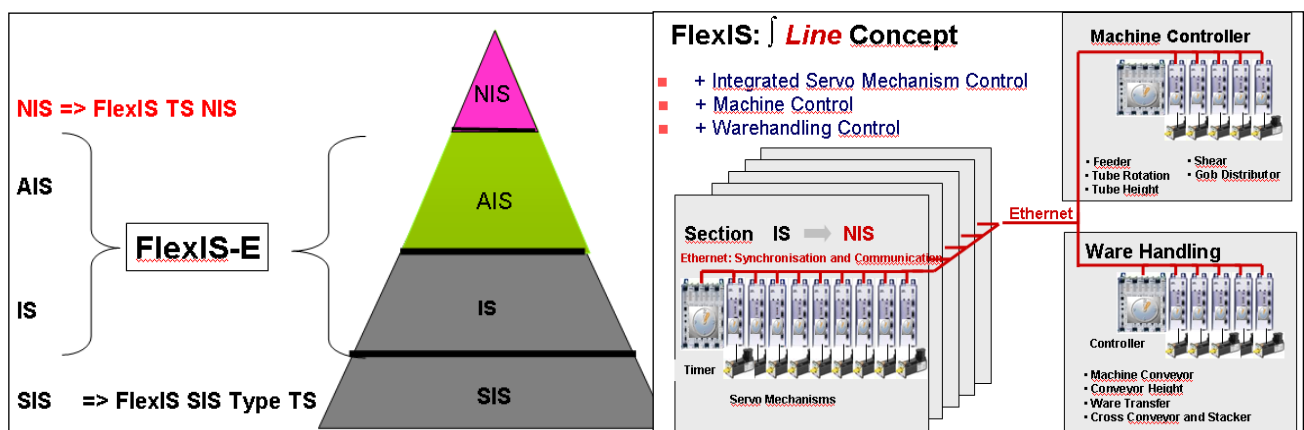


Technical News Bulletin

Steinhausen, September 2020



FlexIS TS-E

- Designed as an integrated Line Control System for IS and AIS machines.
- Scalable and expandable system adapting to the specific customer needs allowing future expansion.
- Spare parts cost savings. Only 3 main items for all the controls.

Introduction

The FlexIS TS-E (Expandable Timing System) has been designed as an integrated Line Control System for IS and AIS machines. The 3 main parts are section control, machine control and ware handling control, using the same components and communicating by Ethernet.

The FlexIS TS-E is a scalable and expandable system adapting to the specific customer needs allowing future expansion.

The basic version is just a timer on the section, were two servos for the FlexPusher can be easily added. In case of choosing the Servo Invert and/or Servo Take out the additional drives can be simply added. This is possible even later, during machine life, when such needs are requested. The same is valid for the FlexPressure System (FPS).

The machine controller driving the five gob forming motors ensure precise and controlled motions for the servo tube rotation and tube height, servo feeder plunger, as well as servo shear and servo gob distributor.

The ware handling controller manages the different servo motors responsible for a smooth optimized container handling. Conveyor, Ware Transfer, Cross Conveyor and Stacker are servo controlled. This integrated system improves synchronization and flexibility. All the existing drive parts and gear box can be used.

This integrated FlexIS TS-E control system covers from the feeder to the stacker the complete glass container forming process and provides all the required operator interfaces.

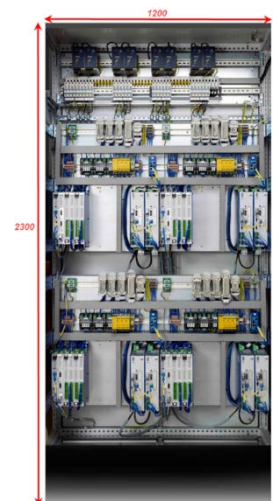
System Description

FlexIS TS-E controls max 12 sections (24 in tandem configuration) and is composed by 3 main parts: section controller, machine controller and ware handling controller.

Section Controller Cabinet

The section control cabinet (see picture) contains four section modules distributed on two plates. Each section has an individual Controller:

- 1 Section Controller manages the section timing
- Up to 4 servo drives for servomechanisms: Invert, Takeout and FlexPusher
- FPS valves analog outputs to pilot max 8 channels
Final Blow FPS connector wired on the section's panel.
- Ethernet TCP/IP devices communication, synchronization
- CAN open bus connection for device configuration
- Expansion of modules for future applications.
- The 24 Volt power supply, two per section, one for timing and one for FPS valves.

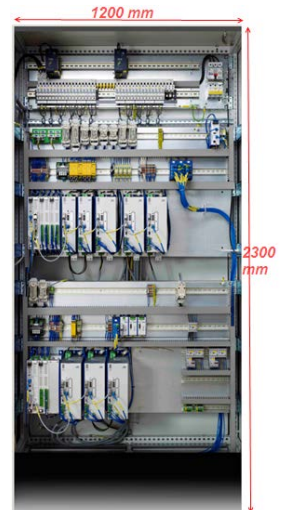


Machine Controller/ Ware Handling Controller (WHC) Cabinet

This cabinet (see picture) contains the **Machine Control** on the upper plate and the **WHC** on the lower plate the.

Machine Controller

- 5 servo drive gob-forming axis (servo feeder, servo shear, tube height, tube rotation and servo gob distributor.
(configurable with Mechanical Feeder and Mechanical Shear)
- All common machine events (shear spray, gob spray, cullet water)
- Ware Handling Control
- WHC controls machine conveyor, ware transfer, cross conveyor and stacker.
- Conveyor Height adjustment (also tandem machines)
- Ware handling supervision (WHS) (option) (see TNB 170 pag. 8) for rejecting stuck and down ware on conveyor with light barrier.
- Pressure Control Unit PCU (option)
- machine forming process air (max. 12 D/A Output and 12 A/D Input channels (monitor and control))



Human Machine Interfaces HMI

The FlexIS HMI consists of the Universal Consol (UC), the Hand Held Terminal (HHT), the Blank side Overhead Panel and the Blowside Panel, the Feeder Operator Station and Ware handling Control (WHC) Operator Station.

Universal Consol (UC)

- Industrial PC (Windows) with touch screen in an air conditioned cabinet and FlexIS software
- Ergonomic pull down menus for quick navigation
- The UC allows to set the desired parameters, the job handling and to import/export job files.
- Provides alarms, machine status, production reports, down time reports.



Hand Held terminal (HHT)

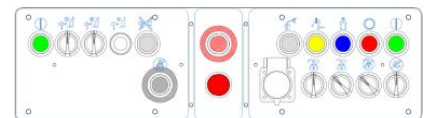
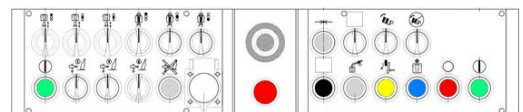
- Allows the operator near the IS Machine
- To individually control most of the equipment functions (normally controlled by the Universal Console (UC)).
- to view and change setup parameters of the IS Machine and associated equipment,
- To view the status of inputs and to activate mechanisms in the system.
- help troubleshooting



Blank side Panel & Blow side Panel

The BK panel is located overhead on the blank side of the section and the BW panel is located on the conveyor in front of each section.

- Switch and button functions are indicated by pictograms.
- Electrical over-ride selector switches for each mechanism allow manual operations, and disable selector switches inhibits any mechanism operation.
- As options are available also BK and BW Panels with a reduced number of electrical overrides and disable switches, only for the servo mechanisms and FPS, see pictures
- It is possible to initiate an automatic calibration cycle for the section's servo-mechanisms
- Special cycles can be activated from both panels. This includes cold blank/blow cycle, manual swab, delivery request, normal stop, blowside special cycle etc.



Feeder Operator Station

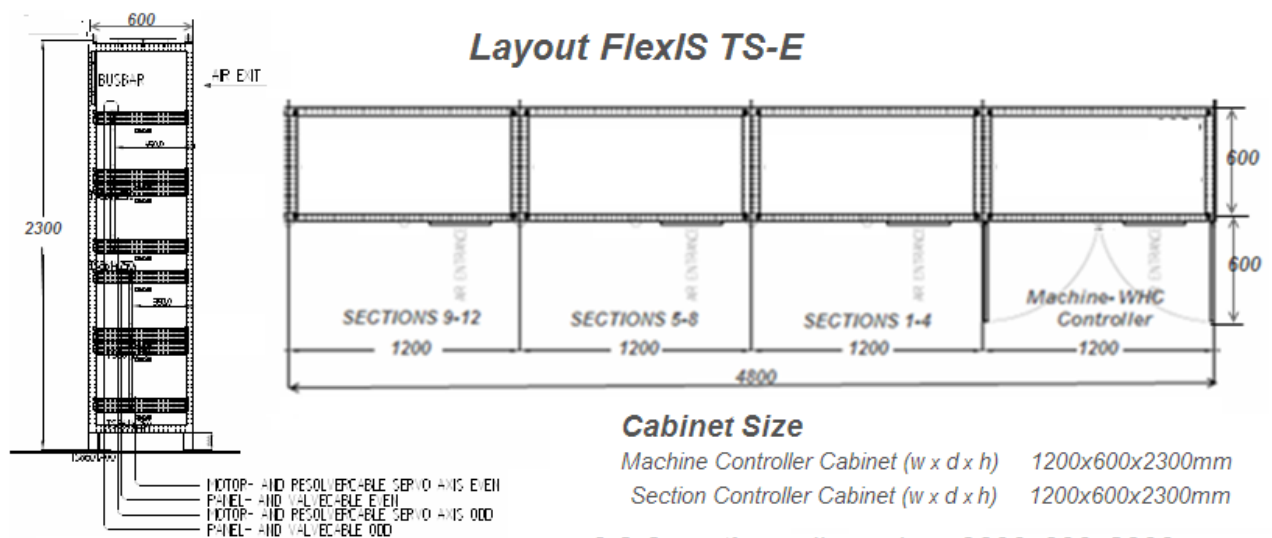
It is the Operator interface for all the machine controller servo mechanisms (feeder, tube, shear, and gob distributor). The built in HHT allows the user to optimize the setting of the gob forming axis and delivery. There is an E-stop and reset of the FlexIS TS-E.



Ware Handling Control Operator Station

Operator interface for the motors of the WHC: Conveyor, Ware Transfer, Cross Conveyor and Stacker.

Cabinet Size



6 & 8 sections dimensions 3600x600x2300 mm
10 & 12 sections dimensions 4800x600x2300 mm

Installation Requirements

Universal Consol air conditioned cabinet

Dimension (w x d x h) 600x600x 1850

Ambient Condition

Temperature 0-55°C

Humidity 10% - 80%

Protection Class IP 54

Main Supply

Line Supply 230VAC -10% /+20%

Line Frequency 48-62 Hz

Line Fuse (to be provided by customer) 16 A

Power Consumption 1KVA

Control Cabinet

Ambient Condition

Temperature 0-55°C

Humidity 10% - 80%

Protection Class IP 54

Main Supply

Line Supply 3x400VAC -10% /+20%

Line Frequency 48-62 Hz

Line Fuse (to be provided by customer) 80 A

Power Consumption

12 Sections all axis 18KVA

10 Sections all axis 16KVA

8 Sections all axis 13KVA

6 Sections all axis 11KVA

Typical heat dissipation

12 Sections all axis 2850 Watt

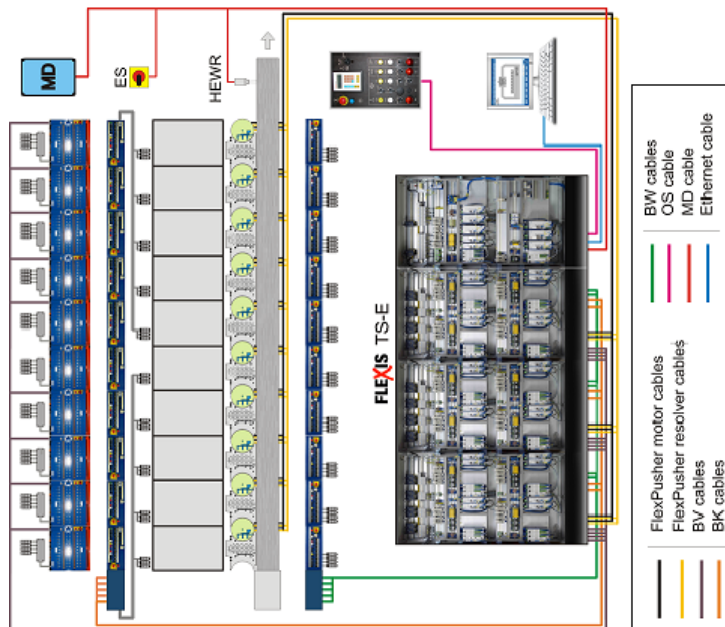
10 Sections all axis 2450 Watt

8 Sections all axis 2050 Watt

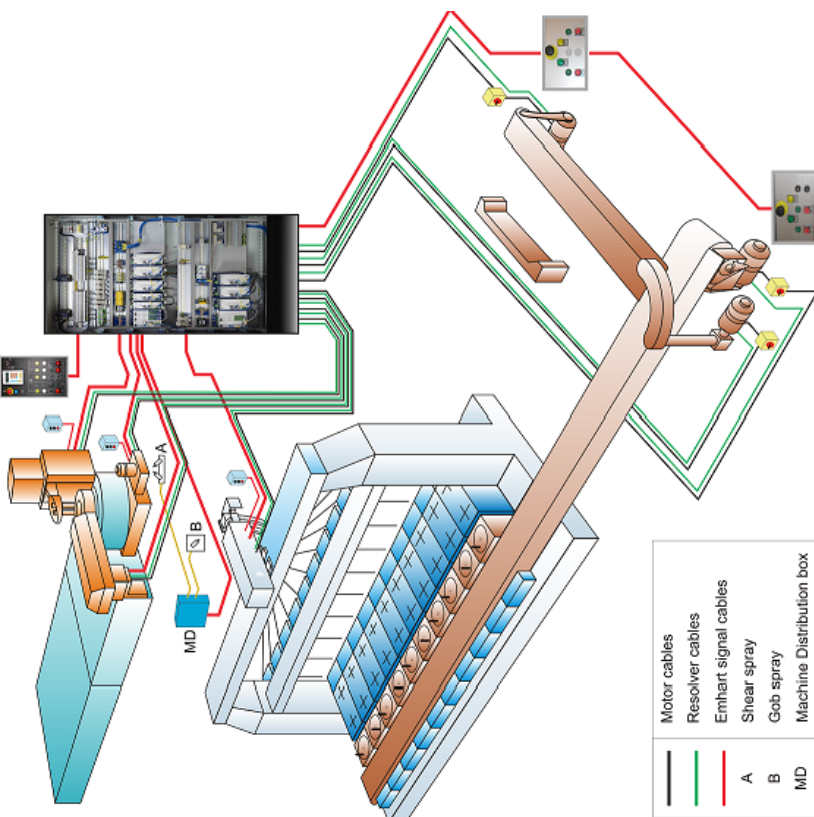
6 Sections all axis 1650 Watt

For reference only

FlexIS TS-E Cables Layout



Section Controller Connections



Machine Controller-Ware Handling Controller Connections

Features / Benefits

- Modular and expandable
- Spare parts cost savings. Only 3 main items for all the controls (see pictures)
- Hardware replacement with automatic configuration
- Valves current supervision and alarm
- FPS Control Integrated to Section Controller
- Possible to mix analogue and servo valve on the same event.
- Capable of controlling pneumatic and servo electric devices
- High degree of flexibility due to integration of modular technology
- Ethernet communication and remote access through internet
- Graphical visualization of Servo axis parameters (theoretical and real curves).
- UC support multi-language database

