

# Technical News Bulletin

Cham, March 2009

## Plunger Up FPS with Exhaust Valve



### 1. Introduction

The FPS technology for the plunger up application is a well accepted option on all our IS machines and the standard for on the NIS. With the latest improvements on the NIS, the PCM blank side has been redesigned to accommodate a separate exhaust valve for the plunger up FPS valve. The concept has now been introduced as an option on conventional IS and AIS machines.

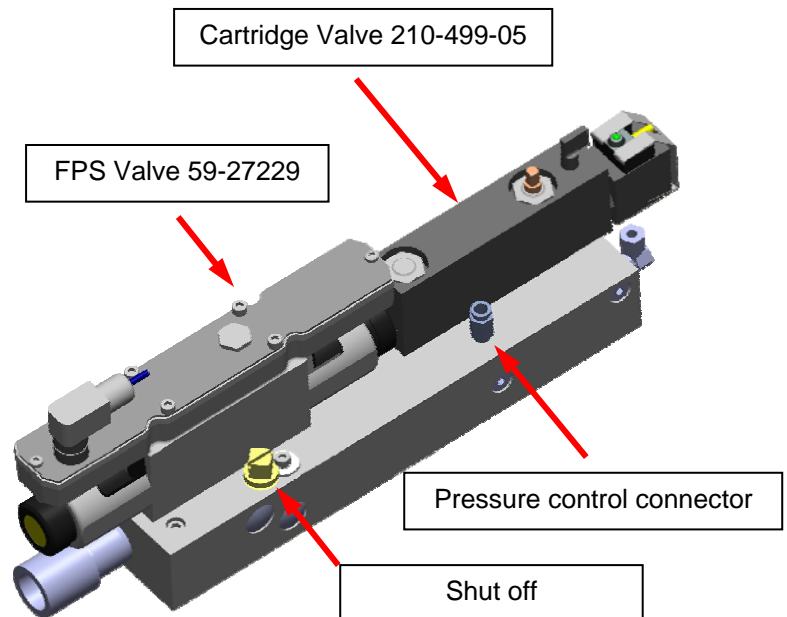
## 2. Features

The new plunger up valve unit 200-2079-01 is based on the NIS PCM blank side design and adapted to the requirements of the IS/AIS machine.

With the new setup all exhaust air is forced through a cartridge valve and not any longer through the FPS valve. This avoids potential contamination of the proportional part of the valve.

The base block rests on top of the plunger up manifold. The aluminum block carries the ED07 plunger up FPS valve (59-27229) and a normally closed (NC) cartridge valve. The cartridge valve is placed in the standard Emhart Glass block, with a manual override and a needle control for the exhaust air.

The user friendliness of the unit has also been improved. All adjustments and handling can be done with access from the top of the valve block. The air supply to the block is direct from the manifold. The exhaust is partially going into the exhaust manifold and partially into the atmosphere. The needle on the exhaust valve controls the exhaust air coming back from the plunger up line. The cartridge valve is identical to the NC valves used in the 26 line Valve Block, on the Universal Conveyor Valve Block and on the NIS PCM blank side. The shut off cuts the supply air to the FPS valve, which allow changing the FPS valve in MS. To change the cartridge exhaust valve the section needs to be in MS and the pilot air supply needs to be shut off. The top accessible pressure control connector provides the possibility to read the actual pressure in the working line by connecting a manometer.



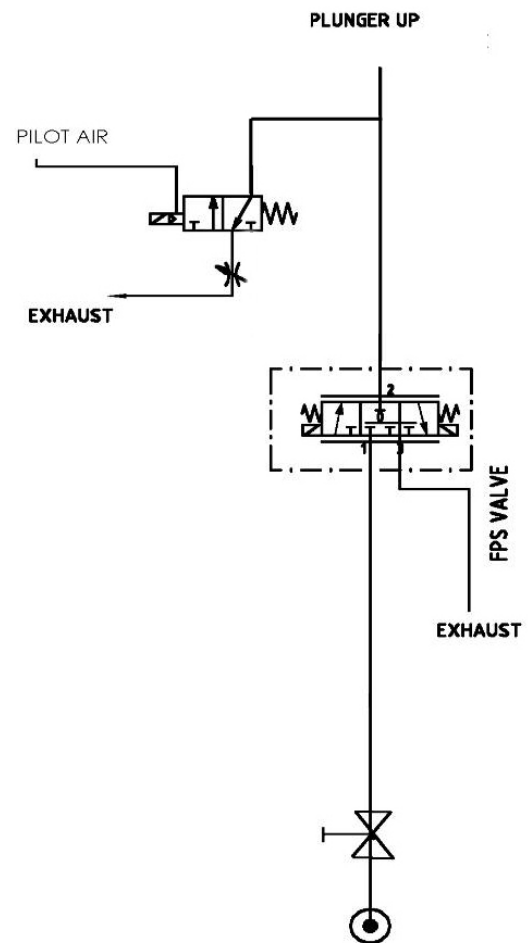
### 3. Operation Principle

The operation of new valve unit combines the features of the two types of valves used. The FPS valve is used to create the pressure as it is required by the process. The exhaust valve is less sensitive against dirt and all exhaust air, but not the exhaust air which is required for the pressure control, will go through the NC cartridge valve. This allows for a quick exhaust with the sensitivity on the needle control build into the cartridge valve. A good needle control on the plunger up exhaust air is important to control the impact on plunger down especially in NNPB process. With this valve setup the speed and precision of the plunger movement to the loading position in NNPB and from the up position to the counter blow position in BB is significantly improved. With the FlexIS control system and the recently introduced possibility for Mixed Event Assignments the entire valve block with both valves can be timed with only one event. This allows the operator to work with the plunger up event in the same way as before.

To avoid the contamination of the FPS valve with the dirt, particles, residues of swabbing and lubrication the main exhaust air flows through the cartridge valve. This is ensured by the software function of the FPS valve. At a pressure set point on 0bar ( $\leq 4\text{mA}$ ) the FPS is closing both the supply and the exhaust port forcing all the air through the exhaust valve.

In MS (maintenance stop) condition the normally closed cartridge valve (NC) is exhausting the working line for plunger up. In most cases the plunger down valve is normally open (NO) valve to force the plunger down in MS. This means the plunger up exhaust valve is able to exhaust the leakage air which is flowing into the plunger up cylinder from the plunger down pressure and avoids the creeping up of the plunger while all valves de-powered.

In addition to the functional benefit described, the lifetime of the FPS valve is expected to be longer as the valve is not energized for longer periods of time.



#### 4. Compatibility

The new valve unit 200-2079-01 can replace the version without exhaust valve 200-1573-00 if the space required is available. The new block uses the same hole pattern as the existing one and extending away from the machine with the dimension of approximately 206mm. An additional requirement is a FlexIS timing system with available outputs on the blank side for the exhaust valve. The pilot air supply for the cartridge valve needs to be installed as well.

The new valve unit uses the ED07 FPS valve 59-27229. This is the only valve which works with this block. With other versions of the FPS valve this block will not function!

