

# Automated Boiler Controls and Systems



**spirax**  
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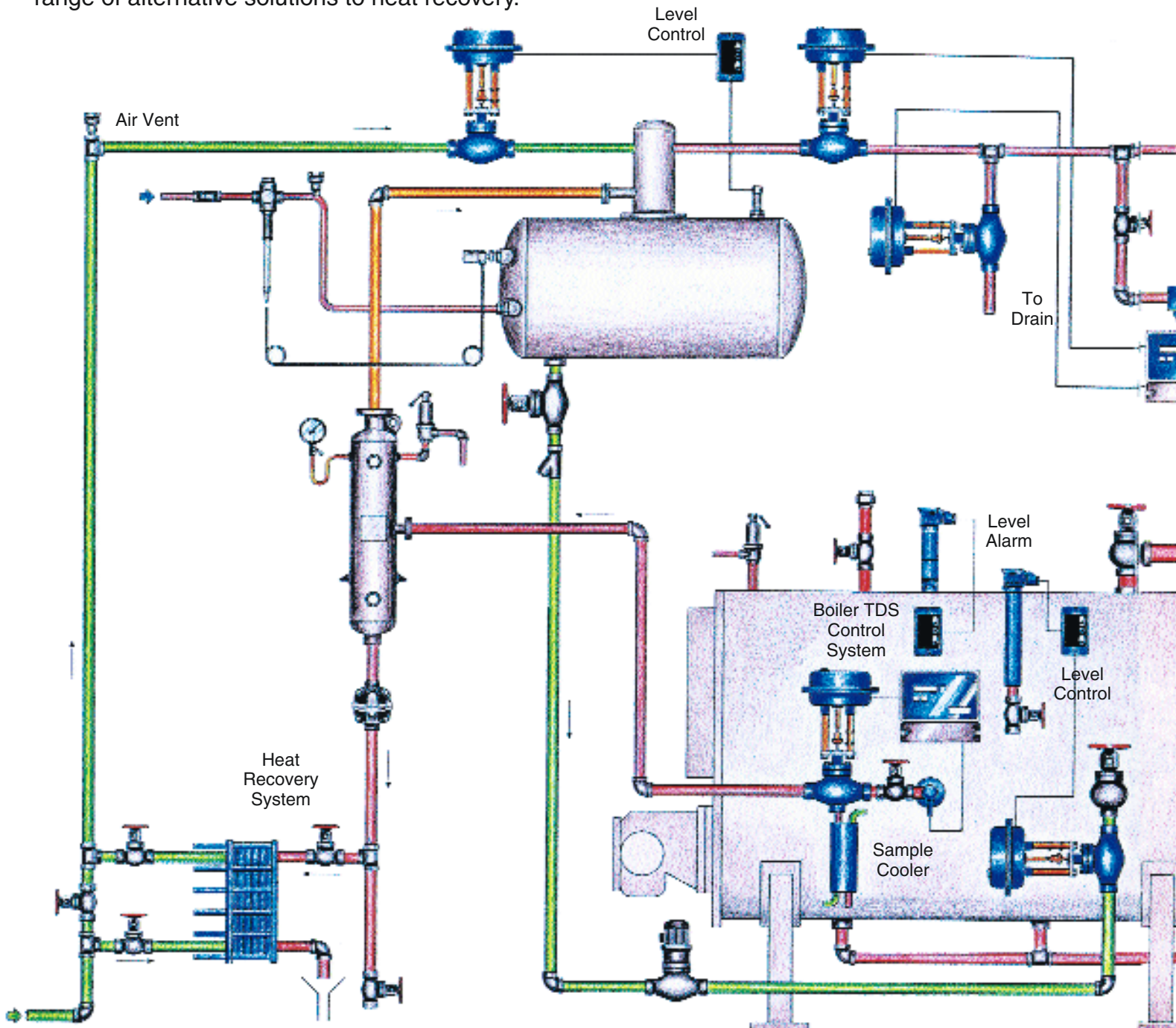
An extensive range of boiler controls and systems is available. Whether it is a new installation or a retrofit application, Spirax Sarco will have the answer.

## ■ Heat recovery systems

Flash steam recovery from blowdown has many 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 solutions to heat recovery.

## ■ Level controls

Significant developments have taken place in recent years improving considerably the standards of safety and reliability of boiler level controls. Probes without moving parts and modern electronic solid state controllers are so reliable that major boiler accidents should be a thing of the past.

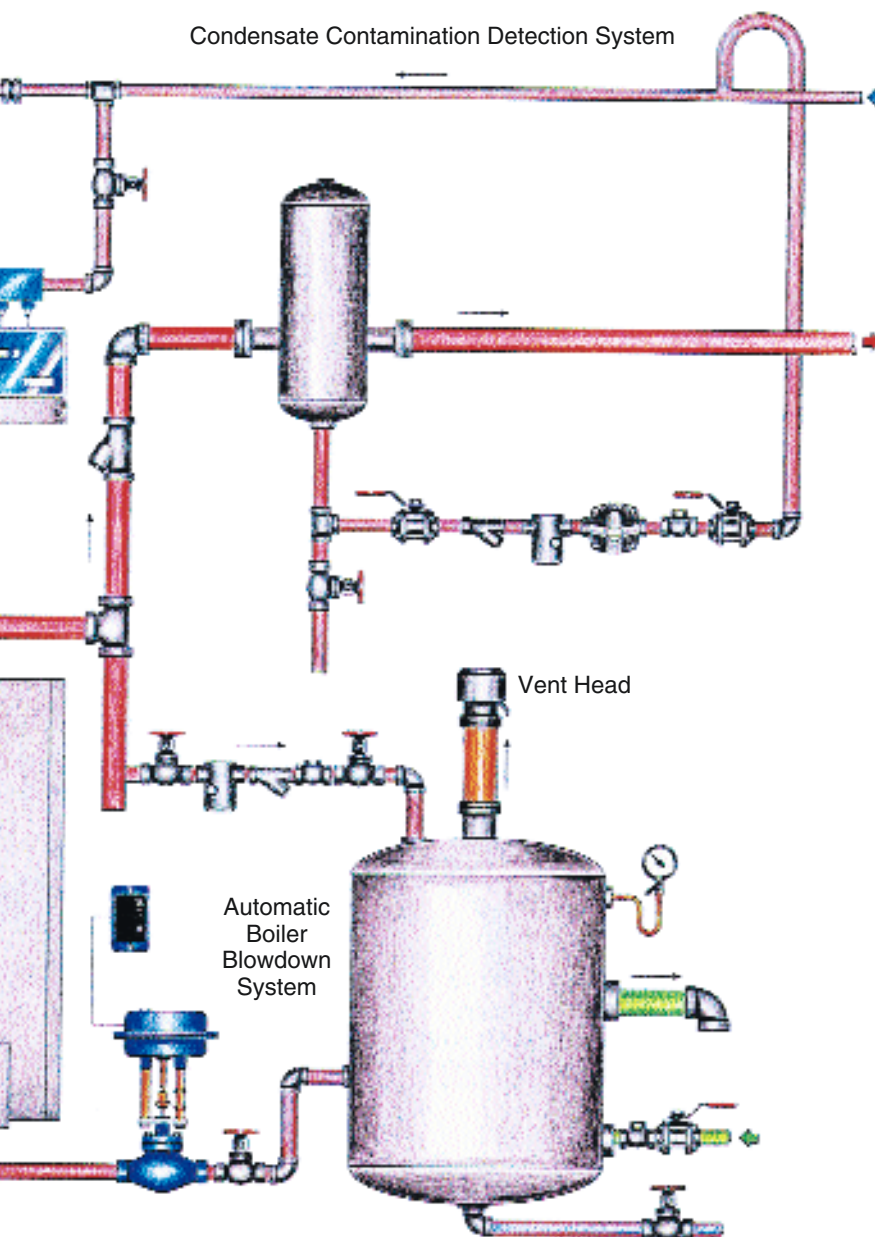


## ■ Boiler TDS control system

As steam forms it leaves behind impurities and dissolved solids in the boiler water that will concentrate unless blown down. The TDS (total dissolved solids) in the boiler must be controlled accurately. High TDS will result in carryover of boiler water and impurities causing problems with production and plant. Low TDS due to too much blowdown will be expensive in fuel costs and water treatment chemical losses. Systems are available for firetube and watertube boilers.

## ■ 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.



## ■ Automatic boiler blowdown system

Systems to ensure precise and regular blowdown of precipitated solids from the bottom of the boiler. Both key operated, manual systems and fully automated systems are available.

### User benefits

- Single source supplier for boiler controls and steam system.
- Full range of products for the boiler room
- Provides information to building management system.
- Blowdown control will save energy and help protect the environment.
- Proven state of the art technology.
- Easy to install and commission.

**Note:** All diagrams contained in this brochure are schematic representations only—not to be used for construction.

# Heat recovery system

Recover heat and water from TDS blowdown to increase energy efficiency and cut costs.

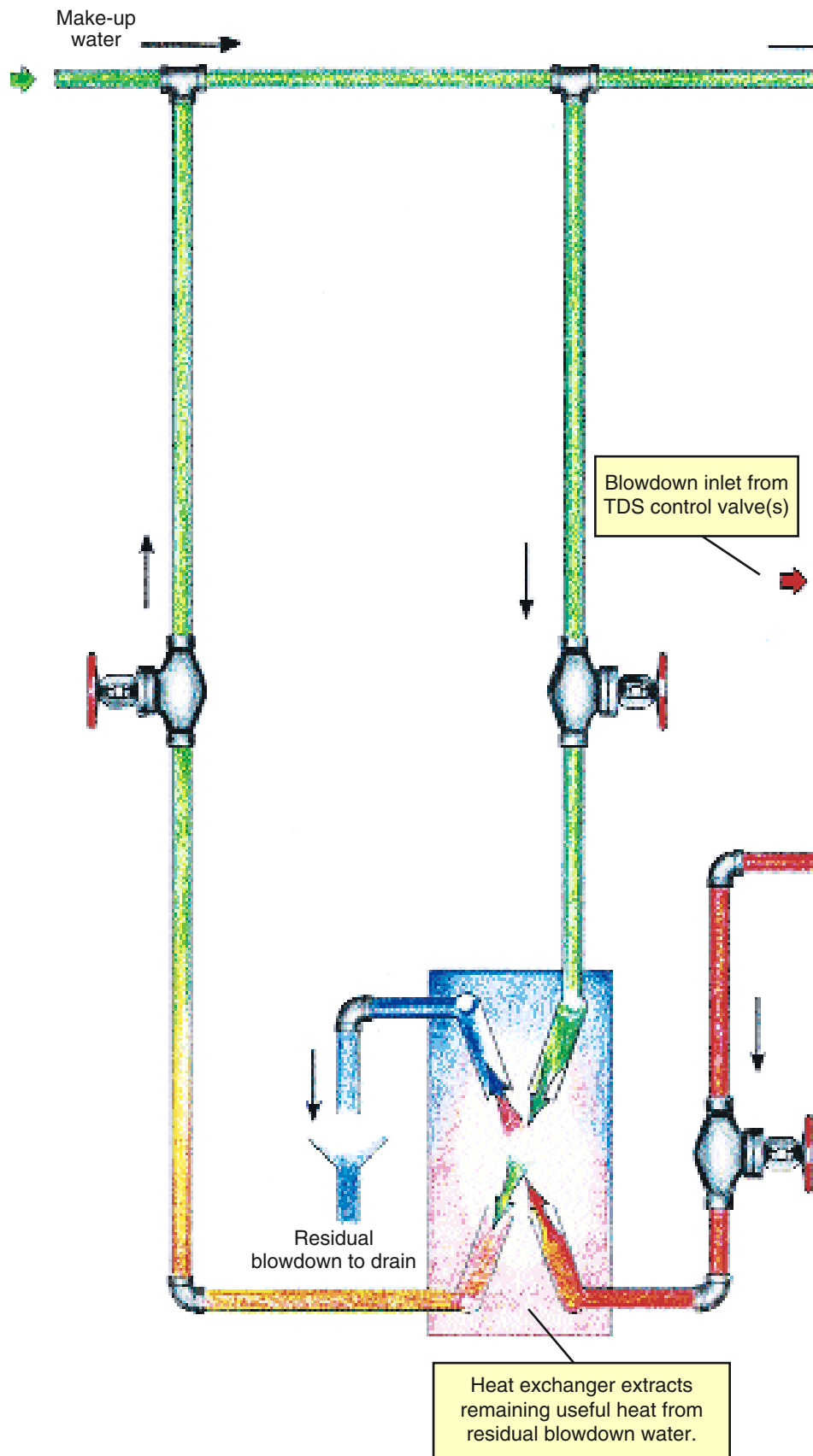
Steam boilers need to be blown down to control the level of total dissolved solids (TDS) in the boiler water. This is best achieved by using a TDS control system which will open a valve to allow boiler water to discharge when the TDS level rises above a pre-set limit. Relatively low TDS feedwater then replaces the discharged boiler water.

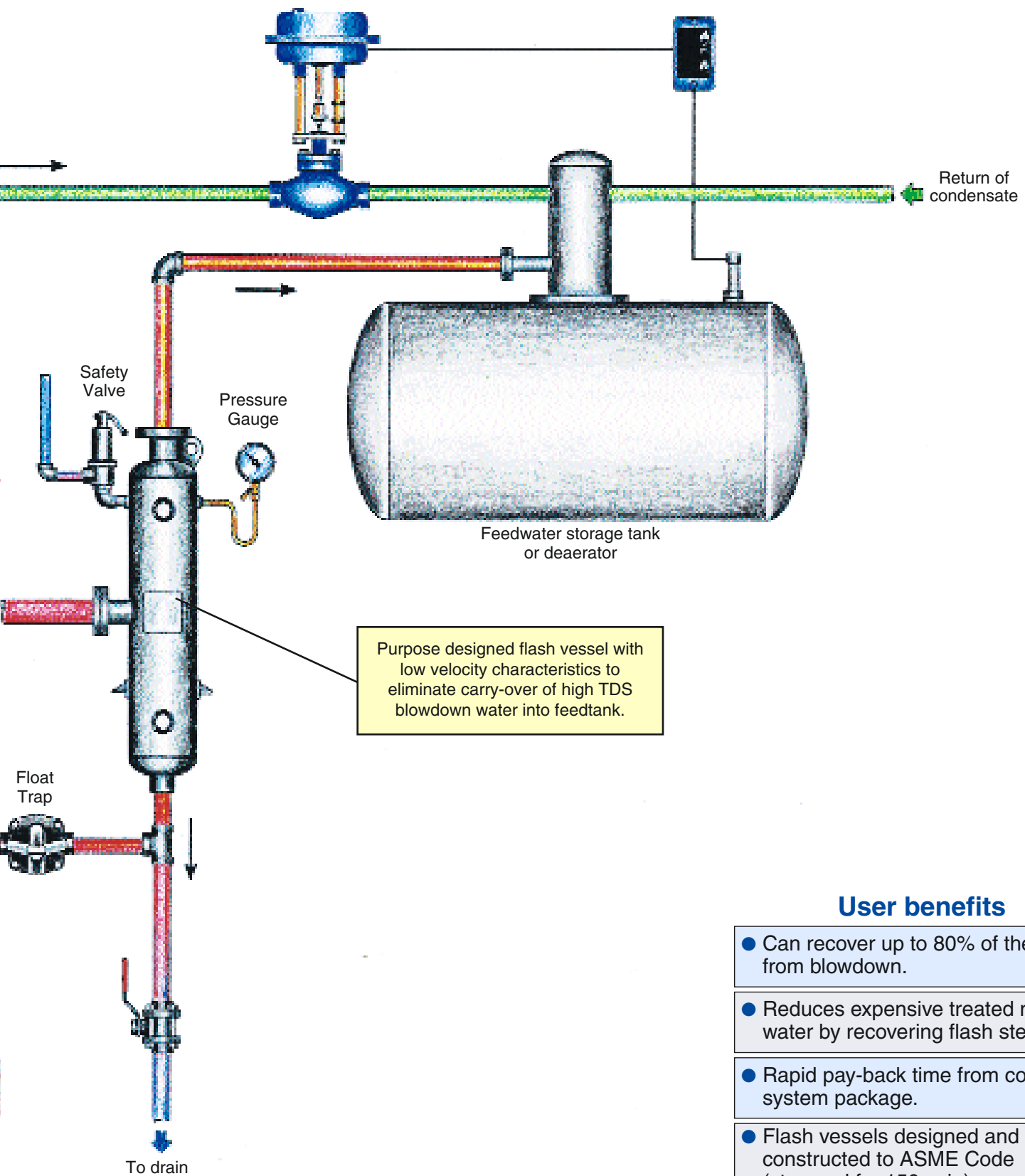
Up to 80% of the heat in this discharged boiler water can be recovered with a properly designed heat recovery system.

## How the system works

Flash steam is released from the hot blowdown water when the pressure drops after the TDS blowdown control valve. This mixture of flash steam and blowdown water is allowed to separate in the flash vessel. The design of the vessel ensures that flow velocities are low to promote good separation. The dry flash steam is then introduced at low pressure into the deaerator. A float trap fitted to the outlet of the flash vessel drains the residual blowdown water.

From the float trap the residual blowdown water, which is still hot at this point, is allowed to pass into the heat exchanger where it gives up its heat to the circulating cold make-up water. The cooled blowdown water then flows safely to drain.





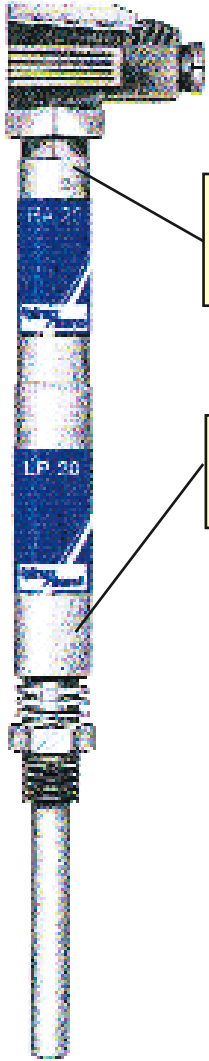
## User benefits

- Can recover up to 80% of the heat from blowdown.
- Reduces expensive treated make-up water by recovering flash steam.
- Rapid pay-back time from complete system package.
- Flash vessels designed and constructed to ASME Code (stamped for 150 psig).
- Stainless steel heat exchanger plates can be removed for examination without disturbing pipework.
- Reduces temperature of blowdown water for safer disposal.

# Level control system components

## LP 20 probe and PA 20 pre-amplifier

The LP 20 probe consists of a stainless steel rod completely insulated from the water by teflon. As the water level rises, the capacitance between the rod and the ground boiler protection tube or probe chamber increases. The capacitance is measured by the pre-amplifier and is transmitted as a dc signal to the controller. Control and alarm levels are set in the controller.



Simple plug connection. All electronics are housed in the controller.

Probe can be used for applications up to 465 psig (32 bar).

### User benefits

- Can provide information to management systems.
- Can be used as direct replacement for old and outdated controls (modulating and on-off).
- Three stage level wave filter to maintain a stable signal.
- Suitable for pressure up to 465 psi (32 bar).

## LC2500 Level Controller



Control and alarm levels can be adjusted without shutting down the boiler.

Alternative input from 4-20mA transmitter.

Adjustment potentiometers on front panel for easy access.

The LC2500 controller is a dual voltage unit with two channels, designated A and B. Either of the channels can be set to provide a high or low alarm, and Channel B can also provide adjustable on/off control.

### Features:

- Wave filter**  
This prevents over-frequent relay operation in turbulent conditions.
- Out of range alarm**  
This can warn of damage to the wiring or other problems that could lead to potentially dangerous situations.

## LC2200 Level Controller (Electric) LC2300 Level Controller (Pneumatic)



The LC2200 and LC2300 controllers are proportional level controllers with adjustable set points and adjustable proportional bands.

### Features:

- Wave filter**  
This prevents over-frequent relay operation in turbulent conditions.

## LT2010 Level Transmitter



4-20mA to management system or remote indicator

Where remote signal representing water level is required (4-20mA isolated signal) an LT2010 can also be connected to the level probe. The transmitter range can be set, for example, to represent the boiler level gauge glass. It can of course be set to represent any range of levels along the probe.

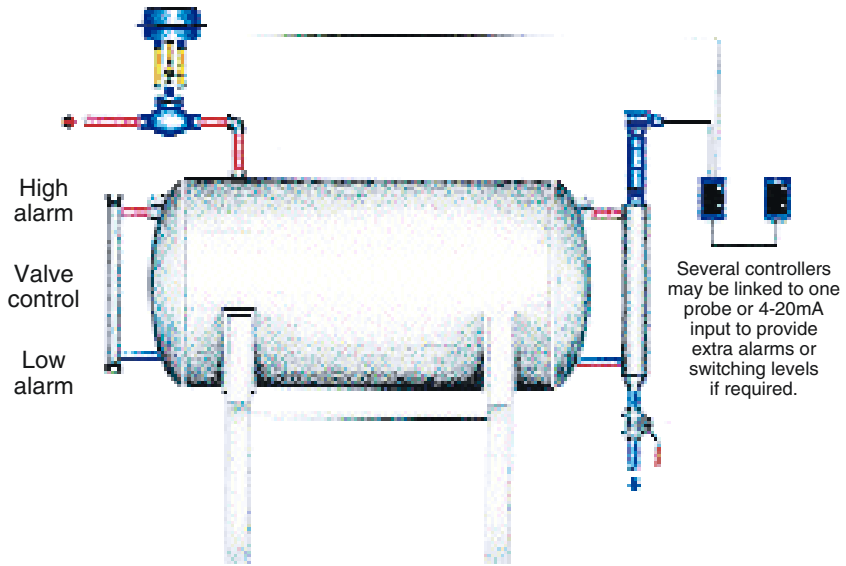
The transmitter output can be used to provide information to a management system or connected to a remote display unit such as the DS 1000.

## DS1000 Digital Display Unit

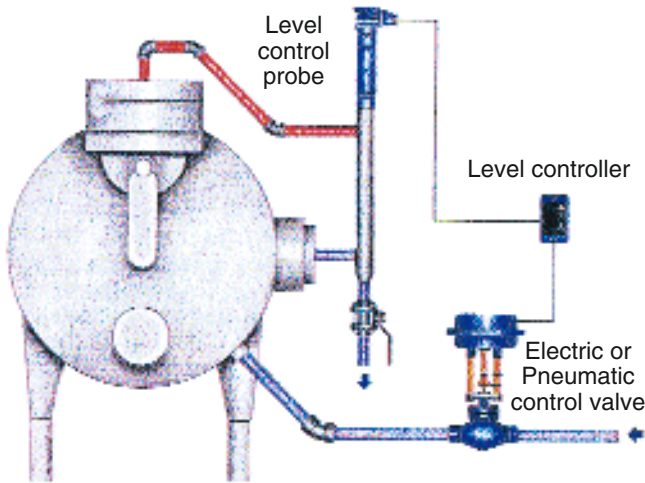


# Level control applications

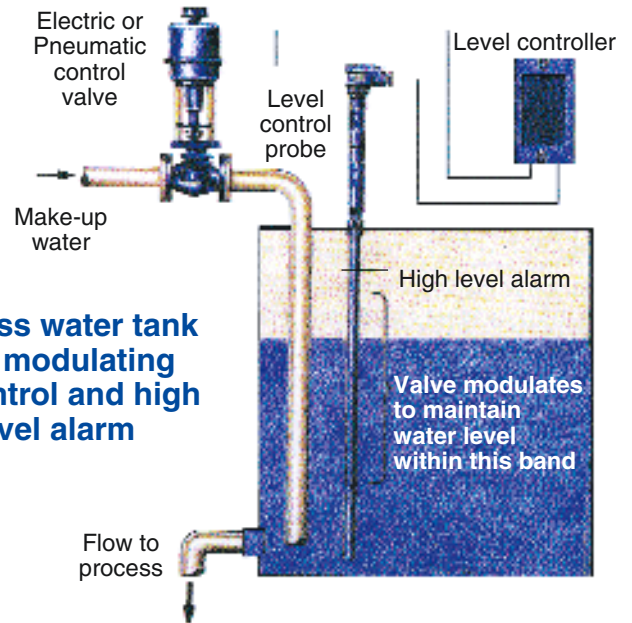
## Deaerator and feedwater application



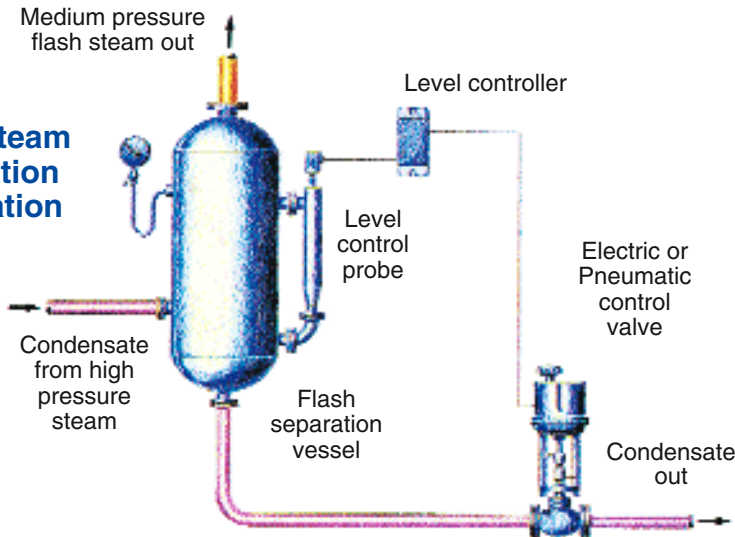
## Boiler application



## Process water tank with modulating fill control and high level alarm



## Flash steam separation application



## How to specify

Proportional level controller for pneumatic actuated valve with alarm output, three stage wave filter and out of range alarm. Complete with capacitance probe and pre-amplifier. Optional: Transmitter and Remote Display Unit.

## How to order

- 1 - Spirax Sarco modulating level control system comprising:
  - LP 20 Probe 41" (1050 mm) long
  - PA 20 Pre-amplifier
  - LC 2300 Controller

# High integrity, self-monitoring low level alarm for the automated steam boilers

## Performance and safety

Today's boilers are designed to extract the maximum possible heat from their fuel. With larger heat transfer areas and smaller steam spaces than earlier designs they are capable of achieving increasingly high outputs from more compact designs. This high performance demands control systems to match, particularly in the important area of boiler water level controls and alarms where failure to achieve proper operation could have grave safety implications.

## Productivity and safety

Requirements for greater productivity have led to increasing boiler house automation and limited levels of supervision. This, in turn, has demanded safety devices that are self-monitoring and will give warnings of system faults and allow safe shutdown of plant.

## How it works

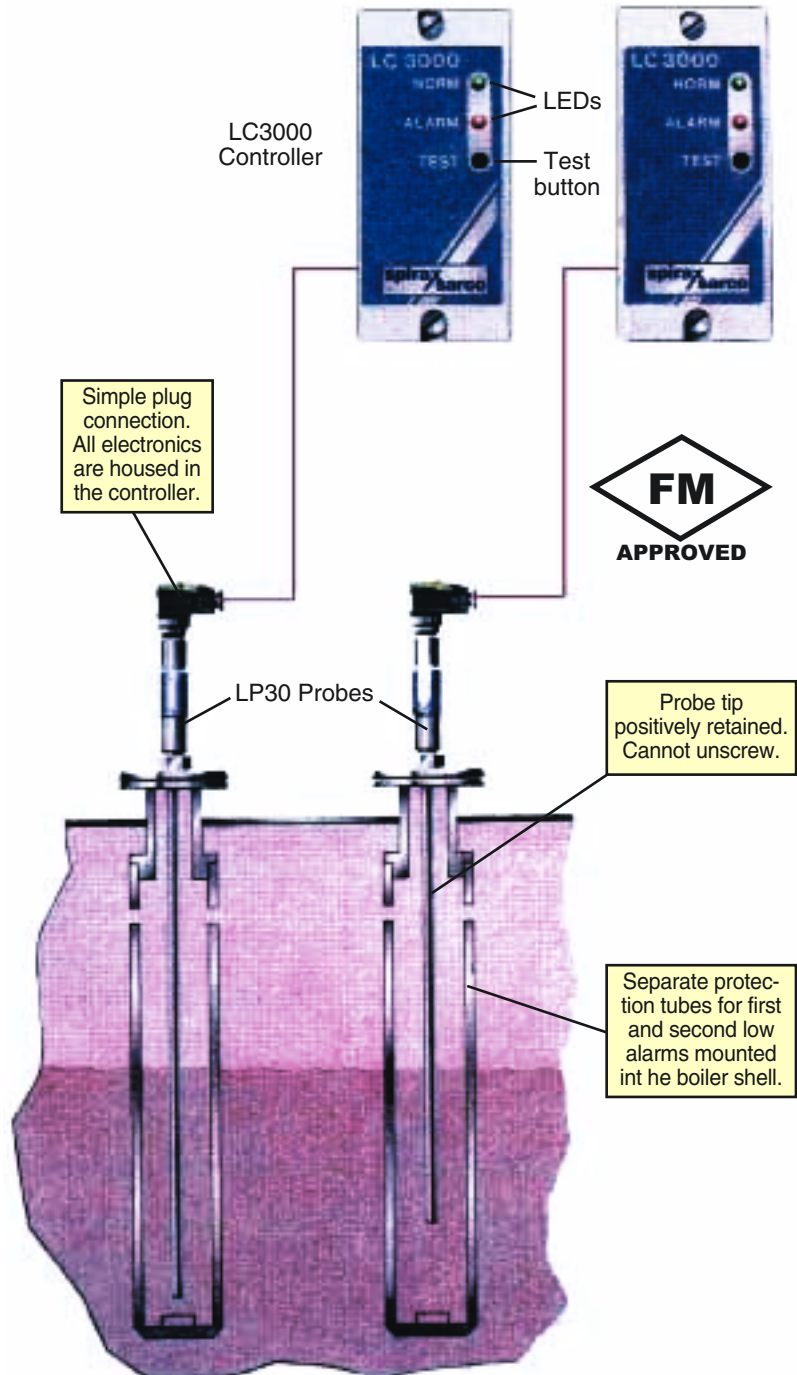
Under normal working conditions the probe tip is immersed, and the resistance to earth is low. If the water level drops below the probe tip the resistance to earth becomes high, activating the low level alarm and shutting down the burner.

The self-monitoring operation is achieved by mounting a comparator tip above the probe tip. The resistance to earth is measured at the comparator tip and this is compared with the measurement at the probe tip. By continuously monitoring both tips, the controller will indicate an alarm if scale or dirt builds up on the tips or insulators, or if moisture enters the probe body.

A cyclic self-test facility in the controller checks the integrity of the probe, probe cable and electronic circuitry every few seconds. It will activate the alarm and shut down the burner if a fault should occur. The system will detect both open-circuit and short-circuit conditions in the cable.

Normal working and alarm conditions are indicated by light emitting diodes in the controller. A manual test button is provided and provision is made for the wiring of a remote test button if required.

The system provides a high integrity, self-monitoring, fail safe operation.



## User benefits

- Safe operation with high integrity self-monitoring low level alarms.
- Low maintenance from solid state components—no floats or linkages.
- Helps to reduce boilerhouse supervision.

# High integrity, self-monitoring high level alarm for the automated steam boilers

## Level control standards

The dangers of a low water level in steam boilers are well known and boiler operating standards around the world require stringent safety measures to be taken to guard against this potentially dangerous condition.

The more advanced of these standards require two independent high integrity, self-monitoring low water level alarms which periodically carry out a self-checking routine.

## High water level—the risks

What are the dangers of too high a water level in a steam boiler?

- Increased carry over of water into the steam will result in poor operation and/or malfunction of the steam system components due to dirt.
- Wet and dirty steam can contaminate or spoil the product where it is used directly.
- Wet steam can lower processing temperatures, perhaps interfering with proper sterilization of food products or processing of pharmaceuticals, causing wastage. At best, lower process and production efficiency will increase process time and unit costs.
- Overfilling the boiler can lead to water hammer in the steam system, risking damage to plant and even injury to personnel.

## High level alarm system

For this reason, Spirax Sarco has developed a high integrity, self-monitoring high water level alarm system. It is suitable for steam boilers, particularly for those operating with only limited supervision, and can also be used with other vessels.

## System description and operation

The system comprises a single tip probe, the LP31, and an LC 3000 controller. The probe is normally installed direct in the boiler shell in a protection tube, but can be mounted in an external chamber if regulations permit.

LP31 is supplied in three nominal tip lengths, and is cut to the exact length prior to installation.

In normal operation, the tip is above the water level, and has a high resistance path to earth.

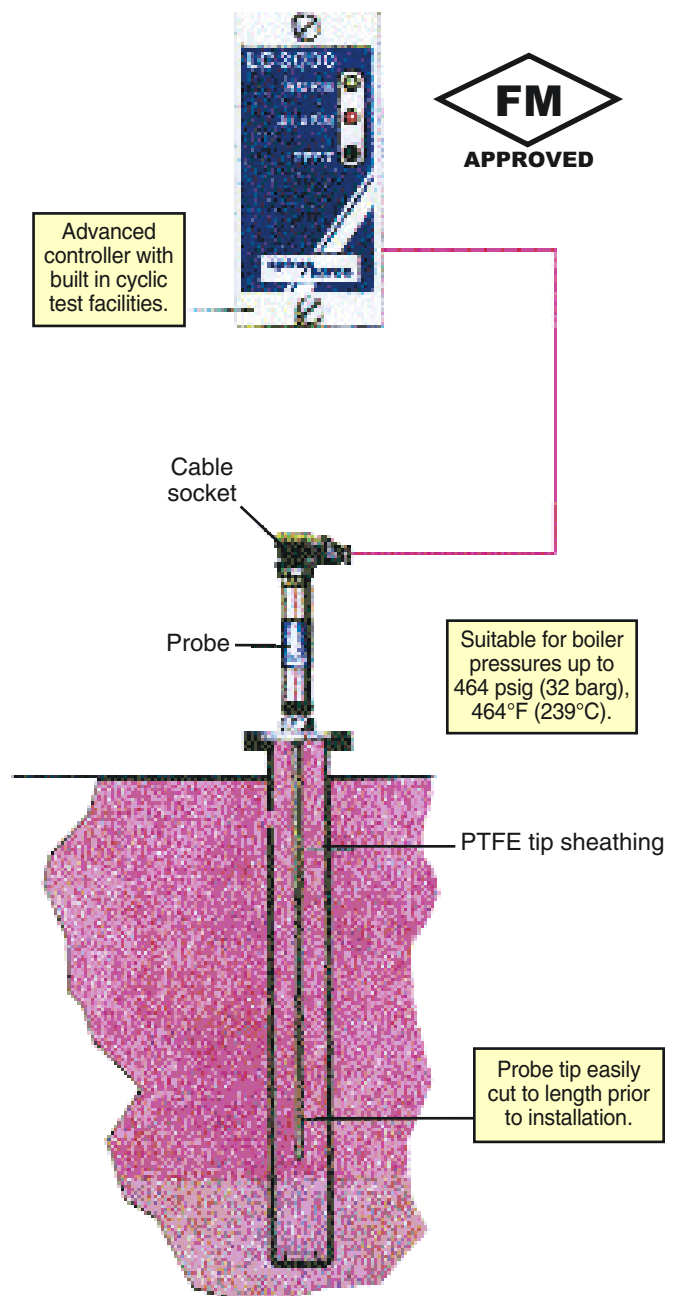
If the water level rises to touch the probe tip, the resistance to earth drops, causing the alarm relays in the controller to be de-energized and the alarm to sound. The boiler feedwater supply may also be cut off by switching off the pump or operating a valve, and the burner supply could be switched off, depending on the installation.

The LP31 is designed so that the integrity of its tip and wiring connections are monitored by the controller, causing the controller to signal an alarm in the event of an open circuit or short circuit occurring in the probe or its wiring.

In addition, the LC 3000 controller internally simulates a high alarm every three seconds, and causes the alarm relays to de-energize after nine seconds if the fault is not detected by its circuitry. A manual test button is also provided to carry out full testing of the probe and controller.

## User benefits

- High integrity self-monitoring high alarm ensures safe operation.
- Low maintenance from solid state components —no floats or linkages.
- Avoids overfilling the boiler which can lead to waterhammer and plant damage.
- Avoids contamination of product with boiler water.



## Controlling the blowdown

By measuring the TDS level in the boiler water, Spirax Sarco has developed boiler blowdown systems that will minimize the amount of blowdown required, reduce carryover of boiler water and provide automatic TDS control.

## Calculating the blowdown rate

Before it is possible to select a suitable boiler blowdown TDS control system it is necessary to estimate the amount of boiler water which has to be blown down.

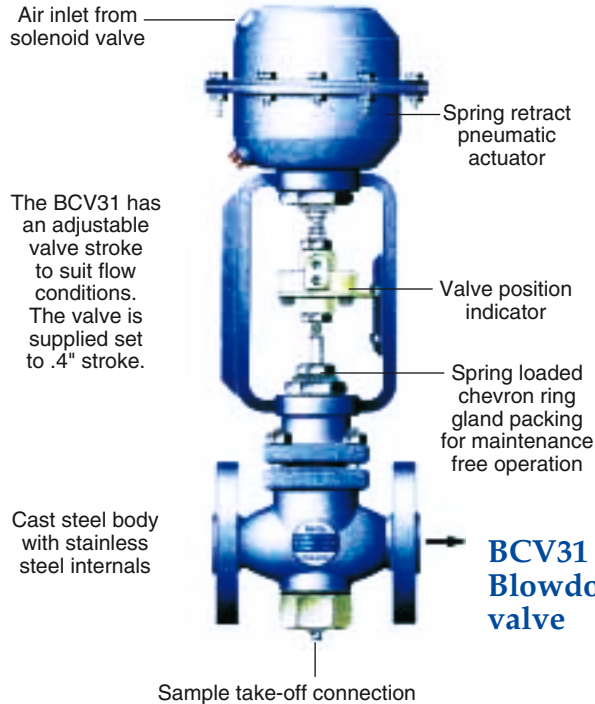
### The following information is required:

1. The required boiler water TDS in parts per million or  $\mu\text{S/cm}$  (B).
2. The feedwater TDS in parts per million or  $\mu\text{S/cm}$  (F). An average value may be obtained by looking at water treatment records or a sample of feedwater may be obtained and measured using the Spirax Sarco MS1 meter.
3. The quantity of steam which the boiler generates, usually measured in lb/hr (S). For selecting a blowdown system, the most important figure is usually the maximum quantity of steam that the boiler can generate at full load.

Note: the feedwater sample must be taken from the feed tank or feedwater line. Do not use a sample of the make-up feed water.

## User benefits

- Complete system package for easy installation.
- Accurate TDS level control minimizes blowdown.
- Reduces carryover of boiler water with steam.
- Automatic control decreases need for supervision.



The BCV31 has an adjustable valve stroke to suit flow conditions. The valve is supplied set to .4" stroke.

**BCV31 Blowdown valve**

When the information in 1, 2, and 3 is available, the required blowdown rate can be calculated as follows:

$$\text{Blowdown rate} = \frac{F}{B-F} \times S \quad \text{where:}$$

- F = feedwater TDS in ppm or  $\mu\text{S/cm}$
  - B = required boiler water TDS in ppm or  $\mu\text{S/cm}$
  - S = steam generation rate lb/hr
- The blowdown rate is then given in lb/hr.

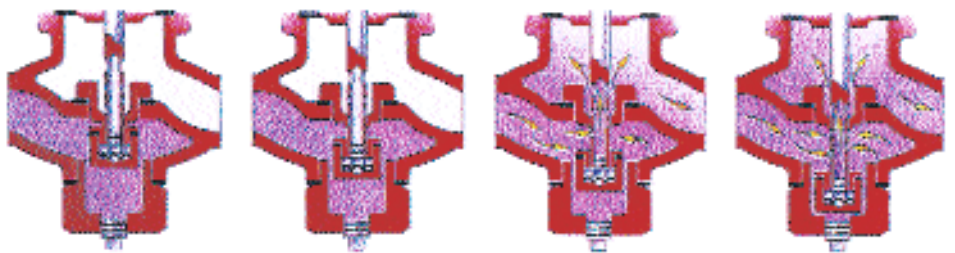
## How a blowdown valve works

Valve closed. Spring loaded valve cone ensures correct alignment and tight shut off.

Valve cone moves away from the seat, but no flow occurs because spindle orifices are not yet uncovered. Valve seat is therefore protected from wear.

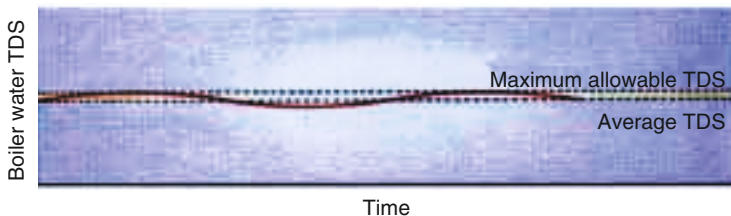
Valve is open at standard (.4") stroke, with flow through one spindle orifice. The flow velocities ensure sludge is not precipitated out in the valve.

Valve is open at maximum (.8") stroke, with flow through all spindle orifices.



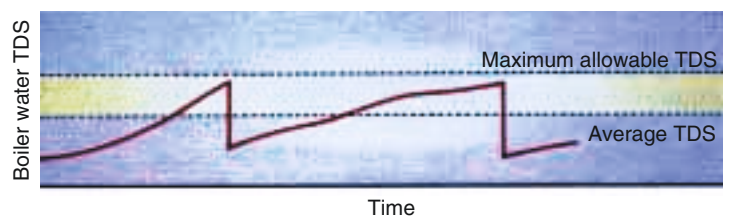
## Automatic TDS control

TDS controlled accurately, near to maximum level, minimizing blowdown yet avoiding carryover and foaming caused by high TDS level.



## Manual blowdown

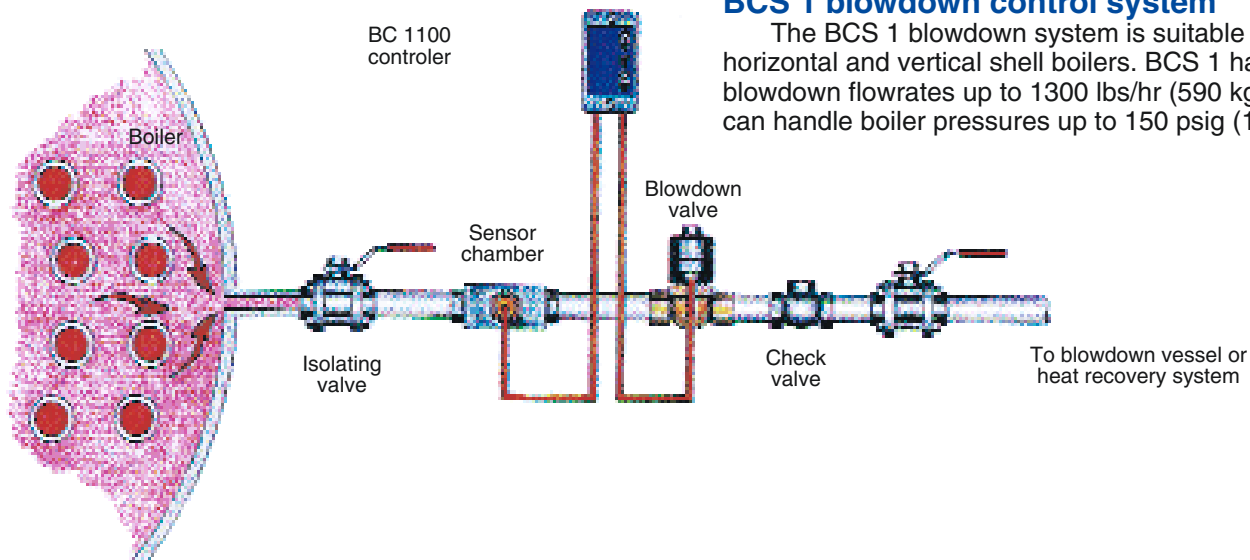
Poor control is causing wastage of boiler water through excessive blowdown.



# control systems

## BCS 1 blowdown control system

The BCS 1 blowdown system is suitable for horizontal and vertical shell boilers. BCS 1 has blowdown flowrates up to 1300 lbs/hr (590 kg/h) and can handle boiler pressures up to 150 psig (14 barg).



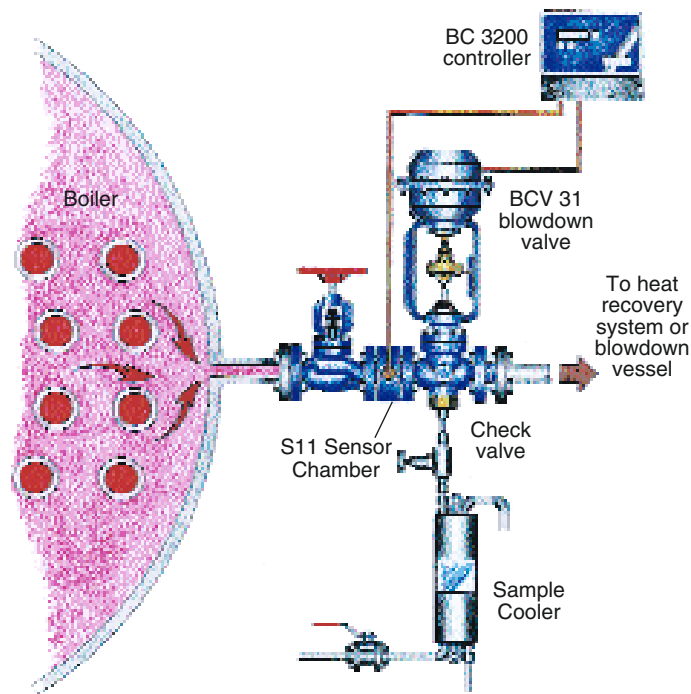
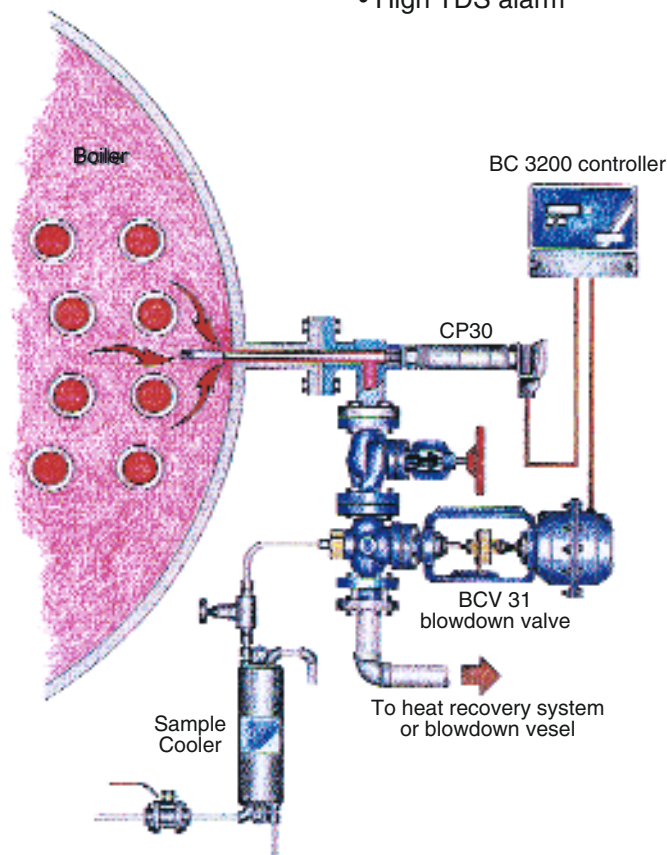
## BCS 3 blowdown control system

The BCS 3 blowdown system is suitable for shell and water tube boilers and can be linked to energy/building management systems. The BCS 3 can handle boiler pressures up to 465 psig (32 barg) and blowdown flowrates can be found in the chart below. Additional features include:

- Continuous digital indication of TDS
- 4-20/0-20 mA output
- Self cleaning probe
- High TDS alarm

## BCS 4 blowdown control system

The BCS 4 blowdown system is suitable for shell and water tube boilers and can be linked to energy/building management systems. The BCS 4 can handle boiler pressures up to 465 psig (32 barg) and blowdown flowrates can be found in the chart below.



**Blowdown valve capacity in lb/h (kg/h)**

Boiler pressure psig (barg)	Low flowrates .4" (10 mm) stroke	Medium flowrates .6" stroke (15 mm) stroke	High flowrates .8" stroke (20 mm) stroke
80 (5.5)	900 (400)	1200 (550)	1900 (860)
102 (7)	1000 (460)	1560 (710)	2500 (1150)
145 (10)	1250 (570)	2100 (950)	3300 (1500)
218 (15)	1550 (700)	2500 (1150)	3600 (1650)
290 (20)	1700 (780)	2750 (1250)	3700 (1700)
464 (32)	2075 (940)	3100 (1400)	3900 (1800)

# Condensate contamination detection system

The Spirax Sarco CCD condensate contamination detection system monitors the conductivity of condensate being returned to the boiler. Contaminated condensate is diverted to drain thereby protecting the boiler.

## Benefits of returning condensate

Steam is an extremely convenient way of transmitting energy and is used for many industrial processes. When it has given up its heat to the process, the hot condensate should be returned to the boiler feedtank in order to:

- Save energy by using the remaining sensible heat content of the condensate.
- Save the cost of water.
- Save on water treatment chemicals since the condensate should be virtually pure water.

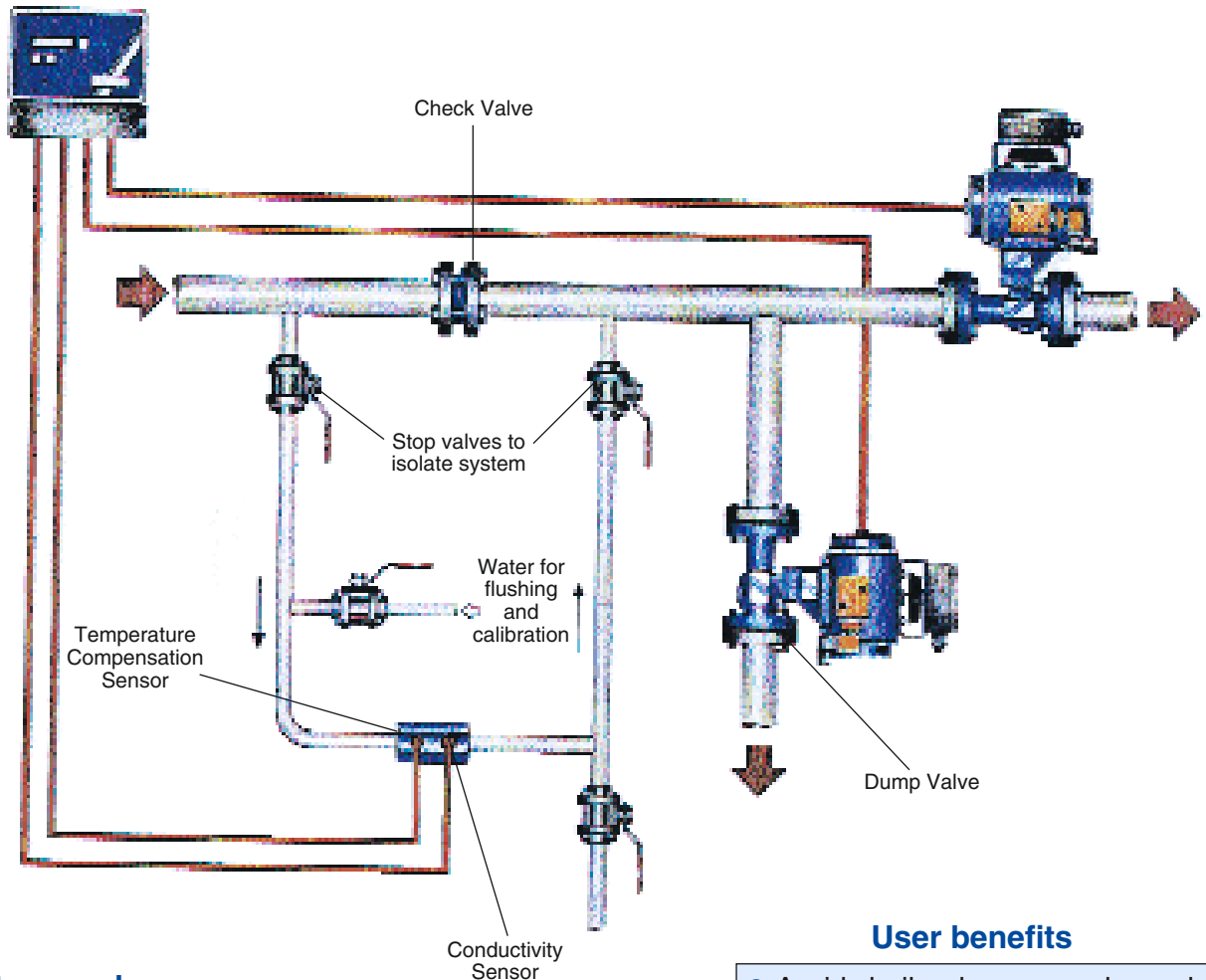
## Contamination - the dangers

While it is desirable to return the maximum amount of condensate to the boiler it is essential to ensure that it is clean. Even low levels of contamination can cause foaming, scaling, or corrosion. If carry-over of boiler water with the steam occurs then the product can become contaminated, resulting in expensive lost production.

## Condensate monitoring

By continuously monitoring the condensate being returned to the boiler it is possible to protect the boiler, ensure product quality and maximize energy and water savings.

This can be achieved using the Spirax Sarco CCD system.



## How the CCD system works

The Spirax Sarco condensate contamination detection system monitors and displays the conductivity of the condensate. It will automatically open a dump valve if the conductivity level should rise above a pre-selected set point, allowing the condensate to flow to drain, preferably via a suitable vessel.

When the conductivity drops, the dump valve is closed and condensate is allowed to return to the boiler system, thus minimizing heat and water wastage, as well as avoiding the possibility of contaminating the feedwater.

**Note:** Though the system can detect very small changes in conductivity, it will not detect the presence of contaminants that do not affect conductivity, such as oils, fats, and sugars.

If in any doubt, carry out a test on known clean condensate and known contaminated condensate, comparing conductivity.

The Spirax Sarco MS1 portable conductivity meter is ideal for this purpose.

## User benefits

- Avoids boiler damage and product contamination.
- Temperature compensation sensor gives accurate results regardless of condensate temperature.
- Minimizes energy wastage.
- Conserves expensive treated water.
- Continuous read-out allows spot checks or connection to a remote data recorder.

# Automatic boiler blowdown system

A time controlled bottom blowdown system for single or multiple boiler installations.

Even after careful feedwater treatment, boiler water still contains dissolved and suspended solids, which must be removed.

Control systems are often fitted to remove boiler water with high levels of total dissolved solids (TDS). Boilers also contain suspended solids such as scale and oxide particles which if allowed to build up in the bottom of the boiler, my cause:

- Blocked blowdown connections.
- Impaired heat transfer.
- Subsequent hotspots and boiler damage.

Therefore all boilers are fitted with a valve at the lowest point, which allows the build-up of sludge to be flushed regularly from the boiler: daily or once per shift.

The traditional manual valve is an acceptable solution as long as the blowdown procedure is:

- Carried out at the right time and at regular intervals.
- Is not forgotten, or repeated by another operator.

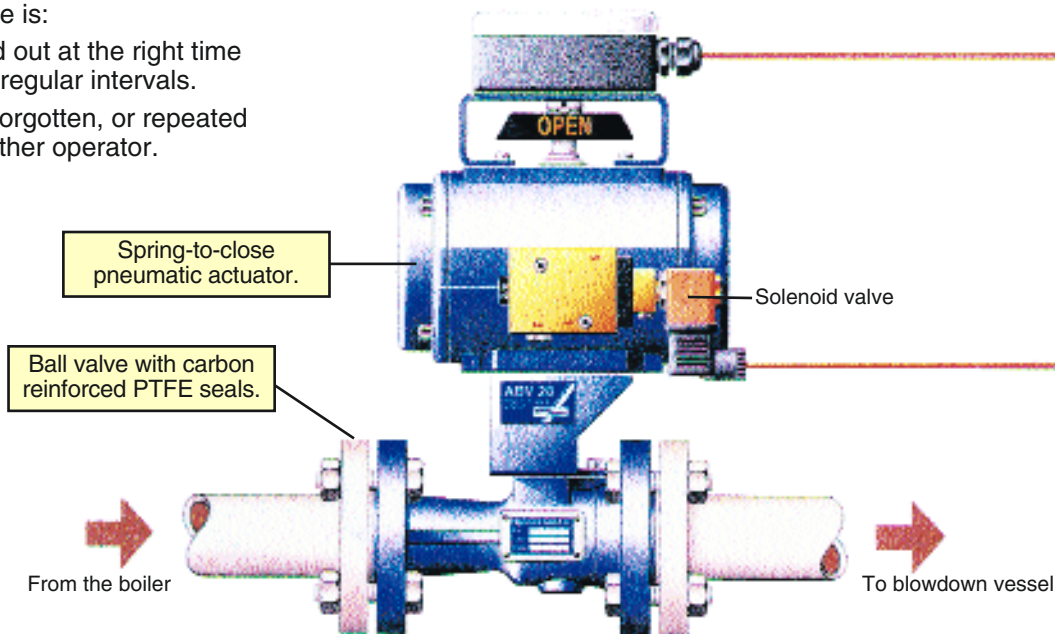
Manual blowdown is also time consuming for multi boiler installations. There should be an interval between blowdowns, to avoid thermal overload of the blowdown vessel. Furthermore, a skilled boiler operator may not always be available. For safety reasons, only one boiler blowdown valve must be open at a time.

Therefore, the Spirax Sarco automatic boiler blowdown system offers considerable advantages. The system comprises a BT 1000 cyclic timer and a pneumatically actuated ABV 20 blowdown valve.

No batteries are needed. Settings are stored in the memory even when the power is switched off.

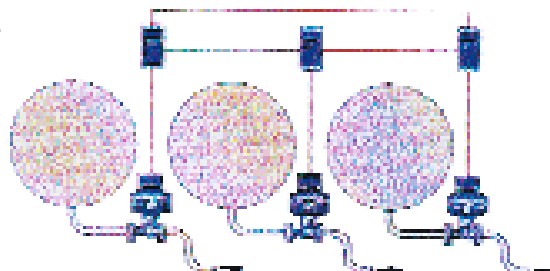
Clear 4-digit LED display which shows the amount of time till the next blowdown.

Two push buttons for straightforward setting or viewing.



## ABV 20 blowdown valve

- Available in 5 sizes for pressures up to 250 psig .
- 90° rotary pneumatic actuator for fast response.
- Spring return to close for safety.
- “NAMUR” (VDI/VDE) interface for solenoid valve. Can fit remotely mounted solenoid valve if preferred.
- A switch box mounted on the actuator provides a “valve open” signal to the timer.



Multi-boiler installation

## User benefits

- Adjustable blowdown interval and duration.
- Repetition or omission of blowdown avoided.
- Valve closes on power failure.
- Automatic timed blowdown avoids wasted heat.

# Key operated boiler blowdown valve

The Spirax Sarco key operated blowdown valve is designed for the manual blowdown of steam boilers to remove precipitated solids from the bottom of the boiler.

## Boiler blowdown

Steam boilers must be blown down to remove concentrations of solids which would otherwise build up in the boiler water. Excessive dissolved or suspended solids would cause the boiler water to foam which would result in unstable water levels and may allow scale to form on the boiler tubes.

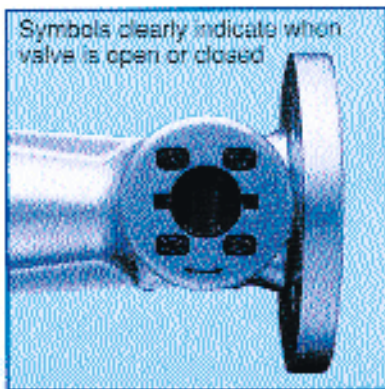
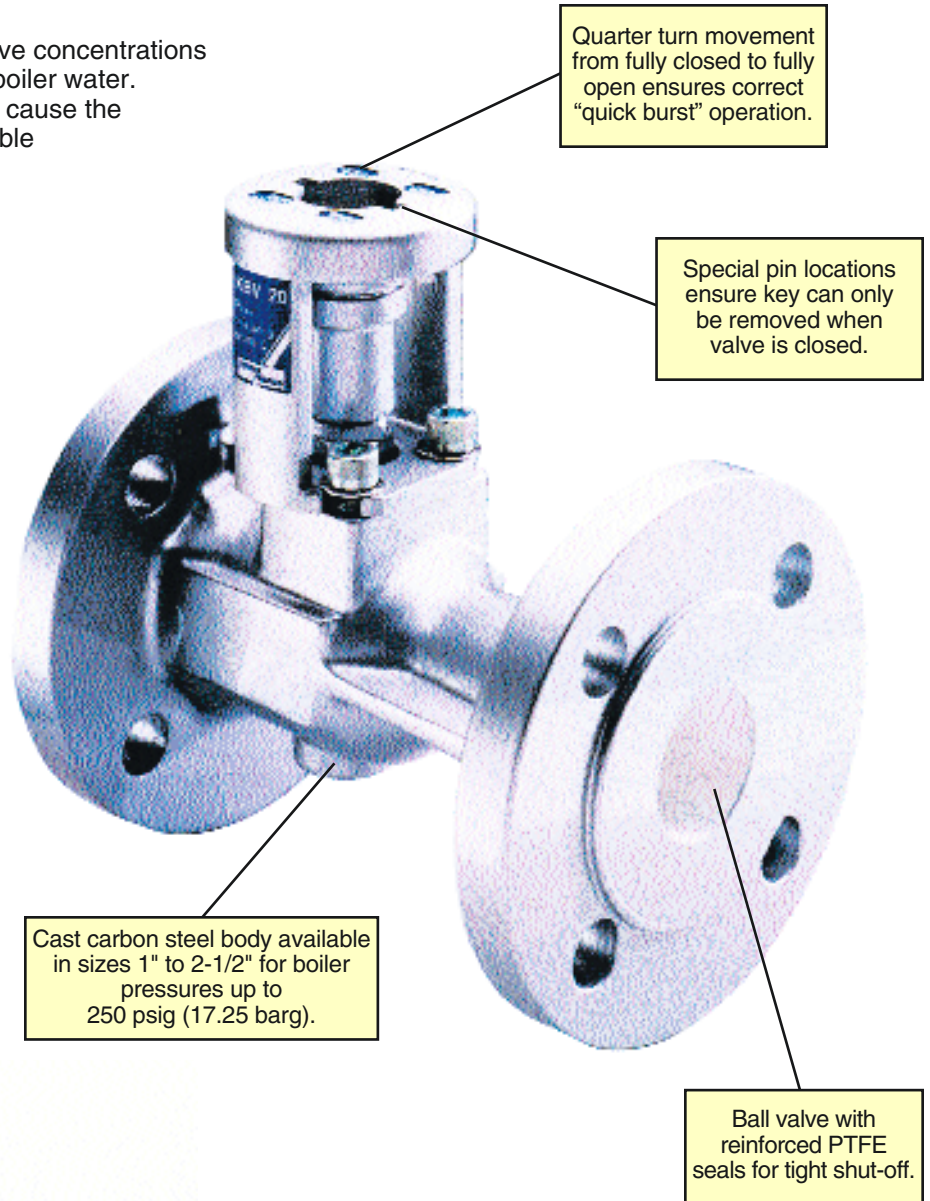
Modern water treatment methods have the effect of converting harmful, scale forming chemicals into a sludge which precipitates out of the boiler water to settle on the bottom of the boiler. This sludge, if it were not removed, would solidify and damage the boiler.

## Blowdown control

Most authorities recommend that intermittent bottom blowdown is carried out in "short sharp bursts". It is normal practice in a well managed boilerhouse to blowdown regularly a small quantity of boiler water to clear any build up of sludge.

Excessive bottom blowdown is very costly in terms of both lost heat energy and water treatment chemicals, so it is important that it is kept to a minimum.

To minimize energy loss and ensure that the total dissolved solids (TDS) level is monitored and kept within design limits, the fitting of an automatic TDS control is also recommended.



## User benefits

- Purpose designed for boiler blowdown applications.
- Option of extended "T" bar key for restricted access installations.
- Can be power operated retrospectively for timed automatic blowdown.
- Use of two separate valve stem seals reduces potential leaks and minimizes maintenance.

# Conductivity Meter

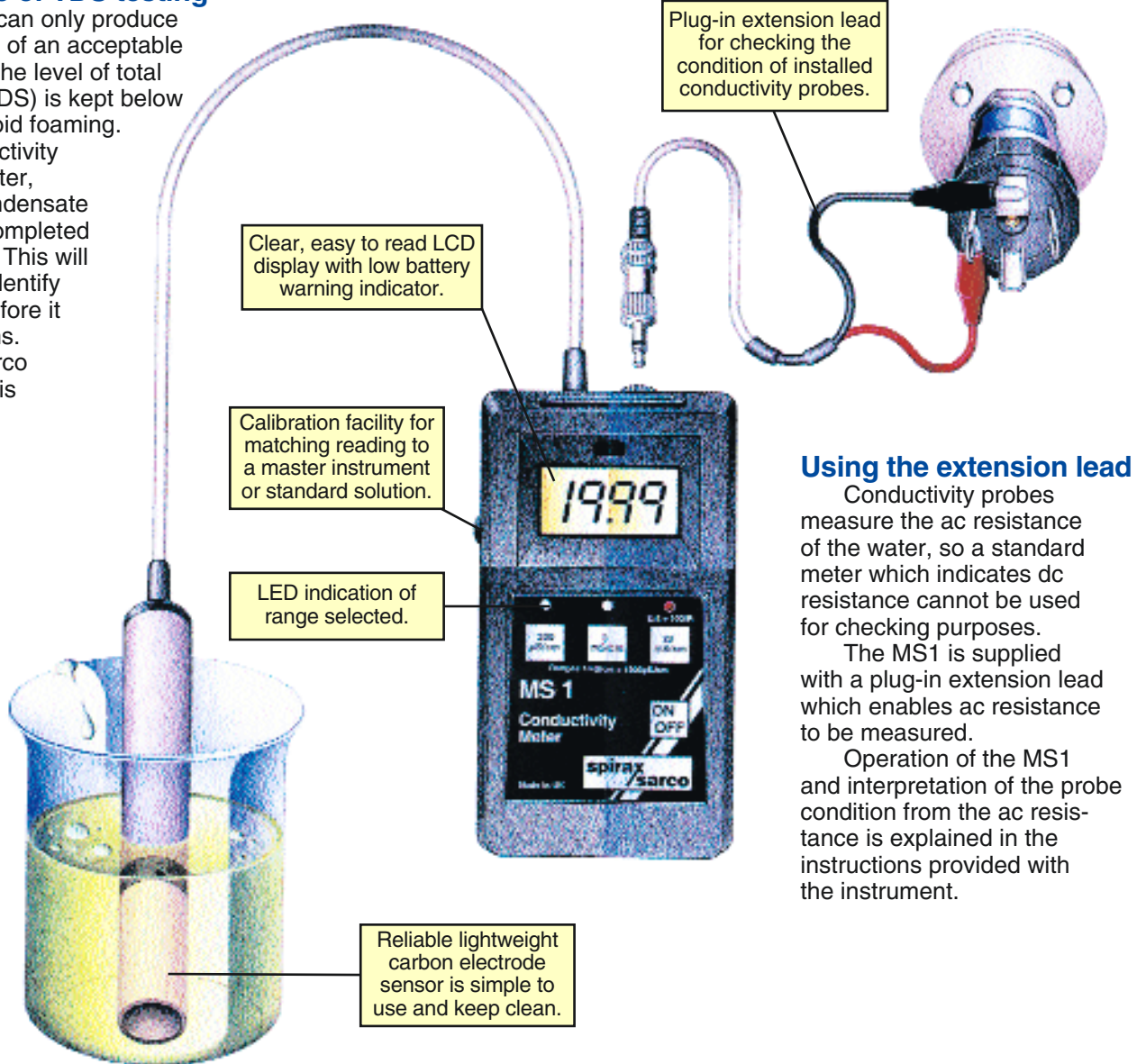
MS1 Conductivity meter, the essential instrument for every boilerhouse.

## The importance of TDS testing

Steam boilers can only produce good quality steam of an acceptable dryness fraction if the level of total dissolved solids (TDS) is kept below certain limits to avoid foaming.

Regular conductivity testing of boiler water, feedwater, and condensate return should be completed on a regular basis. This will help monitor and identify high TDS levels before it can cause problems.

The Spirax Sarco conductivity meter is essential for this monitoring.



## Using the extension lead

Conductivity probes measure the ac resistance of the water, so a standard meter which indicates dc resistance cannot be used for checking purposes.

The MS1 is supplied with a plug-in extension lead which enables ac resistance to be measured.

Operation of the MS1 and interpretation of the probe condition from the ac resistance is explained in the instructions provided with the instrument.

## The MS1 meter

The Spirax Sarco MS1 is a compact, battery powered conductivity meter designed for use in the boilerhouse and is particularly suitable for measuring the conductivity of boiler water, feed water, or condensate samples in order to estimate TDS levels.

The instrument is fitted with a permanently wired carbon electrode sensor with integral temperature sensor, and can be used for sample temperatures up to 115°F, though it is more usual to cool samples to around 77°F before testing, using a sample cooler.

## Using the MS1 meter

Operating the instrument is very straightforward. Ideally, the neutralized sample temperature should be as near to 77°F as possible, but any temperature up to a maximum of 115°F is satisfactory.

The instrument has three range switches, 0-200 $\mu$ S/cm, 0-2mS/cm and 0-20mS/cm. Light emitting diodes indicate the range selected. Simply select the highest range to start with, (right hand button), then switch to the lower ranges to obtain a more accurate reading. The display will automatically indicate "1" if an inappropriately low range is selected.

If a result in ppm is required, multiply the  $\mu$ S/cm result by 0.7 for a neutral sample at 77°F.

## User benefits

- Easy to use, lightweight, portable instrument.
- Automatic temperature compensation saves time cooling the sample.
- Wide, selectable range for accurate readings.
- Automatic switch off saves batteries.
- Can check operation of conductivity probe installed in boiler.
- Protective case included.

# SC 20 Sample Coolers

A sample cooler that is quick to fit, safe to use and simple to operate. For accurate sampling of high pressure and high temperature water and process liquors.

The SC 20 is used to take samples of water and process liquids at high temperature and pressure, preventing "flash-ing-off" or high temperatures which can be dangerous and could result in an inaccurate sample. Its 316L stainless steel construction with counter current flow provides accurate, contamination free samples. The compact, maintenance-free design makes it ideal for either permanent or mobile installation.

## Applications

To be sure that a boiler is operating at the desired concentration of total dissolved solids (TDS) it is necessary to take a sample of boiler water and test it.

This should be done even if an automatic TDS control system is fitted since any automatic system should be checked at intervals.

When a sample of water is taken from a boiler its pressure reduces and flash steam is formed.

If this flash steam were to escape to atmosphere without being condensed the resulting sample would show a greater concentration of TDS than actually existed in the boiler water. To obtain accurate and safe samples it is therefore essential that sufficient cooling is carried out to fully condense any flash steam that is formed prior to discharge.

The sample cooler reduces boiler water temperature to around 80°F ready for immediate analysis.



## User benefits

- 316L stainless steel for long life and contamination free samples.
- Counter current flow for efficient cooling.
- Pipe configuration ensures that coil is always immersed in cooling water.
- Compact and maintenance free design.

## Regional Offices

### Northeast

Spirax Sarco, Inc.  
209 W. Central St.  
Suite 228  
Natick, MA 01760  
Phone: (508) 651-3200  
Fax: (508) 655-9434

### Mid-Atlantic

Spirax Sarco, Inc.  
1125 S. Cedar Crest Blvd.  
Suite 101  
Allentown, PA 18103  
Phone: (610) 432-4557  
Fax: (610) 432-2595

### Midwest

Spirax Sarco, Inc.  
2806 Centre Circle Drive  
Downers Grove, IL 60515  
Phone: (630) 268-0330  
Fax: (630) 268-0336

### West

Spirax Sarco, Inc.  
1930 East Carson St.  
Suite 102  
Long Beach, CA 90810  
Phone: (510) 549-9962  
Fax: (510) 549-7909

Spirax Sarco, Inc.  
7760 Olentangy River Rd.  
Suite 120  
Columbus, OH 43235  
Phone: (614) 436-8055  
Fax: (614) 436-8479

### Southeast

Spirax Sarco, Inc.  
200 Centre Port Drive  
Suite 170  
Greensboro, NC 27409  
Phone: (336) 605-0221  
Fax: (336) 605-1719

### Southwest

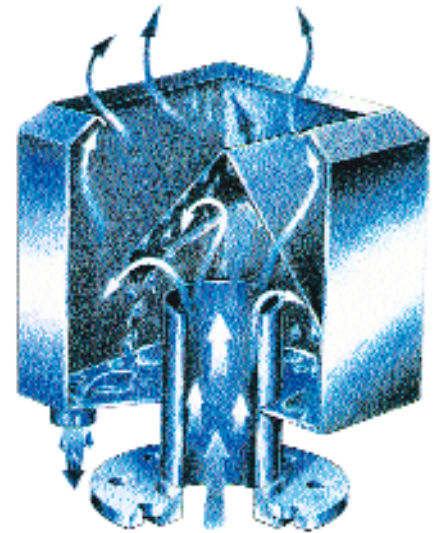
Spirax Sarco, Inc.  
203 Georgia Ave.  
Deer Park, TX 77536  
Phone: (281) 487-4002  
Fax: (281) 478-4615

# Vent Heads

Simple and effective vent heads for increased safety and environmental protection.

Spirax Sarco vent heads are designed for fitting to vertical open-ended steam vent pipes.

The vent head incorporates an internal baffle which separates entrained water from the steam, safely discharging dry steam at decreased velocity to atmosphere, protecting personnel from injury, buildings from damage and minimizing the nuisance of water spray.



## Applications

- Vented pump receivers
- Blowdown vessels
- Flash tanks
- Hot water storage tanks

## Vent Head overview

Model	Inlet Size	Connections	Drain Size NPT	Construction
VH2S	2"	NPT	3/4"	300 Series Stainless Steel
VH3S	3"		3/4"	
VH3	3"	ANSI 150	3/4"	
VH4	4"		1"	
VH6	6"		1"	
VH8	8"		1 1/2"	
VH10	10"		1 1/2"	
VH12	12"		2"	

## User benefits

- Stainless steel for long life.
- Lightweight for easy installation.
- Efficient separation ensures no moisture carryover.
- Reduced discharge velocity prevents erosion and noise.
- No moving parts eliminate maintenance requirements.

**spirax**  
**sarco**®

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