



Pigging Systems

Designed for clean applications
Full product recovery and/or protection
All system components can be "Cleaned-In-Place"
Simple, efficient, economical with high return on investment





AB6: Specializing in clean product displacement, launchers, receivers, and switching stations as well as fully automated installations.

Originally pigs were used in the oil and gas business. They were used to retrieve high value products in the process line as well as to clean the line of build up. The projectile (pig/pusher) generated a squealing noise as it sped through the pipeline, therefore the name "pig". Pigging, as a manufacturing process, is where a pig is sent down a piping system to clean the pipe and/or recover product in the line. This process is used in many food and beverage, cosmetics, and pharmaceutical application for the same reasons.

The main advantages of using a pigging system are:

- To recover product at the end of a production run
- To reduce contaminated waste product
- To reduce Clean In Place (CIP) costs
- To allow quick changeover between different products

AB6 pigging systems are based on a number of design criteria:

- System must consistently recover all possible product
- Pig must be able to go through intricate, compact tubing layouts
- "Closed loop" in order to maintain cleanliness, and to allow for full CIP of all components, including the pig
- Easy maintenance
- Manual or automated management

AB6 pigging and product management systems meet these criteria and more:

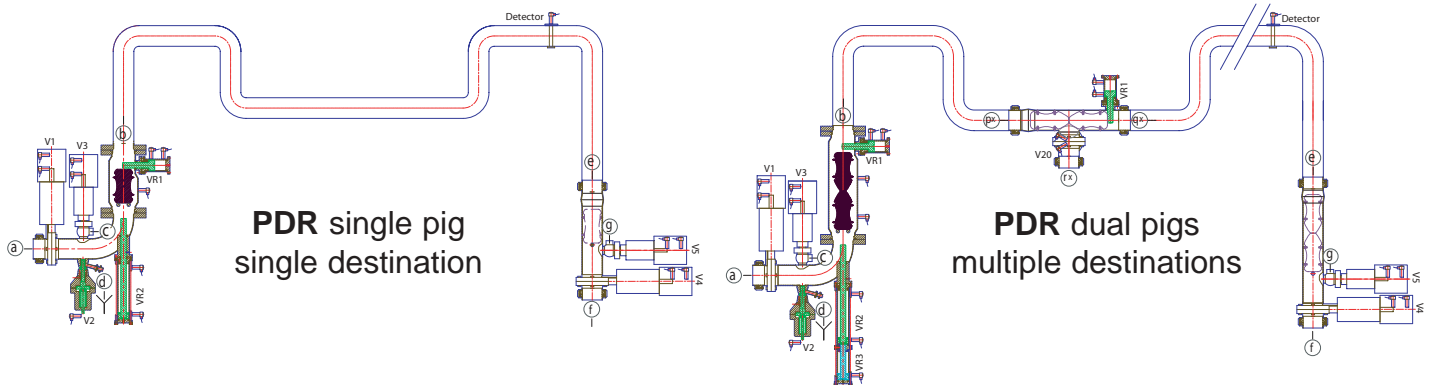
- Product recovery is in the high 90 percentile
- Pushers are designed to go through 1.5D radius bends
- Pig remains in the system at all times while allowing "full product flow", it can be cleaned in place at 90°C/195°F and/or sterilized at 140°C/285°F for over an hour.
- Unique launcher design allows easy removal of pig for maintenance, all other components are also easily serviceable
- Manual and automated options allow product management as well as integration into general plant management operations
- High return on investment because of full product protection/recovery, ease of CIP, speed of product changeover.

Pigging systems have evolved over time, AB6 provides sophisticated systems designed for full product recovery, easy and complete CIP or sterilization. Paypack calculations show AB6 systems pay for themselves in months not years. So, include AB6 pigging solutions when you design new processes or when you update your current facilities. You will "do the right thing": improve your process, save money in your plant and protect the environment!

AB6 systems are designed for Product Displacement and Recovery (PDR) or for Product Protection, Displacement and Recovery (PPDR).

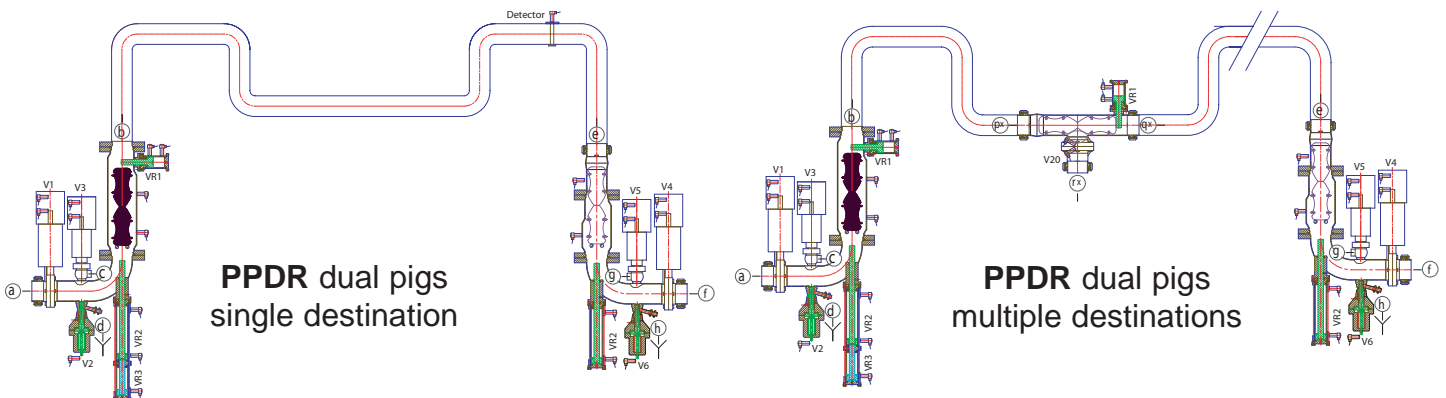
PDR systems come in two versions:

- Single pig
 - In-line stations
 - Used as a pushing/recovery method at the end of production or transfer
- Dual pigs
 - Launchers and receivers are lengthened and provided with supplementary functions
 - Dual pig systems are used to send product to one of multiple destinations.
 - Switching stations effectively and efficiently replaces 3-way valves.



PPDR systems are designed so the first pig precedes the flow of product protecting product from foaming or oxidation, the second pig serves the product recovery function.

- Dual pigs, single destination
- Dual pigs, multiple destinations





Launchers

- Hydroformed stainless steel body (formed at 15,000 psi/1,000 b) with integral formed guides to properly center the pig while allowing full flow around the pig. Since guides are formed as part of the body, there are no welded guides which are difficult to clean.
- Body can be rotated out of line for easy maintenance and/or pig replacement
- Standard materials of construction: 304L or 316L
- Units can be polished to meet customer requirements
- Easy to CIP or sterilize



Outbound sequences – Leaving launcher toward receiver

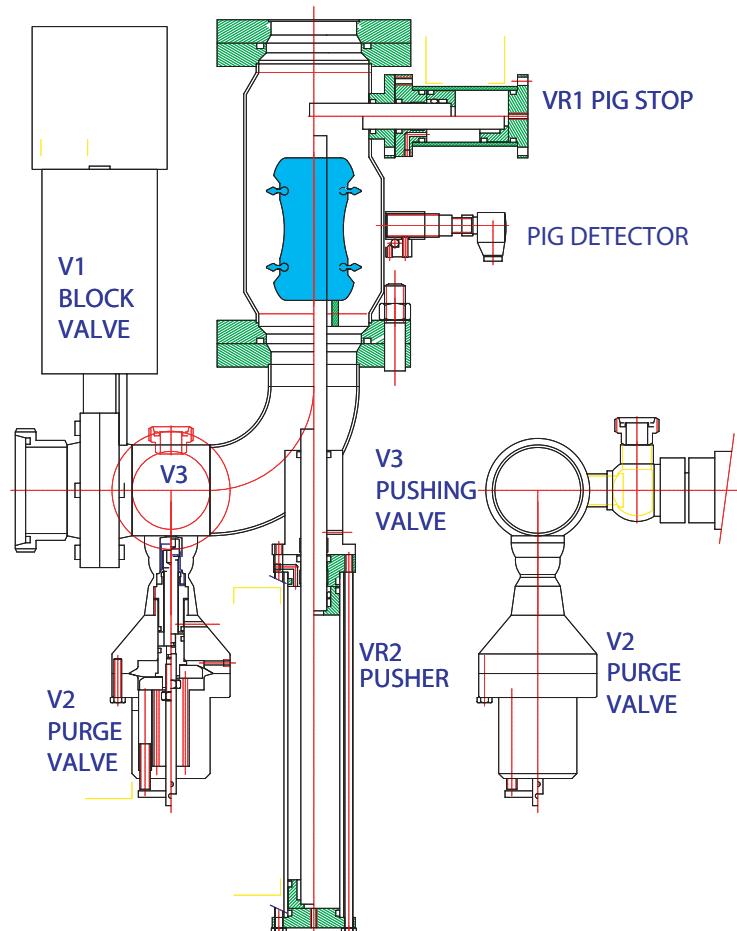
1. At end of production run, V1 is closed
2. VR1 pig stop is retracted.
3. VR2 piston positions pusher in line, and is then retracted.
4. V3 is opened, pushing media enters launcher
5. Pig is pushed through the process line
6. Pig is detected in receiving station
7. V4 block valve is closed
8. V3 push valve is closed

Production run is ended and all product is recovered

Offset launcher for viscuous media, or products containing solids, allows flow-by of products such as jams containing fruit pieces which remain whole.



Launcher Drawing





Receivers

- Compact design – easy to package
- Stops the pig and does not allow push media past the pig — full product recovery
- Reverses the disc lips prior to sending the pig back to launcher – ensures good sealing during return cycle
- Easy to CIP or sterilize

Switching station

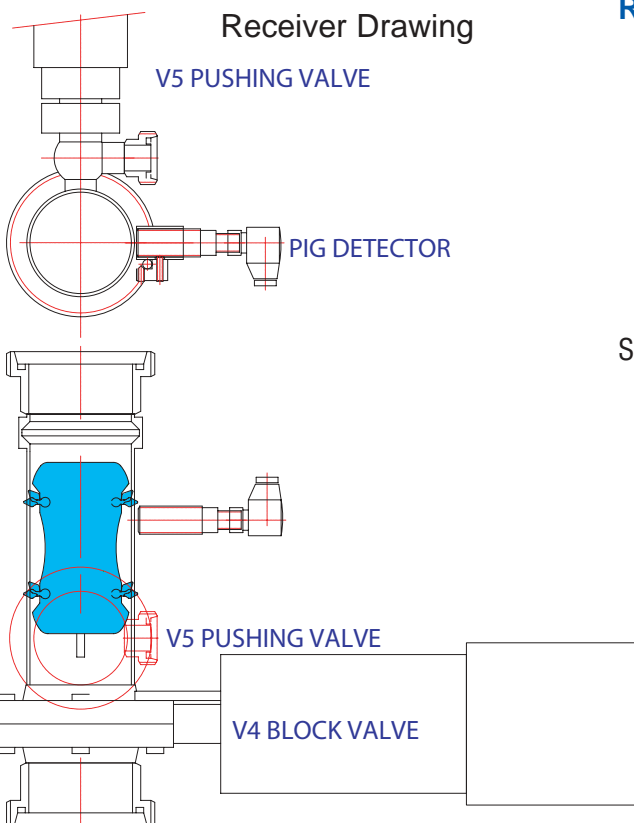
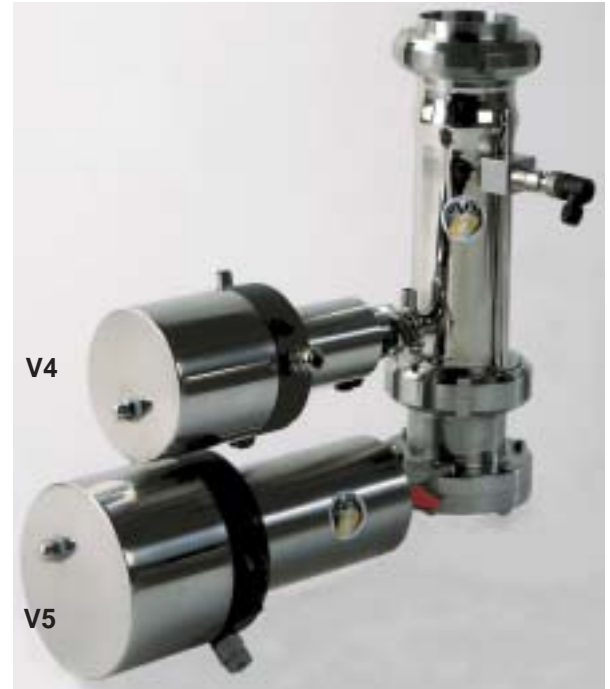
- One is installed for each destination (tank, packaging unit, etc.)
- Used to divert flow (replaces 3-way valves - which are expensive, require regular maintenance and are difficult to effectively CIP)
- Isolates product from piping downstream of switch
- Easy to CIP or sterilize

Magnetic pig detectors

- Installed in launcher/receivers or on piping system to detect pig presence/passage – allow automated processes
- Do not intrude in system – maintain cleanliness

Options

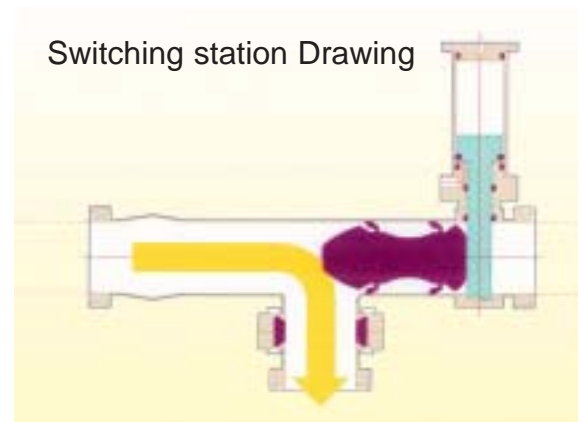
- Medium pressure (150-225 psi/10 -15 b) with reinforcement welded on outside of body
- High Pressure (above 225 psi/15 b) with internal welded supports
- Steamable rams/pistons for pharmaceutical applications
- Special push and purge valves
- Line pig detectors for pig detection along tubing system
- Modulating control systems allows controlled pig speed depending on process requirements
- Jacketed versions
- Offset launchers/receivers for special applications



Return sequences – Leaving receiver towards launcher

1. V2 purge valve (launching station) is opened
2. V5 push valve is opened forcing return media into line
3. Pig starts on return trip
4. Pig is detected in launching station
5. VR1 pig stop is extended
6. V2 purge valve is closed
7. V5 push valve is closed

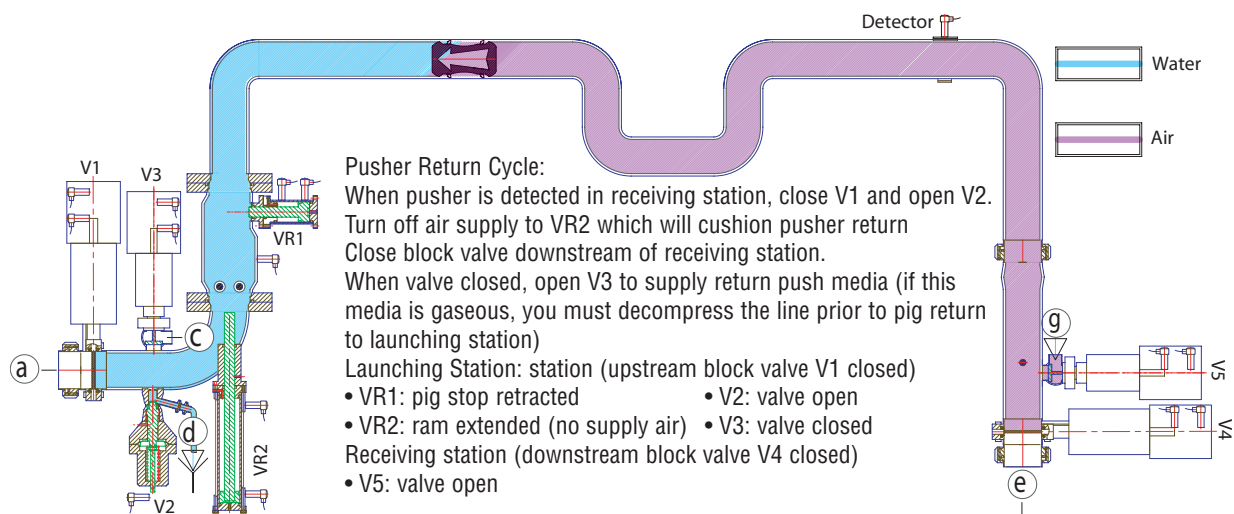
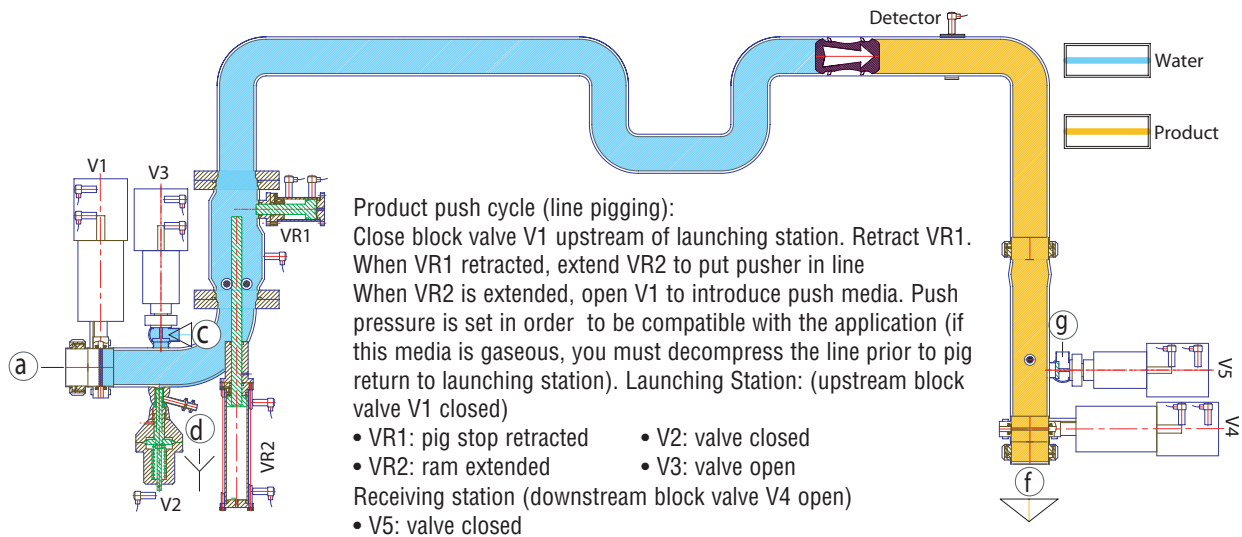
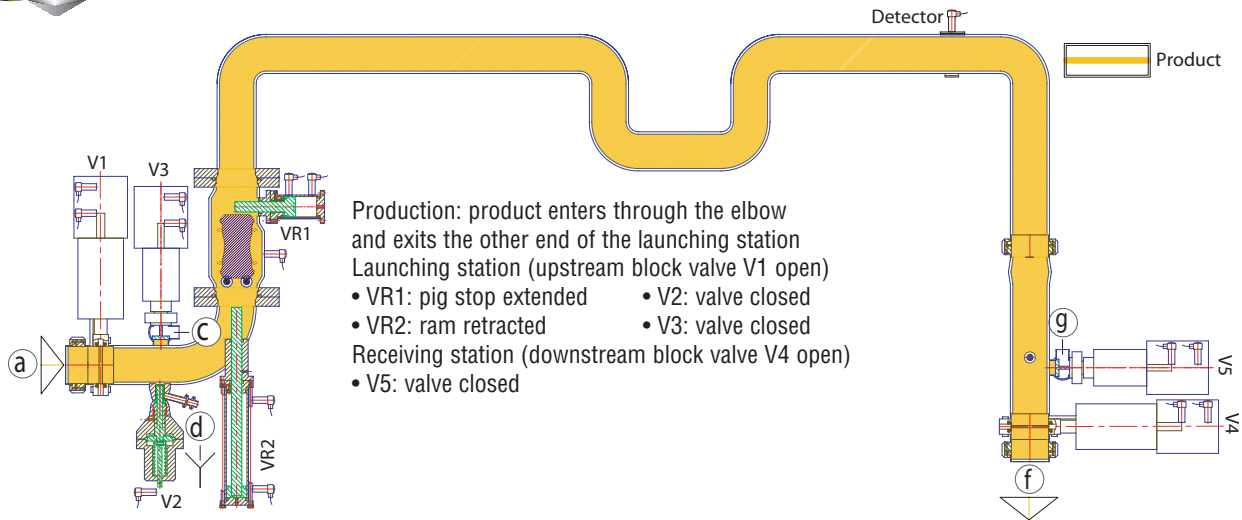
System is cleaned and ready for CIP or production





Process sequences

Example: Single pusher, Product recovery , Water cleaning and Air dry.



When Pusher is detected in launching station, retract ram of VR2 and, after few seconds, extend pig stop VR1. Close V5, then close V2 (after exhausting gas, if necessary). Open block valve V1 upstream of launching station and the block valve V4 downstream of receiving station. System is ready for CIP or to flow product.

**Interchangeable seals, Pass through curves and radiused bends,
Easily detectable (peripheral magnets)**

Features and Benefits

- Body hardness and contour – Excellent tracking – Reduces risk of binding/stopping in curves
- Pass internal obstacles up to 4% of tube ID – Allows for orbital welding
- Pass bends as tight as 1.5 D – Allows for compact designs
- Pass Manifolds and Flexible hoses (supplied by AB6) – Can be used for “hook-ups” and “jumpers”
- Magnets are “locked” into body forming a “magnetic cage” – No risk of loss and ensuing damage
- Magnets on perimeter – Easy pusher detection
- O-ring seals between ends and body—No product retention in pig
- Symmetrical pusher – Same high quality cleaning in both directions
- Low friction – Requires low push pressure
- Quick action – Speeds of 3-6 ft/sec (or higher)
- Replaceable seals – Low maintenance costs
- Excellent cleaning is obtained because of seal design and flexibility (Seal OD is much larger than tube ID)



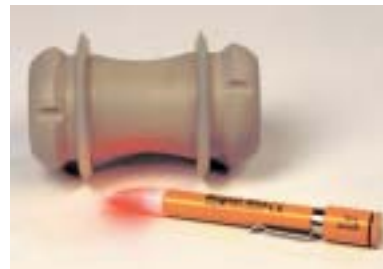
Lip seal disc

Multi-component Pig

- 3 part hard body
- Double lip/disc soft seals

Specifications

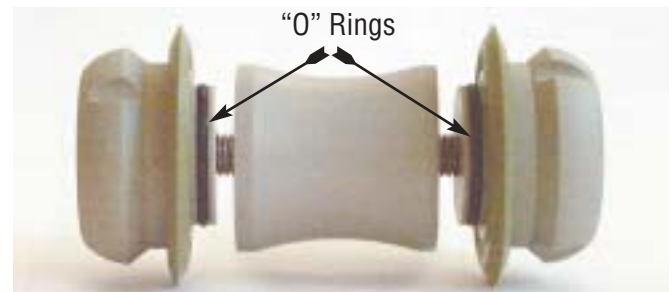
- Range 1”- 6 “, 25mm – 300mm
- International dimensions (OD, US, DIN, SMS, ISO, etc.)
- Body materials (Polypropylene, PTFE, PEEK, etc.)
- Seal materials (Silicone, Buna, EPDM, Viton, Nitrile, etc.)



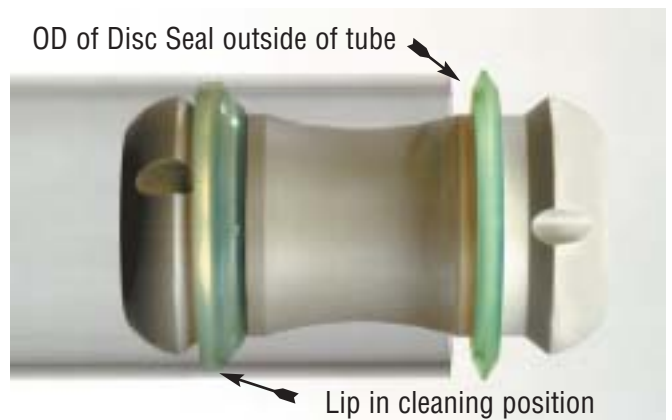
Detection pen



Pig Body
(Magnets encased)



“O” Rings



OD of Disc Seal outside of tube

Lip in cleaning position



Automation

AB6 provides fully automated systems, complying with most international standards. A control panel per line can be provided allowing fully automated process management. It can interface your plant management systems.

Sequences include:

- Start up push process after optional upstream valves/pump shut-off signal or receiving a “go ahead” from the plant’s process manager
- Send “pusher blocked” signal to plant processor
- Send pusher through line, blinking indicator light during cycle
- Manage pusher arrival sequences at receiving station
- Manage return cycle, blinking indicator light during cycle
- Manage pusher arrival sequences in launcher
- Manage end of push process sequences

AB6 can provide complete turn-key packages:

- Full proposal including process analysis, equipment and implementation
- Prefabrication of piping system/ modification on site
- Automation
- Start up and commissioning

AB6 generates higher Return On Investment:

While product displacement process (pigging) is a good investment, AB6 gives you more:

- Know-how developed through many installations
- Optimized adaptation to the customer’s requirements; Standard and “special” options available.



Control Panel

Other AB6 products			
Sampling Valves	Safety/Process/Cleaning combo	Pressure regulation	Precise gas pressure relieving valves
In-line strainer filters	Vacuum relief devices	Automatic purging devices	Precise gas pressure reducing valves
Check valves	Pressure relief devices	In-line mixers; cone or static plate	Combined pressure reducing/relieving valves
Sight-glasses	Pressure/Vacuum relief devices	Clean-In-Place systems	Hoses and fittings

References

Aptunion Ciprial	Gist Brocades-Superdex	Orangina
Blédina	Grace	Parke Davis
Borden Chemical	Henkel	Pauwels
Bostik	Heineken	Pernod Ricard
Brossard	Hot Cuisine	Procter & Gamble
Cadbury	Intermarché	Progipharm
Caves du Jurançon	Johnson & Johnson	Rambol
Coca-Cola	Lever Kermad	Sarbec Labs
Colgate Palmolive	Lindt	Sanofi Synthélabo
Continental Nutrition	L’Oréal Faprogi	Sias
Danone	L’Oréal Soporéal	Tec Inox
Diversey	Materne	Tetra Pak
Garaud	Nestlé Grand Froid	UPSA Lab
Générale Ultra Frais	Nord Cacao	Yves Rocher



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