JSW THE JAPAN STEEL WORKS, LTD.

URL http://www.jsw.co.jp/

Division Head Quarter:
Gate City Ohsaki-West Tower, 11-1, Osaki 1-chome, Shinagawa-ku,
Tokyo 141-0032, Japan
Phone: +81-3-5745-2081 Fax: +81-3-5745-2083～84
URL http://www.jsw.co.jp/inj_f/inj_index.htm

JSW Plastics Machinery Inc.

Head Office: 555 South Promenade Ave., Unit 104, Corona, California 92879, U.S.A.
Phone: +1-951-898-0934 Fax: +1-951-898-0944

Chicago Office: 540 Capital Drive, Suite 130, Lake Zurich, Illinois 60047,U.S.A.
Phone: +1-847-550-0704 Fax: +1-847-550-0725

Detroit Office: 24301 Catherine Industrial Drive, Unit 118, Novi, Michigan 48375, U.S.A.
Phone: +1-248-449-5422 Fax: +1-248-449-6018

JSW Plastics Machinery (S) Pte Ltd

Head Office: 17, Gul Lane, Jurong Town, Singapore 629413, Republic of Singapore
Phone: +65-68614511 Fax: +65-68623166

Philippine Office: Chemdis Bldg., Don Jesus Blvd., Alabang Hills Village, Muntinlupa City, Philippines
Phone: +63-2-809-8982 Fax: +63-2-809-6221

Indonesia Office: Graha Cevril, Jl. Senopati Raya No.6A, Jakarta 12110, Indonesia
Phone: +62-21-725-7486 Fax: +62-21-725-7865

JSW Plastics Machinery (M) SDN. BHD.

D6-5-G,(Ground Floor), Block D6, Pusat Perdagangan Dana 1,
Jalan Pju 1A/46, 47301, Petaling Jaya,
Selangor Darul Ehsan, Malaysia
Phone: +60-3-78426076 Fax: +60-3-78426078

JSW Plastics Machinery (T) Co., Ltd.

78/6 JST Building 4th Fl., Moo 7 King Kaew Road, Rachatewa,
Bangplee, Samutprakarn 10540 Thailand
Phone: +66-2-738-5272 Fax: +66-2-738-5277

JSW Plastics Machinery Vietnam Ltd.

Room103, Techno-Center Thang Long Industrial Park Dong Anh District,
Hanoi, Viet Nam
Phone: +84-4-3951-6383 Fax: +84-4-3951-6384

JSW Plastics Machinery (H.K.) Co., Ltd.

Room 907, Corporation Park, 11 On Lai Street, Shatin N.T., Hong Kong
Phone: +852-2648-0720 Fax: +852-2686-8204

JSW Injection Machine Maintenance (Shenzhen) Co., Ltd.

1/F., Block A, Sanhe Industrial Park,Yongxin Street,Yingrenshi Village,
Shiyan Town, Baoan District, Shenzhen, 518108, People's Republic of China
Phone: +86-755-8602-0930 Fax: +86-755-8602-0934

JSW Plastics Machinery (Shanghai) Corp.

28A, Strength Plaza, No.600-4, Tianshan Road, Shanghai, 200051,
People's Republic of China
Phone: +86-21-5206-7031 Fax: +86-21-5206-7033

JSW Plastics Machinery (TAIWAN) Corp.

Head Office: 1F., No.23, Da Hu 1st Rd., Guishan Shiang, Taoyuan, Taiwan, R.O.C.
Phone: +886-3-396-2102 Fax: +886-3-396-2104

Tainan Office: 15F-7, No.689-78, Shiau E. Rd., Yungkang City Tainan, Taiwan, R.O.C.
Phone: +886-6-311-4192 Fax: +886-6-311-4193

Printed in Japan HO.AB. JG. AE. C

JAD SERIES

Electric Servo Drive Injection Molding Machine

model		
	J550AD	J1000AD
	J650AD	J1300AD
	J850AD	J1800AD
	J850ADW	

JSW

CERTIFIED JQA MANAGEMENT SYSTEM
ISO 9001
ISO 14001
JQA-QMA13993
JQA-EM6416

JAD SERIES
Electric Servo Drive
Injection Molding Machine

Large Electric Servo Drive Injection Molding Machines Promotes Faster Cycles, Energy Sa vings, and High Performance

An industry pioneer, JSW has extensive experience in manufacturing large electric molding mac hines.
The newly released, second-generation large electric servo drive molding machine promises to deliver measurable improvements in productivity, quality, and economy.
This latest improvement retains our time proven toggle clamping unit, which for many years has delivered "faster cycle times" and "unparalleled energy savings."

AD Series Large Size Electric Servo Drive Injection Molding Machine

Providing Increased Productivity

Productivity

- Increased Platen Speed
- Reduced Dry Cycle
- Improved Plasticizing Capability
- Extra Rigid Clamping Unit

Environment

- Reduced Power Consumption
- Reduced CO_2 Emissions
- Power Supply Regenerating Function
- Reduced Cooling Water, Hydraulic Oil, and Lubrication Oil Consumption

Stability

- SYSCOM3000
- Fast Servo Control Circuit
- HAVC Control
- Reverse Seal Control
- IWCS Control
- Clamp Force Feedback Control
- Injection Compression Molding
- Foaming Molding Control

Complying with safety regulations
EU safety regulations (CE Marking)
Industrial machinery
Industry safety rules (JIMS K1001)

Faster Cycle Performance

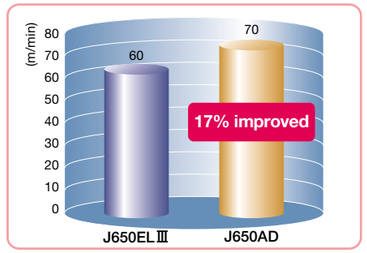
Quicker dry cycle, substantially improving productivity

■Rigid fast cycle toggle

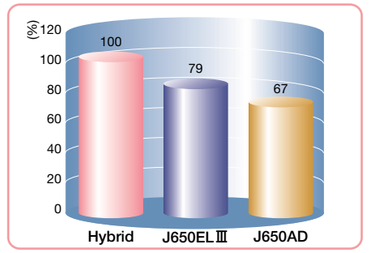
JSW' original high-rigidity fast cycle toggle mechanism, provides quicker dry cycle time.

☆Dry cycle time is further reduced by improving the platen speed by 20%.
☆Ejector speed has been improved to reduce product removal time.
☆The speed of mold height adjustment has been improved to allow reduced setup time.
☆The high-rigidity clamping unit achieves high-precision stabilized molding.
☆The flat press platen structure, which exerts a clamping force evenly distributed over the mold surface, minimizes the wall-thickness fluctuation of molded products. (Pat.#4107509)

■Platen speed



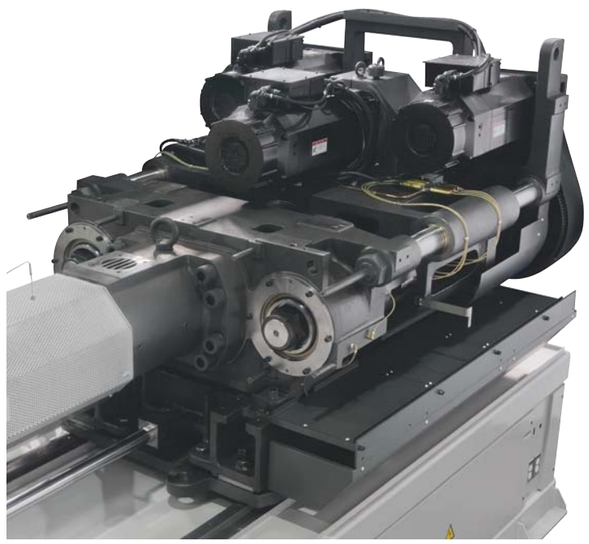
■Dry cycle comparison (relative ratio)



Substantial reduction in plasticizing time of new injection unit and new screw unit

■New injection unit

The newly developed injection unit has been made smaller and lighter, improving injection acceleration and deceleration performance.
Also, high injection power, heavy-duty drive provides robust injection and greater plasticizing capability.

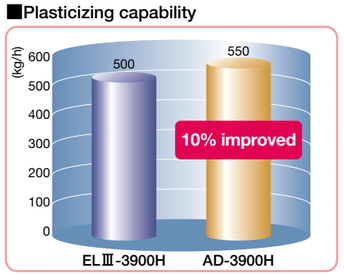


■New design screw

Improved High Melter M Ⅲ Screw with greater plasticizing and mixing performance is equipped as standard for 2300H or larger injection unit.

Already industry-leading plasticizing capability has been further improved by 10%. It reduces the plasticizing time that contributes to the cycle time.

■Plasticizing capability



Phenomenal Energy Savings

JAD SERIES
Electric Servo Drive Injection Molding Machine

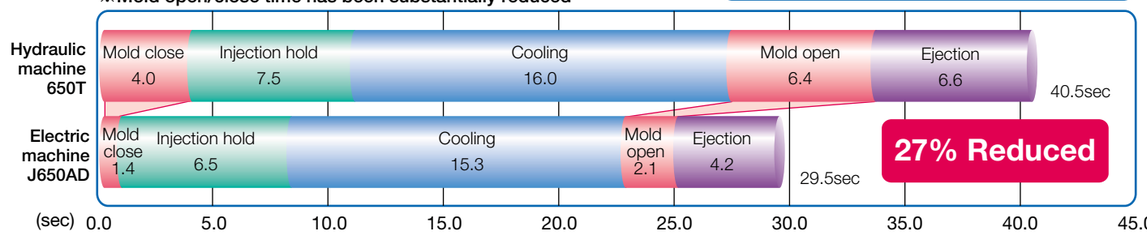
Product improvement by 30%, power consumption reduced by 60%, and CO_2 reduced 92t/year※

Ex.1 **Reduced cycle time and energy savings**

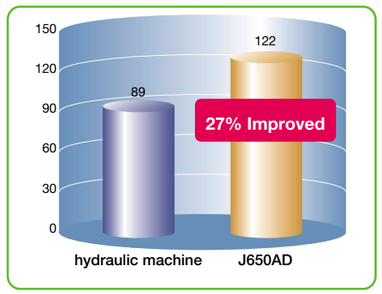
AD Series provides industry-leading energy savings as well as substantial reduction in cycle time

Product: Case
Qty: 1
Resin: PP
Weight: 935g

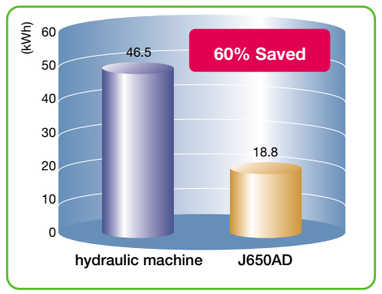
※Mold open/close time has been substantially reduced



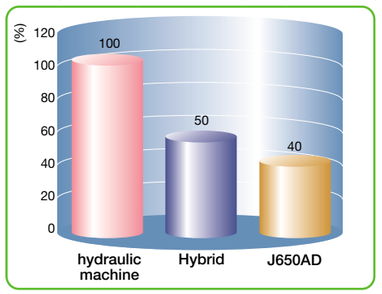
●Number of products per hour



●Power consumption per hour



●Comparison of power consumption (relative ratio)

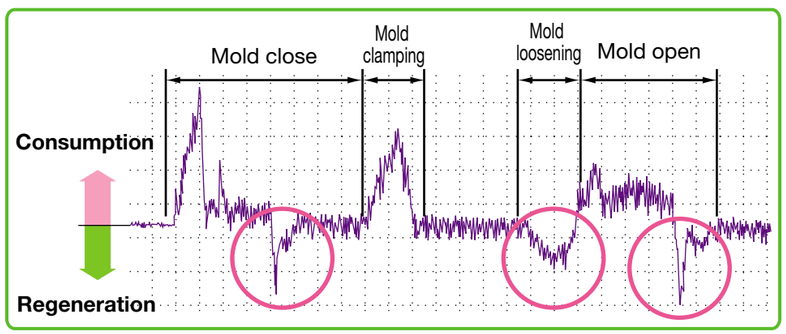


※Comparison of our hydraulic machine (650T) and J650AD. When calculated with CO2 conversion factor of 0.555kg/kWh for annual operation time of 6,000 hours (20 hours x 300 days).

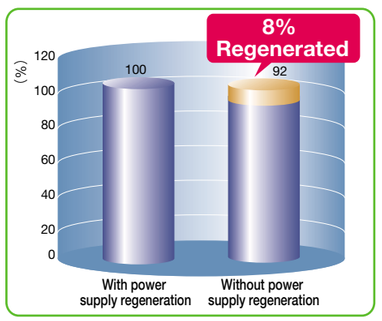
Original Power Supply Regenerating Function (Energy Savings Technology)

The power supply regenerating function, which retrieves energy generated in injection or deceleration in mold open/close action as electric power, has been equipped from the previous series. Substantial energy savings are achieved through power supply regenerating function in all the processes.

Ex.2 **Regenerated power supply in mold open/close**



Through power supply regenerating function, approximately 8% of power supply is regenerated in mold open/close process.



Environmentally-friendly, substantially reducing cooling water, hydraulic oil, and lubrication oil

☆Cooling water usage saving to 1/5 or less of the hydraulic machine
☆Hydraulic oil usage saving to 1/30 or less of the hydraulic machine
☆Lubricating grease usage reduced by 25% from the previous series by developing new JS1 Grease, superior in load bearing, adhesi ve property, and lubrication property

Upgraded Controller

Easy Operation, Multiple Functions
New Controller SYSCOM3000

☆A vertically arranged large 15-inch TFT color LCD screen. The controller provides the operator with a clear view of molding parameters.
☆An illustration of the machine, in conjunction with operation mode keys and a touch screen ensures easy operation.
☆Languages are selectable from English, Chinese, and Japanese even during running. Other languages (Hangul, Spanish, and French) are optional.
☆Storage of molding conditions: 120 conditions can be stored in internal memory and 1,000 conditions in external USB memory.
☆Molding conditions, waveform data, or measurement data can be exported to USB memory, which makes editing and managing in a computer easy.
☆Password function has been added for security. Passwords can be set for each management level. (Option)

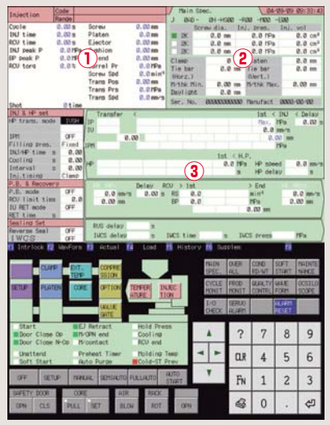
SYSCOM3000 screen

Operation includes the condition setting screen, the touch panel screen, and the selector switches.

Condition setting screen

Touch panel screen

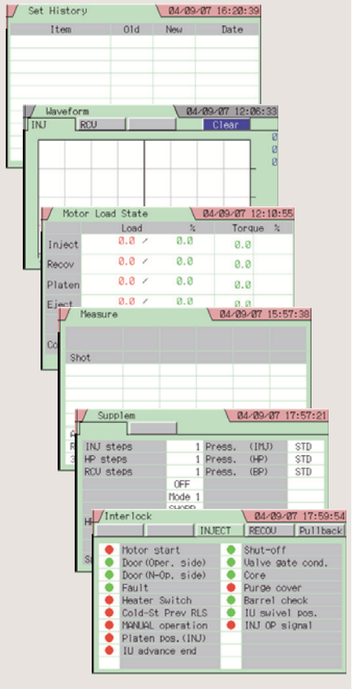
Selector switches



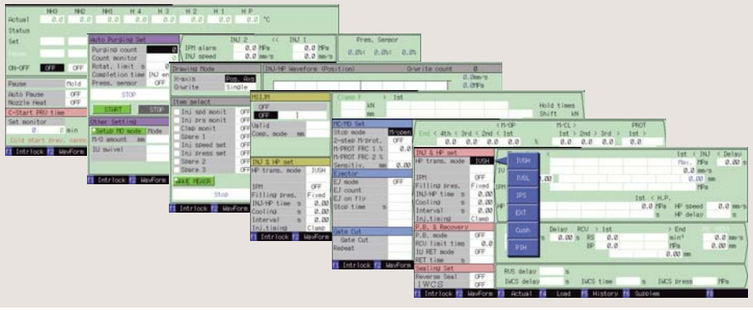
①Cycle monitor screen

Injection	Code / Range			
Cycle	0.00 s	Screw	0.00 mm	
INJ time	0.00 s	Platen	0.0 mm	
RCU time	0.00 s	Ejector	0.00 mm	
INJ peak P	0.0 MPa	Cushion	0.00 mm	
BP peak P	0.0 MPa	HP end	0.00 mm	
RCU torq	0.0 %	Barrel Pr	0.0 MPa	
		Screw Spd	0.0 min⁻¹	
		Trans Pos	0.00 mm	
		Trans Prs	0.0 MPa	
		Trans Spd	0.0 mm/s	
Shot	0 time			

②Convenient monitoring screens



③Condition setting screens



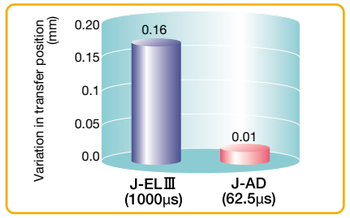
Advanced Control System

JAD SERIES
Electric Servo Drive Injection Molding Machine

The industry's fastest class 62 micro second servo control circuit attains a new high in accuracy and stable quality levels

Use of a high-speed servo control circuit in the AD Series reduces scanning time to 1/16th of conventional controls and achieves an outstanding 62 micro seconds of scan time. It promotes product quality through a reduction in performance variation, such as holding pressure transfer positions.

■Comparisons of variations in the transfer position at 160 mm/s injection speed

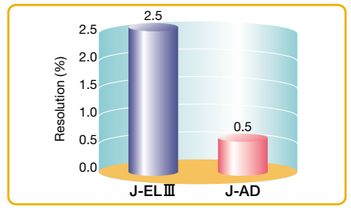


JSW original high-speed servo control board

Highly upgraded resolution of the injection pressure detector

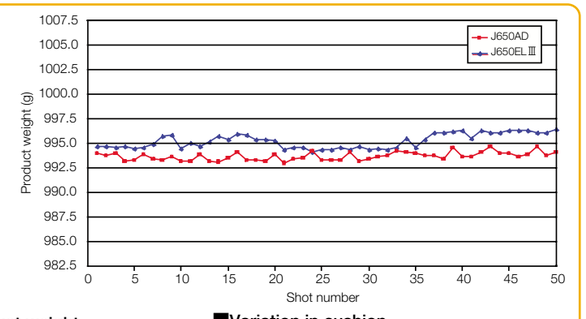
The resolution of the load cell amplifier for the injection pressure has been intensified five fold for more accurate back pressure control which helps ensure stabilized precision molding.

■Resolution of pressure detection (assumed to be 10 Mpa of back pressure)



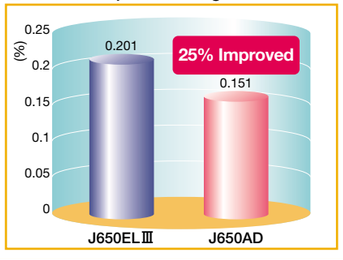
Ex.3 Molding stability (Standard molding)

Product: Tray
Qty : 1
Resin : PP

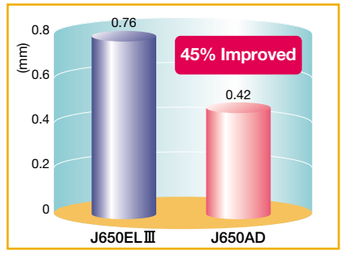


	Product weight (g)	
	J650EL Ⅲ	J650AD
MAX	997.8	996.3
MIN	995.8	994.8
AVG	996.8	995.4
R	2.0	1.5
R/AVG (%)	**0.201**	**0.151**
σ	0.641	0.365
σ/AVG (%)	0.064	0.037

■Variation in product weight



■Variation in cushion



Dual Integrated Control system (D.I.C. system) for molding machine and product takeout robot

Optional equipment

The product takeout robot can be operated from SYSCOM3000, and also the molding machine can be operated from the controller of the product takeout robot. Effective for reducing setup time.

※Jointly developed with Yushin Precision Equipment Co., Ltd.

JSW' Original Control Enables Precision Mo lding

JAD SERIES
Electric Servo Drive Injection Molding Machine

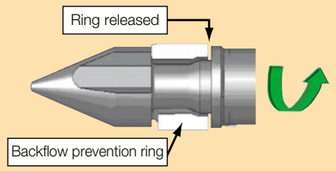
HAVC (High Accuracy Volume Control) NEW

Standard equipment

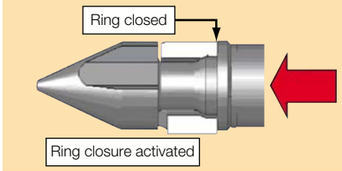
Technology to stabilize injection pressure for every shot and product weights by reverse sealing after completion of weighting and performing high precision control of screw position. Effective for molding that requires higher level of precision stability than traditional stability control.

Control action

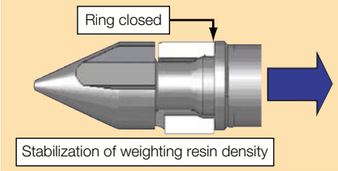
■Rolling action when reverse sealing



■Re-back pressure action



■Depressurizing action



Reverse Seal Control

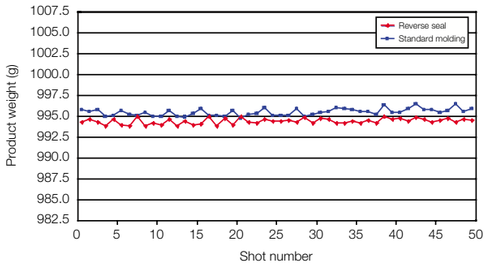
Standard equipment

Closure of the backflow prevention ring by rotating the screw in reverse direction for a certain amount to lower the pressure in the screw and at the tip. It is especially effective for low speed injection molding.

Ex. 4 Product stability (Reverse seal)

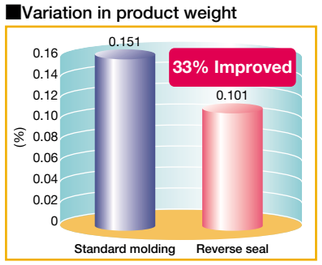
Molding machine: J650AD
Product: Tray
Qty: 1
Material: PP

Control action



	Product weight (g)	
	Standard molding	Reverse seal
MAX	996.3	995.0
MIN	994.8	994.0
AVG	995.4	994.5
R	1.5	1.0
R/AVG (%)	**0.151**	**0.101**
σ	0.365	0.298
σ /AVG (%)	0.037	0.030

■Variation in product weight

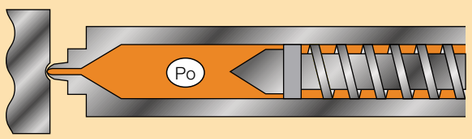


IWCS (Injection Weight and Cushion Stability) Control

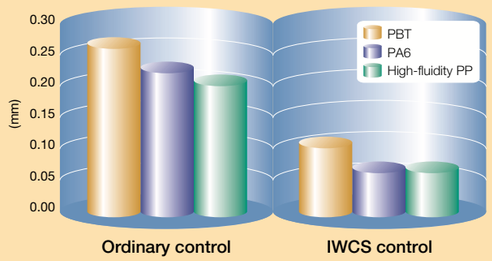
Standard equipment

A patented control that stabilizes the density of the molten resin stored at the tip of the screw on every shot. This technology is effective in minimizing the variance in product weight. (Pat. # 3529771)

This is the control method to re-stabilize the measured density of melted resin of each shot after plasticizing which is prepared at screw head section. This is the unique control technology of JSW that exerts great effect to correct unbalance between product mass and cushion.



Effect of reduced cushion variation



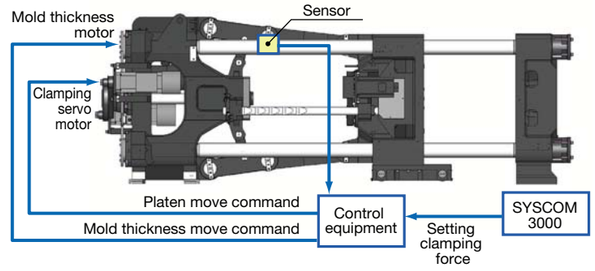
Clamp Force Feedback Control NEW

Standard equipment

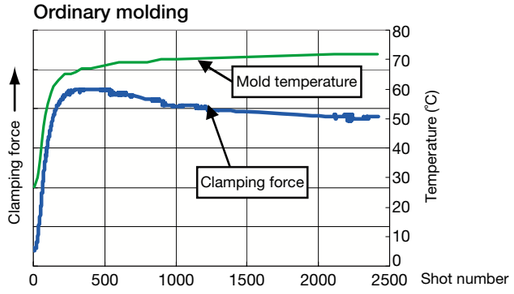
■Clamping force feedback effect (patent pending)

Clamping force is always monitored with a sensor while molding and automatically corrected to the set value. Also, clamping force can be changed while molding observing the actual molding.

☆"Visualization" of the actual clamping force in toggling machine
☆"Improved product quality" by stabilizing gas venting
☆"Longer mold life" with optimum clamping force
☆"Reduction of mold maintenance" by stabilizing gas venting

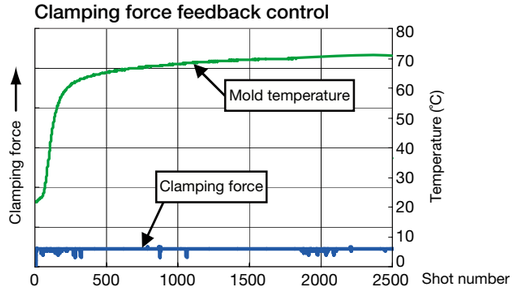


Ordinary molding



Clamping force increases as mold temperature rises

Clamping force feedback control



Stable even when mold temperature rises

Injection Compression Molding

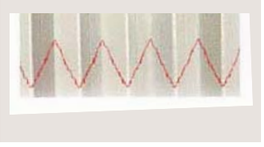
Standard equipment

JSW injection compression molding feature enables the mold position to be controlled to accuracies over 10 times that of direct-pressure molding.

A-mode (A1 – A6, A7 <option>)

B-mode (B1 and B3)

Light guide panel fine prism transfer



Lamination molding

■Effects of injection compression molding

☆Reduction in product distortion
☆Improvement in transcription
☆Easier mold release
☆Cycle time reduction
☆Lowering the clamping force (Low-pressure molding)
☆Gas venting
☆Skin adhesion molding

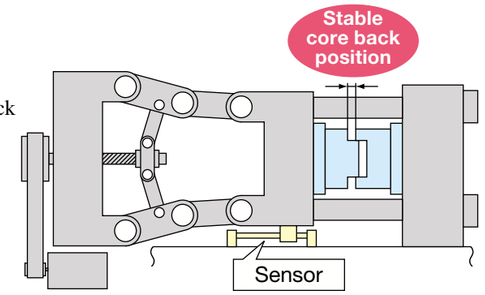
Foaming Molding Control

Optional equipment

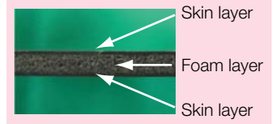
JSW's unique high precision platen position control enables expanding foam molding incomparably stable compared with traditional method. The dedicated position sensor stabilizes product dimensions by directly detecting the position of the platen and performing feedback control.

■Features

☆Excellent stability in repeated core back position control
☆Relatively inexpensive equipment
☆Post installable to existing machine



Product cross section



Standard and Optional Equipment Enabling High Quality Performance

JAD SERIES
Electric Servo Drive
Injection Molding Machine

■Standard Equipment List

	Item		
Injection and Plasticizing Unit	Open nozzle		
	N2000F barrel		
	Chrome plated screw		Note 1
	Purge cover (with limit switch)		
	Injection unit swiveling device (with limit switch)		Note 2
	Screw cold start prevention		
	Molding/Pause temperature select		
	Auto purging circuit		
	Nozzle retract select		
	Pull-back select		
	Auto grease lubrication		
	Injection/Metering programmed control	Injection/Holding pressure :1~6 Steps (Variable) Metering/Back pressure :1~3 Steps (Variable)	
	Holding pressure transfer select		
	Holding pressure control select	Step mode Slope mode	
	Barrel temperature control (PID)		Note 3
	Nozzle temperature control (PID/SSR)		
	Synchronous temperature rise control		
	Hopper flange temperature control		
	Soft pack servo control		
	HAVC (High Accuracy Volume Control)		
	IWCS (Injection Weight and Cushion Stability) control		
	Reverse seal control		
Clamping Unit	Grease-free toggle bushing		
	Auto grease lubrication		
	High-performance platen support		
	Flat press platen mechanism (Stationary side/Movable side)		
	Mold open/close and Ejector programmed control	Mold open/close : 4 Steps (Fixed) Ejector : 1~3 Steps (Variable)	
	Mold protection	1~3 Steps (Variable)	
	Ejector braking system		Note 4
	Electric-driven mold thickness adjusting device		
	Auto clamp force setting		
	Clamp force display		
	Clamp force feed back control		
	Toggle type clamp injection compression Function	A -mode B -mode Compression : 1~6 Steps (Variable)	
	Clamping safety device (Electrical/Mechanical)		
	Robot mounting holes		
	Compound action	Screw rotation during mold open/close Eject during mold open Injection during clamp up	
	Safety mat	Operator side step safety mat Under mold area safety mat	Note 5

Note 1. GP21 screw for Injection unit 1400H.
High-Melter MIII screw for Injection unit 2300H and higher.
Note 2. Manual operation type for Injection unit 1400H.
Note 3. Injection unit 1400H is controlled by SSR (non-contact).
Injection unit 2300H and higher are controlled by MC (contact).
Note 4. Equipped as standard for J650AD and higher, optional for J550AD.
Note 5. Safety mat on the top of the step is equipped as standard for J650AD and higher, optional for J550AD.
Safety mat on the top of the inter-platens bed is equipped as standard for J850ADW and higher (models with 1200mm or wider gap between tie-bars), optional for J850AD.

	Item	
Controller	Touch panel 15" TFT color LCD controller	
	120 Mold condition storage (Internal memory)	Note 6
	Soft start molding	
	Self diagnostics function	
	Help function	
	Pop-up display	
	Clock	
	Multi-language select (English, Chinese, Japanese)	
	Print screen by USB memory	
	USB printer port	Note 7
	Overall setting screen	
	Pre-heat timer	
	Product takeout robot circuit	
	Attended/Unattended operation select	
	Emergency stop button	
	Safety key	
Monitor	Actual value display	
	Mold temperature display	Note 8
	Injection/Metering waveform monitor	
	Oscilloscope waveform monitor	
	Injection/Metering waveform storage	
	Barrel temperature monitor	
	Injection pressure monitor	
	Statistical graph	
	Production monitor	
	Cumulative operating hour display	
	Cycle monitor	
	Molding condition upper/lower limit monitor	Note 9
	Inspection and Maintenance guide	Note 10
	Heater system fault alarm	
	Injection pressure overshoot alarm	
	Grease lubrication fault alarm	
	Servo fault alarm	
	Unreleased clamp alarm	
	Position calibration request	
	Alarm buzzer	
	Alarm history	
	Set value history	
Others	Safety compliance to JIMS K1001	
	Cooling water closed circuit for feed throat	
	Mold cooling water circuit (Machine bed)	
	Accessories (Maintenance tools, Ejector rods, etc.)	

Note 6. The external memory is capable of storing conditions for 1,000 molds.
Prepare commercial USB data storage media.
Note 7. The printer and printer cables are options.
Note 8. Temperature sensors and electric wiring are not included.
Note 9. Maximum of 16 items and alarms can be selected out of the following monitor items.
①Cycle time ②Injection time ③Metering time ④Cushion position
⑤Holding pressure end position ⑥Injection pressure
⑦Holding pressure transfer pressure ⑧Screw back pressure
⑨Metering end position ⑩Injection start position ⑪Holding pressure transfer position
⑫Mold open time ⑬Mold close time ⑭Metering torque
⑮Holding pressure transfer speed ⑯Mold inner pressure (option)
⑰Clamp force ⑱Shift amount (HAVC) ⑲End speed (HAVC)
Note 10. Indicates inspection times and items.

■Options List

	Item		
Injection Unit	Long nozzle		
	Shut-off nozzles (Pneumatic type and Hydraulic type)		
	LSP-2 screw (Abrasion-resistant type)		
	Wide selection of screws & barrels	Screw & Barrel for high plasticization Screw & Barrel for optical application High dispersion screw High viscosity resin screw Long-fiber resin screw Special screw	Note 1
	Barrel Insulation cover		
	Barrel blower cooling unit		
	Hopper (Option for all the region)		
	High holding pressure molding (for long-time holding pressure molding)		Note 2
	Electric motor driven IU advance/retract		
	Vented barrel		
Clamping Unit	Daylight extension		
	T-slot platen		
	Locating ring		
	Air jet		
	Core pull device (Pneumatic type and Hydraulic type)		Note 3
	Valve gate device (Pneumatic type and Hydraulic type)		Note 3
	Auto safety gate open		
	Auto safety gate open/close		
	Safety mat		Note 4
	Safety footplate		
	Mold clamper		
	Mold setup device		
	Magnet mold Clamper		Note 5
	Cooling water manifold on platen		
	Hydraulic power pack		
	Ejector braking system		Note 6

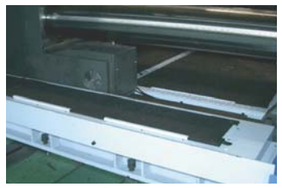
	Item	
Electrical Instrumentation and control	Multi-language select (French, Spanish or Hangul)	Note 7
	Simple centralized monitor system Link10	Note 8
	Centralized control system NET100	Note 9
	Heater burnout alarm	
	Mold temperature display (with mold temperature upper/lower limit alarm)	
	Mold temperature control (with mold temperature upper/lower limit alarm)	
	Printer (with printer cable)	
	Password Function	
	Hot runner control circuit	
	Unscrewing motor circuit	
	Ejector gate cutting circuit	
	Ejector plate return confirmation circuit	
	Injection speed:10 Steps control	
	Injection speed slope control	
	Foaming molding control	
	Skin adhesion molding control	
	D.I.C. (Dual Integrated Control) with Yushin Robot	
Others	Hopper stage	
	Cooling water failure warning	
	Leveling pad for installation	Note 10
	Rotary warning light	
	Export specification	Note 11
	Designated color	Note 12

●For details of each option, confirm in the specifications for the options.

Note 1. Regarding special screws, contact us separately.
Note 2. Enables a long holding time and high holding pressure molding.
The injection speed may become lower.
Note 3 For the hydraulic type, a separate hydraulic unit is needed.
Note 4. Safety mat on the top of the step is equipped as standard for J650AD and higher.
Safety mat on the top of the inter-platens bed is equipped as standard for J850ADW and higher (models with 1200mm or wider gap between tie-bars).
Note 5. When applied, extended nozzle is required.
Note that the usable mold thickness range will change.
Note 6. Equipped as standard for J650AD and higher.

Note 7. Regarding the other languages, contact us separately.
English and Chinese are equipped as standard.
Note 8. The LINK10 has actual data collection, molding condition control and remote control functions.
Note 9. The NET100 has quality control and production control function in addition to the functions that the LINK10 has.
Note 10. May not be applicable depending on the model.
Note 11. Regarding the export specifications, separate discussion is needed in some cases, depending upon the export destination.
Note 12. Designate colors, referring to color samples or Munsell codes.

■Examples of standard equipment


Safety mat


Mold cooling water closed circuit (bed installing type)

■Examples of optional equipment


Leveling pad for installation


Mold cooling water closed circuit (platen installing type)


Hydraulic unit


Core circuit (hydraulic) unloading slot


Spare receptacle


Screws for various molding applications