

Electronic steam boiler controls

for boiler level, TDS blowdown and bottom blowdown

CONTROL &
INSTRUMENTATION
SOLUTIONS



First for Steam Solutions

EXPERTISE | SOLUTIONS | SUSTAINABILITY

spirax
sarco

Electronic steam boiler controls

Simple, safe and reliable

Modern boilers are designed to meet the needs of a variety of industries and their associated processes. Consequently the engineers at Spirax Sarco have researched and developed a comprehensive range of electronic boiler control systems to match the performance and operating requirements of most boilerhouses.

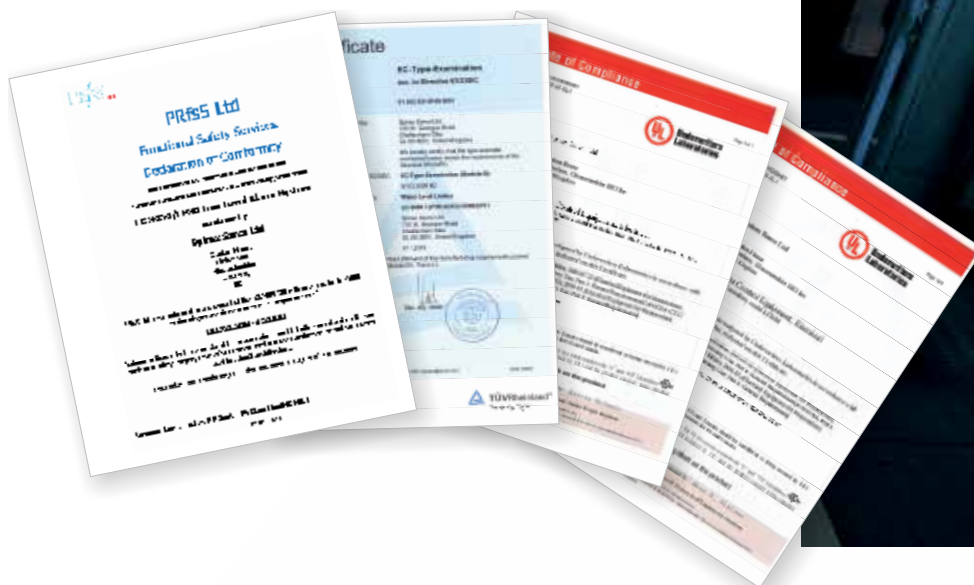
Spirax Sarco's electronic boiler control systems are designed for simple installation, easy commissioning and provide safe and trouble free operation. Investing in one of our systems will ensure that major boiler accidents are a thing of the past. The range offered has been approved to many national standards, relevant codes of practice and local regulations.

All electronic boiler controllers incorporate a 'wire free' infrared communication capability, providing intercontroller communication. End user versions have an additional Modbus EIA (RS) 485 external communications providing remote monitoring of settings and parameters.

Spirax Sarco's sensing probes have no moving parts, can be easily mounted, either directly into the boiler shell or into probe chambers. All the control systems require very little or no maintenance.

Wherever you are in the world, your local Spirax Sarco representative will be able to assist you in matching the most appropriate system for your specific needs:

- Level control.
- TDS (total dissolved solids) continuous blowdown.
- Bottom blowdown control.
- Condensate contamination detection.



First for Steam Solutions



Spirax Sarco electronic steam boiler controls

Spirax Sarco expertise

With over 100 year's experience in providing total steam solutions to our customers and benefiting from operating sales companies in 35 countries, it's no surprise that we are world leaders in our field of expertise.

Our collective knowledge is second to none and comes from 100 years of working alongside industries like yours - we understand the challenges you face in the boiler house and we are committed to long-standing relationships with all of our customers.

Spirax Sarco training

Our commitment to customer knowledge is openly evident - We have over 30 training centres around the world running a broad spectrum of practical and theoretical courses specifically tailored to your needs. Alternatively you can arrange one of the many on-site courses that we run; these are available on request.

Please note that Spirax Sarco is a licensed and approved training provider for the Boiler Accreditation Scheme (BOAS). The Boiler Accreditation Scheme provides national accreditation for industrial boiler operators and boiler plant managers.

Spirax Sarco support

We are committed to providing long-term, dedicated support to our customers. Wherever you are in the world our teams of representatives are close-by to offer whatever support and advice you require.



Choice	Providing the right control system.
Quick delivery	All controllers and probes supplied from local stocks.
Quality	ISO 9001 approved company.
Reliability	No moving parts, designed for purpose.
Ease of maintenance	Little or no maintenance required.
Service and knowledge	Specialists sales and service engineers.
Value for money	Providing a comprehensive range at competitive prices.





Spirax Sarco electronic steam boiler controls - at a glance

Level controls and alarms

	Level controllers	Input signal range	Control characteristic	Communication	Mounting options	Enclosure rating
	LC1350	Minimum: 1 μ S/cm (25°C)	On / off	Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
	LC2250	1 to 6 volt 0 - 20 mA 4 - 20 mA	On / off Adjustable on / off Modulating	Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
	LC2650	1 to 6 volt 0 - 20 mA 4 - 20 mA	2 and 3 element control Adjustable on / off Modulating	Modbus EIA (RS) 485 and Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
	LC3050	Minimum: 30 μ S/cm or 30 ppm @ 25°C	High integrity Limiter Low alarm High alarm	Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
	Level probes	Probe type	Control characteristic	Probe process connection	Nominal length	Body design rating
	LP10-4	Conductivity	On / off	1" BSP taper 1" NPT	95 mm to 2 095 mm	PN40
	LP20 / PA20 and LP20 / PA420 (NB optional PA420 preamplifier)	Capacitance	Adjustable on / off Modulating	½" BSP taper ½" NPT	370 mm to 1 500 mm	PN40
	LP30	Conductivity	High integrity Limiter Low alarm	½" BSP taper ½" NPT	500 mm 1 000 mm 1 500 mm	PN40
	LP31	Conductivity	High integrity Limiter High alarm	½" BSP taper ½" NPT	500 mm 1 000 mm 1 500 mm	PN40

TDS blowdown controls and alarms



TDS blowdown controllers	Input signal range	Control characteristic	Communication	Mounting options	Enclosure rating
BC3150	Minimum 10 µS/cm	Monitor Limiter	Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
BC3250	Minimum 10 µS/cm	Monitor Simple timer Limiter	Modbus EIA (RS) 485 & Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
Conductivity probes	Probe type	Control characteristic	Connection	Nominal length	Body design rating
CP10	Conductivity	On / off	3/8" BSP taper	50 mm	PN40
CP30	Conductivity	On / off	3/8" BSP taper 1/2" NPT	300 mm 500 mm 1 000 mm 1 500 mm	PN40
CP32	Conductivity	On / off	3/8" BSP taper 1/2" NPT	300 mm 500 mm 1 000 mm	PN40

Bottom blowdown controls and alarms



Bottom blowdown controllers	Input signal range	Control characteristic	Communication	Mounting options	Enclosure rating
BT1050	N/A	Real time clock	Modbus EIA (RS) 485 & Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)

Condensate contamination detection



Conductive contamination	Input signal range	Control characteristic	Communication	Mounting options	Enclosure rating
BC3250	Minimum 10 µS/cm	Monitor Limiter	Modbus EIA (RS) 485 & Intercontroller infrared	DIN rail Panel Chassis	IP65 (Panel mounted)
CP10	Conductivity	On/Off	3/8" BSP taper	50 mm	PN40
Non-conductive contamination					
556 Converter	Factory Set 0-25 ppm	2 x SPDT Relay	0(4)-20mA	Rack or Housing	IP40 (IP65 Housing)
TF56-N	Scattered Light	Continuous	n/a	Flanged	DN25 PN16 1" ANSI 150

Level controls and alarms

LC1350 and LP10-4 level control system

For simple liquid level controls and alarms select the LP10-4 conductivity probe and LC1350 level controller system.

This system provides simple on /off control by completing an electrical circuit to earth when the water level contacts each tip.

The LP10-4 conductivity probe and LC1350 level control system is ideal for small steam boiler installations with a reasonably constant steam demand.

The LC1350 controller can be used to control a feedpump, operate a solenoid valve or sound an alarm, depending on the application assigned to each tip.

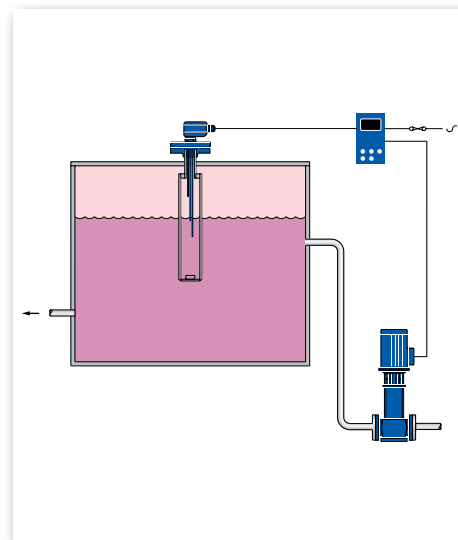
The LP10-4 probe has four tips, supplied separately, that are cut to length on installation to give the required switching level. The probe tips are 1 000 mm in length (set of 4) and supplied inclusive of connectors and supports.

Important note

Under many local regulations, boilers using this system for 1st and 2nd low water alarms must be supervised, and the alarms tested daily.

In many cases, 1st and 2nd low water alarms on a boiler must be independent. Two LP10-4 probes should be preferably mounted in separate protection tubes and each connected to a separate LC1350.

Alternatively, the LP10-4 probes could be mounted in separate side chambers.



Key features:

- Versatile system for a wide range of applications providing maximum flexibility.
- Can sense conductivities down to 1 $\mu\text{S} / \text{cm}$ at 25°C.
- Automatically senses supply voltage and water turbulence.
- Manual test buttons for pump and alarm.
- Inbuilt, infrared communications port.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Universal power supply: 99 Vac to 260 Vac.

Associated products:

- Steel enclosures.
- Plastic enclosures.
- C2 probe chamber.
- SPV1 and SPV2 sequencing purge valves.
- Probe mounting flanges and adaptors.

Level controls and alarms

LC2250 and LP20 / PA20 level control system

For liquid level controls and alarms select the LP20 / PA20 capacitance probe and LC2250 level controller.

This system provides adjustable on / off or modulating control.

The capacitance probe and preamplifier assembly is powered by the controller and produces a dc voltage proportional to the water level.

The LP20 / PA20 capacitance probe and LC2250 level control system is ideal for medium sized steam boiler installations with a variable steam demand.

This control system offers an extended flexibility, providing:

- An advanced on / off boiler feedpump control system with adjustable switching levels.
- Modulating boiler feedwater control using an electrically actuated valve.
- Modulating boiler feedwater control using a pneumatic control valve and positioner.

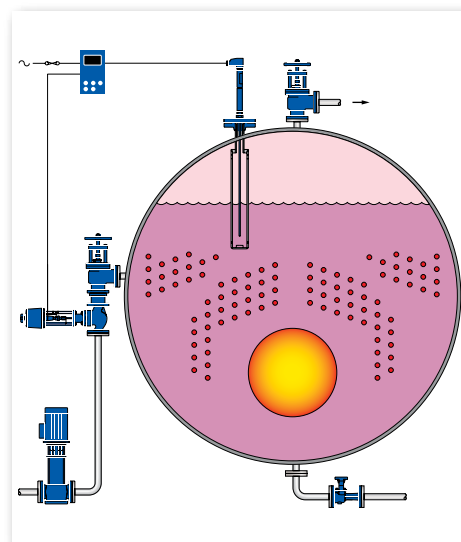
A main feature of this control system is that switching levels can be easily set and adjusted without shutting down the boiler.

The setting up process is considerably simplified, as the water level in a boiler can vary from the level shown in the gauge glass at different firing rates.

This system is also ideal for tank level control or with any two-wire 4-20 mA transmitter. For example for pressure, temperature or level control using a pressure or differential pressure transmitter.

The LP20 / PA20 capacitance probe is available in a range of predetermined lengths (mm):-

370	470	550	600	650
750	800	900	950	1050
1200	1350	1500		



Key features:

- Simple 'two point' calibration.
- Alter switching levels without shutting down the boiler.
- Versatile system for a wide range of applications.
- Can sense conductivities down to 10 $\mu\text{S} / \text{cm}$ at 25°C.
- Manual test buttons for valve / pump and alarm.
- Isolated 0-20 mA or 4-20 mA for a positioner or retransmit.
- Inbuilt, infrared communications Port.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Switchable alarm latch.

Associated products:

- DS1000 digital display unit.
- SP200 positioner.
- Electrically actuated control valve.
- Pneumatically actuated control valves.
- DCV2/B disc check valve.
- C2 probe chamber.
- SPV1 and SPV2 sequencing purge valves.
- Probe mounting flanges and adaptors.

Level controls and alarms

LC2650 and LP20 / PA20 level control system

For accurate control of water levels in boilers and tanks select the LP20 / PA20 capacitance probe and LC2650 multi-functional level controller.

This system is ideal for controlling the boiler water levels in modern steam boilers where there is a difficult balance between steam pressure, load and feedwater flowrate.

Incorrect level control can result in boiler lockouts or carryover of boiler water into the steam system.

The LP20 / PA20 level probe and LC2650 control system is well matched for medium to large steam boiler installations with a varying steam demand.

This control system is ideal for applications where close control of tank or boiler water levels is required. The system can be easily configured to provide:

- On /off water level control within tanks.
- Modulating control for electrically or pneumatically actuated control valves.

A feature of this control system is the adjustable integral action giving closer control of water level, reducing the risk of carryover and spurious alarms.

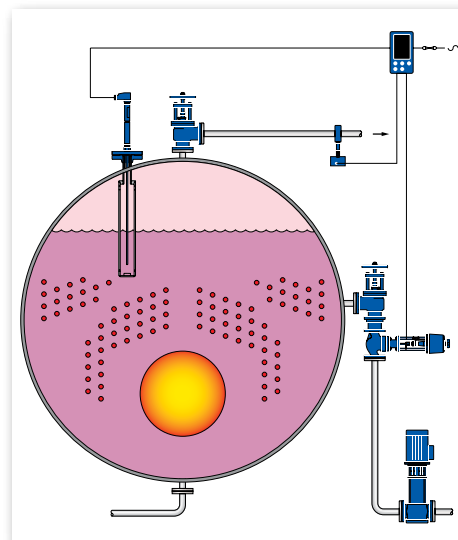
Another important feature of the LC2650 is the 2 and 3 element control capability.

By configuring 2 element control the system utilises a signal output from a steam flowmeter as a feed forward signal, for applications where sudden load swings can be experienced in, for example, breweries and laundries.

Where a number of boilers share a common feedwater supply the differential pressure can vary across the feedwater valve, changing the flowrate. This change can be compensated for by configuring 3 element control, taking an additional signal from a feedwater flowmeter.

The LP20 / PA20 capacitance probe is available in a range of predetermined set lengths (mm):-

370	470	550	600	650
750	800	900	950	1050
1200	1350	1500		



Key features:

- Simple 'two point' calibration.
- Adjustable integral action.
- Standard 2 and 3 element control.
- Versatile system for a wide range of applications.
- Can sense conductivities down to 10 $\mu\text{S}/\text{cm}$ at 25°C.
- Manual test buttons for valve / pump and alarm.
- Isolated 0-20 mA or 4-20 mA for a positioner or retransmission.
- Inbuilt, infrared communications port.
- Modbus EIA (RS) 485 for external communications.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Switchable alarm latch.

Associated products:

- DS1000 digital display unit.
- SP200 positioner.
- Electrically actuated control valve.
- Pneumatically actuated control valves.
- DCV2/B disc check valve.
- C2 probe chamber.
- SPV1 and SPV2 sequencing purge valves.
- Probe mounting flanges and adaptors.

Level controls and alarms

LP20 using PA420 preamplifier

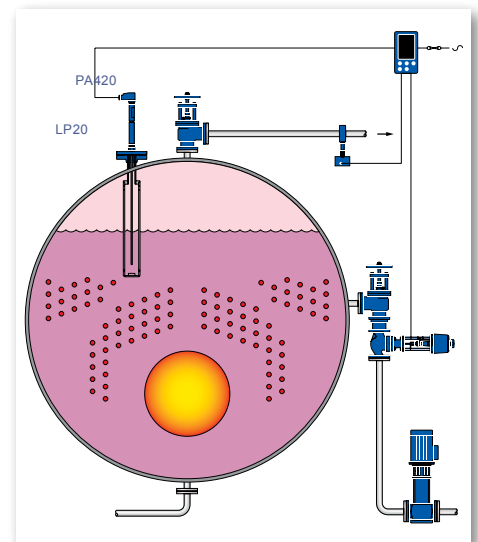
The LP20/PA420 probe is a flexible solution that integrates easily with your existing control system.

The PA420 preamplifier is a loop powered two-wire level transmitter for use in conjunction with LP20 level probes. It amplifies the capacitance measured and converts it to a direct 4-20 mA output proportional to the liquid level.

A water level control transmitter for steam boilers and process tanks that provides a direct 4-20 mA output to either a Spirax Sarco level controller or to an alternative existing PLC control system.

The PA420 is easily commissioned using only two buttons to set up and calibrate the desired water levels in your level control application. A dual green / red LED indicates status for confirmation, error or alarm.

The PA420 can be configured to output 4 - 20 mA over a water level range. The 4 - 20 mA signal may also be inverted for applications that require 20 mA high and 4 mA low water levels.



Key features:

- Direct 4 - 20 mA analogue output
- Simple 2 button commissioning
- Loop powered 2-wire transmitter
- Capacitance based modulating control
- Minimum water conductivity 5 μ S / cm (5 ppm)
- 4 - 20 mA signal can be inverted
- Dual green / red LED status indication
- Compatible with all lengths of LP20 probe
- Low cost level control solution

Level controls and alarms

LC3050 and LP30 high integrity, self-monitoring low level alarm system

To protect your steam boiler from low water conditions select the LP30 conductivity probe and LC3050 controller.

This system monitors the water level on the probe tip, where resistance to earth is low. If the water level falls below the tip, resistance to earth becomes high, activating the low level alarm and shutting down the boiler.

This system enables operators to increase boiler house automation for greater productivity without sacrificing safety.

High integrity, self-monitoring alarms will give warnings of system faults and allow safe shutdown of plant.

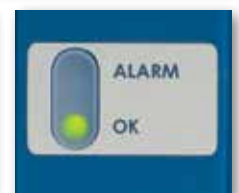
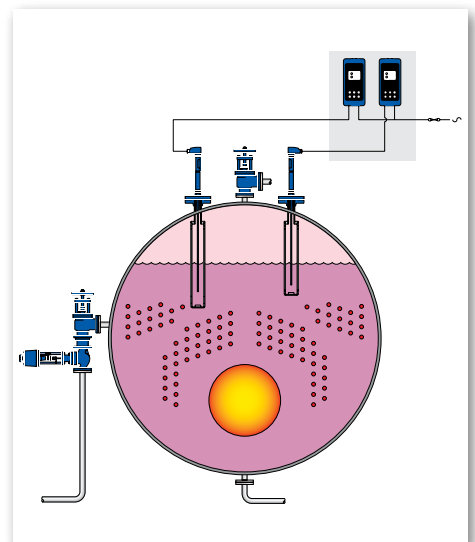
The system normally consists of two completely independent self-monitoring LP30 probes for 1st and 2nd low water level limiters. Each probe must be mounted in a separate protection tube within the boiler shell and connected to its own LC3050 controller.

A cyclic self-test facility in the LC3050 controller checks the integrity of the probe cable and electronics 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.

Many National Standards state that boilers fitted with high integrity, self-monitoring controls can be run without the need for a trained boiler attendant to be on site at all times.

Level limiting systems are approved under PED Regulations as a Category 4 safety limiter.

The LC3050 and LP30 system has third party approval as suitable in demand and continuous mode to a safety integrity level of SIL2 when used in 1001 architecture and SIL3 when used in 1002 architecture, meeting the requirements of IEC 61508-2:2000.



Key features:

- No moving parts and minimal maintenance.
- Inbuilt, infrared communications port.
- Cyclic self-test of the probe, cable and electronic circuit.
- Can sense conductivities down to 30 $\mu\text{S}/\text{cm}$ at 25°C.
- Manual test buttons to operate alarm.
- Fail safe design.
- Double fault safe.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Selectable voltage range, either:
 - 99 – 121 Vac or
 - 198 – 264 Vac.

Associated products:

- Steel enclosure panels.
- Polycarbonate enclosures.
- Probe mounting flanges and adaptors.

Level controls and alarms

LC3050 and LP31 high integrity, self-monitoring high level alarm system

To protect your steam boiler from high water conditions, and provide a safeguard against poor quality steam production select the LP31 conductivity probe and LC3050 controller.

If the water level rises to touch the probe tip, the resistance to earth becomes low, causing the alarm relays in the controller to be de-energised and the alarms to sound.

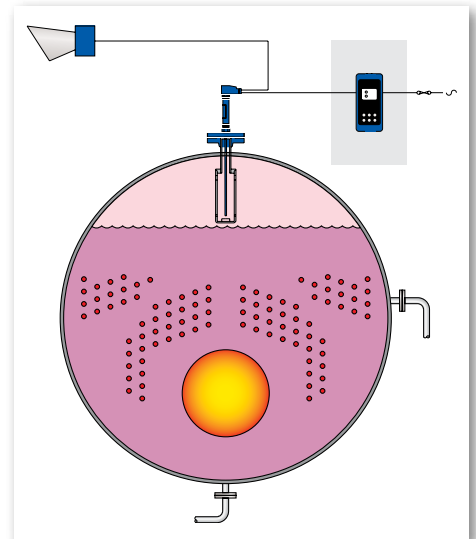
The LP31 and LC3050 is ideal for all steam boiler installations.

This control system monitors the integrity of the tip and wiring connections, causing the controller to signal an alarm in the event of an open circuit or short circuit occurring in the probe or its wiring.

The probe is normally installed directly in the boiler shell in a protection tube, but it can be mounted in an external chamber, if local regulations permit.

Reasons for protection against high water level:

- Increased carryover of water into the steam will result in poor operation and/or malfunction of steam system components.
- Wet steam can lower processing temperatures. This can interfere with proper sterilisation of food products or processing of pharmaceuticals and cause wastage.
- Increased risk of waterhammer in the steam system, damage to plant and even injury to personnel.



Key features:

- No moving parts and minimal maintenance.
- Inbuilt, infrared communications port.
- Cyclic self-test of the probe, cable and electronic circuit.
- Can sense conductivities down to 30 $\mu\text{S/cm}$ at 25°C.
- Manual test buttons to operate alarm.
- Fail safe design.
- Double fault safe.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Selectable voltage range, either:
 - 99 – 121 Vac or
 - 198 – 264 Vac.

Associated products:

- Steel enclosure panels.
- Polycarbonate enclosures.
- Probe mounting flanges and adaptors.

TDS blowdown controls and alarms

BCS1 blowdown control system

The BCS1 blowdown control system is suitable for small horizontal and vertical shell boilers.

The control system measures the electrical conductivity of the boiler water which is directly related to the level of total dissolved solids (TDS).

Accurate control of TDS minimises blowdown and reduces the risk of carryover. Automatic TDS control can significantly reduce operating costs whilst ensuring the quality of steam production.

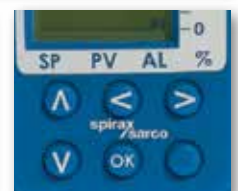
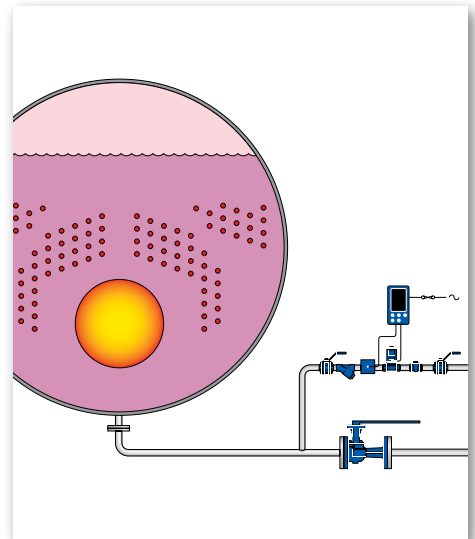
The conductivity of the boiler water is compared with the Set Point in the controller. If it is lower than the Set Point the blowdown valve closes at the end of the purge time and remains closed. If the conductivity is higher than the Set Point the blowdown valve will remain open until the conductivity level drops below the Set Point.

There is the option to choose either the BC3150 or the BC3250 controller. The adjacent key features are for the BC3150. The BC3250 has all the features of the BC3150 plus the following additional benefits:

- Calibration reminder.
- Real time clock.
- Variable alarm hysteresis with latch.
- Compensated scale detect.
- Option for continuous or pulsed cleaning cycle.
- Temperature displayed in °C or °F.
- A bottom blowdown countdown timer.

The BCS1 pipeline is available as a packed set.

- PT2 plug tail.
- BCV1 blowdown valve.
- Fig 12 strainer.
- Two model 10 isolating valves.
- LCV1 lift check valve.



Key features for the BC3150:

- TÜV type approved as a TDS limiter.
- 4 wire compensated conductivity measurement.
- Compensated temperature and scale detection.
- Pulsed probe conditioning cycle.
- Automatic detection of temperature input (Pt100).
- Automatic purge on calibration.
- Isolated 0-20 mA or 4-20 mA for retransmission.
- Switchable alarm latch.
- Integrated infrared communications.
- Versatile mounting options: DIN rail, Panel or Chassis
- Manual purge, probe cleaning cycle and system calibration can be activated from the 'run' menu.

Associated products:

- KBV20.
- MSI conductivity meter.

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TDS blowdown controls and alarms

BCS3 blowdown control system

The BCS3 blowdown control system is suitable for shell and water tube boilers, where the probe can be fitted in the boiler shell itself (the ideal arrangement) and can easily be linked to energy / building management systems.

The control system measures the electrical conductivity of the boiler water which is directly related to the level of total dissolved solids (TDS).

Accurate control of TDS minimises blowdown and reduces the risk of carryover. Automatic TDS control can significantly reduce operating costs whilst ensuring the quality of steam production.

The conductivity probe is mounted directly in the boiler shell and continuously monitors the conductivity of the boiler water which is directly related to the level of total dissolved solids (TDS). This measured value is compared with the Set Point in the controller. If it is lower than the Set Point the blowdown valve remains closed, if it is higher than the Set Point the blowdown valve will be open. The high TDS boiler water is replenished by clean make-up water, lowering the measured conductivity and closing the blowdown valve.

The BCS3 system offers a choice of controllers, conductivity probes, and blowdown valves.

There is the option to choose either the BC3150 or the BC3250 controller. The adjacent key features are for the BC3150. The BC3250 has all the features of the BC3150 plus the following additional benefits:

- Calibration reminder.
- Real time clock.
- Variable alarm hysteresis with latch.
- Compensated scale detect.
- Option for continuous or pulsed cleaning cycle.
- Temperature displayed in °C or °F.
- A bottom blowdown countdown timer.

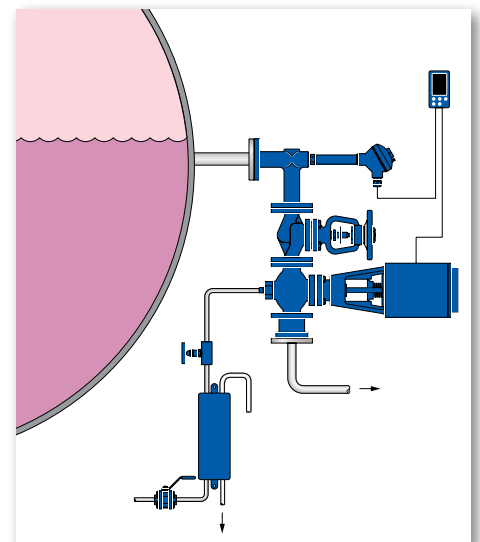
The CP30 and CP32 probes measure the boiler water conductivity. In addition the CP32 has an integral temperature sensor that compensates for temperature variation and a patented scale compensation feature to automatically detect and compensate for any scaling or polarisation on the tip.

Two types and two sizes of blowdown control valve are available:

- DN20 and DN40 BCV30 blowdown control valve - electrohydraulically actuated.
- DN20 and DN40 BCV31 blowdown control valve - pneumatically actuated.

The BCS3 blowdown control system comprises of:

- BCV30 or BCV31 blowdown control valve.
- CP30 or CP32
- Probe elbow



Key features for the BC3150:

- TÜV type approved as a TDS limiter.
- 4 wire compensated conductivity measurement.
- Compensated temperature and scale detection.
- Pulsed probe conditioning cycle.
- Automatic detection of temperature input (Pt100).
- Automatic purge on calibration.
- Isolated 0-20 mA or 4-20 mA for retransmission.
- Switchable alarm latch.
- Integrated infrared communications.
- Versatile mounting options: DIN rail, Panel or Chassis.

Associated products:

- DS1000.
- SC20 sample cooler.
- EL2270 temperature sensor.
- DCV2 check valve.
- G3 stop valve.
- MS1 conductivity meter.

TDS blowdown controls and alarms

BCS4 blowdown control system

The BCS4 blowdown control system is suitable for shell and water tube boilers, where it is not possible to mount a conductivity probe directly in the boiler shell.

The control system measures the electrical conductivity of the boiler water which is directly related to the level of total dissolved solids (TDS).

The BCS4 system can easily be linked to energy/building management systems.

Accurate control of TDS minimises blowdown and reduces the risk of carryover. Automatic TDS control can significantly reduce operating costs whilst ensuring the quality of steam production.

The conductivity of the boiler water is compared with the Set Point in the controller. If it is lower than the Set Point the blowdown valve closes at the end of the purge time and remains closed. If the conductivity is higher than the Set Point the blowdown valve will remain open, the high TDS boiler water is replenished by clean make-up water, lowering the measured conductivity and the blowdown valve closes.

The BCS4 system offers a choice of controllers and blowdown valves.

There is the option to choose either the BC3150 or the BC3250 controller. The adjacent key features are for the BC3150. The BC3250 has all the features of the BC3150 plus the following additional benefits:

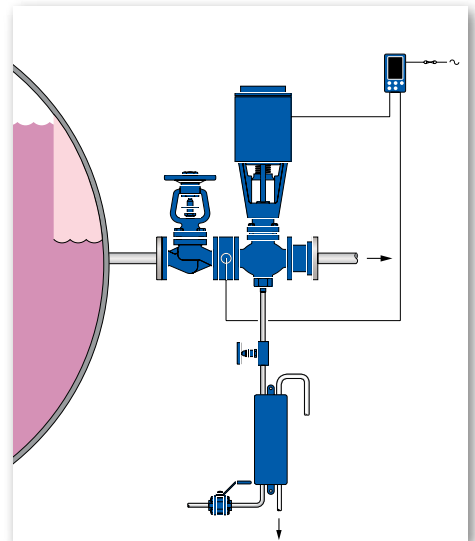
- Bottom blowdown timer.
- Calibration reminder.
- Real time clock.
- Variable alarm hysteresis with latch.
- Compensated scale detect.
- Option for continuous or pulsed cleaning cycle.
- Temperature displayed in °C or °F.
- A bottom blowdown countdown timer.

Two types and two sizes of blowdown control valve are available:

- DN20 and DN40 BCV30 blowdown control valve - electrohydraulically actuated.
- DN20 and DN40 BCV31 blowdown control valve - pneumatically actuated.

The BCS4 blowdown control system comprises of:

- BCV30 or BCV31 blowdown control valve.
- S11 sensor chamber.
- CP10 conductivity probe.
- PT2 plug tail.- SC20 sample cooler.
- G3 stop valve.
- DCV2 check valve.



Key features for the BC3150:

- TÜV type approved as a TDS limiter.
- 4 wire compensated conductivity measurement.
- Compensated temperature and scale detection.
- Pulsed probe conditioning cycle.
- Automatic detection of temperature input (Pt100).
- Automatic purge on calibration.
- Isolated 0-20 mA or 4-20 mA for retransmission.
- Switchable alarm latch.
- Integrated infrared communications.
- Versatile mounting options: DIN rail, Panel or Chassis.

Associated products:

- SC20 sample cooler.
- G3 stop valve.
- DCV2 check valve.
- EL2270 temperature sensor.
- MS1 conductivity meter.

Bottom blowdown controls and alarms

BT1050 bottom blowdown control system

For automatic control of bottom blowdown in boilers select either the DFG300 or ABV20 with the BT1050 controller.

The BT1050 has a 'Real Time' clock / calendar that allows blowdown cycles at 30 minute intervals.

The Spirax Sarco automatic boiler bottom blowdown system is designed to be efficient and cost effective.

The system comprises a BT1050 controller and an actuated ABV20 or a DFG300A blowdown valve for boiler pressures up to 32 bar g.

The advantages of automatic boiler blowdown are:

- Automatic timed blowdown avoids wasted heat.
- Choose the exact time and duration of blowdown.
- Repetition or omission of blowdown is avoided.
- Up to 9 BT1050 systems can be linked to blow down sequentially.

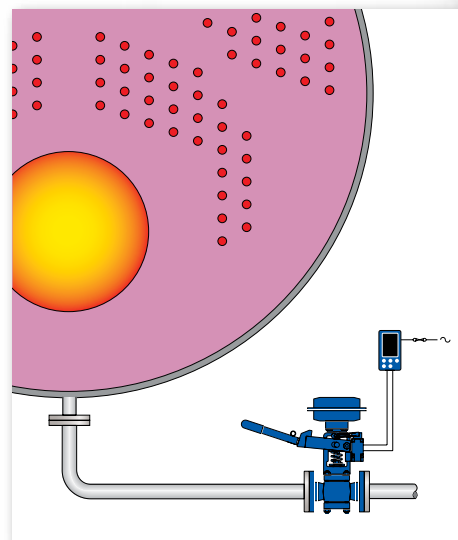
Time controlled bottom blowdown systems bring many benefits to your plant and business.

Minimised energy loss from the boiler blowdown can save approximately 2% of a facilities total energy use, with an average simple pay back in one year.

The system can be used for single and multi-boiler installations.

Less water, fuel and water treatment chemicals are required, providing a cleaner and more efficient boiler.

Reduced operating costs, reduced labour cost and a safer boiler.



Key features:

- Real time clock and calendar.
- Variable valve closing and opening times.
- Manual valve open / close.
- Isolated 0-20 mA or 4-20 mA for a positioner or retransmit.
- Inbuilt, infrared communications port.
- Modbus EIA (RS) 485 for external communications.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Switchable alarm latch.
- Blowdown cycles at 30 minute intervals.
- Range of linear and rotary blowdown valves.

Associated products:

- MV11 solenoid valve.
- Optional manual handle for DFG300A.
- ABV20.
- DFG300.

Condensate contamination detection

BC3250 and CP10 condensate contamination detection system

For conductive condensate contamination detection (CCD) select the CP10 conductivity probe and BC3250 controller.

The control system monitors and displays the conductivity of condensate being returned to the boiler and diverts contaminated condensate to drain.

Steam is an extremely efficient way of transmitting energy, and is used for many industrial processes.

When steam has given up its heat to the process, the remaining hot condensate, ideally, should be returned to the boiler feedtank.

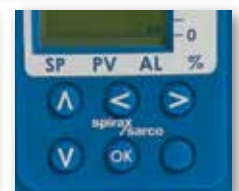
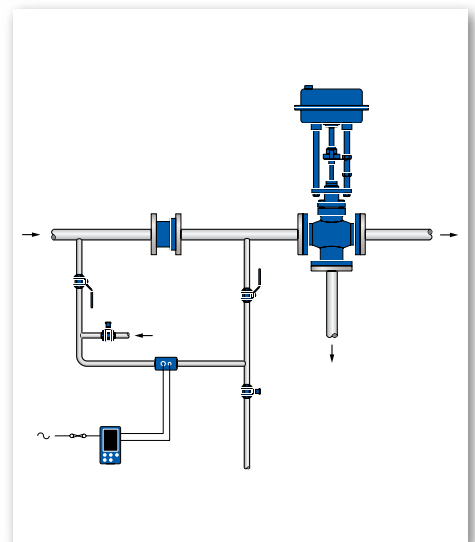
There are significant benefits to be gained from installing a CCD system:

- Saving water.
- Saving residual heat in condensate.
- Saving on expensive water treatment chemicals.

It is essential to ensure that the condensate is clean, even low levels of contamination can cause foaming, scaling or corrosion. Continuous condensate contamination monitoring can protect the boiler, ensure product quality and maximise energy and water savings.

The CCD system comprises of:

- S20 sensor chamber.
- CP10 conductivity sensor.
- TP20 temperature probe.



Key features:

- Avoids boiler damage and product contamination.
- Can sense conductivities down to 1 $\mu\text{S}/\text{cm}$ at 25°C.
- Condensate temperature compensation for greater accuracy.
- Isolated 0-20 mA or 4-20 mA output.
- Inbuilt, infrared communications port.
- Modbus EIA (RS) 485 for external communications.
- Versatile mounting options: DIN rail, Panel or Chassis.
- Switchable alarm latch.

Associated products:

- SCS20 sample cooler systems.
- MS1 portable conductivity meter.
- DS1000 remote digital display unit.
- DCV2 check valves.
- Stop valves.
- Electrically actuated valves.
- Pneumatically actuated valves.

First for Steam Solutions

Condensate contamination detection

Model 556/TF56-N Turbidity Monitoring System

Select the TF56-N Turbidimeter and the 556 Converter to monitor non-conductive contamination in condensate return and make-up water to a boiler's feed water system.

The Turbidity Monitoring System from Spirax Sarco is a precise and reliable solution for preventing non-conductive contamination entering a boiler's feed water system. The system is designed to monitor make up water and condensate returns to the feed water system and divert any contaminated water or condensate to drain, avoiding malfunction and process interruption in your plant.

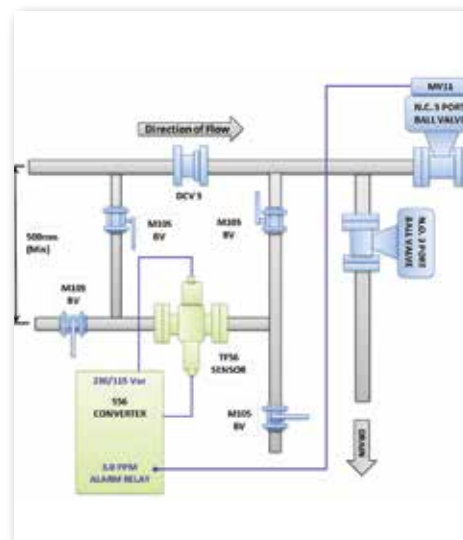
For example, harmonised standards EN12952 and EN12953 now cite minimum requirements for limiting devices to protect all boilers. The turbidity monitoring system is one such device that will fulfil your need for 'Water Quality Protection' against the ingress of oil and grease.

The turbidity monitoring system continuously monitors for oil and grease contamination in condensate return to a boiler's feed water system and automatically diverts contaminated condensate to drain if prescribed limits are exceeded.

There are significant savings to be gained by installing a turbidity monitoring system.

- Reduced water consumption
- Recovery of condensate and residual heat
- Reduced use of water treatment chemicals

The turbidimeter is a precise, dual channel, scattered light turbidity monitor that uses light in the visible range (VIS) and Near Infrared Range (NIR) from 400 to 1100 nm. A precisely defined constant light beam penetrates the fluid medium and the light scattered from any oil or grease particles in the condensate or make-up water is detected by four hermetically sealed silicon photodiodes set at an angle of 11°. Simultaneously unscattered light is detected by a reference photodiode. This unique Dual Channel Design compensates for colour and disturbances in the flow returns. The sensor can measure very low particle sizes and concentrations.

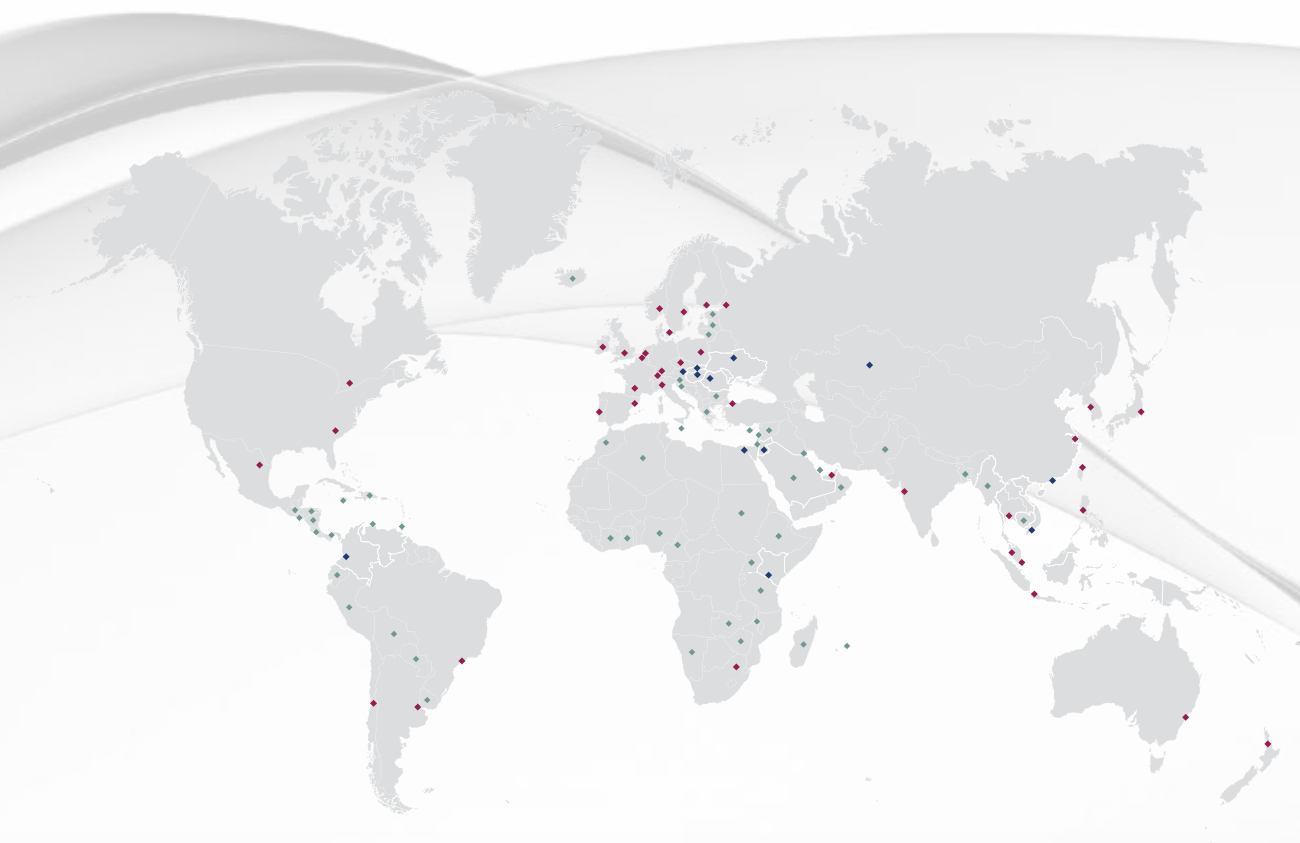


Key features:

- Continuous, real-time monitoring
- Two independent alarm set points
- Fail safe relay
- 0 - 20 or 4 - 20 mA output
- Compensating dual channel design
- Low maintenance
- CIP/SIP compatible
- Compact dimensions
- Reliable, cost effective measurement

Associated products:

- MS10 isolating ball valve
- DCV 3 check valve
- ¼ turn ball valve actuator
- M21 two port ball valve
- MV solenoid valve
- Three port QL valve



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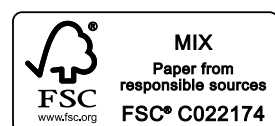
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