



## BCR3250

## BHD50

# Blowdown Controller, Operating and Display Unit

### Description

The functional unit consisting of the operating and display unit BHD50, blowdown controller BCR3250 and conductivity probes CP10, CP30/CP40 and CP32/CP42 is used as blowdown controller and limiter. Typical applications include steam boilers, (pressurised) hot-water installations as well as condensate and feedwater tanks.

A Pt100 temperature sensor may be connected to the controller to display the boiler water temperature and provide temperature compensation. This is recommended if the boiler is working at varying pressures, or for other applications such as condensate monitoring or coil boilers, where the temperature may vary.

The blowdown controller indicates when the preset MAX TDS/Conductivity is reached, opens or closes a blowdown valve and may also control a bottom blowdown valve. The controller can provide either a MIN alarm or a bottom blowdown timer function. One BHD50 can be used with a LCR2652 and a BCR3250 controller to provide a combined level and TDS control system.

The operating and display unit BHD50 and the blowdown controller BCR3250 form a functional unit featuring the following properties:

- TDS/Conductivity control and limiter using conductivity probes CP10 or CP30/CP40, with or without a separate temperature sensor Pt 100 (TP20) to provide temperature compensation (0 - 250 °C)
- TDS/Conductivity control and limiter using conductivity probe CP32/CP42, with an integrated temperature sensor (temperature compensation), scale management and optional alarm
- Electronic probe cleaning, to remove scale from probe tip
- Modulating control using a valve motor drive (VMD) by proportional-plus-integral control action (PI controller) on an electrical blowdown valve  
A 3-position stepping control is used, therefore no feedback potentiometer is required
- ON/OFF control with purge time for probe in pipeline installations
- An optional filter to increase damping effects, to avoid over-frequent valve operation
- Indication of MAX TDS/Conductivity limit (TDS/Conductivity limiter)
- Indication of MIN TDS/Conductivity limit or control of a bottom blowdown valve
- Conductivity to TDS conversion (unit in  $\mu\text{S}/\text{cm}$  or ppm)
- Standby/burner input (24 Vdc), to reduce boiler water loss, if the boiler is on standby or low demand
- Real time clock controlled Bottom Blowdown (BB), with limit switch box and priority link for multiple boiler applications (interlocking up to 9 BCR3250 or BT1050 controllers)
- Actual value output 4-20 mA
- Indication of actual value (indicated in ppm or  $\mu\text{S}/\text{cm}$  and as bar graph)



- Indication/adjustment of control parameters and settings
- Trend record
- Indication and listing of errors, alarms and warnings
- Test of MIN/MAX output relays
- Manual/automatic operation
- Modbus RTU (RS232, RS422 or RS485) and Modbus TCP (Ethernet 10/100Mb) communication
- Password protection

### Typical applications

- Steam Boilers
- Hot-Water Installations
- Condensate and Feedwater Tanks

## Technical data BCR3250

Supply voltage	24 Vdc +/- 20%
Fuse	external 0.5 A (semi-delay)
Power consumption	5 W
Inputs	1 five-wire connection to CP32/CP42 or three-wire connection to CP30/CP40 and two-wire connection to the CP10 (Drive+Sense bridged at controller) 1 two-wire Pt100 temperature sensor (range 0 - 250°C) 1 two-wire bottom blowdown valve switch 1 two-wire bottom blowdown link (blowdown valve interlocking) 1 two-wire standby or burner connection (24Vdc +/- 20%, 10mA)
Outputs	1 or 2 volt-free change-over contacts, 8 A 250 Vac/30 Vdc cos $\phi$ = 1 (valve control) 2 volt-free change-over contacts, 8 A 250 Vac/30 Vdc cos $\phi$ = 1, (MIN/MAX alarm) 1 analogue output 4-20 mA, max. load 500 ohm (actual value indication) Provide inductive loads with RC combinations according to manufacturer's specification to ensure interference suppression
Data line	1 interface for data exchange with operating and display unit BHD50
Indicators and adjustors	1 tri-colour LED indicator (start-up = amber, power ON = green, malfunction = red) 1 code switch with four poles for configuration
Housing	Housing material: base: polycarbonate, black; front: polycarbonate, grey Conductor size: 1 x 4,0 mm <sup>2</sup> solid per wire or 1 x 2.5 mm <sup>2</sup> per stranded wire with sleeve to DIN 46228 or 2 x 1.5 mm <sup>2</sup> per stranded wire with sleeve to DIN 46228 (min. $\varnothing$ 0.1 mm) terminal strips can be detached separately Fixing of housing: Mounting clip on supporting rail TH 35, EN 60715
Electrical safety	Pollution degree 2 for installation in control cabinet with protection IP 54, completely insulated
Protection	Housing: IP 40 to EN 60529 Terminal strip: IP 20 to EN 60529
Weight	approx. 0.5 kg
Ambient temperature	when system is switched on: 0° ... 55 °C, during operation: -10 ... 55°C
Transport temperature	-20 ... +80 °C (<100 hours), defrosting time of the de-energised equipment before it can be put into operation: 24 hours
Storage temperature	-20 ... +70 °C, defrosting time of the de-energised equipment before it can be put into operation: 24 hours
Relative humidity	max. 95%, no moisture condensation

## Technical data BHD50

Supply voltage	24 Vdc +/- 20%
Fuse	internal automatic
Power consumption	14.4 W
User interface	5" color display with capacitive touch screen, resolution 800 x 480 pixels, illuminated
Communication interface	RS232, RS422, RS485 and Ethernet 10/100Mb (USB for maintenance only)
Data line	For connection to a LCR2652 and BCR3250 (in parallel)
Dimensions	Front panel: 147x107 mm Panel cut-out: 136x96 mm Depth: 52 + 8 mm
Weight	approx. 1.3 kg
Protection	Front: IP 66 to EN 60529 Rear: IP 20 to EN 60529
Electrical connection	1 power connector with 3 poles 1 D-SUB connector with 9 poles 2 Ethernet (10/100Mb) RJ45 connector 1 USB Port V2.0, max. 500 mA - for maintenance only 1 Serial connector with 8 poles

## Directives and standards

### VdTÜV Bulletin "Wasserüberwachung 100" (Water Monitoring 100)

The functional unit consisting of the operating & display unit BHD50, blowdown controller BCR3250 and conductivity probes CP10, CP30/CP40 and CP32/CP42 are type approved according to VdTÜV Bulletin "Wasserüberwachung (Water Monitoring) 100". The VdTÜV Bulletin "Water Monitoring 100" states the requirements made on water monitoring equipment. Type approval no. TÜV · WR · XX-XXX (see name plate).

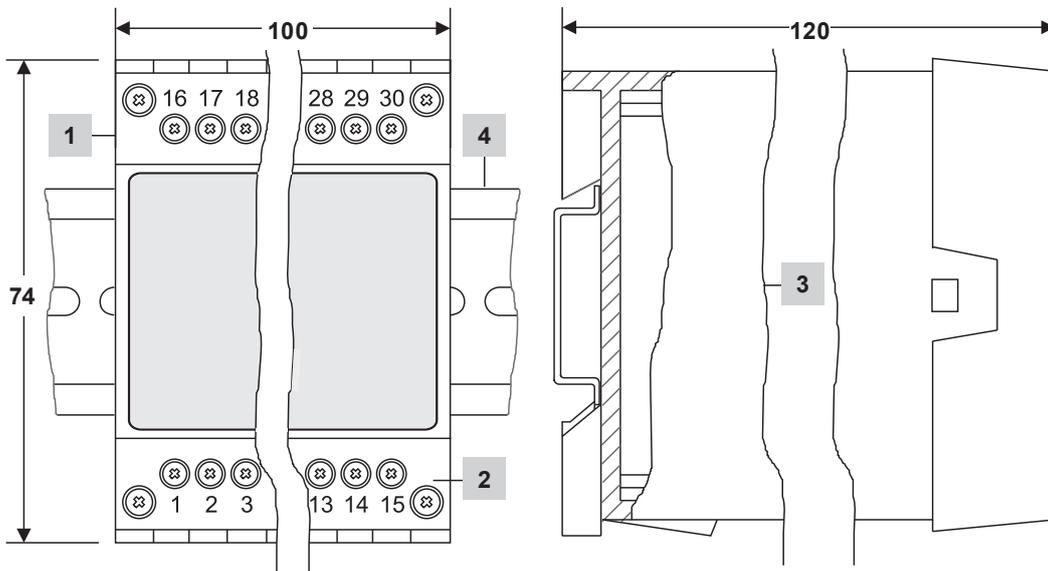
### LV (Low Voltage) Directive and EMC (Electromagnetic Compatibility)

The equipment meets the requirements of the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU.

### ATEX (Atmosphère Explosible)

According to the European Directive 2014/34/EU the equipment must not be used in explosion risk areas.

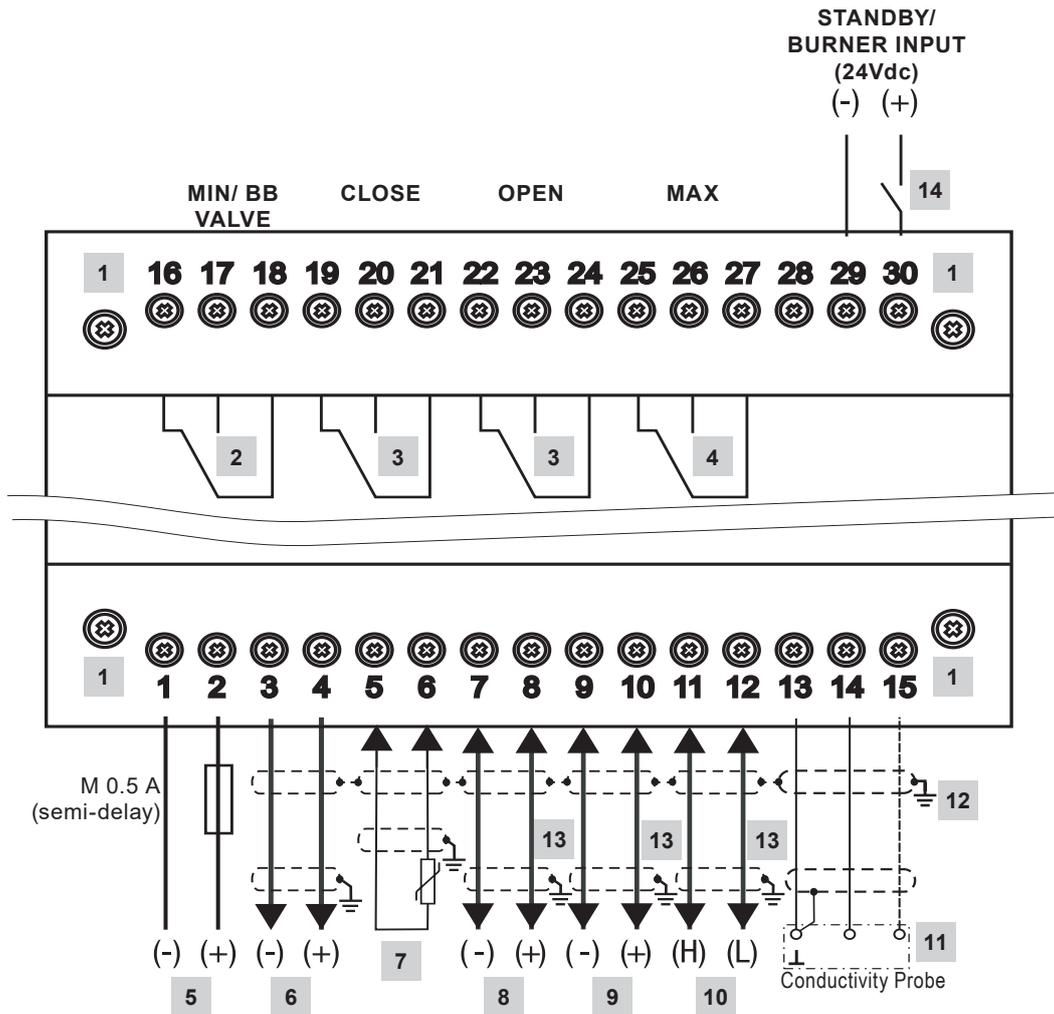
## Dimensions (BCR3250) (approximate) in mm



Item	
1	Upper terminal strip
2	Lower terminal strip
3	Housing
4	Support rail TH 35, EN 60715

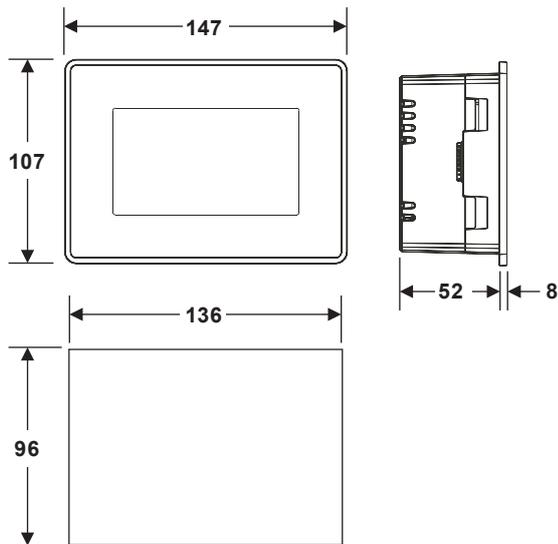
The blowdown controller BCR3250 is clipped onto the support rail type TH 35, EN 60715 in the control cabinet, see item 4.

# Wiring Diagram

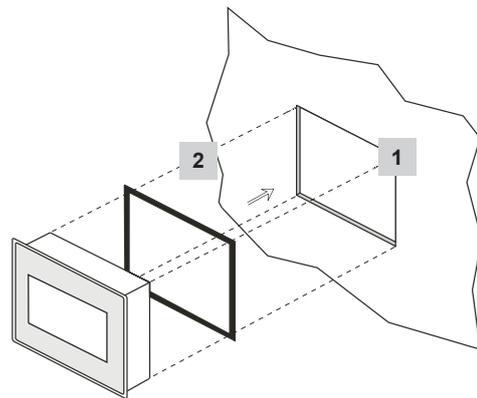


Item	
1	Fixing screws for terminal strip
2	MIN alarm output contact or Bottom Blowdown (BB) output contacts
3	Output contacts for activating the control valve
4	MAX alarm output contact
5	Connection of supply voltage 24 Vdc with fuse 0.5 A (semi-delay) provided on site
6	Actual value output 4-20 mA
7	2 wire Pt 100 temperature sensor input
8	Bottom blowdown (BB) link input
9	Bottom blowdown (BB) switch input
10	Data line for operating and display unit BHD50
11	Conductivity Probes - See figure 5
12	Central earthing point (CEP) in control cabinet
13	Earthing point at the auxiliary equipment (e.g. CP30/CP40)
14	Standby/burner input (24 Vdc), ON = standby/burner on, OFF = normal running/burner off

**Dimensions (BHD50) (approximate) in mm**

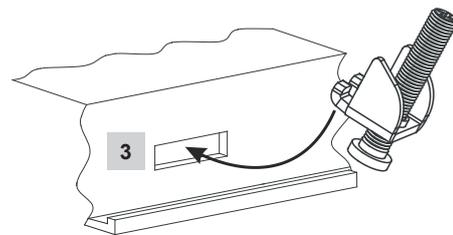


**Fig. 2a**



Control panel cut-out with the dimensions indicated in Fig. 2a, showing gasket item 2.

Item	
1	Cut-out in control cabinet 136 x 96 mm
2	Gasket
3	Fixing elements



Fixing element detail.

**How to specify**

Conductivity Controller with Operating and Display Unit, 4 volt-free change-over contacts for MIN/MAX alarm & blowdown valve, supply voltage 24V DC 4W

**How to order**

Example: 1 off Spirax Sarco BCR3250 Blowdown Controller, 1 off Spirax Sarco BHD50 Operating and Display Unit