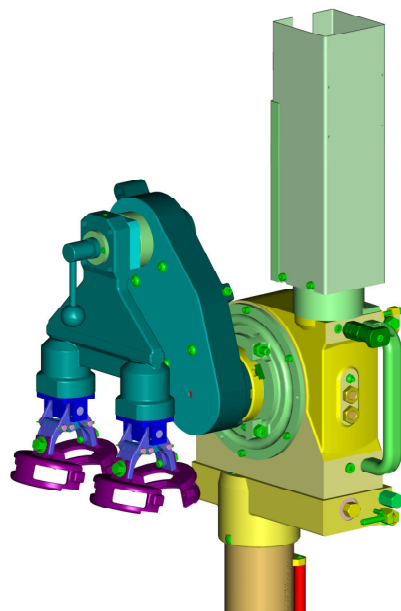


# Technical News Bulletin

16-Feb-05

## Servo Electric Takeout – Series 200

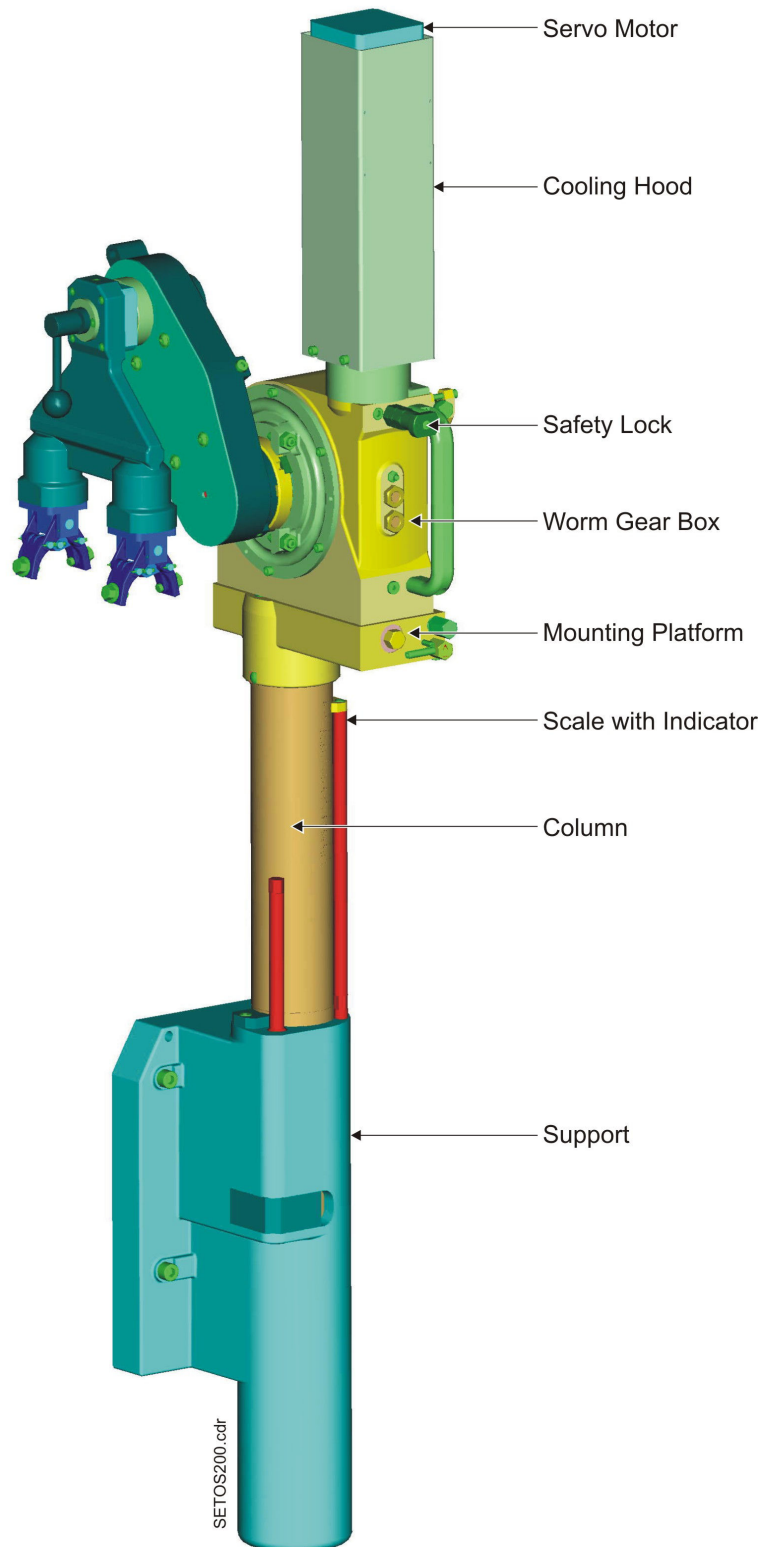


### 1. Introduction

Emhart Glass' Servo Electric Takeout Mechanism (SETO) is designed to meet today's Glass Industry requirements for precise and stable ware transfer from the molds to the conveyor dead plate. Newly formed containers are very susceptible to defects. This makes a controlled takeout motion critical for the ware handling process.

The SETO employs a straightforward mechanism design. In combination with Emhart Glass' AC Servo control it makes the takeout motions precise and repeatable. The AC Servo control allows optimizing the speed and profiles of the takeout IN and OUT motions for each different container. This provides the appropriate balance between takeout motion and increased mold contact time.

The reliable and efficient ware handling provided by the Servo Electric Takeout is another way that Emhart Glass is making the Glass Industry more productive.



## **2. Product Description**

### **2.1 Mechanism**

The Servo Electric Takeout mechanism consists of the following main components:

- Gear box with motor
- Mounting and positioning assembly
- Takeout arm with tong head

The rigid cast housing of the gearbox contains the high efficiency, low backlash worm gear, which runs in an oil bath. The large wheelbase reduces forces and wear.

The AC Servomotor is flanged in a vertical position to the top of the housing and its output shaft connected to the worm shaft by means of a coupling. This coupling has a shock absorbing elastomeric element. The motor is protected by a cover, which also serves as a cooling hood. The cooling air supply is from the section frame, through the mounting support and a porthole in the gearbox.

The support of the mounting and positioning assembly is flanged to the front of the section frame. This support carries and guides the height adjustable column. The mounting platform for the gearbox is mounted to the top of the column. This mounting platform has the facilities to adjust the position of the gearbox in both, the X- and Y-axis, and also to adjust the angle relative to the section centerline.

Height adjustment of the mechanism is over the drive shaft located in the mounting platform at chest height. This drive shaft connects to a bevel gear, driving the height adjustment spindle. A scale on the column allows equal and repeatable setting of the mechanism over the whole machine. The height adjustment is backlash free.

A lateral hole at the lower end of the column serves for cooling air supply from the section frame, through a porthole in the gearbox into the cooling hood of the motor.

The takeout arm is a wide belt driven type as described in the TNB 91. Arm assembly/disassembly into/from the hub of the gearbox is done without having to interfere with the neighboring section, as the clamping screw is accessible from the section center.

The torque from the gearbox to the arm is transmitted via key slots in the hub and corresponding keys on the arm. One of these keys is extended as end stop, acting against the adjustable end stops on the gearbox.

The vertical position of the takeout tong head can be adjusted from the front of the gearbox via an adjusting screw moving the lever.

Tong close air supply to the takeout tong head is from the blank side valve block, using existing section frame piping, through an integrated pipe in the column and portholes in the hub of the gearbox takeout arm. Tong close speed control is over a check valve located in the mounting platform.

A spring-loaded plunger mounted on the gearbox allows the operator to lock the takeout arm in any position for maintenance or job change purpose. For locking, the nose of this plunger engages in a hole of the coupling.

The SETO Series 200 installs easily into new or existing section frames.

## 2.2 Controls

The SETO uses Emhart Glass AC Servo Technology to precisely accelerate, decelerate and position the takeout tong head. The system uses two Emhart Glass control modules for this process. These modules are the general-purpose Control Module and the Amplifier Module.

The general-purpose **Control Module** utilizes a PC motherboard as the primary data processor. Communication is over the standard Emhart Hand Held Terminal (HHT). This allows easy configuration of the takeout IN, takeout OUT and kickback positions, as well as speed and acceleration and deceleration curves.

The **Amplifier Module** uses the encoder feedback signal from the AC servomotor to create precise and repeatable takeout motions.

The long-term information pertaining to the takeout process is stored in the Emhart Glass Production Line Console computer (PLC). Arcnet communication is used to exchange information (job setup data, error, and event logging) between each takeout mechanism and the PLC.

## 3. Specification

The SETO is interchangeable with the conventional mechanism and available for all standard IS and AIS machines of the following configurations:

Machine Type	Center Distance	Section Frame Type
IS 4 ¼	SG, 4 ¼" DG & 3" TG	Standard
IS 5	SG, 5" DG & 85 TG	Standard and 35 mm increased height
IS 5 ½"	SG, 5 ½" DG	Standard and 65 mm increased height
IS 6 ¼	SG, 6 ¼" DG & 4 ¼" TG	Standard and 65 mm increased height
AIS	6 ¼" DG & 4 ¼" TG	Standard and 65 mm increased height

<b>Technical Details</b>	
Operating speed	1 – 25 cycles per minute
Takeout Arm Swing	180° + 30°
Takeout IN time	0.30 seconds minimum from kickback position
Takeout OUT time	0.40 seconds minimum
Position accuracy	0.01° or < 0.05 mm at tong head
Tong close air	2.1 bar min. / 0.005 Nm <sup>3</sup> for DG operation at 15 cycles
Lubrication	Oil bath lubrication of the gear box
Power requirement	230 volt +/- 10%, 3 phase, 30 amps, 50/60 Hz

<b>Reference Drawings</b>	
210-390	SETO Mechanism Master List
210-480	Gear Box, Series 200
210-481	Takeout Mounting & Positioning Assembly
210-388	Motor Selection Chart
200-2031-1	Takeout Arm, IS 4 ¼
200-2032-1	Takeout Arm, IS 5
210-439-1	Takeout Arm, IS 5 ½, IS 6 ¼ & AIS
210-275	Takeout Tong Head, Quick Change
94-690	Aligning Fixtures
711-10	SETO Control, Master List
120-749	Cable Way Assembly

#### 4. Features and Benefits

- Controlled takeout motion
- Less variances of takeout kinematics
- Smooth container handling resulting in fewer critical defects
- Identical motion on each section and cycle
- Many different profiles allow optimization for each container type
- Fast and consistent takeout motion
- Integrated gear box **and** servo motor cooling
- Simple takeout tong arm exchange **from the inside of the section**
- Safety device for takeout tong arm exchange or work on section
- Simple conversion, fits into existing sections
- Scale for easy and repeatable height adjustment
- Three degrees of freedom for takeout aligning. **No realigning when gearbox exchange.**
- Wide belt takeout arm **with integrated cooling**
- Solid torque transmission from gear to arm
- No external piping
- Integrated oil gage