J-EL III SERIES
Large Size

Electric Servo Drive
Injection Molding Machine

JSW Hiroshima Plant

JSW Injection Molding
Machinery Division
Large Size Electric Servo Drive
Injection Molding Machine J-ELⅢ Series
—Tomorrow’s technology that is the fruits of tradition and advance

JSW, a large injection molding machine pioneer, is a trail blazer developed upon extensive experiences.
Our advanced technology has actualized the excellent performance.
Integration of ecology and technology contributes to dramatic improvements in quality, productivity and economy.
Excellent high quality stable molding
Extra rigid clamping mechanism
Powerful output dual-servo injection machine
High speed and high pressure injection
High accuracy injection control

Phenomenal energy savings
Reduced power consumption
Less cooling water
No hydraulic oil
Reduction in equipment cost

High cycle
High plasticizing rate
High speed mold open/close and ejector
High speed mold height adjustment
High speed dual function

Functionality
Injection compression molding
Soft pack servo
SYSCOM2000 controller
Easy maintenance

The appearance and the specifications of the machine may be altered for improvement without notice.
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The photographs in this leaflet include options.
■ Extra rigid clamping mechanism
Pursuit of precision steady molding and durability has resulted in 1.2 times rigidity in comparison with the current machine. High rigid clamping ensures superior quality steady molding.
- New design high cycle and rigid toggle system
- Rigid platens designed by FEM analysis
- Large-diameter tie bar
- Movable platen supporting system and long platen guide
Long preservation of mold open/close accuracy and platen parallelism is guaranteed without

Extra rigid clamping platen

■ Powerful dual-servo injection unit
JSW high accuracy dual synchronous control system and rigid injection unit have actualized not only high-speed molding but powerful injection (patent pending).
- Sturdy injection system with plates (3 pcs) and guide bars (4 pcs) retaining high durability
- Linear bearing guide ensuring rigid stability and high accuracy

Accurate linear bearing guide
- **High speed and high pressure injection**
  Injection rate becomes 1.8 times faster than the hydraulic machine due to the high speed. Injection pressure also exceeds the hydraulic machine. It realized thin wall molding.

- **Accurate injection control**
  JSW’s high performance feedback control (APC control) leads to excellent pressure trackability and responsiveness in injection process (Patent No. 3168289).

**Holding Pressure Characteristics**

**Advanced Pressure Control**

- **Optimum pressure control according to the resin filling condition**
- **Feed back pressure**
  - **Controller**
  - **Estimator**
  - **Servo drive**

**EX. 1 Weight stability**

J-ELIII molding stability prompts improvements in molding quality. Weight variations reduced to 1/2 or less of the hydraulic machine.

**Product**: Tray  
**Cycle**: 64.7 sec  
**Resin**: PP

<table>
<thead>
<tr>
<th></th>
<th>Hydraulic machine (BSOT)</th>
<th>Electric machine (J850ELIII)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average weight</td>
<td>993.0g</td>
<td>978.2g</td>
</tr>
<tr>
<td>Max. variation (R)</td>
<td>4.8g</td>
<td>2.2g</td>
</tr>
<tr>
<td>Deviation (e)</td>
<td>0.32g</td>
<td>0.45g</td>
</tr>
<tr>
<td>R / R</td>
<td>0.46%</td>
<td>0.22%</td>
</tr>
<tr>
<td>e / R</td>
<td>0.12%</td>
<td>0.08%</td>
</tr>
</tbody>
</table>
**High performance screw**

- **High plasticizing capability**
  Plasticizing becomes 1.3 times better than the hydraulic machine. It reduces the plasticizing time that occupies the cycle time.

- **New high melter III screw**
  Upgraded new high melter III screw, with improvement of the current high melter III screw, is standard.

  ![Image of screw](image)

  **[Features of new high melter III screw]**
  JSW's dual flight screw with the two sub flights between the main flight
  - Reduction in molding distortion due to homogeneous well-kneading
  - High speed screw revolution according to high dispersion
  - High plasticizing capability by the long screw
  - Reduction in cooling time due to low-temperature plasticizing

**OPTIONS**
Screw development leader JSW provides the wide selection of screws to satisfy user needs.
- High plasticizing capability screw
- Well-kneading and high dispersion screw
- High viscosity resin screw
- Long-fiber resin screw

**High speed mold open/close**

High cycle toggle mechanism has actualized high speed mold open/close performance that eventually contributes to 20% reduction in dry cycle. Accurate platen stop has improvement in productivity, eliminating chuck failure of the take out robot.

![Comparison of platen stop precision](image)

- **Comparison of mold open/close time**
- **Comparison of platen stop precision**
**High speed ejector**

Ejector speed has been modified in 1.2 times faster than the hydraulic machine that enables reduction in product removal time.

**High speed mold height adjustment**

1.5 times faster mold height adjustment has been attained in comparison with the hydraulic system, which allows substantial setup time cutting.

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**Ex. 2 Reduced cycle time**

Cycle time reduction is available by high efficiency peculiar to J-EL electric servo machines. High cycle performance completes productivity modification.

**Further cycle reduction with multifunctional operation**

Full use of high speed multifunctional operation function that is actuated by independent drive enables extensive reduction in molding cycle.
EX. 3 Energy savings

Reduction in substantial energy savings as well as cycle time has been actuated as to J-EL III large electric series.

- Power consumption is saved by 1/3 to 1/2 of the hydraulic machine
- Cooling water usage saving to 1/5 or less of the hydraulic machine
- No hydraulic oil
- Factory equipment cost is saved (such as the power, cooling water and air conditioning)

**Comparison of power consumption**

- Hydraulic machine (BSOT) 0.90kWh/shot
- Electric machine (JB850ELIII) 0.32kWh/shot

**Comparison of savings**

- Annually 61% cost-cutting achieved

Substantial energy savings offer you enormous economic effects.
**Functionality**

**Injection compression molding**

**JSW’s injection compression molding**

(standard equipment: Patent No. 1744469)

Injection compression molding is controlled by high accuracy platen positioning of JSW electric toggle machine. Arbitrary settings of operation mode and pressure level are available for various moldings.

**Equipment Mode**

Equipment modes A and B are available for diverse moldings.

**[Effects of injection compression molding]**

- Reduction in molding distortion
- Improvement in transcription
- Easier mold release
- Cycle time reduction
- Gas venting
- Skin adhesion molding

**EX. 4 Effects of injection compression molding**

The following effects are to be gained by J-ELII injection compression molding: reductions in molding distortion, cycle time and clamping force.

**Product**: Roof of doghouse  
**Resin**: Recycled PP

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Injection compression (A1 mode)</th>
<th>Effect of injection compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distortion</td>
<td>7.5–11.0 mm</td>
<td>0.2–0.5mm reduced</td>
<td></td>
</tr>
<tr>
<td>Cycle time</td>
<td>74.8 sec</td>
<td>19.5 sec reduced</td>
<td></td>
</tr>
<tr>
<td>Clamping force</td>
<td>1300 t</td>
<td>800 t reduced</td>
<td>500 t reduced</td>
</tr>
</tbody>
</table>

**Soft pack servo**

**Soft pack servo, proper pressure injection molding**

(standard equipment: Patent No. 1755568)

Resin filling at a proper pressure is executed, suppressing the peak pressure immediately before holding pressure changeover in injection process. Soft pack servo produces effects on over-packing prevention to thin wall molding.

**[Effects of soft pack servo]**

- Reduction in molding distortion
- No flash
- Improvement in weight stability
- Reduction in clamping force (low-pressure molding)
- Longer mold life
**Functionality**

**Operator-friendly interactive controller SYSCOM2000**

- **TFT color LCD with touch panel**
  Large TFT color LCD provides a clear picture for operator-friendly viewing.
  Interactive operation has been actualized with the screen-touch that allows ease of condition settings.

- **High-touch keyboard**
  User-friendly design is offered with the mode selections arranged on the illustration of the molding machine, and easy setting prevents misoperation.

- **Built-in controller**
  Controller composed of the display and operating keyboard is provided, which is embedded in the local box of the machine center with the least wasted space around the machine that enables all operations.

- **Memory of molding conditions**
  40 mold conditions are to be stored in either a data card as well as internal memory.

- **Language switching function**
  Language selection is available between Japanese and English in response to the need for internationalization. Adaptable to other languages (optional).

**Easy Maintenance**

- **Automatic lubrication system**
  Automatic lubrication system is equipped in the clamping unit and injection unit. 
  Alarm is to be issued upon the occurrence of greasing error that contributes to substantial improvements in maintenance.

- **High endurable ball screw**
  High endurable ball screws are adopted for high speed and high load.

- **JSW original servo amplifier**
  Large injection machine servo amplifiers, soft and hard, are our developments that enable quick maintenance at any circumstances.
Standard Equipment

<table>
<thead>
<tr>
<th>Unit Item</th>
<th>Unit Item</th>
<th>Unit Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection and Plasticizing</td>
<td>Controller</td>
<td>Injection</td>
</tr>
<tr>
<td>Standard open nozzle</td>
<td>TFT color LCD controller with SY530M touch panel</td>
<td>Long nozzle</td>
</tr>
<tr>
<td>Screw cylinder</td>
<td>Data card</td>
<td>SVM shut-off nozzle (spring type)</td>
</tr>
<tr>
<td>High meter M4 screw</td>
<td>Self touch start-up function</td>
<td>Wear and corrosion-resistant cylinder</td>
</tr>
<tr>
<td>Screw suck back</td>
<td>Printer output terminal</td>
<td>Wear and corrosion-resistant screw</td>
</tr>
<tr>
<td>Plunge cover with L3</td>
<td>Self-diagnostic function</td>
<td>Wide selection of screws</td>
</tr>
<tr>
<td>Cold screw start-up prevention</td>
<td>Overall set screen</td>
<td>Cylinder heat insulating cover</td>
</tr>
<tr>
<td>Automatic purging circuit</td>
<td>Emergency stop button switch</td>
<td>Cylinder cooling unit (blower)</td>
</tr>
<tr>
<td>Sprue break timing selection</td>
<td>Safety key</td>
<td>Shut off nozzle (hydraulic or pneumatic)</td>
</tr>
</tbody>
</table>

Optional Equipment

<table>
<thead>
<tr>
<th>Unit Item</th>
<th>Injection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long nozzle</td>
<td>Air jet</td>
</tr>
<tr>
<td>SVM shut-off nozzle (spring type)</td>
<td>Core puller circuit (hydraulic or pneumatic)</td>
</tr>
<tr>
<td>Wear and corrosion-resistant cylinder</td>
<td>Unidirectional motor control circuit</td>
</tr>
<tr>
<td>Wear and corrosion-resistant screw</td>
<td>Gate-cut circuit</td>
</tr>
<tr>
<td>Wide selection of screws</td>
<td>Automatic opening safety door</td>
</tr>
<tr>
<td>Cylinder heat insulating cover</td>
<td>Automatic opening and closing safety door</td>
</tr>
<tr>
<td>Cylinder cooling unit (blower)</td>
<td>Special locating ring</td>
</tr>
<tr>
<td>Shut off nozzle (hydraulic or pneumatic)</td>
<td>Safety rail switch</td>
</tr>
</tbody>
</table>

Notes:
1) N2000F cylinder for 1400H injection unit, and nitride cylinder for 2300H and up.
2) G25 screw for 1400H injection unit.
4) Solid state control (SSR) for 1400H injection unit and magnetic contactor control (MC) for 2300H and up.
5) The printer, printer cable and receptacle are optional.
6) The Japanese/English switching function is standard equipment.
7) Sensor and cable are not included.
8) Setting of production quantity and advance notice are possible and completion time is displayed.
9) Monitoring functions of the following particulars are equipped as standard:
   - Cycle time, injection time, rotation time. Mold opening closing time.
   - Cushion, Injection start position, Changeover position to holding pressure, injection pressure, Changeover pressure to holding, Screw back pressure)
10) Maintenance service time and areas are displayed.
11) One more language can be added, in addition to Japanese and English.

J-ELI Large Size Electric Servo Drive Module System [Wide Selection]

- Injection Unit
- Screw cylinder (Theoretical output capacity unit:)

<table>
<thead>
<tr>
<th>J550ELIII</th>
<th>1400H</th>
</tr>
</thead>
<tbody>
<tr>
<td>J650ELIII</td>
<td>2300H</td>
</tr>
<tr>
<td>J850ELIII</td>
<td>3100H</td>
</tr>
<tr>
<td>J850ELIIV</td>
<td>3100H</td>
</tr>
<tr>
<td>J1000ELIII</td>
<td>3900H</td>
</tr>
<tr>
<td>J1300ELIII</td>
<td>5200H</td>
</tr>
<tr>
<td>J1800ELIII</td>
<td>7800H</td>
</tr>
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</table>