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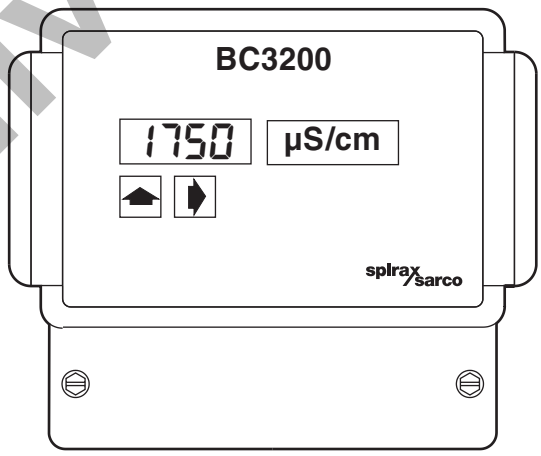
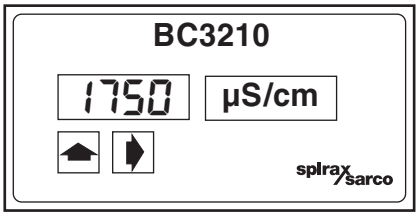
BC3200 and BC3210 Blowdown Controllers

- Compact unit for TDS control on large or small boilers.
- Wall or panel mounted versions.
- 4 digit LED display (ppm or uS/cm).
- 4 - 20 mA output and high TDS alarm. Temperature compensated.
- Probe cleaning circuit (UK patent No. 2276943).
- No batteries - stored in non-volatile memory.





Application

The BC3200 and BC3210 controllers are used to monitor the conductivity of liquids.
The BC3200 is wall mounted, and the BC3210 panel mounted. As they are identical in nearly all other respects, the following information will, for clarity, refer to the BC3200.
The main application of the unit is for boiler blowdown control, where it monitors the level of total dissolved solids (TDS), causing a blowdown valve to open if the TDS rises above a set point, and an alarm to be signalled at a higher TDS level. The TDS probe may be mounted in the boiler or in the blowdown line.
The controller may also be used for monitoring condensate return, signalling a dump valve to open if the conductivity of the condensate exceeds a pre-set level.

Description

The BC3200 is a dual voltage controller for use with a blowdown valve or dump valve to monitor and control TDS levels, usually as part of a steam boiler installation. The front panel has a four digit LED display and two push buttons to select, view, and change functions. An optional front cover lock is available for the BC3200, and a lockable cover assembly is available for the BC3210.
In normal operation the display shows the actual TDS value.
Voltage, ranges, and other operating parameters are set on installation using internal switches.
The controller has a programmable probe cleaning (conditioning) circuit (UK Patent No. 2276943), which allows the system to maintain its accuracy even when some boiler scaling is taking place. It should not, however, be regarded as a substitute for a proper water treatment regime. The cleaning (conditioning) time can be adjusted.
The controller has adjustable set point, alarm, and calibration. The set point hysteresis is adjustable, providing a damping effect where changes of water circulation at the probe may otherwise cause over-frequent switching of the blowdown or dump valve.
An additional filter can be selected to increase the damping effect where the TDS probe is fitted directly in the boiler.
A conductivity probe with a built-in Pt100 temperature sensor may be connected to the controller to provide temperature compensation (2%/°C) where the boiler is working at varying pressures. For other applications such as condensate monitoring or coil boilers where the temperature may vary, a separate temperature sensor may be used.
For smaller boilers where the capacity of the blowdown valve is relatively high compared to the boiler size, the blowdown may be set to pulsed, rather than continuous output, opening for 10 seconds, and closing for 20 seconds. This slows the rate at which the boiler water is removed so that the level is not unduly affected, avoiding the risk of triggering a low water alarm.
A 0 - 20 mA or 4 - 20 mA output is provided as standard, and may be used for remote display of TDS level or as an output to a computerised management system.
A security feature allows parameters to be viewed but not adjusted.

Probe in boiler shell
For systems where the TDS probe is fitted in the boiler shell, the BC3200 will open the blowdown valve if the conductivity of the boiler exceeds a certain level (set point). As the contaminated water in the boiler is replaced by clean water from the feedtank, the TDS will fall to the set point (less the hysteresis value), when the controller will close the blowdown valve.

Probe in blowdown line
For systems where the sensor is mounted in the blowdown line, the controller periodically opens the blowdown valve to allow a sample of water from the boiler to pass the sensor (purge).
If the TDS is below the set point, the valve will close after the purge time has elapsed. The purge time is adjustable for different blowdown installations, to ensure that all water from the previous sample has been removed from the system, and that the sample is at a similar temperature to the water in the boiler. The BC3200 may be set to purge either half an hour from the last purge, or for every half hour of boiler firing, (useful for stand-by boilers).
If the TDS level is above the set point, the blowdown valve will remain open to allow the high TDS water to be replaced by clean water from the feedtank.
The valve will close when the TDS level falls to the set point (less the hysteresis value). When the valve is closed, the controller stores the TDS level in memory so that the last true value is always shown on the display and is output as the mA signal.

Materials

BC3200	
Case	Polystyrene
Front panel	Polycarbonate

BC3210	
Case	Noryl (glass filled)
Front panel	Polyester

Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change the specification.

Limiting conditions

Protection rating	BC3200	IP65
	BC3210	IP65 (Front panel only as the case is normally inside a boiler panel)
Maximum ambient temperature		55°C
Maximum cable length (probe to controller)		100 m
Maximum resistance of 0/4 - 20 mA (Negative is earthed to boiler at the probe)		500 Ω
Minimum conductivity setting		10 uS/cm or 10 ppm

Technical data

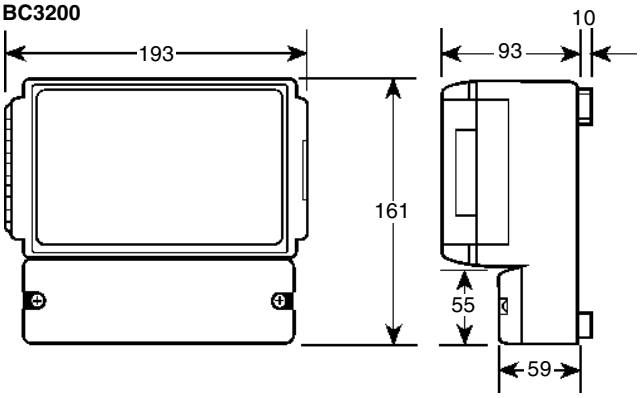
Mains supply voltage	230 V setting	198 V - 264 Vac
	115 V setting	99 V - 132 Vac
Frequency		50 - 60 Hz
Fuse type		20 mm cartridge 100 mA anti-surge
Maximum power consumption		6 VA
Alarm hysteresis		3%
Probe cleaning (conditioning)	Frequency	Every 12 hours
	Duration	0 - 99 seconds
Purge time		0 - 99 seconds or 0 - 0.99 hour

Note: If the purge time is set to anything other than zero, cleaning (conditioning) time is automatically limited to 9 seconds to avoid bubbles forming on the probe.

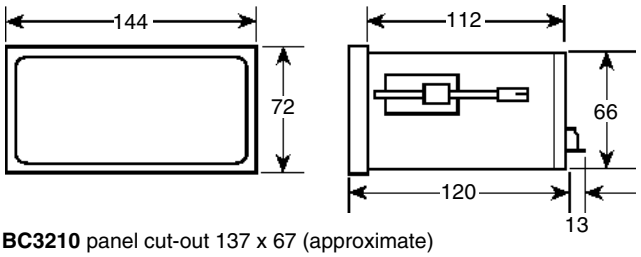
Cumulative purge time	Every 30 minutes or every 30 minutes of boiler firing
Blowdown	Continuous or intermittent - (off for 20 sec/on for 10 sec)
Ranges (switch selectable)	10 - 99 µS/cm or ppm
	100 - 999 µS/cm or ppm
	1000 - 9990 µS/cm or ppm

Dimensions (approximate) in millimetres

BC3200



BC3210



BC3210 panel cut-out 137 x 67 (approximate)

Weights (approximate) in kg

BC3200	0.8
BC3210	0.6

Safety information, installation and maintenance

This document does not contain sufficient information to install the product safely. See the Installation and Maintenance Instructions supplied with the product which give full wiring, commissioning and operating instructions.

Warning:
Isolate the mains supply before unplugging the controller as live terminals at mains voltage will be exposed in the controller base.

Installation note:
The controller must be installed in an enclosure or control panel to provide environmental and impact protection.
Spirax Sarco can supply suitable enclosures. Allow 15 mm spacing between multiple units for air circulation. The controller may be mounted on a 'top hat' DIN rail using the mounting clip provided or the clip may be removed and the controller base screwed direct to a chassis plate.

How to specify

BC3200 TDS controller
TDS controllers shall be Spirax Sarco type BC3200 for the control of TDS in large or small boilers. They shall be of the wall mounted type and be housed in an IP65 polystyrene case and polycarbonate cover. They shall incorporate a 4 digit LED display and provide a 4 - 20 mA output and high TDS alarm, and have a patented probe conditioning device.

BC3210 TDS controller
TDS controllers shall be Spirax Sarco type BC3210 for the control of TDS in large or small boilers. They shall be panel mounted and housed in a Noryl (glass filled) case with Polyester front panel. They shall incorporate a 4 digit LED display and provide a 4 - 20 mA output and high TDS alarm, and have a patented probe conditioning device.

How to order

Example: 1 off Spirax Sarco BC3200 blowdown controller.