

Technical News Bulletin

Steinhausen, September 2008



FPS Final Blow – tight process air control

- FPS technology provides the possibility to run up to 4 different pressures in one 360° cycle.
- Benefits with this new valve are the fast and precise pressure build up which allows controlling the two functions of the final with individual pressures.
- Features cooling of the container from the inside and maintaining the contact of the glass with the mold.

Introduction

The adoption of servo technology is moving quickly into the container glass industry. Servo electric drive systems are more and more used for precise and reproducible motion control. This has become a standard for pusher mechanisms and well-accepted options for take-out and invert mechanisms. Our NIS machine represents the ultimate in adoption of servo technology, reducing energy usage and improving control and alignment.

The remaining pneumatics on the machine are mainly for forming air systems. The Emhart Glass Flex Pressure System technology is improving the control of the pneumatics in a similar way. The FPS technology has been available for plunger up and counter blow/plunger cooling for many years. The application of the servo valves has been expanded now to the blow function, especially with Final Blow, offering potential for further improvements in speed and quality.

Features / Benefits

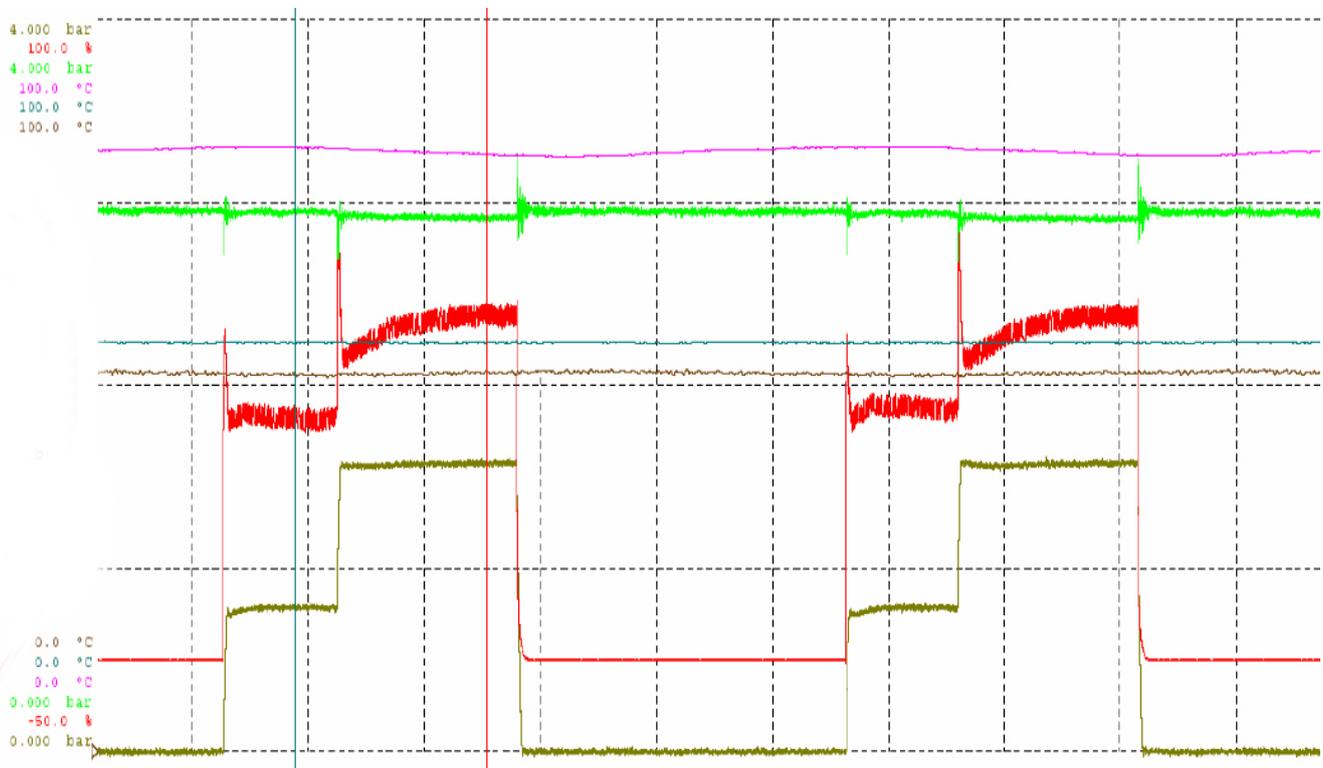
The Emhart Glass FPS technology provides the possibility to run up to 4 different pressures in one 360° cycle. The valve creates the requested pressure by controlling the supply and the exhaust side of the valve. The internal pressure sensor controls the working pressure and balances variations created by the working side as well as from the supply side.

The Flex Pressure System is already well-accepted for plunger up and counter blow/plunger cooling. This has now been expanded to the blow functions of the IS machine, especially Final Blow.

The benefits with this new valve are the fast and precise pressure build-up, which allows controlling the two functions of the final with individual pressures.

The first function of the final blow is to shape the container by blowing the glass onto the walls of the mold. It is important during this step that the glass is blown to contact all surfaces of the blow mold. This means that the pressure must be high enough to shape all the radiuses, especially sharp shoulders, and also fill engravings or textures. The final blow pressure must also be low enough not to blow the hot glass into any seams, or create defects.

The second feature of the final blow is the cooling of the container from the inside and maintaining the contact of the glass with the mold. Usually this requires a higher pressure than the initial forming pressure. The higher cooling pressure together with the blow head lift, which is possible on the servo-driven blow head mechanism of the NIS, provides a very efficient cooling of the inside of the container, maximizing speed potential.

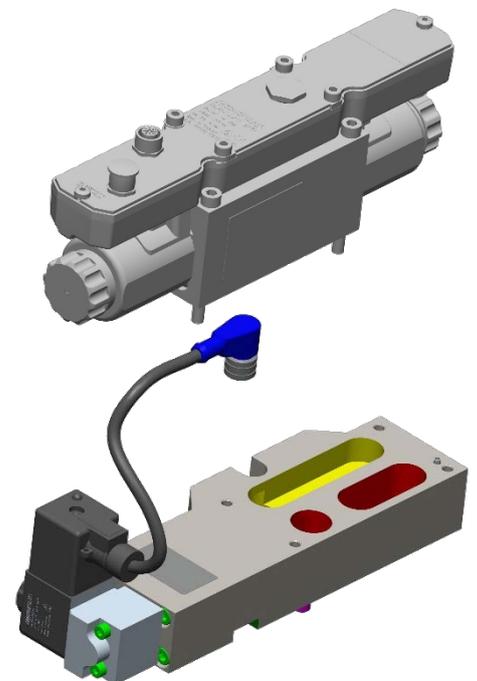


Operation Principles

The new FPS Final Blow valve ED 19 consists of two major components.

The proportional part which creates the pressure controlled supply part of the valve is using the existing design of the ED12 with modifications. The valve uses both proportional sides of the ED 12 valve for air supply. This double ported configuration of the valve is able to supply high air volumes required for the final blow function.

The exhaust function of the valve is done with the second major component, the base plate. This plate houses a standard Emhart Glass cartridge valve which is piloted from a solenoid mounted on the end of the plate. The solenoid is controlled by the proportional valve and triggers the exhaust for a set point of 0bar. The pilot air for the cartridge valve is the supply air for the entire unit, this means no extra pilot air has to be supplied.

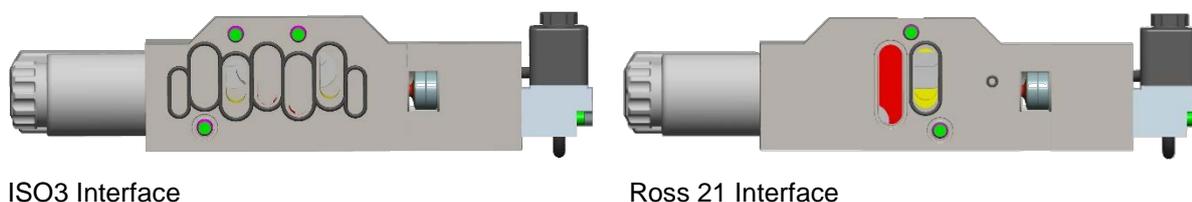


The pressure set point is set, like on all other FPS valves from the FlexIS Process Control System. In the 360 degree forming cycle up to 4 different pressures can be set from the system.

Specification

The valve will be available in two configurations to fit our standard overhead valve block interfaces. The ED19 will be a direct replacement of the currently used ON/OFF valves. The today's standards are the Numatics version of the overhead valve block and the Ross version.

Interface Version	Overhead Valve Block	FPS Final Blow Valve	Replaced Valve
ISO3/Numatics	200-575-3 (1/2)	59-27262-1	59-90119
Ross 21	200-575-4	59-27262-2	95-90462



The valve has one cable connection which provides the supply power and the set point signal. The cable has to be routed from the FPS box in the blank side platform to the valve. In order to supply the 24V very stable trough the long cables to the valve, the FPS distribution box will be equipped with a DC/DC transducer which stabilizes the 24V supply for all FPS valves.

The cables are rated to withstand the temperatures at the overhead manifolds and the supply wires for the 24V power supply to the valves are sized for the required current.

Repair process

The cable set and all electrical installation material is available with the part number 601-141 (FPS Final Blow cable kit)

The repair process for the ED19 will be similar to the other FPS valves. The spare parts for the repair are identical to the ED12 with the only difference that the ED19 has two supply cartridges. (See TNB 124)

Technical Data

Air requirements:

Compressed air purity class DIN ISO 8573-1

Solid impurities: ISO class 4

Water content: ISO class 4

Oil content: ISO class 3

Supply pressure: max. 5 bar (72.5psi)

Temperature: 10°-55°C

Device temperature: max. 70°C

Pin assignment

Plug XPC: M12, male, 5-pole

Pin 1	24V
Pin 2	set value (+): current 0/4-20mA
Pin 3	0 V
Pin 4	actual values (+): current 0/4-20r
Pin 5	FE

