Servo Mechanical Presses

Electropneumatics & Hydraulics (India) Pvt. Ltd.
Machine Manufacturing Division
Electropneumatics has been providing innovative solutions for forming applications since 1972.

The extensive range of indigenous machines, products and technologies offer a perfect blend of modern technology and cost-competitiveness and cater to a variety of metal forming and allied applications.

The machines shape/form metals, engineering plastics and composites, ceramics, etc. in solid, sheet, tube or powder form through stamping, cold extrusion, powder compaction, honing, bending, shearing/cutting, moulding and other methods.

Electropneumatics has its corporate office and manufacturing plant at Pune, a sales and service network throughout India and a dedicated and proficient engineering team to work out solutions for different customer needs. Electropneumatics continually enhances its technological strength through on-going research and development of new products and upgradation of existing ones.

Servo Mechanical Presses

Servo mechanical presses are the answer to today’s requirement of flexibility and productivity in manufacturing. They combine the speed and reliability of eccentric drive mechanical presses and the versatility of hydraulic presses with innovative electric servo technology. The high torque, low inertia dynamic servo motors connected to the eccentric gear train replace the flywheel, clutch and brake.

- AC servo motor
- Bull gear
- Intermediate gear
- Eccentric gear
- Counterbalance cylinder
- Slide adjustment
- Hydraulic overload safety
- Slide
- Bearing arrangement
- Press frame
- Cushion
- Cushion cylinder
- Hydraulic power pack
Benefits over Conventional Mechanical Presses

**Benefits over Conventional Mechanical Presses**

**Flexibility**
Servo mechanical presses give the user flexibility to
- Program desired motion profile
- Program slide speed
- Perform various processes like blanking, coining, trimming, shallow draw, tool tryout, progressive die operations on the same press
- Enable slow approach to reduce impact and vibration
- Dwell anywhere within the stroke for in-die/secondary operations
- Form high strength steels and exotic materials
- Electronic synchronisation for press to press operations

**Basic Features**
- Servo system
- Stepless programming of slide
- Auto shut height adjustment
- Online capture facility to study the slide speed/position profile
- Total production counter on HMI
  - Energy management system
  - Programmable motion profiles
  - Automatic lubrication system
  - 7” or 12” full color touch panel (HMI)
  - Full torque at lower speed

**Safety Features**
- Counter balance cylinders
- Tonnage control safety
- Hydraulic overload protection
- Emergency stop push button
  - Single phase preventer
  - Phase reversal safety
  - Electro mechanical safety brake

**Optional Features**
- Die cushion- pneumatic, hydraulic or servo electric
- Safety guards
  - Servo roll feeders
  - Handling system

**Advantages**
- Control force & speed
- Ability to dwell in stroke
- Reduce spring back
- Improve blanking edge
- Increase tool life
  - Perform in-die operations
  - Special processes like warm forming
  - Reduce impact
  - Reduce noise levels
  - Reduce energy
  - Increase stroke rates & production

**Progressive die operation**

**Conventional crank motion**

**Coining**

**Blanking**

**Drawing**
User Friendly Interface

• User friendly interface with LCD provides all necessary data at the user’s fingertips
• Provides step less programming of the slide for speed, position, acceleration and deceleration
• Programmable strokes and slide velocities enable different slide motion profiles for various critical forming applications with higher part accuracy.
• Servo motor controlled in velocity and torque limit modes for speed control and tonnage limit control of the slide
• Online capture facility to study the slide, speed and tonnage profile position

Higher Output

There can be considerable increase in production rate (SPM) by optimising the stroke length. The press can be operated in pendulum motion with shorter stroke length thereby increasing SPM. This ability to independently program the parameters as per the process makes servo mechanical presses highly productive.

![12 stage-progressive die component](image)

Full stroke cycle

Pendulum motion (short stroke)

Higher Quality

The quality of the part can be increased considerably in a servo press by slowing down at the time of forming. Servo mechanical press is well suited for tryout operations, where extremely slow speeds are required. The slide can be stopped at any point in the stroke and full rated force is available at even the slowest of speeds. Dynamic speed control at any position of the stroke enables effective forming of different materials.

Lower Maintenance

Servo mechanical presses are extremely low on maintenance as there are fewer rotating parts. The mechanism of flywheel and clutch is replaced by servo motors with gear box, which are less prone to maintenance.

Noise Free Environment

Servo mechanical presses are considered to be silent presses because of the silent driving unit, the servo motor and elimination of hydraulics.

Forming Stage Reduction

Many mechanical presses used for a forming application can be substituted by a single or combination of servo presses depending on the application. Thus it saves time, space and money in every way.
Increased Tool Life
The life of dies used on servo mechanical presses is considerably more than on mechanical presses because of impact and thereby, vibrations can be effectively controlled through control of slide motion using slow approach and fast return. Studies show a three-fold increase in die life.

Energy Management
While the connected motor capacity on a servo mechanical press may seem high, the actual power consumed is very low and is comparable to conventional mechanical presses. This is made possible due to Energy Management in the form of capacitive buffering. The capacitor bank is pre-charged by the mains with low power during idle or non-loaded part of the cycle and it acts as a buffer of energy. When the press goes through its actual loading cycle, energy is pulled from the capacitor bank and not from the mains. Hence, the actual power consumed is low as compared to the connected load.

One Press, Many Applications
A variety of operations can be performed in the same press with advantages such as better spring back control, good flattening/bottoming effect, fine trimmed edges and consistent repeatability. Carry out progressive die forming, warm forming, punching, blanking, forming, precision blanking, burr-free blanking, in-die assembly and more in one press.
### Specifications

#### C-Frame Construction

**Low Tonnage Range: 35 T to 250 T**

<table>
<thead>
<tr>
<th>Tonnage Capacity</th>
<th>35 T</th>
<th>60 T</th>
<th>80 T</th>
<th>110 T</th>
<th>160 T</th>
<th>200 T</th>
<th>250 T</th>
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<tbody>
<tr>
<td><strong>Model No.</strong></td>
<td>ESC1-35</td>
<td>ESC1-60</td>
<td>ESC1-80</td>
<td>ESC1-110</td>
<td>ESC1-160</td>
<td>ESC1-200</td>
<td>ESC1-250</td>
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<td>100</td>
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<td><strong>Throat</strong></td>
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<td>250</td>
<td>310</td>
<td>350</td>
<td>390</td>
<td>460</td>
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<td><strong>Shut height (SDAU)</strong></td>
<td>mm</td>
<td>220</td>
<td>300</td>
<td>320</td>
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<td>400</td>
<td>450</td>
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<td>80</td>
<td>90</td>
<td>100</td>
<td>110</td>
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<td><strong>Slide size (LR x FB)</strong></td>
<td>mm</td>
<td>380 x 300</td>
<td>500 x 400</td>
<td>560 x 460</td>
<td>630 x 520</td>
<td>700 x 580</td>
<td>850 x 650</td>
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<td>mm</td>
<td>780 x 400</td>
<td>900 x 500</td>
<td>1000 x 600</td>
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<td>400 x 260</td>
<td>450 x 340</td>
<td>600 x 350</td>
<td>600 x 500</td>
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**Die cushion type**

- **Pneumatic**
- **Pneumatic**
- **Pneumatic**
- **Pneumatic**
- **Pneumatic**
- **Pneumatic**
- **Pneumatic**

**Die cushion stroke**

- 35 mm
- 50 mm
- 50 mm
- 55 mm
- 60 mm
- 75 mm
- 85 mm

**Die cushion pad size**

- 300 x 210 mm
- 350 x 300 mm
- 400 x 260 mm
- 450 x 340 mm
- 600 x 350 mm
- 600 x 500 mm
- 650 x 500 mm
### Specifications

**Straight-Sided Construction**

**Medium Tonnage Range: 80 T to 400 T**

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<tr>
<th>Tonnage Capacity</th>
<th>80 T</th>
<th>110 T</th>
<th>160 T</th>
<th>200 T</th>
<th>250 T</th>
<th>315 T</th>
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<td>ESS1-110</td>
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<td>ESS1-200</td>
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<td>125</td>
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<td>700 x 460</td>
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<td>450 x 340</td>
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<td>600 x 500</td>
<td>650 x 500</td>
<td>650 x 560</td>
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<td>900 x 580</td>
<td>1000 x 650</td>
<td>1300 x 720</td>
<td>1300 x 800</td>
<td>2300 x 1100</td>
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<td>Bolster size (LR x FB)</td>
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<td>1000 x 680</td>
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<td>1500 x 900</td>
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<td>Die cushion stroke</td>
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<td>55</td>
<td>60</td>
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<tr>
<td>Die cushion pad size</td>
<td>mm</td>
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<td>450 x 340</td>
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<td>600 x 500</td>
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### Specifications

**Column Construction**

High Tonnage Range: 500 T to 1250 T

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<thead>
<tr>
<th>Tonnage Capacity</th>
<th>500 T</th>
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<th>800 T</th>
<th>1000 T</th>
<th>1250 T</th>
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<td>750</td>
<td>850</td>
<td>800</td>
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<tr>
<td><strong>Strokes per minute (no load, full stroke)</strong> spm</td>
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<td>16</td>
<td>15</td>
<td>15</td>
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<tr>
<td><strong>Slide adjustment (motorised)</strong> mm</td>
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<td>250</td>
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