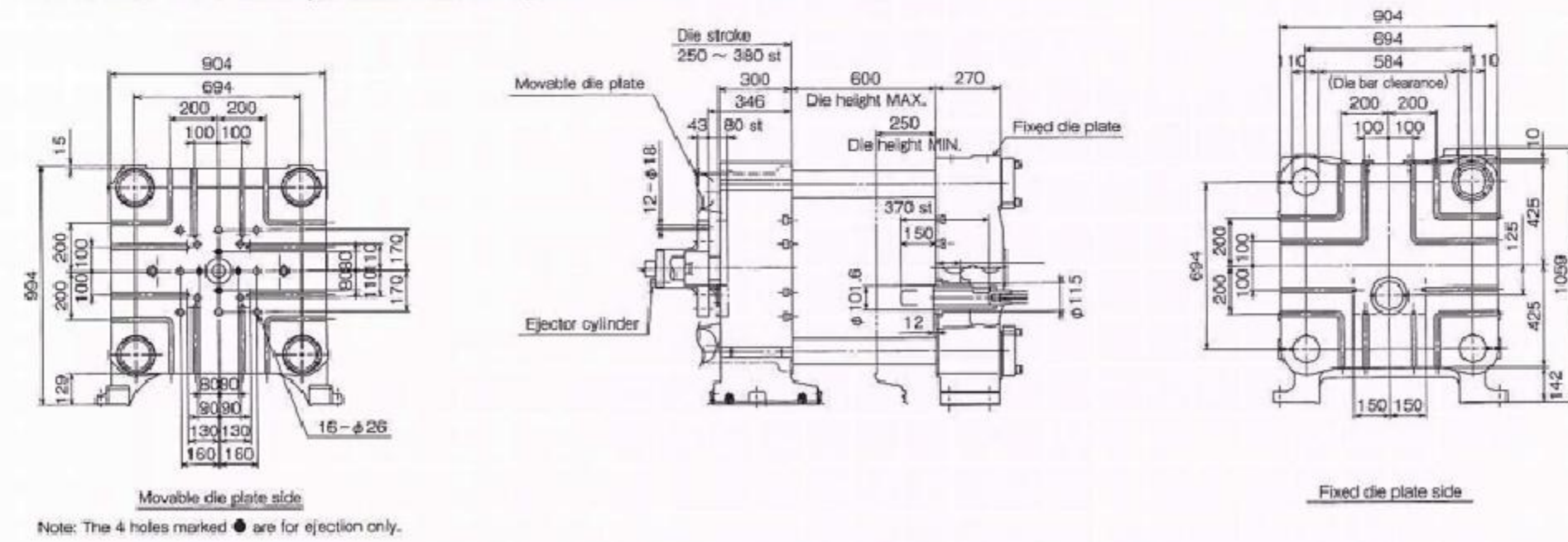
BD-125V5 EX die plate and ejector related diagram



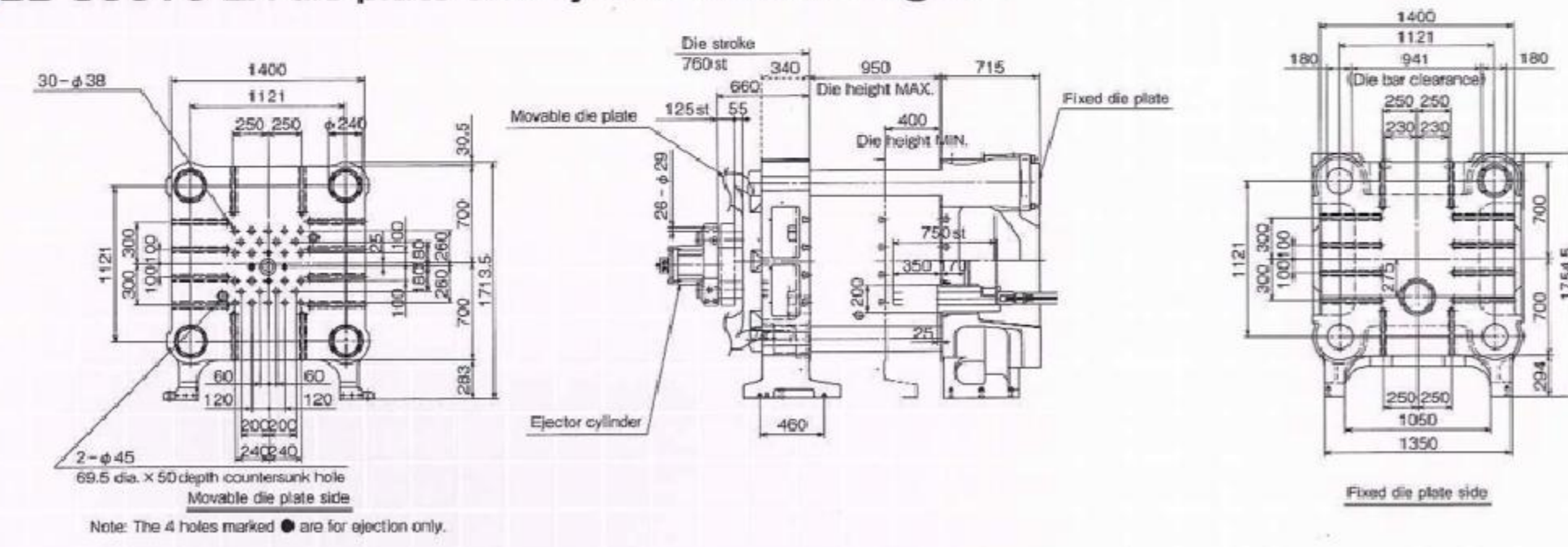
BD-650V5 EX die plate and ejector related diagram



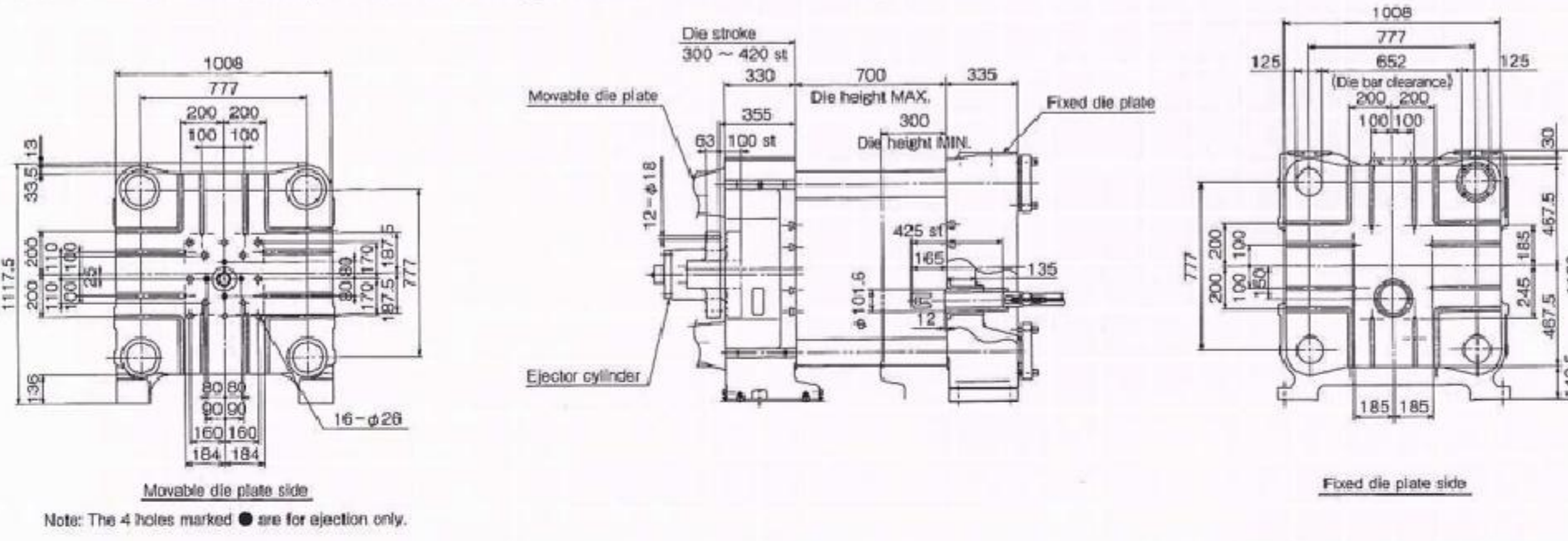
BD-250V5 EX die plate and ejector related diagram



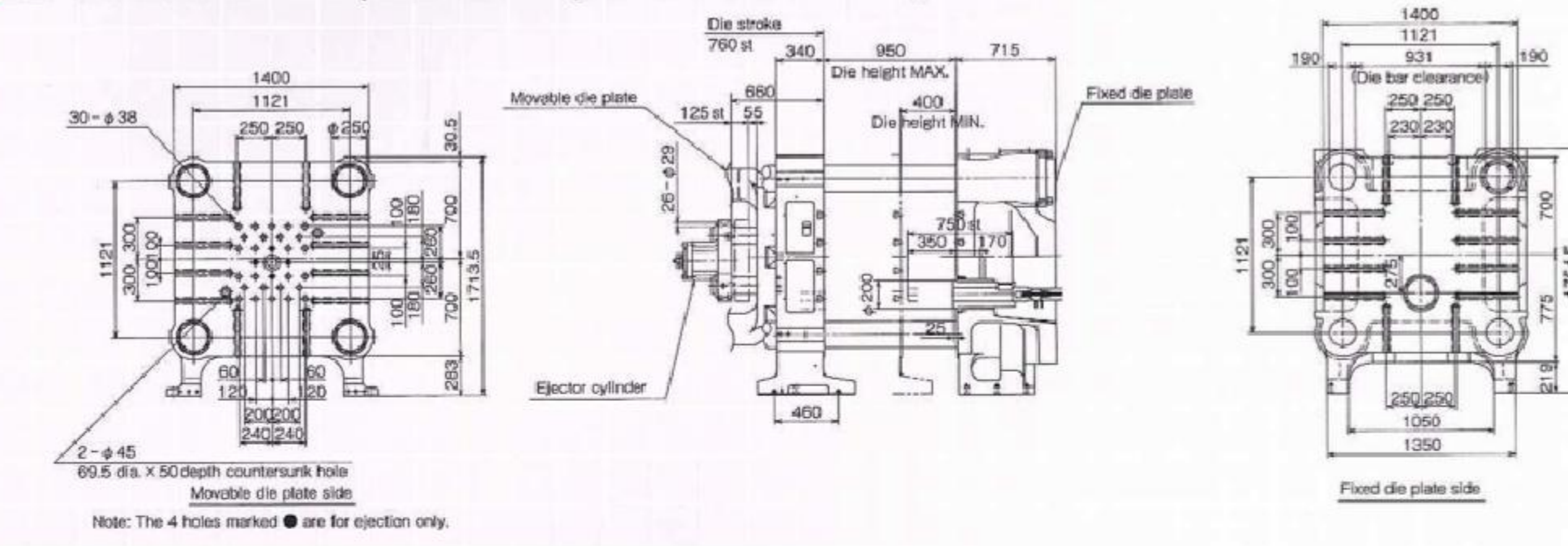
BD-800V5 EX die plate and ejector related diagram



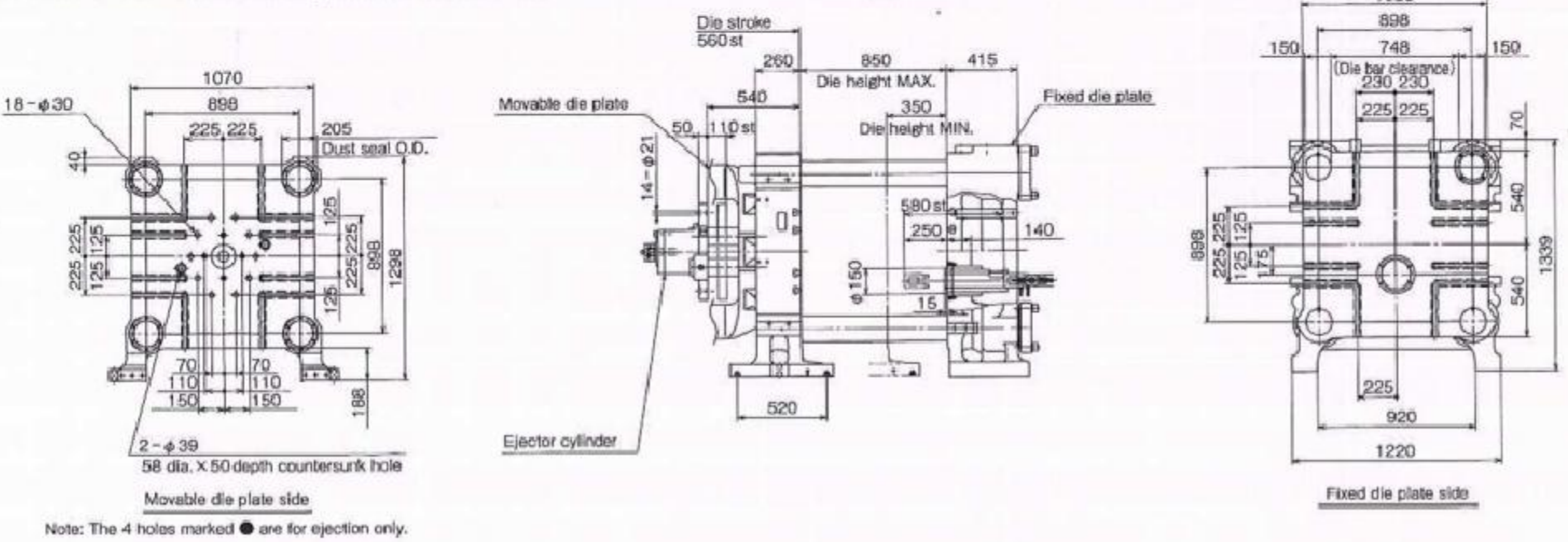
BD-350V5 EX die plate and ejector related diagram



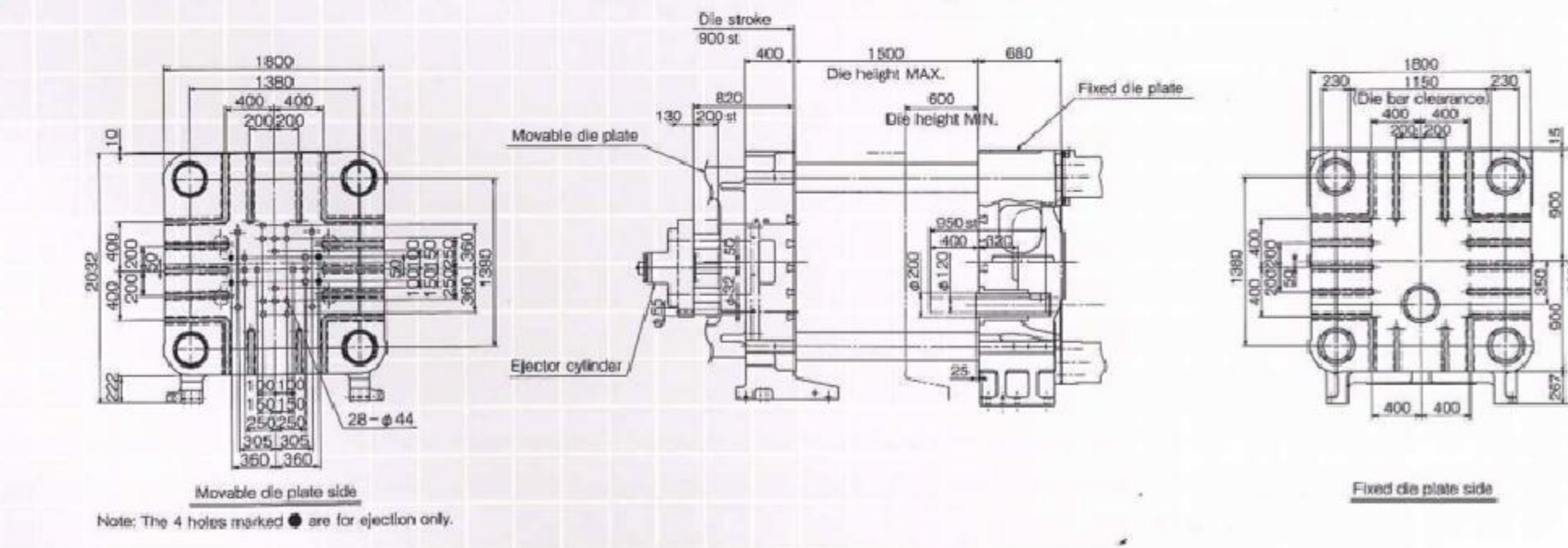
BD-900V5 EX die plate and ejector related diagram



BD-500V5 EX die plate and ejector related diagram



BD-1250V5 EX die plate and ejector related diagram

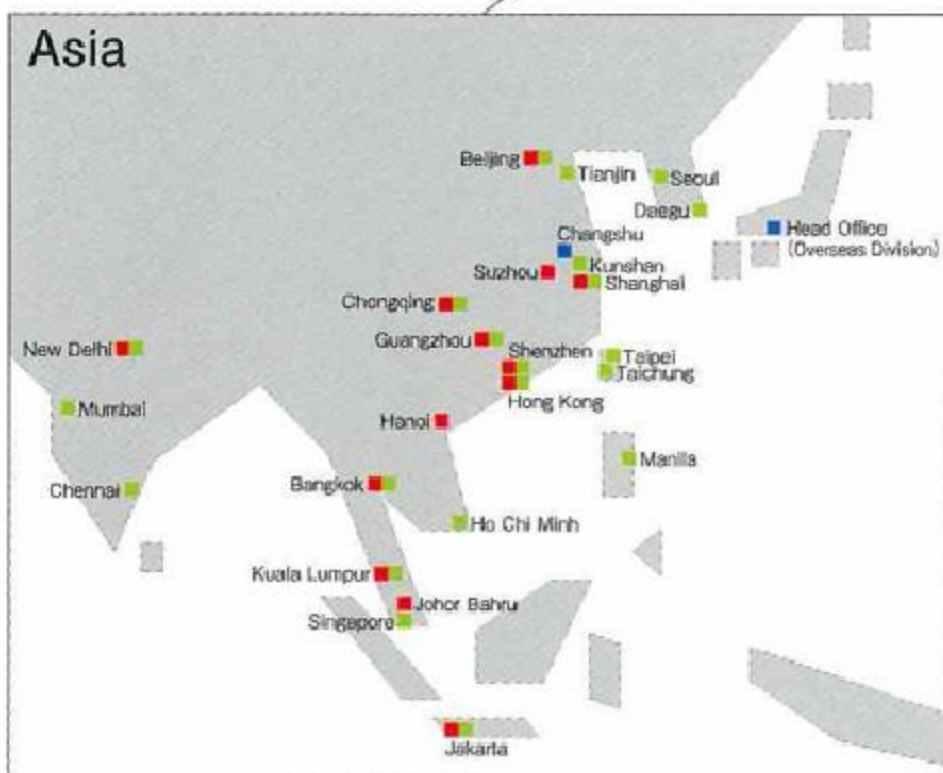
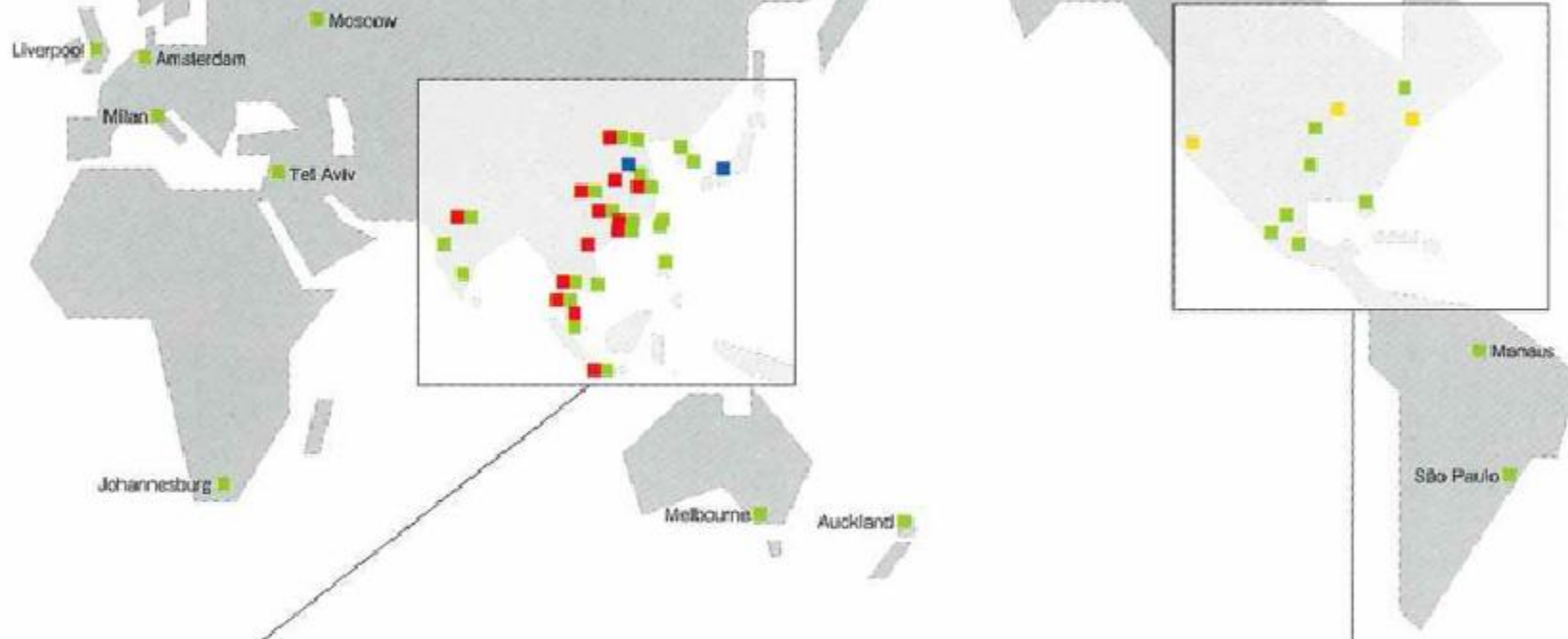




Die Casting Machine

# BD-V5 EX series

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 **Caution** 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.

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- 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.
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