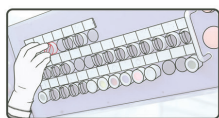
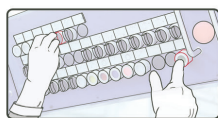


Manual mode increases safety levels

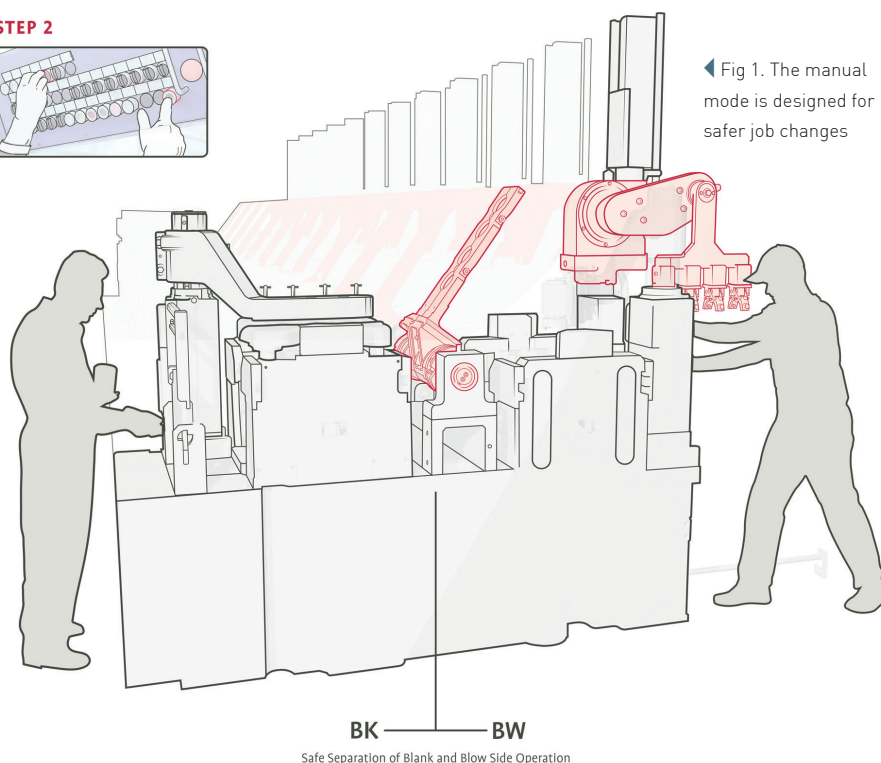
STEP 1



STEP 2



Inge Friberg* discusses how a manual safety mode within Emhart Glass's new FlexIS 3 control system reduces risk and simplifies the job change procedure.



◀ Fig 1. The manual mode is designed for safer job changes

A job change on a glass-forming machine is always a challenge. Each minute without glass has an economic impact on the plant. Therefore, diminishing the downtime is a key goal. To optimise the machine shutdown, there is a high level of co-activity on the machine, with operators working simultaneously on both sides of the machine. Numerous parts of the section equipment have to be changed and adjusted.

These adjustments are done manually by using electrical override commands to run each section mechanism individually. During manual operation of the mechanisms with these commands, the operator should not interact with the section mechanisms to avoid any risk of injury.

During a job change procedure, there are numerous occasions where a manipulation of blank and blow side mechanisms is required, thus increasing the risks of hazard inherent to the interaction between the operator on the blank side and the operator on the blow side. This can only be reduced by an intricate cooperation between the operators on each side of the machine.

Manual mode operation

With the release of the next generation of its forming control system FlexIS 3, Bucher Emhart Glass (BEG) has launched a new safety concept for manual interaction with the sections of a glass forming machine.

The safety control development is based on three principles:

- Separation of the Blank side and Blow side mechanisms (patented);
- Two-hand Operation of the mechanisms; and
- Speed Supervision for Servo Electric Invert (SEI) and Servo Electric Take-out (SETO) mechanisms.

The combination of these three principles with the use of the Manual Mode reduces the risk and simplifies the job change procedure.

The Manual Mode safety controls are certified in accordance with ISO EN 13849 requirements.

The separation of Blank and Blow Sides, the Two-hand Operation, and the speed supervision are based on the JetSafe technology introduced with the FlexIS 3 controls (*pictured overleaf*).

When interacting with a section during accessory exchange or job change, the operator will now activate the Manual Mode operation by a switch located at his working side (Blank and/or Blow side).

The activation of Manual Mode initiates the Two-hand Operation mode and the Speed Supervision.

By activating the Manual Mode on the blank side, the operation of the mechanisms on the blank side is only possible (Blank Moulds, Baffle, Funnel, Invert, Plunger) by simultaneously pressing and holding the Enable button and activating the override switch for a mechanism.

Similarly, the activation of the Manual Mode operation on the blow side allows for manual operation of the blow side mechanisms (Invert, Blow Moulds, Blowhead, SETO) by the same Two-hand Operation mode.

The Two-hand Operation mode eliminates the risk of having any human interaction in the section while a mechanism is moving. As soon as the Enable button is released, the mechanism

Continued>>

stops immediately and the section remains in a safe stop condition.

The separation of the blank and blow sides for the mechanisms reduces the need for the operators to coordinate operation between both sides of the machine and herewith reduces risks. The operator on the blow side takes the ownership of the blow side mechanisms only, and the operator on the blank side takes the ownership of the blank side mechanisms only.

The operation of the SEI mechanism in Manual Mode can be done from both sides of the machine but the operator who initiates the movement is the one who controls the SEI mechanism. In this condition, the SEI cannot be activated simultaneously from the other side of the machine.

During Manual Mode operation, the speed of both the SEI and SETO mechanisms is considerably reduced and safely supervised. Should the speed exceed the specified limits for any reason;

the section immediately stops in safe mode.

The Two-hand Operation of the SEI and SETO mechanisms with Speed Supervision simplifies the adjustment of the neck rings and the take-out arm.

The Manual Mode is fully operational with all the servo mechanisms of the NIS and BIS machines.

All BEG IS and AIS machines equipped with SEI mechanisms and SETO mechanisms can benefit from the Safety Controls and Manual Mode operation, to take advantage of the Two-hand Operation with Speed Supervision for servo mechanism adjustment.

The Safety Controls and Manual Mode Operation is part of the BEG strategy to develop a simple and safe glass forming machine operation. ■



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