



# Controllers / Instruments

## Boiler Water Controllers

Ordering Code	Description
<b>TDS-XP5-BP</b>	Sampling conductivity blowdown controller + manifold kit (either blowdown period or idle period starts after every sample, depending on conductivity of sample measured)
<b>AT200BB</b>	Time based blowdown controller + manifold kit (continuous cycle - blowdown period followed by idle period, repeated)
<b>T200BB</b>	Time based blowdown controller + manifold kit (blowdown period occurs every time boiler feed pump stops, ie boiler full)

**Note:** All manifold components supplied loose are to be assembled by a qualified boiler fitter



TDS-XP5-BP

## Description

The AT200BB, T200BB and TDS-XP5-BP boiler blowdown (bleed) systems are all designed to maintain the conductivity of the boiler water to a desired level. The TDS-XP5 actually measures the conductivity of the boiler water on a sample basis and decides whether to bleed the water (if the conductivity is too high) or go into an idle period before taking the next sample. The AT200BB and T200BB are time based, which are suitable for smaller boilers where the amount of blowdown required proportional to the boiler operating time is known.

## Features & Benefits

- Complete system - controller + manifold kit
- Bleed (blowdown) controlled via steam rated solenoid valve
- Easy to program
- TDS-XP5: LCD displays conductivity & Setpoint



AT200BB

## Operation

Mounted on a vertical surface at eye level, the boiler controller performs its control functions to give complete peace-of-mind water treatment.

### AT200BB:

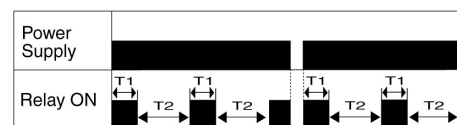
The AT200BB controller starts timing as soon as mains power is applied (usually when the boiler is operating).

When the AT200BB is powered, a BLOW-DOWN time commences. Once the BLOW-DOWN time is complete, an IDLE time commences. During the BLOW-DOWN time, the solenoid valve is energised, allowing boiler water to pass through. Once, the IDLE time is complete, the cycle starts again with another BLOW-DOWN time.

After experimentation, the adjusted time settings will provide sufficient blow-down time to keep the TDS of the boiler water at a desirable level.

The diagram below illustrates this:

**Rhomberg Timer Model AT200**  
**Function 2:** Asymmetrical Recycling. ON cycle first.



T1 = Time set for BLOW-DOWN time  
T2 = Time set for IDLE time



T200BB

## T200BB:

The T200BB is activated by the boiler feedwater pump to which it is connected. The boiler feedwater pump controls the make-up water addition which affects the total dissolved solids TDS entering the boiler.

Whenever the feedwater pump switches off (ie. the boiler is full), the T200BB is activated and blowdown commences. The blowdown solenoid opens and remains open for a time period set up by the operator (time ranges available are in seconds, minutes, hours or 10 hours). After experimentation, the correct time setting will provide sufficient blow-down time to keep the TDS of the boiler water at a desirable level.

The T200BB is connected so that it is continuously powered when the boiler is operating. This ensures that the blowdown time remains constant, regardless of when the feedwater pump switches on again.

The operation is illustrated below:



## TDS-XP5:

The TDS-XP5 controller has two modes of operation:

- Monitoring Mode
- Blow-down Mode

### Monitoring Mode:

During this mode the boiler conductivity ( $\mu\text{S}/\text{TDS}$ ) is monitored periodically. The steam solenoid valve is opened (activated) to draw a fresh boiler water sample past the probe. (The active period of the solenoid valve is called the 'Sample Time'.) The TDS-XP5 controller then closes the valve and measures the conductivity of the new sample. Should the measured conductivity ( $\mu\text{S}/\text{TDS}$ ) be below the setpoint, the controller enters a dormant period, called the 'Idle Time'. Both the 'Sample Time' and 'Idle Time' period are programmable.

This cycle is repeated until the measured conductivity ( $\mu\text{S}/\text{TDS}$ ) of the boiler water exceeds the Setpoint at which time the Blow-down mode commences.

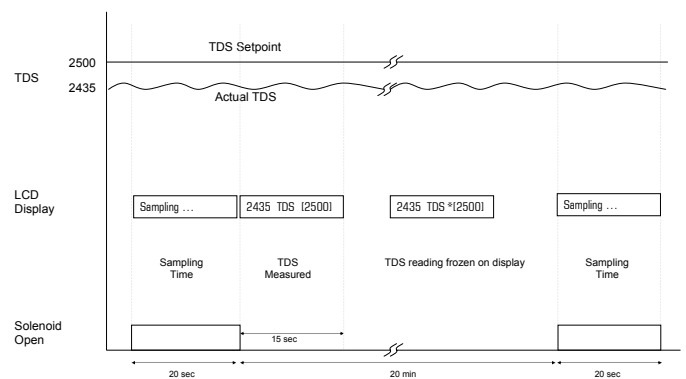
### Blow-down Mode:

Once the measured conductivity ( $\mu\text{S}/\text{TDS}$ ) of the boiler water exceeds the setpoint, the solenoid valve is activated (ie. opened). The solenoid will remain active for the programmed 'Blow-down' time plus the programmed 'sample time'. The TDS-XP5 controller then closes the solenoid valve and measures the conductivity ( $\mu\text{S}/\text{TDS}$ ) of the boiler water again. Should the conductivity ( $\mu\text{S}/\text{TDS}$ ) of the boiler water still be above the setpoint, the solenoid valve is re-opened and the 'Blow-down' cycle is repeated.

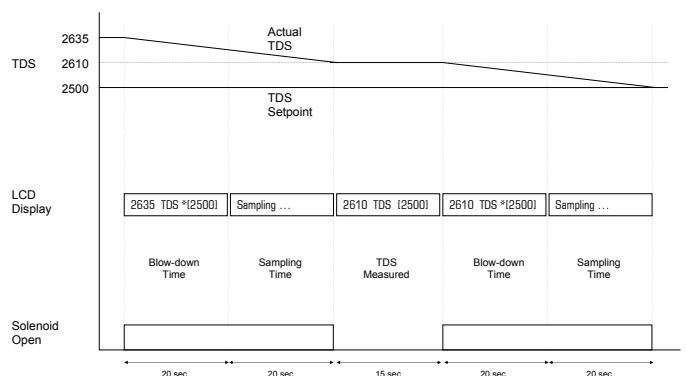
Once the conductivity ( $\mu\text{S}/\text{TDS}$ ) falls below the setpoint, 'Blow-down' is stopped and the monitoring mode is started again.

The timing diagrams below illustrate the operation of both Monitoring and Blow-down modes:

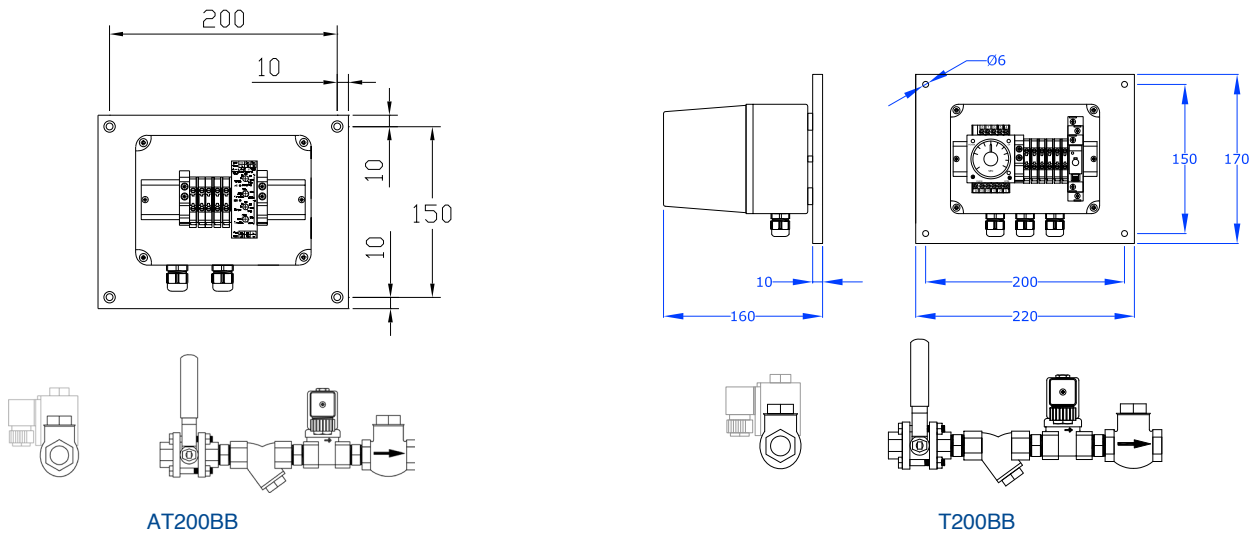
TDS-XP5: Monitoring Mode



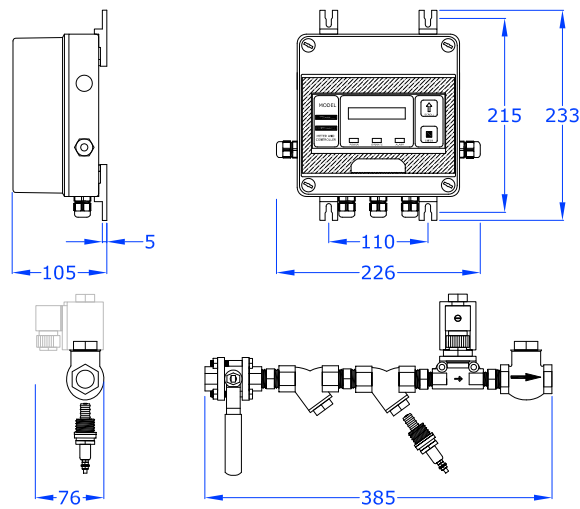
TDS-XP5: Blow-down Mode



## Dimensional Drawings



Note: Mounting holes 6mm diameter, countersunk



TDS-XP5-BP

## Options & Accessories

Ordering Code	Description
AF09-XP2	TDS-XP5 only: Isolated 4-20mA interface - proportional to measured TDS
AF10-XP2	TDS-XP5 only: Card with Isolated 4-20mA (or 1-5V) proportional to TDS, & 3 event outputs (NPN open collector): Solenoid valve output on, Alarm activated, controller Power Failure



## Specifications

	AT200BB	T200BB	TDS-XP5
<b>Controller Function</b>			
Variable Measured	Time		Conductivity ( $\mu\text{S}$ ) / Total Dissolved Solids (TDS)
Range	Bleed/Idle: 0.2s-4hr (ea)	Bleed: 0.1s-10hr	1 - 9999 $\mu\text{S}/\text{TDS}$
Resolution	-		1 $\mu\text{S}/\text{TDS}$
Accuracy	-		2%
Hysteresis	-		1 - 90%
Control Function	Bleed/blow-down of boiler water		
Device Controlled	Switches 240VAC to open blow-down valve		
Control Algorithm	Bleed/Idle cycle repeats during boiler operation	Bleed proportional to feed pump frequency	Cyclical bleed - ON/OFF control to TDS setpoint on a cycle with idle time
Re-transmission	-		Options AF09-XP2 (4-20mA) & AF10-XP2 (4-20mA + Events)
Displayed on LCD	-		TDS & Setpoint
<b>Controller Alarms</b>			
Activation	-		High & Low TDS, Max bleed time, Power failure
Relay Contact	-		1 C/O (ie fail-safe), 2A/250VAC, resistive load, potential free
<b>Manifold</b>			
Description	1/2" Isolation valve, 1/2" Y-strainer, 3/8" Blow-down solenoid valve, 1/2" check valve (Parts supplied loose)		1/2" Isolation valve, 1/2" Y-strainer, TDS Probe in 1/2" Probe holder, 3/8" Blow-down solenoid valve, 1/2" check valve (Parts supplied loose)
Included Probe	-		SP-JS5-BS1
Max pressure & temp.	1000kPa (10bar) @ 180°C steam rated		
<b>Electrical</b>			
Power Supply	220-240 VAC, 50/60Hz (110VAC available on request)		
Control Relay Output	240VAC switched		
Relay Rating	5A/250VAC, resistive load		10A/250VAC, resistive load
<b>Physical</b>			
Protection	IP55 (weatherproof)	IP65 (weatherproof)	IP55 (weatherproof)
Panel Dimensions	170 (h) x 220 (w) mm	345 (h) x 300 (w) mm	210 (h) x 220 (w) mm
Packaged dimensions	350mm (l) x 350mm (w) x 200mm (h)		
Packaged weight	5 kg		