

## 清管系统(猪头顶料系统) PIGGING SYSTEM



北京瀚海峰科技有限公司

BEIJING HYPERFORE TECHNOLOGY CO., LTD

## Company Profile

Beijing Hyperfore Technology Co., Ltd. is an experienced enterprise with comprehensive engineering capabilities. We provide turnkey solutions, production line construction, system integration, skid/modular equipment, technical services for food, dairy, beverage, cosmetics, pharmaceutical and new energy lithium battery industries.

Our business scope includes electrical and automation systems, process engineering, installation engineering, maintenance and repair services, as well as equipment sales. With years of rich experience and professional technology, Hyperfore has been expanding its business fields. Our customers are located both domestically and internationally, including many well-known dairy groups, brewery groups, pharmaceutical groups, food groups, etc. We also cooperate with world-class engineering companies to provide end users with high-quality process and automation engineering projects.

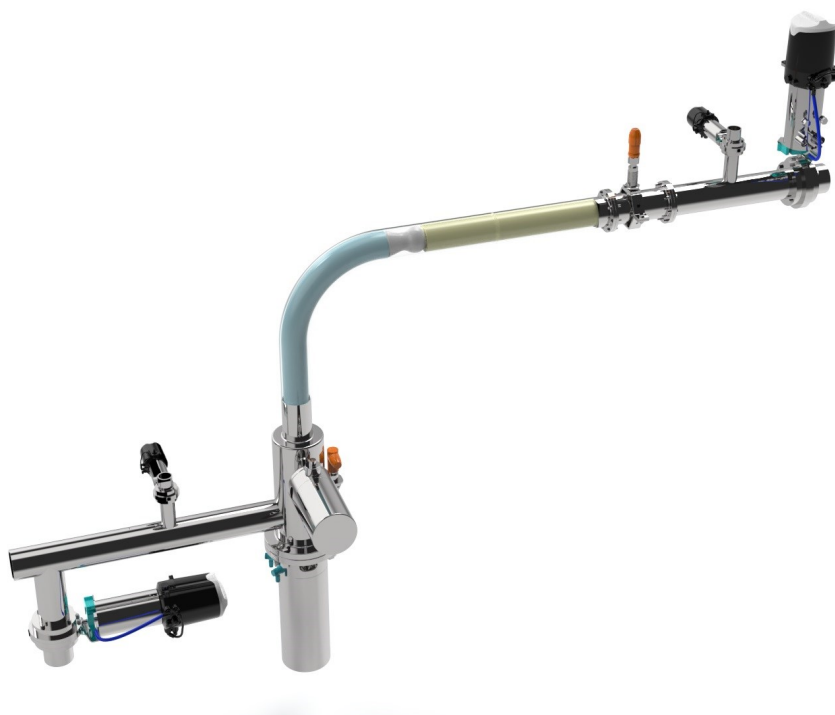
We provide modular equipment for customers, including pigging system, CIP system, pasteurization system, membrane filtration system, and so on. We also supply products and spare parts including valves, pumps, instruments, PLCs, HMIs, etc. We have established stable cooperative relationships with world-class suppliers, offering high-quality products and spare parts at reasonable prices. We strive to lower costs and create value for our customers!



## Pigging System

### What is pigging system/product recovery system?

Since the early 20th century, pigging technology has been developed in various forms. Today, pigging technology is used in a variety of industries and applications that handle liquids and powders, to recover liquids and powders from pipelines, reduce waste, and improve manufacturing and production processes.

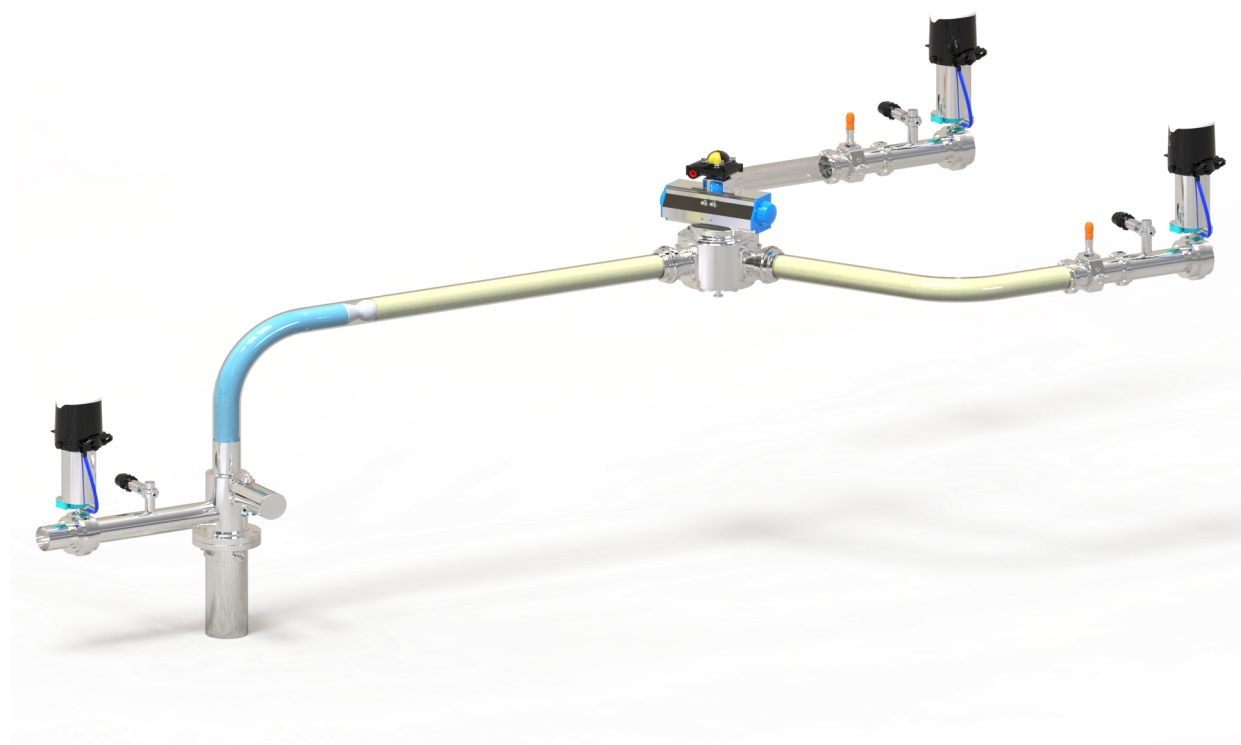


The main purpose of pigging is to remove or recover residual products that are left in pipelines after being transported from one location to another in a production line. In its simplest form, a pigging system consists of a flexible projectile (also known as a "pig" or "pig ball") that is slightly larger in diameter than the pipeline being pigged. The pig is then pushed through the pipeline using water, compressed gas (sterile air, nitrogen, steam), or even the product being processed, to remove or recover high-value products.

# Pigging System

## Improving product utilization and reducing waste

In food and beverage pipelines and other liquid processing pipelines, residue is almost always present in the pipeline when liquids are transported. When multiple products need to be transported through the same production line, it is essential to remove the residual product. In most cases, this is achieved by using process water or cleaning chemicals on the production line. However, this is time-consuming and uses a lot of resources, resulting in a significant amount of product waste and pollution.



Hyperfore's pigging system can recover almost every last drop of product remaining in the pipeline, significantly improving product utilization and maximizing savings in water and CIP chemicals, reducing product waste, and pollution emissions. In addition, the recovered product is not disposed of as waste, but is saved by the pigging system and pushed to a designated storage location (tank, packaging, storage, etc.).

## Pigging System

### Automated pigging solution improves operational reliability

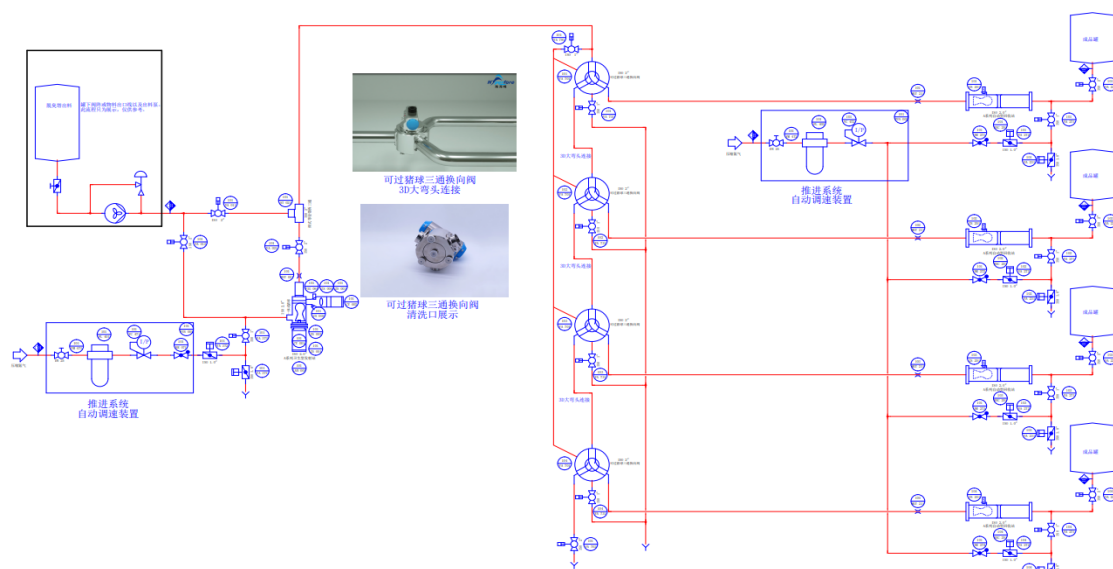
As labor costs increase and food safety regulations become increasingly stringent, we are looking for ways to reduce manual labor and increase automation. Automation reduces error rates, and more and more manufacturers are using automation in many processes. Hyperfore's automated pigging system is used in industries such as food, beverages, and pharmaceuticals to replace manual labor, making it more hygienic, efficient, and reliable. The automated system can also help improve processing speed, minimize human intervention, and extend normal operation time.



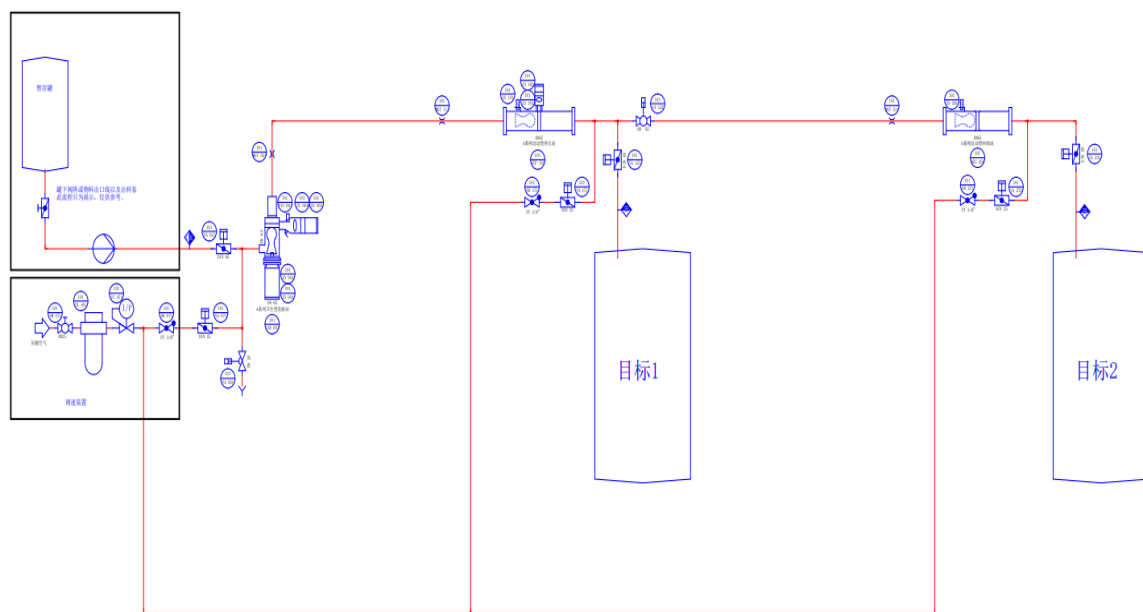
Pigging systems are widely used in industries such as dairy products, beer, beverages, pharmaceuticals, lithium batteries, and daily chemicals. Hyperfore provides reliable and efficient pigging solutions to solve problems such as production automation, internal cleaning of pipelines before and after production, waste water treatment, the need for hygiene cleaning and sterilization of production equipment, efficient recovery of high-value products in pipelines, and rapid conversion of multiple products during production. Hyperfore pigging system can be customized to the most suitable, advantageous, and efficient configuration according to user needs and can achieve comprehensive automation control of the

# Typical Application

Pigging system process flow diagram (for edible oil)

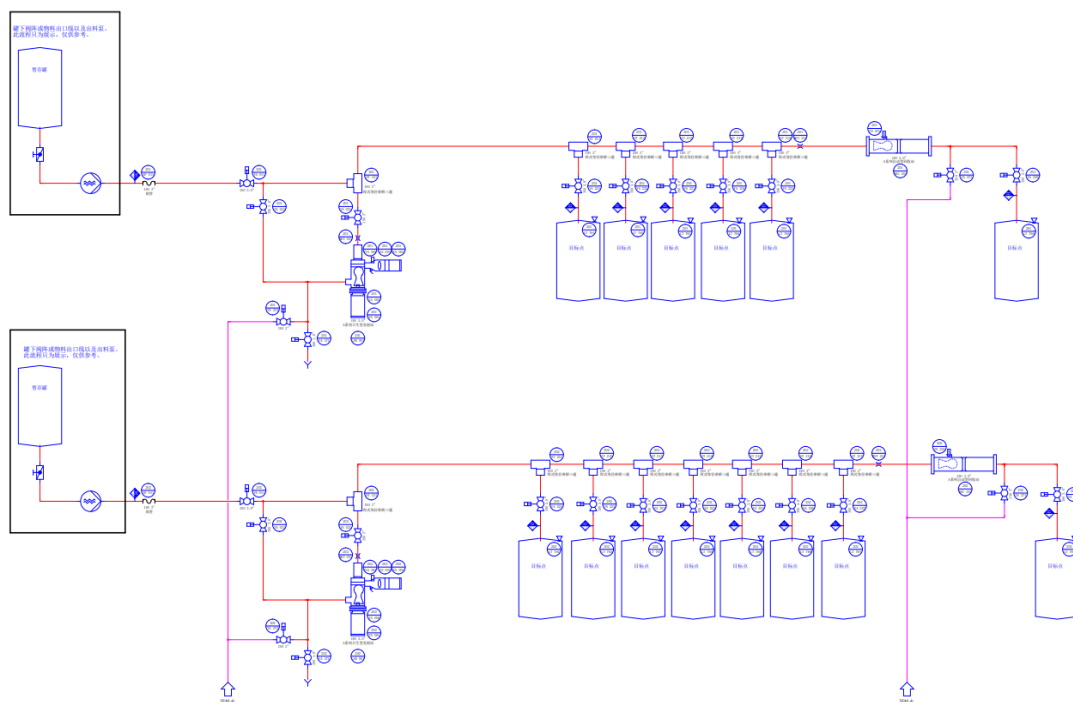


Pigging system process flow diagram (for lithium battery slurry)

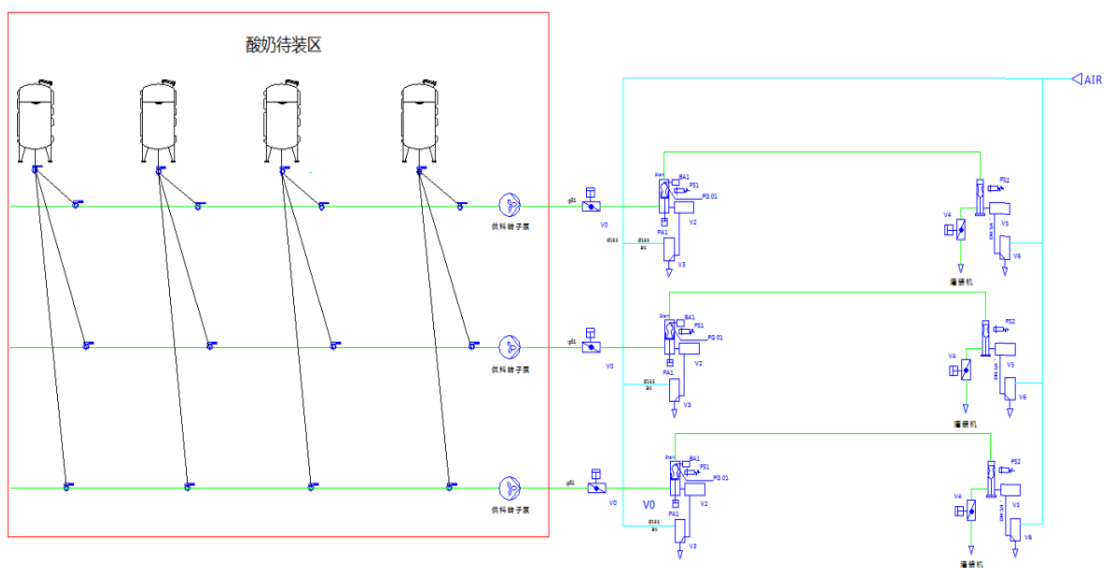


# Typical Application

Pigging system process flow diagram (for Ham sausage)



Pigging system process flow diagram (for yoghurt)

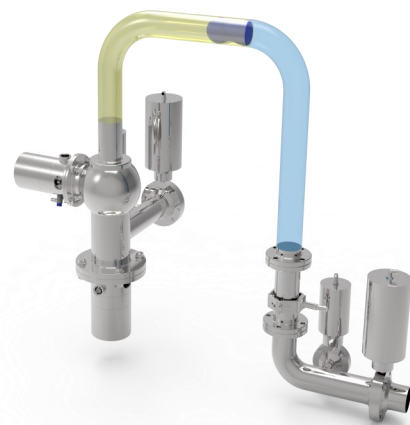


# Aseptic Pigging System

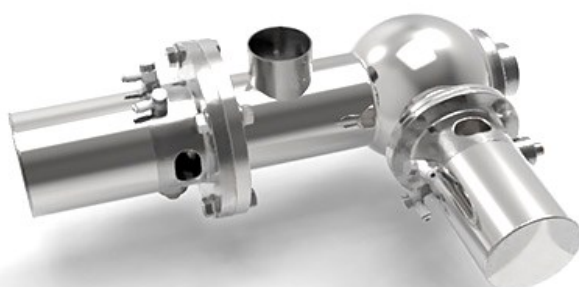
## Sterile automatic pigging system

Suitable for high hygiene requirements in the food and pharmaceutical industries.

Hyperfore sterile automatic pigging system can be CIP or SIP, consisting of a sterile pigging station, automatic receiving station, and pigging equipment. The sterile automatic pigging system is a further upgrade to the hygienic automatic pigging system. The modification of the launching station enables the entire system to achieve a sterile level with no dead corners



## Aseptic launcher



We can provide customers with equipment that conforms to the following pipe diameter specifications:

DIN11850 series 2 standard: DN25, DN40, DN50, DN65, DN80, DN100, DN125, DN150

ISO standard (commonly used domestically):

1", 1.25", 1.5", 2", 2.5", 3", 3.5", 4", 5", 6"

Non-standard pipe diameters can be customized.

### Advantages:

- The station is designed as aseptic as a whole, with no dead corners and easy to clean.
- Easy to integrate into product pipelines
- Low energy consumption · Low maintenance and repair costs
- Fast return on investment
- Significant reduction in sewage volume
- Aseptic structure, can be cleaned in place (CIP) and sterilized in place (SIP)
- Standard working pressure: <8bar.

# Automatic Pigging System

## Sanitary pigging system

The hygienic pigging system is suitable for applications in the hygiene industries, including food, beverages, dairy products, chocolate, candy, cosmetics, shampoo, and cleaning agents, etc.

Hyperfore pigging system consists of an automatic launching station, an automatic stopper, an automatic receiving station, a pig, and other piggable components. It can be cleaned in place (CIP) or sterilized in place (SIP), and can recover more than 99.5% of residual products.

The equipment is designed to accommodate the following pipe diameter standards: DIN11850 Series 2 Standard:

DN25, DN40, DN50, DN65, DN80, DN100, DN125, DN150;

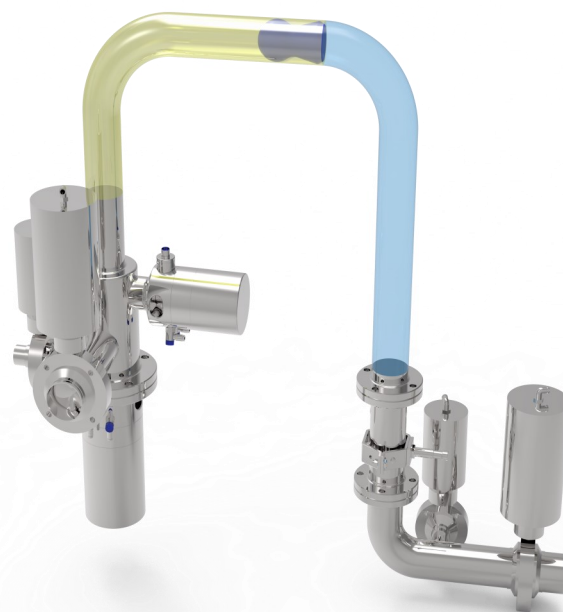
ISO standard (commonly used in China):

1", 1.25", 1.5", 2", 2.5", 3", 3.5", 4", 5", 6".

Non-standard pipe diameters can be customized.

### The automatic pigging system solution includes:

- ◆ Design of the product recovery system
- ◆ Process engineering design
- ◆ Automation control system
- ◆ Mechanical and electrical installation
- ◆ Remote support services, including training, debugging, maintenance, etc.
- ◆ Technical support and spare parts.



# Automatic Pigging System

## Automatic launcher:

Sanitary

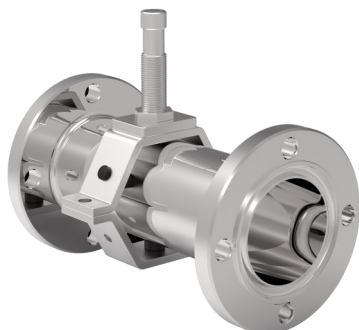


Aseptic



## Automatic receiver:

Flange connection



Tri-clamp connection



The equipment is designed to accommodate the following pipe diameter standards: DIN11850 Series 2 Standard:

DN25、DN40、DN50、DN65、DN80、DN100、DN125、DN150

ISO standard (commonly used in China):

1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"、5"、6"

# Automatic Pigging System

## Automatic stopper

Flange connection



Tri-clamp connection



## Technical features:

Function: The automatic stopper allows for intermediate stops and allows liquid products to pass through.

Features: Hygienic, food-grade, more hygienic than cleanable ball valves.

Control: Gas control, feedback on piston rod position monitoring.

Auxiliary devices: Pipe pig position monitoring unit.

Applicable pipe specifications:

DIN11850 Series 2 standard: DN25, DN40, DN50, DN65, DN80, DN100, DN125, DN150;

ISO standard (commonly used in China): 1", 1.25", 1.5", 2", 2.5", 3", 3.5", 4", 5", 6".

# Manual Pigging System

## Economic (manual) pigging system

Suitable for simple applications in industries such as chemical, paint, cosmetics, and detergent. It is suitable for customers who want to save costs or quickly obtain investment returns.

Hyperfore economic pigging system consists of a launching station, a receiving station, a pig and piggable components. The pig can be manually removed from the receiving station.



### The following specifications are available:

DIN11850 second series standard:

DN25、DN40、DN50、DN65、DN80、  
DN100、DN125、DN150

ISO standard (commonly used in China):

1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"、5"、  
6"

### Features:

- ◆ The launching and receiving stations can be cleaned together with the pipeline using CIP.
- ◆ Automatic components can be further upgraded at any time.
- ◆ Easy to disassemble, low maintenance cost.
- ◆ Used with pig detectors and mechanical speed control devices.
- ◆ Can be installed vertically
- ◆ After manual cleaning, the pig can be manually placed back into the launching station.



## Manual Pigging System

### Manual launcher:

Threaded connection



Tri-clamp connection

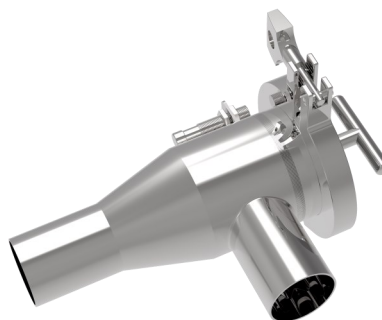


### Manual receiver:

Threaded connection



Tri-clamp connection



**The following specifications are available:**

DIN11850 second series standard::

DN25、DN40、DN50、DN65、DN80、DN100、DN125、DN150

ISO standard (commonly used in China):

1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"、5"、6"

## Pigs (Scrapers)

### Tangent solid pig - suitable for all situations

Hyperfore tangent solid pig uses elastic and sanitary materials and are wear-resisting. It has a round head and a thin waist. This design allows it to smoothly pass through the elbow with a minimum bending radius of 3D. It can recover 99.5% of products in the pipeline. Tangent solid pigs can also pass through reducing tees. The permanent magnet inside the pig is thoroughly coated, so even if there is an accident, the permanent magnet will not be smashed or cause pollution.

Material: VMQ (FKM, NBR, EPDM, PU can be customized)



### Lip pig - with super scraping capacity

Hyperfore lip pig is made of sanitary materials and has soft elastic lips. The design of the lips makes the service life of the pig longer and more suitable for products with particles or products causing friction. The lips can be replaced separately. The lip pig can pass through the pipeline with a minimum bending radius of 3D.

Material: lip (VMQ, FKM, EPDM, etc.)

Body (PP, PFA, etc.)



The driving medium required by the pig can be: water, product, compressed air

DIN11850 second series standard: DN25、DN40、DN50、DN65、DN80、DN100、DN125、DN150

ISO standard (commonly used in China): 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"、5"、6"

# Pig Driving System

## Pig speed controlling system:

### 1. Gas-driven type:

Gas-driven pig speed control system include: mechanical pig speed controller (gas pressure control), automatic pig speed controller (gas pressure control, gas volume control, gas mass control), sterile air filter and steam filter.

The gas-driven automatic controller can filter out water, particles, bacteria, and small substances in compressed air, and control the pressure of the automatic control system. It has the characteristics of simple structure, safe and stable operation, and easy installation.

It continuously and automatically adjusts the pig's pushing pressure to the most appropriate pressure. During pigging process, it is used to control the moving speed of the pig in real-time.



Mechanical pig speed controller



Automatic pig speed controller  
(gas pressure control)



Automatic pig speed controller  
(gas volume control)



Automatic pig speed controller  
(gas mass control)

# Pig Driving System

## Sterile air filtration system

The sterile air filtration system consists of a filter housing, filter element, valves, drain valve, instruments, etc. The sterile air filter is used to filter impurities, harmful bacteria, microorganisms, etc. in the air.



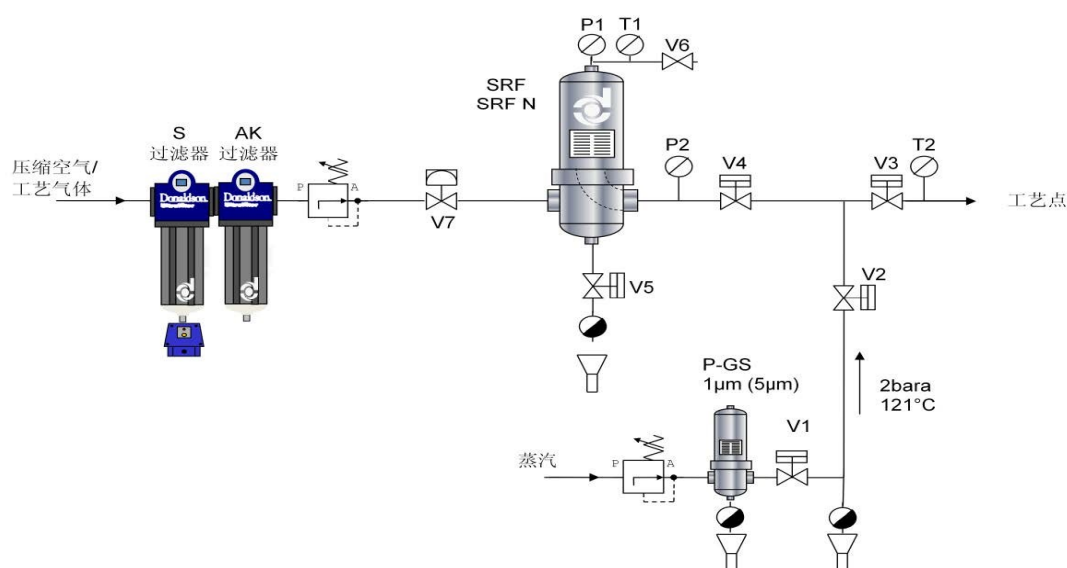
Sterile air filter



Steam filter

The steam filter is used to filter impurities and condensate in the steam. The filtered steam is used to sterilize the sterile air filter.

Application process flow chart:



Sterilization of sterile air filter - reverse sterilization

# Pig Driving System

## 2. Aseptic water-driven type:

Including a flow regulating valve and a pre-filter. The sterilizing filter and steam filter is optional.

### Flow control valve

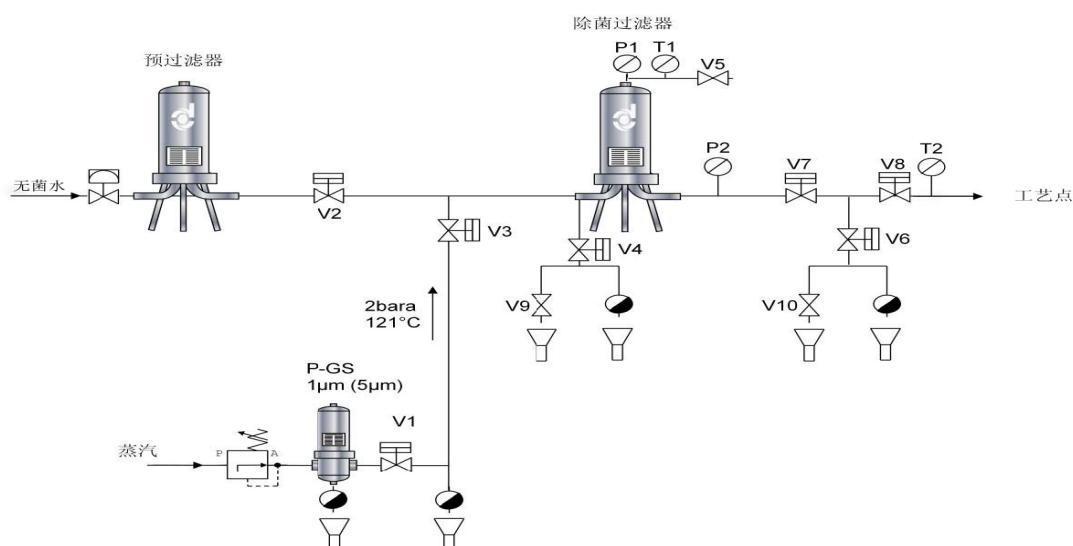
By accepting control signals from the control unit, the flow control valve can change the fluid flow through dynamic operation.



### Aseptic water filter

The filter housing is specially designed for the filtration of process liquids. The filter element is an aseptic-grade filter membrane with stable pore size.

### Application process flow chart:



### Sterilization of sterile air filter - forward sterilization

## Pigging Products

### Pig detection unit:

- ◇ DIN11850 second series: DN25、DN40、DN50、DN65、DN80、DN100、DN125、DN150
- ◇ ISO (common in China) : 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"、5"、6"
- ◇ Materials: 304,316L
- ◇ Sensing distance: 60 mm、100 mm



### Pig position detecting pen:

- ◇ The internal magnetic induction device is used to detect the position of the pig. It is convenient to carry, and the magnetic induction sensitivity is 50 GS.
- ◇ It is beneficial for checking the status of the pig in the product recovery system and maintaining the system.



### Gas-liquid separator:

- ◇ When using gas as the driving force, the discharged gas is a gas-liquid mixture after pigging is completed. When the gas-liquid mixture is discharged from the pipeline, the liquid will splash with the air. To prevent this situation, a gas-liquid separator is required.
- ◇ It has a simple structure and is easy to disassemble.
- ◇ Equipped with a spray ball, it can be cleaned simultaneously with the front-end equipment after connecting to the CIP pipeline. Material: 304, Seal material: EPDM (other materials can be customized) Connection method: welding.



## Pigging Products

### Piggable sanitary 3-way diverter valve:

- ◇ Suitable for production processes that require transport from a single source to multiple targets or from multiple sources to a common target.
- ◇ Internal elbow structure with 120° distribution for three channels.
- ◇ Replacing manual diverter plates, saving labor and reducing human error, also being hygienic and time-saving.
- ◇ Can be cleaned by a pigging system, meeting the needs of both production and product recovery processes.
- ◇ Can be cleaned in place (CIP) and sterilized in place (SIP) with a hygienic design that has no dead corners, making it an ideal valve for product recovery system.



### Piggable manual swing bend panel:

- ◇ Compact structure, one changeover panel can be connected to 2-10 targets
- ◇ Can transfer products from a single source to any of the multiple destinations
- ◇ Clear the pipelines and recover the products from the source to the destination.
- ◇ Manual connection, the proximity switch on the swing bend panel can be integrated into the automation system to detect the position of the bend connection.



## Pigging Products

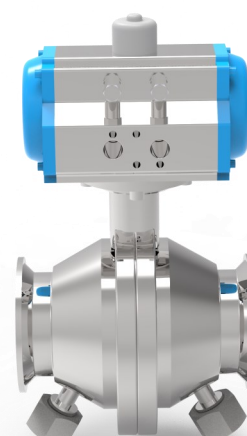
### Piggable sanitary mixing- proof valve:

- ◇ High mechanical strength, not easy to deform. The valve body material is 316L stainless steel.
- ◇ Sanitary and free of dead end.
- ◇ PFA gasket has good chemical compatibility and is corrosion resistance.
- ◇ single-seat double-seal mixing proof valve has one seat and two seals to form two independent chambers. The leakage chamber in the middle avoids the mixing of two liquid medium when the seat seal is damaged.
- ◇ The leakage chamber can be cleaned independently.
- ◇ The pig can pass through the pipeline in the lower valve chamber.



### Cleanable in place (CIP) pneumatic ball valve:

- The ball valve has two cleaning ports. The valve core and seals can be cleaned to the sanitary level. It has no cleaning dead corner.
- The ball valve is piggable, It is an ideal valve for the product recovery system.



## Pigging Products

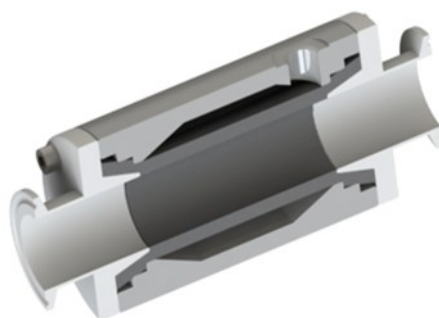
### Piggable sanitary pneumatic ball valve:

- ◇ Pneumatic operation, convenient and durable, low fluid resistance
- ◇ Material: SUS316L (area contacting with the medium), SUS304 (not contacting with the medium)
- ◇ Specifications:  
DN25/DN32/DN40/DN50/DN65/DN80/  
DN100/ DN125/DN150;  
ISO1"/ISO1.5"/ISO2"/ISO2.5"/ISO3"/ISO3.5"/  
ISO4";  
Connection: welding  
Sealing: PTFE



### Piggable sanitary pinch valve:

- ◇ Pneumatic operation, convenient and durable, low fluid resistance
- ◇ Material: sanitary cloth inserted hose (in contact with the medium), SUS304 (not in contact with the medium)
- ◇ Sealing: NBR/EPDM (other materials can be customized)
- ◇ Specifications  
DN40/DN50/DN65/DN80/DN100  
ISO1.5"/ISO2"/ISO2.5"/ISO3"/ISO3.5"/ISO4"  
Connection: Tri-clamp/welding



### Piggable sanitary manual ball valve:

- ◇ Manual operation, convenient and durable, small fluid resistance
- ◇ Material: SUS316L (area contacting with the medium), SUS304 (not contacting with the medium)
- ◇ Specifications:  
DN25/DN32/DN40/DN50/DN65/DN80/  
DN100/ DN125/DN150;  
ISO1"/ISO1.5"/ISO2"/ISO2.5"/ISO3"/ISO3.5"/  
ISO4";  
·Connection: welding  
Sealing: PTFE



## Auxiliary Pigging Products

### Pneumatic sanitary diverting valve:

- ◇ Pneumatic operation, convenient and durable, low fluid resistance
- ◇ Material: SUS316L (area contacting the medium), SUS304 (not contacting medium)
- ◇ Sealing: EPDM (other materials can be customized)
- ◇ Specifications:  
DN25/DN32/DN40/DN50/DN65/DN80/  
DN100/DN125/DN150;  
ISO1"/ISO1.5"/ISO2"/ISO2.5"/ISO3"/  
ISO3.5"/ISO4"  
Connection: welding



### Manual sanitary butterfly valve:

- ◇ Manual operation, convenient and durable, low fluid resistance
- ◇ Material: SUS316L (area contacting the medium), SUS304 (not contacting medium)
- ◇ Sealing: EPDM (other materials can be customized)
- ◇ Specifications:  
DN25/DN32/DN40/DN50/DN65/DN80/  
DN100/DN125/DN150;  
ISO1"/ISO1.5"/ISO2"/ISO2.5"/ISO3"/  
ISO3.5"/ISO4";  
Connection: welding



### Pneumatic sanitary butterfly valve:

- ◇ Pneumatic operation, convenient and durable, low fluid resistance
- ◇ Material: SUS316L (area contacting the medium), SUS304 (not contacting medium)
- ◇ Sealing: EPDM (other materials can be customized)
- ◇ Specifications:  
DN25/DN32/DN40/DN50/DN65/DN80/  
DN100/ DN125/DN150;  
ISO1"/ISO1.5"/ISO2"/ISO2.5"/ISO3"/  
ISO3.5"/ISO4";  
Connection: welding



## Piggable Pipes And Fittings

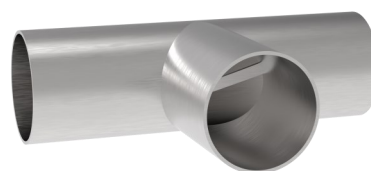
### Pipeline sight glass:

- ◇ DIN11850 second series: DN25、DN40、DN50、DN65、DN80、DN100、DN125
- ISO (common in China) : 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"
- ◇ Material: 304,316L



### Piggable equal diameter tee with bridge:

- ◇ DIN11850 second series: DN25、DN40、DN50、DN65、DN80、DN100、DN125、DN150
- ISO (common in China) : 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"
- ◇ Material: 304,316L
- ◇ Pigs can pass through smoothly



### Sterile flange:

- ◇ The gap between flange sealings is very small, and the pig can pass through smoothly
- ◇ DIN11850 2rd series: DN25、DN40、DN50、DN65、DN80、DN100、DN125
- ISO (common in China) : 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"
- ◇ Material: 304,316L



### Sterile tri-clamp set:

- ◇ The gap between sealings is very small, and the pig can easily pass through
- ◇ DIN11850 2rd series: DN25、DN40、DN50、DN65、DN80、DN100、DN125;
- ISO (common in China) : 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"
- ◇ Material: 304,316L



## Piggable Pipes And Fittings

### Sterile flange:

- ◇ DIN11850 second series: DN25, DN40, DN50, DN65, DN80, DN100, DN125, DN150
- ISO (commonly used in China): 1", 1.25", 1.5", 2", 2.5", 3", 3.5", 4"
- ◇ Material: 304,316L



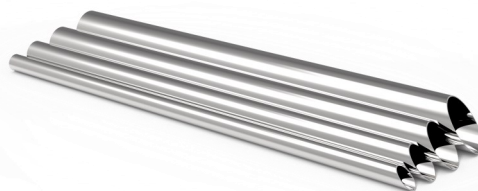
### Piggable sanitary 3D elbow

- ◇ DIN11850 second series: DN25、DN40、DN50、DN65、DN80、DN100
- ISO (commonly used in China): 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"
- ◇ Material: 304,316L



### Piggable sanitary pipes:

- ◇ DIN11850 second series: DN25、DN40、DN50、DN65、DN80、DN100
- ISO (commonly used in China): 1"、1.25"、1.5"、2"、2.5"、3"、3.5"、4"
- ◇ Material: 304,316L



### Piggable hose:

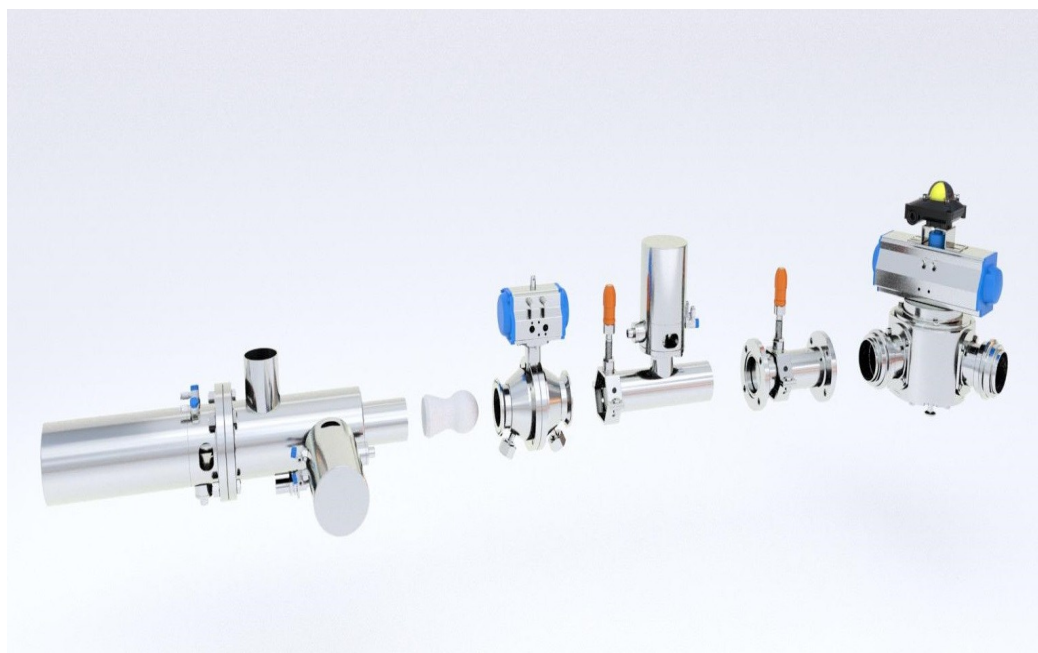
- ◇ Applicable for products such as food, drinks, chemicals and daily chemical products.
- ◇ Special stainless steel joint and flange joint ensure the safety and sanitation of connection. The piggable hoses can flexibly be connected between different sources to different targets, Regardless of distance and location, the recovery of pipeline products becomes simple and convenient.
- ◇ Specifications: DN50, DN65, DN80, DN100 (ISO2", 2.5", 3", 3.5", 4")



## Pigging System Expert

### Beijing Hyperfore Technology - expert of automatic pigging system

Automatic pigging system improves processing speed, improves production efficiency and output. It also enhances security and reduces the possibility of human error. More importantly, Hyperfore fully automatic pigging system also ensures high cleanliness and hygiene levels.



### Electrical automation system - HMI/SCADA and PLC system

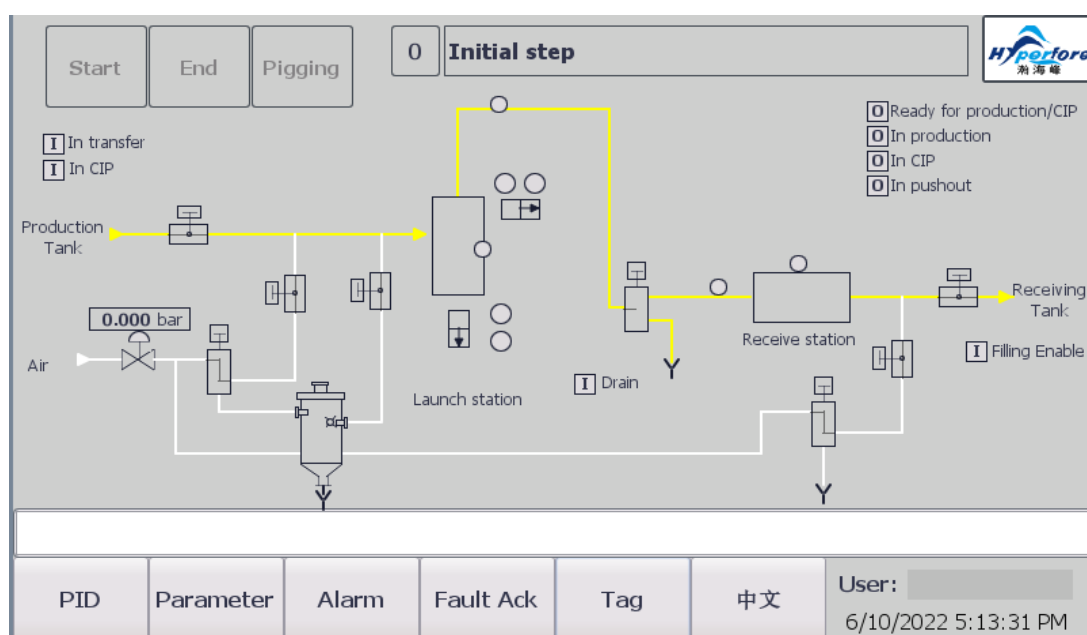
Hyperfore provides electrical automation solutions for different types of pigging systems, with the following features:

In terms of human-machine interface, it includes HMI of different sizes and SCADA systems of different forms. The electrical control cabinet can provide PLC included/not-included options. If PLC is not included, the pigging system will be integrated into the customer's existing control system. It can exchange signal with the existing control systems through a hard wire connection method.

# Pigging System Expert

## Electrical automation system -- engineering and technical services

Depending on our rich experience and knowledge in fluid process control, we have developed and written a flexible, powerful pigging system automation software. Although our focus is on automatic pigging system control, we can also develop automation systems to control other process operations in the factory.

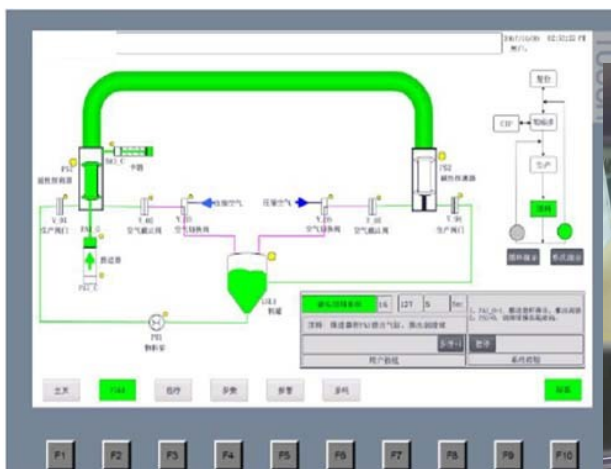


### Hyperfore electrical automation team can provide the following services:

- Modify existing programming and automation control system
- Integrate new equipment into existing systems
- Implement programming conversion between different PLC types
- Write Functional Design Specification (FDS)
- Provide full-sized HMI and various forms of SCADA system
- Provide dedicated telephone support
- Remote access to the system to assist in troubleshooting, if necessary, remote modification.

# Pigging System Automation

Independent and integrated pigging system. Beijing Hyperfore Technology has an experienced automation professional team that can meet your factory's automation control needs. We specialize in Siemens and AB control equipment. Our automatic pigging system is controlled by PLC and equipped with HMI or SCADA system.



Hyperfore also designs and manufactures the control cabinet required by your project.

The independent system has a separate electrical control cabinet, with PLC and HMI. which can automatically control the pigging process. And we provide SCADA system for a relatively larger project. Although it is independent, we can realized communication to transfer data from one PLC to another. We normally use profinet to connect with the customer's automation system.

If there is expansion capability to integrate the pigging automation system into the existing control system, our engineers can realize the automation integration when necessary, Then we provide a control cabinet without PLC.

We can also write functional design specification (FDS) and cooperate with the customer's engineers to ensure effective and stable performance of the pigging automation system.

## Turnkey Project Solutions

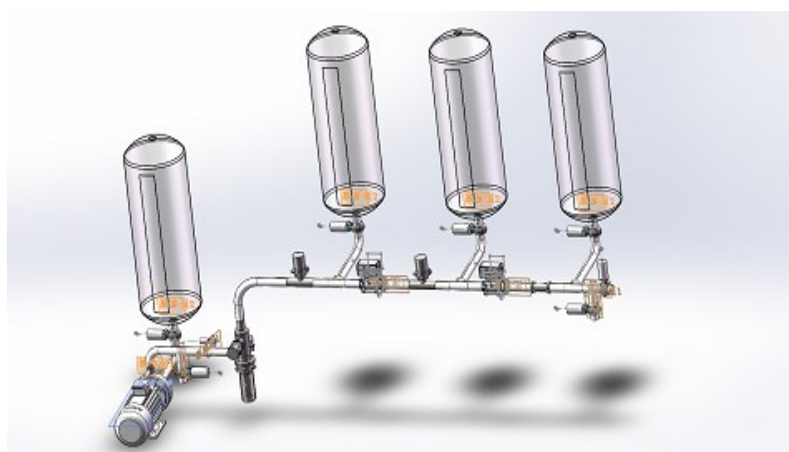
### Hyperfore pigging system turnkey solutions

Hyperfore provides professional and customized pigging solutions, including process design, 3D design services, pigging system equipment and process components, electrical control cabinet, automation system programming, on-site commissioning, electrical and mechanical installation services, project management, remote technical support and maintenance, etc. Our customers include industries such as dairy, pharmaceutical, beverage, paint, shampoo, cosmetic and lithium battery industries, etc.

Hyperfore cooperates with world-famous suppliers, providing the most appropriate process equipment and components according to your needs. We fully understand your goals, and offer cost-effective solutions, so that you can focus on the operation of factories. If necessary, we can also design and build new systems or upgrade existing systems for you.

#### 3D process engineering design and services

Hyperfore has gained rich experience in the production process of the sanitary plants, meanwhile we can provide 3D engineering design and also implement relevant engineering services for pigging systems and other process systems in the factory.



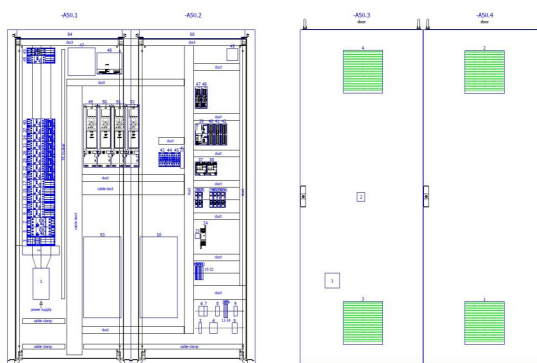
#### PLC components and instruments

Hyperfore work with world-class high-quality PLC and instruments suppliers to provide high-quality equipment to satisfy the needs of safe and efficient production.

# Turnkey Project Solutions

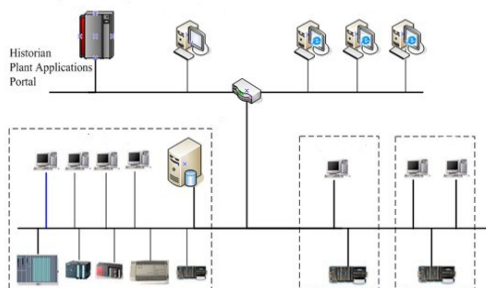
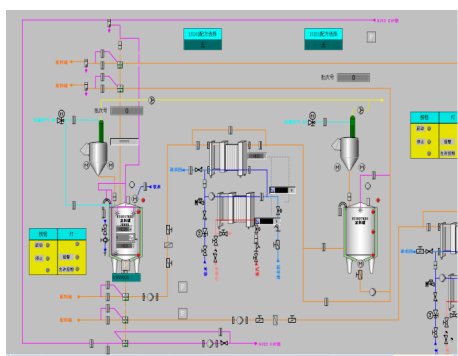
## Electrical control cabinet

Every Hyperfore cabinet design is inspected carefully, we try our best to minimize the possibility of failure. We use efficient management methods to improve the rationality and accuracy of the design work, and the electrical cabinet we manufacture is neat, safe and stable.



## Automatic system programming

Hyperfore is an expert in electrical automation systems. In more than ten years of engineering practice, we have been working with world-famous engineering companies to supply them with high-quality electrical design, programming, commissioning, which contribute to their business expansion in China.



## Turnkey Project Solutions

### **Mechanical and electrical installation service**

Hyperfore has accumulated more than ten years of experience in the field of mechanical and electrical installation. Our installation team has provided high-quality installation services to customers in many industries.

### **On-site installation supervision**

Professional engineering technical support is essential for the application of product recovery systems (pigging system) in different industries. Hyperfore master the relevant know-how to solve possible problems from the beginning. We also provide professional on-site supervision and management.

### **Site commissioning**

The on-site commissioning of the product recovery system needs good organization and management. Hyperfore provides high-quality commissioning services, including process equipment installation guidance, IO test, dry test, water test, product test and acceptance test. Our experienced engineers try their best to ensure the normal operation of individual components in the system and the good coordination between them, guarantee the smooth and trouble-free startup of your factory.

### **Remote support and maintenance**

In case of any problem or emergency, Hyperfore supplies remote support at the first time and maintenance work based on Internet to make sure that customer can gain production guarantee and minimize the possibility of stop production.

# Remote Technical Support

## Remote technical support system



- ◆ Remote monitoring/operation: Authorized personnel can remotely monitor and operate through electronic device
- ◆ Remote technical support: In case of maintenance, upgrading, trouble shooting, engineers can respond remotely
- ◆ Remote training: Engineers can remotely do training work as soon as customers have need.
- ◆ Remote commissioning: Remote commissioning can be done through the Internet due in case of force majeure.
- ◆ Zero cost: Supporting any IOS/Android mobile phone or tablet, Mac/Win operating system, without any additional cost

# Remote Technical Support

## Remote technical support system

- ◆ Remote operation/monitoring

Authorized personnel can remotely monitor the production situation on site any-time and anywhere. They can monitor and operate the operation status through tablets and mobile phones, which largely reduces the failure rate during production.

- ◆ Remote technical support

In case of breakdown, engineers can provide with corresponding production guarantee immediately, to minimize the possibility of production shutdown. Engineers can also upgrade and maintain the equipment remotely through computers, which greatly saves time and reduces cost.

- ◆ Remote training

If customers have training needs at any time, engineers can conduct remote training through computers.

- ◆ Remote commissioning

Engineers can complete the commissioning process remotely through computers, which greatly reduces the delay caused by journey or the epidemic.

- ◆ Strong applicability

Supporting any tablets or mobile phones of IOS/Android system、 or Mac/Win system。

## Mobile phone touch panel monitoring

You can perform touch screen monitoring and operation anytime through a mobile phone or tablet by downloading the corresponding app.



## Touch screen monitoring on computer.

You can perform touch screen monitoring and operation anytime on the computer without installing any software.



# Remote Supporting-Operation Interface

## Product recovery system operation interface

### Intuitive picture

The flow chart shows the status of on-site valves and motors, as well as the status and data of on-site instruments.

The labels of the valve motors and instruments are convenient for operators and to find relevant equipment quickly, and can be hidden during normal production to keep the picture clean and tidy.

The alarm area displays the alarm information, and the operator knows the break-down point at the first time and makes corresponding response immediately in case of abnormal state.

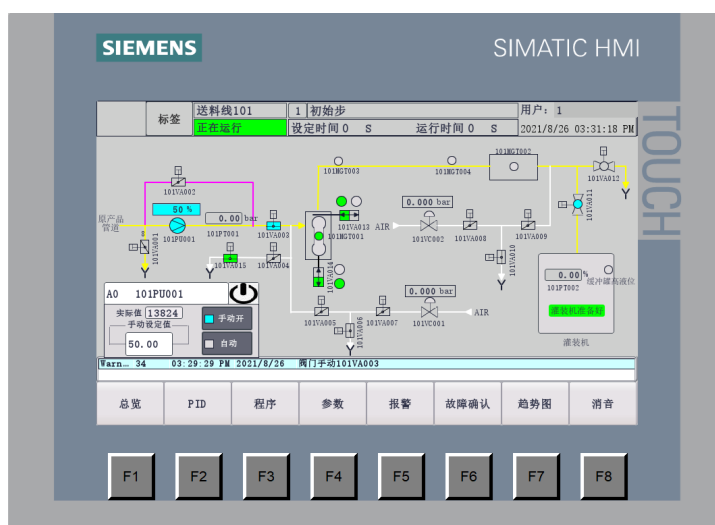
The production status, step sequence and production time display the current production process.

### Powerful operation function

All valves, motors and their PID control can realize manual and automatic functions, which is convenient for operators to handle flexibly during operation.

The production program screen can flexibly select production or cleaning modes.

The parameter screen can set the parameter values needed in the production process, and modify different parameter values according to different processes.

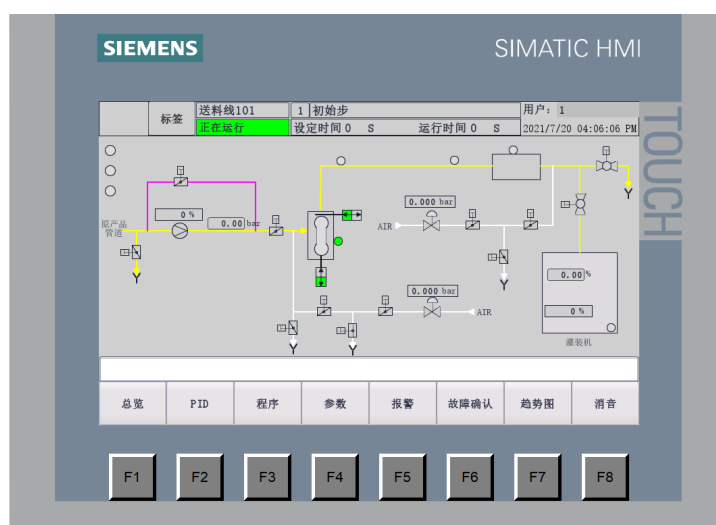


# Remote Supporting-Operation Interface

## Working interface

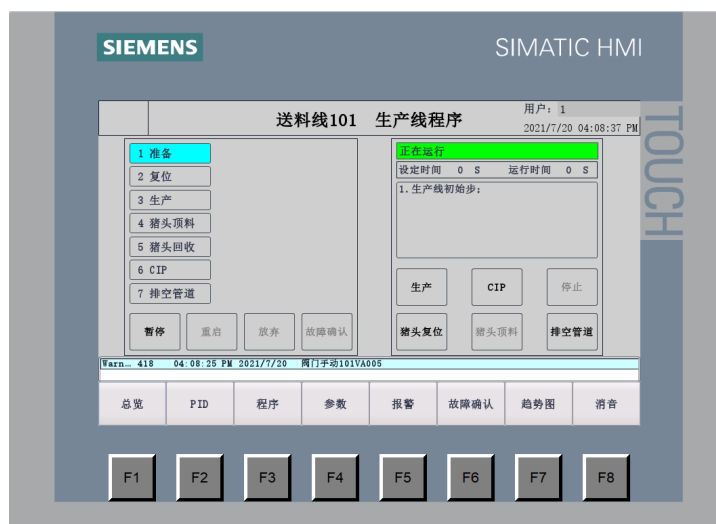
Main picture

Operation picture during production



## Program control interface

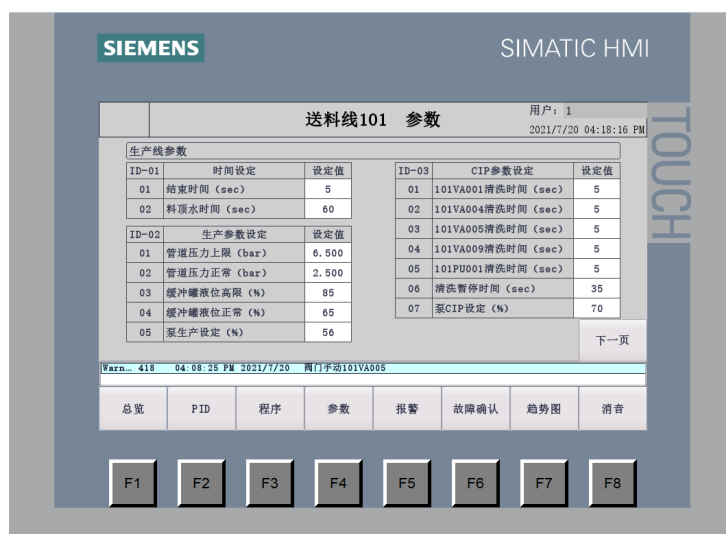
After clicking the program button, the page will switch to the desired screen (as shown below). This screen will show which process the system is in. At the same time, the confirmation of production, pause, reset, breakdown and other operations can also be performed in this screen.



# Remote Supporting-Operation Interface

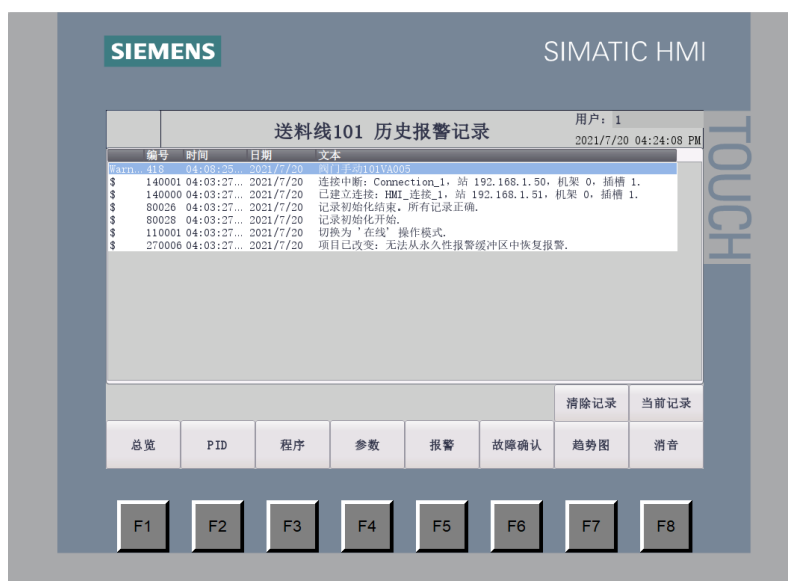
## Parameter interface

Click the parameter button and select different parameter pages to access the corresponding parameter setting interface. The parameter setting interface is shown in the following figure. Click on the number box on the right side of the interface to set the corresponding parameter data



## Alarm interface

Click the alarm button to view the current alarm and historical alarm.



## **Pigging system process description**

### **The pig reset operation**

If the launch station cannot detect the pig before production begins, the program will automatically initiate a reset operation. The receiving station's air supply will push the pig to the launching station and lock it in place.

### **The pigging operation**

After production is complete, the product recovery sequence is initiated. The launching station's air supply will push the pig to the receiving station, and the raw materials in the product pipeline will be pigged into the buffer tank to complete the pigging process.

### **CIP operation**

After pigging, the pig will return to the launching station, and the CIP cleaning sequence can be initiated to clean the production pipeline.

### **Emptying pipeline operation**

After CIP, the sequence of emptying the pipeline can be initiated. The residual water in the pipeline can be drained by pig to ensure that there is no residual water in the pipeline before the next production procedure.

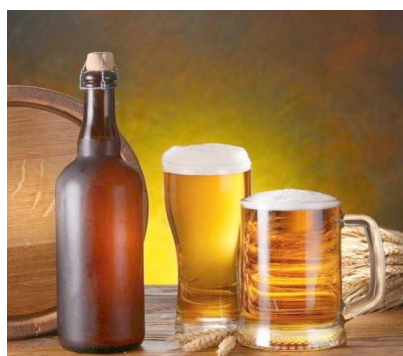
# Pigging System Application

## Hyperfore sanitary pigging system application

Hyperfore sanitary pigging system is applied in the sanitary fields, such as food, beverage, chocolate, dairy products and other fluid products industries, Our pigging systems can be manual or automatic, suitable for different pipeline standards .

### Wine industry/beverage industry

Product recovery solutions are widely used in the entire wine industry and beverage industry. The automatic control of the pigging operation and liquid transportation can help to speed up the conversion time, reduce cleaning water, prevent cross-contamination, and reduce the waste of manufacturers' products.



### Candy industry

In the chocolate industry, the pigging system is essential. Without it, there will be several problems in chocolate production:

Chocolate is transported through pipes at 45-50 °C. When the product temperature is lower than this temperature, it is impossible to pump or store chocolate. Therefore, chocolate manufacturers install very expensive pipes, which reveal several shortcomings.

When production stops (such as weekends), it is impossible to empty the pipeline. With the permanent heating of the pipe, the aging and quality loss of chocolate will also occur. There is also the possibility of sediment accumulation in the pipeline. Many chocolate manufacturers have found the advantages of using pigging technology to clean the pipeline: the production pipeline and storage container can be connected with each other through one or more piggable pipelines. Using pigging technology, more than 99.5% of the products in the pipeline can be effectively recovered.

# Pigging System Application

## Dairy products/edible oil/liquid food industry

Hyperfore pigging system has performed satisfactorily in the dairy industry, beverage industry and oil industry. Our pigging system can effectively recover over 99.5% of the milk, yoghurt, cream, cheese, juice and soft drinks, and edible oil in the pipeline.



Sanitary pigging system is applicable to the following products:

- ◆ Shampoo, bath liquid, moisturizer, toothpaste
- ◆ Liquid medicine
- ◆ Detergent
- ◆ Yogurt, cheese
- ◆ Fruit pulp, syrup, concentrate
- ◆ Dough, vegetable oil
- ◆ Personal care products
- ◆ Lithium battery slurry

- ◆ Prerequisites for the application of pigging system:
- ◆ Fluid products suitable for pumping
- ◆ There is no protruding objects inside the pipeline to be pigged, such as the installation of measuring instruments
- ◆ Valves on the pipes must be pig-gable
- ◆ The internal diameter of the pipe system is the same
- ◆ No sharp edge and uneven welding line
- ◆ 3D, 5D elbow
- ◆ The tee in the pipeline shall be pig-gable

## Pigging System Application

### Chemical industry

Product processing in the chemical industry is complex. Both safety and cross contamination must be considered. Hyperfore automatic pigging system provides efficient treatment methods for the chemical industry and meets the high quality requirements. We supply customization services to cater for the specific needs.

### Lithium battery industry

Lithium battery slurry is an important material for lithium battery production. Lithium battery slurry accounts for more than 35% of the product cost in the whole production process of lithium battery. If it is wasted in the production process, it will cause great losses; Hyperfore pigging system provides an effective recycling method, which can efficiently recover the remaining lithium battery slurry in the transmission pipeline, reduce the waste of products, avoid the problems of pipeline pollution, and realize the alternative production of multi-component slurry, also improve efficiency, reduce downtime and reduce production costs.



# Pigging System Application

## Hyperfore sterile pigging system application

The design and assembly are completely in accordance with the aseptic standard, the pig and sealing material conform to FDA standards, the inner and outer surfaces of the pigging components have undergone high-gloss polishing treatment and the inner and outer surfaces roughness of our sterile pigging system is less than  $0.4 \mu m$ . Hyperfore pigs are made of sanitary materials that can be used for sterile applications, And we supply tailored sterile pigging system solution according to customer requirements.



## Pharmaceutical and food industry

Hyperfore aseptic pigging system is mainly used to recover yoghurt, whey, cream, pharmaceutical and other products with high value. It is also applicable to other liquid products with strict sanitary requirements.



# Pigging System Application

## Hyperfore manual pigging system application

Hyperfore manual pigging system is applied in cosmetics, daily chemical products, pet food, paint and other industries. And we supply tailored manual pigging system solution according to customer requirements.

### Cosmetics industry

In the cosmetics industry, the pigging system has been successfully applied. The pigging system minimizes the use of CIP cleaning agent and reduces sewage discharge. The rapid conversion of products and colors improves the productivity. If a simple configuration is required, Hyperfore manual pigging system is a good choice.



### Shampoo and detergent industry

Our specially designed pigging system can recover up to 99.5% of the residue products in the pipeline. The manual pigging system is easy to operate and saves costs. It is an ideal choice if the pigging operation is not performed very often. Shampoo and detergent industry



### Paint and pigment industries

Hyperfore has always been a supplier of pigging systems for the paint and pigment industries. Our pigging solution is especially designed to avoid product mixture. The pigging system with two pigs is a very effective way to clean the pipeline.



# 北京瀚海峰科技有限公司

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工艺工程

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柜体成套

机电安装

产品代理

备品备件

地址：北京市昌平区景兴街18号企业墅上区1-5单元3层

电话：+86 18513953013

+86 10 89764800

邮箱：sales@hyperfore.cn

网址：www.piggingsystem.com



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