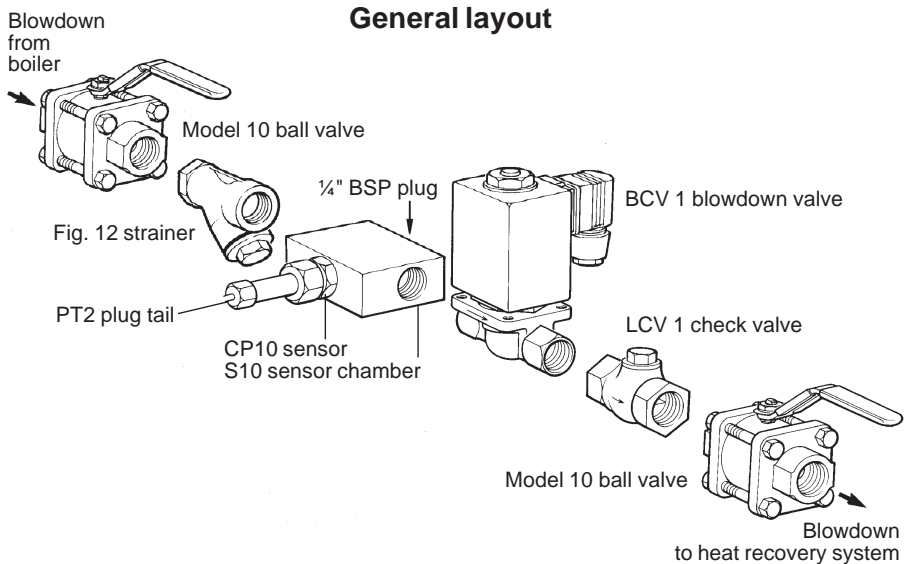


## BCS 1 Pipeline Set Installation and Maintenance Instructions



### Safety

Your attention is drawn to Safety Information Leaflet IM-GCM-10, as well as to any National Regulations concerning boiler blowdown.

In the UK, guidance is given in HSE Guidance Note PM 60.

#### WARNING

This pipeline set is for use with one of several Spirax Sarco blowdown controllers. The controllers comply with the requirements of Electromagnetic Compatibility Directive 89/336/EEC by meeting the standards of BS EN 50081-1 (Emissions) and BS EN 50082-2 (Industrial Immunity).

Controllers may be exposed to interference above the limits of BS EN 50082-2 if:-

- The product or its wiring is located near a radio transmitter.
- Excessive electrical noise occurs on the mains supply.

Cellular telephones and mobile radios may cause interference if used within approximately one metre of the product or its wiring. The actual separation distance necessary will vary according to the surroundings of the installation and the power of the transmitter.

AC power line protectors should be installed if mains supply noise is likely. Protectors can combine filtering, suppression, surge and spike arrestors.

Isolate the mains supply before unplugging controllers as on certain types, live terminals at mains voltage would otherwise be exposed in the controller base.

The blowdown valve is powered by mains voltage. Isolate the supply before unplugging the cable socket.

## Description

Components in this pipeline set have been selected to enable straightforward installation of a blowdown system where the probe is to be mounted in the pipeline. It consists of the following items:-

- 1 - S10 sensor chamber ½" BSP.
- 1 - CP10 sensor and gasket.
- 1 - PT2 Plug tail.
- 1 - Sensor chamber plug ¼" BSP.
- 1 - BCV 1 solenoid valve ½" BSP 230V.
- 1 - LCV 1 check valve ½" BSP
- 1 - Fig. 12 SG iron strainer ½" BSP.
- 2 - Model 10 CS ball valve ½" BSP.

A controller is also required, and should be selected from the Spirax Sarco range. The controllers offer a variety of features which are described in separate literature.

## Operation

The blowdown system works by periodically opening the blowdown valve in order to purge the system and allow a flow of boiler water past the sensor.

The controller measures the electrical conductivity of the water, which is directly related to the level of total dissolved solids, or TDS. The measured value is compared with the set point in the controller.

If the measured value is lower than the set point the blowdown valve closes at the end of the purge time.

If the measured value is higher than the set point the controller holds the blowdown valve open, allowing the contaminated boiler water to be replaced by clean, low TDS make-up water. The blowdown valve closes when the conductivity of the boiler water drops below the controller set point.

### WARNING

**With some small boilers, an excessive purge time may lower the water level significantly, and may even trigger a low water alarm.**

## Electrical installation

Wiring of the controller, blowdown valve, and sensor is described in the Installation and Maintenance Instructions supplied with each item. Copies are available on request.

## Mechanical installation

### General

Unpack the system, read and keep the Installation and Maintenance Instructions provided with the individual items. They will be needed for future maintenance.

It is strongly recommended that, wherever possible, the blowdown system is connected to a boiler side connection, well away from the boiler feedwater inlet. This minimises the chance of suspended solids entering the blowdown system strainer, and ensures that a representative sample of boiler water is taken. See Fig. 1.

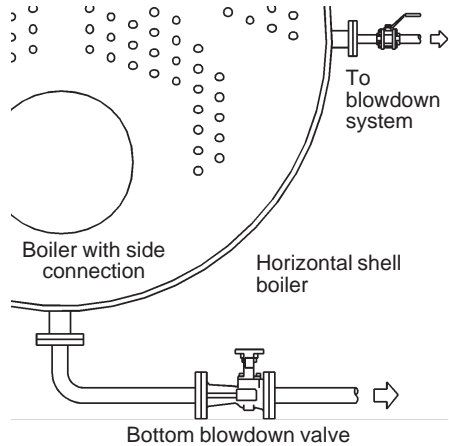


Fig. 1 Blowdown from side connection

If a side connection is not possible and a tee connection has to be taken from the main bottom blowdown pipe, make the connection at the top of the pipe, as near as possible to the boiler, before the bottom blowdown valve. Fig. 2. If a high level of suspended solids is likely, (old boiler or less than adequate water treatment) ensure the tee connection is the same diameter as the blowdown line for 300mm, then fit a reducer to ½" pipe.

It may also be useful to consider the use of a larger strainer than the one provided, as shown in Fig. 3.

The strainer provided in the kit has 0.8mm screen perforations. Do not fit a strainer screen finer than that provided as it may become blocked prematurely.

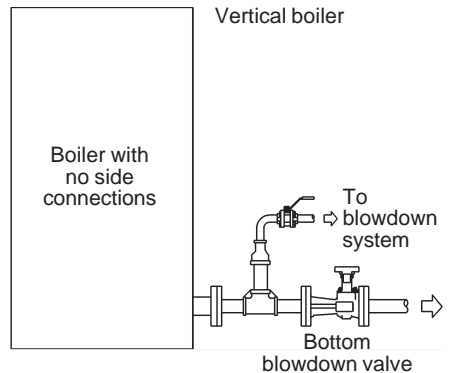
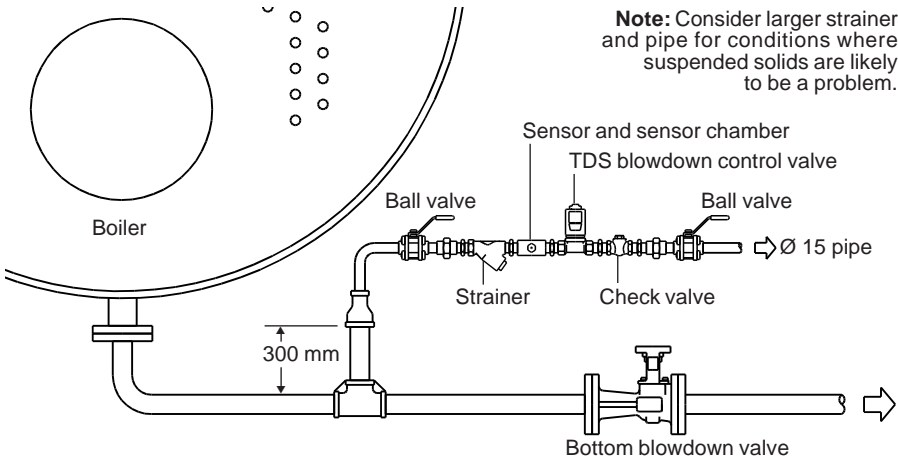


Fig. 2 Blowdown from bottom connection



**Fig. 3** Installation where no side connection is available and suspended solids are likely.

Install the system components in the order shown in Fig. 4, using 1/2" BSP connectors and PTFE tape.

Union fittings are recommended to allow easy removal of the assembly.

**Strainer**

Install with the flow in the direction of the arrow with the end cap downwards. Do not overtighten connectors.

**S10 sensor chamber**

Install the sensor chamber upstream of the blowdown valve, as close to the boiler as possible, either horizontally, or vertically with the flow upwards. The 3/8" BSP sensor connection should be horizontal so that the sensor may be fitted from the side.

A sample cooler may be connected to the 1/4" BSP connection on the sensor chamber for boiler water sampling. If not used, it must be plugged with the 1/4" BSP plug provided.

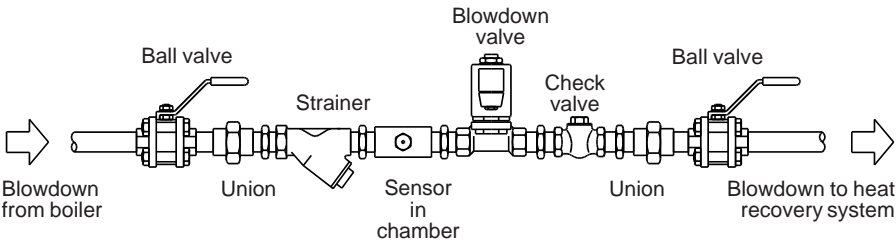
**CP10 sensor and PT2 plug tail.**

Fit the joint gasket and tighten the sensor to a torque of 50-56 Nm.

We do not recommend the use of PTFE tape on the thread, but a graphited or copper based sealing compound may be used to aid subsequent removal. Fit the plug tail using the gasket provided. Do not overtighten the union nut. When mechanical protection of the cable is required, the end nut may be removed from the plug tail and the M16 thread used to fit a flexible conduit adaptor.

**Blowdown valve**

Install with the flow in the direction of the arrow, in a horizontal pipeline, with the solenoid vertically above the valve. Do not overtighten the connectors into the brass body. For ease of installation the solenoid unit may be moved through 360° by slackening the top nut. The cable socket insert can also be repositioned if required.



**Fig.4** Typical installation

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### **Lift check valve**

Install with the flow in the direction of the arrow, in a horizontal pipeline with the screwed cap on top. Do not overtighten the connectors.

### **Ball valves**

May be installed in any plane with flow in either direction. Ensure that there is space available for free movement of the lever.

### **WARNING**

**National Regulations may call for a special type of isolating valve at the boiler shell.**

### **Discharge pipework**

In the UK and many other countries, for **single boiler installations** the blowdown may discharge into the bottom blowdown line downstream of the bottom blowdown valve.

For **multi boiler installations** the blowdown pipelines must be kept separate from the bottom blowdown lines up to the blowdown vessel. For further information in the UK see Health and Safety Executive Guidance Note PM 60.

### **WARNING**

**Other regulations or Guidance Notes may apply outside the UK.**

## **Maintenance**

Controllers require no maintenance.

The blowdown system, however, should be checked as follows:-

### **Weekly**

Take a sample of the boiler water through a sample cooler and measure its TDS, or conductivity. The Spirax Sarco MS 1 is a suitable instrument for this purpose.

Carry out a manual purge of the system.

Check that blowdown is actually discharged (e.g. by temperature or sound) and that the blowdown valve shuts off fully.

Operate the stop valves to ensure they shut off and are not seized or stiff.

### **Annually**

Isolate the system (or empty the boiler), inspect and service the system components as described in their relevant Installation and Maintenance Instructions.

## **Severe operating conditions**

Where it is suspected that scaling may be taking place, or where water quality is suspect, it may be necessary to increase the frequency of servicing.

Inspect the strainer, valves and sensor every month initially, increasing or decreasing intervals according to the degree of contamination found.

Always consult the local competent boiler authority for advice on the frequency of boiler inspections.