

BC3250 Blowdown Controller

Description

The BC3250 is a blowdown controller for steam boilers. It controls TDS (total dissolved solids - salts in solution) by opening and closing a blowdown valve.

It also has a timer that controls a bottom blowdown valve, to remove precipitated solids from the bottom of the boiler.

The product works in conjunction with a Spirax Sarco conductivity sensor, a boiler blowdown valve and, for condensate contamination detection, a dump valve.

It can operate on a supply voltage of between 110 to 240 Vac @ 50/60 Hz.

The front panel has an LCD graphics display and five-button keypad to select, view, and change functions.

In run mode (standard setting) the display is divided into three sections:

- i) Process variable and control parameters.
- ii) Information line, displays the various control states and process units.
- iii) Three bar graphs, which show a percentage of full scale of:
 - PV Process Variable highest and lowest recorded value.
 - SP Set Point and hysteresis point.
 - AL High Alarm and hysteresis point.

An additional filter can be selected to increase the damping effect where the probe is fitted directly in the boiler. This avoids over-frequent valve operation.

A Trend graph screen display appears if the right or left button is pressed in run mode - This displays a record of the variation in TDS over a set time.

The BC3250 can be used on a condensate contamination system. Please note that it will not detect contaminants that do not change the conductivity, e.g. oils, fats, or sugars.

The blowdown may be set to pulsed, rather than continuous output, opening for 10 seconds, and closing for 20 seconds. This avoids the risk of triggering a low water alarm in smaller boilers.

An isolated 0 - 20 or 4 - 20 mA output is provided for remote display of the TDS level or as an output to a management system.

If a switch box is fitted to the bottom blowdown valve actuator, an alarm can be configured to indicate if the bottom blowdown valve fails to close or to lift off its seat.

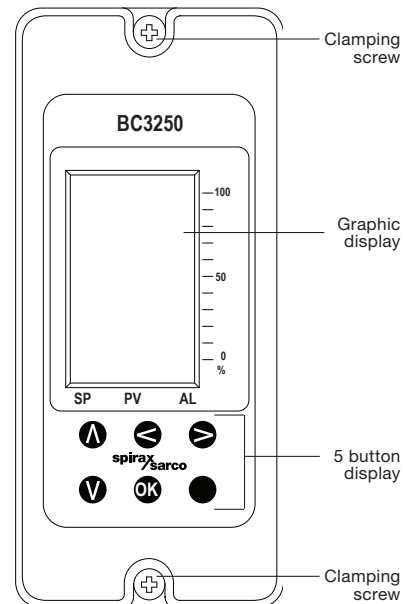
The BC3250 can communicate via an infrared link between adjacent controllers. It can be designated as either a master unit or a slave unit.

The unit can be panel, DIN rail or chassis mounted.

Principal features:

- Blowdown controller with bottom blowdown timer.
- Multi-voltage 110 Vac to 240 Vac.
- Display in $\mu\text{S}/\text{cm}$ or ppm.
- LCD graphics display of PV and sequential trend graph.
- Filter for turbulent conditions.
- Infrared communications.
- Diagnostic / test facility.
- 0/4 - 20 mA output.
- EIA 485/Modbus communications.
- UL and TÜV approved.

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only. In the interests of development and improvement of the product, we reserve the right to change the specification.



Approvals

This product complies with the Electromagnetic Compatibility Directive 2004 / 108 / EC and all its requirements.

The BC3250 is suitable for Class A Environments (e.g. industrial). A fully detailed EMC assessment has been made and has the reference number UK Supply BH BC3250 2008.

The BC3250 complies with the Low Voltage Directive by meeting the standards of:

- EN 61010-1:2010 safety requirements for electrical equipment for measurement, control, and laboratory use.

The BC3250 has been type-tested as a TDS controller and limiter by meeting the standard:

- Vd TÜV requirements for TDS control and limiting devices, Water Level 100 (07.2006).
- UL listed (open)

Function

Inputs

The BC3250 can accept a signal from a Spirax Sarco CP10, CP30 or CP32 conductivity probe, and a Pt100 temperature sensor.

Function / outputs

If the water conductivity exceeds the Set Point, the valve relay will be energised until the conductivity drops below the Set Point. If the water conductivity exceeds the alarm level, the alarm relay will be de-energised until the conductivity drops below the alarm level.

Other features:

- Test function.
- Direct display of probe factor.
- Commissioning parameters protected with a pass code.

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Technical data BC3250

Power supply	Mains voltage range	110 Vac to 240 Vac at 50/60 Hz		
	Power consumption	7.5 W (maximum)		
Environmental	General	Indoor use only		
	Maximum altitude	2 000 m (6 562 ft) above sea level		
	Ambient temperature limits	0 - 55°C (32-131°F)		
	Maximum relative humidity	80% up to 31°C (88°F) decreasing linearly to 50% at 40°C (104°F)		
	Overvoltage category	III		
	Pollution degree	2 (as supplied)		
		3 (when installed in an enclosure) - Minimum of IP54 or UL50 / NEMA Type 3, 3S, 4, 4X, 6, 6P or 13.		
	Enclosure rating (front panel only)	NEMA type 4 hose down only (UL approval) and IP65 (verified by TRAC Global)		
	LVD (safety)	Electrical safety EN 61010-1 UL61010-1, 3rd Edition, 2012-05 CAN/CSA-C22.2 No. 61010-1, 3rd Edition, 2012-05		
	EMC	Immunity/Emissions	Suitable for heavy industrial locations	
	Enclosure	Material	Polycarbonate	
Front panel	Color	Pantone 294 (blue)		
	Material	Silicone rubber, 60 shore.		
Solder	Tin/lead (60/40%)			
Mains and signal connector	Termination	Rising clamp plug-in terminal blocks with screw connectors. Caution: Use only the connectors supplied by Spirax Sarco Ltd. Safety and Approvals may be compromised otherwise.		
	Cable size	0.2 mm ² (24 AWG) to 2.5 mm ² (12 AWG).		
	Stripping length	5 - 6 mm (0.2")		
TDS cable/wire	Type	High temperature		
	Shield type	Screened		
	Number of cores	4		
	Gauge	1 - 1.5 mm ² (18 - 16 AWG)		
		0 - 9.99 range - 10 metres (33ft)		
	Maximum length	0 - 99.90 range - 30 metres (100ft)		
0-999.0 range and 0-9990 ranges - 100 metres (328ft)				
Recommended type	Prysmian (Pirelli) FP200, Delta Crompton Firetuf OHLS			
Pt100 probe cable / wires	Type	High temperature, twisted		
	Shield type	Screened		
	Number of cores	3		
	Gauge	1 - 1.5 mm ² (18 - 16 AWG)		
	Maximum length	100 m (328 ft)		
0/4-20 mA output(s) cable/wire	Type	Twisted pair		
	Shield type	Screened		
	Number of pairs	1		
	Gauge	0.23 - 1 mm ² (24 - 18 AWG)		
	Maximum length	100 m (328 ft)		
Recommended type	various			
RS485 communication cable / wire	Type	EIA RS485 twisted pair		
	Shield type	Screened		
	Number of pairs	2 or 3		
	Gauge	0.23 mm ² (24 AWG)		
	Maximum length	1200 m (4000 ft)		
Recommended type	Alpha Wire 6413 or 6414			
LAN Cat 5 or Cat 5E ScTP (screened), FTP (foil) or STP (shielded) cable can be used, but limited to 600 m.				

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Technical data BC3250 (continued)

Input technical data	Water conductivity	Probes type:	CP10, CP30 and CP32
		Ranges	Minimum $\geq 1 \mu\text{S}$ @ 25°C (77°F)
			0 – 9.99 ppm or $\mu\text{S}/\text{cm}$
			0 – 99.9 ppm or $\mu\text{S}/\text{cm}$
			0 – 999 ppm or $\mu\text{S}/\text{cm}$
			0 – 9990 ppm or $\mu\text{S}/\text{cm}$
	Accuracy	$\pm 2.5\%$ FSD (Poss > if high EMC)	
	pH factor	0.50 – 1.00 (0.7 default)	
	Neutralising factor	0.7	
	Resolution	0.1% FSD	
	Drive:	ac – 4 wires	
	Temperature compensation (TC)	Sensor type	Pt100 – Class B or better
		Range	0 - 250°C (32-482°F) (With Pt100 not fitted – user programmed temperature 100 - 250°C {212-482°F}, 1°C steps)
Accuracy		$\pm 2.5\%$ FSD – system accuracy $\pm 5\%$	
Resolution		1% FSD	
Drive:		dc – 3 wires	
Burner input	Input voltage range	110 – 240 Vac	
	Maximum current input	2 mA maximum	
Output technical data	Probe cleaning	Maximum voltage	32 Vdc
		Drive	ac/dc/pulsed
	4 - 20 mA	Minimum current	0 mA
		Maximum current	20 mA
		Open circuit voltage (maximum)	19 Vdc
		Resolution	1% FSD
		Maximum output load	500 ohm
		Isolation	100 V
	Output rate	10 / second	
	Relays	Contacts	2 x single pole changeover relays (SPCO)
		Voltage ratings (maximum)	250 Vac
		Resistive load	3 amp @ 250 Vac
		Inductive load	1 amp @ 250 Vac
ac motor load		1/4 HP (2.9 amp) @ 250 Vac 1/10 HP (3 amp) @ 120 Vac	
Pilot duty load		C300 (2.5 amp) - control circuit/coils	
Electrical life (operations)		3×10^5 or greater depending on load	
Mechanical life (operations)		30×10^6	
RS485	Physical layer	RS485 4-wire full or 2-wire half duplex	
	Protocol	Modbus RTU format	
	Isolation	60 Vac/dc	
	Receiver unit load	1/8 (256 devices - maximum)	
	Output rate	Up to 10 frames / second	
Infrared	Physical layer	IrDA	
	Baud	38 400	
	Range	10 cm (4")	
	Working angle	15°	
Eye safety information	Exempt from EN 60825-12: 2007 Safety of laser products - does not exceed the accessible emission limits (AEL) of Class 1		

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Safety information, installation and maintenance

Warning: This document does not contain sufficient information to install the unit safely. The unit operates at a potentially fatal mains voltage. Before attempting to install the unit read the Installation and Maintenance Instructions supplied with it.

The product must be installed in a suitable industrial control panel or fireproof enclosure to provide impact and environmental protection. A minimum of IP54 (EN 60529) or Type 3, 3S, 4, 4X, 6, 6P and 13 (UL50/NEMA 250) is required.

The product may be installed on a DIN rail, a chassis plate, or in a panel cut-out. A bezel is supplied.

Install the product in an environment that minimizes the effects of heat, vibration, shock and electrical interference.

Do not install the product outdoors without additional weather protection.

Do not attempt to open the product - it is sealed and has no replaceable parts or internal switches.

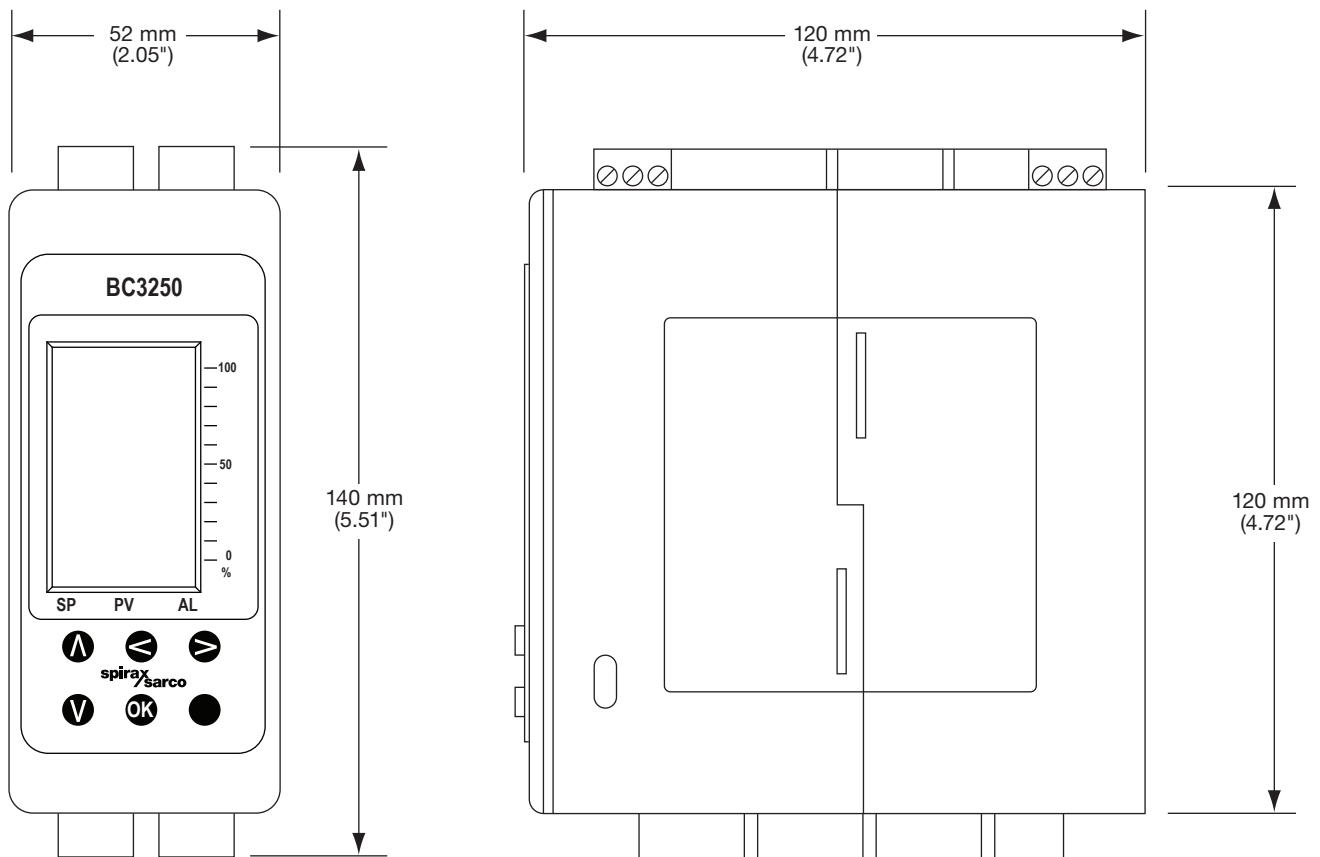
Do not cover or obstruct the infrared beam between products.

No special servicing, preventative maintenance or inspection of the product is required.

Boiler water level controls and level alarms do, however, require testing and inspection.

Dimensions / weight (approximate)

Weight 1.21 lb



How to specify

Blowdown controller with integral bottom blowdown timer and infrared comms.

How to order

Example: 1 off Spirax Sarco BC3250 blowdown controller.