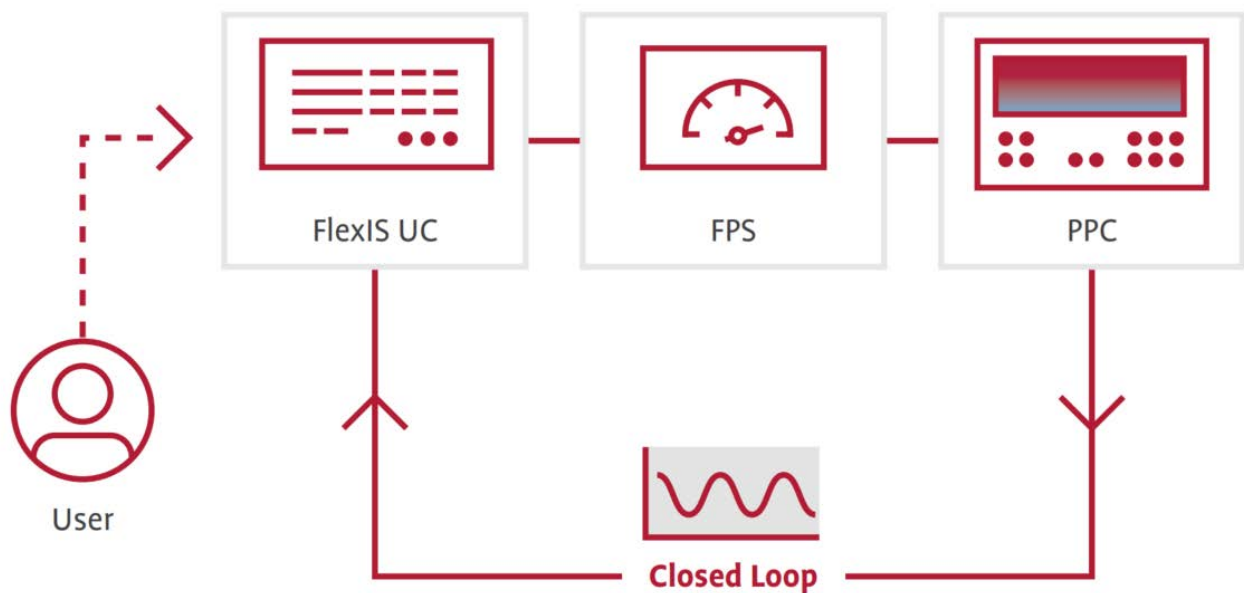# Technical News Bulletin

Steinhausen, April 2020



**FlexIS Plunger Up Control**
– Automatically adjusts FPS pressure levels and timing to keep a constant plunger rise time / dwell time.
– FlexIS Plunger Up Control is fully integrated into the FlexIS controls
– Remote access to PPC and Plunger Up closed loop.
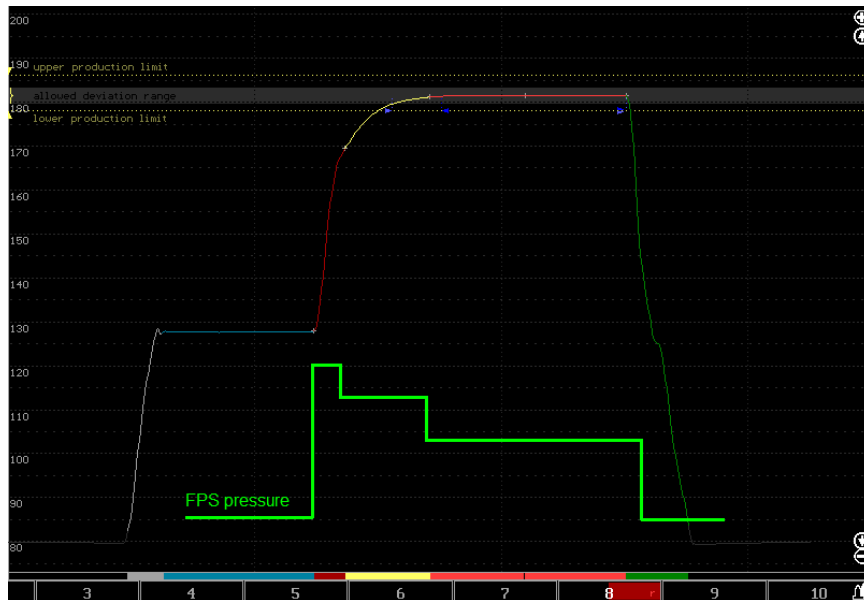
# Introduction

FlexIS Plunger Up Control is a control loop available in the FlexIS Timing using information from the PPC (Plunger Process Control). In Press and Blow (P&B) and Narrow Neck Press and Blow (NNPB) production, it determines the time needed to move the plunger up to its end pressing position. It adjusts FPS pressures and sets FPS timing values so that the desired time to raise the plunger is maintained. Having a defined plunger rise time means also having a defined full contact time ('dwell time'), which is – in common understanding - an important process parameter.
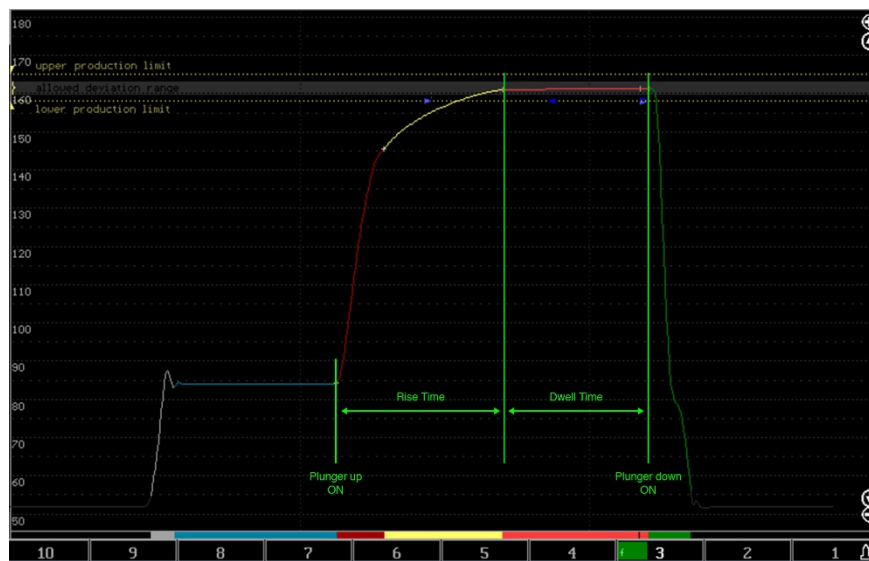


Plunger Rise- and Dwell-Time between Plunger up and down movement.

Up to now, controlling the plunger rise time and thus the full contact time between plunger and glass was hardly done systematically for all cavities. The result depended on many influencing factors like friction in the plunger mechanism, glass viscosity, loading situation etc. Even if it was controlled systematically, pressing with only one pressure offered a limited range to influence the plunger rise time without risking other quality issues.

FlexIS Plunger Up Control uses multi pressure pressing to have a wide range of influence on the plunger rise time. By continually adjusting the initial pressure levels and also the switch points (timing) for stepping between the pressure levels, the system makes multi pressure pressing usable in a comfortable way without risking any quality issues.

Press curve and FPS pressure sequence shown as example.

## Application

FlexIS Plunger Up Control is very beneficial for NNPB and P&B production.

## Setting Description

FlexIS Plunger Up Control is fully integrated into the FlexIS controls. All settings are done on the User Console and are stored as job data.

Settings (all per cavity)
- FlexIS Plunger Up Control on / off
- Setpoint value for plunger rise time
- Upper and lower limits for pressure adjustment

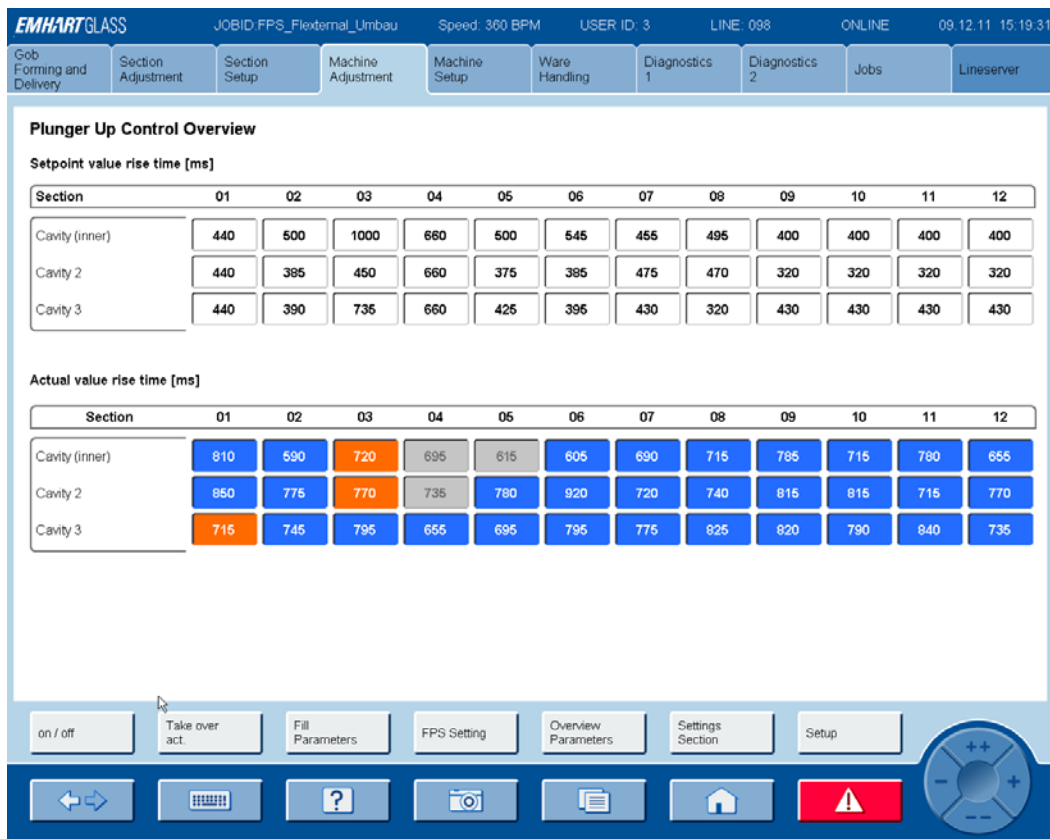Feedback to the user (all per cavity)
- Actual (measured) value for plunger rise time
- FlexIS Plunger Up Control on / off
- Pressure reached a limit

Functions
- See all values per section or grouped in an overview
- Fill values to all cavities or to all sections

Remote Access Extension
- The 'PPC remote access box' makes PPC accessible through the FlexIS remote access system.



FlexIS 1 user interface: Set point values and measured values with colored status indication shown in the Overview page (sample values).

FlexIS 2 and 3 user interface: Setpoint values and measured values with colored status indication shown in the Closed Loop Adjustment page (sample values).

## Installation Requirements

FlexIS Plunger Up Control can be ordered for any forming machine having:

- ✓ FlexIS Timing Control - Software Version 1.07.03.033 or higher
- ✓ PPC Plunger Process Control system
- ✓ FPS Flex Pressure System
- ✓ Basic Closed Loop Equipment (TNB248)

## Order Information

FlexIS Plunger Up Control includes:

- 601-20001-3     Software License FlexIS Plunger Up Control
- 601-217-2     Communication Kit for PPC (specify cable length PPC master to FlexIS MC cabinet)
- 601-217-5     PPC Remote Access Kit
- 1 day     Service engineer for installation
- 2 days     Production specialist for commissioning and on site training

## Documentation

H11103_EN is the English manual of FlexIS Plunger Up Control.

| Features | Benefits |
|---|---|
| Automatically adjusts FPS pressure levels and switch points between pressures according to press curve | Keeps process steady / less variation<br>- over time<br>- from cavity to cavity<br>- less stops<br><br>Machine reaches steady state production faster after job change |
| Uses FPS multi pressure pressing | More regular plunger motion due to higher initial pressure levels. |
| FlexIS Plunger Up Control is fully integrated into the FlexIS controls | Reduced complexity / better ease of use |
| PPC remote access through the FlexIS remote access system | Optimal addition to FlexIS remote service. Experts can support remotely auditing real time PPC and Plunger Up closed loop. |