



We at Spirax Sarco aim to be the first choice provider of efficient solutions in the use of steam and related industrial fluids . . .





## **We aim to be the first choice provider through use of our collective expertise**

The business management, engineering and sales team at Spirax Sarco have over 75 years of collective experience in steam, condensate and related industrial fluid systems. No other supplier understands its customers business better than us.

Our customers can benefit from our unrivalled knowledge by visiting our website: [www.SpiraxSarco.com](http://www.SpiraxSarco.com) where an extensive range of literature, training courses and tools are available.

Having over 1000 locally based sales engineers working in 32 countries across the world; we are only a phone call away from talking through a problem or arranging a personal visit to tailor a solution to your specific needs.

Our philosophy is to use our knowledge and experience to help our customers reduce costs by improving process efficiency and saving energy.

## **We aim to be the first choice provider by having a comprehensive product offering**

From the most sophisticated packaged system to the humblest pressure gauge, Spirax Sarco is able to provide the largest product choice, within its area of expertise, to the widest geographic area. This extensive range of products isn't just limited to the steam and condensate loop but covers applications in most related industrial fluids. Our product offering enables us to provide total solutions for our customers.

## **We aim to be the first choice provider by offering the right solution for our customers business . . .**

We fully appreciate today's demands on our customers. Our aim is to solve their plant problems and provide fully integrated solutions tailored to their business – everything from a simple product replacement right through to a major turnkey project. In providing this comprehensive support we allow our customers to focus on their core business.

**. . . it is the combination of expertise, comprehensive product offering and our worldwide capability as a solutions provider, that makes Spirax Sarco an unequalled business partner for our customers.**

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Customer focused solutions partner



System audits



Ready assembled control systems



Steam condition monitoring

# Complete integrated solutions

Businesses today are increasingly relying on outside expertise for management of their energy sources. This allows them to concentrate more on their core business activities.

Spirax Sarco has the knowledge, service and products our customers require regarding the use of steam and other related industrial fluids. Our offering makes us the perfect partner as a solutions provider. These solutions can range from simple product assemblies to major turnkey projects such as boiler house upgrades.

Some examples of the 'solutions' Spirax Sarco can offer are briefly described in this and the following two pages:

## System services

We at Spirax Sarco offer a complete range of services to ensure the effective and safe management of steam, condensate and other industrial utility fluid systems.

### **These services include:**

- Tailored audits to identify areas for improving system efficiency, and ensure compliance with Health, Safety and Environmental legislation.
- Steam System Conditioning and Quality Testing programs that deliver reduced cost of ownership and optimised heat transfer throughout the system.
- Design of customer-specific energy saving schemes and strategies.
- Design of process improvement schemes to increase product quality and/or yield.
- Installation of new and replacement products to improve energy utilisation, system reliability and reduce water and chemical usage.
- Provision of commissioning and routine servicing, in addition to advice on Planned Preventative Maintenance programs, to fully optimize process performance and uptime.
- Project management to ensure seamless on-time, on-budget completion of large turnkey contracts.
- Equipment recalibration and repair facility to help maintain system safety and process availability.



Compact standard heat exchange packages



Clean and pure steam generators



Specially designed heat exchange solutions



Bespoke engineered systems



## Complete integrated solutions - continued

### Heat exchange solutions

#### High purity generators

A range of generators which produce clean steam, pure steam or WFI (water for injection) conforming to recognised standards using plant steam as the primary heat source.

#### Heat exchange solutions

Packaged heat exchange solutions can be provided to meet your exact requirements, offering a highly efficient solution to heating with steam. Compact units, which include the unique EasiHeat™ and QuickHeat™ systems, are pre-assembled to offer quick, simple installation, and speedy commissioning. To provide complete flexibility we will also design and provide un-assembled heat exchange solutions to meet your individual requirements.

#### Bespoke heat exchange solutions

Specifically and individually designed to suit your application requirements.

### Packaged products

Assemblies of products all selected and sized to provide an integrated solution. Some examples of packaged solutions are:

#### - Condensate pump/steam trap assemblies

Condensate pumps with steam trap and/or receiver for the effective removal and return of condensate.

#### - Control valve/flowmeter stations

Pre-assembled stations including matched products to condition the fluid prior to controlling it's temperature, pressure etc., or measuring it's flowrate. Includes all necessary downstream products.



# Boiler control and systems

An extensive range of boiler controls and systems are available. Whether it's a completely new boiler house plant or a simple blowdown valve replacement, Spirax Sarco will have the answer.

## 1. Feedtanks

The Spirax Sarco feedtank is an atmospheric deaerator fully constructed in stainless steel - no rusting, no linings, coatings or joints to leak. It is fitted with a flash condensing deaerator head which combines: cold make-up, condensate return and flash recovery. Flash steam is condensed whilst heating and deaerating the cold make-up.

The deaerator head is also available for fitting into existing feedtanks.

## 2. Boiler blowdown systems

As steam forms it leaves behind impurities in the boiler water that will concentrate unless removed. The TDS (Total Dissolved Solids) in the boiler must be accurately controlled. High TDS can result in carryover of boiler water and impurities causing problems with production and plant. Low TDS due to too much blowdown increases fuel and water treatment chemical costs. Systems are available for all sizes and types of boiler.

## 3. Sample coolers

To be sure that a boiler is operating at the desired concentration of TDS it is necessary to take a sample of the water and test it. The stainless steel sample cooler lets the operator do this safely and accurately.

## 4. Steam injection systems

Steam injection systems can be used to inject steam into feedtanks to drive off the dissolved oxygen. This reduces the amount of oxygen scavenging chemicals required, and maintains a high and steady feedwater temperature to the boiler.

## 5. Level controls and alarms

Significant developments have taken place in recent years considerably improving the standards of safety and reliability of boiler level controls.

Probes without moving parts and modern electronic controllers are so reliable that major boiler accidents should be a thing of the past.

The range offered has been approved as complying with the relevant Codes of Practice and European regulations.

## 6. Feedpump check valves

Feedpump check valves are fitted with heavy-duty springs and soft seats to prevent a shutdown boiler from flooding with feedwater.

## 7. Heat recovery systems

Flash steam recovery from blowdown has two advantages. In addition to the heat recovered the flash steam is condensed to 'pure' water, reducing the amount of make-up water and chemical treatment required.

For certain conditions it may be more economical to pass the blowdown directly to a heat exchanger without using a flash vessel. Spirax Sarco can provide a range of alternative heat recovery solutions.

## 8. Bottom blowdown valves

For the precise and regular control of precipitated solids in steam boilers. A choice of manual key operated or fully, automated valves are available.

## 9. Vent heads

The vent head separates condensate from flash steam and vents it safely without spray. Vent heads are manufactured in stainless steel for a corrosion resistant long life.

## 10. Blowdown vessels

Blowdown vessels are now manufactured to ASME VIII to allow operation to an ambient temperature of -10°C.

## 11. Conductivity meters

The temperature compensated conductivity meter is an essential instrument to have in the boiler house for checking boiler water and feedwater TDS levels, and calibrating control instrumentation.

## 12. Condensate contamination detection systems

Even low levels of contamination can cause foaming, scaling and corrosion in the boiler.

The contamination detection system monitors the conductivity of the condensate and will raise an alarm and divert it to drain if a pre-set limit is passed.



# Flowmeters

Whatever your process or system requirements, there is a flowmeter to suit your needs from the Spirax Sarco range. Our flowmeters have an unrivalled reputation for accuracy, turndown and reliability. They are versatile, being suitable for steam as well as most liquids and gases. A comprehensive selection of flow computers and display units, all of which can be linked to plant and building management systems, complement the range.

## 1. Spiraflo flowmeters

For use on steam, the Spiraflo flowmeter has built-in density compensation and is designed to give very accurate results, regardless of variations in steam pressure.

Available in pipeline sizes from DN40 to DN100.

## 2. DIVA flowmeters

The Spirax Sarco Digital In-line Variable Area flowmeter (DIVA) has been designed as an ideal steam flowmeter for use in energy management systems. It is an innovative development providing a pipeline unit, flow computer and display in a single package.

Available in pipeline sizes from DN50 to DN100.

## 3. Gilflo ILVA flowmeters

The Gilflo/ILVA range of flowmeters offers an unrivalled turndown ratio of up to 100:1 and can be used to meter most industrial fluids including steam and gases.

Available in pipeline sizes from DN50 to DN400.

## 4. Orifice plate flowmeters

Spirax Sarco orifice plate flowmeters are especially suited for installations in pipelines where the need for high accuracy and turndown is not critical.

They can be interfaced with flow computers to give up-to-the-minute data at the touch of a button.

Available in pipeline sizes from DN25 upwards.

## 5. Flow computers

A range of flow computers is available to give automatic density compensation plus analogue, pulse and RS 485 Modbus outputs. The units also have built-in timers and event loggers enabling peak flows, temperatures, pressures and totals to be recorded. Units for heat metering applications are also available.



# Control systems

To enable you to make the right choice for your application Spirax Sarco has developed a range of control systems ranging from simple self-acting controls to systems that will fit into highly sophisticated control loops.

## 1. Electrically actuated control valves

Two-port or three-port valves manufactured in a wide choice of materials for pressures up to 40 bar and having connections in sizes up to DN200.

The actuators are suitable for HVAC or industrial process applications and are available with VMD, mV or mA input signals.

Options include: spring reserve and, where more accurate control is required, a valve positioning card.

## 2. Pneumatically actuated control valves

Two-port or three-port control valves manufactured in a wide choice of materials for pressures up to 40 bar and having connections in sizes up to DN200.

Pneumatic actuators are low profile to NAMUR standard, spring-to-open or spring-to-close, and incorporate a fully rolling diaphragm.

A handwheel option is available.

## 3. Positioners

To complement the range of pneumatically actuated control valves, pneumatic and electropneumatic positioners will allow small actuators to close against higher differential pressures, eliminate hysteresis and improve accuracy and positioning time.

Variants are available with automatic commissioning, smart control, programmable functions and digital communications.

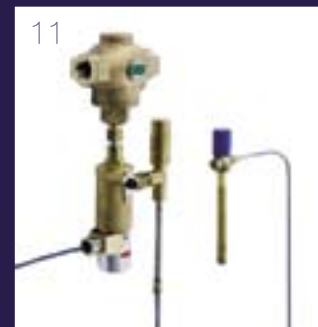
## 4. Programmable electronic controllers

Panel mounted single loop controllers suitable for single or multi-setpoint control. They incorporate PID, auto TUNE and ADAPTIVE algorithms. Multi-input options are available.

## 5. Pneumatic controllers

For the control of pressure or temperature. Pneumatic controllers are available with simple proportional control action, or with the addition of integral and derivative action. Temperature sensing is via a nitrogen filled direct expansion system and pressure sensing by interconnecting pipework to an internal bourdon tube.





### 6. High specification control valves

A range of high specification control valves manufactured in a wide choice of materials and internal trims making them suitable for the more arduous application.

Internal trims include: multi-stage, balanced, unbalanced, low noise and anti-cavitation.

These valves are used in conjunction with high power, pneumatically operated actuators.

### 7. Direct acting pressure reducing and surplussing valves

These are self-powered valves designed to control the pressure of water, steam and gases up to 40 bar. They are available in a wide range of materials, and have pipeline connections up to DN100.

### 8. Pilot operated pressure reducing and surplussing valves

Like direct acting pressure reducing valves, these valves are self-powered. Pilot operation provides accurate control under large load change conditions.

Available in SG iron, cast steel and stainless steel in sizes up to DN80.

Options include: soft seats for gas applications with solenoid valve or pneumatic actuator for remote operation.

### 9. Safety valves

Vital for the protection of people and plant. A comprehensive range of safety valves is available in bronze, iron and carbon steel body materials. These valves conform to ASME and EN standards with a range of pipe end connections and sizes up to DN150. Options include: soft seal, open or closed bonnet, with or without easing lever.

### 10. Self-acting temperature controls

Self-acting temperature control systems are ideal for applications demanding rugged reliability and low maintenance. They are particularly suited to harsh or hazardous environments.

They are used in conjunction with two-port or three-port control valves to form a flexible control system in terms of capillary length and temperature range.

### 11. High limit temperature cut-out

Designed to protect personnel and product, the high limit temperature cut-out is a self-powered, independent overheat safeguard for use with two-port and three-port valves.

It is inherently 'fail-safe', and can provide remote indication of operation.

# Steam traps

It is essential, without loss of live steam, to remove condensate and often air and other incondensable gases from steam systems. The Spirax Sarco range of steam traps allows the best choice to be made for all applications. A steam trap performance monitoring system complements the range.



## 1. Thermodynamic steam traps

Thermodynamic steam traps combine reliability, simplicity and efficiency of operation; with just one moving part (a hardened stainless steel disc) they give a blast discharge with clean, tight shut-off. They are able to withstand: superheat, waterhammer, corrosive condensate, freezing and vibration. The TD trap is the first choice for removal of condensate from steam distribution systems.

Sizes up to DN25.

For pressures up to 250 bar.

Body material: carbon steel, stainless steel or alloy steel.

## 2. Ball float steam traps

Ball float steam traps are extremely versatile and work efficiently on both light and heavy condensate loads. Although compact in size, their discharge capacity is high and continuous, ensuring maximum heat transfer. These traps are the best choice for draining plant with automatic temperature control.

An integral air vent is fitted as standard and an adjustable needle valve is available as an option to prevent steam locking.

Sizes up to DN100.

For pressures up to 32 bar.

Body material: cast iron, SG iron, cast steel or stainless steel.

## 3. Balanced pressure thermostatic steam traps

Balanced pressure thermostatic steam traps adjust automatically to varying steam pressures and have excellent air venting characteristics during plant start-up and during normal operation. They have large discharge capacities for their size and the robust design of the internals gives a good life expectancy.

Sizes up to DN25.

For pressures up to 32 bar.

Body material: brass, cast steel or stainless steel

## 4. Sealed steam traps

Sealed maintenance free steam traps.

Range: balanced pressure, inverted bucket and bimetallic versions.

Sizes up to DN25.

For pressures up to 45 bar.

Body material: stainless steel.





### 5. Inverted bucket steam traps

Inverted bucket traps are the most robust type of the mechanical traps and will resist waterhammer. When the check valve option has been fitted in the inlet, they can be used with superheated steam. They are available with a wide selection of valve orifices for precise pressure and load matching.

Sizes up to DN50.

For pressures up to 62 bar.

Body material: cast iron, cast steel, alloy steel or stainless steel.

### 6. Bimetallic thermostatic steam traps

Bimetallic steam traps can conserve energy by discharging sub-cooled condensate in those applications which can utilise sensible heat.

They are the most robust of all the thermostatic steam traps, being able to withstand waterhammer and corrosive condensate.

Sizes up to DN100.

For pressures up to 210 bar.

Body material: cast steel, alloy steel or stainless steel.

### 7. Spiratec steam trap monitors

Every steam trap that fails to operate properly can cause problems elsewhere in the steam system.

Spiratec can continuously monitor your steam traps to show their operation and warn of malfunctions.

It will detect if traps are passing live steam or if they are waterlogged.

The system either uses sensor chambers mounted upstream of conventional steam traps, or integral sensors in pipeline connectors or steam traps, giving a signal to an external test point.

Sizes up to DN50.

For pressures up to 32 bar.

Body material: carbon steel, SG iron or stainless steel.

### 8. Quickfit steam traps

The comprehensive range of pipeline connectors coupled with world leading steam trap technology reduces plant downtime, maintenance costs and ensures zero emissions, whilst maintaining system efficiency.

Range: Suitable for use with balanced pressure, thermodynamic, inverted bucket, float and bimetallic steam traps.

Sizes up to DN25.

For pressures up to 32 bar.

Body material: generally stainless steel.

# Condensate pumps and energy recovery

To maximise energy efficiency it is essential to return clean condensate to the boiler house. Spirax Sarco's range of condensate handling equipment allows you to achieve this effectively and economically.

## 1. Automatic steam (or gas) powered condensate pumps

This range of self-contained pumps uses steam or other pressurised gas as motive power and is designed to remove and recover condensate (or other fluids) under all operating conditions.

They are ideal for use in hazardous areas where electrical pumps would not be suitable, and for the efficient drainage of heat exchangers.

## 2. Automatic steam powered condensate pump traps

APTs (Automatic Pump Traps) offer the benefit of both pump and steam trap as one item. This ensures complete condensate removal from plant, even under vacuum, thus maximising thermal efficiency at all times as well as recovering valuable condensate for re-use.

## 3. Electric powered condensate recovery units

A range of electrically powered condensate return pumps specially designed with low NPSH (Net Positive Suction Head) requirements to handle hot condensate in a compact size.

## 4. Flash steam recovery vessels

Flash steam is allowed to separate from the condensate in the vessel. The flash steam may then be used in a low pressure steam system and the separated condensate returned to the boiler house.



# Humidifiers

Control of relative humidity is growing in importance as new technologies and health requirements in the workplace demand tighter environmental management. With both direct steam injection and self-generative humidifiers, Spirax Sarco can provide the correct solution for your specific humidification needs.

## 1. Direct steam injection humidifiers

When plant steam is available the direct steam injection humidifier will provide optimum control and efficiency.

## 2. Hygromatik self-generative humidifiers

A comprehensive range of self-generative humidifiers is available complete with all the necessary control equipment.

Models are available for use with mains or fully demineralised water.



# High purity products

Avoidance of the risk of contamination across many industries has resulted in a growing need for clean steam, pure steam and water of WFI (Water For Injection) quality. Products suitable for these high purity systems must be designed and manufactured to a high standard to ensure compliance with the exacting rules and regulations set for example by the biopharmaceutical and healthcare industries. Spirax Sarco's extensive range of high purity products extends from generation through distribution to usage.

## 1. Generation

A comprehensive range of clean and pure steam generators and WFI distillation units designed and manufactured to cGMP, ISPE, ASME BPE and FDA guidelines to produce steam and water in compliance with International Pharmacopodia and HTM 2031/EN 285 standards.



## 2. Sanitary control and instrumentation

Accurate control is essential for the successful operation of your process. Spirax Sarco offers a wide range of electrically and pneumatically actuated control valves as well as direct acting pressure regulators.

A variety of sanitary instrumentation is also available to complete your control loop as well as sanitary safety valve to protect your system.

### 3. Pure and clean steam trapping

A comprehensive range of thermodynamic and thermostatic steam traps developed specifically for clean and pure steam applications. This range includes traps that minimise condensate back-up for critical steam-in-place applications.



### 4. Sanitary ancillary products

To complete your high purity system, Spirax Sarco offers a broad range of ancillary products including: check valves and sample coolers, sanitary ball valves and steam separators.

Custom sanitary systems are also available including: pure steam humidifiers, sanitary heat exchangers and filter housings.

# Pipeline ancillaries

To achieve long and reliable service from steam plant equipment it is necessary that the steam is clean, dry and that maintenance can easily be carried out.

Spirax Sarco provides the complete range of products to ensure the condition of the steam and the steam system itself is properly maintained.

## 1. Manifolds

A compact range of forged steel manifolds designed for steam tracing applications.

The manifolds have 4, 8 or 12 tracer line connections and are supplied with integral piston type isolation valves.

Screwed, socket weld, butt weld and flanged connections.

## 2. Bellows sealed stop valves

Bellows sealed stop valves are ideal for any application where minimal maintenance and zero emissions are required.

Pipeline sizes up to DN250.

For pressures up to 40 bar.

Body material: cast iron, SG iron, carbon steel or stainless steel.

## 3. Check valves

This range of valves offers an effective, low maintenance solution for the prevention of reverse flow in pipelines.

Pipeline sizes up to DN300.

For pressures up to 50 bar.

Body material: bronze or stainless steel.

Connections: wafer pattern or screwed.

## 4. Separators

Separators remove moisture from steam or gas pipelines. They provide a drain point for condensate droplets moving along the pipe wall and deflect entrained droplets out of the main flow. Separators therefore ensure that steam or gas is delivered to its point of use dry - particularly important with highly rated plant or equipment like sterilizers, where steam comes into contact with the product.

Pipeline sizes up to DN350.

For pressures up to 50 bar.

Body material: cast iron, SG iron, carbon steel or stainless steel.

## 5. Diffusers

When fitted to the outlet of a steam/air trap that is discharging to atmosphere, the diffuser will greatly reduce the noise level and will offer protection from high velocity discharge.

## 6. Strainers

Strainers protect expensive downstream equipment such as control or flowmetering devices from damage.

Pipeline sizes up to DN250.

For pressures up to 100 bar.

Body material: bronze, cast iron, SG iron, cast steel or stainless steel.

## 7. Piston actuated valves

Robust and compact bronze or stainless steel pneumatically actuated valves with PTFE soft seat providing a tight shut-off making them suitable for a wide range of media, up to 180°C.

Pipeline sizes up to 2".

For pressures up to 20 bar.

Body material: bronze or stainless steel.

Connections: screwed, flanged, sanitary clamp, butt weld or socket weld.

## 8. Sight glasses, sight checks and pressure gauges

A wide range of sight glasses, sight check valves and pressure gauges are readily available.

## 9. Hosedown stations

For general cleaning and washdown applications the hosedown station is the perfect tool. Hot water is economically provided by safely mixing steam and cold water.

## 10. Air vents and vacuum breakers

Air vents and vacuum breakers, for use on steam and water systems, are designed to protect plant and process equipment.

Pipeline sizes up to DN25.

For pressures up to 50 bar.

Body material: brass, carbon steel or stainless steel.

## 11. Ball valves

Spirax Sarco has a broad range of ball valves to suit every application requirement.

These ball valves are available as a manual valve or can be supplied with a pneumatic actuator.

Pipeline sizes up to DN200.

For pressures up to 140 bar.

Body material: cast steel or stainless steel.

## 12. Compressed air products

The condition of compressed air is critical to plant efficiency. Poor quality air can lead to shortened air tool life, increased manufacturing times and even health risks. The Spirax-Monnier range of compressed air products; filters, regulators and lubricators, guarantees high quality air at the point of use.

The compressed air product range is complemented by: soft seated pressure reducing valves, safety valves, separators, strainers, ball valves and drain traps.

