

TOSHIBA MACHINE

A large, three-dimensional, metallic-looking letter 'J' is the central focus of the advertisement. It has a greenish-blue gradient and a reflective surface. The words 'DIE CASTING MACHINE' are printed across the middle of the 'J' in a gold, sans-serif font.

DIE CASTING MACHINE

DC250

DC350

DC500

DC650

DC800

J-MS

Multistage Injection as Standard

**The Times have Changed from Logic to Servo.
The Machine with Multistage Injection
as Standard Makes its Debut!**

DC J-MS

The hydraulic servo technology cultivated through J-MT and CL-HT machines is now applied to the standard machine. In addition, it is loaded with the new TOSCAST, making its debut as a new-standard machine!

Having expanded its capability from conventional two-speed control of low speed and high to the flexible acceleration/deceleration one by hydraulic servo and increased the high speed by about 30% or more, the ample performance of the J-MS machine, with the super-low-speed injection, the whole area real-time feedback control and the high-responsiveness injection that outclasses other companies, will surely become the best partner essential to Customer's good-part making.



Photograph shows a DC800J—MS machine equipped with servo injection as standard.

NEW

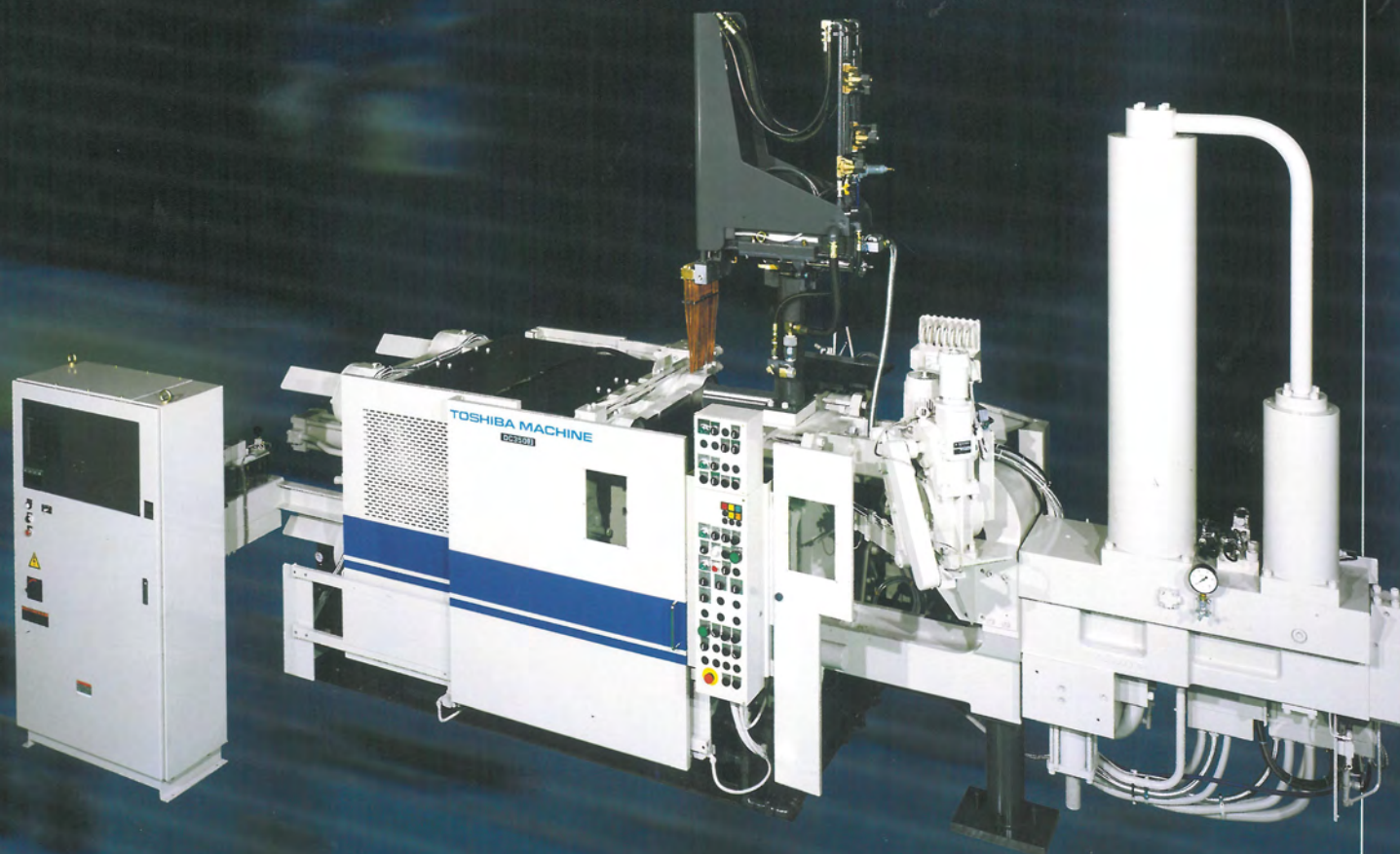
**DC500J-MS
DC650J-MS
DC800J-MS**

DC J-MS
Multistage Injection
as Standard

NEW

DC250J-MS
DC350J-MS

Photograph shows a DC350J-MS machine equipped with servo injection as standard.

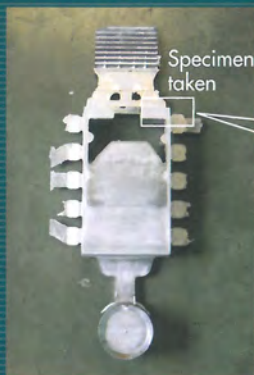


A New-Standard Machine Equipped with hydraulic Servo Injection as Standard

It has been half a century since Toshiba Machine built the Japan's first die-casting machine in 1953. Now we gather the technology to create the future of die casting and assure all die casters of further technological innovation by equipping as standard the shot end with the hydraulic servo control system that has achieved high flow rate and high responsiveness.

Blowhole porosity and non fill in die castings

Why does blowhole porosity occur in a die casting? It is because air in the die cannot get out during the high-speed filling and is entrapped inside the casting; in addition, the pressure cannot reach and squeeze the entrapped gas. On the other hand, securing the external quality requires certain degree of high speed, which calls for acceleration period prior to itself. If the acceleration performance is not good enough, the high-speed start must be positioned sooner, but then the gas entrapment is subject to increasing.



Gas makes porosity



Gas compressed successfully



It is important on die casting to reduce the gas entrapment by using an appropriate high-speed length and to transmit the pressure onto the product firmly.

Flash on Die Cast Product

To complete the filling with the metal in a more liquefied state, the shot speed must be increased. However, with the shot speed increased too much, flashes will be generated; production cannot be achieved.

What is important for die casting from now is the compatibility: short time filling and flash-free.



Cultivated Servo Shot Control Technology

The servo shot enables multistage control in the whole injection process including not only low speed but also high speed and achieves the output force that will not yield to the metal-filling resistance.

Only servo injection system can offer output force that matches with various filling resistance.

Servo valve with high reliability

The high flow rate/high responsiveness hydraulic servo valve, which J-MS is equipped with as standard achieves stable injection operation even under harsh environment.

Voice coil type pilot servo valve

High responsiveness

High contamination resistance

Two-way main servo

No adjustment

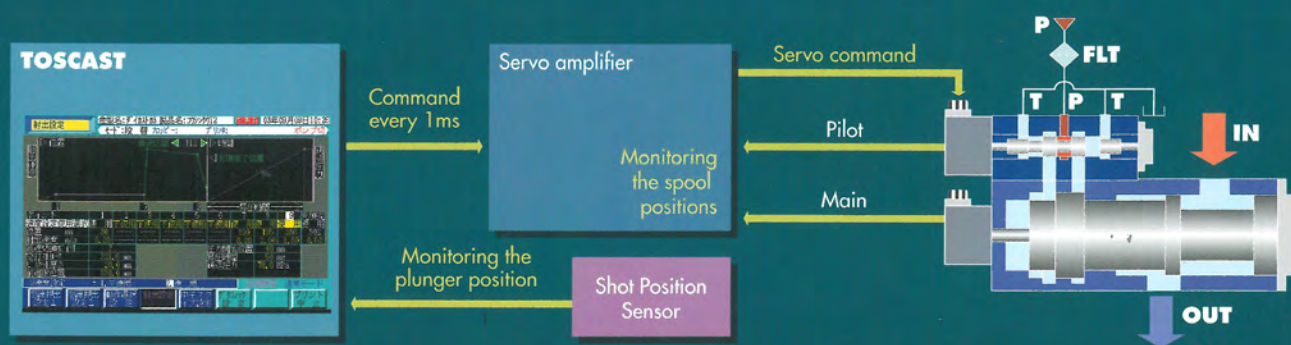
Safe

Stability

Little secular change

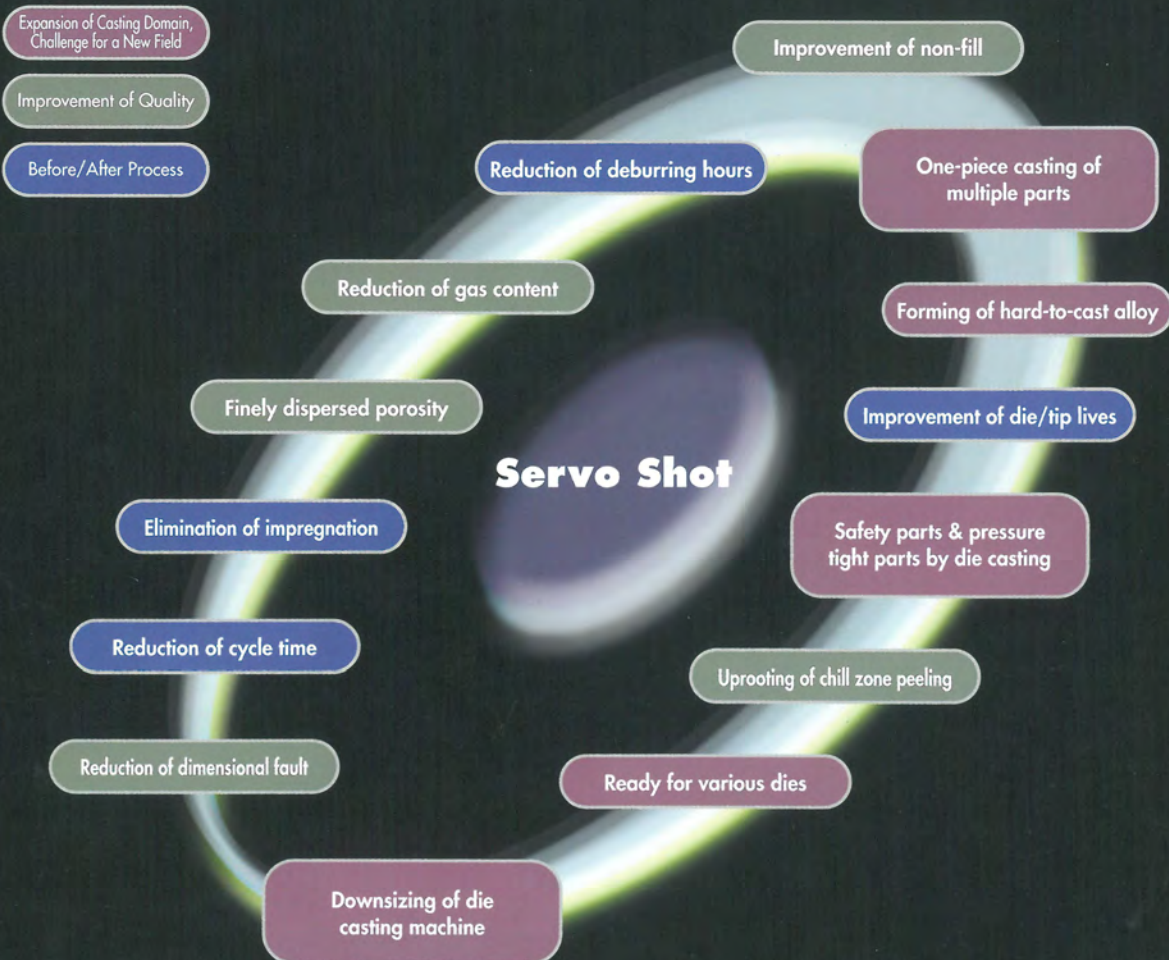
Servo Valve Control for J-MS

The servo valve detects/controls its spool position during injection so that the actual shot motion may not run off the command. In addition to this real-time feedback control, the learning control function, which corrects the command setting based on the measurement result of previous shots to enhance the following ability, is added to achieve further sophisticated injection motions.



Toshiba Machine's Servo Injection Will Meet Various Customers' Demands For Die Casting.

DC J-MS
Multistage Injection
as Standard



The merit of die casting method

The merit of die casting method is that it can form a product of complex shape in one process when molding from liquid material.

Toshiba Machine believes firmly that the achievement of servo shot control in the high-speed domain enables Customer to cast a wider range of parts.

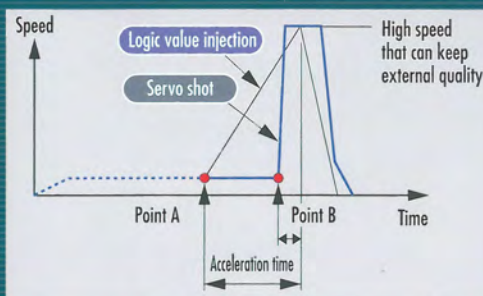
We hope to be able to help Customer to challenge for a new field with the Toshiba Machine's servo injection.

The Multistage Injection for Next Generation Begins.



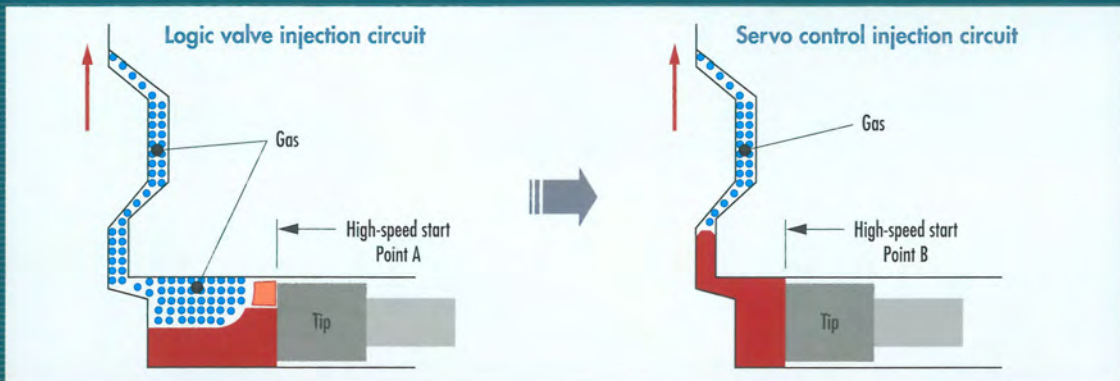
Without the acceleration/deceleration functions ready for various dies, new-generation die casting cannot be achieved!
The servo valve-aided multistage injection covering the whole process from low speed to high is the very standard from now!

The reduction of gas content is expected due to flexible injection operation!!



The high-speed length needs to be made shorter to reduce the gas entrapment. The servo-controlled injection circuit with its outstanding acceleration performance can make the high-speed length minimal. In addition, the whole process real-time feedback & learning control make shots with fidelity to the speed setting without being affected by gate etc.

In short, the servo shot die-casting machine can minimize the gas content inside a product without sacrificing its external quality.



The servo-shot flash-free casting is different here!!

Various deceleration patterns by servo valve



If high speed is raised to shorten the filling time, it tends to generate a flash.

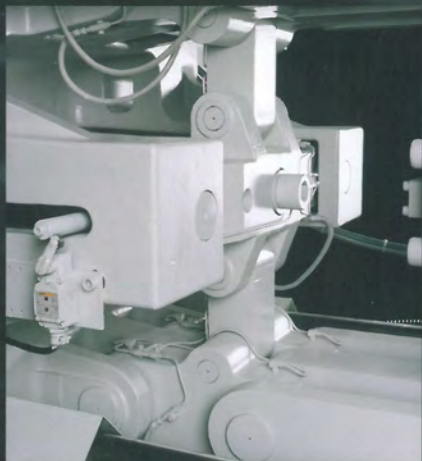
The ON-OFF control in a conventional logic valve injection system cannot achieve appropriate deceleration because its timing is set only by position.

The servo-shot die-casting machine does have a deceleration function.

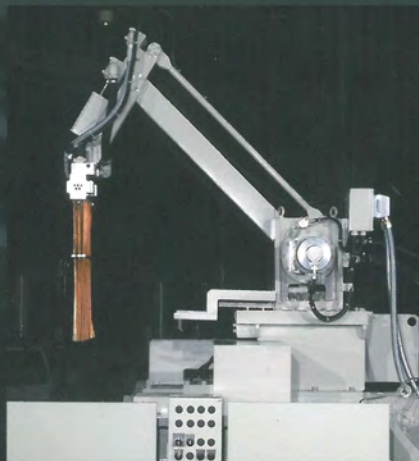
The servo valve loaded on J-MS can be controlled even during the high-speed shot operation, enabling various deceleration patterns.

The J-MS can achieve deceleration appropriate for various casting.

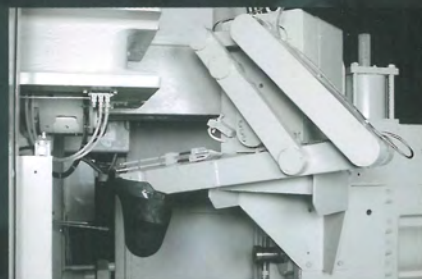
Productivity



The 250ton and 350ton machines, having adopted various multiple motions and a toggle mechanism that made a new departure from the CL series, have reduced their cycle time in fully automatic operation by 25%.



The 500ton, 650ton and 800ton machines have achieved a reduction of cycle time by employing the automatic devices loaded with newly developed high-function servomotors.



Setting Up Ease

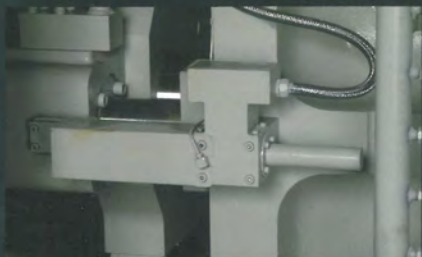
Batch loading/setting of injection, die-closing and ejection conditions are possible by TOSCAST.

The 250/350ton machines have ejection guide bars built-in, making the ejector area open for easy setting up work.

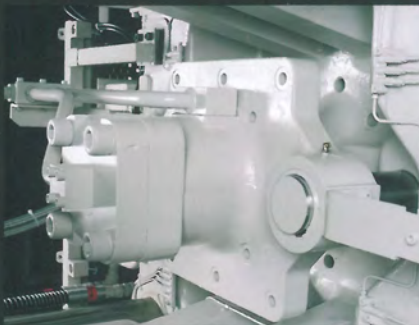
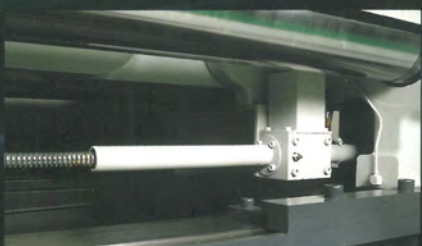
All the T-slots on platens are machined for easy die-clamping work.



Die-locking load sensor (photograph shows a DC350J-MS machine)

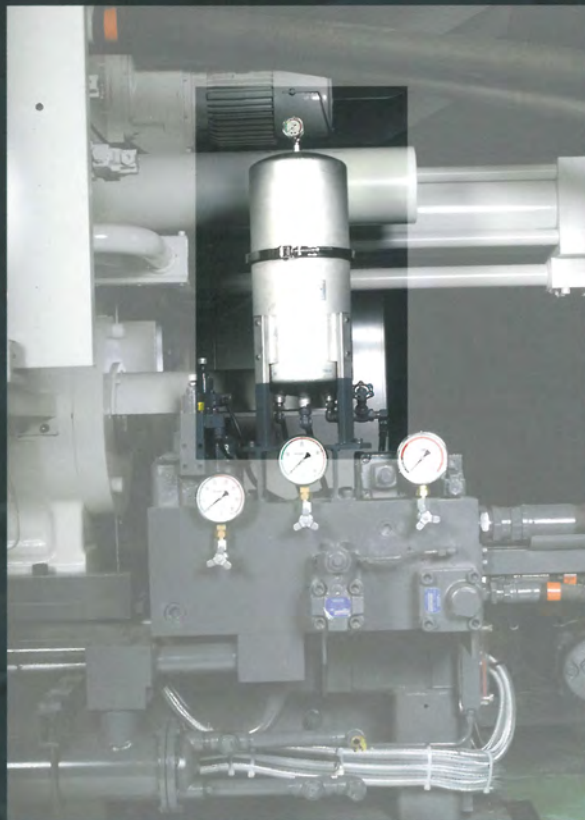


Ejection sensor

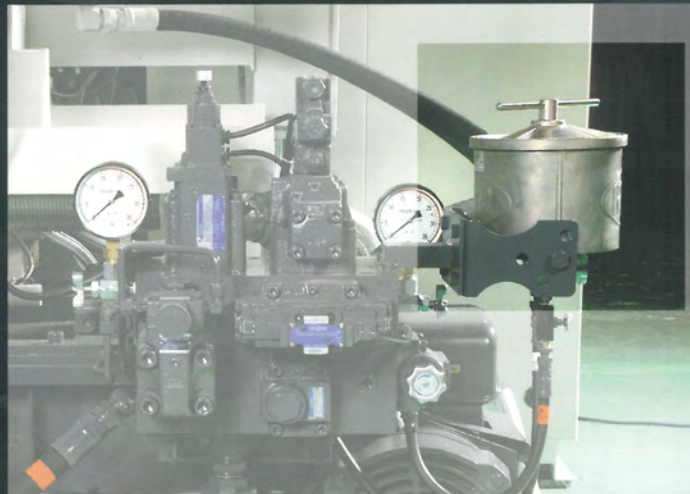


Maintenance Ease

DC J-MS
Multistage Injection
as Standard



(photograph shows a DC800J-MS machine)



(photograph shows a DC350J-MS machine)

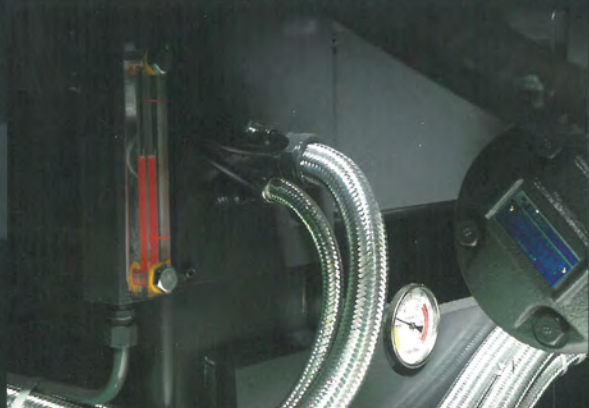
An oil cleaner is included as standard, protecting the hydraulic equipment/component from hydraulic oil contaminations.



(photograph shows a DC350J-MS machine)

Automatic oil lubrication of a fixed distribution system is provided for the toggle area lubrication. It is designed to collect the waste lubricating oil in one spot for discharge.

The hydraulic oil level and temperature gages are installed in easy-to-read positions, making the management simple.



Technical Support

Toshiba Machine will help customers having such wishes as - "want to use the newest servo shot die casting machine efficiently to achieve a challenge for further upgraded technology, improved quality and/or a new field".

DC School

The DC school, being held six times a year, covers the history of die casting, casting theory, how to read casting profiles, actual casting practice using a machine and lectures for maintenance work. Not just knowing of Toshiba Machine's know-how, but also technical exchange among the customers who are engaged in die casting in various types of industry is active. Those who participate the DC school can always obtain new technology.



Casting Trial

Customer is to bring the die; Toshiba Machine is to carry out the die-casting trial with its newest powerful machine. Having managed more than 50 casting trials a year, the sales engineers with the knowledge of casting technology in the world will provide complete customer support. In addition, they can also handle special die casting such as high-vacuum die casting, special material casting or casting using Squeeze Master.



Casting Support

In order for Customer, who has introduced the die-casting machine, to make the most of the machine's performance, our sales engineer visits and implements directly consulting support for casting. We devote ourselves to the profit of various Customers either inside Japan or outside.



Consulting

L O N G E V I T Y S H O T S L E E V E

Cermet Sleeve

Compared with conventional sleeves of SKD materials, the life span is longer. It contributes to stabilization of quality.



The "J-MS" Type Loaded with New TOSCAST (Die Casting Machine Total Control System) Aimed at Future Open Network Systems

DC J-MS
Multistage Injection
as Standard

The J-MS series, equipped with new TOSCAST, has enhanced its operational ease and high performance.

The expanded function* for host communication and the provision for LAN* enrich the centralized control function, making the machine that should be recommended to those who are looking for new models of die-casting production in the future.



Various conditions for casting can be set, and the batch loading is possible.



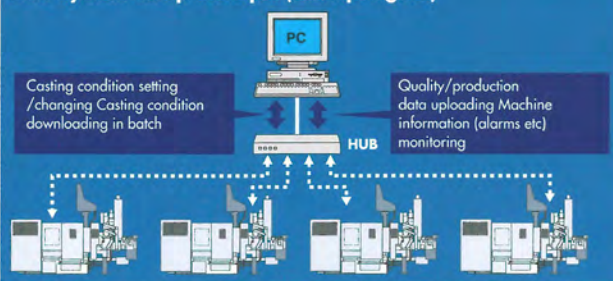
TOSHIBA MACHINE's long-time accumulated know-how is now applied to theoretical calculations, making them more practical.



Shot profiles and machine motions can be displayed; alarms and their output methods can be set.

Note: *option

LAN System Setup Example (concept figure)



A 32MB memory card has been adopted, making its memory capacity more than 20 times the ones adopted so far.



Touch panel keys are adopted for the operation, making it possible to input just by touching softly.

Reliable Automated Devices to Support Quick Cycles(Optional)

For Small Size Machines



Automatic Ladle Device For DC250/350J-MS

The inverter control has enabled a smooth and high-precision pouring motion.

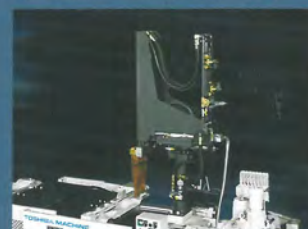
For Small Size Machines



Product Take-out Device For DC250/350J-MS

Adoption of the link mechanism and the inverter control has enabled the smooth move-in/take-out motions.

For Small Size Machines



Automatic Spray Device For DC250/350J-MS

Adoption of the new spray head has enabled the fine atomization of die lubricant.

For Medium Size Machines



Automatic Ladle Device For DC500/650/800J-MS

The servo control has increased the loading accuracy by two times.

For Medium Size Machines



Product Take-out Device For DC500/650/800J-MS

The servomotor-driven speed and acceleration/deceleration smoothness.

For Medium Size Machines



Automatic Spray Device For DC500/650/800J-MS

Adoption of the servo-driven up/down mechanism has reduced the cycle time.

User's Selection to Make the Most of the Function of J-MS

J-MS Standard Specification/Optional Specification

Specification item		DC250~350J-MS		DC500~800J-MS	
		Standard	Optional	Standard	Optional
Die-closing	1 Machined T-slots on platens (fixed/movable)	●		●	
	2 Toggle auto lubrication (fixed amount with alarm)	●		●	
	3 Automatic die-height adjustment device	●		●	
	4 Moving foot adjustment system	●		●	
	5 Digital load meter (one spot, shown on TOSCAST)	●		●	
	6 Automatic die-locking force adjustment	●		●	
	7 Tie-bar draw-out device on upper operator side		●		●
	8 Tie-bar chromium plating		●		●
	9 Wear-plate mounting on platens		●		●
	10 Provision for die support mounting		●		●
	11 Die support (spacer system)		●		●
	12 Ejector plate clamping (H bar system)		●		●
	13 Pouring start LS (for Toshiba Machine made ladler)	●		●	
	14 Take-out start LS (for Toshiba Machine made one)	●		●	
	15 Automatic control of injection conditions	●		●	
Injection	2 Servo control injection	●		●	
	3 Short-sleeve specification	●		●	
	4 Batch loading of casting conditions (64 dies)	●		●	
	5 Long-sleeve specification		●	●	
	6 Low speed/high speed acceleration time adjustment	●		●	
	7 Automatic injection force adjustment system	●		●	
	8 Piston type accumulator	●		●	
	9 Intensification accumulator				●
	10 Additional injection limit switch for vacuum		●		●
	11 Addition of push button switch for injection		●		●
	12 Addition of foot switch for injection		●		●
	13 ASME code (gas accumulator change)		●		●
	14 Shot end waste oil receiving tray		●		●
	15 Short shot for high-speed start position		●		●
Core	1 Core sequence free selection circuit	●		●	
	2 Core spray circuit (with Toshiba Machine sprayer)	●		●	
	3 Movable-side core 1 set	●		●	
	4 Movable-side core additional 1 set		●		●
	5 Movable-side core additional 2 sets		●		●
	6 Fixed-side core additional 1 set		●		●
	7 Fixed-side core additional 2 sets		●		●
	8 Addition of reducing valve for movable core		●		●
	9 Addition of movable-core ports (offside center)		●		●
	10 Squeeze-compatible circuit for movable core-1		●		●
	11 Additional circuit dedicated to squeeze (movable)		●		●
Hydraulic&Water	1 Ejection position automatic control	●		●	
	2 Fire-retardant hydraulic fluid specification	●		●	
	3 Provision for mineral oil based hydraulic fluid		●		●
	4 Die cooling water adjusting valve (7 fixed/8 movable)	●		●	
	5 Die cooling water recovery box (fixed platen offside)	●		●	
	6 Glycerin-filled pressure gage		●		●
	7 Hydraulic oil temp gage (with an upper limit contact)		●		●
	8 Automatic cooling water supply valve for oil cooler		●		●
	9 Addition of hydraulic oil level lower limit alarm		●		●
	10 Oil cleaner	●		●	
Safety	11 Magnetic separator	●		●	
	12 Increased oil cooler capacity		●		●
	13 Reduced-pressure ejection circuit	●		●	
	1 Operator side manual type door		●		●
	2 Toggle side covers (operator side/helper side)		●		●
	3 Injection end cover (operator side)	●		●	
	4 Injection end cover (helper side)		●		●
	5 Helper side fence		●		●
	6 Ladle path chute		●		●
	7 Die-opening limit safety hook	●		●	
	8 Emergency stop buttons (two places)	●		●	
	9 Anti-repeat circuit (die-closing pushbutton check)	●		●	
	10 Control panel door with interlock		●		●
	11 Control panel door handle with lock & key	●		●	
	12 Operator side manual type door (facilitating core)		●		●
	13 Operator side automatic door (self-standing type)		●		●
	14 Helper side manual door		●		●
	15 Helper side automatic door (self-standing type)		●		●
	16 Photoelectric tube safety device		●		●
	17 Ratchet type safety hook		●		●

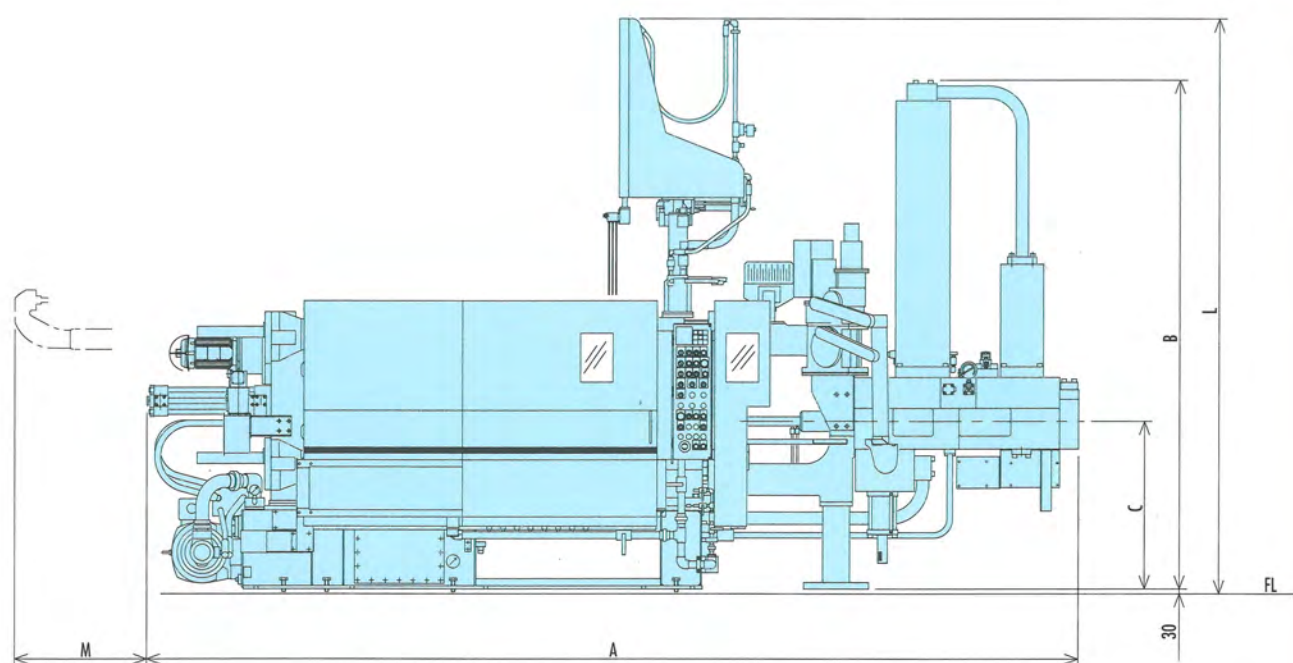
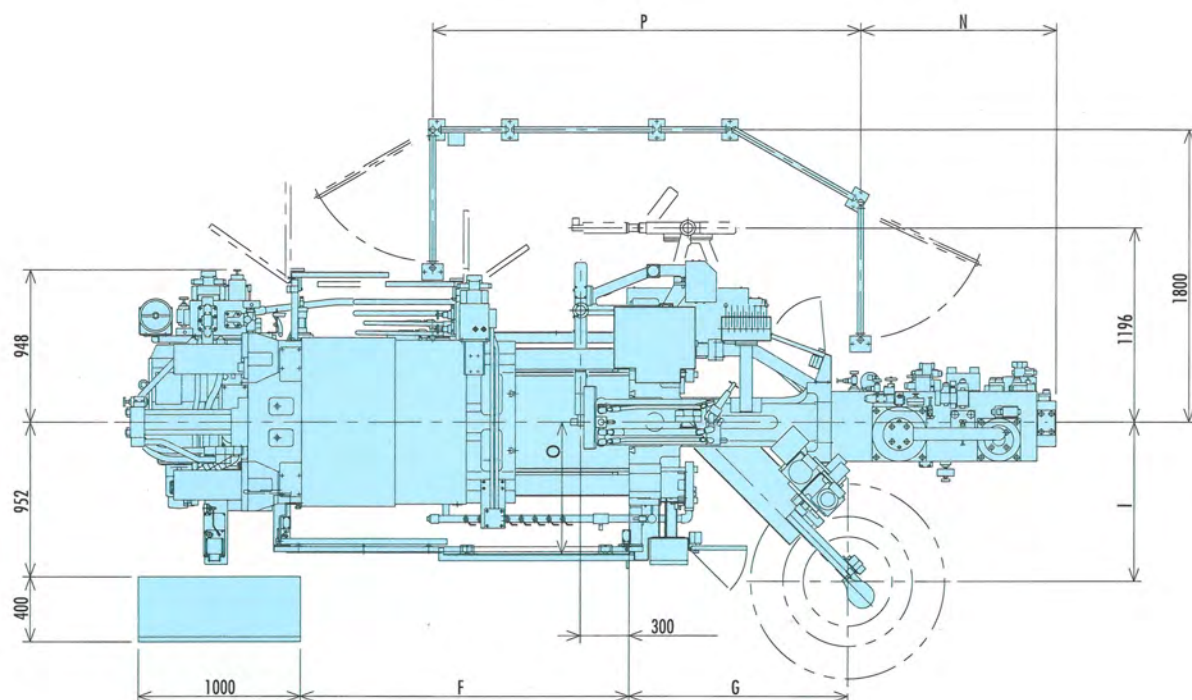
Specification item		DC250~350J-MS		DC500~800J-MS	
		Standard	Optional	Standard	Optional
Controls	1 Die casting machine total control system (TOSCAST)	●		●	
	2 Programmable logic controller (TC200)	●		●	
	3 Indication of LS faults	●		●	
	4 Casting preparation mode switch	●		●	
	5 Take-out-avoiding-die spray start (for Toshiba devices)	●		●	
	6 Startup control	●		●	
	7 Ladle fine tilt at fwd limit (Toshiba Machine made ladler)	●		●	
	8 Pictorial symbol/Japanese on operation nameplates	●		●	
	9 Fully automatic circuit		●		●
	10 Interlocks for other maker's automatic devices		●		●
	11 Interlocks for other maker's robot		●		●
	12 Y-△ start		●		●
	13 Totally enclosed outer fan motor	●		●	
	14 Partite on top of control panel	●		●	
	15 Provision of outlet (100V) on control panel	●		●	
	16 Power supply/voltage change	●		●	
	17 Earth leakage breaker	●		●	
	18 Temperature monitor specification	●		●	
	19 Heat exchanger in control panel	●		●	
	20 Air conditioner in control panel	●		●	
	21 Lighting equipment inside control panel		●		●
	22 Personal computer programmer		●		●
	23 Printer-connecting cable for TOSCAST	●		●	
	24 Printer for TOSCAST		●		●
	25 Printer cable for TOSCAST		●		●
	26 Handy programmer for TC200		●		●
	27 TOSCAST Japanese specification	●		●	
	28 TOSCAST other language spec (English,Chinese,Korean)		●		●
	29 Provision for Squeeze Master (SQM)		●		●
	30 Provision for CASTVIEW (DPM)		●		●
	31 Provision for vacuum device (DVF)		●		●
Time&Counter	1 Die opening (die timer)	●		●	
	2 Ejection delay	●		●	
	3 Ejection return	●		●	
	4 Injection return	●		●	
	5 Ladle in furnace (for Toshiba Machine made ladler)	●		●	
	6 Fine tilt start (for Toshiba Machine made ladler)	●		●	
	7 Pouring return (for Toshiba Machine made ladler)	●		●	
	8 Injection delay (for Toshiba Machine made ladler)	●		●	
	9 Backward stand-by (for Toshiba Machine made ladler)	●		●	
	10 Spray start (for Toshiba Machine made sprayer)	●		●	
	11 Die sweep-1 (for Toshiba Machine made sprayer)	●		●	
	12 Die lubricant spray (for Toshiba Machine made sprayer)	●		●	
	13 Die sweep-2 (for Toshiba Machine made sprayer)	●		●	
	14 Spray up (for Toshiba Machine made sprayer)	●		●	
	15 Sleeve sweep-1 (Toshiba Machine Plunger lubricator)	●		●	
	16 Tip lubrication (for Toshiba Machine Plunger lubricator)	●		●	
	17 Sleeve sweep-2 (Toshiba Machine Plunger lubricator)	●		●	
	18 Tip lube/sleeve sweep skip counter (Toshiba Machine P-lubricator)	●		●	
Others	1 Channel system foundation	●		●	
	2 Anchor system foundation		●		●
	3 Painting color (two tones of ivory/gray)	●		●	
	4 Designated painting color		●		●
	5 Supplementary tool kit (with a tool box)		●		●
	6 Nitrogen gas charging hose	●		●	
	7 Hand spray gun	●		●	
	8 Automatic ladle device (DAL)	●		●	
	9 Heat insulation cover for ladle device	●		●	
	10 Output signal of melt shortage	●		●	
	11 Ladle device mounting bracket (slide type)		●		●
	12 Plunger lubrication device	●		●	
	13 Plunger lubrication mixing system		●		●
	14 Plunger lubrication pump delivery volume change		●		●
	15 Automatic spray device (DBS)	●		●	
	16 Lubricant booster tank (200L)	●		●	
	17 Lubricant booster tank (200L) with agitator	●		●	
	18 Lubricant booster tank (100L) with agitator	●		●	
	19 Spray device fwd/back motion inside die	●		●	
	20 Product take-out device (DTO)	●		●	
	21 Photoelectric type part sensing specification	●		●	
	22 Addition of take-out device up/down system	●		●	
	23 Take-out device automatic die height adjustment	●		●	
	24 Vacuum die-casting device (DVF)	●		●	
	25 SQUEEZE MASTER (SQM)	●		●	
	26 SQM-2 communication function	●		●	
	27 CASTVIEW (DPM)	●		●	

J-MS Numerical Specification

	Specification item	Unit	DC250J-MS	DC350J-MS	DC500J-MS	DC650J-MS	DC800J-MS
Die closing	Die-locking force	kN	2500	3500	5000	6500	8000
	Platen dimensions (VXH)	mm	850×850	935×935	1060×1060	1200×1200	1400×1400
	Tie bar spacing (VXH)	mm	580×580	650×650	750×750	850×850	930×930
	Tie bar diameter	mm	110	125	150	160	180
	Die thickness	mm	600~300	700~300	850~350	900~350	950~400
	Die stroke	mm	360	420	550	660	760
Injection	Maximum injection force	kN	270	340	480	549	598
	Intensification ratio		1 : 1.94	1 : 2.07	1 : 2.53	1 : 2.52	1 : 2.56
	Plunger stroke	mm	415	480	580	670	750
	Tip protrusion	mm	230	265	250	300	350
	Injection port position	mm	-125	-125	-175	-175	-250
	Injection speed	m/s	0.05~8	0.05~6.5	0.05~8	0.05~7	0.05~6.5
	Tip diameter	mm	60	70	80	85	90
	Sleeve length	mm	212	247	365	405	445
Ejection	Ejection force	kN	124	190	235	294	371
	Ejection stroke	mm	10~80	10~90	10~100	10~125	10~125
Hydraulic	Number of movable cores	Size×No.	3/8"× each1	3/8"×1	1/2"×1	1/2"×1	3/4"×1
	Number of movable-core ports	No. of set	3/4"×2	3/4"×2	3/4"×2	3/4"×2	3/4"×2
	Operating pressure	MPa	15	15	15	15	15
	Required hydraulic oil volume	L	430	430	700	900	1100
	Hydraulic oil tank capacity	L	330	330	550	750	950
Cooling water	Die cooling water inlet port size	Rc	1+1/4"	1+1/4"	1+1/2"	1+1/2"	1+1/2"
	Die cooling water outlet port size	Rc	2+1/2"	2+1/2"	3"	3"	3"
	Oil cooler water inlet port size	Rc	1"	1"	1"	1"	1"
	Oil cooler water outlet port size	Rc	1"	1"	1"	1"	1"
	Die cooling adjustment valve (fixed)	Rc×No.	1/4"×7	1/4"×7	1/4"×7	1/4"×7	1/4"×7
	Die cooling adjustment valve (moving)	Rc×No.	1/4"×8	1/4"×8	1/4"×10	1/4"×10	1/4"×10
	Sprue bush cooling adjustment valve	Rc×No.	1/4"×2	1/4"×2	1/4"×2	1/4"×2	1/4"×2
	Required cooling water (oil cooler)	L/min	35	35	50	50	50
	Required cooling water (for die)	L/min	70~120	70~120	70~120	70~120	120~160
Electrical	For hydraulic pump	kW	22	22	37	37	45
	For die height adjustment	kW	0.75	1.5	2.2	2.2	3.7
	For lubrication pump	W	40	40	40	40	40
	Electrical capacity	KVA	40	40	60	60	75
	Power supply	V	AC200/220	AC200/220	AC200/220	AC200/220	AC200/220
Air	Air connection port	Rc	1/4, 3/8 each1	1/4, 3/8 each1	1/4, 3/8 each1	1/4, 3/8 each1	1/4, 3/8 each1
	Air pressure	MPa	0.4	0.4	0.4	0.4	0.4
Size	Necessary floor space	mm	5520×1730	5745×1830	7690×2195	8420×2370	9270×2485
	Machine height	mm	2660	3130	2985	3505	3805
	Machine mass	ton	9.2	12	20.5	28.5	38

Full View

DC 250·350 J-MS



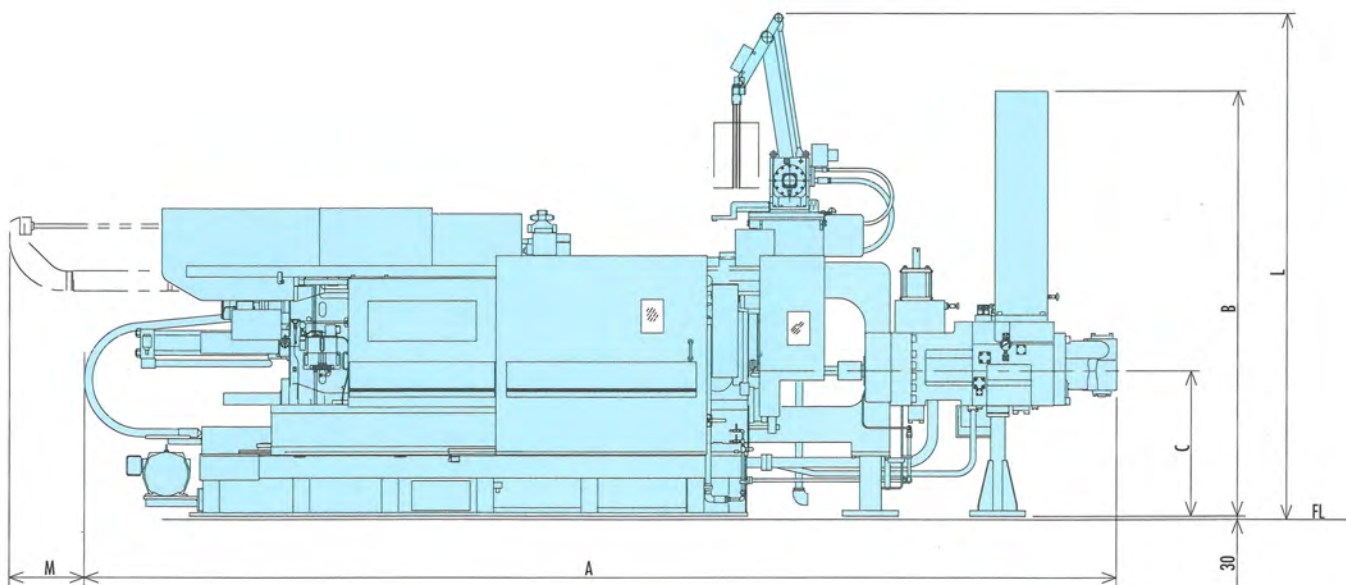
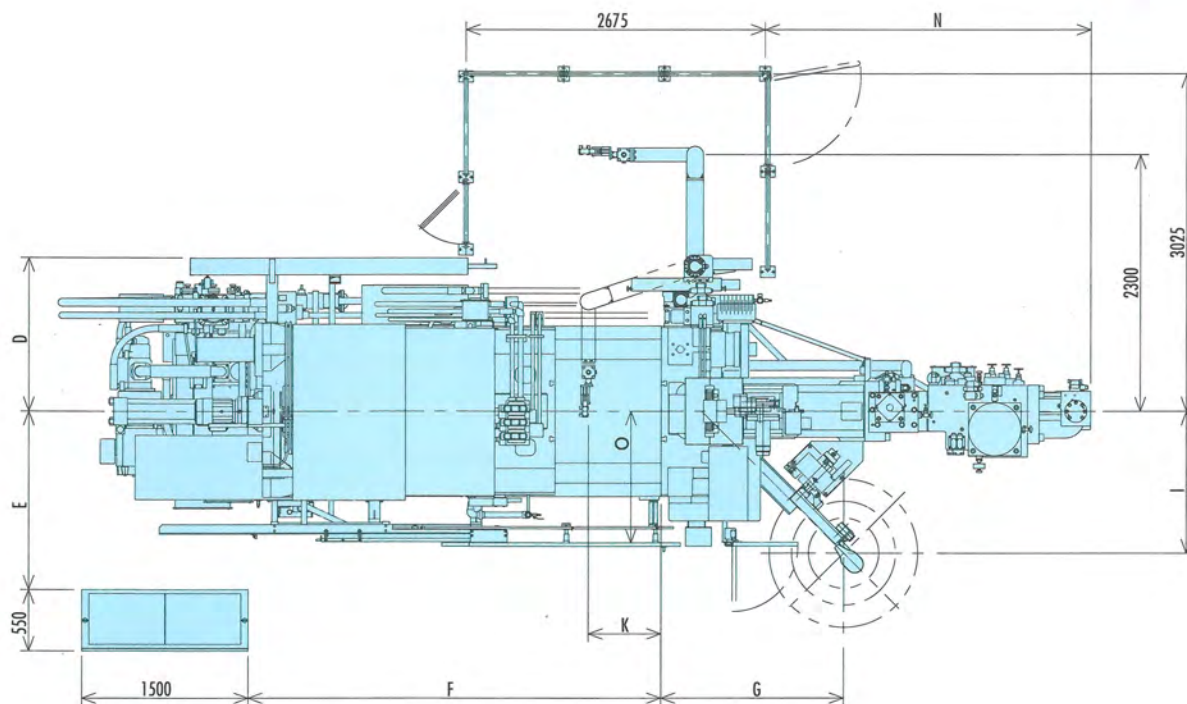
	A	B	C	F	G	I	L	M	N	O	P
DC250J-MS	5,520	2,660	960	2,070	1,135	975	3,407	433	1,230	769	2,105
DC350J-MS	5,745	3,127	1,030	2,020	1,165	980	3,535	820	1,210	810	2,635

N.B. - The photographs include some optional features

Full View

DC 500·650·800 J-MS

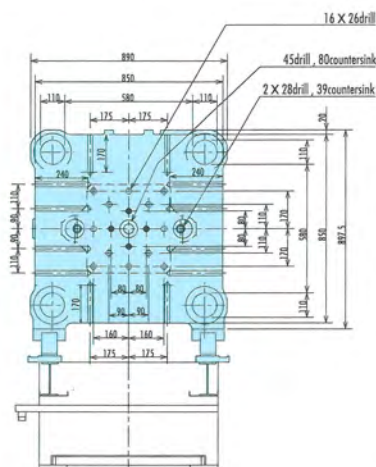
DC J-MS
Multistage Injection
as Standard



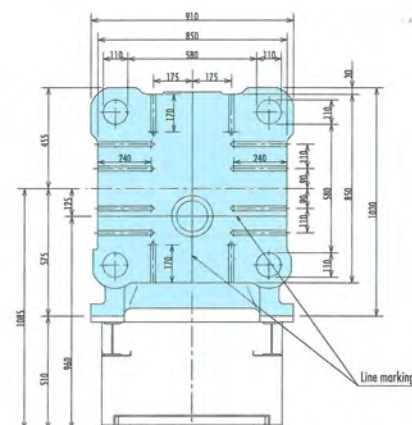
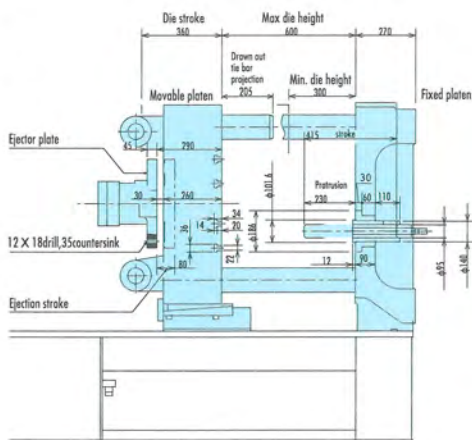
	A	B	C	D	E	F	G	I	K	L	M	N	O
DC500J-MS	7,690	2,985	1,080	1,190	1,500	2,800	1,457	1,257	340	4,310	503	2,015	825
DC650J-MS	8,420	3,505	1,225	1,300	1,500	3,200	1,594	1,259	440	4,455	655	2,410	1,065
DC800J-MS	9,270	3,805	1,300	1,375	1,600	3,700	1,633	1,273	650	4,530	672	2,905	1,180

Die Mounting Diagram

DC250J-MS



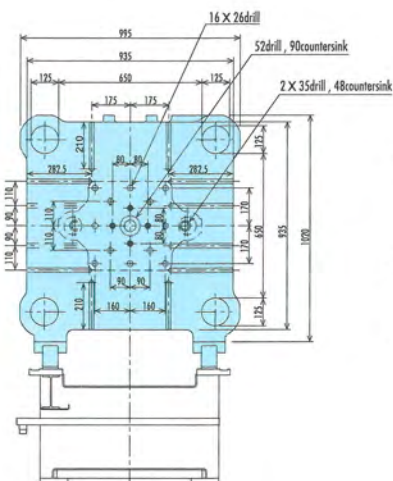
Movable platen



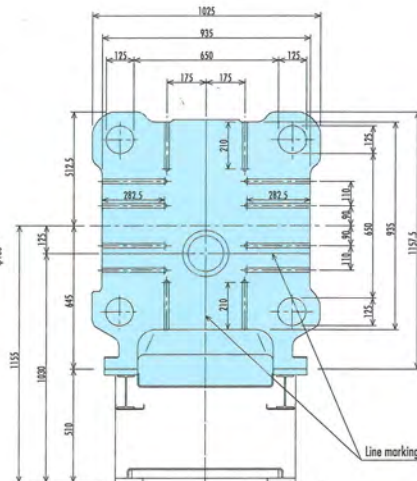
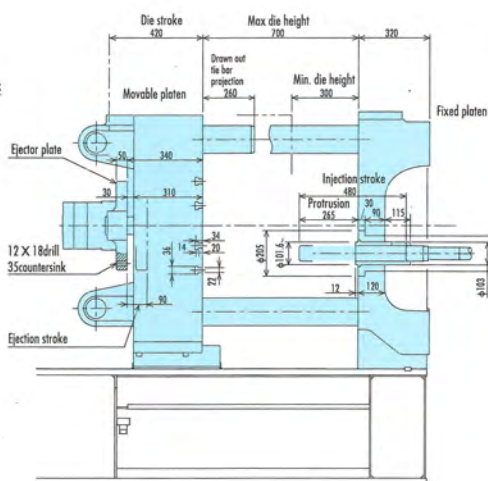
Fixed platen

Note: The ejection holes marked with "●" (4 spots) on the movable platen will not allow ejector rods to be connected to the ejection cylinder.

DC350J-MS



Movable platen



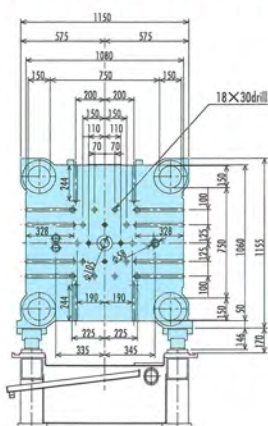
Fixed platen

Note: The ejection holes marked with "●" (4 spots) on the movable platen will not allow ejector rods to be connected to the ejection cylinder.

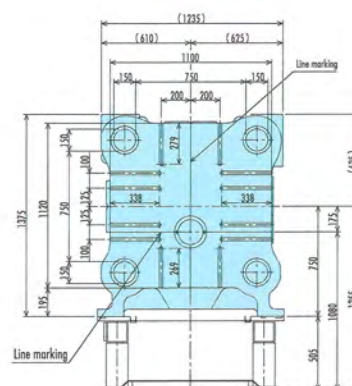
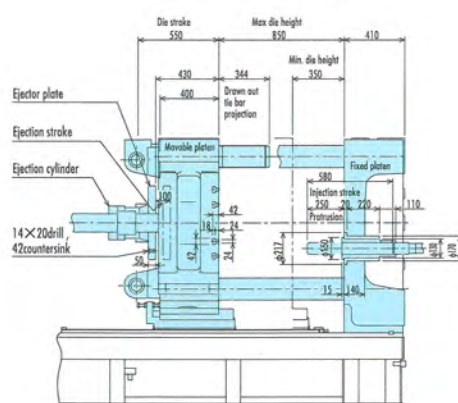
Die Mounting Diagram

DC500J-MS

DC J-MS
Multistage Injection
as Standard



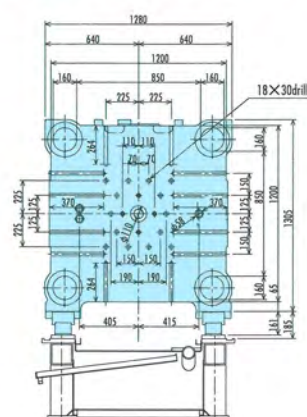
Movable platen



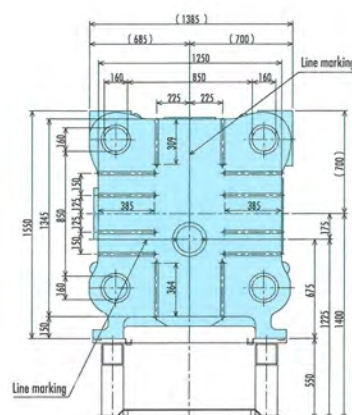
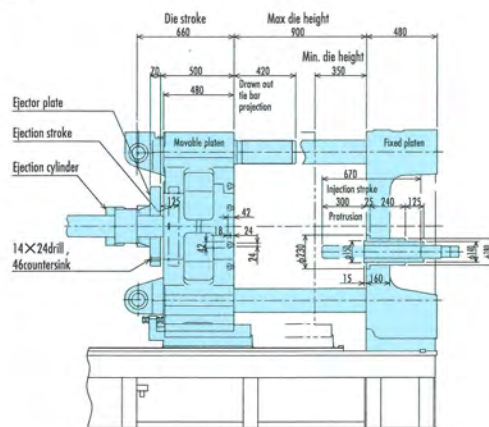
Fixed platen

Note: The ejection holes marked with "●" (4 spots) on the movable platen will not allow ejector rods to be connected to the ejection cylinder.

DC650J-MS



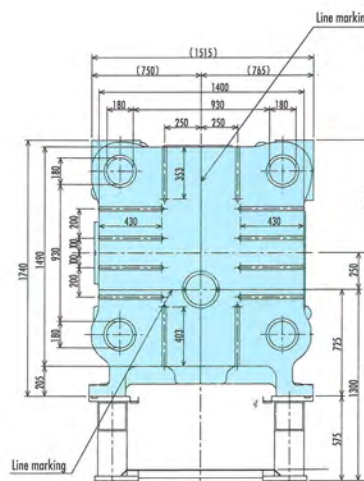
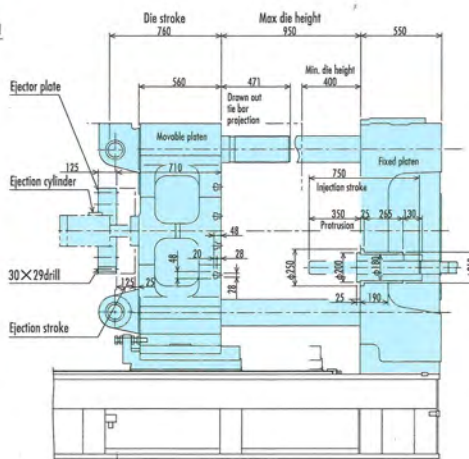
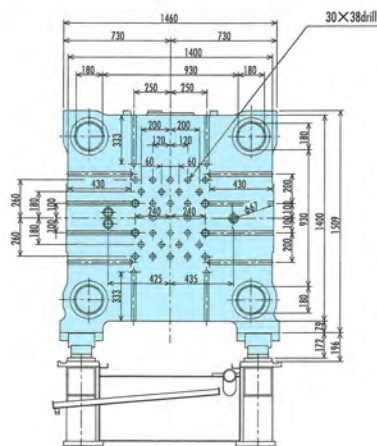
Movable platen



Fixed platen

Note: The ejection holes marked with "●" (4 spots) on the movable platen will not allow ejector rods to be connected to the ejection cylinder.

DC800J-MS





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NOTE

1 In the above telephone and fax numbers the numerals in [] denote country code