Electric Servo Drive

JT-ELⅢ SERIES

Vertical Type Electric Servo Drive Injection Molding Machine

JSW Hiroshima Plant

JSW

JSW Injection Molding Machinery Division

Harmonizing Ecology and Technology JSW Builds The Most Advanced Vertical Type Electric Servo Drive Injection Molding Machine

Friendly to Earth Environment is now needed.
Here's the response by JSW. All the technologies cultured and build-up for many years by JSW are concentrated on the vertical type electric Servo Motor driven injection molding machine. In addition a shorter molding cycle time and improved precision molding have performed.
Also by taking advantages of the space saving design, adaptability to automatic system and characteristics of vertical clamp machine, this is equipped with the unique JSW electric servo-driven system exclusive for molding operation and new high performance APC pressure control system. A bell crank toggle mechanism is applied for compact design to feature a fast, low costing and stable molding operation.

A Wide Selection

Block Systems

Our JT-ELⅢseries has various modules ready for use. The size, shape, production quantity and mode of a molding part will select the most opportune specification and viable performance of an injection machine currently available, resulting in a precise, steady and enhanced molding production.

Single acting type

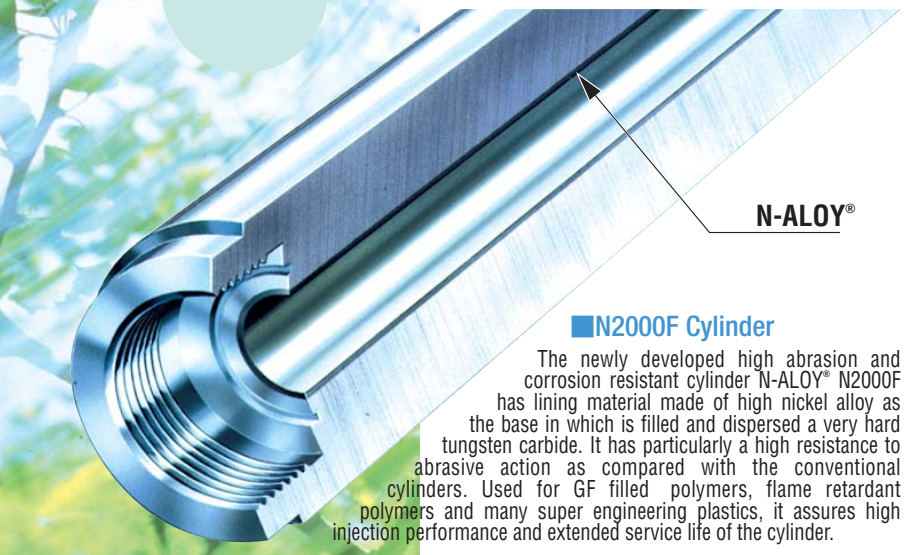
	Single acting type			
	M40	M70	M100	Clamping module
20V	■			
55V	■	■	■	
110V	■	■	■	
230V			■	
Injection module				

Rotary type

	Rotary type					
	M20R	M40R	M70R	M100R	M150R	Clamping module
20V	■	■				
55V	■	■	■	■		
110V		■	■	■	■	
230V				■	■	
Injection module						

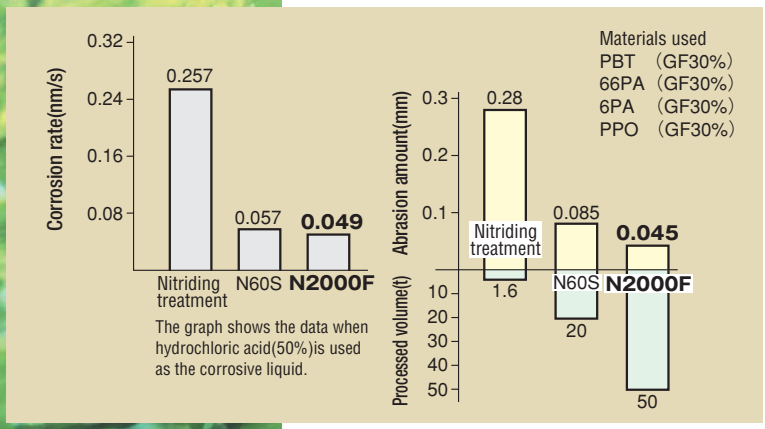
※Sliding type will be optional.

Screw and Cylinder with Ultimate Precision Design and High Rigidity Are Standard Specifications



■N2000F Cylinder

The newly developed high abrasion and corrosion resistant cylinder N-ALOY® N2000F has lining material made of high nickel alloy as the base in which is filled and dispersed a very hard tungsten carbide. It has particularly a high resistance to abrasive action as compared with the conventional cylinders. Used for GF filled polymers, flame retardant polymers and many super engineering plastics, it assures high injection performance and extended service life of the cylinder.



■S50 Screw

JSW's own high-hardness alloy. Having an outstanding high wear resistance, a single flight S50 screw is a new development realizing a fast cycle molding.

■HT Screw Head

This HT screw head is useful for stabilizing parts weight. As compared with the conventional screw heads, the clearance between the cylinder and check ring is decreased to the minimum, so that the back flowing resin is decreased to the minimum.

■Tip Nozzle

In contrast to the conventional open nozzle structure, this new type consists of a tip nozzle and an adaptor. The advantages are: an easy replacement of the tip nozzle and an enlargement of molding conditions.

Safety, Easy Operation with Energy Conservation and Space Saving

Rotary Table

The table turning mechanism driven by the electric servo motor needs no positioning pin for the table. Shortening of the revolving time, noiseless rotation, stable stopping point and stopping accuracy have been improved. (180 deg. turning reciprocated)

The rotary type has a photoelectric safety device equipped as a standard specification on both sides of operator's position for safety improvement.

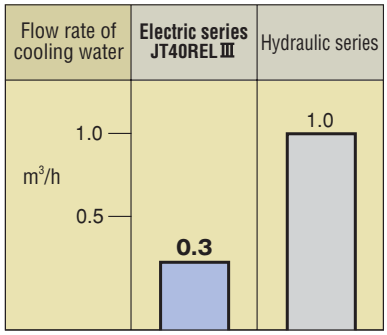
Mold Access in Three Directions

A three-piece safety door is designed. By shortening each door, opening and closing are getting easy, operation has been improved and the machine installation is more easy. A mold can be accessed in three directions, from either of the machine sides or front, therefore conection to auxiliary equipment is more flexible.

Reply the Ecological Requirements

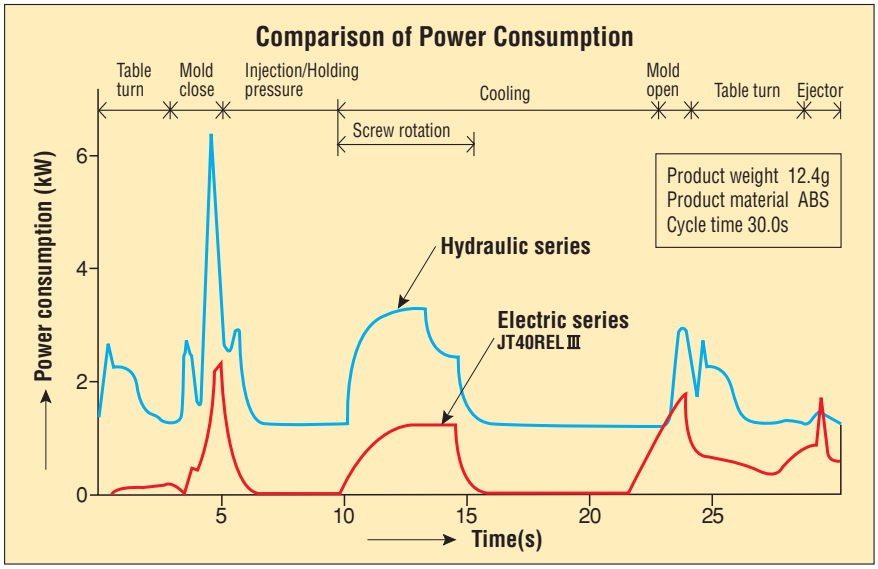
Not only the running cost, but also the primary equipment cost in plant for power and water can be reduced.

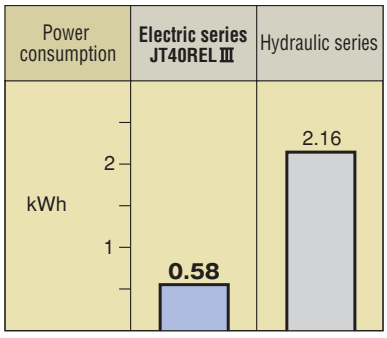
Consumption of Cooling Water (Intra-company comparison)



In the hydraulic machines, the cooling water is mostly consumed by the oil cooler, but in electric machines, there is no oil cooler, so water consumption is greatly saved.

Energy Consumption (Intra-company comparison)





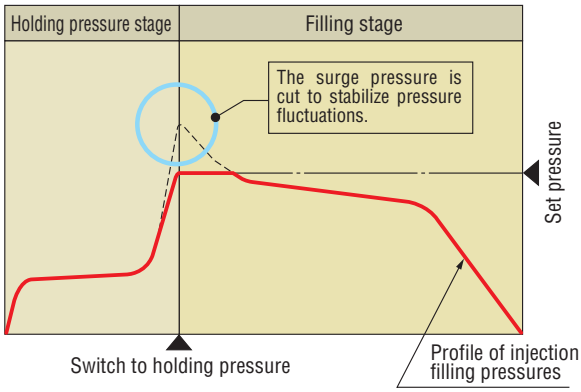
(Note: Cylinder heater energy is not included.)

Power consumption is reduced by one third to one quarter, compared to hydraulic powered machines.

Our Unique Control System Pursuits Ultimate Stable Molding

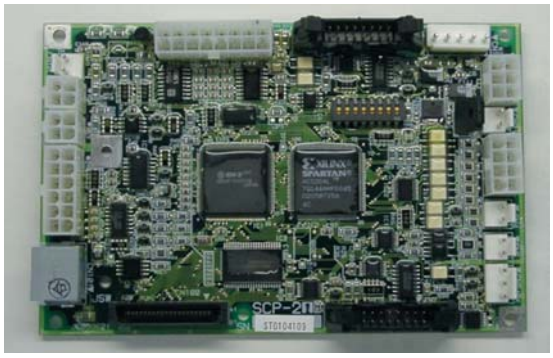
Soft-Pack Servo Unit for Setting Injection Pressures

The optimum pressure molding (soft-pack servo)known for its performance in the hydraulic operated machines has been adopted for this electrically driven machine. Eliminating the peak pressure immediately before switching to the holding pressure is effective for reducing flash and warp problems.



Original Servo-Amplifier Developed by JSW

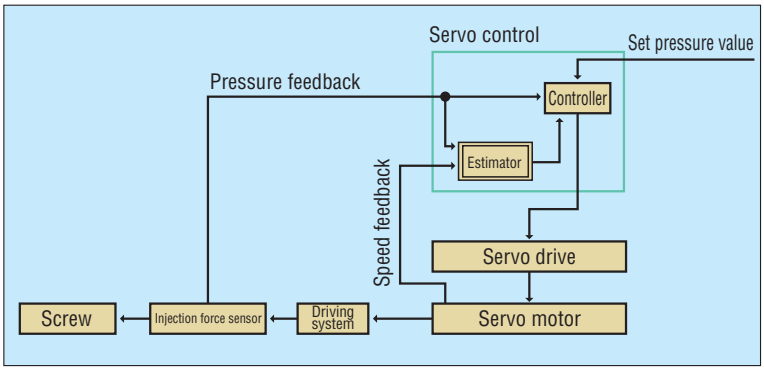
A result of JSW's Research & Development designed to be operated under severe conditions, the servo driving system is built exclusively for molding machines. A 32 bit RISC chip delivers high speed processing, with a high degree of accuracy.



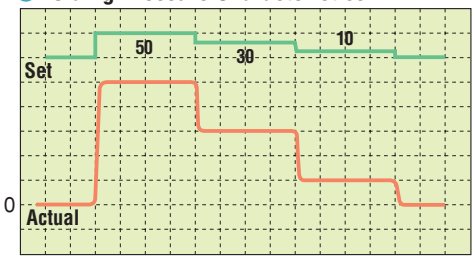
APC (High performance injection force feedback control) Delivers High Precision Control

The injection force sensor combined with JSW's high performance feedback control has realized a truly reliable pressure follow-up and shockless pressure control.

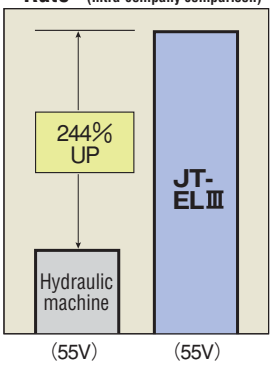
Theory of Control



Holding Pressure Characteristics



Comparison of Injection Rate (Intra-company comparison)



SSR Control for Cylinder Heater

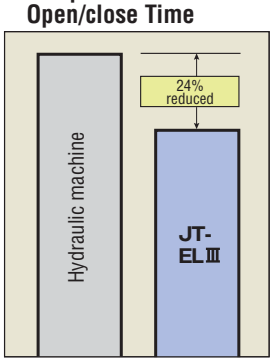
PID temperature controllers regulated by SSR (solid state control) for all zones, including nozzle section.

Smooth Operation and High Cycle Molding

Shorter Cycle Time

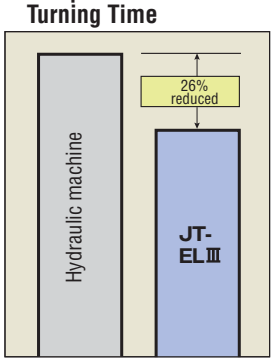
A high response function and speed provided by simple designed drive unit, increases a shorter operation time of mold open / close and table turning. (Intra-company comparison)

Comparison of Mold Open/close Time



JT40RELⅢ

Comparison of Table Turning Time



JT40RELⅢ

Automatic Central Lubrication

Automatic central lubrication of all moving parts, clamp, injection carriage and ball screws is standard spec. Any grease malfunctions cause an audible alarm.

Compound Actions

Reliable compound movements by the single driving inherent to the electric servo driven machine further reduce the cycle time and expand the adaptability range of the gate cutting function and others.

Automatic grease supplying unit

Reliable Controller of Easy Handling and High Function

■SYSCOM2000T (Standard specification)

A clear and friendly to operator screen has been realized by adoption a large TFT color LC display screen (10.4 inches). Also interactive operation enables easy setting of the conditions. just by touching the setting place.

■High-touch Keyboard

Friendly to operator and easy-to-handle design with the mode selection keys arranged on the machine illustrated on the display screen. Easy setting to totally eliminate erroneous handling. (The internal memory has a storing capacity of the molding conditions of 40 molds and a data card has the same for 40 molds.)

■Built-in Controller

The display section (large LC display screen) and operational keyboard are housed in the operator's control panel at stationary platen. This eliminates wasteful space around the machine. The operator is able to command all machine operation while standing by the panel.

■Printer Output

With a printer connection, it is possible to keep records of molding conditions, measured data of various sorts and injection profiles.

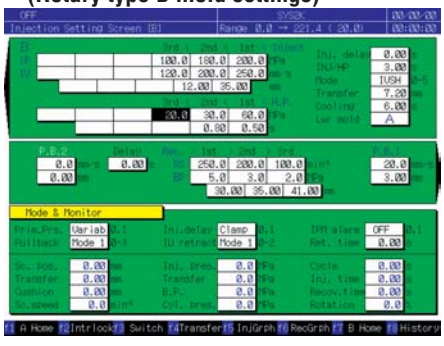
■Molding Condition Change (Rotary type specification)

Two lower dies, delicately differs from each other in terms of their molding requirements. To conform, the requirements for either die (INJECTION, HOLDING PRESSURE, SCREW ROTATION) are made settable, independently.

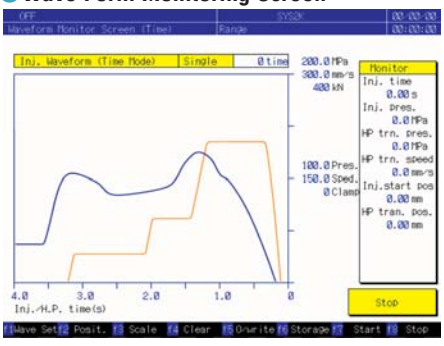
SYSCOM2000T(Color LC Display)

●Overall Set-up Screen

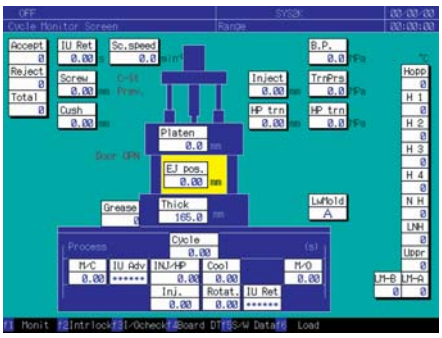
●Injection Parameters Set Screen (Rotary type B mold settings)



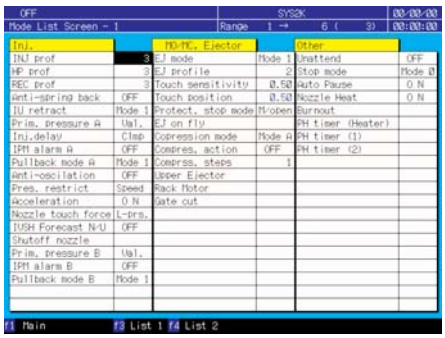
●Wave Form Monitoring Screen



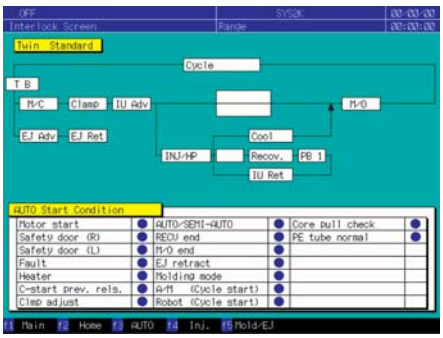
●Action Monitor Screen



●Mode List Set Screen



●Interlock Screen



Standard Equipment／Optional Equipment

Standard Equipment

Unit	Item
Injection and Plasticizing	Open nozzle (tip type)
	Wear and corrosion-resistant cylinder Note 1)
	Wear and corrosion-resistant screw Note 1)
	HT screw head
	Screw cylinder exchanger
	Cold start-up prevention
	Mold-pause changeover function
	Automatic purging circuit
	Nozzle touch force remote setting
	Nozzle back timing select
	Injection/rotation program control Inj.speed/press,Holding press.: 1～6 steps(adjust.) Screw speed/back press.: 1～6 steps(adjust.)
	Transfer to holding pressure by sensing injection speed(IVS)
	Cylinder temp.remote setting
	Cylinder temp. control (SSR)
	Soft-pack servo control
Mold Clamping	Self-lubricating toggle bushings
	Automatic greasing
	Mold open/close and ejector program control Mold open/close:1～4 steps(fixed) ejector:1～3 steps(adjust.)
	Automatic mold clamping force setting
	Automatic mold height adjuster
	Remote setting mold height
	Mold protection device
	Safety devices (electrical, and mechanical)Note 2)
	Photocell type safety device(for rotary type only)
	Remote setting of table rotation speed

Unit	Item
Controller	SYSCOM controller display(touch panel TFT color LCD)
	Japanese/English switching function Note 3)
	Interlock display function
	Injection 2 molding conditions change(for rotary type only)
	Memory of Molding conditions (internal memory 40 molds)
	Data card (40 molds/card)
	Printer output terminal Note 4)
	Self-diagnostic function
	Overall set screen
	Compound actions
Monitor	Cylinder temp. monitoring function
	Heater circuit alarm
	Injection pressure monitor function(IPM)
	Injection wave form monitor
	Injection wave form memory
	Statistical graph function
	Measured value display
	Grease alarm
	Production monitor function Note 5)
	Operating time display function
	Action monitor function
	Molding condition upper/lower limit monitor Note 6)
	Maintenance service Note 7)
	History of alarm
	History of set value
	Servo control fault alarm
	Abnormal alarm buzzer
Other	Mold cooling water closed circuit
	Auxiliary parts (maintenance tools, ejector rod)

Optional Equipment

Optional	Item
Injection	B size screw cylinder
	High accurate nozzle temperature control(2 zone control)
	SVO long nozzle
	High-melter M Ⅱ screw Note 8)
	LCP resin exclusive screw Note 9)
	Cylinder heat insulation cover
	Shut-off nozzle (pneumatic type)
	Hopper
	Friction ring ceramic
	Sylinder module system
	Resin dwell fault alarm
Mold Clamping	Toggle injection compression function Note 10)
	Daylight extension
	Mold platen heat insulating plate
	Air jet
	Pneumatic core puller circuit
	Unscrewing motor control circuit
	Die clamper
	Ejector for upper mold (hydraulic type)
	Ejector 3 points ejection (rotary type only)
	Ejector stroke extention(rotary type only)
	Mold heater circuit
	Mold temp. control piping for high temp.(rotary type only)
	Quick mold change device
	Mold positioning device
	Mold temperature display
Controller	Language switching function Note 11)
	Calendar timer
	Warning light
	Communication function with host computer(Link10)
	Printer (with printer cable)
	Printer cable (IBM compatible type)
	Deta card (40 molds/card)
	Robot interface
	Spare plug receptacle
Other	Flow indicator for cooling water
	Cooling water cut-off alarm
	Vibration proof rubbers

Note 1) Either of the A or K size are standard specification. (B size will be optional.)
Note 2) The operating section of the rotary type shall be a photoelectric type.
Note 3) Japanese/English switching function is standard equipment.
Note 4) The printer unit and cable are optional.
Note 5) The production volume and advanced notice of production complete can be set and expected finish time is displayed.
Note 6) Monitoring functions of the following particulars are equipped as standard.
〇Cycle time 〇Injection time 〇Rotation time 〇Mold opening/closing time 〇Cushion 〇Injection start point 〇Changeover position to holding pressure 〇Changeover pressure to holding 〇Injection pressure 〇Screw back pressure
Note 7) Maintenance service time and areas are displayed.
Note 8) Adaptable for screw diameter over 35mm.
Note 9) Adaptable for screw diameter smaller than 28mm.
Note 10) A and B mode are available for injection compression operaion, compression can be adjusted in 1-6 steps.
Note 11) One more language can be added,in addition to Japanese and English.