Digital glass making is complete
Welcome to the digital age...

NIS and BIS cover the complete ware range with full servo technology. Future glassmaking is now complete.
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End to End Innovation Pathway

Bucher Emhart Glass is proud to introduce its End to End vision. In the glass plant of the future, integrated equipment will read, analyze and react to data completely automatically. Backed with support, ranging from selecting the right machine to assistance in maintaining and running it, plants can achieve better performance, efficiency, safety, traceability, and reliability, ultimately leading to higher profits.

The NIS and BIS machines are perfect to stabilize the process due to their reliable and controllable servo electric motions. Also data of all the servo mechanisms can be stored easily for further analysis. With this they are THE vehicle for future glass production following the E2E innovation path.

Control Centre
The Control Center acts as the central location which connects both the processes.

Closed Loops
Closed Loops focus on monitoring and automating adjustments in the Hot End production process.
- Blank cooling control
- Bottle spacing control
- Plunger up control
- Plunging cooling control

Scout
SCOUT is the intelligence software and hardware that powers inspection equipment today.

Safety Controls
The End to End’s Safety Control system allows operators on either side to switch to a safe state isolated from each other.

Data Trend Analysis
Data is collected, analyzed and used to alert when changes are required or even trigger automatic adjustments in the forming process.
Condition Monitoring
Condition Monitoring and Preventive Maintenance tools enable plants to schedule repairs sufficiently, as well as reduce unintentional downtime.

Traceability
Each bottle will be marked with a unique code which will be correlated to production data. This will allow traceability across days, weeks, months and years of production.

Defect Visualization
Defect Visualization operates by providing a data bridge where images of defects seen in the Cold End are viewable in the Hot End.

Adjust Sensitivity
Automatic Sensitivity Adjustment safeguards against times when the forming process deviates from one of its control limits by tightening the limits in the cold end inspection.

Robots:
End to End fully integrates robots into the Hot End process and takes on various roles around the machine.
NIS Overview

The NIS machine is the 1st fully servo controlled IS machine. The extended center distances of 5” TG and 95mm QG together with the conversion features DG<->TG<->QG make the NIS a very flexible high performance machine.
Features

• FlexIS TS Control System
• Servo Electric Gob Distributor
• Constant Cone Suspended Delivery
• Parallel Blank and Blow Mold
• Quick Change Plunger Mechanism
• Pneumatic Control Module (Blank and Blow side)
• FPS Valve Technology for Plunger up, Counter Blow and Final Blow
• VertiFlow Blank Mold Cooling
• Neck Ring Cooling
• VertiFlow Blow Mold Cooling
• VertiFlow Assist
• High Low Deadplate Cooling
• Automatic Lub-System with 4 zones
• Vacuum Assist Blow Side

Servo Electric Mechanisms for:

• Blank Mold Open and Close MOC (2 motors)
• Baffle Mechanism
• Invert Mechanism
• Blow Mold Open and Close MOC (2 motors)
• Blowhead
• Takeout Mechanism
• FlexPusher

Optional Features

• Blank Side InVertiFlow Mold Cooling
• FPS Valve Technology Final Blow
• Vacuum Assist Blank Side
• Integrated Dead Plate Guide Air
• Plunger Process Control PPC (enabling closed loop control)
• Temperature Control System TCS or Blank Radar (enabling closed loop control)
• Lifting Device
• Variable Center Distance Tonghead VCD TG, QG
• Blank side barrier

NIS Ware Range

<table>
<thead>
<tr>
<th>NIS</th>
<th>6 1/4&quot; Double gob</th>
<th>5&quot; Triple gob</th>
<th>95 mm Quad gob</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B&amp;B</td>
<td>P&amp;B</td>
<td>NNPB</td>
</tr>
<tr>
<td>Height under finish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>95 mm</td>
<td>75 mm</td>
<td>75 mm</td>
</tr>
<tr>
<td>Maximum</td>
<td>365 mm</td>
<td>345 mm</td>
<td>345 mm</td>
</tr>
<tr>
<td>Body diameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>121 mm</td>
<td>121 mm</td>
<td>121 mm</td>
</tr>
<tr>
<td>Finish diameter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>48 mm</td>
<td>83 mm</td>
<td>50 mm</td>
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</tbody>
</table>
NIS Benefits

**Flexibility**
The NIS covers the 6 1/4 DG - 5" TG - 95mm QG forming production ware range within same footprint as a conventional IS-machine.

**Quality**
Parallel mold open close extends the mold equipment. Servo-electric mechanisms provide precise, repeatable motions.
**Performance**
Allows for 5" triple gob production run at a similar speed as double gob.
Allows for 95mm quad gob production run at the same speed as triple gob.
Quick job change using three fixed plunger position heights

**Energy**
Lower energy consumption and less compressed air required.

**Safety**
Dedicated safety features with standard operating procedures and reduced ambient noise.
BIS Overview

The BIS machine is the 2nd fully servo controlled IS machine. The BIS covers the ware range of the pneumatic IS machine types 4¼, 5" and 5½ and therefore complements the NIS machine perfectly.
Features

- FlexIS TS Control System
- Servo Electric Gob Distributor
- Constant Cone Suspended Delivery
- Parallel Blank and Blow Mold
- Quick Change Plunger Mechanism
- Automatic Lub-System with 4 zones
- Pneumatic Control Module
- Blank Side with FPS Valve Technology
- VertiFlow Blank Mold Cooling - 6 on/off
- Neck Ring Cooling - 2 on/off
- VertiFlow Blow Mold Cooling
- VertiFlow Assist - 4 on/off
- High Low Dead Plate Cooling
- Pocket Air Finger
- Vacuum Assist Blow Side

Servo Electric Mechanisms for:

- Blank Mold Open and Close MOC (Single Motor)
- Baffle Mechanism
- Invert Mechanism
- Blow Mold Open and Close MOC (Single Motor)
- Blowhead
- Takeout Mechanism
- FlexPusher

Optional Features

- Special Adaptors to use up existing Molds (Type 4 1/4” DG, 3” TG, 5” DG, 85 mm TG, 5 1/2” DG)
- Funnel Mechanism (Servo)
- Blow Side VertiFlow Assist Cooling
- Vacuum Assist Blank Side
- Integrated Dead Plate Guide Air
- Plunger Process Control PCC (enabling closed loop control)
- Temperature Control System TCS or Blank Radar (enabling closed loop control)
- Lifting Device
- Blank side barrier

BIS Ware Range

<table>
<thead>
<tr>
<th>BIS</th>
<th>140mm Double gob</th>
<th>95mm Triple gob</th>
<th>70 mm Quad gob</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B&amp;B</strong></td>
<td><strong>P&amp;B</strong></td>
<td><strong>NNPB</strong></td>
<td><strong>B&amp;B</strong></td>
</tr>
<tr>
<td><strong>Height under finish</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>64 mm</td>
<td>59 mm</td>
<td>48 mm</td>
</tr>
<tr>
<td>Maximum</td>
<td>342 mm</td>
<td>322 mm</td>
<td>302 mm</td>
</tr>
<tr>
<td><strong>Body diameter</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>102 mm</td>
<td>65 mm</td>
<td>45 mm</td>
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<tr>
<td><strong>Finish diameter</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>48 mm</td>
<td>48 mm</td>
<td>TBD</td>
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<tr>
<td>Minimum</td>
<td>90 mm</td>
<td>50 mm</td>
<td>TBD</td>
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<tr>
<td>Maximum</td>
<td>38 mm</td>
<td>38 mm</td>
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</table>
BIS Benefits

**Flexibility**
The BIS covers the entire 4 ¼" 5" and 5 ½" forming machine production ware range. Performance: quicker job change as servo motion is immediately precise and repeatable. Machine for long and short runs.

**Quality**
Individual cooling and close loop controls enhance the forming process. Parallel mold open and close extends the mold equipment lifetime.
Compatibility
Existing molds can be utilized with minor modifications

Energy
Lower energy consumption and less compressed air required.

Safety
Dedicated safety features with standard operating procedures and reduced ambient noise.
Ware Range and Dimensions

NIS and BIS can cover the complete ware range of any glass plant in the industry – and all of it with servo technology. Forward-looking glass-container plants are switching from pneumatic to servo controls, and BIS and NIS allow them to use the servo technology for all types of containers. With 99% uptime, improved energy consumption, better quality and far easier maintenance, it is estimated, that the lifetime total cost of ownership for a servo machine is 10% lower than a pneumatic equivalent. Servo machines are quieter too, improving the working environment for operators.
## NIS Ware Range

<table>
<thead>
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<th>5” Triple gob</th>
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<tr>
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<td>102 mm</td>
</tr>
<tr>
<td>Finish diameter</td>
<td>Maximum</td>
<td>48 mm</td>
<td>90 mm</td>
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IS machine - machine height with Constant Cone delivery

<table>
<thead>
<tr>
<th>Installation layout</th>
<th>NIS</th>
<th>BIS</th>
</tr>
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<tr>
<td></td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>FB1</td>
<td>6396</td>
<td>7540</td>
</tr>
<tr>
<td>FB2</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>FB3</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>L1</td>
<td>5258</td>
<td>6400</td>
</tr>
<tr>
<td>L2</td>
<td>1375</td>
<td>1375</td>
</tr>
<tr>
<td>L3</td>
<td>1100</td>
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</tr>
<tr>
<td>T1</td>
<td>3694</td>
<td>3944</td>
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<tr>
<td>T2</td>
<td>4105</td>
<td>4352</td>
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<tr>
<td>T3</td>
<td>4364</td>
<td>4614</td>
</tr>
<tr>
<td>CL1</td>
<td>3050</td>
<td>3050</td>
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<tr>
<td>CL2</td>
<td>884</td>
<td>884</td>
</tr>
</tbody>
</table>

Note: For machine height with non-Constant Cone delivery, please contact Bucher Emhart Glass.

* A free gob drop of 900-1200 mm is recommended
Utility requirements

<table>
<thead>
<tr>
<th>Media</th>
<th>Pressure bar</th>
<th>NIS 400-51157 Nm³/min/section</th>
<th>BIS 401-10413 Nm³/min/section</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCU operating air (15 cycles/min)</td>
<td>4.0</td>
<td>4.0</td>
<td>3.8</td>
</tr>
<tr>
<td>FPS operating air (15 cycles/min)</td>
<td>5.0 bar max</td>
<td>1.6 Nm³/min/cavity</td>
<td>1.5 Nm³/min/cavity</td>
</tr>
<tr>
<td>Vacuum</td>
<td>85%</td>
<td>0.4</td>
<td>0.2-0.3</td>
</tr>
<tr>
<td>VertiFlow blank and NR cooling</td>
<td>1200 mm H₂O</td>
<td>17/14 BB/NNPB</td>
<td>14/11 BB/NNPB</td>
</tr>
<tr>
<td>VertiFlow blow side standard (bottom plate)</td>
<td>1200 mm H₂O</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>VertiFlow blow side with vertiflow assist</td>
<td>1200 mm H₂O</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Conveyor</td>
<td>1200 mm H₂O</td>
<td>12</td>
<td>10.0</td>
</tr>
<tr>
<td>Cooling air requirements, Appendix</td>
<td></td>
<td>200-15864</td>
<td>200-15864</td>
</tr>
<tr>
<td>Lubrication oil</td>
<td>80.0</td>
<td>0.3 liter/section/day</td>
<td>0.3 liter/section/day</td>
</tr>
<tr>
<td>Cooling water</td>
<td>2.1</td>
<td>25 liter/min</td>
<td>15 liter/min</td>
</tr>
</tbody>
</table>

- Cooling values show highest possible consumption
- Calculate highest-lowest expected heat load = tonnage, cooling system pressures, production, machine type, molds, etc.
- Calculated values allow energy efficient fan selection

Dimension specification for feeder & spout

<table>
<thead>
<tr>
<th>Feeder &amp; spout</th>
<th>S Spout depth (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 std</td>
<td>324</td>
</tr>
<tr>
<td>81 deep</td>
<td>375</td>
</tr>
<tr>
<td>503</td>
<td>414</td>
</tr>
<tr>
<td>515</td>
<td>477</td>
</tr>
<tr>
<td>555 std with 503 spout</td>
<td>414</td>
</tr>
<tr>
<td>555 deep with 515 spout</td>
<td>477</td>
</tr>
<tr>
<td>585</td>
<td>459</td>
</tr>
</tbody>
</table>

Bucher Emhart Glass makes every effort to provide valid, helpful information to our customers so that our equipment will be best utilized. If you encounter information that is not correct or information which can be misunderstood or not understood, please advise Bucher Emhart Glass so that we can improve this information. All the above figures are typical values and subject to change. For specific project requirements, please contact Bucher Emhart Glass Technical Service.
Good maintenance practices are a wise investment in productivity as they ensure high levels of performance and minimize unplanned downtime. Bucher Emhart Glass offers a range of services to keep our customers’ machines in top operating condition.
Essential parts

Quality parts are readily available:
Our S-Class program stocks 5,000 of the most frequently requested hot and inspection machine parts for shipment within hours of order.
Parts are manufactured to precision standards at Bucher Emhart Glass in Örebro, Sweden.

Top quality parts ensure optimum operating life.

Web Shop and Customer Contact Parts

The cooperation between Bucher Emhart Glass and our customers depends greatly on efficient communications. In each sales location, the Customer Contact Parts (CCP) department is the first contact for the daily parts related business. Offering contact in the local time zone and in the local languages is an important service to support our customers in their 24 h, 7 day operations.

24/7 Emergency Assistance

For production critical emergencies our 24/7 Emergency Assistance offers you phone assistance around the clock by experienced service engineers. If necessary, we dispatch a service engineer for an urgent on-site service.

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