The Clamping Unit

The SE-DUZ ensures the highest levels of clamping performance with:

- Low inertia, high performance direct-drive motors for clamping and ejection with a new high-response servo system.
- The Z-molding Minimum Clamping Molding (MCM) System that determines the minimum force required at mold touch (See previous page).
- Clamp open/close speeds to 1200mm/sec, and low vibration, for improved cycle times and smooth, quiet operation.
- CPP (Center Press Plate) clamp design (See top right)
- A unique clamping force correcting system (See middle right)
- High-speed ejector operation (333mm/sec)
- Ejector impact absorber feature that prevents parts from sticking to the ejector pins
- Moving platen supports (standard) with a larger shoe for added support area

To help molders meet a wide range of applications requirements, the SE-DUZ also offers:

- Multi-stage mold open/close speed control that can be used to tailor machine operation to specific mold requirements.
- Excellent clamp force linearity, from low to high tonnage, enables optimum setting of clamp force to suit parts with different projected areas.
- Selectable auto-ranging modes can be used to optimize clamp open and close profiles for fast cycling with shock-free movement.
- Mold protection is never an issue with the SE-DUZ. With low pressure mold protection settable to 0.1mm, and mold open/close positions settable to 0.01mm, precision mold protection is ensured and there's no banging — even at high speeds.
- Mold open stop position accuracy of 20 microns, an important factor for take-out robots and 3-plate molds, is ensured with monitoring by precise optical encoders and full closed-loop control.

Multi-stage clamp force control, a standard feature on the SE-DUZ, offers two modes:

- A high-pressure mode in which filling can begin during clamping for improved cycle time.
- A low-pressure mode in which filling can begin during low-pressure clamping for improved part quality.

For optimum life of the ball screws, toggle pins and tie bar bushings, the SE-DUZ is equipped with a highly reliable, automatic grease supply system through a valve-type progressive distribution system. This system uses an externally mounted pump unit with easy-to-load grease cartridges that can be changed without interrupting machine operation. Additionally, the grease level is monitored via sensor, and the machine shuts down automatically if the grease level becomes too low.

The Increased width between tie bars on the SE-DUZ allows installation of large mold bases and increases the work space for mold setup.

For additional information on the SE-DUZ Series, including complete specifications, please consult your Sumitomo (SHI) Demag Sales Representative or visit our website at the address below:

www.sumitomo-shi-demag.us

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Patent Pending Feedback System for Clamp Force Control

The SE-DUZ is equipped with a unique clamp force correcting system that uses a sensor on the tie bar (strain gauge) that measures actual clamp tonnage. Unlike systems that rely solely on measurement of the mold space, this system compensates for the thermal expansion of the mold. Working together with a control device and high precision rotary encoder, this patented system keeps clamping force stable.

Features supporting fast, easy mold changes include:

- Enhanced horizontal clearance between tie bars
- Simple (digital remote) clamp force adjustment
- Increased space for tie-in of ejector rods
The SE-DUZ (20 - 33 U.S. ton) series features the latest advancements in Sumitomo’s all-electric injection molding technology, providing users with the highest level of injection molding precision with low-pressure filling and reduced clamp force. The SE-DUZ is now offered in 20 and 33 U.S. ton models only.

The SE-DUZ Series Direct-Drive All-Electrics

- **Advanced Motor Technology**: Uses a lighter, smaller motor with higher efficiency, repeatability, and durability.
- **Compact Design**: Provides improved force protection for improved force and stability.
- **Improved Force**: Provides improved precision on a wide range of applications.
- **Advanced Motor Technology**: Enables faster velocity response, unaffected by belt elasticity, for high-precision shot molding.
- **High Pressure and Speed**: Provides the speeds, pressures, and torque for high-viscosity resins. And compared with hydraulic machines, the SE-DUZ requires fewer devices because there are no proportional and directional valves.

Simple Process Setting (SPS) System

- **One Process = One Screen**: One Process Setting System reduces screen switching for mold setup and purging by 68%.
- **SPS Reduced**: Settings are arranged by process from the operator’s point of view.
- **Avoid Oversetting**: Avoids overfilling, allowing gases to be released and preventing short shots.

Minimum Clamping Molding (MCM) System

- **Precision Clamp Force Detection**: Precision clamp force detection and feedback control capabilities of the MCM System determine the minimum clamping force required for the shot. The MCM also works together with the Clamp Force Correcting System to compensate for the thermal expansion of the mold.
- **Benefits of MCM System**: Avoids overfilling, allowing gases to be released and preventing short shots.
- **Avoid Oversetting**: Avoids overfilling, allowing gases to be released and preventing short shots.
- **Lower Clamp Force**: Lower clamp force can also reduce power consumption, improve cycle time and in some cases allow molds to be run on lower tonnage machines.
The SE-DUZ (20 - 33 U.S. ton) features four direct-drive motors (plasticizing, injection, clamping and ejection) with closed-loop key control and an integral screw. Each motion except plasticizing uses a ball screw and all four motors are feedback, providing superior mechanical efficiency, repeatability and durability, and avoiding belt-driven problems. The advanced motor technology uses a lighter, compact, low-inertia design with the best mechanical configuration for each motion. The result is a low inertia system that:

- Provides the speeds, pressures and torque for the most demanding applications.
- Draws power only as needed.
- Is easier and faster to adjust.
- Provides exceptional precision and repeatability.

Raising the bar for injection molding machine control, the SE-DUZ is equipped with Sumitomo (SHI) Demag’s Z-molding capabilities that provide a new level of injection molding precision with low pressure filling and reduced clamp force.

The Sumitomo (SHI) Demag Difference
- Sumitomo’s advanced motor technology and the company’s ability to design and build specialized motors for injection molding.
- Programmable feedback that dictates the speed of motion only as needed.
- Over 60 years of R&D on all-electric injection molding machines.
- The ability to approach any combination of motors for the machine type, function and size.
- Over 40 years of R&D on all-electric injection molding machines.
- Patent pending constant speed screw drive motors.
- Programmable screw feedback that ensures of ease of use, optimizes machine performance and reduces pressure.
- Fuses and motors feedback that ensures ease of use, optimizes machine performance and reduces pressure.
- Faster changing the internal characterization of motors that are required for precision.
- Provides feedback that ensures ease of use, optimizes machine performance and reduces pressure.
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- Provides feedback that ensures ease of use, optimizes machine performance and reduces pressure.

The SE-DUZ is equipped with an easy-to-use PC-based control with Z-molding capabilities, providing exceptional molding precision with low pressure filling and reduced clamp force. By shifting the focus from low-pressure filling and reduced clamp force, molders can achieve substantial profits in precision, part cost and overall productivity.

Designed to help molders achieve zero defect molding and optimum machine performance, Z-molding combines three unique systems.

Simple Process Setting (SPS) System
The Simple Process Setting (SPS) System allows easy setup and operation while taking the operator’s ease of set-ups to new heights. Key advantages of the SPS System include:
- Settings are arranged by process from the operator’s point of view
- One Process = One Screen
- SPS reduces screen switching for mold setup and purging by 68%
- Avoiding operator error reduces part quality problems, mold damage and scrap

Potential Flowing Post Control System
The Flow Flow Control (FTC) System optimizes the flow front, further improving the performance of low thermal processability in the cavities. This system:
- Takes advantage of the viscoelastic properties of the resin and allows complete filling without flash.
- Provides precise control of screen position to ensure consistent filling.
- Avoids overfilling, allowing gases to be released and preventing short shots.

Minimum Clamping Molding (MCM) System
Precision clamp force detection and the feedback control capabilities of the MCM System determine the minimum clamp force necessary for fill. The MCM also works together with the Clamp Force Correcting System to compensate for the thermal expansion of the mold.

Benefits of the MCM System include:
- Avoidance of burn spots and short shots.
- Less trapped gases reduces mold maintenance.
- Lower clamp force can also reduce pressure consumption, improve cycle time and in some cases allow models to be run on lower tonnage machines.
The SE-DUZ is equipped with an easy-to-use PC-based control with Z-molding capabilities. Z-molding provides exceptional molding precision with low-pressure filling and reduced clamp force. By shifting the focus to low-pressure filling and reduced clamp force, molders can achieve combined benefits in precision, part cost and overall productivity.

Designed to help molders achieve zero-defect molding and optimal machine performance, Z-molding combines these unique systems.

**Simple Process Setting (SPS) System**

- Settings are arranged by process from the operator’s point of view
- One Process = One Screen
- SPS reduces screen switching for mold setup and purging by 48%
- Avoiding operator error reduces part quality problems, mold damage and scrap

**Potential Flowing Control (PFC) System**

- The Flow Flow Control (PFC) system optimizes the flow front, further increasing the effective flow of thermal pressures inside the cavities.
- Three advantages of the viscoelastic properties of the resin and allows complete filling without flash.
- Provides precision control of screw position to ensure consistent filling
- Avoids overfilling, allowing gases to be released and preventing short shots

**Minimum Clamping Molding (MCM) System**

- Prevents clamp force detection and the feedback control capabilities of the MCM System determine the minimum amount of necessary clamp force.
- The MCM also works together with the Clamp Force Correcting System to compensate for the thermal expansion of the mold.
- Benefits of the MCM System include:
  - Avoidance of burn spots and short shots
  - Lower clamp force can also reduce power consumption, improves cycle times and in some cases allows models to be run on lower tonnage machines.

**SK-II Control**

The SK-II Control uses a specially designed spool tip (optional) and control software (standard) to:

- Eliminate back flow during screw pull back
- Improve shot density control by one well-pressure and clamping position
- Graphical compensating for any changes in resin properties
- Achieve new levels of injection fill pressure (shot weight and density) and peak pressure stability

- On completion of recovery, the check ring is mechanically sealed, completely shutting off material flow (or back flow). Pressure is then put on the screw prior to injection. When the preset pressure is reached, the machine controller calculates the required density correction for the next shot to achieve the correct shot weight. The pressure and speed at which the forward motion occurs are set on the injection control screen for the SK-II.

- Programmable switch over from velocity to hold selectable by pressure
- Hold pressure selectable to a high ($5000$ PSIG or higher) that provides full machine precision of velocity and pressure. "Hold pressure" switch
- Flash speed mode, for injection speeds of 500 PSIG or higher, using a specially designed spool tip and high-pressure valve
- Propagates melt back with no pressure or exterior seal failure. In this mode, control of screw on position and background PID are off
- PID temperature control system that optimizes melt condition with 4-second sampling and a 0.005°C settable
- Additional temperature control features include: nozzles, temperature control as standard, a double-shaft barrel heater, fever burner motor, synchronous bevel gears, and a water cooling/pump temperature control device.
The Clamping Unit

The SE-DUZ ensures the highest levels of clamping performance with:

- Low inertia, high performance direct drive motors for clamping and ejection with a new high response servo system.

- The Z-molding Minimum Clamping Molding (MCM) System that determines the minimum force required at mold touch (See previous page).

- Clamp open/close speeds to 1200mm/sec, and low vibration, for improved cycle times and smooth, quiet operation.

- CPP (Center Press Platen) clamp design (See top right)

- A unique clamping force correcting system (See middle-right)

- High-speed ejector operation (333mm/sec)

- Ejector impact absorber feature that prevents parts from sticking to the ejector pins.

- Moving platen supports (standard) with a larger shoe for added support area.

To help molders meet a wide range of application requirements, the SE-DUZ also offers:

- Multi-stage mold open/close speed control that can be used to tailor machine operation to specific mold requirements.

- Excellent clamp force linearity, from low to high tonnage, enables optimum setting of clamp force to suit parts with different projected areas.

- Selectable auto-ranging modes can be used to optimize clamp opening and closing to suit parts with different projected areas.

- Mold protection is never an issue with the SE-DUZ. With low pressure mold protection settable to 0.1mm, and mold open/close positions settable to 0.01mm, precision mold protection is ensured and there's no banging — even at high speeds.

Mold open stop position accuracy at 20 microns, an important factor for take-out robots and 3-plate molds, is ensured with monitoring by precise optical encoders and full closed-loop control.

For additional information on the SE-DUZ Series, including complete specifications, please consult your Sumitomo (SHI) Demag Sales Representative or visit our website at the address below.

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The Clamping Unit

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- Clamp open/close speeds to 1200mm/sec, and low vibration, for improved cycle times and smooth, quiet operation
- A unique clamping force correcting system (See middle right)
- High-speed ejector operation (333mm/sec) for optimum filling and ejection
- Selectable auto-ramping modes can be used to optimize clamp open and close profiles for fast cycling with shock-free movement
- Multi-stage mold open/close speed control that can be used to tailor machine operation to specific mold requirements
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For optimum life of the ball screws, toggle pin and tie bar bushings, the SE-DUZ is equipped with a highly reliable, automatic grease supply through a valve-type progressive distribution system. This system uses an externally mounted pump unit with wash-to-load grease cartridges that can be changed without interrupting machine operation. Additionally, the grease level is monitored via sensor, and the machine shuts down automatically if the grease level becomes too low.

Center Press Platen

The CPP (Center Press Platen) clamp design, combined with the SE-DUZ’s superior press rigidity, provides improved force distribution, elimination of short shot and flash problems, and improved mold protection.

Features supporting fast, easy mold changeovers include:

- Extended horizontal clearance between tie bars
- Simple (digital remote) clamp force adjustment
- Increased space for tie-in of ejector rods

For additional information on the SE-DUZ Series, including complete specifications, please consult your Sumitomo (SHI) Demag Sales Representative or visit our website at the address below.

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