



***INSTRUCTION MANUAL***  
***CHEMTROL® BT110 & BT112***  
***BOILER INSTALLATION AND PROGRAMMING***  
***ADDENDUM***

***TECHNICAL SUPPORT***

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## *Introduction*

Congratulations on your selection of a CHEMTROL® BT110 / BT112 Programmable Controller for your water treatment facility.

CHEMTROL® Automation uses the most advanced electronic sensing technology to monitor and control the critical parameters for water treatment, i.e. conductivity, pH, Oxidation-Reduction Potential (ORP) and temperature. Also available is monitoring of flow rates for make-up and bleed water and influent/effluent filter pressures.

This Instruction Manual covers the BT110 and BT112 Models Controller. The controller offers the following features:

- Temperature Compensated Conductivity Control, Temperature monitoring, and three additive programs.
- Data logging is available on all models.
- Remote operation (with an internal 4G router or Ethernet Connection) is an option on all models.
- Communication through most Building Automation Systems (BMS module) is an option on all models.

## *Water Maintenance*

The accepted industry standard for monitoring the water quality in a boiler is electrical conductivity. Conductivity measures the ability of water to pass current. In the BT110 controller, it is measured in either TDS (total dissolved solids, measured in PPM), or microsiemens. With the BT110 and/or BT112 assembly, we have chosen the more efficient method of measuring both conductivity and temperature over their full ranges, and, through software, adjusting the conductivity reading for the changes in temperature.

In order to avoid the fluctuations in conductivity that can occur due to exposure of the sensor to flash steam, it is critical that the boiler probe be installed according to the Boiler Sensor Suggested Plumbing drawing, which is included with this document. (Refer to Sensor Installation Section)

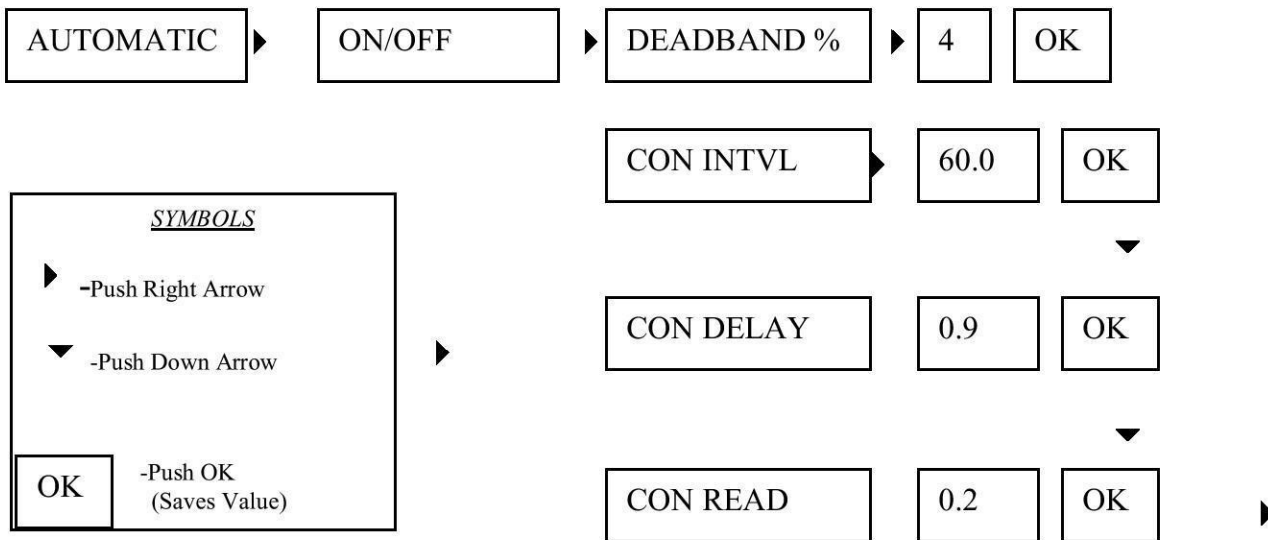
Small to mid-size boiler operations require a timed sampling procedure. Both models BT110 and BT112 offer this capability. The changes occur only in the automatic section of the conductivity control menus. Nothing else about the controller is changed from the CT110 Instruction Manual, which is provided.



## *Programming*

To program the timed-sample method of conductivity control, navigate to the Automatic menu of Conductivity for the controller. You accomplish this by pushing the right arrow on the Conductivity reading; then pushing the right arrow on “Conductivity Off”. Then scroll down to “Automatic”, and follow the following menu tree.

The following menu tree describes the options of the timed-sample control menu:



### DEFINITIONS

**DEADBAND %** - the span between the setpoint and relay activation. Should be at least 1% to avoid relay chatter.

**CON INTVL** – the interval of time, in minutes, between conductivity sampling cycles. This is programmable between 0.1 and 9999 minutes.

**CON DELAY** – During the sampling cycle, this is a time interval to fill the pipe. This delay helps to avoid reading during steam flash conditions. Limits: 0.1 to 99 minutes.

**CON READ** – during the sampling cycle, this is the amount of time to read conductivity, if the reading is below the setpoint. At the end of this interval, the timed-sample cycle begins. Limits: 0.1 to 9999 minutes.



## Sensor Installation

The boiler probe connections are as follows:

1. **Black Wire** – Conductivity Connection.
2. **White Wire** – Conductivity Connection.
3. **Red Wire** – Temperature Connection.
4. **Green Wire** – Temperature Connection.

There is a four-wire cable coming out of one of the cord grip openings at the bottom of the controller. The color-codes for this cable match the probe connections.

Please refer to Figures 1 and 2 for correct sensor installation. Figure 1 shows the orientation of the sensor in the cross fitting, and Figure 2 shows the location of the sensor in the piping system.

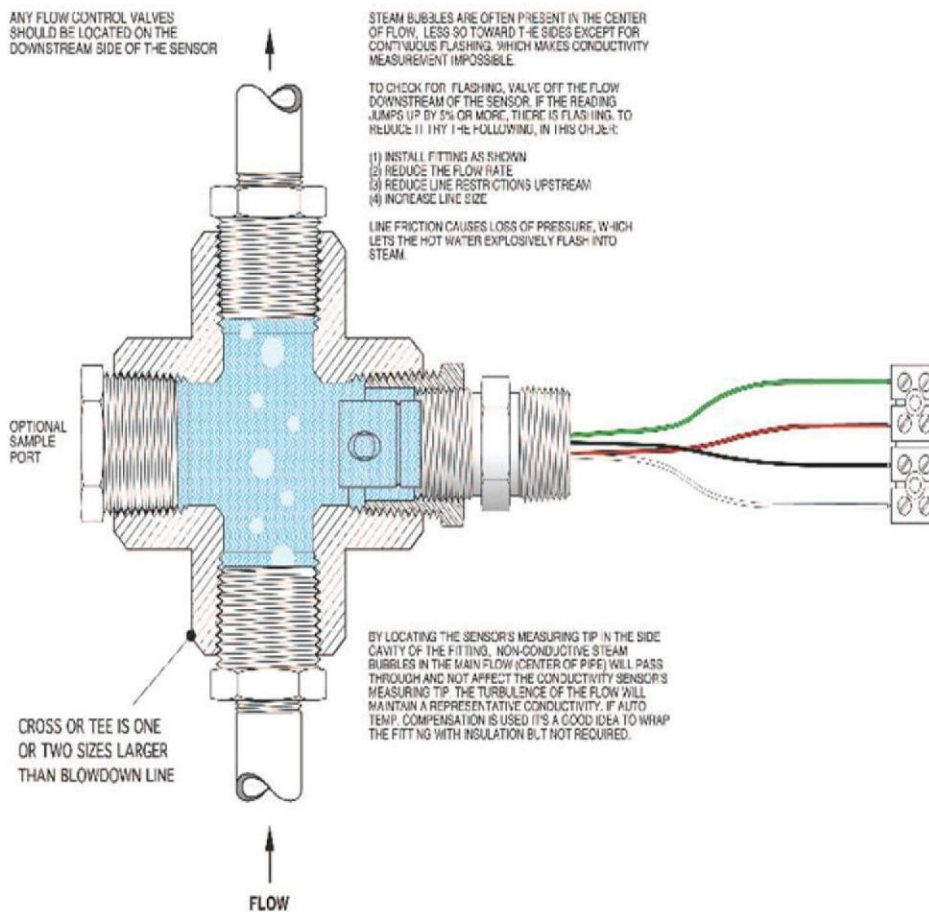


Figure 1. Sensor Orientation





Figure 2. Sensor Piping Location.

