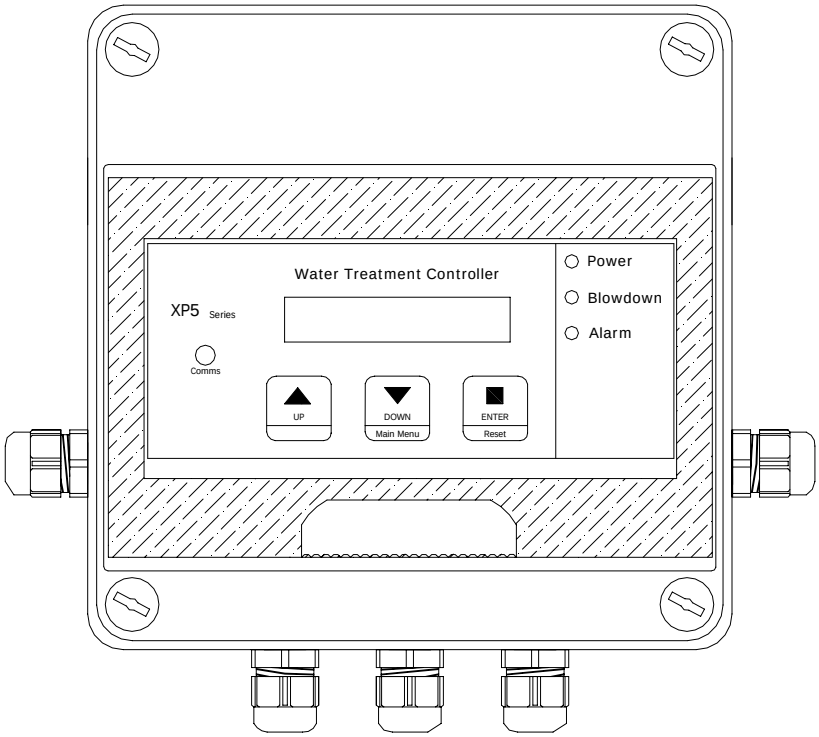
Instruction **Manual**

TDS-XP5
TDS-XP5-BP



BOILER BLOW-DOWN CONTROLLER
BOILER BLOW-DOWN CONTROL SYSTEM

Supplied by:

Convergent Water Controls Pty Ltd
2/4 Huntley Street, PO Box 7058
Alexandria NSW 2015

t: (02) 9698 3131
f: (02) 9698 3210
w: cwc.com.au
e: support@cwc.com.au

M1 ver 1.1

Manufacturer: Convergent Water Controls Pty Ltd, Sydney Australia.

Note: On-going product development at Convergent Water Controls may lead to changes in the specifications of this product.

Warranty: This product is guaranteed for a period of 12 months from installation date or 18 months from Invoice date (whichever occurs first). The warranty applies to manufacturing or component defects which may cause the unit to malfunction under specified conditions. The guarantee does not cover damage due to abuse, tampering or improper installation.

Disclaimer: Convergent Water Controls will not be held liable for any consequential damage or loss arising resulting from product malfunction.

TABLE OF CONTENTS

1. INTRODUCTION *4*

1.1 Components of a Boiler Blow-down System **4**

2. DESCRIPTION OF OPERATION *6*

2.1 Monitoring Mode **6**

2.2 Blow-down Mode **6**

3. INSTALLATION *8*

3.1 Mounting the Controller & Bypass Manifold Assembly **8**

3.2 Electrical Wiring Information **9**

3.3 Probe & Y-strainer Maintenance **10**

3.4 Adding Optional 4-20mA Card (ordering code AF09-XP2) **10**

4. COMMISSIONING *11*

4.1 Start-Up **11**

4.2 Menu Logic **12**

4.3 Set UNITS **14**

4.4 ZERO Calibration **15**

4.5 SLOPE Calibration **16**

4.6 RESET Calibration **17**

4.7 TEST OUTPUTS **18**

4.8 TAKE SAMPLE **19**

4.9 TIME & DATE **20**

4.10 FACTORY SETTINGS **21**

4.11 VIEW SETTINGS **22**

5. PROGRAMMING STEPS IN DETAIL *23*

5.1 Set Conductivity Setpoint **23**

5.2 Set Hysteresis **24**

5.3 Set Sample Time **25**

5.4 Set IDLE Time **26**

5.5 Set Blowdown Time **27**

5.6 Set mA Range **28**

5.7 Set Probe Factor **29**

5.8 ALARM Parameters **30**

5.9 Set TIMER Alarm **31**

5.10 Data Logging **32**

6. FACTORY SETTINGS / PROGRAMMABLE OPTIONS *33*

7. SPECIFICATIONS *33*

1. INTRODUCTION

The TDS-XP5 controller, normally used for boiler-blowdown control, is easy to set up and operate, and has built in features to warn the user should any part of the process fail. The instrument samples the boiler water periodically and when the TDS exceeds the user programmable SETPOINT, then a controlled blow-down takes place. Once the TDS is corrected, blow-down stops. The speed of TDS correction is programmable, preventing excessive blow-down.

IMPORTANT:

The manifold supplied with the TDS-XP5-BP system is rated at 180 °C, 10 bar maximum.

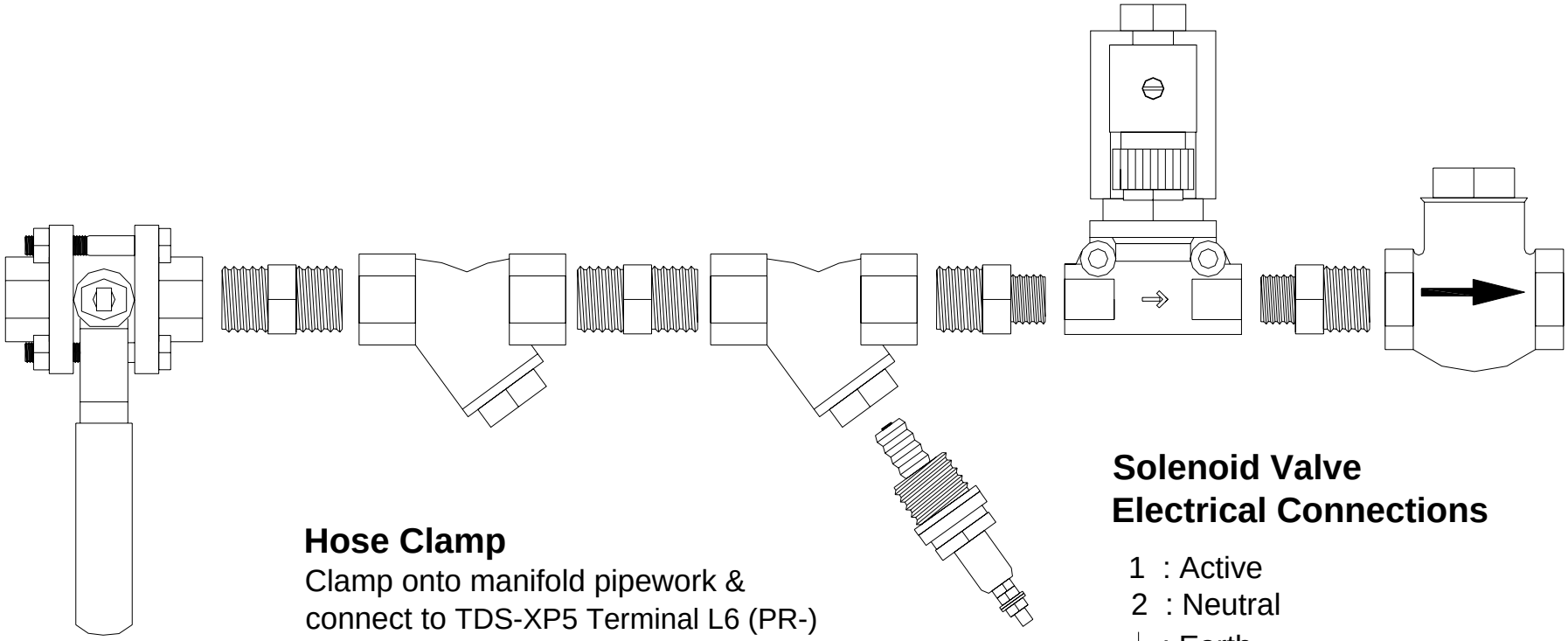
1.1 Components of a Boiler Blow-down System

The following components are required for boiler TDS control:

1. TDS Controller (eg. TDS-XP5).
2. Isolation Valve installed on outlet of sample line of boiler.
3. Y-strainer to prevent solids from clogging the solenoid valve.
4. Conductivity Probe.
5. Steam Solenoid Valve.
6. Check Valve.
7. Blow-down line.

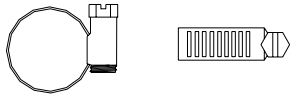
The diagram overleaf outlines the Bypass Assembly used in a boiler blow-down system. This assembly consists of an isolation valve, Y-strainer, probe & probe holder, a steam solenoid and a check valve.

Manifold Components



Hose Clamp

Clamp onto manifold pipework &
connect to TDS-XP5 Terminal L6 (PR-)



Solenoid Valve
Electrical Connections

1 : Active
2 : Neutral
⏚ : Earth

2. DESCRIPTION OF OPERATION

The TDS-XP5 controller has two modes of operation:

- Monitoring Mode
- Blow-down Mode

2.1 Monitoring Mode

During this mode the boiler conductivity (**μS**/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 (**μS**/TDS) be below the setpoint, the controller enters a **dormant** period, called the **'Idle Time'**. Both the **'Sample Time'** and **'Idle Time'** periods are programmable.

This cycle is repeated until the measured conductivity (**μS**/TDS) of the boiler water exceeds the Setpoint at which time the **Blow-down mode** commences.

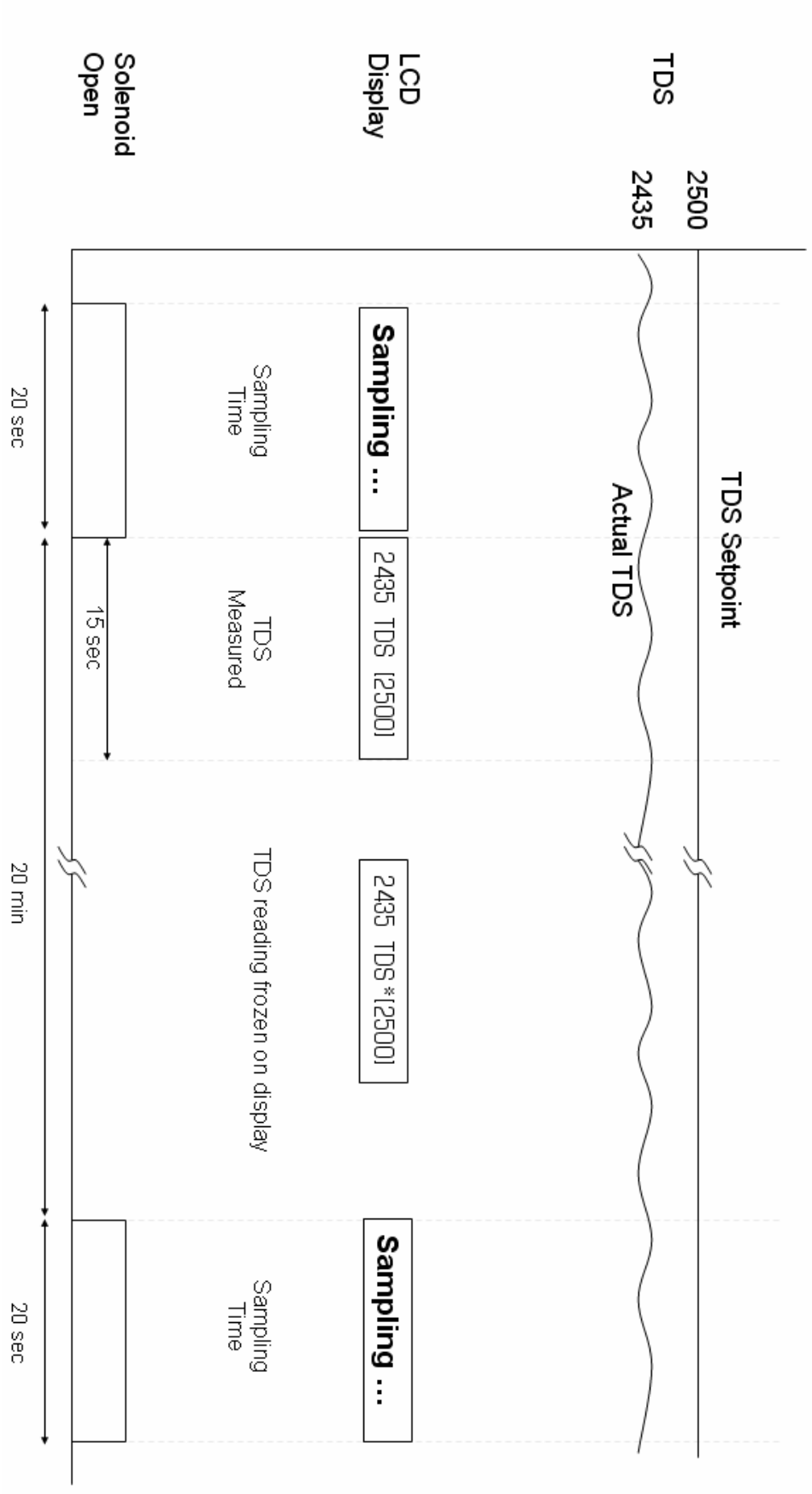
Important: See diagram of Monitoring Mode on page 7

2.2 Blow-down Mode

Once the measured conductivity (**μS**/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. The TDS-XP5 controller then closes the solenoid valve and measures the conductivity (**μS**/TDS) of the boiler water again. Should the conductivity (**μS**/TDS) of the boiler water still be above the setpoint, the solenoid valve is re-opened and the **'Blow-down'** cycle is repeated. In between blow-down cycles the TDS-XP5 pauses for a programmed period of time before the even if the conductivity is above the Setpoint. The pause period is called the blow-down wait period. This period is programmable up to 99 seconds.
Once the conductivity (**μS**/TDS) falls below the setpoint, **'Blow-down'** is stopped and the monitoring mode is started.

Note: The TDS-XP5 is not temperature compensated and the conductivity readout will drop as the sample cools down. This will not be a true reflection of the boiler TDS. The TDS-XP5 will freeze the display 15 seconds after a sample. This will ensure that the readout on the display is a true reflection of boiler TDS. The display will show an asterisk next to the SETPOINT when the displayed TDS is frozen.

Monitoring Mode



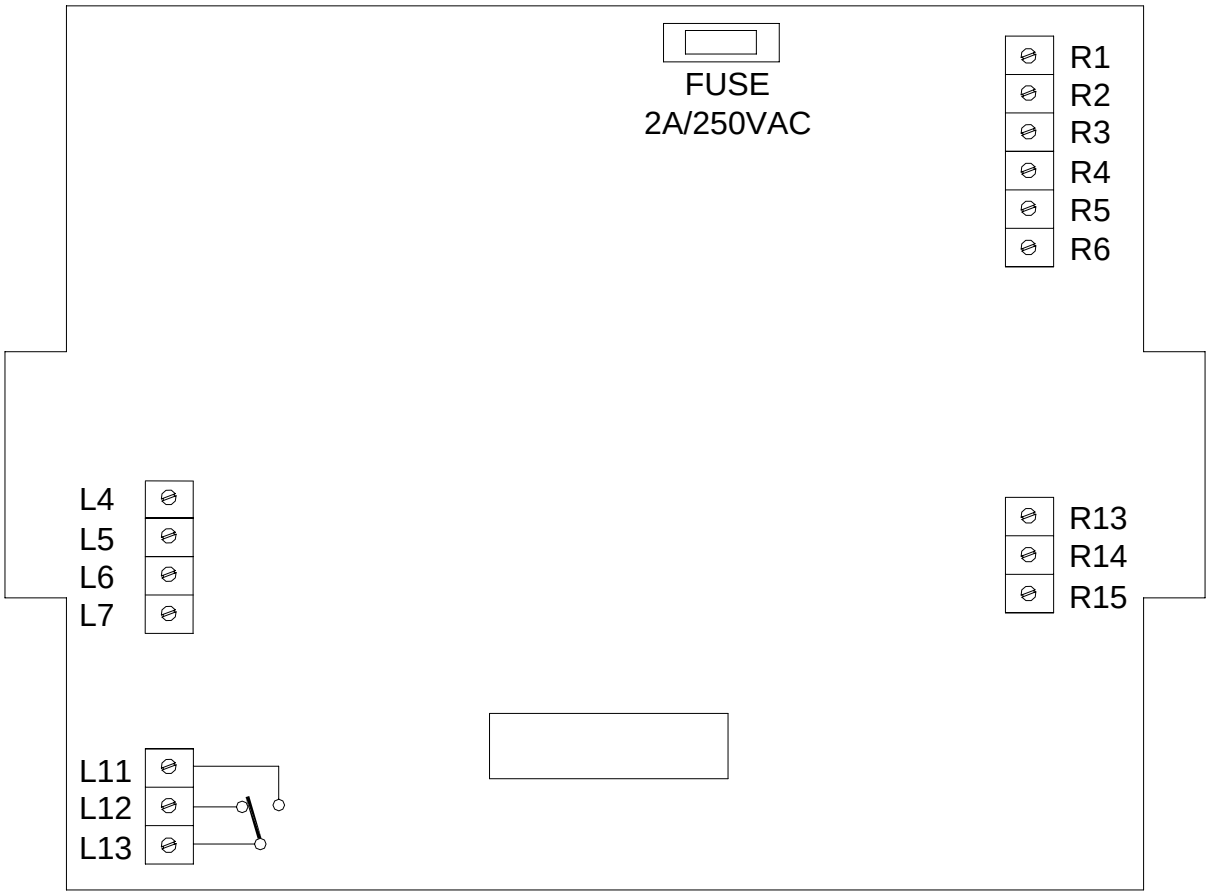
3. INSTALLATION

3.1 Mounting the Controller & Bypass Manifold Assembly

1. Mount the controller on a flat vertical surface away from extreme heat, humidity or areas where temperature variation is extreme.
2. Mount the TDS-XP5 such that the instrument is at eye-level to allow good visibility of the LCD display.
3. Make up the bypass manifold assembly as shown in section 1.1 which should be plumbed from the sample line. THIS SHOULD ONY BE PERFORMED BY A QUALIFIED BOILER FITTER.
4. Use sufficient PTFE tape to provide leak-proof connection to sample line and other fittings.
5. Fit the isolation valve side of the bypass assembly to the sample line of the boiler.
6. Fit the other end of the bypass assembly to the main blow-down line. If necessary, weld a socket to the blow-down line. Make sure that no manual 'bottom' blow-down takes place when doing this installation.
7. Wire the probe by using two crimp lugs. The first lug must be wired to the probe electrode, which is located at the tip of the exposed part of the probe. Using fine sandpaper, sand down any paint or coating on the exposed pipe-work and with the aid of a hose clamp (which should be stainless steel), fit the other lug between the pipe-work and clamp (this serves to ground the probe). Tighten the clamp to secure good electrical connection between the pipe-work and the lug.
8. See section 3.2 below for wiring the probe and solenoid to the TDS-XP5 controller.

3.2 Electrical Wiring Information

The diagram below shows the connections to the TDS-XP5 controller circuitry.



Note: Silicone coated wire is recommended for wiring the probe and solenoid.

L4:	Screen (Optional)
L5:	Conductivity Probe (PR+) ie. Probe Tip
L6:	Conductivity Probe (PR -) ie. Probe body/manifold
L7:	not used
L11+ L13:	Alarm Relay N/O volt-free (10A, 250Vac Resistive)
L12+ L13:	Alarm Relay N/C volt-free (10A, 250Vac Resistive)

R1:	Mains Active 240VAC (power supply)
R2:	Mains Neutral
R3:	Auxiliary Continuous Active 240VAC (2A Fused)
R4:	Auxiliary Neutral
R5:	Output (solenoid) Active 240VAC (2A Fused)
R6:	Output (solenoid) Neutral
R13 – R15:	Earth

Fuse: 2A/250VAC (M205, 20mm x 5mm diameter)

Notes on Alarm Relay Contacts :

1. Alarm relay is energised (ie. L11 connected to L13) during normal operation of the unit.
2. Alarm relay de-energises (ie. L12 connected to L13) when an alarm is raised or when the unit loses power.

3.3 Probe & Y-strainer Maintenance

The probe's electrode should periodically be cleaned to maintain accurate TDS measurements. The frequency of cleaning required will vary from one application to another.

To clean the probe, first close the isolation valve. Then remove the crimp lug from the probe and unscrew the probe from the manifold. The probe can normally be cleaned using a cloth or paper towel. Occasionally the probe's stainless steel electrode may be coated with certain substances which requires more vigorous cleaning (this coating may not always be visible). To clean a coated electrode, use a fine grit abrasive, such as emery paper.

After cleaning, apply more Teflon® tape to the probe thread and screw back into the manifold.

The controller should always be calibrated after probe cleaning.

The Y-strainer should also be cleaned before opening the isolation valve again.

3.4 Adding Optional 4-20mA Card (ordering code AF09-XP2)

The TDS-XP5 can be fitted with an optically isolated 4-20mA interface card to provide an output to a data logger, chart recorder or building management system. The interface card is an ordering option and can be retro-fitted to the TDS-XP5, or can be supplied factory fitted.

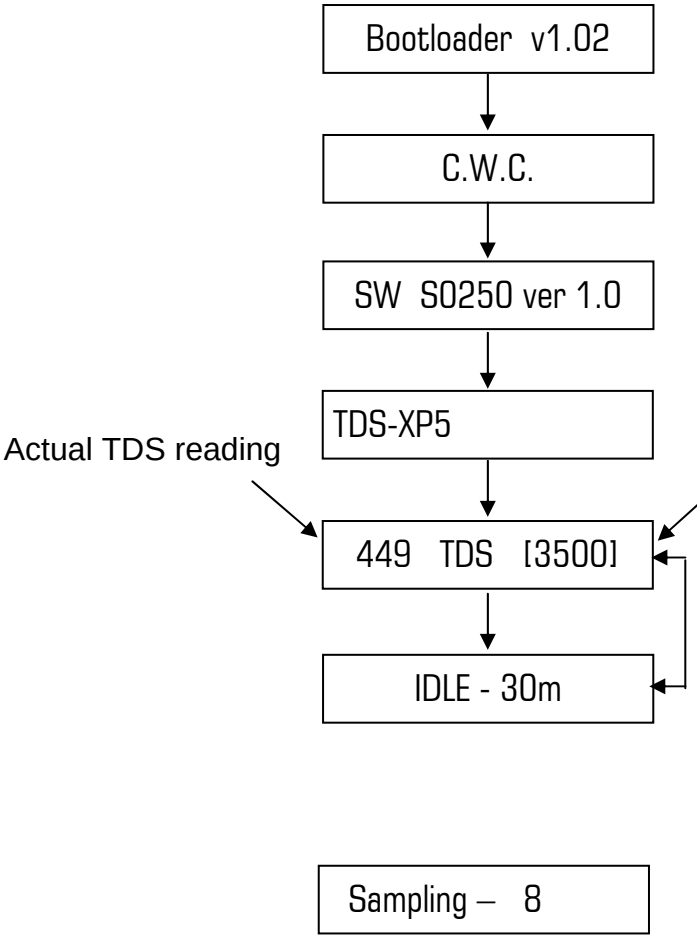
The AF09-XP2 optional kit consists of the following:

1. Optically isolated 4 – 20mA card
2. Interconnecting communications cable.
3. 2 x 25mm metal spacers.

4. COMMISSIONING

4.1 Start-Up

A few seconds after power-up, the Mains ON LED should illuminate. The LCD display will indicate the following:



The display will alternate between the two screens until the indicated idle time has lapsed. When the time lapses, the solenoid valve will activate, drawing a sample of boiler water past the probe. The LCD display will indicate Sampling:

Sampling time is indicated on the display and will count down to zero in seconds until sampling is complete. Blowdown LED (orange) is activated for the duration of the sampling time. Once the sampling period is finished, the display will revert to operating mode and all the relevant information is displayed as explained below.

or …

Frozen TDS reading (ie. TDS of most recent sample measured)

*** denotes frozen TDS reading**

or …

Note: The TDS-XP5 is not temperature compensated and the conductivity readout will drop as the sample cools down. This will not be a true reflection of the boiler TDS. The TDS-XP5 will freeze the display for approximately 15 seconds after a sample. This will ensure that the readout on the display is a true reflection of boiler TDS. The display will show an asterisk next to the SETPOINT when the display is frozen.

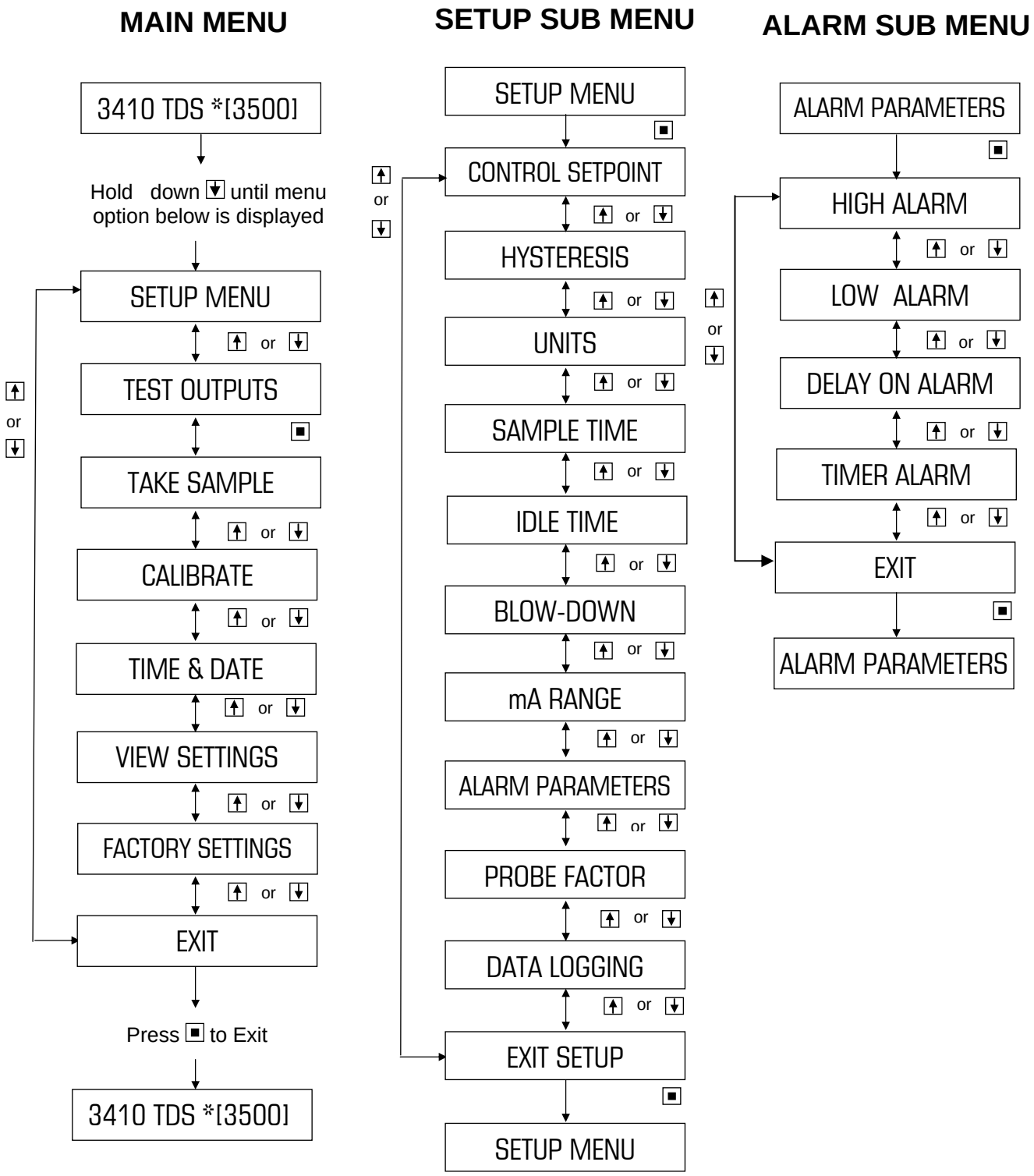
Display **during normal operation**:	Measured TDS & TDS Setpoint, as shown above.
Display **during programming**:	Programming information (eg. “SET: Setpoint”).
Display **if alarm is reported**:	Displays alarm activated, eg. “**Alarm !! [HIGH]**”

4.2 Menu Logic

The TDS-XP5 has an advanced but very user-friendly menu system:

- The menu structure is circular
- The relevant menu item, or programmed value flashes
- Up & Down arrow pushbuttons allow you to scroll through the menu items and to increase/decrease programmed settings
- The MAIN MENU expands to several levels of SUB MENUS when pressing ENTER on various menu items
- The LCD is backlit

The MAIN MENU of the controller is illustrated as follows (see next page):


MAIN MENU
SETUP SUB MENU
ALARM SUB MENU
3410 TDS *[3500]
Hold down until menu option below is displayed
SETUP MENU
TEST OUTPUTS
TAKE SAMPLE
CALIBRATE
TIME & DATE
VIEW SETTINGS
FACTORY SETTINGS
EXIT
Press to Exit
3410 TDS *[3500]
or
SETUP MENU
CONTROL SETPOINT
HYSTERESIS
UNITS
SAMPLE TIME
IDLE TIME
BLOW-DOWN
mA RANGE
ALARM PARAMETERS
PROBE FACTOR
DATA LOGGING
EXIT SETUP
SETUP MENU
ALARM PARAMETERS
HIGH ALARM
LOW ALARM
DELAY ON ALARM
TIMER ALARM
EXIT
ALARM PARAMETERS

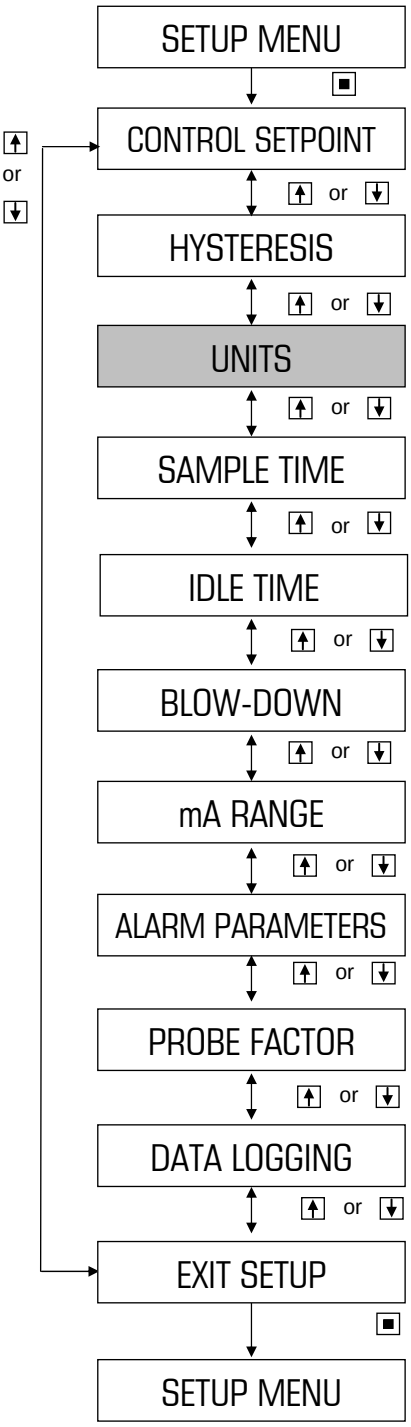
4.3 Set UNITS

Conductivity can be displayed in either:

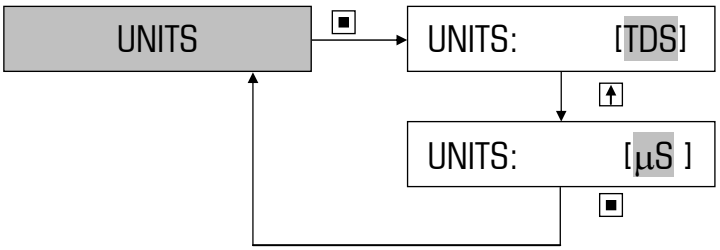
TDS (ie. Total Dissolved Solids), or
μS (ie. microsiemens)

The displayed units, ie. either TDS or μS should be selected before performing calibration and before programming conductivity setpoint.

To leave the display in TDS, ie. factory default setting, proceed to section 4.4.



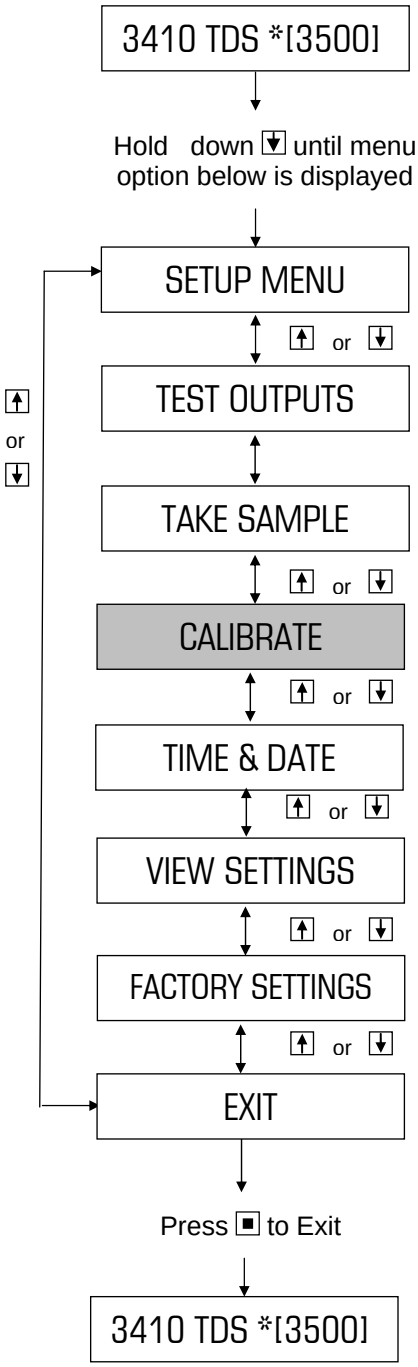
Example:
Changing the factory default of TDS to μS

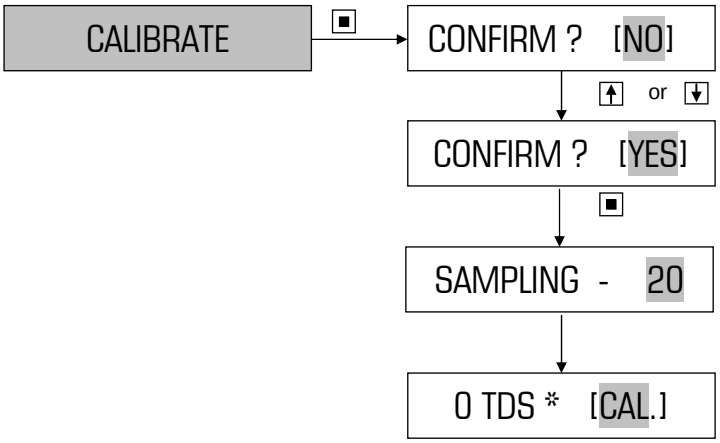


4.4 ZERO Calibration

The TDS-XP5 has a 2 point calibration system. The controller is factory zero calibrated and zero calibration should not be necessary. However, zero calibration can be confirmed as follows:

Disconnect the probe wire from the tip of the probe, then proceed as follows:





The display should read zero or very close to zero

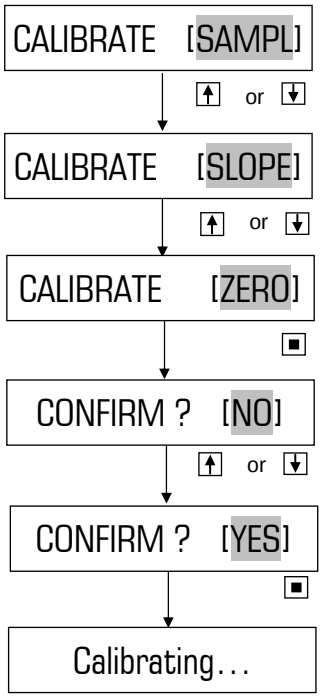
Should Zero calibration be necessary, leave the probe disconnected, hold ▼ for 3 seconds and follow the illustration below:

Item flashing on display:

▼ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

If another sample is required,
Press ■ on CALIBRATE **[**SAMPL**]**



Re-connect the probe and exit calibration mode by holding ▼ for 3 seconds, then scroll to CALIBRATE [EXIT] and press ■.

4.5 SLOPE Calibration

Take a neutralised sample of water from the boiler and measure the TDS with a hand-held conductivity meter. Should the TDS readout on the display differ from the sample taken, calibrate the controller as follows:

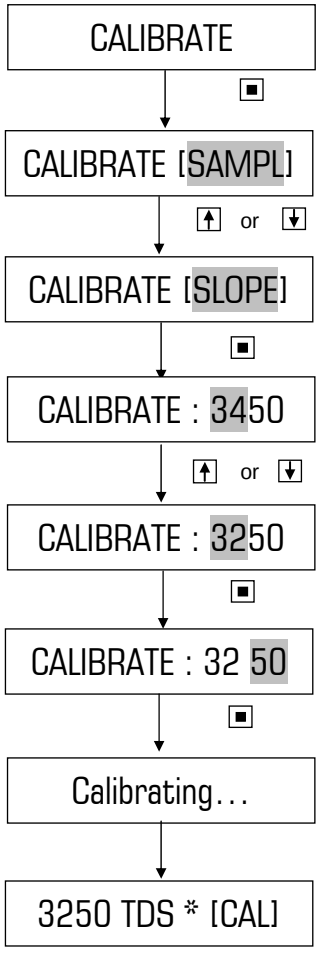
1. Consult the previous section and enter calibration mode.
2. The display of the controller will now continuously display the conductivity as measured by the probe.
3. Lets assume the controller displays a reading of say 3450 TDS and the actual conductivity is 3250 TDS. This new value is then programmed into the controller as follows:

Item flashing on display:

⊡ Press to Scroll
▣ Press to Select/Enter

Note: Shading represents flashing

If another sample is required,
Press ▣ on CALIBRATE **[**SAMPL**]**



Now and exit calibration mode by holding ⊡ for 3 seconds, then scroll to CALIBRATE [EXIT] and press ▣.

4.6 RESET Calibration

If for some reason the unit cannot be calibrated, resetting the Calibration of the controller can, in most cases correct the internal software calibration of the controller. **A Slope Calibration will likely be necessary after a Calibration Reset.**

Consult Section 4.4 and enter Calibration mode

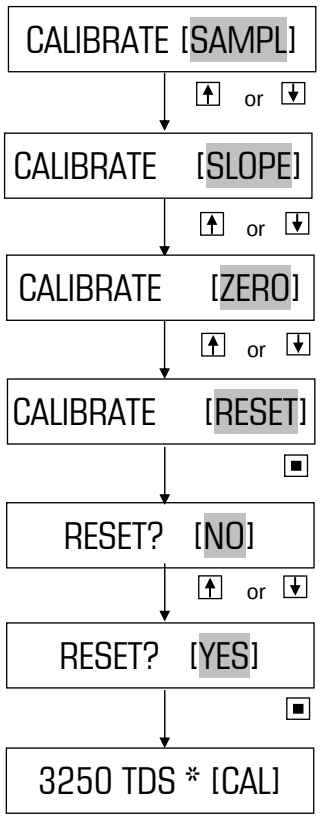
Follow the illustration below to Reset the Controller's Calibration:

Item flashing on display:

▼ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

If another sample is required,
Press ■ on CALIBRATE **[**SAMPL**]**

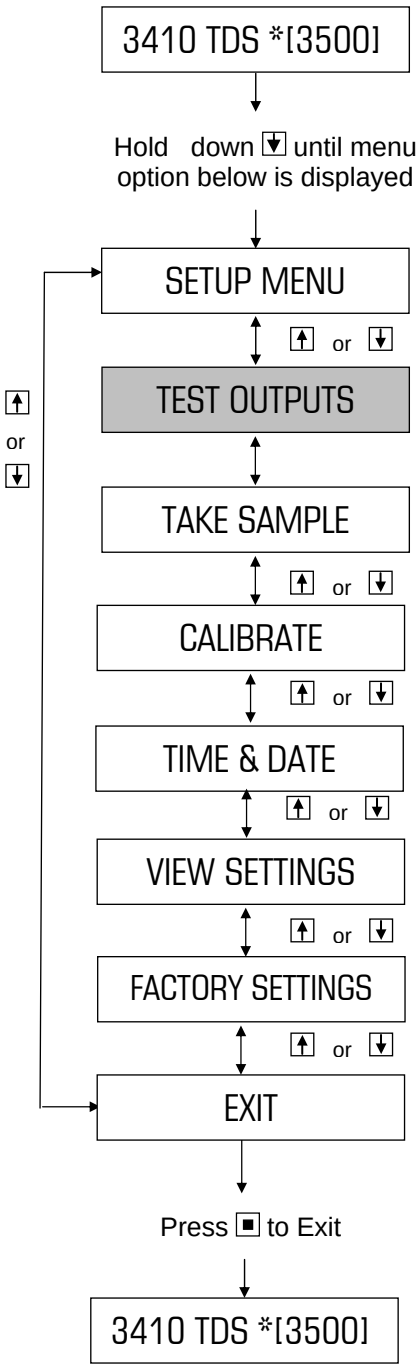


Now and exit calibration mode by holding ▼ for 3 seconds, then scroll to CALIBRATE [EXIT] and press ■.

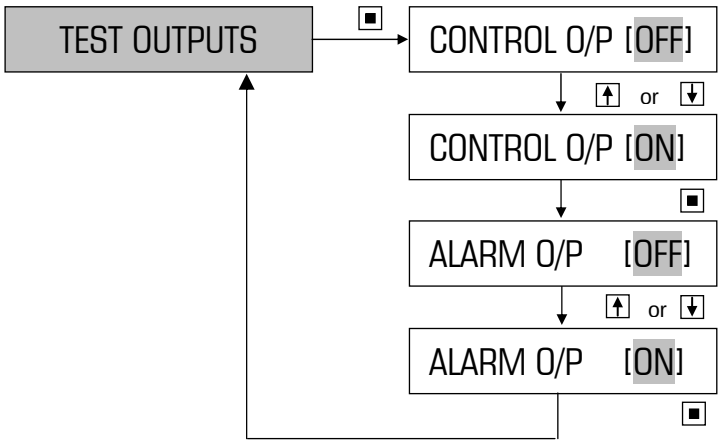
Important: Remember to do a Slope Calibration again, after resetting the calibration.

4.7 TEST OUTPUTS

For Manually Testing the operation of the Blowdown output, and Alarm output, please follow the instructions below:



To toggle the outputs on or off, press the up or down arrow keys.



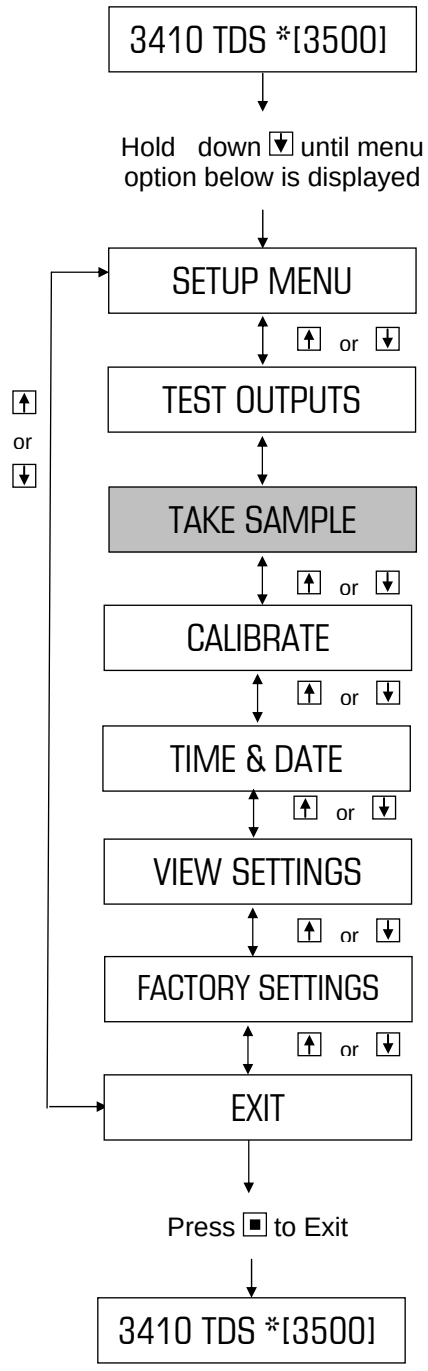
Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

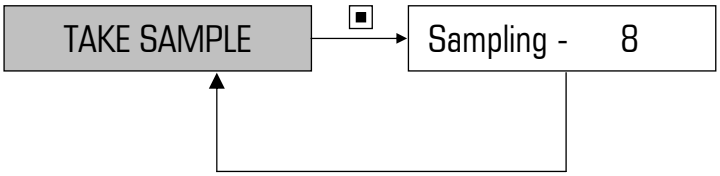
4.8 TAKE SAMPLE

To Manually take a sample from the boiler water, please follow the instructions below. This is done in order to get a current TDS reading.



The Sample time is based on the set value (see section 5.3) of the controller. The default value is 8 seconds.

In the example below, the controller will take a sample for 8 seconds, counting down, then automatically enter the Setup Menu again under 'Take Sample'. To take another sample, press Enter again.



Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

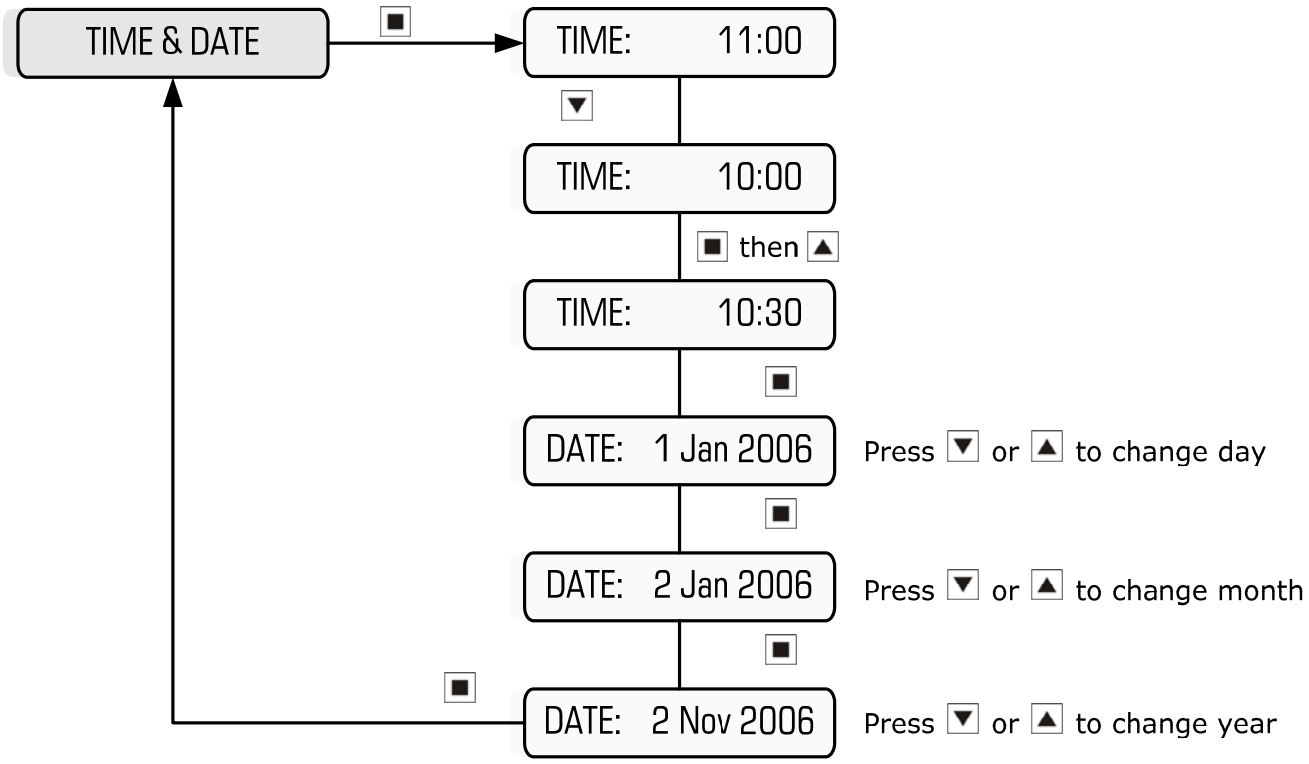
Note: Shading represents flashing

Note: Once the sample time counts down to zero, the normal display is shown and the TDS reading is current until the asterisk (*) is displayed. To obtain a new current reading, repeat the procedure.

4.9 TIME & DATE

Main Menu > *TIME & DATE*

Please note that the time and date setting will not keep if the power is switched off. This unit currently does not have a battery for data logging purposes, which is a feature that will soon be incorporated into the unit.



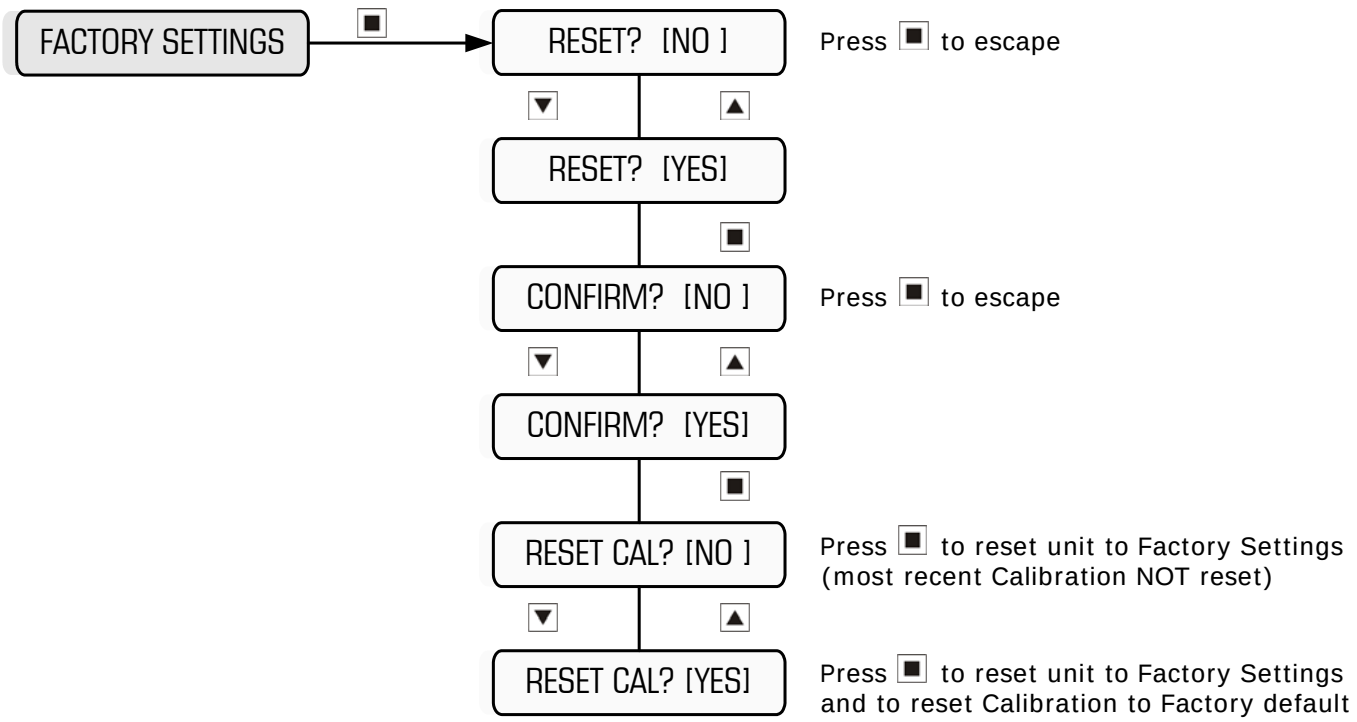
Example: Setting time & date to 10:30 on 2 Nov 2006

4.10 FACTORY SETTINGS

Main Menu > *FACTORY SETTINGS*

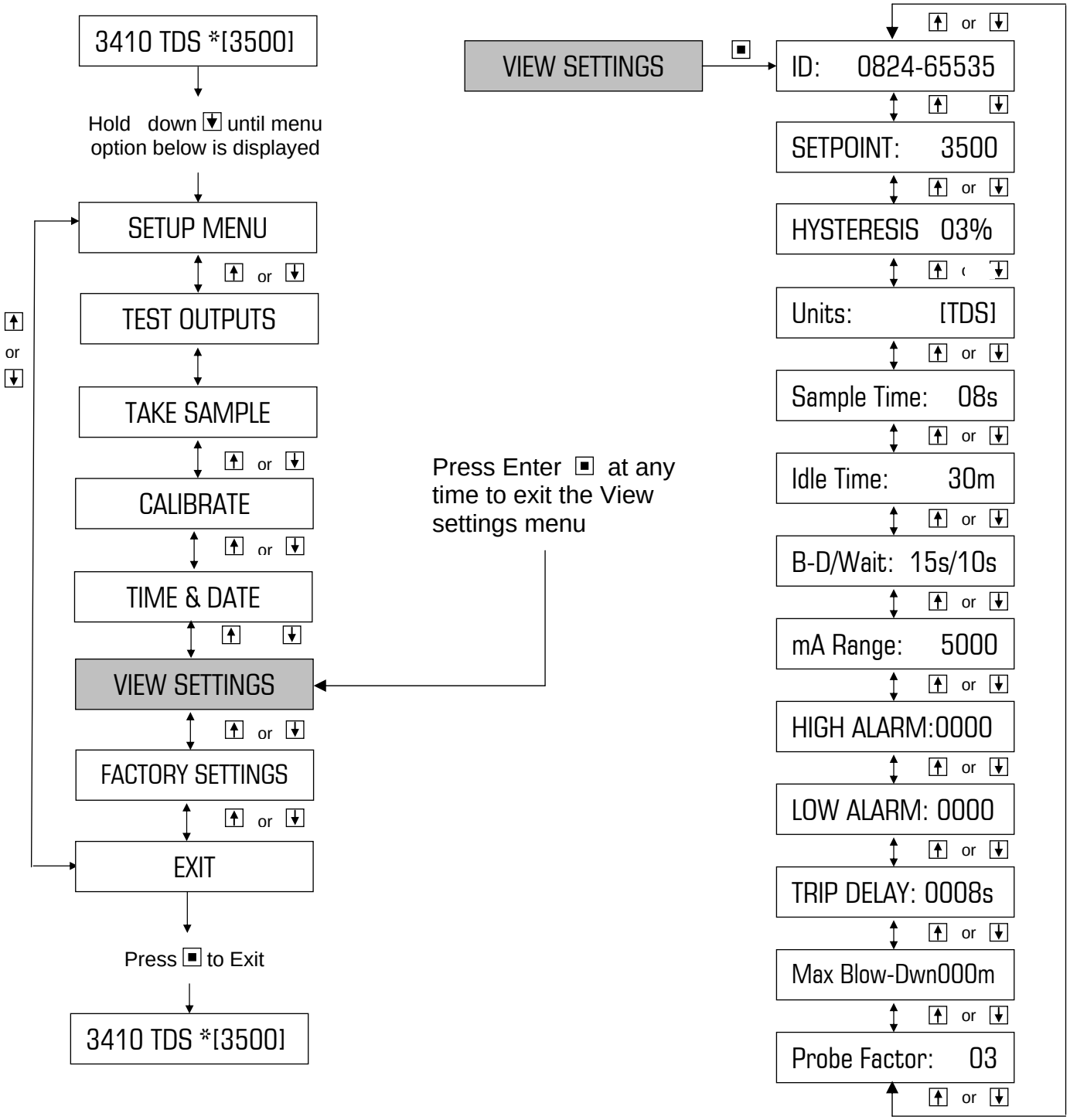
CAUTION:

- Enter this part of the program ONLY if you wish to erase your program settings.
- The default settings (listed in Section 6 of this manual) most likely will not suit your application, so it will be necessary to reprogram the controller with your desired settings.
- This menu gives the option of resetting the calibration as well.



4.11 VIEW SETTINGS

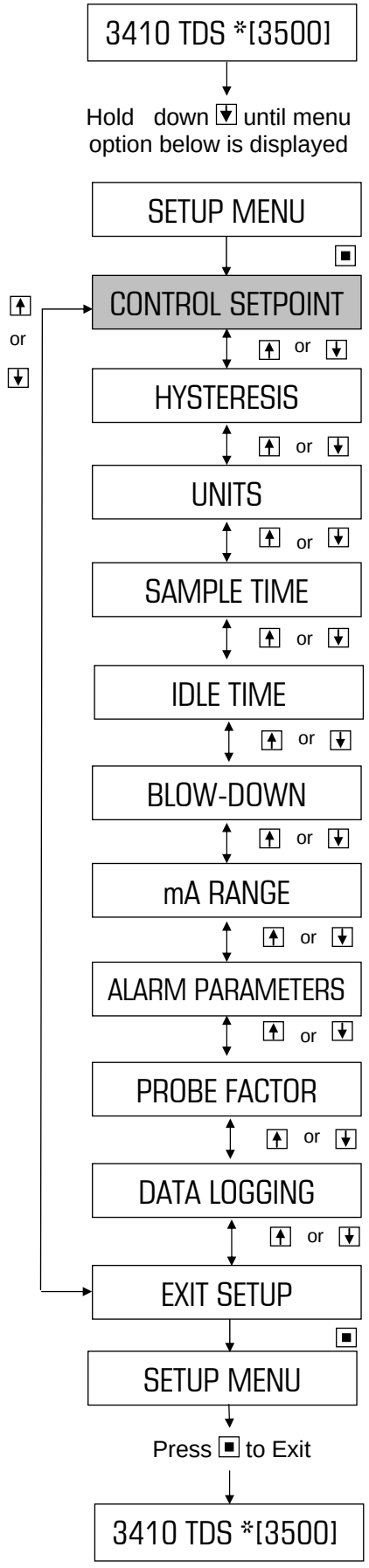
Follow the procedure below if you wish you view the current settings of the controller, without having to go into the different menu settings:



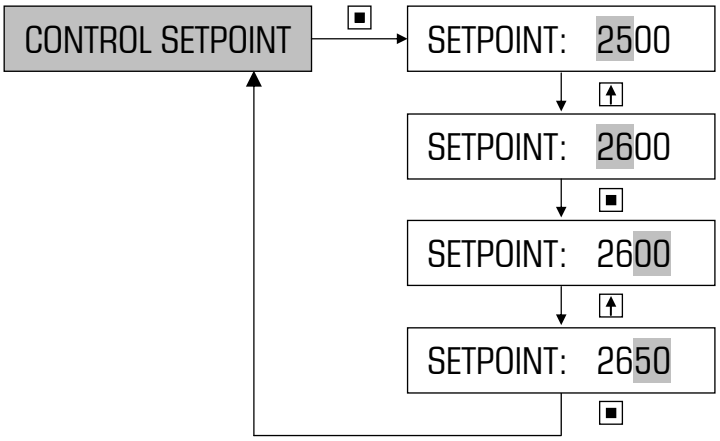
5.PROGRAMMING STEPS IN DETAIL

5.1 Set Conductivity Setpoint

The main operation of the TDS-XP5 is conductivity Blowdown control.
The setpoint is entered as an actual number (eg. 2500 TDS).



Example:
Increasing factory default setpoint of 2500 TDS to a new setting of 2650 TDS

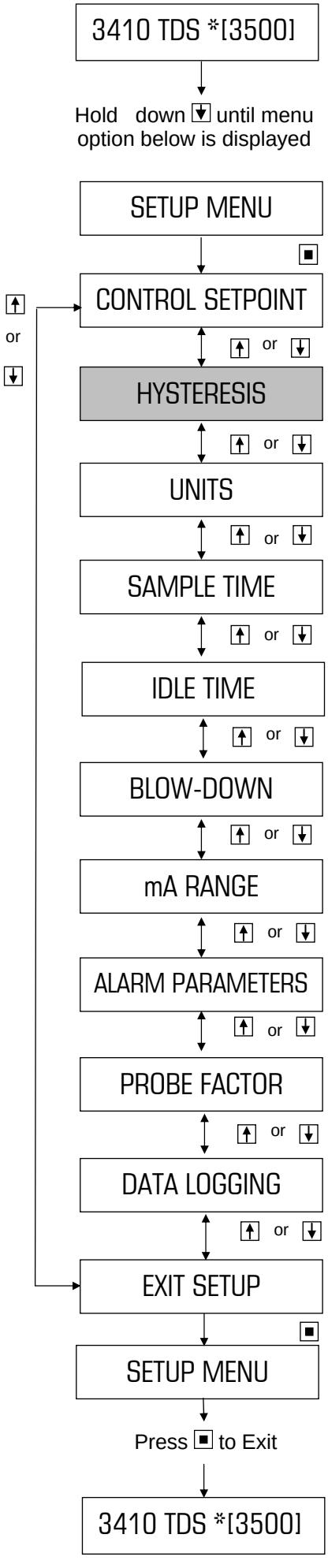


Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

5.2 Set Hysteresis

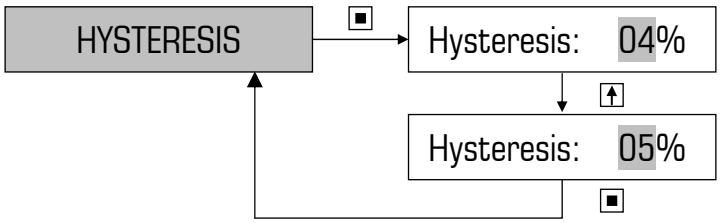


Hysteresis sets the margin/band of TDS control. 'Hysteresis' is the difference in TDS level at which the solenoid valve opens and closes.

Blowdown will occur when the TDS readout rises above the SETPOINT. Blowdown will stop once the readout drops below the SETPOINT minus a percentage. (This percentage is the hysteresis value and is a percentage of the SETPOINT).

For example, if the SETPOINT is 2500 TDS and the hysteresis value is 4% then the calculated hysteresis value is 100 TDS and when subtracted from the Setpoint, the Setpoint will be 2400. When the readout drops below 2400 TDS, Blowdown will stop.

Example:
Increasing factory default hysteresis of 4% to a new setting of 5%

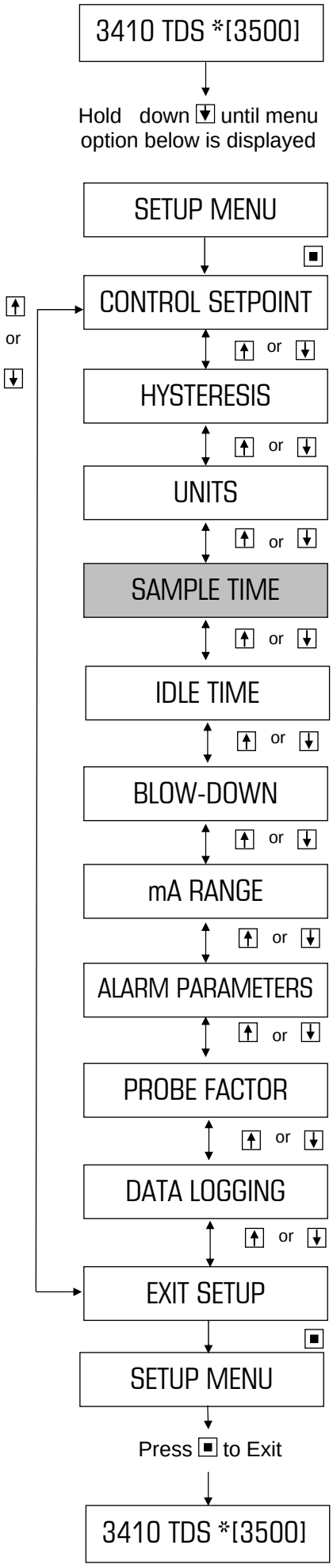


Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

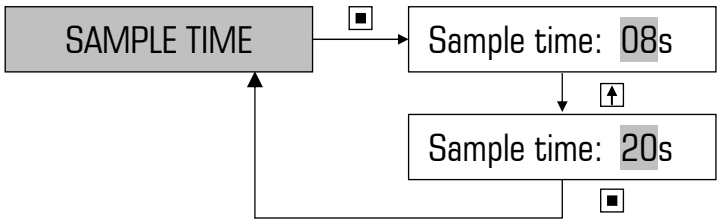
5.3 Set Sample Time



To leave the default factory Sample Time setting of 8 seconds, proceed to section 5.4. A time of 8 seconds is recommended as a starting point.

The sample time is the period the solenoid valve stays open to draw a fresh boiler water sample past the probe, before taking the conductivity measurement.

Example:
Increasing factory default Sample time of 8sec to a new setting of 20 sec.

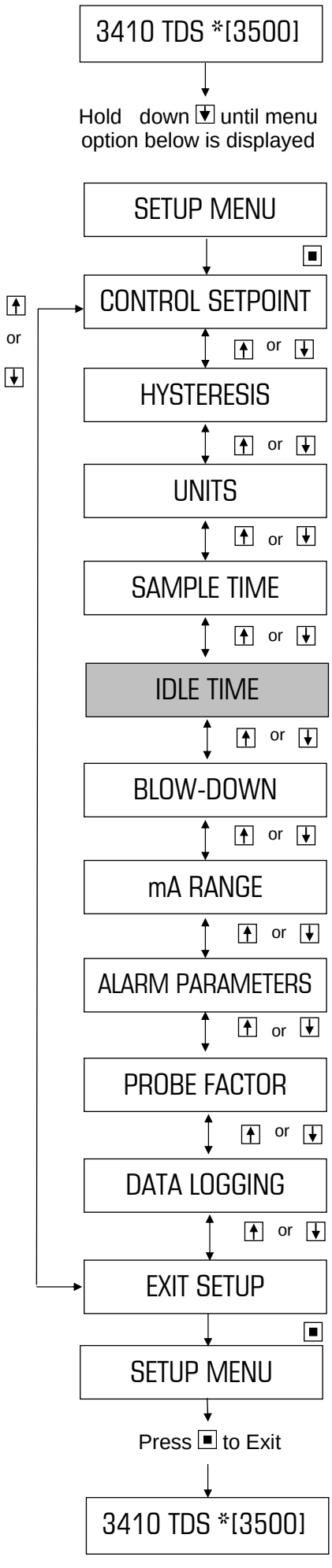


Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

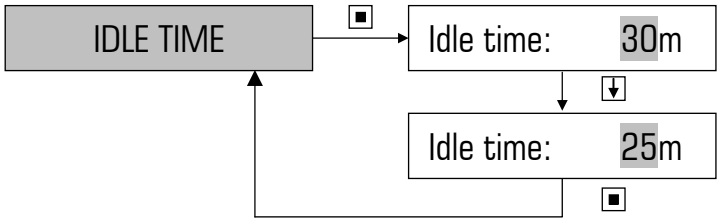
5.4 Set IDLE Time



To leave the default factory IDLE Time setting of 30 minutes, proceed to section 5.5. A time of 30 minutes is recommended as a starting point.

The IDLE time is the dormant time between samples, where the controller is not active. The controller is only in this state when the TDS is below the Setpoint.

Example:
Redusing factory default IDLE time of 30 min to a new setting of 25 min.

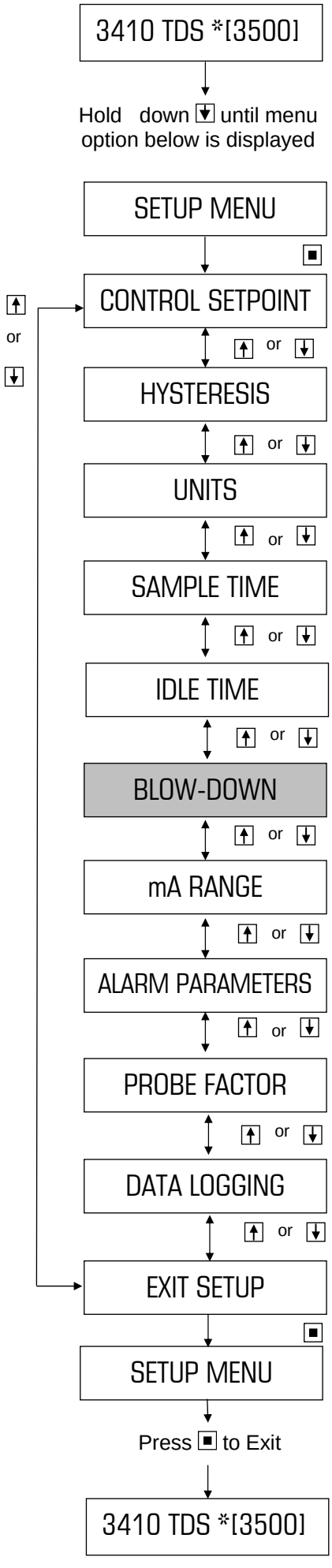


Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

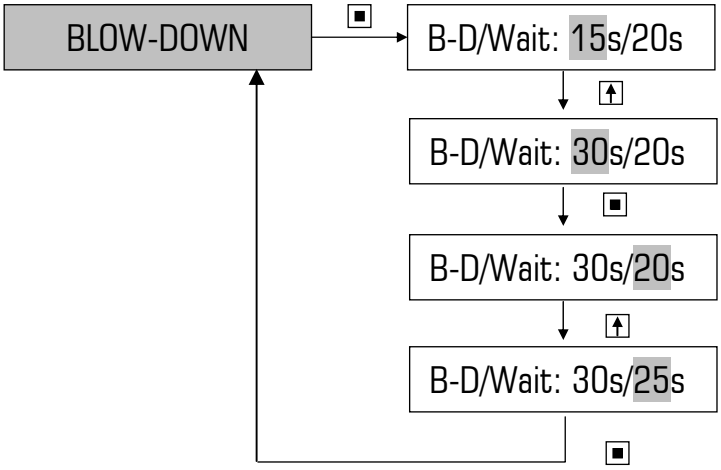
5.5 Set Blowdown Time



To leave the default factory Blowdown Time setting of 15 seconds and a Blow-down wait of 10 seconds, proceed to section 5.6. A time of 15 seconds is recommended as a starting point for both functions.

When the measured TDS (taken during the sample period) exceeds the setpoint, Blowdown mode commences. Each sample period is followed by a blow-down period and a Blowdown wait period, which is repeated until the TDS drops below the setpoint.

Example:
Increasing factory default blow-down time of 15 sec to a new setting of 30 sec and the blow-down wait time to a new setting of 25 sec.

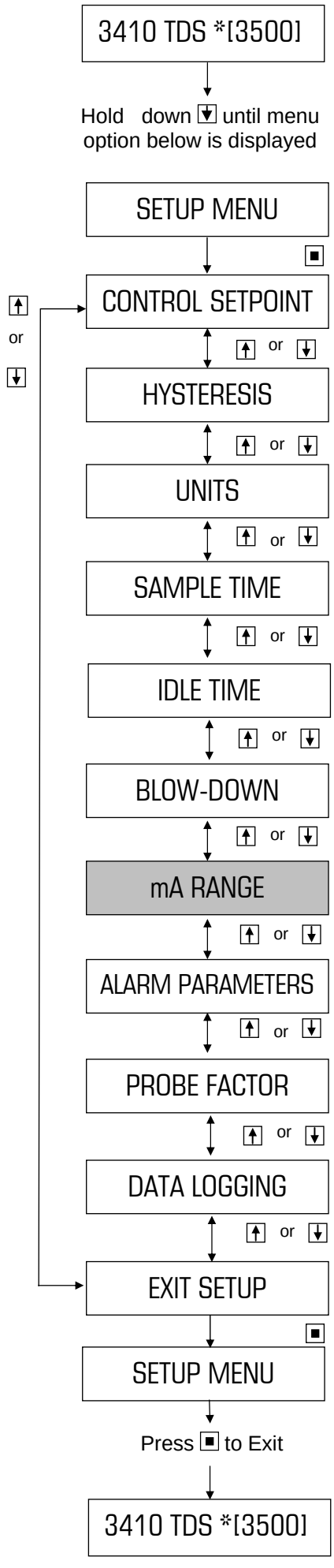


Item flashing on display:

Press to Scroll
Press to Select/Enter

Note: Shading represents flashing

5.6 Set mA Range

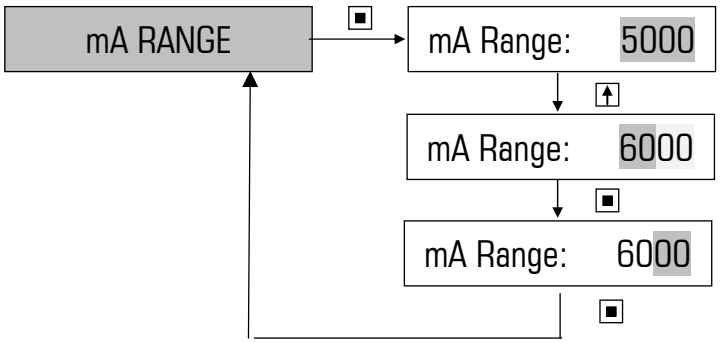


The mA range of the TDS-XP5 is programmable between 1 to 9999 μS/TDS.

For example, if the mA range is set at a conductivity of 5000 μS, then 20mA will be transmitted at 5000 μS, 12mA at 2500 μS and 4mA at 0 μS.

The mA Range is entered as an actual number (eg. 5000 μS), in 1 μS/TDS increments.

Example:
Increasing mA Range of 5000 μS to a new setting of 6000 μS

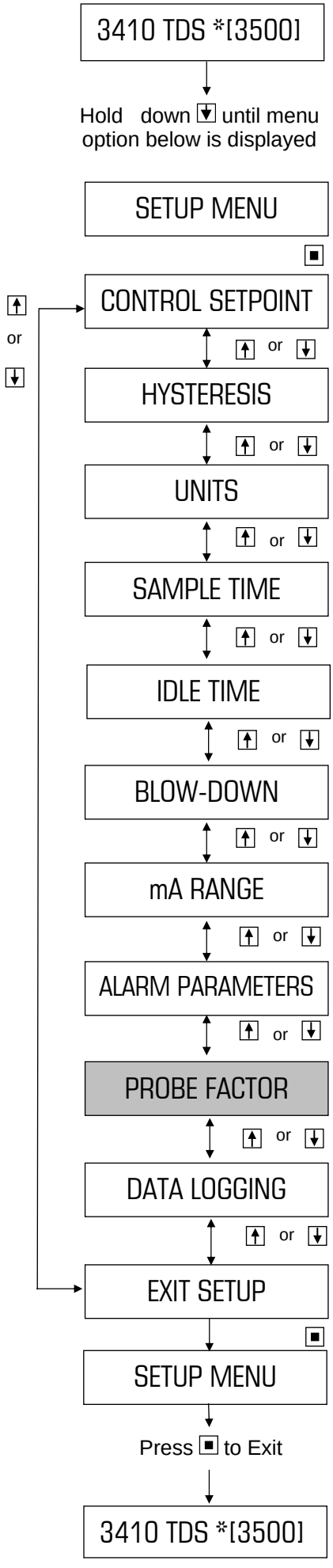


Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

5.7 Set Probe Factor



Do not change this setting unless you are familiar with electrode cell constants, or if the readout cannot be calibrated to match the conductivity of the sample.

Please use this setting with care as it can affect the accuracy of the unit.

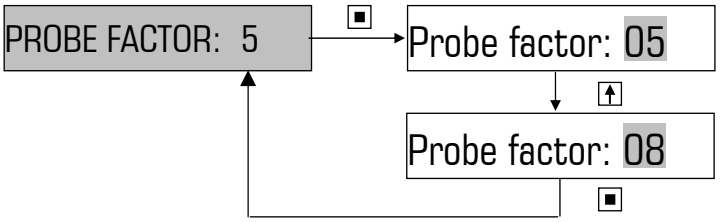
The TDS-XP5 is can be used with different models of boiler probes. If calibration is not possible, even after probe cleaning, change the probe factor setting as follows:

If the readout is less than actual, increase the default probe factor value. *The factory default is 5.*

Increasing the probe factor will electronically increase the signal from the conductivity probe thereby increasing the TDS reading. Decreasing the probe factor will attenuate the signal from the probe, thereby decreasing the TDS reading. This is a hardware function build into the electronics of the controller.

This will enable you to calibrate the slope of the controller.

Example:
Increasing factory default Probe factor of 5 to 8



Item flashing on display:

▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

5.8 ALARM Parameters

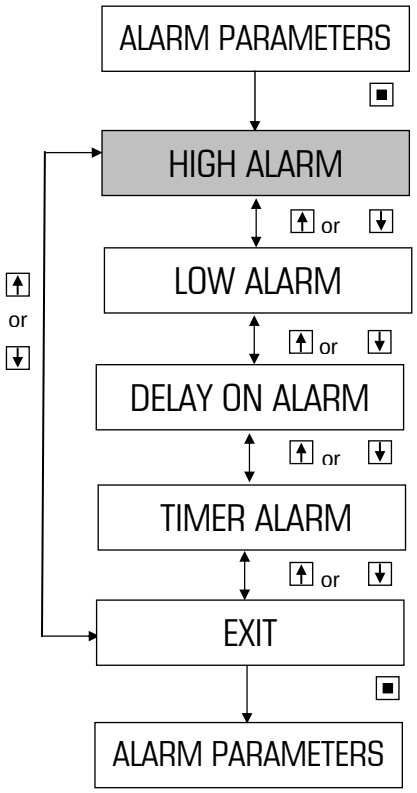
The TDS-XP5 has 5 programmable alarm functions.

1.	HIGH ALARM:	Reports an alarm if the conductivity rises above the programmed HIGH TDS ALARM value
2.	LOW ALARM:	Reports an alarm if the conductivity falls below the programmed LOW TDS ALARM value
3.	DELAY ON ALARM	High, Low, No Flow alarms must be continuously active for longer than the DELAY ON ALARM period before the appropriate alarm is reported.
4.	TIMER ALARM	Reports an alarm when bleed time exceeds BLEED TIMER ALARM value

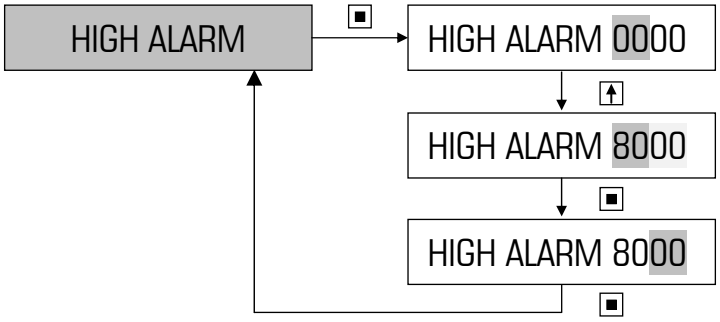
Access the programmable alarms as follows:

From the SETUP MENU, select the ALARM PARAMETERS menu, then press ENTER. Details are shown below:

The example below shows editing the High Alarm.
Program the other alarms in the same manner.



Example:
HIGH ALARM
Factory default: 0 (ie. alarm disabled)
Change to: 8000 TDS



Item flashing on display:

Press to Scroll
Press to Select/Enter

Note: Shading represents flashing

5.9 Set TIMER Alarm

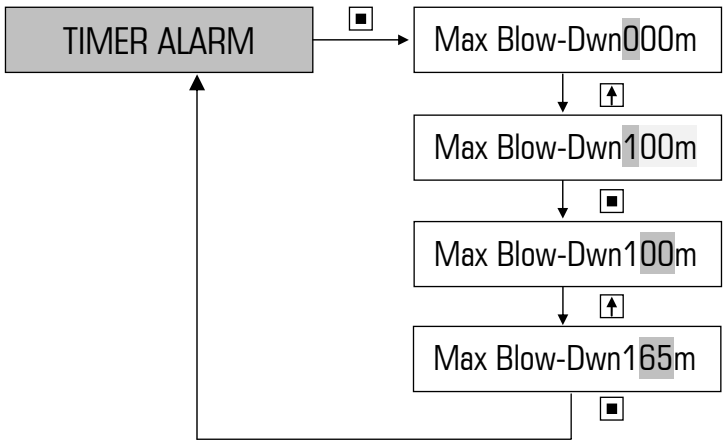
The TIMER alarm activates when the maximum permissible continuous blow-down time is exceeded. This alarm is designed to protect the system from excessive blow-down. Should there be a problem with make-up water not entering the boiler, the solenoid will continue to bleed indefinitely as no dilution takes place. Alternatively, a faulty TDS probe may read a high TDS when in fact the TDS is low, and the solenoid will continue to blow-down indefinitely. The TIMER alarm prevents these excessive conditions.

The factory default setting of 000m, leaves the alarm disabled.

If the TDS reaches the setpoint within the programmed time, the timer resets. However, if the timer times out before the TDS reaches the setpoint, the solenoid switches off and is disabled until the unit is manually reset by holding down the ENTER button. Until then, the alarm will be reported on the display and the alarm LED will illuminate. Furthermore, if enabled, the audible alarm buzzer will sound.

When an alarm is reported, the display will alternate between the alarm and the normal display. For instance, the display will alternate between "Alarm !! [Timer]" & "2610 TDS [2500]", assuming the TDS reading from the probe is 2610 TDS.

Example:
Factory default: 000m (ie. alarm disabled)
Change to: 165min



Item flashing on display:

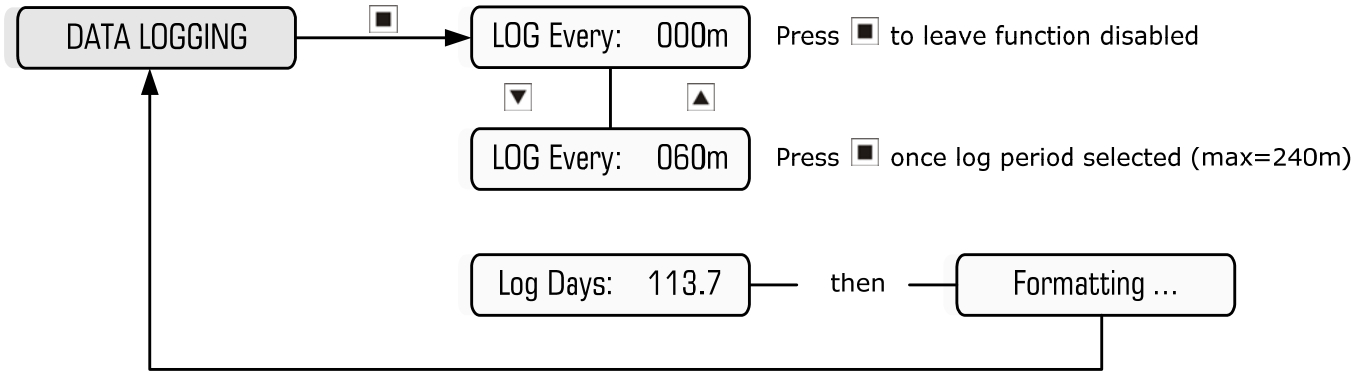
▲ Press to Scroll
■ Press to Select/Enter

Note: Shading represents flashing

5.10 Data Logging

NOTE: Data logging is not yet available for this unit, although the instructions below explain the feature. Data logging not available in earlier models.

Main Menu > *SETUP MENU > DATA LOGGING*



Example: Setting the controller to log every 60 min

The controller has the facility to log the following items at the pre-programmed intervals:

- Date
- Time
- Conductivity reading (in TDS or μS)
- Percentage of time the Blowdown Output was active
- Percentage of time the Common Alarm was activated

The pre-programmed intervals are 5, 10, 15, 30, 60, 120 or 240 minutes. If the controller is set to log every 0 minutes, then logging is disabled.

Each logged entry takes up memory, so the longer the interval, the longer the time can be between downloads. For example, the controller will have enough memory to store data for 9.4 days for a log taken every 5 minutes, 56.8 days for a log taken every 30 minutes, or for 455 days for a log taken every 240 minutes.

Once the memory is full, the data logger loses the oldest information first.

The data is downloaded via the Comms port on the front panel of the controller. An optional cable is required, P/N SP-XP2-COMCABLE-1, to perform a direct download to a pc or laptop.

6. FACTORY SETTINGS / PROGRAMMABLE OPTIONS

Item	Factory Setting	Option	Note
Setpoint	3500 TDS	1 – 10,000 TDS/μS	Determine the desired system TDS/μS
Hysteresis	3%	1 – 90 %	Lower value ensures tighter control
High Alarm/ Low Alarm	0000 TDS	0 – 10,000 TDS/μS	0000 = alarm disabled Otherwise HIGH alarm setting must be greater than Setpoint . LOW alarm setting must be less than Setpoint
Timer Alarm	000 minutes	0 – 999 minutes	000 = alarm disabled
Delay ON Alarm	8s	0 – 9999 sec	
Sample time	8s	1 - 99 sec	
Units	TDS	TDS or μS	Must be set before calibrating
Idle time	30m	1 - 99 min	
Blow-down time **Wait time** **Probe factor**	15s 10s 5	1 - 99 sec 1 - 99 sec 1 – 10	 Leave at 5

7. SPECIFICATIONS

Power Supply:	220 – 240 VAC, 50/60 Hz
Inputs:	Conductivity Probe DCON-DCON-BS1 (Note: Probe and manifold supplied with Boiler Blowdown package TDS-XP5-BP, 180°C, 10 bar max)
Standard Outputs:	240VAC applied to Solenoid – max 10A/250VAC Resistive. Potential free contact available on request. Alarm relay NO & NC potential free (max 10A/250VAC Resistive)
Optional Outputs:	AF09-XP2: Isolated 4-20mA card to remotely monitor conductivity level
Measured TDS Resolution:	1 TDS / μS
LED Indication:	Power ON, Solenoid Operate (ie Blowdown), Alarm
Controller Enclosure rating:	IP55 (ie. completely weatherproof)
Operating Temperature:	0 - 50°C
Memory backup:	EEPROM. Data retention of 10 years min.