Prestige Medical
Integrated decontamination solutions

Advance Pro

A presentation by

Richard Crisp

made in GREAT BRITAIN

Contents

Specifications

	16 l	22 l
Height in mm	410	410
Length in mm	450	580
Width in mm	480	480
Weight in kg	39.5	43
Chamber diameter in mm	250	250
Chamber length in mm	340	470
Capacity in litres	16	22
Sterilizing temperature min °C	134	134
Sterilizing time in minutes min	3.5	3.5
Operating pressure in bar min	2.05	2.05
Voltage	230	230
Wattage	2200	2200
Frequency Hz	50	50

Prestige Medical

Advance Pro

Features and Benefits

```
**********
Prestige Medical
Range: Advance Pro
Model: 30002000
Serial : 1035
Firmware PCB: V0.66
Firmware LCD: V0.01
Script OS : V1.53
Cycle: (134B)
Cycle Count: 951
Date: 06/12/2017

Cycle Start:
09:24:55
**********
AC: A:1.02 C:1.02
09:27:53   27.36C   0.30BA
09:42:35  121.78C   2.90BA
09:47:58   82.59C   0.45BA
09:54:42  132.14C   2.90BA
10:00:20   83.49C   0.48BA
----------
Sterilise Start
10:07:33  135.13C   3.14BA
10:07:54  135.70C   3.19BA
10:08:16  135.99C   3.21BA
10:08:37  136.12C   3.22BA
10:08:58  136.15C   3.22BA
10:09:19  136.13C   3.22BA
10:09:40  136.10C   3.22BA
10:10:01  136.07C   3.22BA
10:10:22  136.04C   3.22BA
10:10:43  136.02C   3.21BA
10:11:04  135.97C   3.21BA

Sterilise End
10:11:04  135.97C   3.21BA
----------
Hold Time:      210 Secs
Temperature Min: 135.16 C
Temperature Max: 136.16 C
Pressure Min:    3.15 BA
Pressure Max:    3.22 BA
Drying:          13:00

AC: A:1.03 C:1.02
Cycle Finished:
10:28:38
Cycle Time:63:23

CYCLE PASSED
```

Integrated SD data logger or optional thermal printer

Note: Integrated logger for Pro range only

Integrated Micro SD, which stores historical data

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Features and Benefits

Simplified180° LED Display

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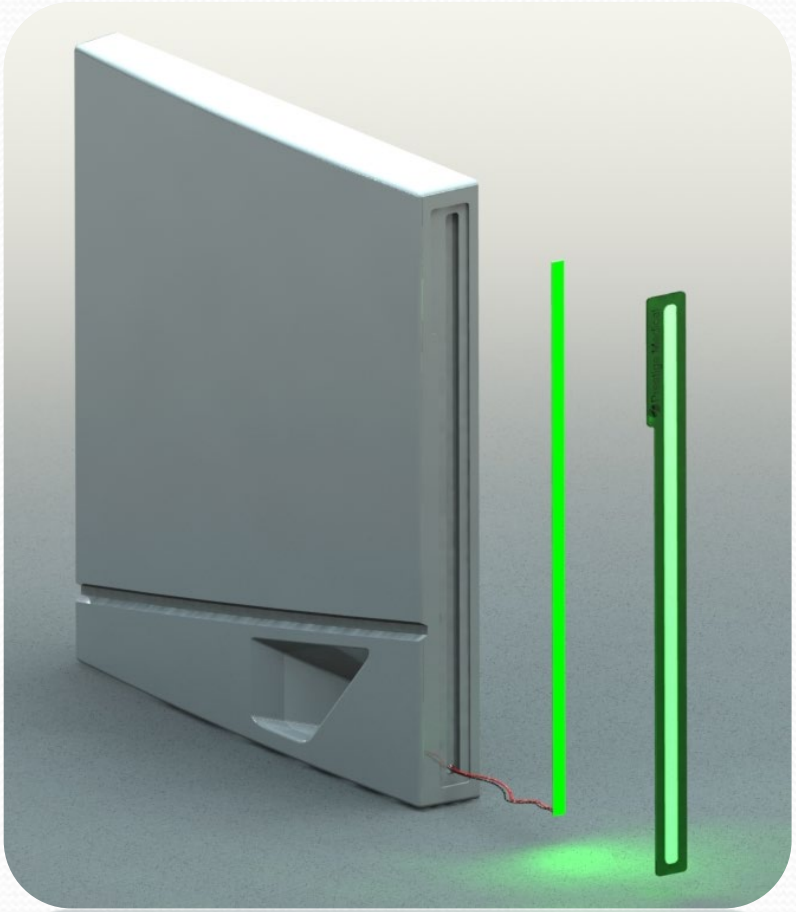
Features and Benefits

Simplified Navigation

Features and Benefits



Visual Warning and Cycle Progression Indicator

Features and Benefits

Ready Mode:
Blue

Warming phase:
Yellow

Sterilizing Phase:
Pink

Drying phase:
White

Cycle End:
Green flashing

Errors & Warnings:
Red flashing

Visual Warning and Cycle Progression Indicator

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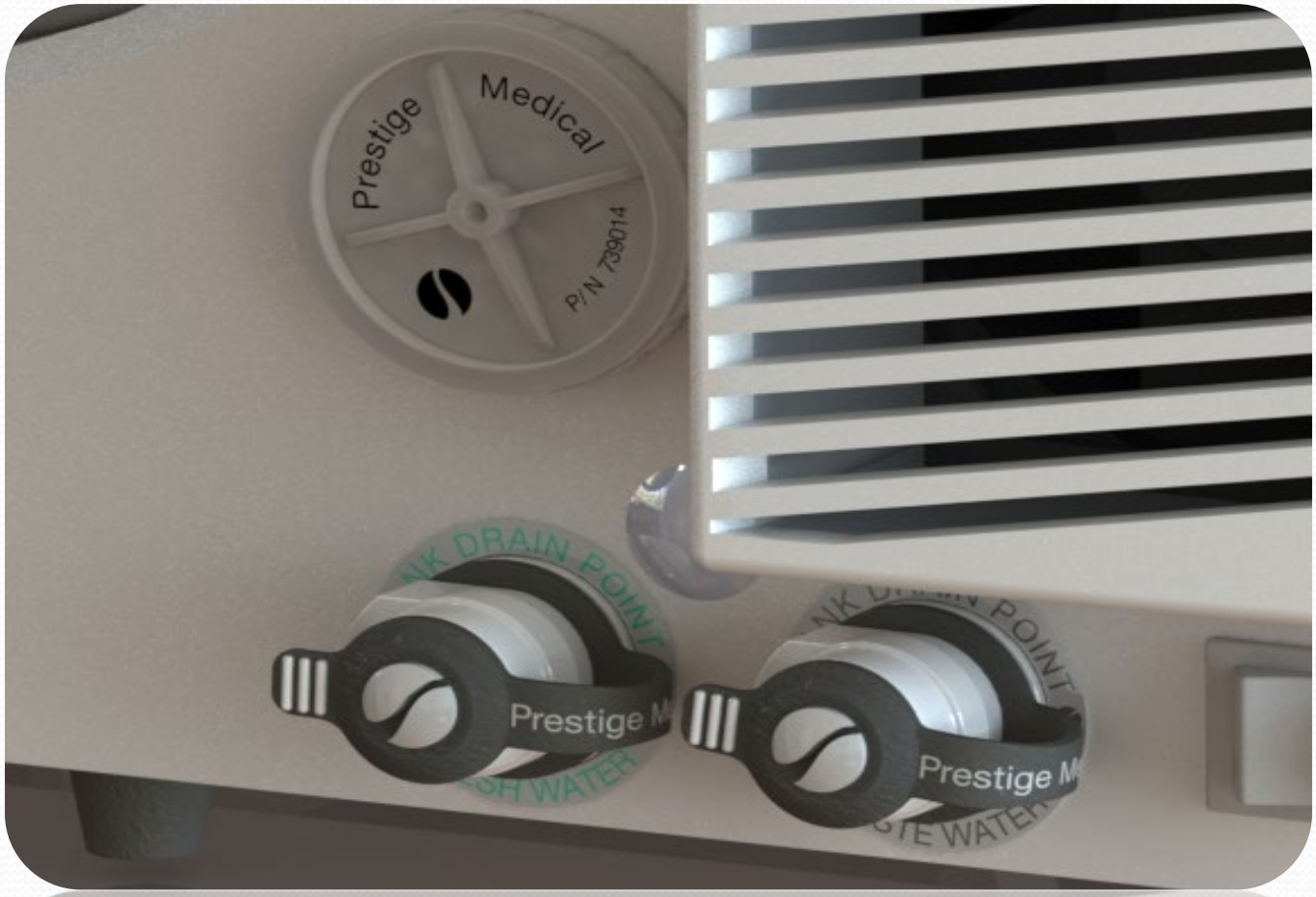
Features and Benefits



Fresh and Waste Water Drain Outlets

Features and Benefits

Rapid Drain System

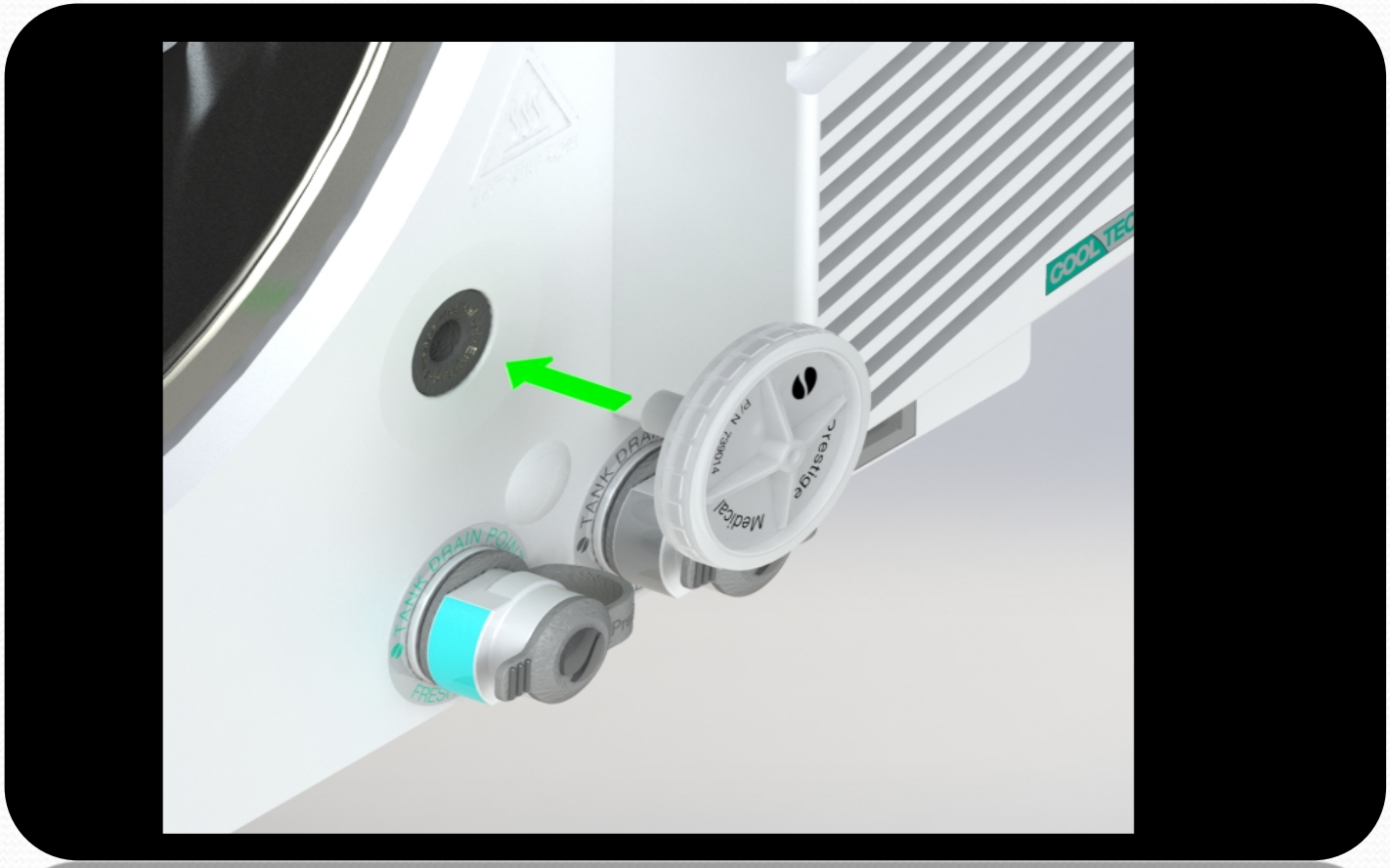
Features and Benefits

Rapid Drain System

Features and Benefits

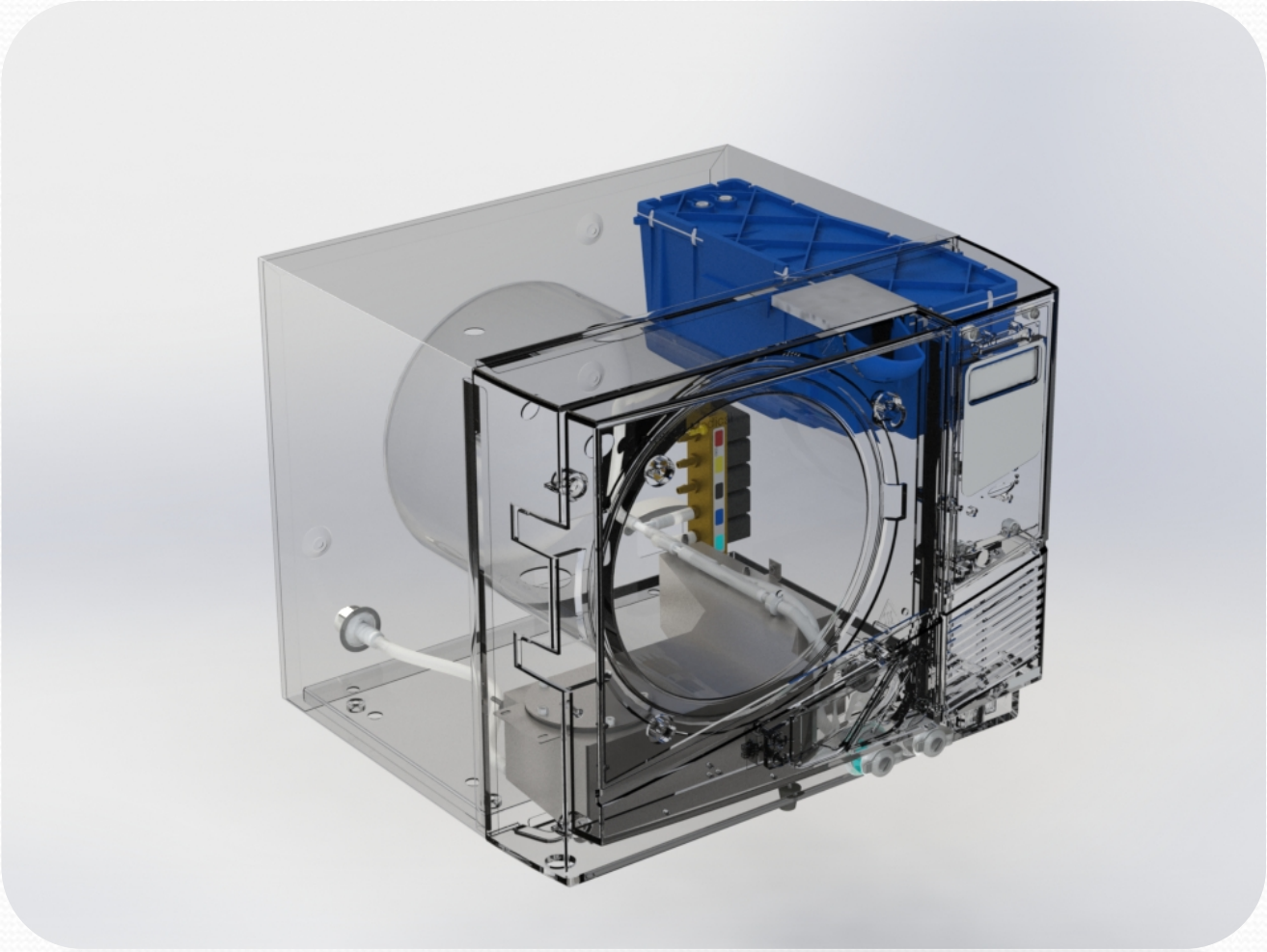
Emergency Pressure Release/Door Access

Features and Benefits



Push-Fit Air Filter

Features and Benefits



Integrated Waste Water Tank

Features and Benefits

High quality stainless waste tank for both 16ltr and 22ltr models

Capacity for 16ltr is 4 cycles…approx

Capacity for 22ltr is 6 cycles… approx

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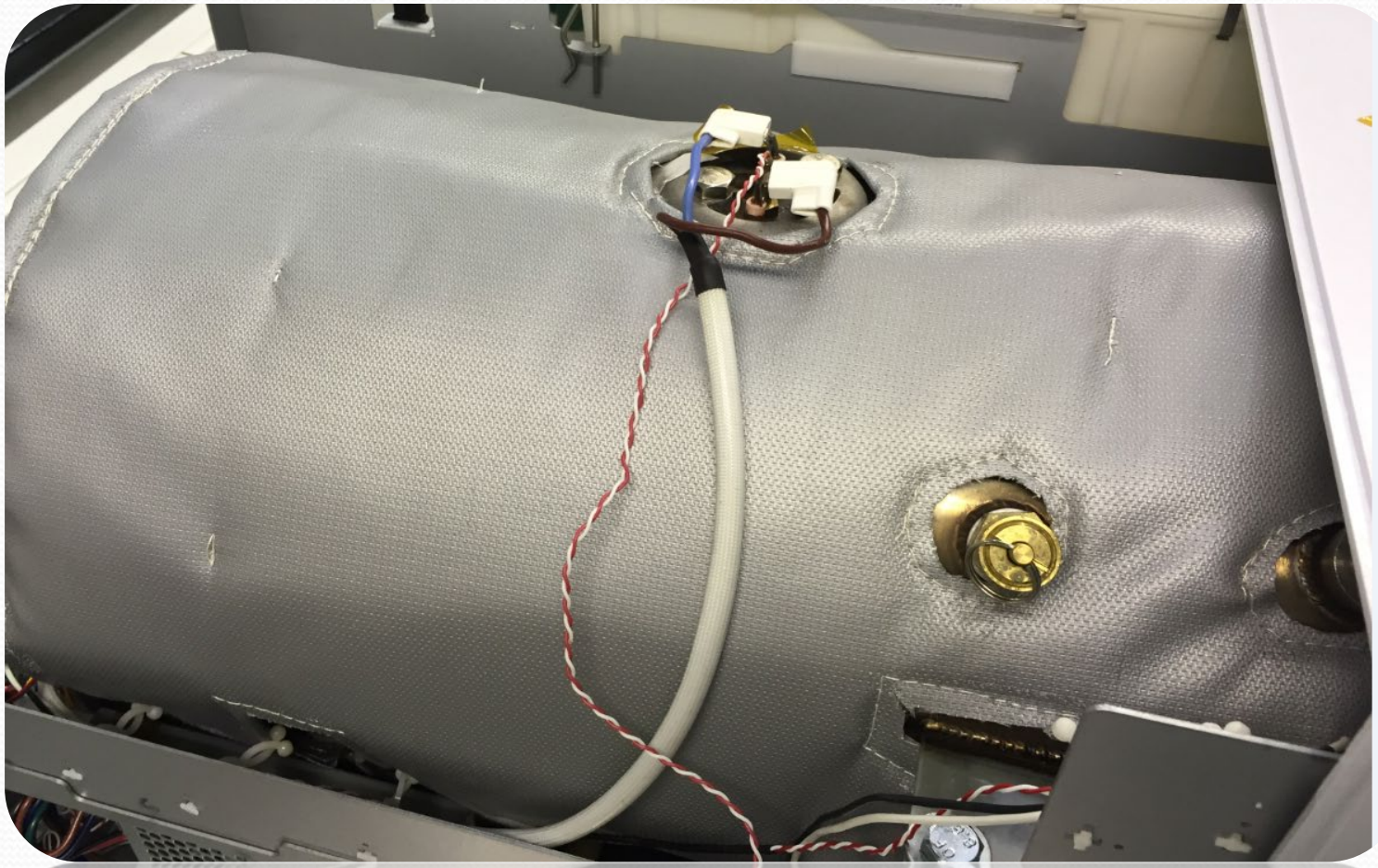
Features and Benefits



Vessel Jacket

Reduced heat loss
Reduced power consumption
Improved drying

Features and Benefits

Flexi-Rack Tray System

Flexible load management
Improved drying
reduced power consumption
reduced drying time

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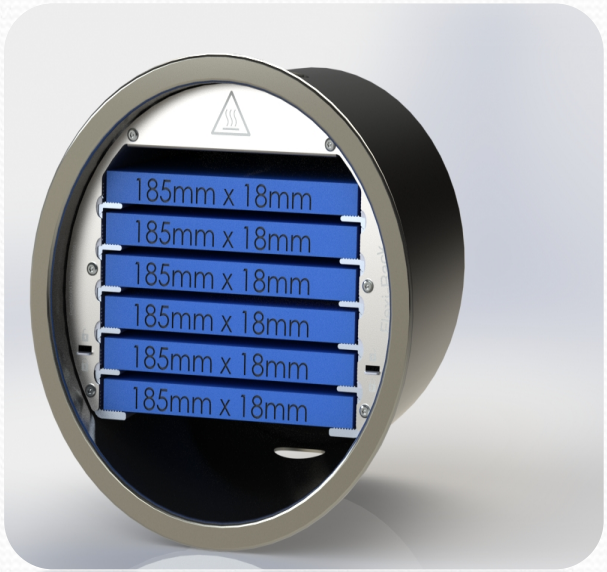
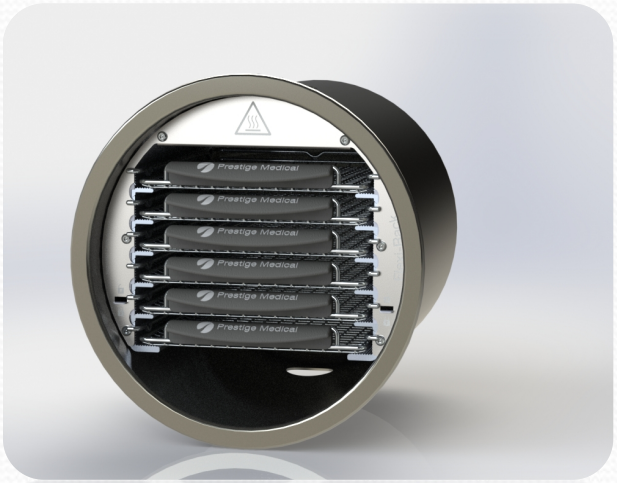
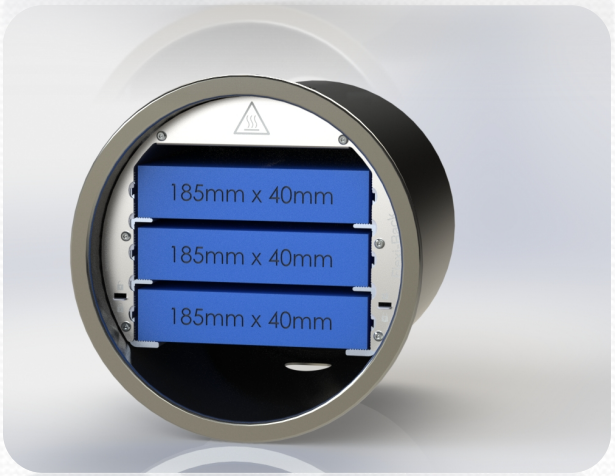
Features and Benefits







Flexible Load Management

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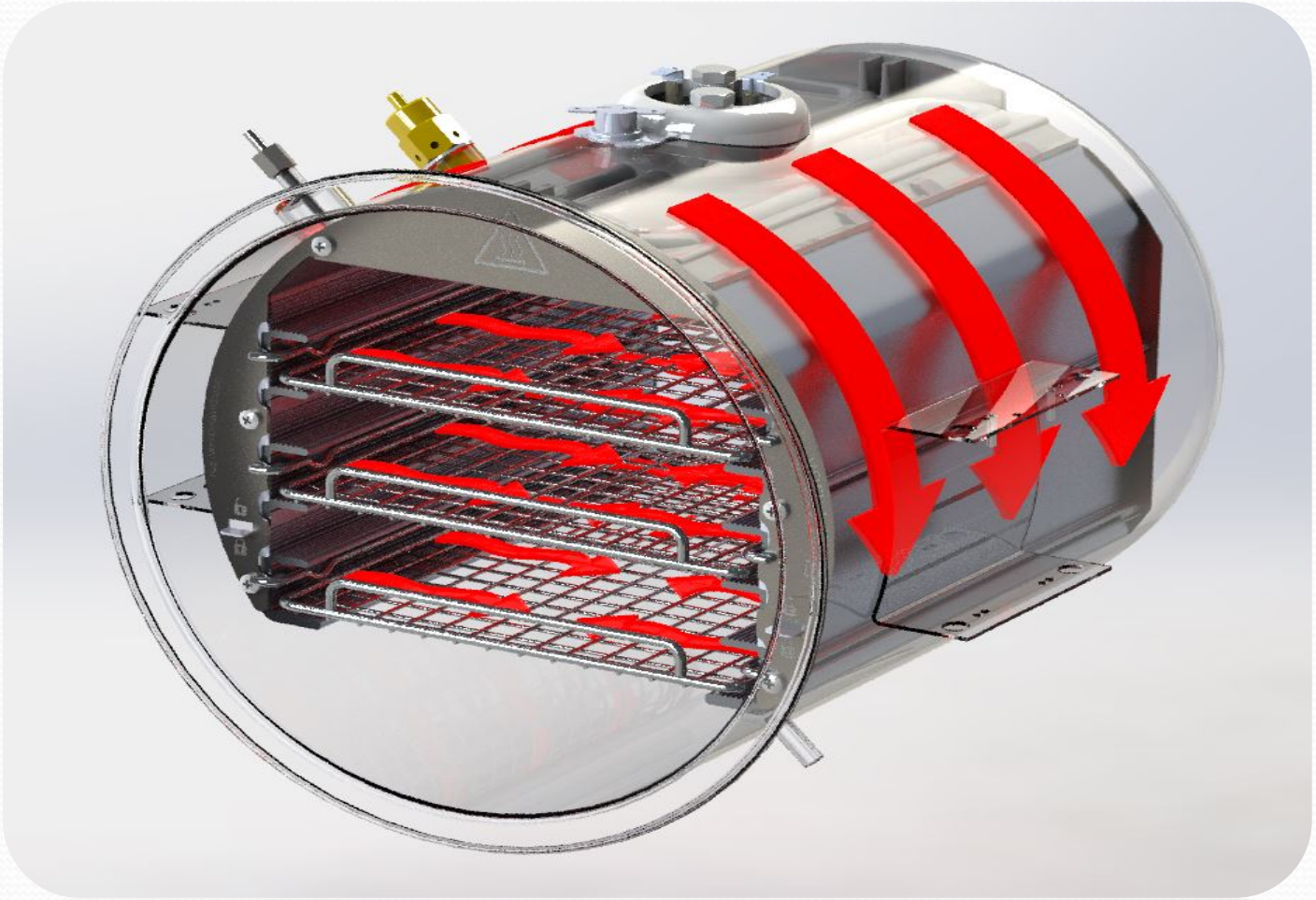
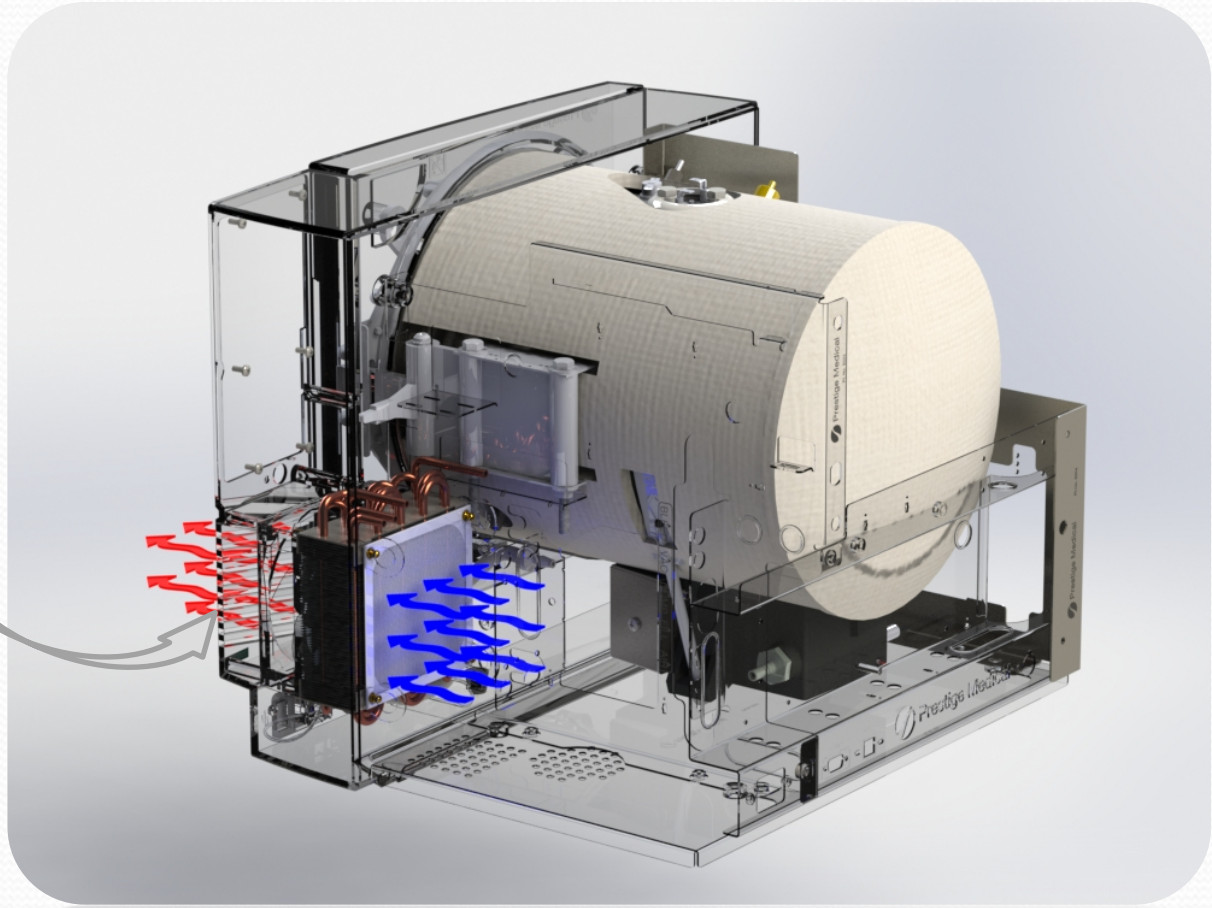
Features and Benefits



Flexi-Rack Tray System

Heat transfer flow for improved drying

Features and Benefits



Cool-Tech Dual (Vacuum and Flush)
Condensing Unit

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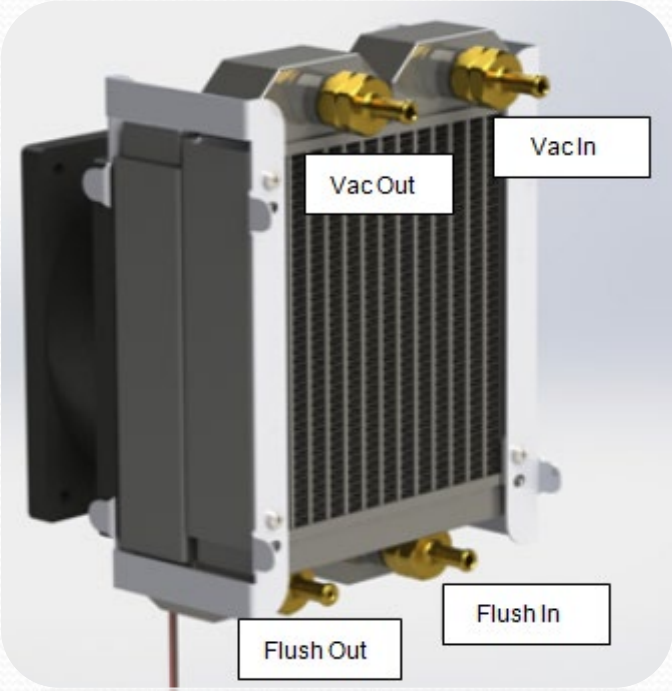
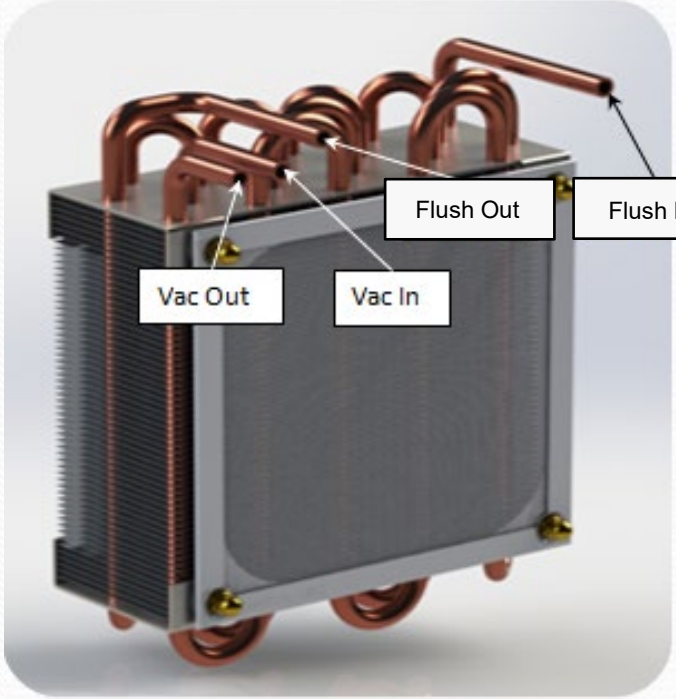
Features and Benefits





Quick Release System

Cool-Tech Condensing Unit

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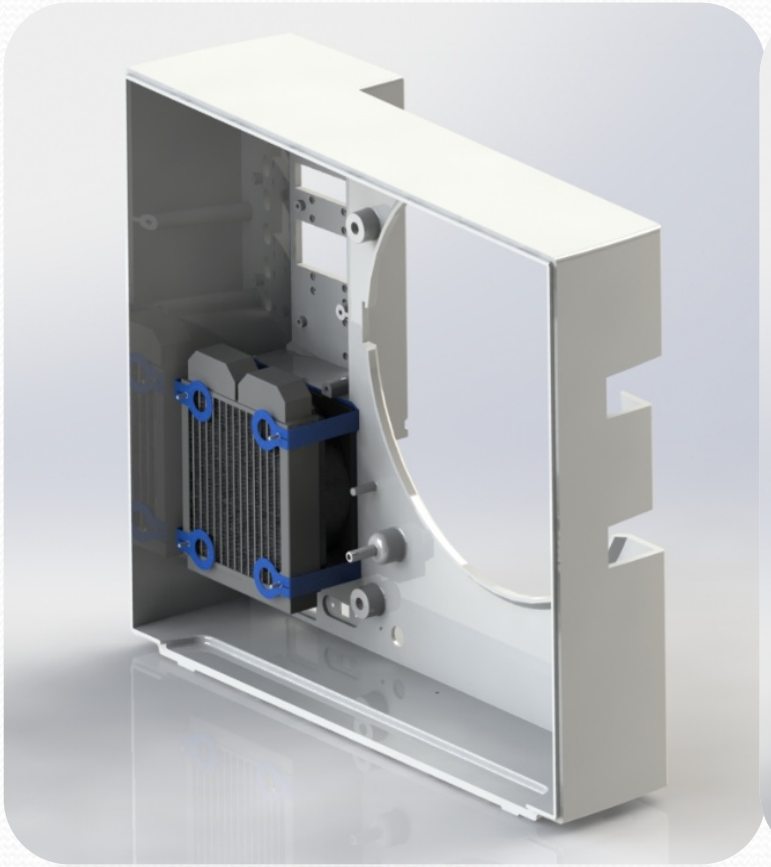
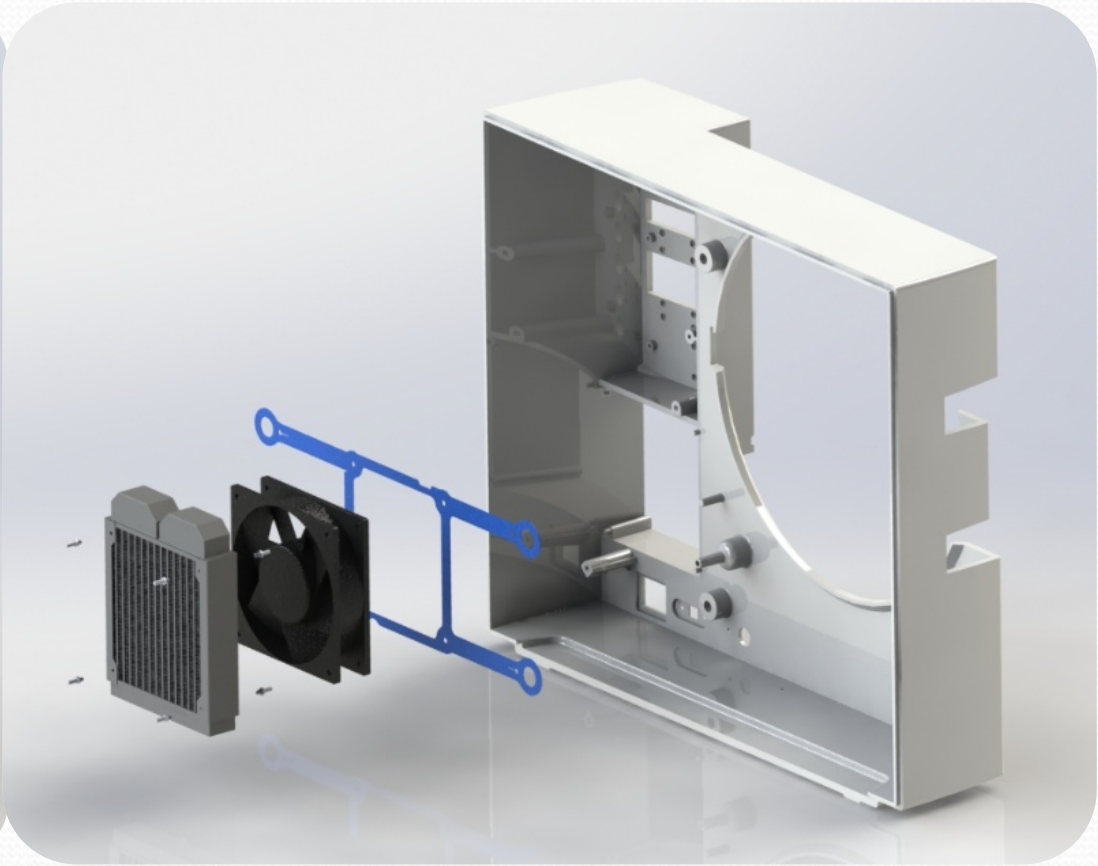
Features and Benefits





Quick Release System

Cool-Tech Condensing Unit

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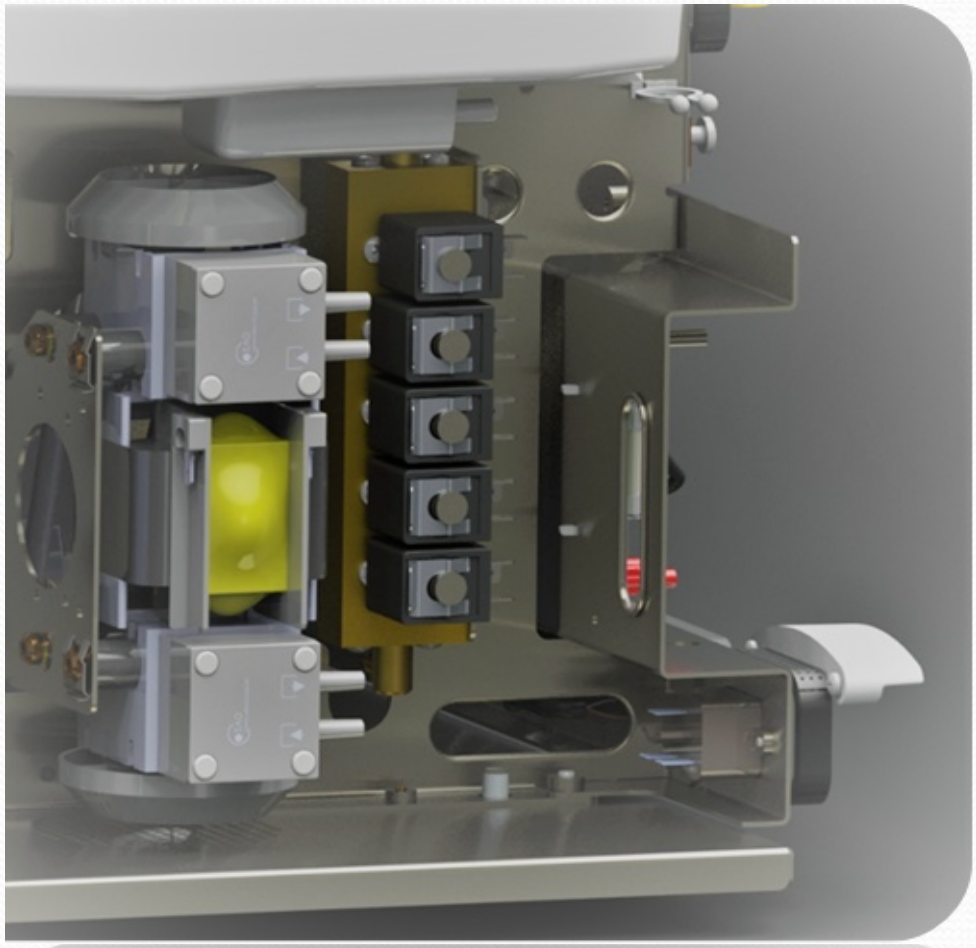
Features and Benefits



Quick Release System

Vacuum Pump and Valve Block

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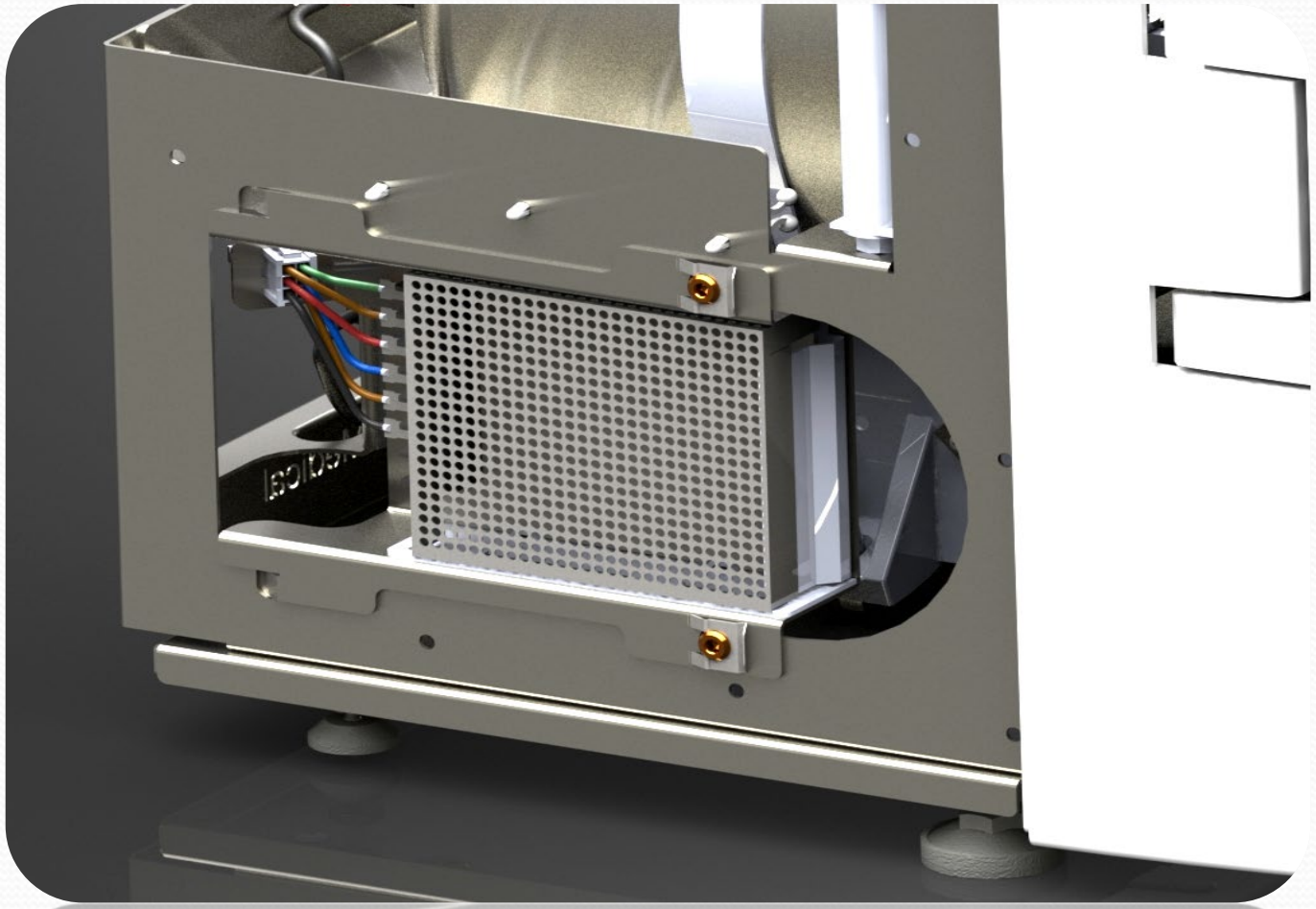
Features and Benefits



Quick Release System
PSU

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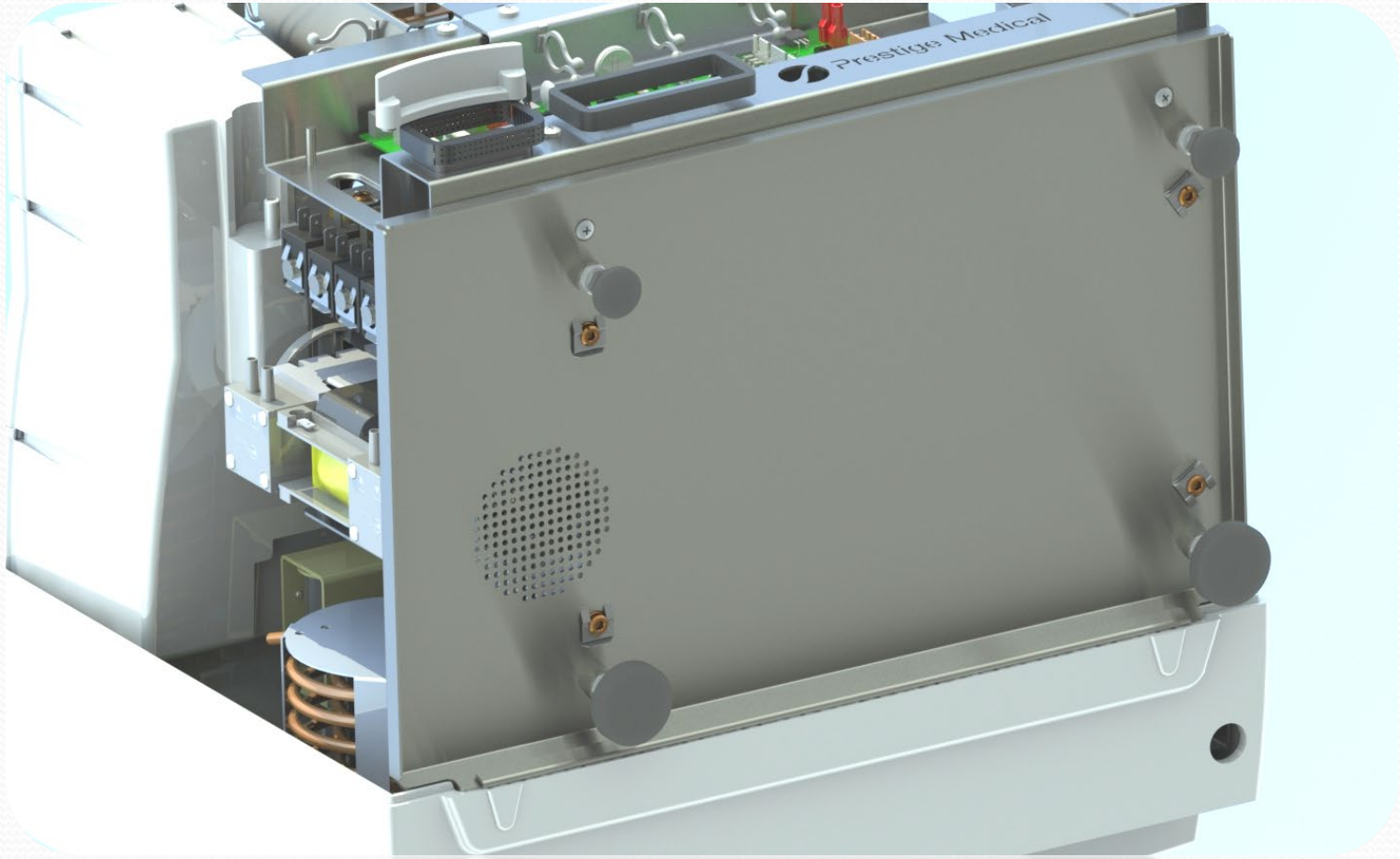
Features and Benefits



Quick Release System

Base Plate, with integrated feet

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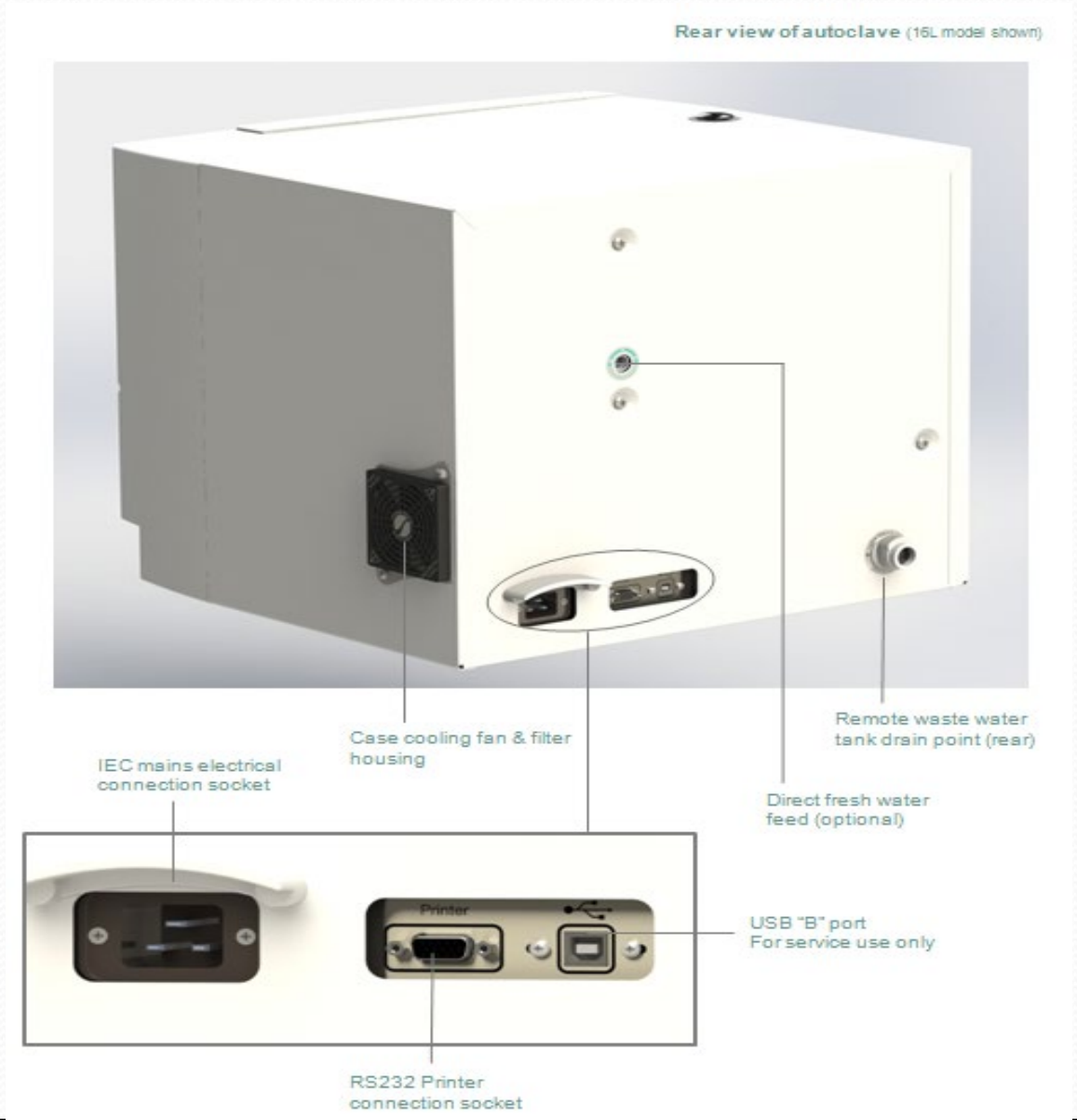
Features and Benefits



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Cycles

Cycle Options

- 3 Class B cycles.
- 2 Class N cycles optional drying
- 134°C and 121°C Class B/N options.
- PCD (Process challenge device) cycle for helix or Bowie Dick.
- System Air leak test.
- Recovery Cycle

Cycle times (approximate)

Cycle	Min Sterilizing Temp °C	Sterilizing Time (Mins)	16 litre cycle time	22 litre cycle time
134C Class B	134 °C	3.5 Minutes	39 Minutes	48 Minutes
121C Class B	121 °C	16 Minutes	51 Minutes	55 Minutes
PRION	134 °C	18 Minutes	54 Minutes	60 Minutes
PCD (Process Challenge Device)	134 °C	3.5 Minutes	26 Minutes	35 Minutes
134C Class N	134 °C	3.5 Minutes	17 Minutes	22 Minutes
121C Class N	121 °C	16 Minutes	28 Minutes	32 Minutes

Optional selectable additional drying available up to 15 minutes, in 5 minute increments.

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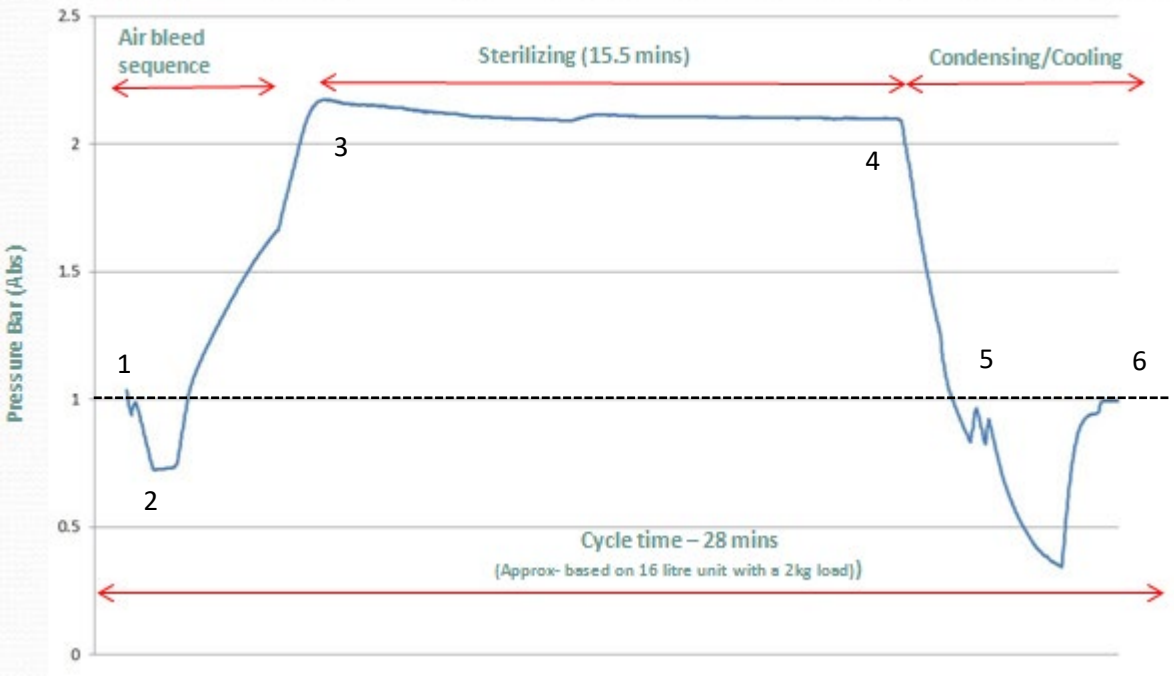
Cycle Options

121°C Non Vacuum cycle profile



Atmospheric Pressure

Stage description.	No.	Pressure
Pre-Vacuum 1st pulse.	1 to 2	Vacuum level 750mbarAbs. (-0.25 bar gauge)
Sterilizing	3 to 4	2.05 to 2.25 bar Abs (1.05 to 1.24 bar gauge). For 960 seconds.
De-pressurisation	4 to 5	
Drying	5 to 6	No Drying, but can be added up to 15 minutes in 5 minute increments.

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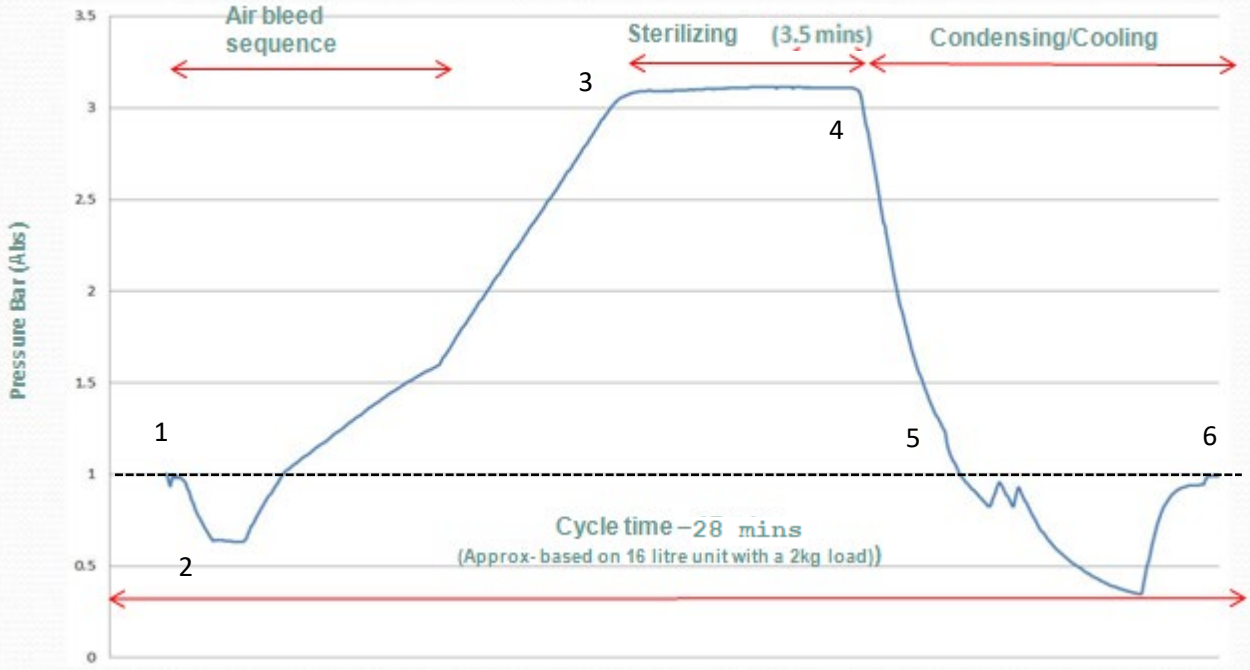
Cycle Options

134°C Non Vacuum cycle profile



Atmospheric Pressure

Stage description.	No.	Pressure
Pre-Vacuum 1st pulse.	1 to 2	Vacuum level 750mbarAbs. (-0.25 bar gauge)
Sterilizing	3 to 4	3.08 to 3.32 bar Abs (2.08 to 2.30 bar gauge). For 210 seconds.
De-pressurisation	4 to 5	
Drying	5 to 6	No Drying, but can be added up to 15 minutes in 5 minute increments.

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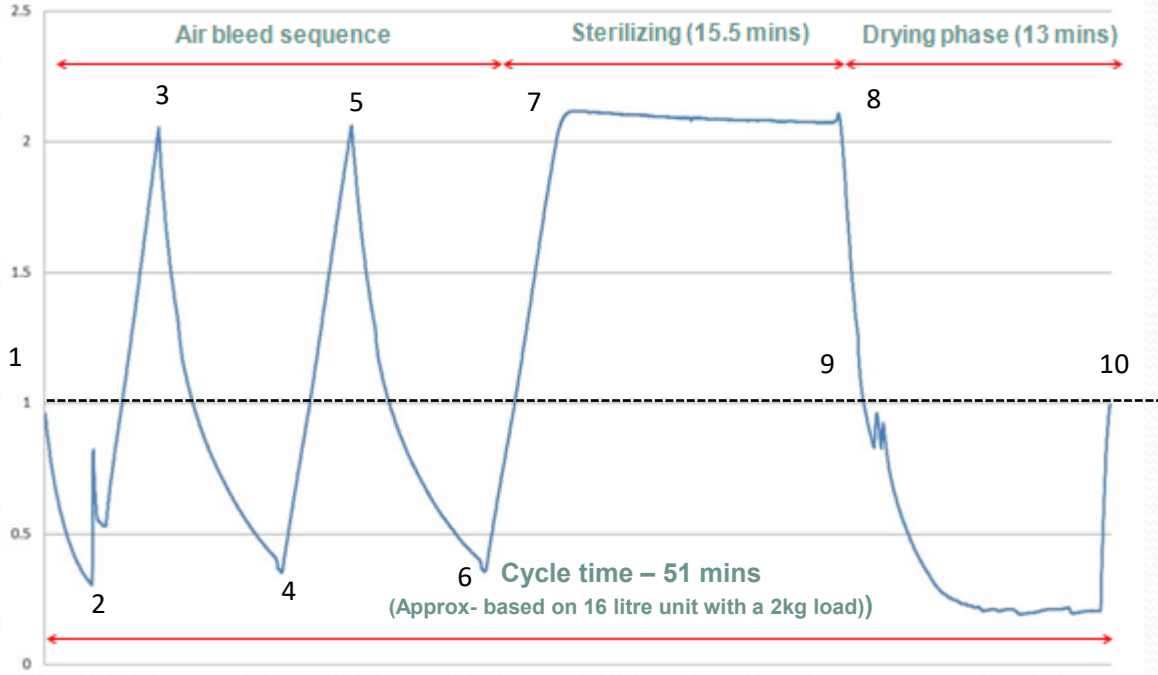
Cycle Options

121°C Class B Vacuum cycle profile



Stage description.	No.	Pressure
Pre-Vacuum 1st pulse.	1 to 2	Vacuum level 300mbarAbs. (-0.70 bar gauge)
Positive Pulse	3 & 5	2.05 bar Abs (1.05 bar gauge)
Pre-Vacuum 2nd & 3rd pulses	4 & 6	400 mbar Abs (- 0.61 bar gauge)
Sterilizing	7 to 8	2.05 to 2.25 bar Abs (1.05 to 1.24 bar gauge). For 960 seconds.
De-pressurisation	8 to 9	
Drying	9 to 10	13 minutes

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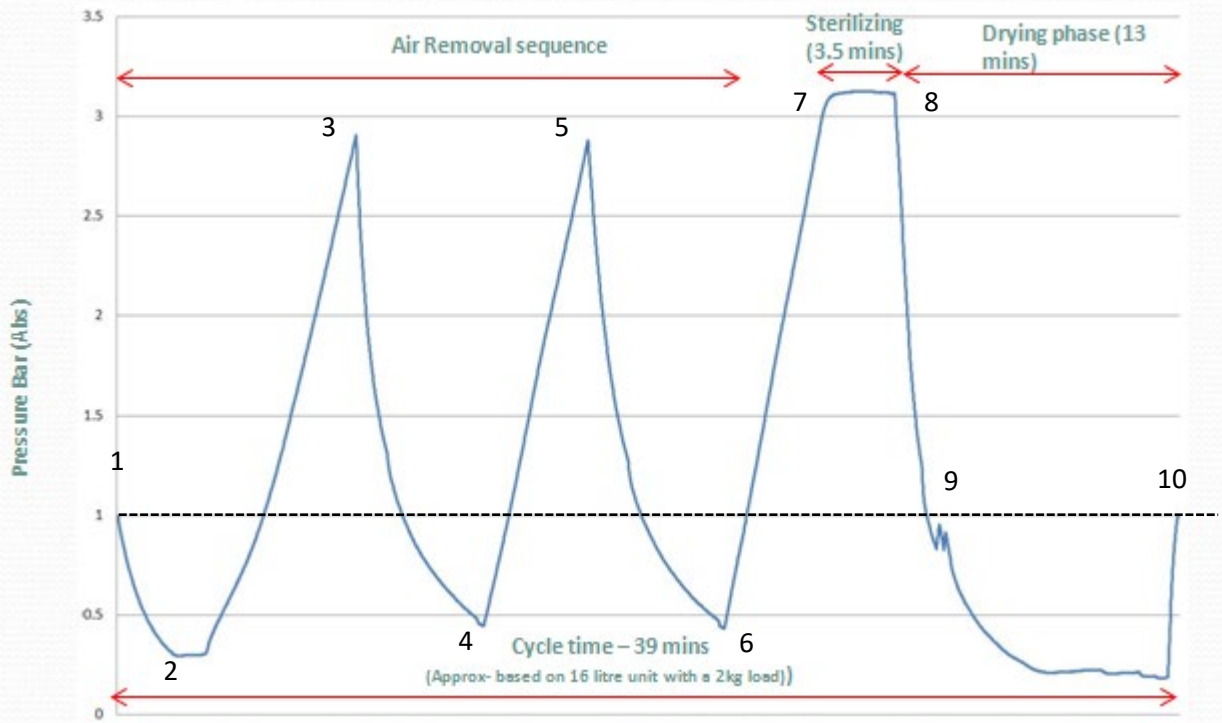
Cycle Options

134°C Class B Vacuum cycle profile



Stage description.	No.	Pressure
Pre-Vacuum 1st pulse.	1 to 2	Vacuum level 300mbarAbs. (-0.70 bar gauge)
Positive Pulse	3 & 5	2.9 bar Abs (1.9 bar gauge)
Pre-Vacuum 2nd & 3rd pulses	4 & 6	480mbar Abs (- 0.52 bar gauge)
Sterilizing	7 to 8	3.08 to 3.32 bar Abs (2.08 to 2.30 bar gauge). For 210 seconds.
De-pressurisation	8 to 9	
Drying	9 to 10	13minutes.

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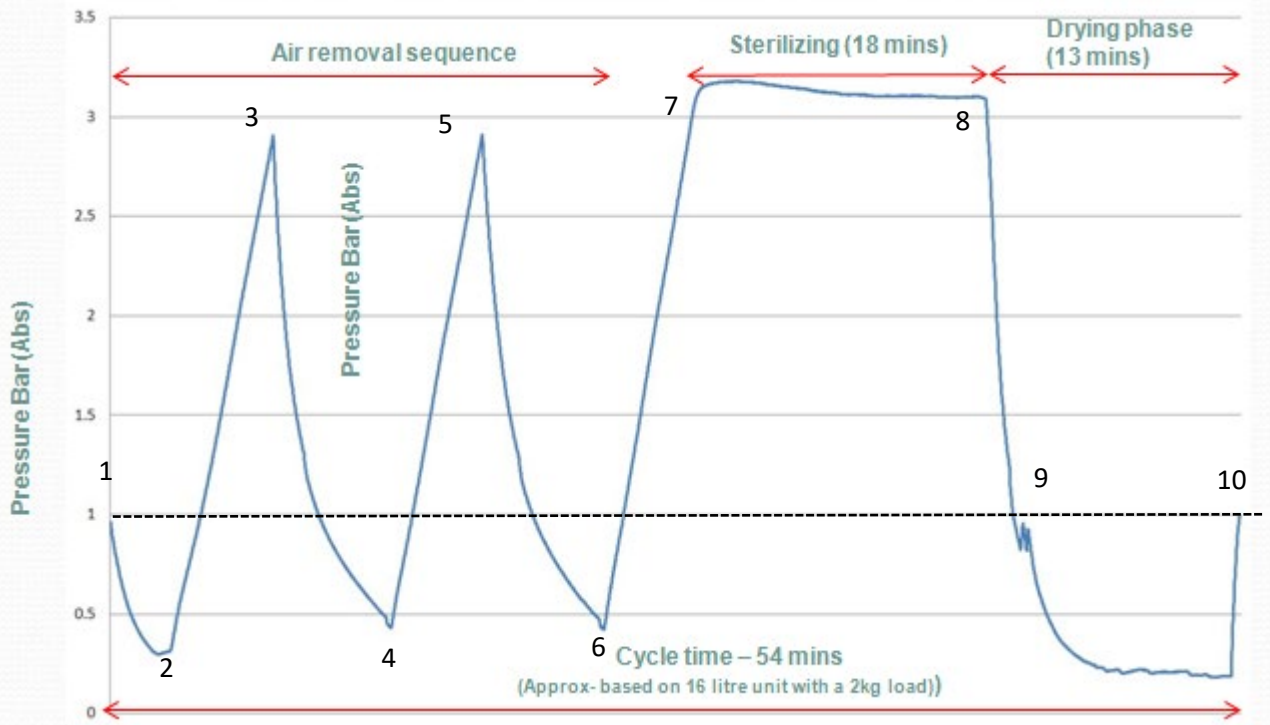
Cycle Options

Prion cycle profile



Atmospheric Pressure

Stage description.	No.	Pressure
Pre-Vacuum 1st pulse.	1 to 2	Vacuum level 300mbarAbs. (-0.70 bar gauge)
Positive Pulse	3 & 5	2.9 bar Abs (1.9 bar gauge)
Pre-Vacuum 2nd & 3rd pulses	4 & 6	480mbar Abs (- 0.52 bar gauge)
Sterilizing	7 to 8	3.08 to 3.32 bar Abs (2.08 to 2.30 bar gauge). For 210 seconds.
De-pressurisation	8 to 9	
Drying	9 to 10	13minutes.

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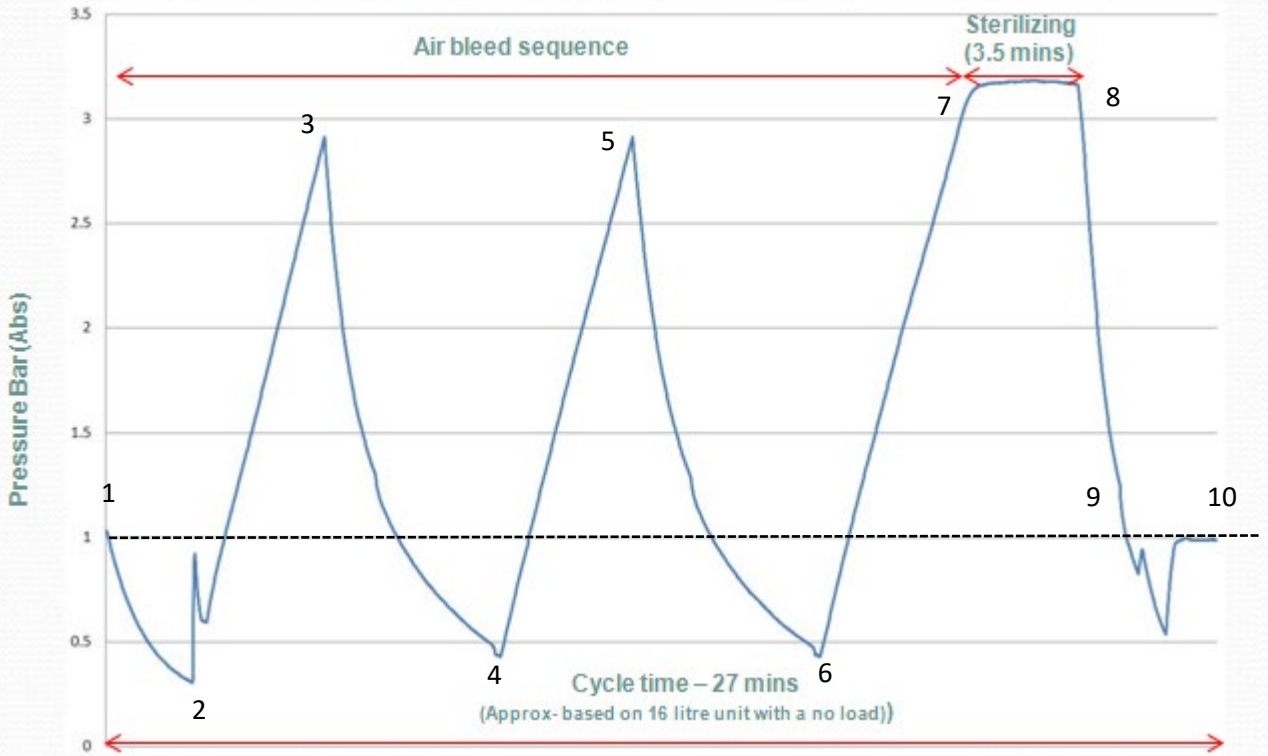
Cycle Options

PCD cycle profile



Atmospheric Pressure

Stage description.	No.	Pressure
Pre-Vacuum 1st pulse.	1 to 2	Vacuum level 300mbarAbs. (-0.70 bar gauge)
Positive Pulse	3 & 5	2.9 bar Abs (1.9 bar gauge)
Pre-Vacuum 2nd & 3rd pulses	4 & 6	480mbar Abs (- 0.52 bar gauge)
Sterilizing	7 to 8	3.08 to 3.32 bar Abs (2.08 to 2.30 bar gauge). For 210 seconds.
De-pressurisation	8 to 9	
Drying	9 to 10	No Drying

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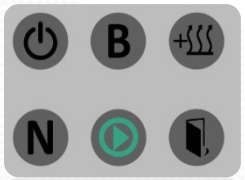
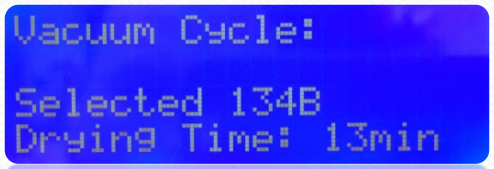
Advance Pro

Cycle selection:
Selecting cycles on the Advance Pro is very simple, the two buttons used for the cycle selection are B & N (see image right), button B is for vacuum (class B cycles) cycle selection and button N is for non-vacuum cycle selection (class N)

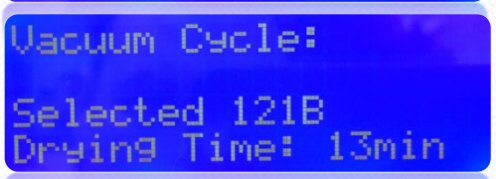


Home screen:
The image on the right is of the standard home screen. After each cycle the unit will return to the default cycle. This is the 134ºC /3½min Vacuum cycle for porous loads, wrapped, pouched solid / hollow instruments with drying (B cycle).

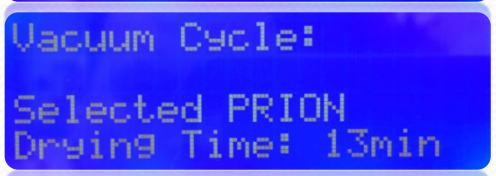
Press the button "B" to scroll through the class "B" cycle menu



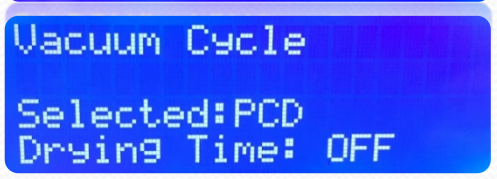
134ºC /3½min. Vacuum cycle for porous loads, wrapped, pouched, solid / hollow instruments with drying.



121ºC /15½min. Vacuum cycle for porous loads, wrapped, pouched, solid / hollow instruments with drying.



PRION(134ºC /18min). Vacuum cycle for porous loads, wrapped, pouched, solid / hollow instruments with drying.



PCD. Steam penetration test without drying. Suitable for Bowie Dick Test Pack or Helix.

LEAK TEST

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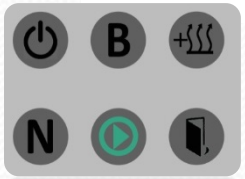
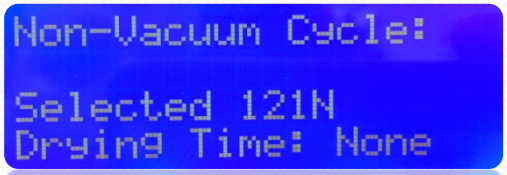
Cycle selection:
Selecting cycles on the Advance Pro is very simple, the two buttons used for the cycle selection are B & N (see image right), button B is for vacuum (class B cycles) cycle selection and button N is for non-vacuum cycle selection (class N)



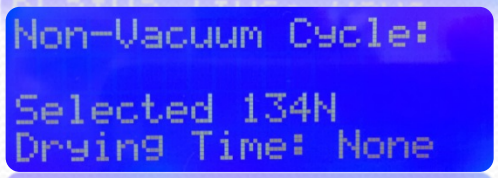
Home screen:
The image on the right is of the standard home screen. After each cycle the unit will return to the default cycle. This is the 134ºC /3½min Vacuum cycle for porous loads, wrapped, pouched solid / hollow instruments with drying (B cycle).

Press the button "N" to scroll through the class "N" cycle menu

121ºC /15½min. Non-vacuum cycle for unwrapped solid instruments, without drying.



134ºC /3½min. Non-vacuum cycle for unwrapped solid instruments, without drying.



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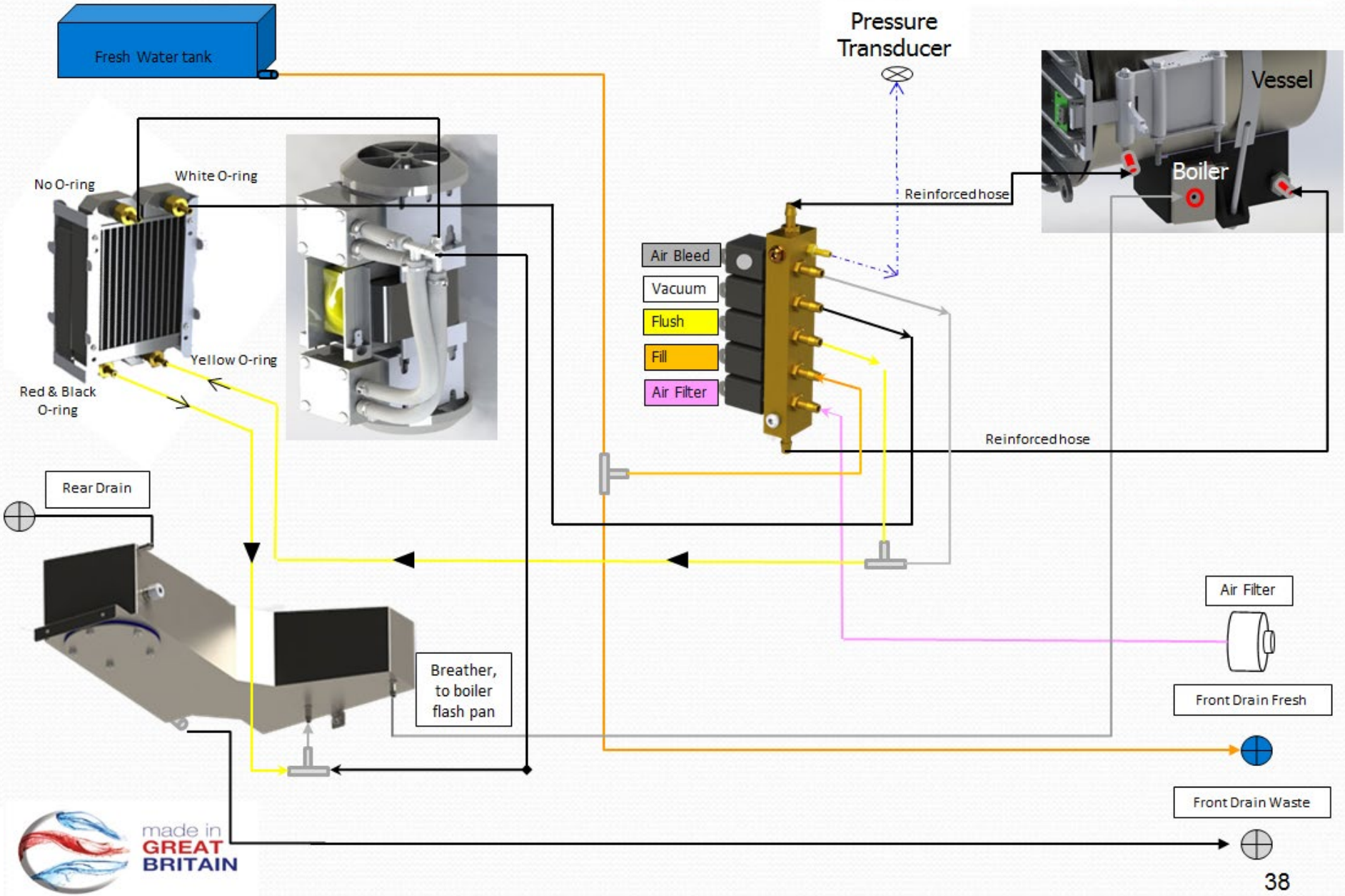

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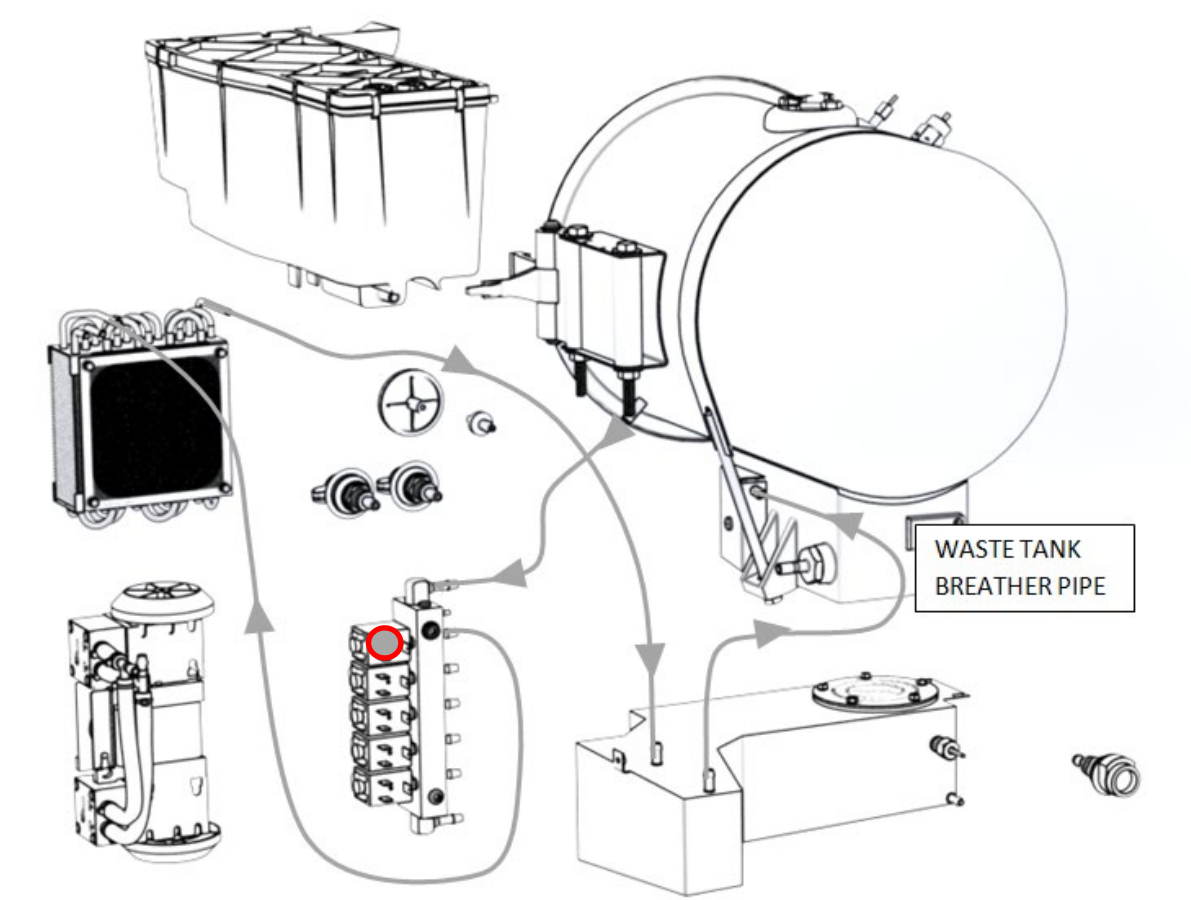
Class B Cycle Phase (step-by-step)

POWER UP.

When the unit is switched on, it will enter the 'stand by mode'. In this condition all of the valves will be closed and the heaters will be switched off.

Pressing the ready/standby button puts the unit into the ready mode with the air bleed valve being energised. The internal chamber heater powers up and tries to maintain its temperature at 120°C. In the 'ready mode' it is possible to select & start cycles.

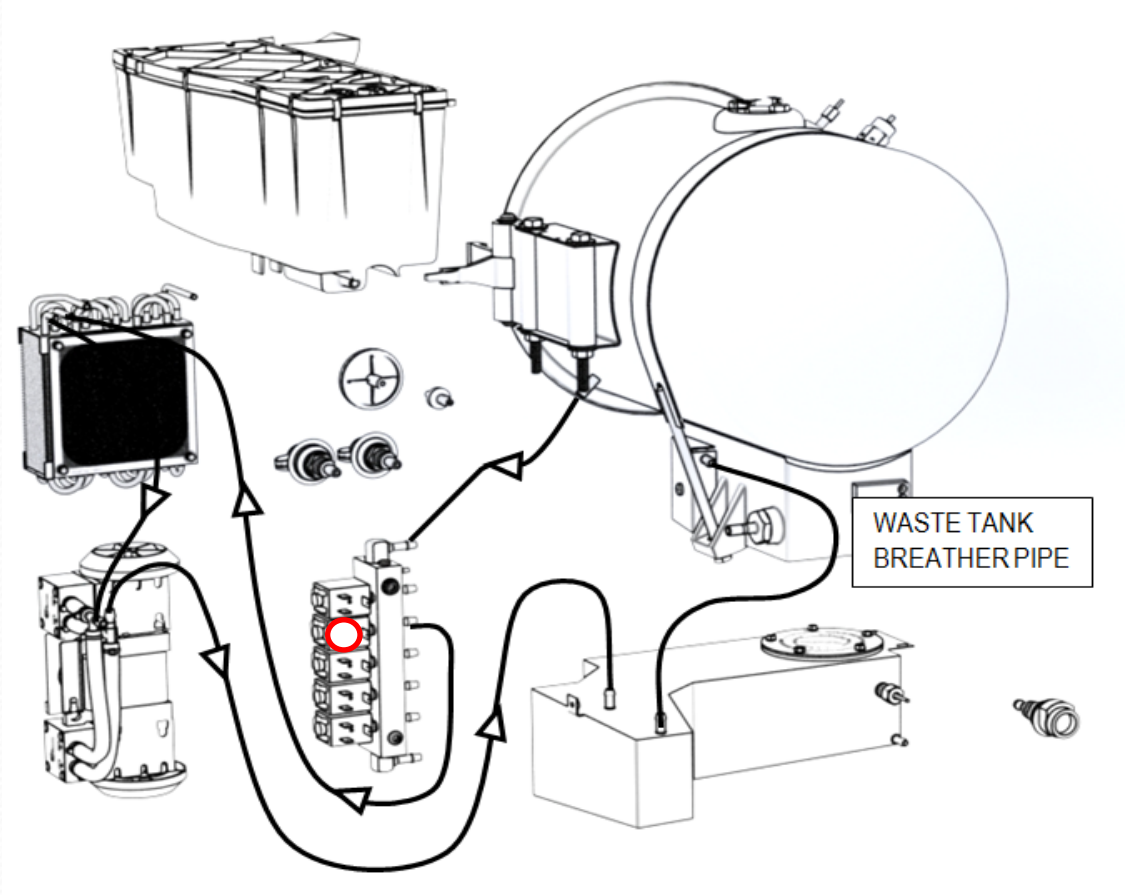


Class B Cycle Phase (step-by-step)

STAGE 1 - PRE VACUUM.

When the start button is pressed the air bleed valve will close.

The vacuum pump and vacuum solenoid valve ○ will then be energised and a vacuum will form within the chamber. The level that the vacuum drawn is determined by the value set in software (300mbar abs (-0.7bar/g)). All type B cycles are set to waitfor≤300mbar abs [or -0.7 bar gauge]. On the 134B, 121B, 134B18 and 134TP cycles the vacuum valve will then close and the vacuum pump will be turned off



Note: Failure to achieve the required vacuum in the time specified (900seconds) will result in the cycle terminating and Error 01 (Vacuum Timeout) being indicated on the display panel.

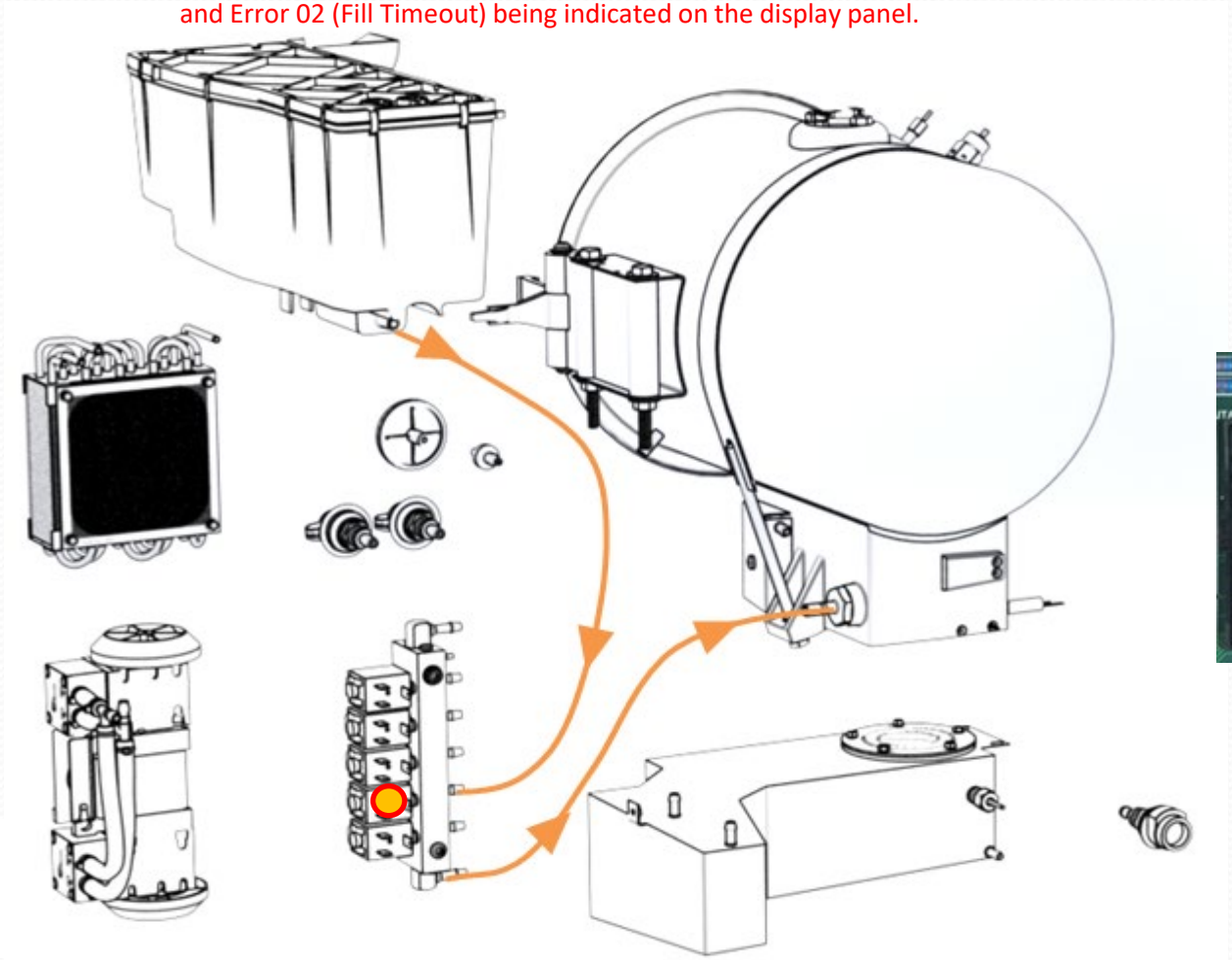
Class B Cycle Phase (step-by-step)

STAGE 1 cont.. - WATER FILL

Once the vacuum level has been achieved, the water fill solenoid will energise and water will enter the boiler from the tank, through the water fill valve and to the boiler via the filter.

In order to achieve the correct water fill level, the boiler probe also acts as a water level sensor. When the water reaches the boiler probe a circuit is completed and the fill valve will close.

Note: Failure to achieve 100% water fill in the time specified (240 seconds) will result in the cycle terminating and Error 02 (Fill Timeout) being indicated on the display panel.

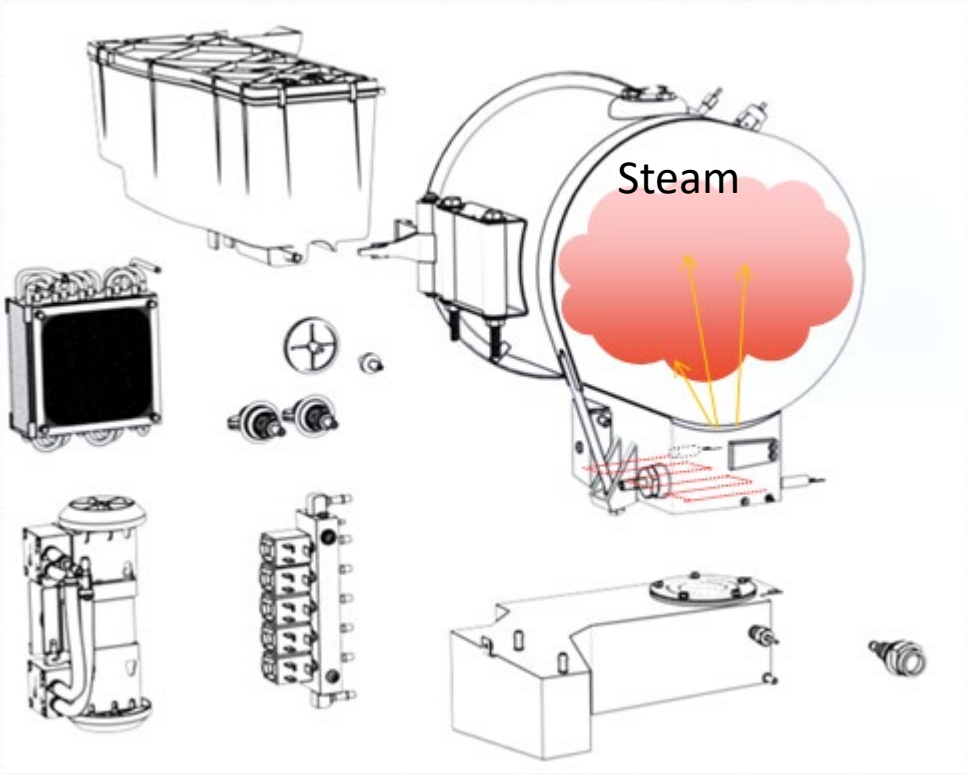


Class B Cycle Phase (step-by-step)

STAGE 2 – HEATING – 1st Positive Pulse.

The boiler heater is energised and pressure begins to rise inside the chamber to achieve the 1st positive set point of 1.90 bar/g (2.90 bar abs). This level is pre-programmed set point within the software .

Note: Failure to achieve this positive set point in the time specified (2500 seconds) will result in the cycle terminating and Error 03 (Pressure Timeout) being indicated on the display panel.

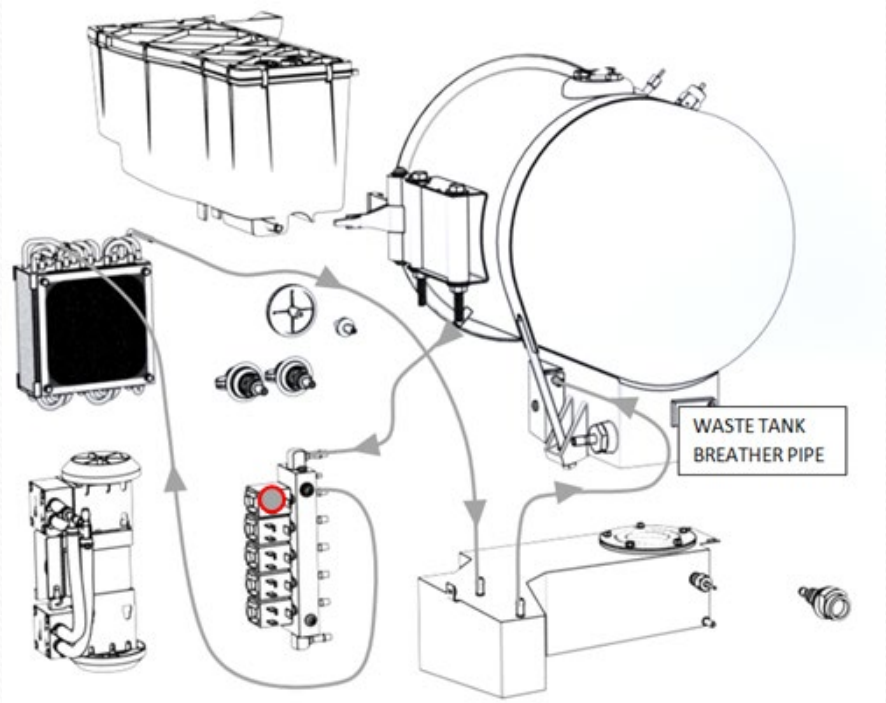


Class B Cycle Phase (step-by-step)

STAGE 1 - PRE VACUUM 2.

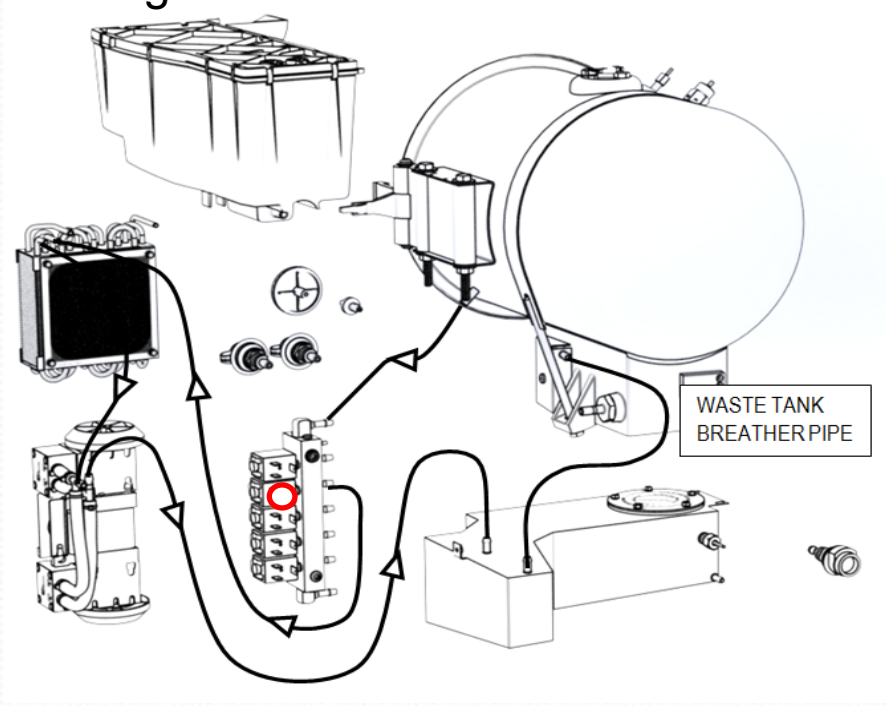
Once the desired +ve set point of 1.90 bar/g (2.90 bar abs) has been achieved, the steam will be released via the air bleed valve (Fig 1).
When the pressure drops to 0.3 bar/g (1.3 bar abs) the air bleed valve will close and the vacuum valve will open (Fig 2). At circa 105°C the vacuum pump will start and the pressure inside the vessel reduces to -0.58 bar/g (0.48 bar abs). When this is achieved the vacuum valve will close and the vacuum pump will be turned off.
Note: The boiler water level will be checked and if required re-filled.

Fig 1



Note: Failure to achieve the depressurizing set point in the time specified (900seconds) will result in the cycle terminating and Error 04 (Flush Timeout) being indicated on the display panel.

Fig 2



Note: Failure to achieve the required vacuum in the time specified (900seconds) will result in the cycle terminating and Error 01 (Vacuum Timeout) being indicated on the display panel.

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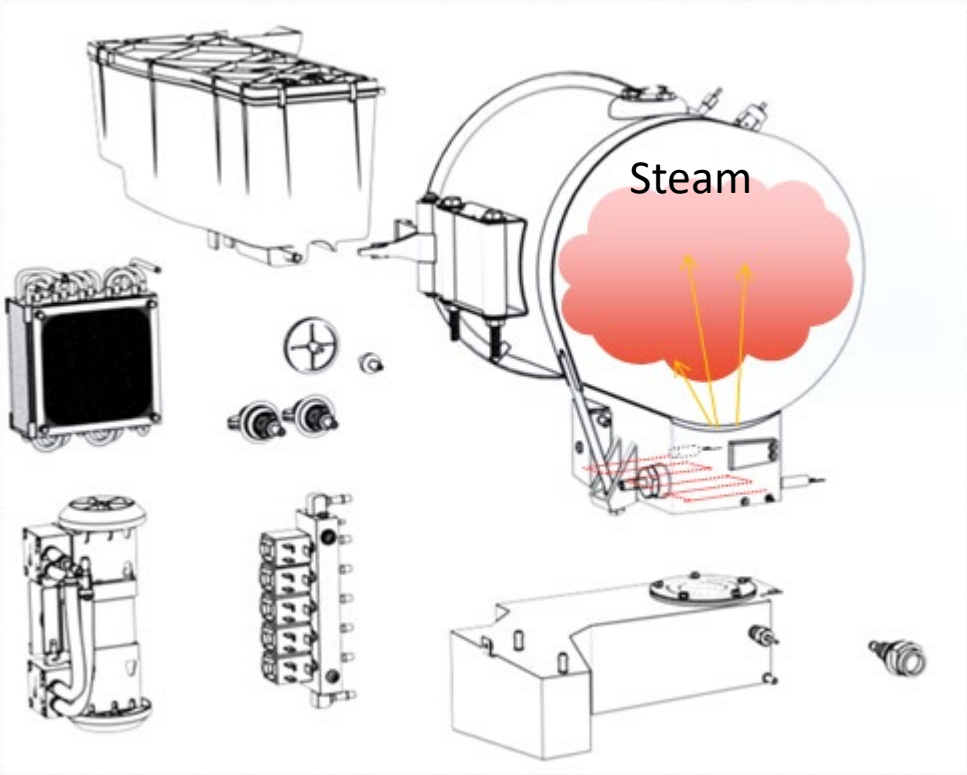
Class B Cycle Phase (step-by-step)

STAGE 2 – HEATING – 2nd Positive Pulse.

The boiler heater is energised and pressure begins to rise inside the chamber to achieve a 2nd positive set point of 1.90 bar/g (2.90 bar abs). This level is pre-programmed set point within the software .

Note: Failure to achieve this positive set point in the time specified (2500 seconds) will result in the cycle terminating and Error 03 (Pressure Timeout) being indicated on the display panel.



Class B Cycle Phase (step-by-step)

STAGE 1 - PRE VACUUM 3.

Once the desired +ve set point of 1.90 bar/g (2.90 bar abs) has been achieved, the steam will be released via the air bleed valve (Fig 1).
When the pressure drops to 0.3 bar/g (1.3 bar abs) the air bleed valve will close and the vacuum valve will open (Fig 2). At circa 105°C the vacuum pump will start and the pressure inside the vessel reduces to -0.58 bar/g (0.48 bar abs). When this is achieved the vacuum valve will close and the vacuum pump will be turned off.
Note: The boiler water level will be checked and if required re-filled.

Fig 1

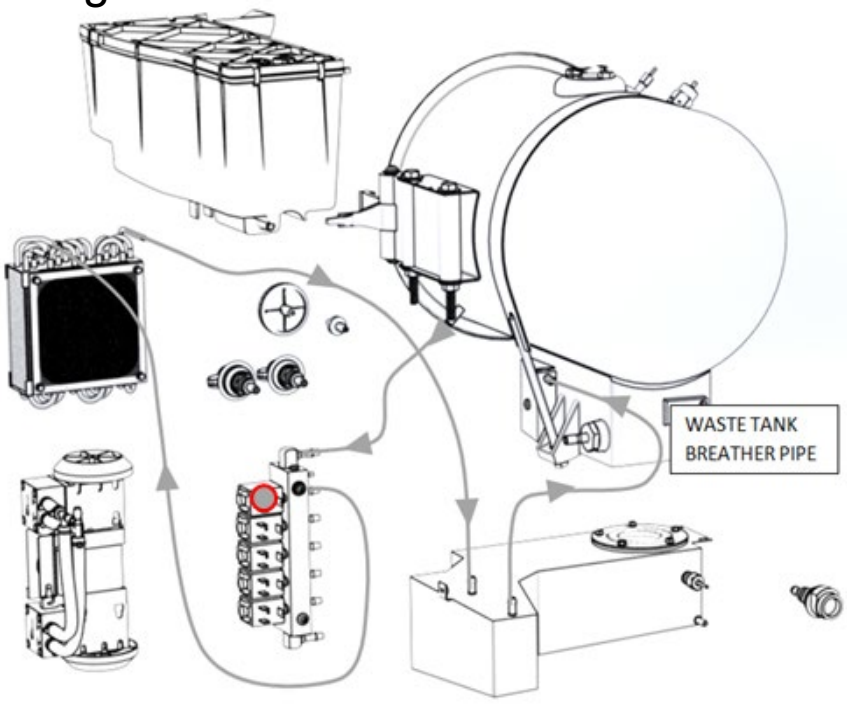
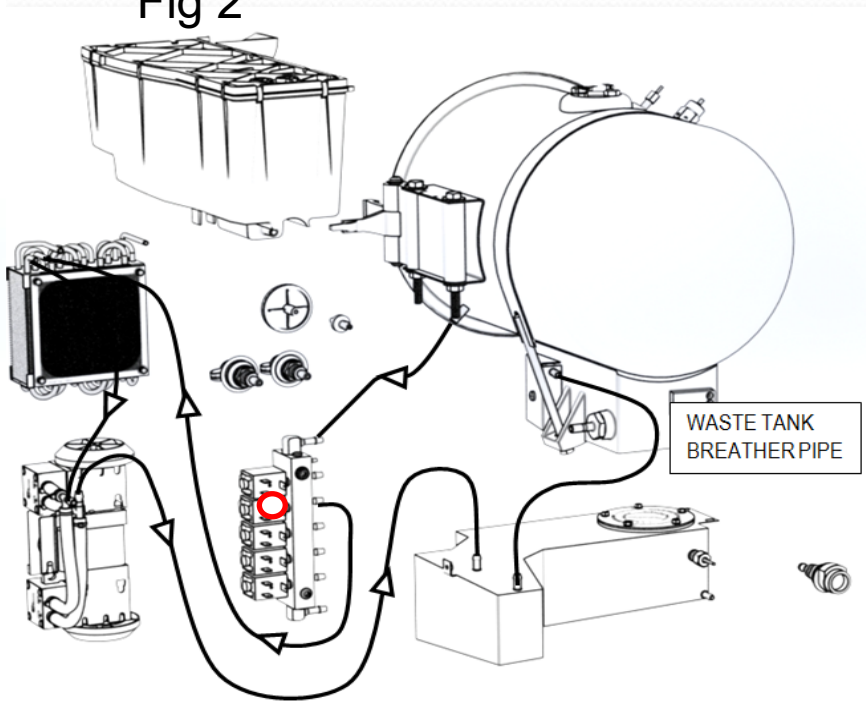


Fig 2



Note: Failure to achieve the flush set point in the time specified (900seconds) will result in the cycle terminating and Error 04 (Flush Timeout) being indicated on the display panel.

Note: Failure to achieve the required vacuum in the time specified (900seconds) will result in the cycle terminating and Error 01 (Vacuum Timeout) being indicated on the display panel.

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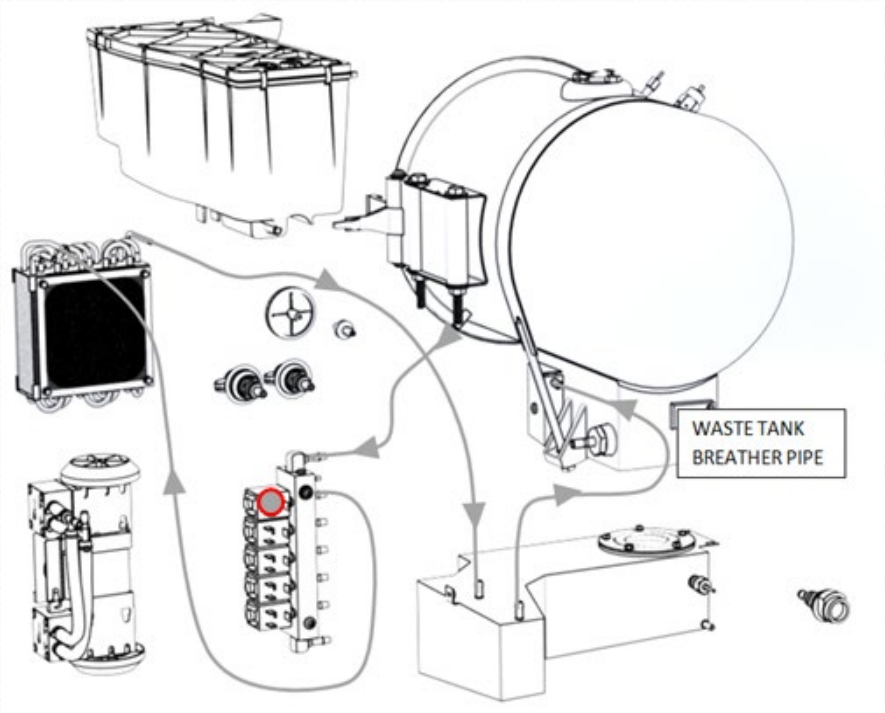
Class B Cycle Phase (step-by-step)

STAGE 2 – HEATING – To Sterilising

The boiler heater is energised and pressure begins to rise inside the chamber .

On Vacuum cycles the air bleed opens at 1.21Bar Abs during this final heating stage. At this point the air bleed steam tables are activated and 60 consecutive passes are required before the air bleed valve closes. The temperature then continues to rise up to the sterilizing set points.

Please note: On all Non-Vacuum cycles, once the boiler has initially filled with water, the boiler element will be turned on. The air bleed solenoid will be energised (valve open). Steam will then rise into the rear of the chamber and push the air forward and out through the air bleed port (located at the front of the chamber) and then to the waste tank via the air bleed valve, and at 1.0 bar abs and 120 consecutive passes are required before the air bleed valve closes.



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Note: Failure to achieve the required set point (60 passes) in the time specified (900 seconds) will result in the cycle terminating and Error 05 (Air Bleed Timeout) being indicated on the display panel.

Class B Cycle Phase (step-by-step)

STAGE 3 – STERILIZING.

As the temperature approaches the onset of sterilizing, the energy input is reduced so avoiding the possibility of temperature overshoot. This is controlled using the Steam Power PID loop.

On reaching the required sterilizing temperature another steam table check is conducted [10 consecutive passes being required in two minutes] if 10 passes are not achieved in this time then an error 14 will be displayed and the cycle aborted.

Once 10 passes are achieved the sterilizing timer starts.
This timer is 210 seconds for 134°C cycles (Except Prion where it is 1080 or 960 seconds on 121°C cycles).

During the sterilization period the temperature and pressure are continually monitored and compared against the steam table and any deviation from the acceptable limits results in an Error 09 (Press v's Temp error) occurring.

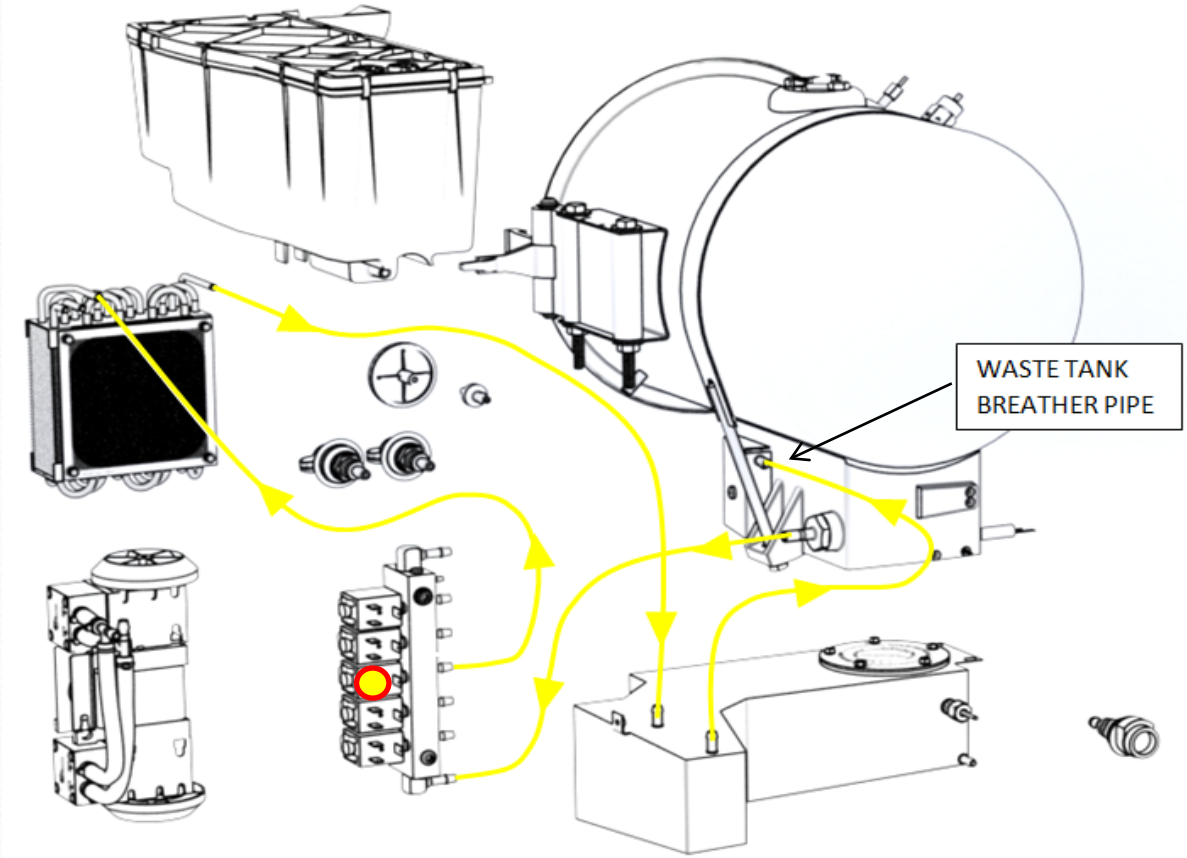
Note. Possible faults displayed in this stage:
Error 11 (Out of Sterilizing Range (Band 134.0 to 138.0°C))
Error 09 (Press V's Temp Error (Tolerance 1.5°C)

Class B Cycle Phase (step-by-step)

STAGE 4 – DEPRESSURISATION.

At the end of the sterilizing period the steam power is turned off, the internal heater switched on and the flush valve is energised .
With the valve open the remaining pressure in the chamber forces residual water out of the boiler and back to the used water tank.
As the water leaves the vessel the pressure in the chamber falls rapidly.
Once the pressure has returned to 0.3 bar/g (1.3 bar abs) the flush valve will close and the vacuum valve will open to proceed to drying

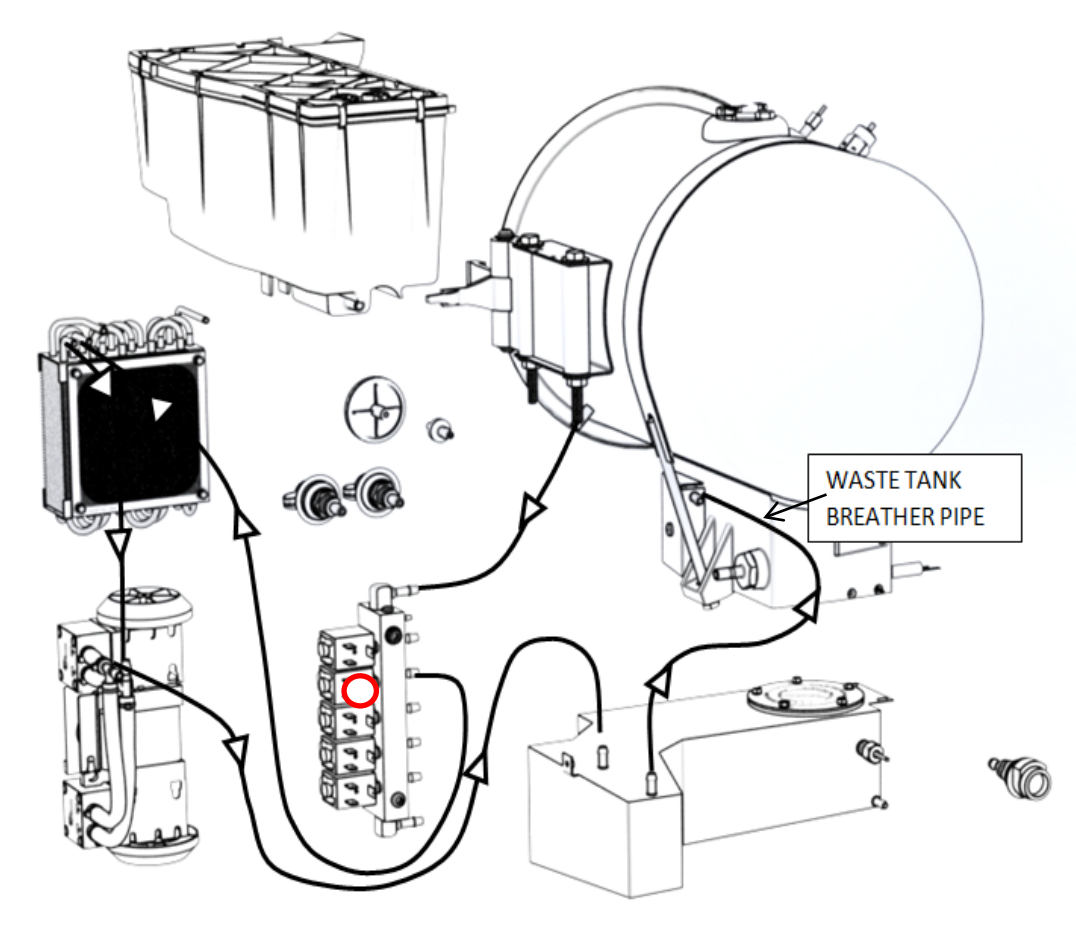
Note: Failure to achieve the depressurizing set point in the time specified (900seconds) will result in the cycle terminating and Error 04 (Flush Timeout) being indicated on the display panel.



Class B Cycle Phase (step-by-step)

STAGE 4 Cont.. - VACUUM DRYING.

Power will be applied to the boiler and internal heater, at the same time the vacuum solenoid will be energised ○ and the vacuum pump will start.
The vacuum has 3 stages (2 x check vacuum's and 1 long deep drawn vacuum)
The pump will operate and vacuum of -0.15Bar/abs (850mb abs), must be created within 120s or Error 7 will occur. Once achieved the pump and vac valve are de-energised and the air filter valve energised to achieve atmospheric pressure of 950mb abs, within 900s or Error 8 will occur. This stage is then repeated prior to a deep drawn vacuum for 13 minutes (No Error associated during this vacuum stage)
At the end of this time the vacuum pump and valve will be turned off.

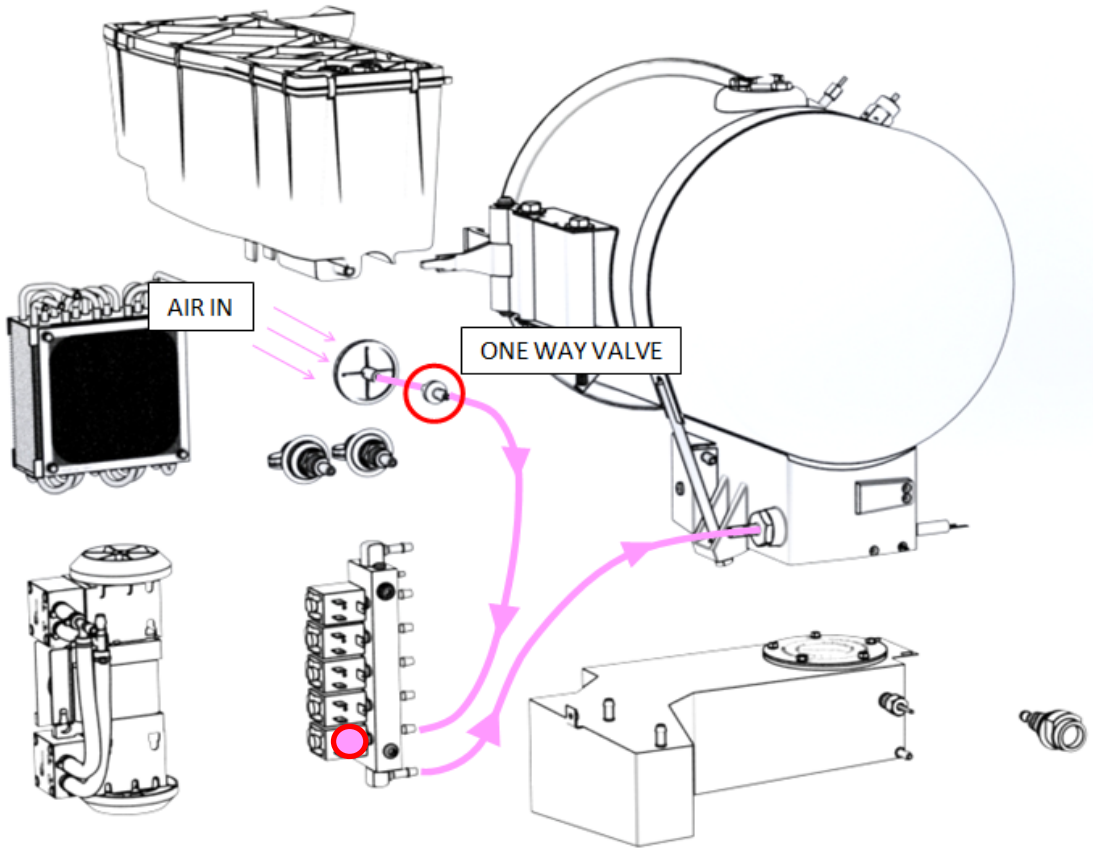


Class B Cycle Phase (step-by-step)

STAGE 4 Cont.. - AIR ADMISSION.

At the end of drying the air filter valve will open and remain energized until the pressure in the chamber returns to atmospheric pressure (-0.05Bar/g (950mb abs. If this is not done in the required time Error 08 will be displayed.

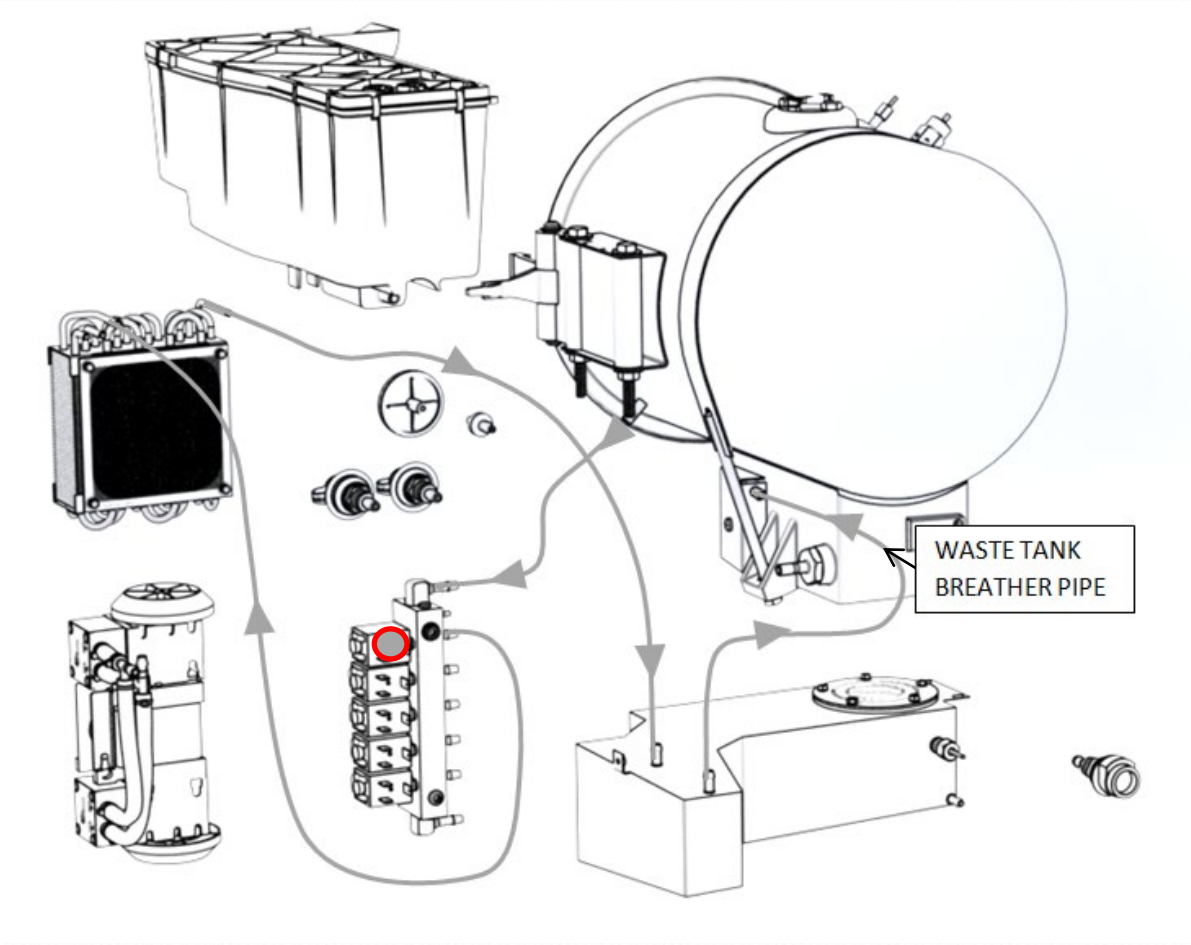
Note: Failure to achieve atmospheric pressure set point in the time specified (900seconds) will result in the cycle terminating and Error 08 (DRYING PRESSURE RISE TOO LONG) being indicated on the display panel.



Class B Cycle Phase (step-by-step)

STAGE 4 Cont.. - AIR EQUILISATION.

Once atmospheric pressure is achieved, the air inlet valve, boiler and internal heater are de-energised, and power is applied to the air bleed solenoid. The air bleed valve ◯ opens and atmospheric pressure is maintained within the chamber.

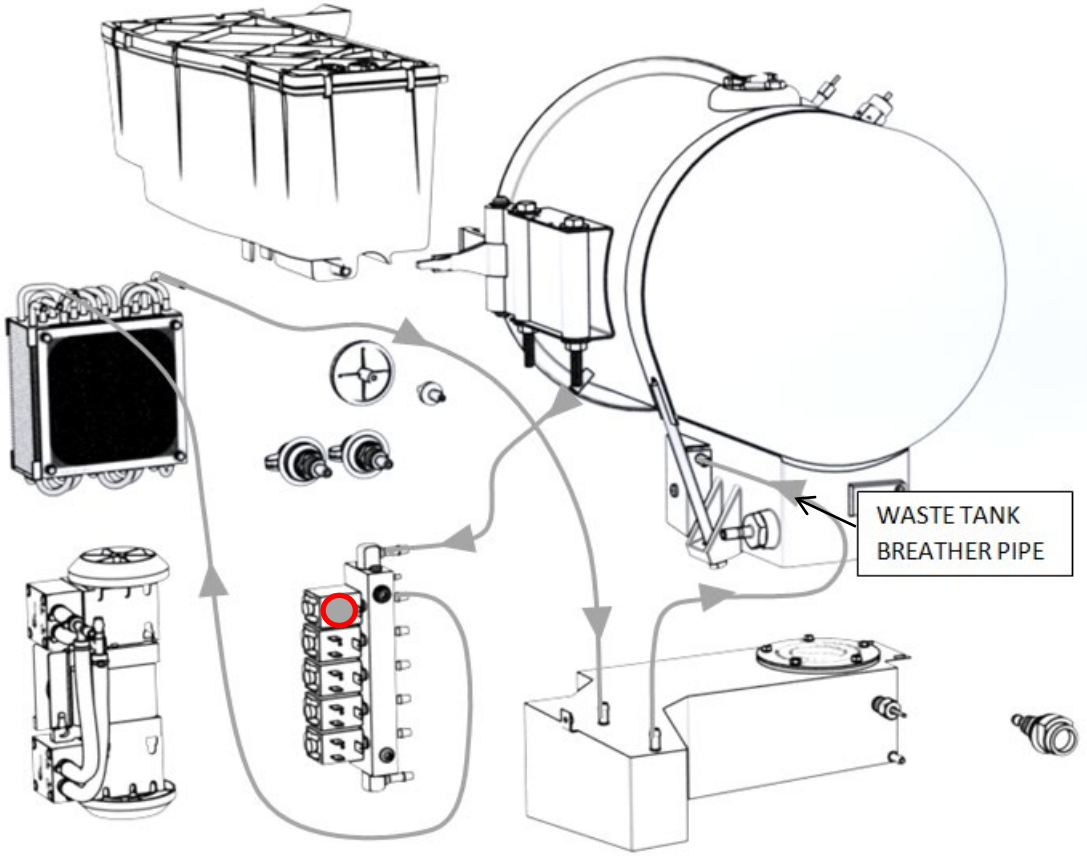


Class B Cycle Phase (step-by-step)

STAGE 5 – CYCLE COMPLETE.

After a few moments delay, the cycle will complete.
This is indicated by several bleeps from the buzzer.
The air bleed valve will remain open to avoid either a pressure increase or vacuum forming within the chamber, before the door is opened.

Note: Either a positive or negative pressure in the chamber can stop the door from opening.
Once the door open button is pressed, a reduced power is applied to the boiler heater, and the cooling fan will remain on for a period of five minutes. If a new cycle is not selected within this period the fan will automatically turn off.



Engineers Manual

Pages xx of the service manual

Software

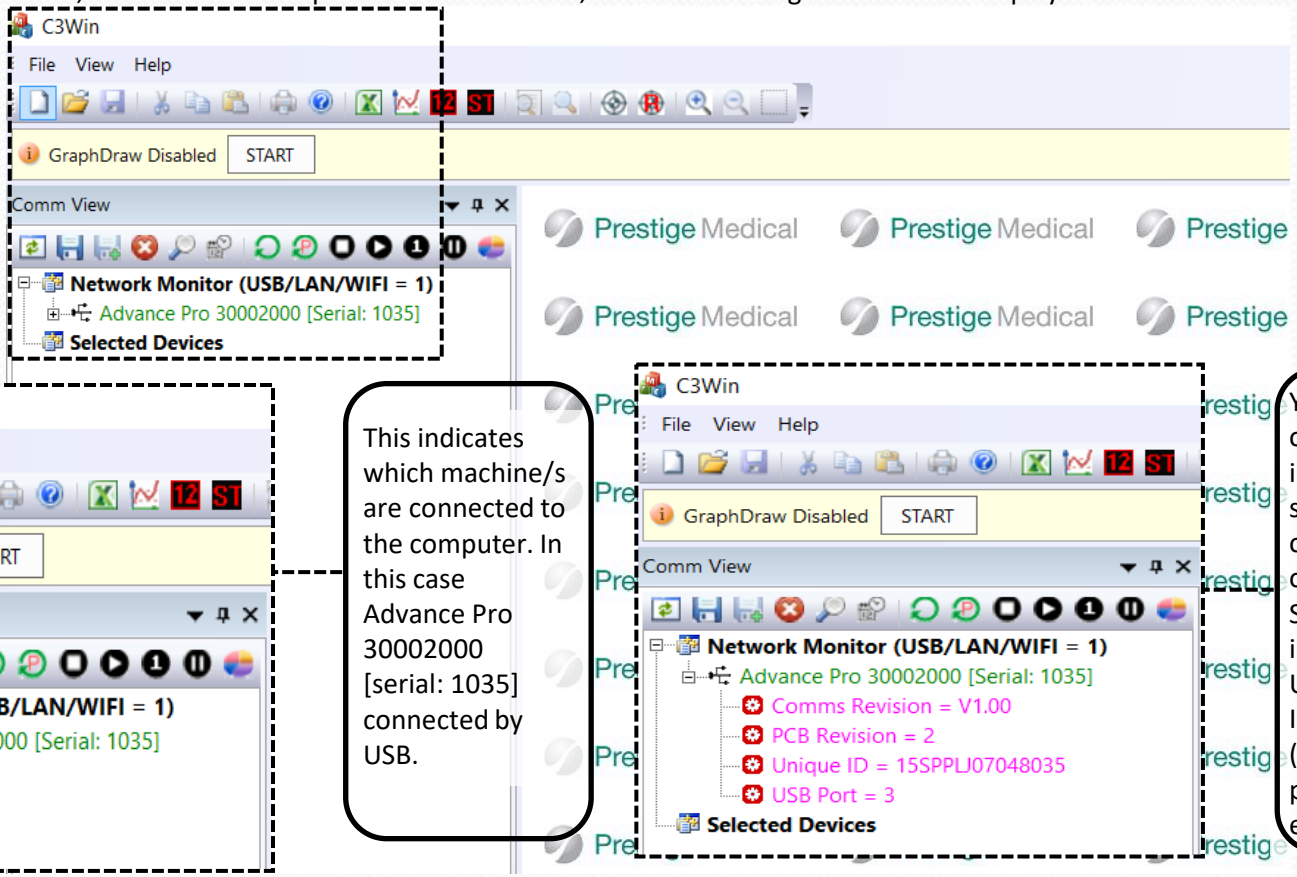
Introduction

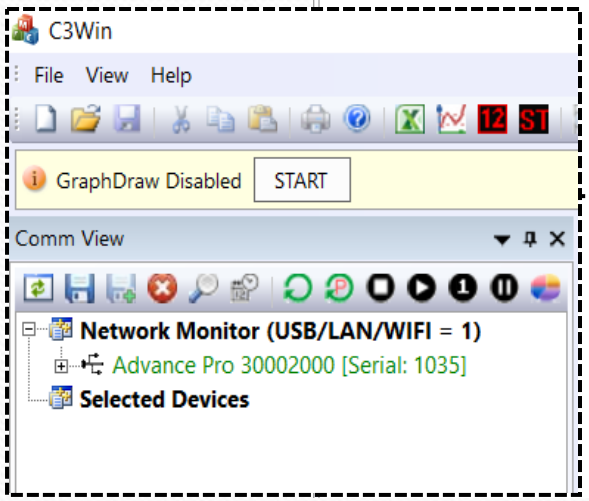
The Advance Pro's intelligent windows access software, allows you to connect to multiple units simultaneously, via USB and allows you to monitor cycle progress, component status, and steam table results during operation, and you can also view all files and folders relating to the unit, and perform temperature/pressure calibration on the fly.

Software

The C3 Win Application is designed to enable engineers to access the system, to conduct diagnostics, calibration, software updates etc…

To enter this application, click on the desktop icon as shown above, and the following screen will be displayed: -



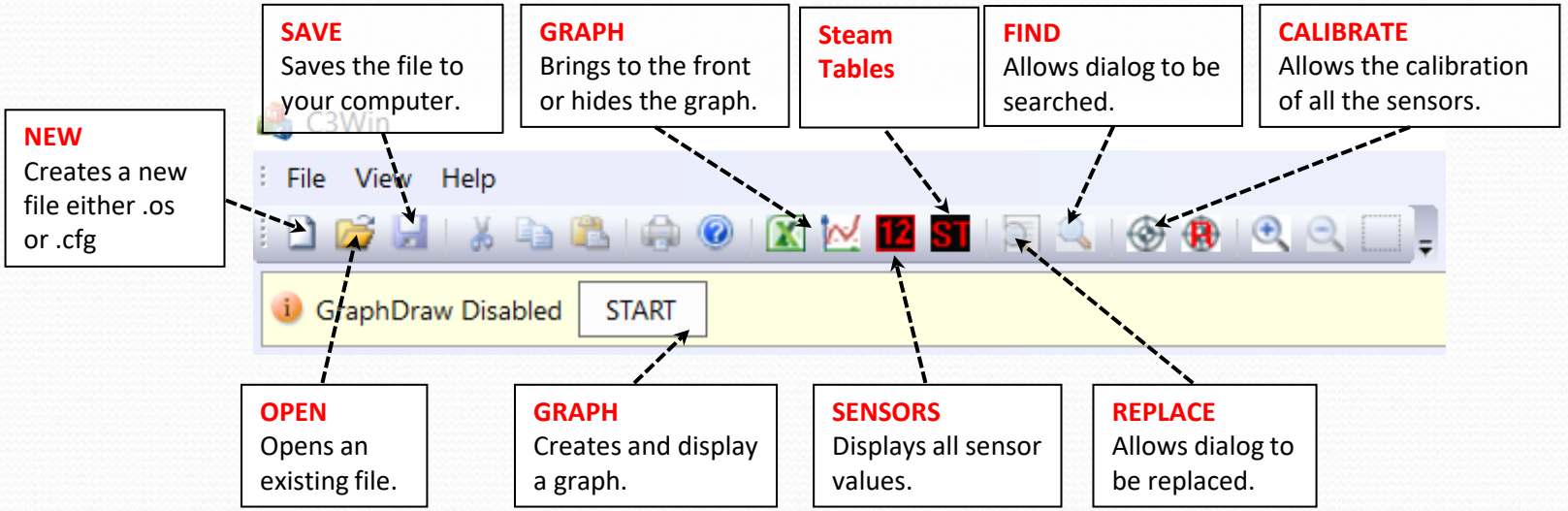


This indicates which machine/s are connected to the computer. In this case Advance Pro 30002000 [serial: 1035] connected by USB.

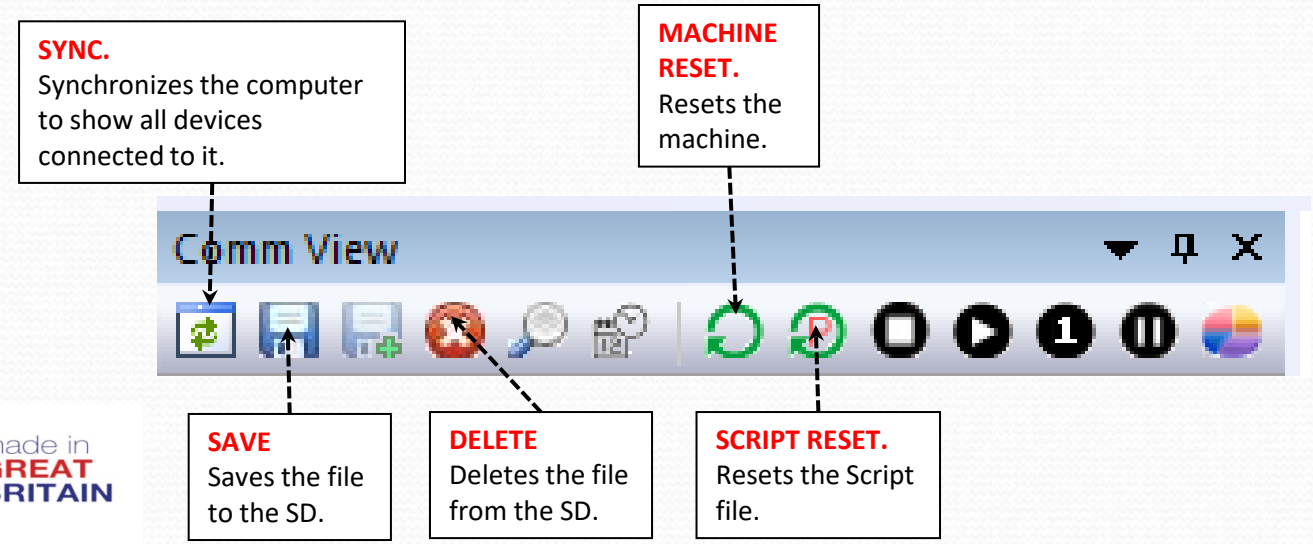
You can expand or contract the information shown by clicking on +/- to the left of the USB Symbol. i.e. The PCB's Unique Identification (UID) and which port is being used etc…

Software - Icons

C3Win icons relate to files on the computer being used



Comm View icons relate to files on the Module/SD Card.



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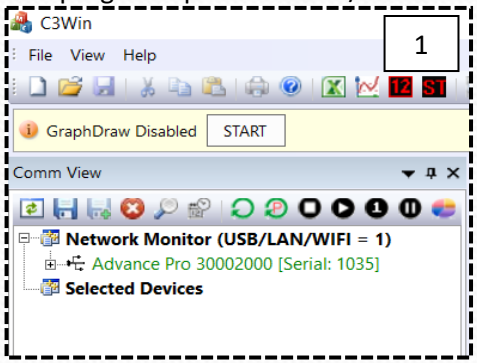
Time and date Setting

Connect your laptop to the autoclave via the USB B rear comms port.

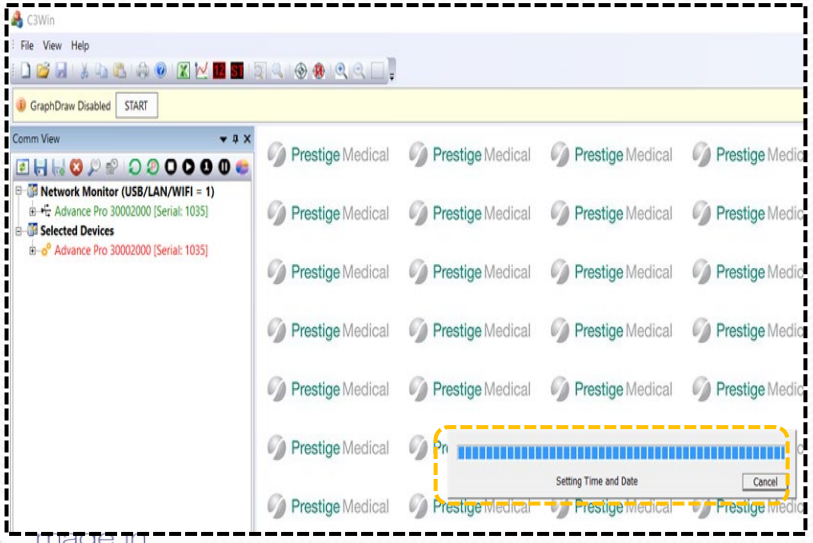
Open the windows program by clicking on the icon opposite. 

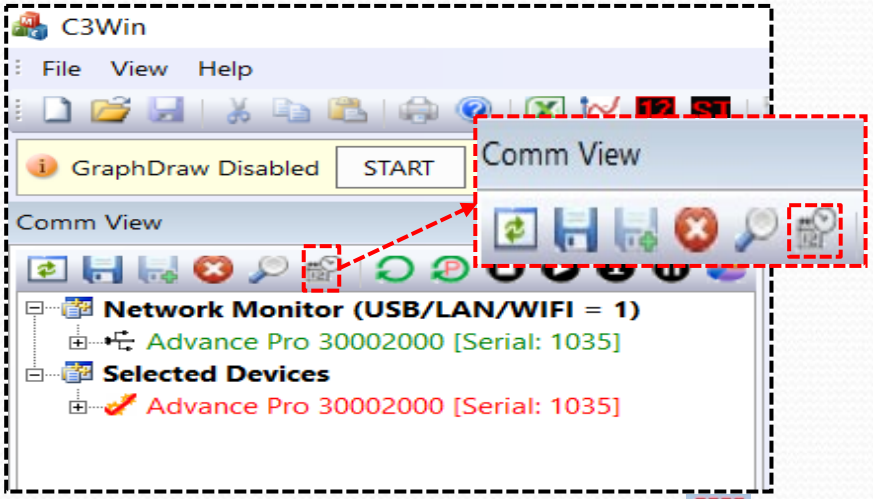
When the program opens machine/s connected to the computer will be shown in the left window (see image 1).



Left click to highlight the machine (see image 2

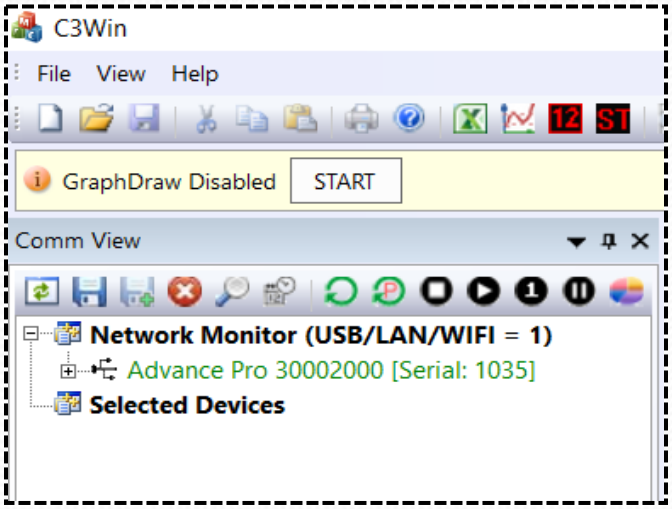
Right click on the highlighted machine, adds the unit to selected devices and sets the time and date (see image 3)



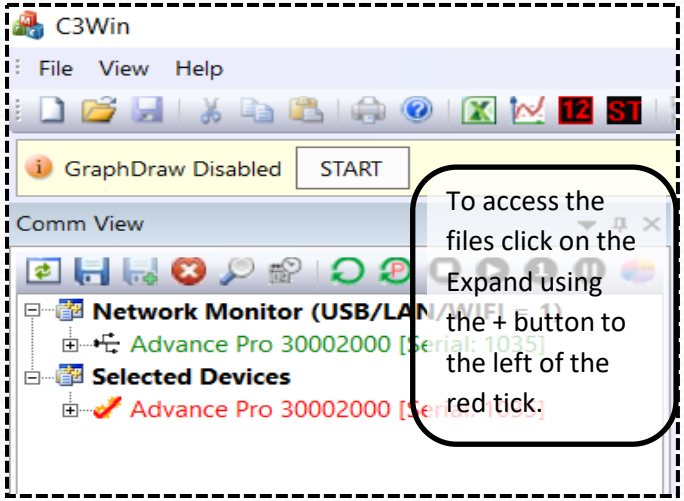


Alternatively you can set the time and date by pressing once in selected devices (see above) 

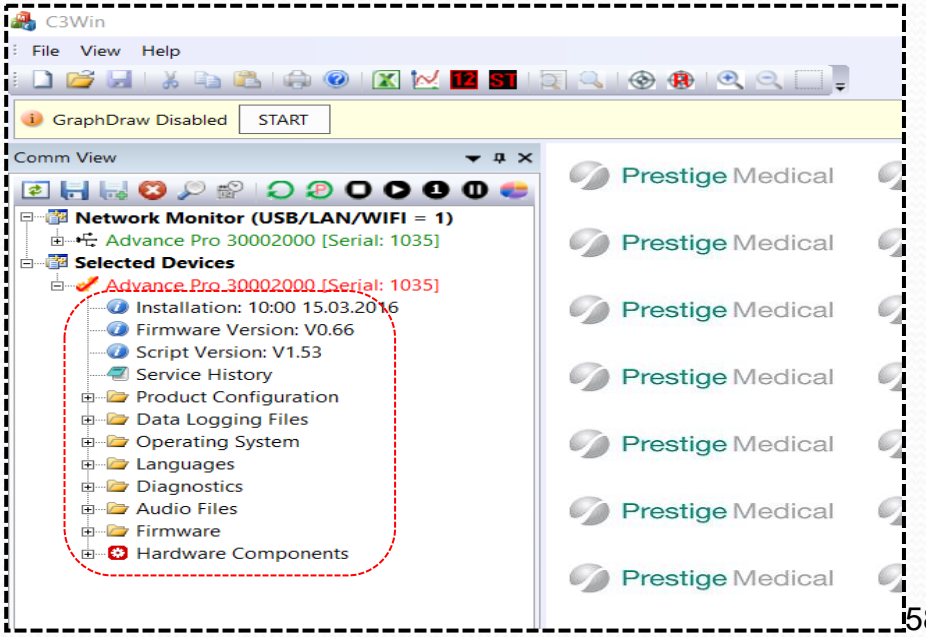
Software – File View



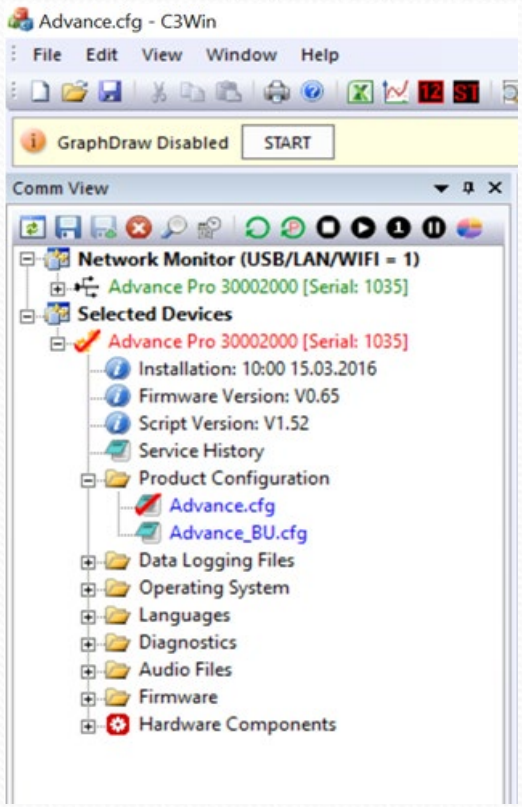
Left click to highlight the machine (right image), then right click the machine which adds it to selected devices (below image)

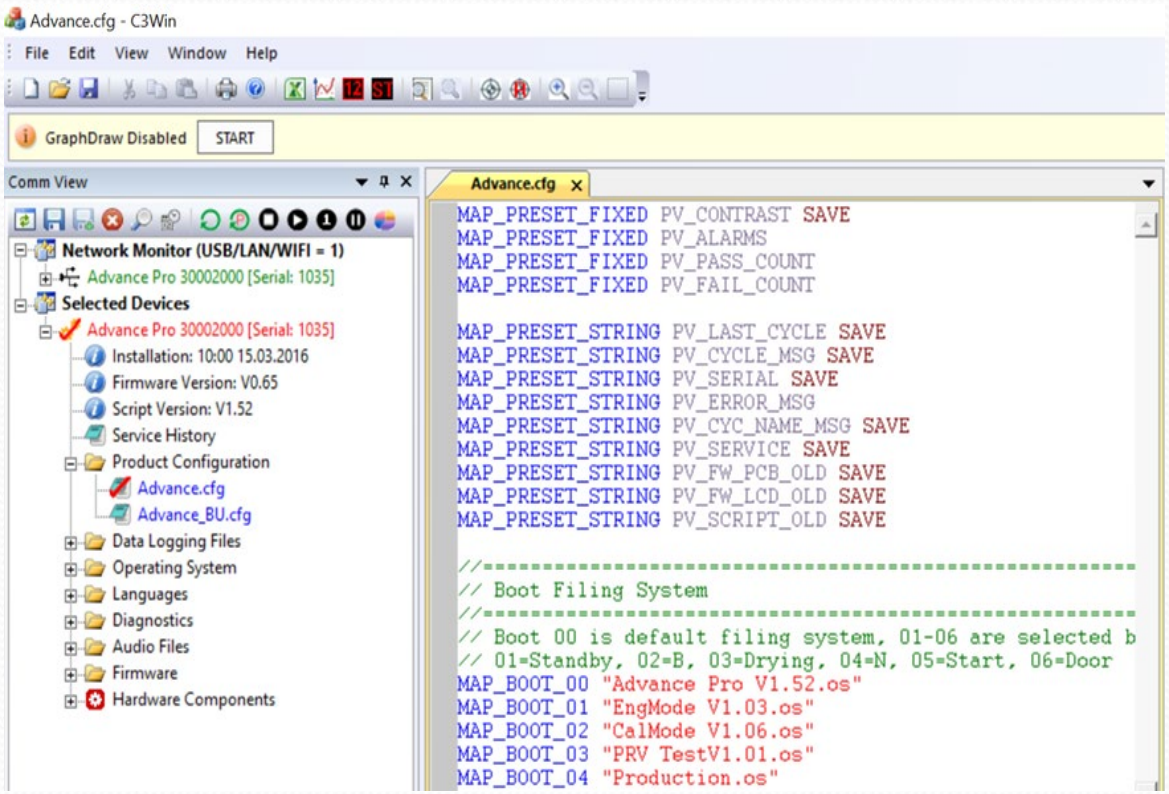


To access the files click on the Expand using the + button to the left of the red tick.



Software





All the files are now available to examine, the one that is active is highlighted by a red tick.

All files can be opened by highlighting (move the cursor over the file and left clicking on the mouse).

When highlighted in blue double click to open. After a short while the file appears in a new tab in the window to the Right.

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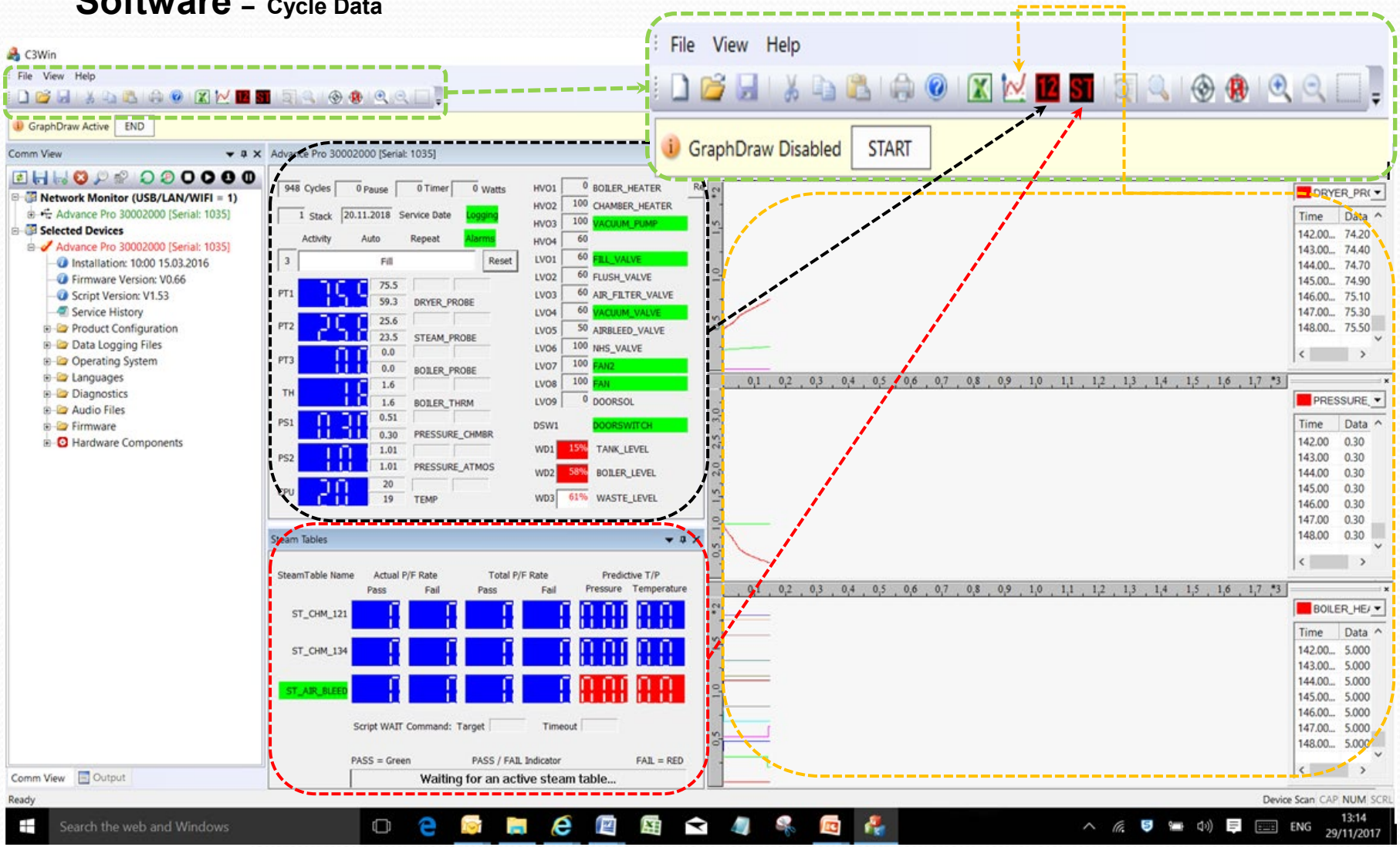
FYI - The Product Configuration file, configures the machine upon power up.

Prestige Medical
Integrated decontamination solutions

Advance Pro

Software – Cycle Data



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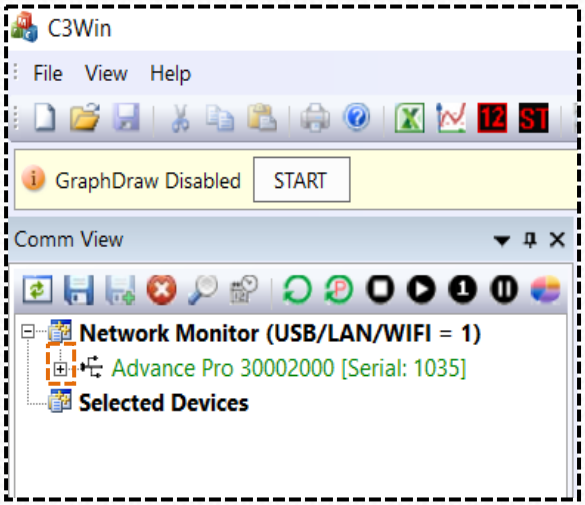
Software (Firmware Upgrade)

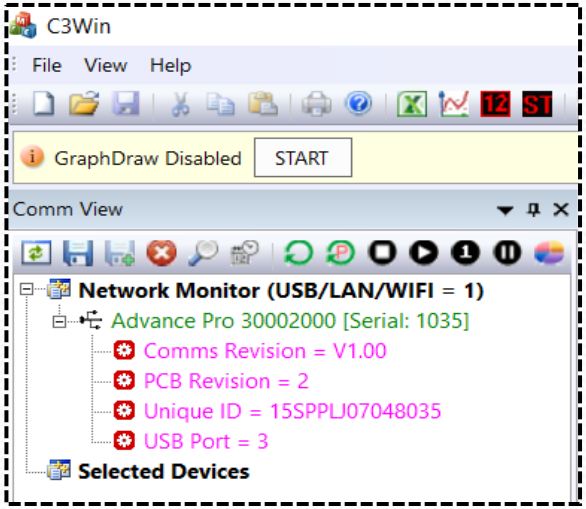
STEP 1: Download and install SAM-BA [2.17 for Windows (XP, Vista, Seven editions)].

STEP 2: Plug the USB cable from the PC in to the rear USB socket located at the rear of the machine.

STEP 3: Switch the unit on and open the C3Win program.
Expand the unit requiring upgrade by clicking on the + sign to the left of the appropriate unit, highlighted by the [ ] below.

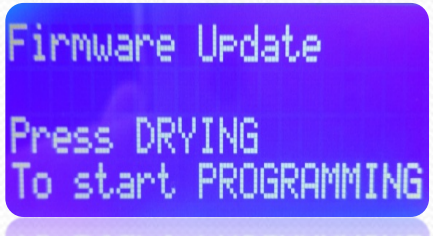
Once you have the usb/Com port number close C3Win program





STEP 4: Switch the Autoclave on whilst holding the start button.

+



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Software (Firmware Upgrade)

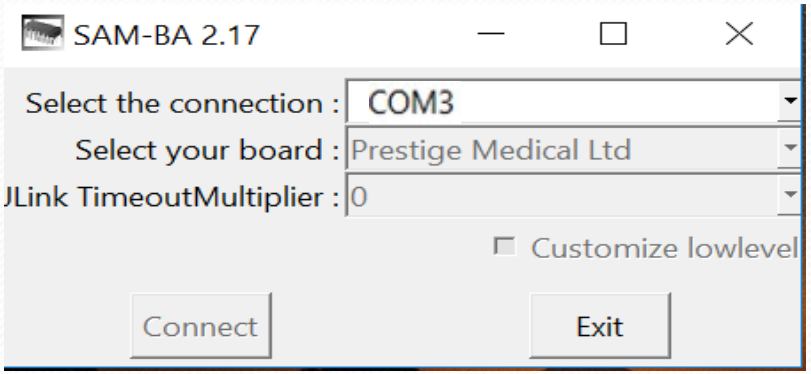
STEP 5: Press the drying button.

STEP 6: OPEN SAM-BA Program

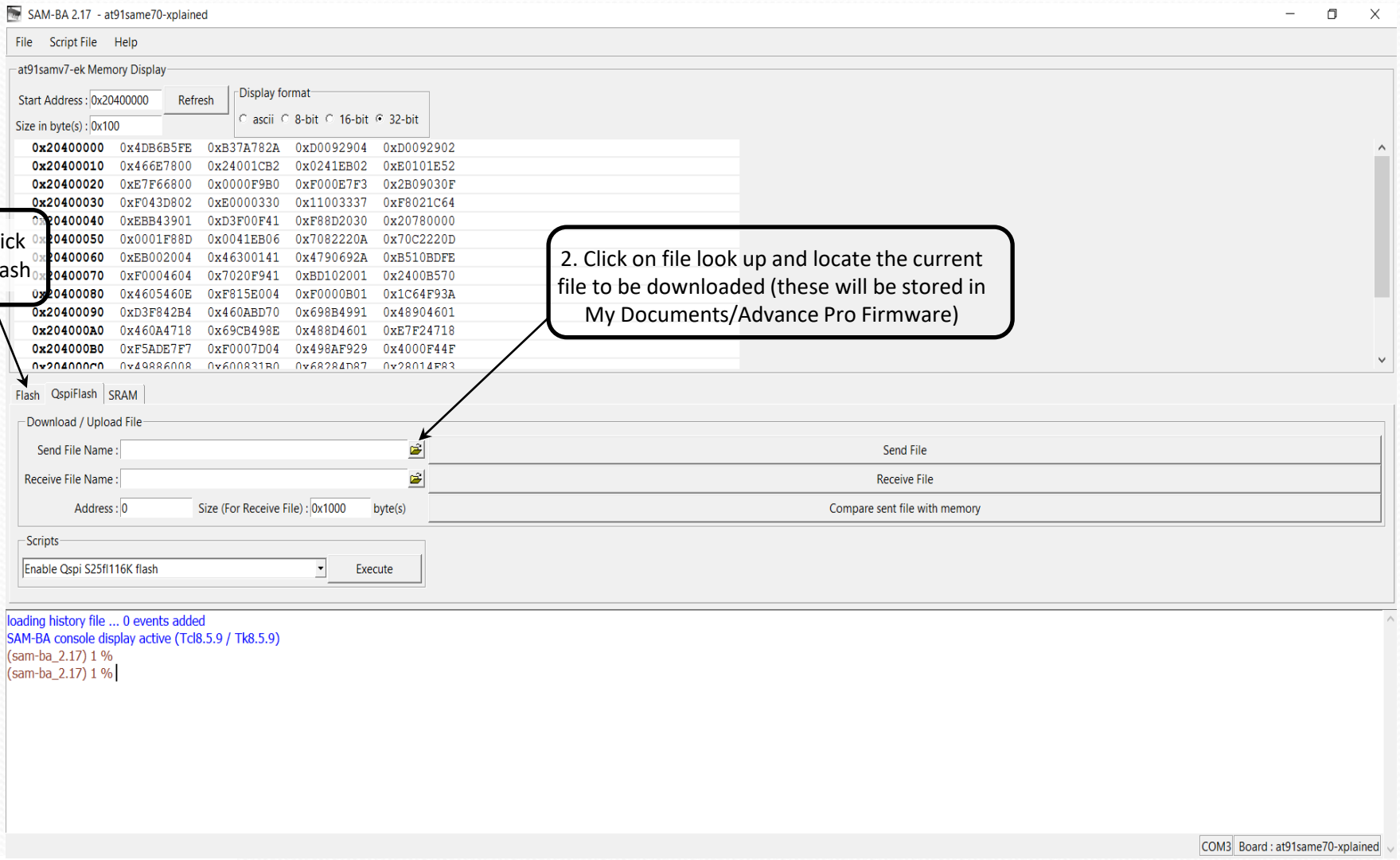
On opening the software, the screen will appear as shown below.

Ensure the correct COM PORT is selected
Ensure the Select your board is correct
I.e. Prestige Medical Ltd

Then click on "Connect".



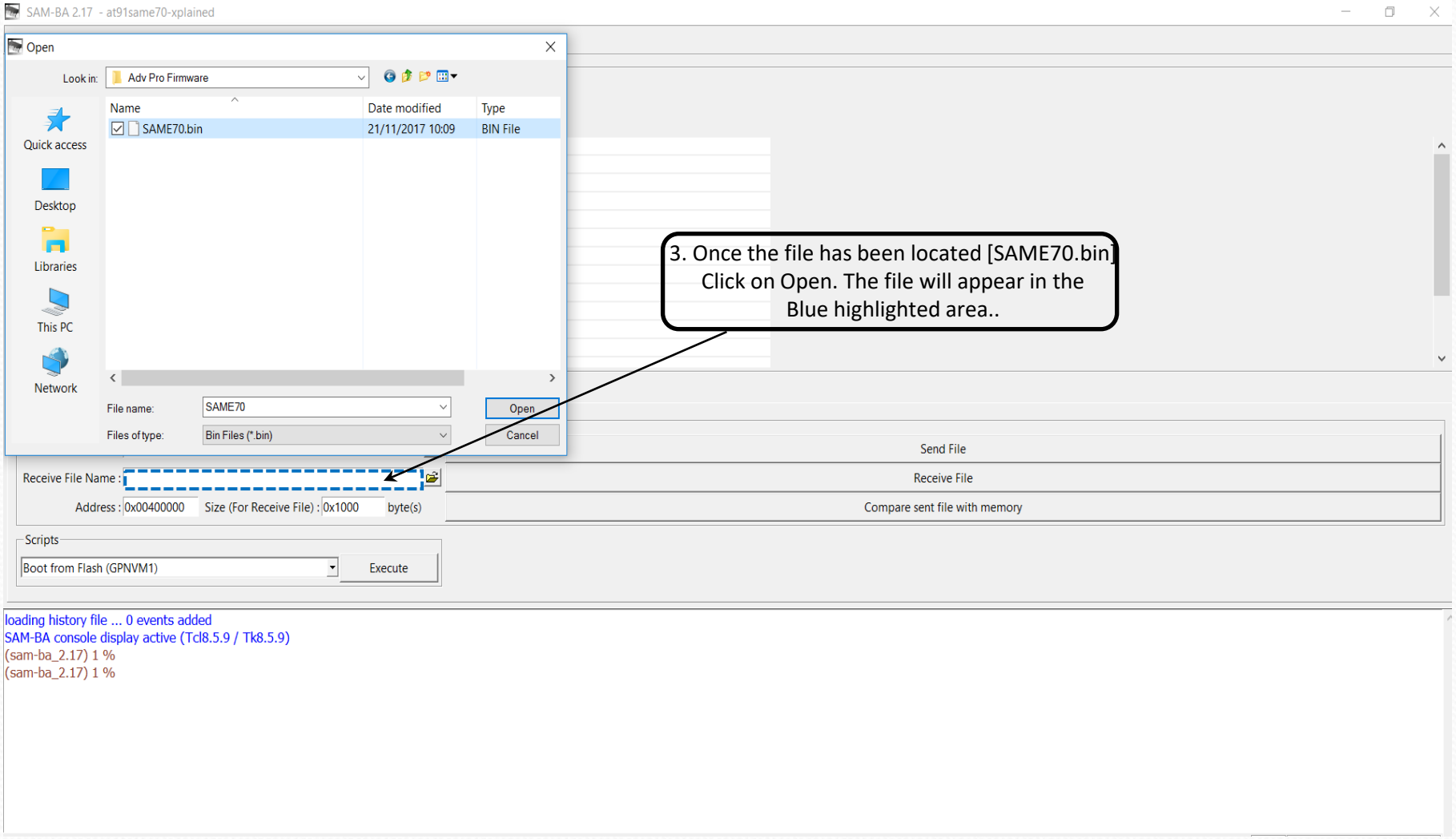
Software (Firmware Upgrade)



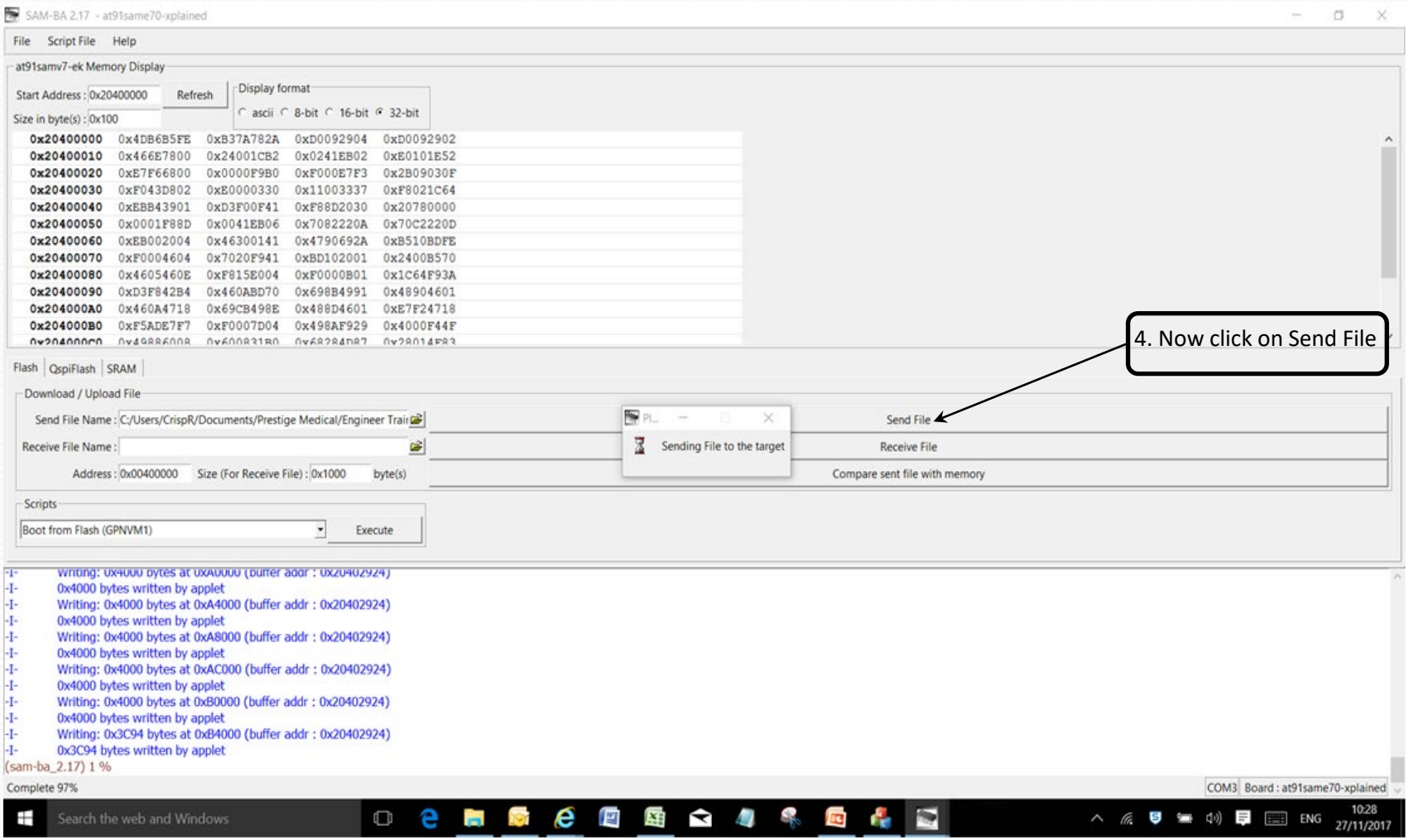
1. Click on Flash

2. Click on file look up and locate the current file to be downloaded (these will be stored in My Documents/Advance Pro Firmware)

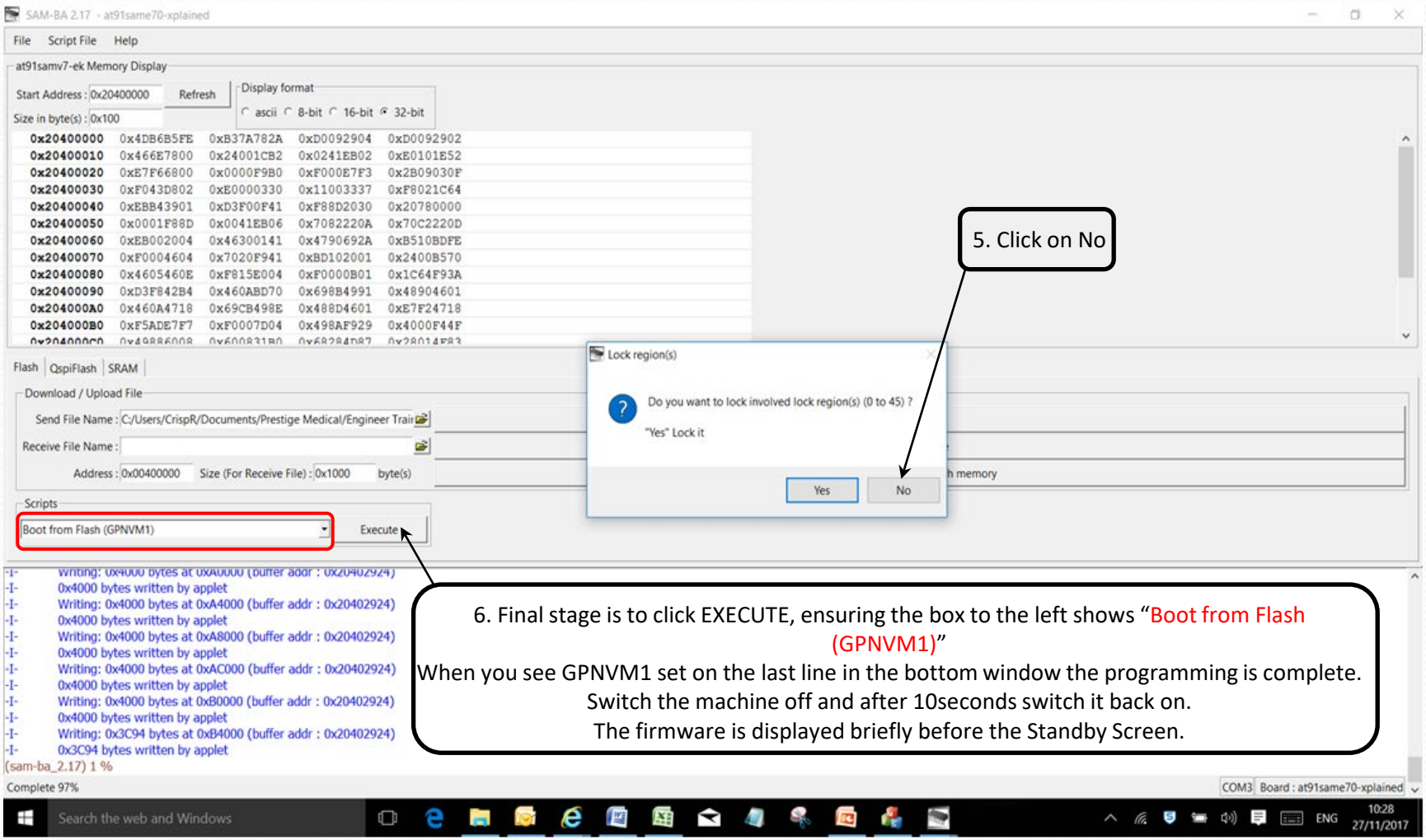
Software (Firmware Upgrade)



Software (Firmware Upgrade)



Software (Firmware Upgrade)



6. Final stage is to click EXECUTE, ensuring the box to the left shows "Boot from Flash (GPNVM1)"
When you see GPNVM1 set on the last line in the bottom window the programming is complete.
Switch the machine off and after 10seconds switch it back on.
The firmware is displayed briefly before the Standby Screen.

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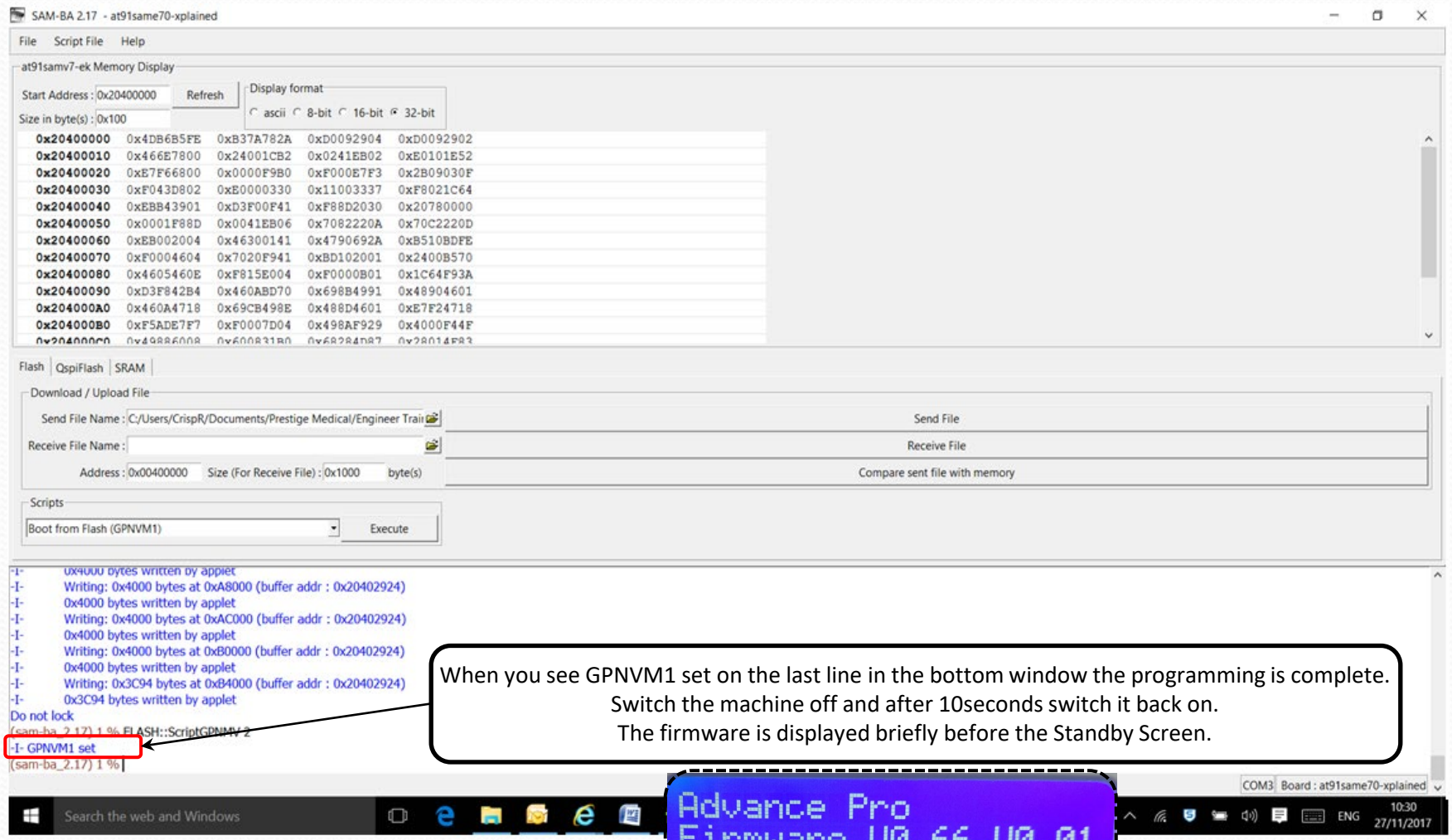
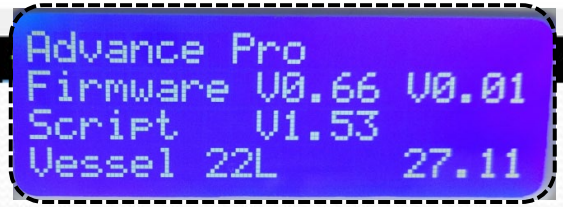
Software (Firmware Upgrade)



When you see GPNVM1 set on the last line in the bottom window the programming is complete.
Switch the machine off and after 10seconds switch it back on.
The firmware is displayed briefly before the Standby Screen.



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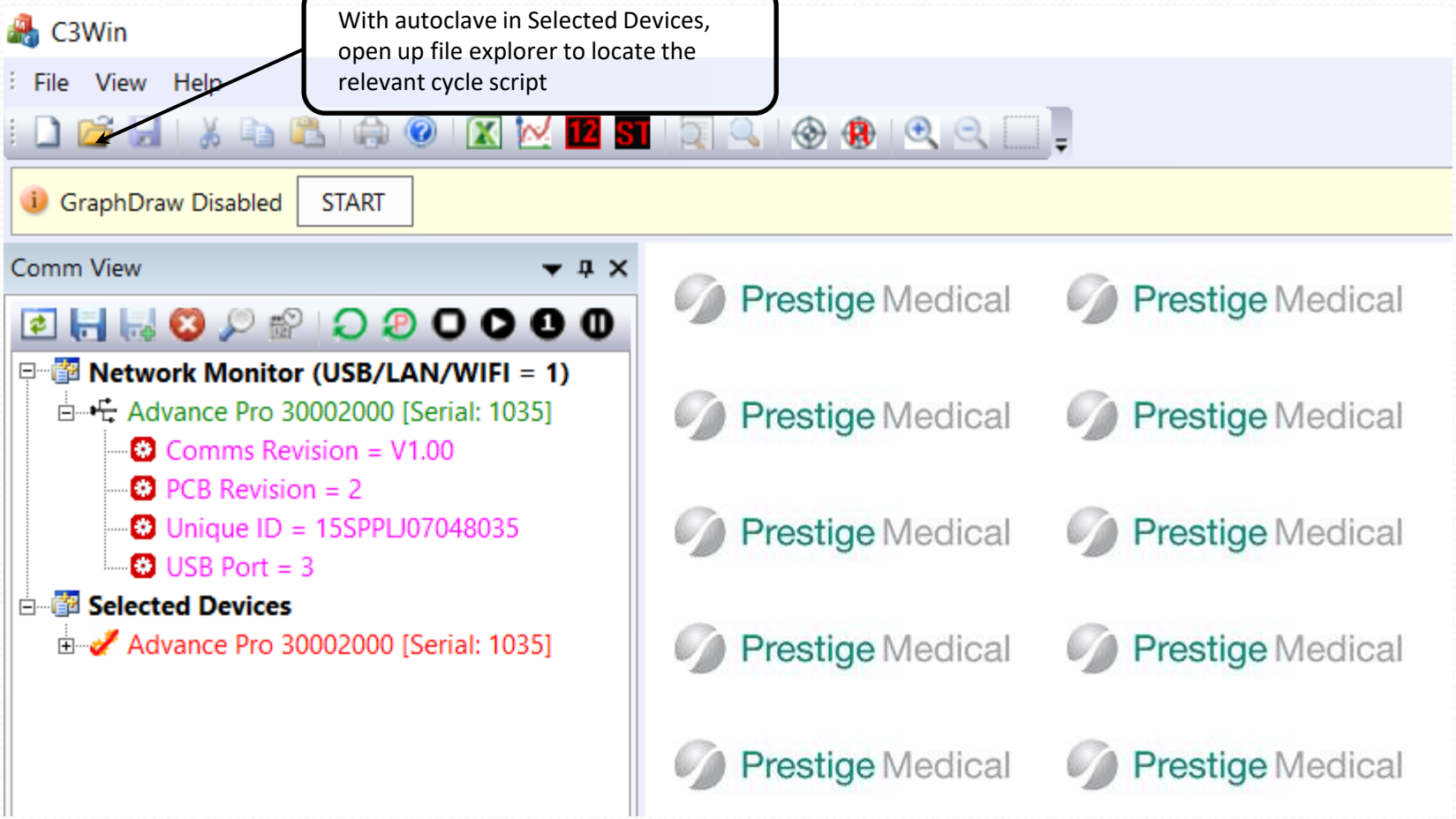
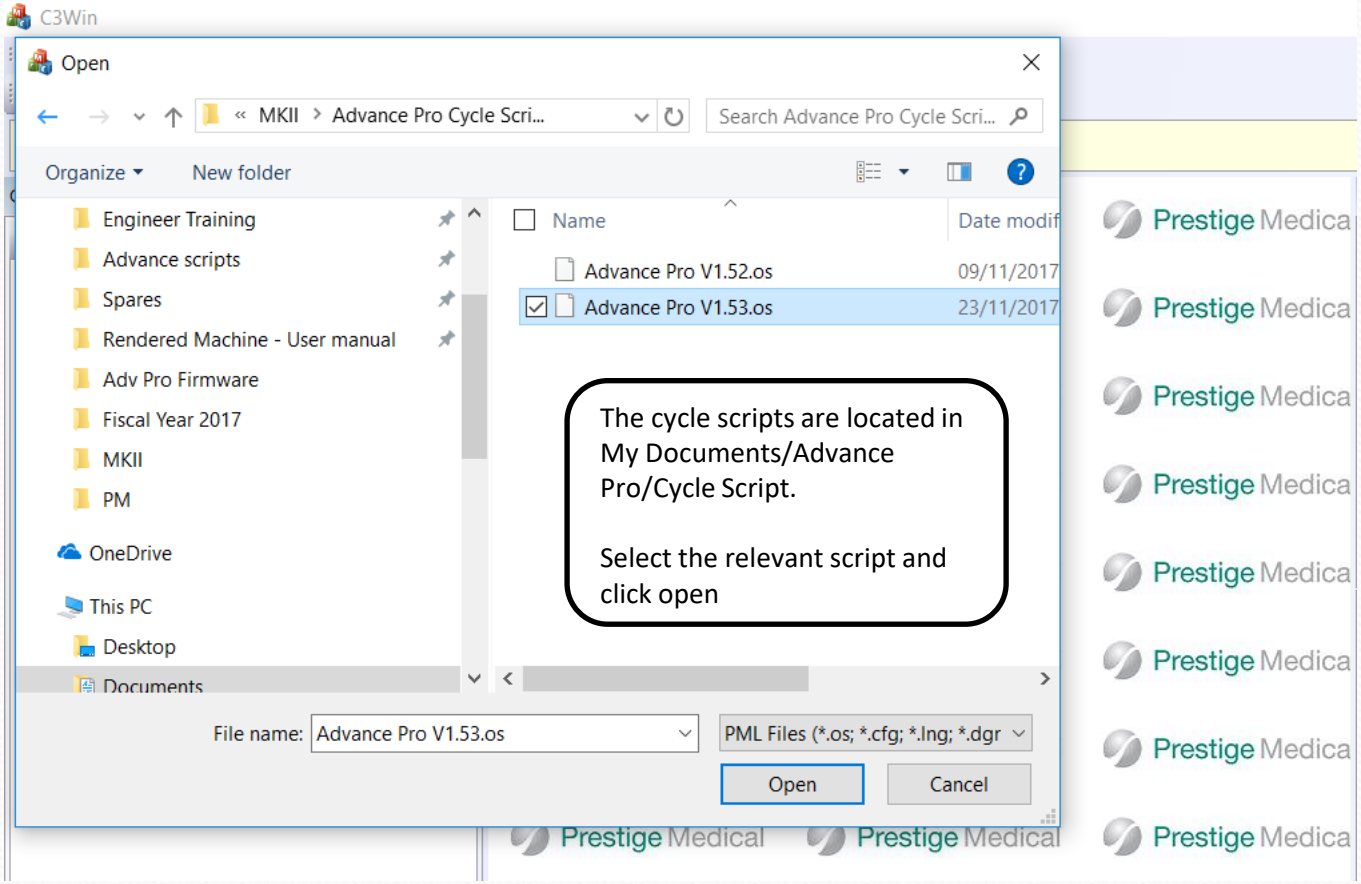
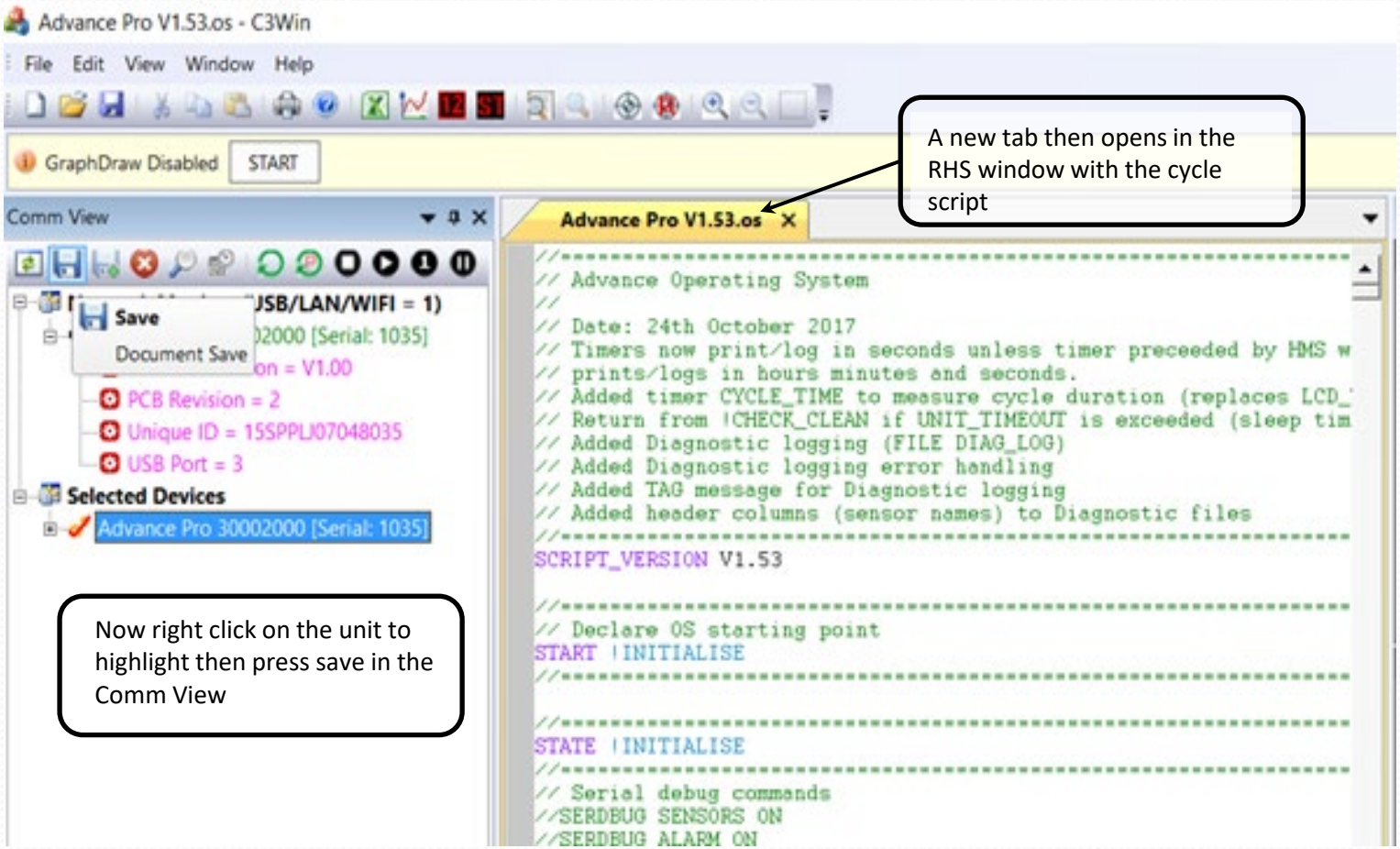
Software (Cycle Script Upgrade (or Eng Mode, Cal Mode, PRV Test, Firmware Update)



Software (Cycle Script Upgrade)



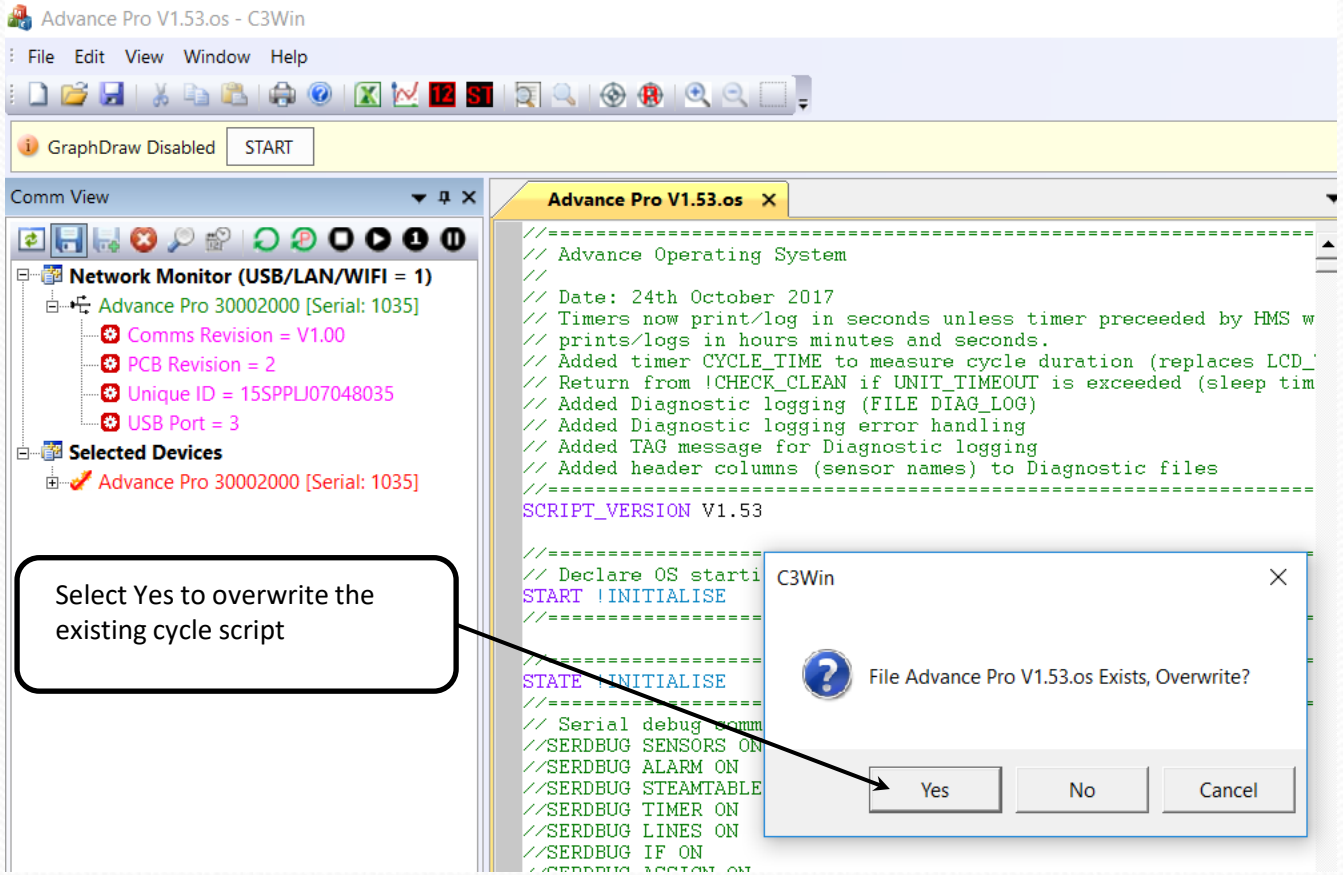
Software (Cycle Script Upgrade)



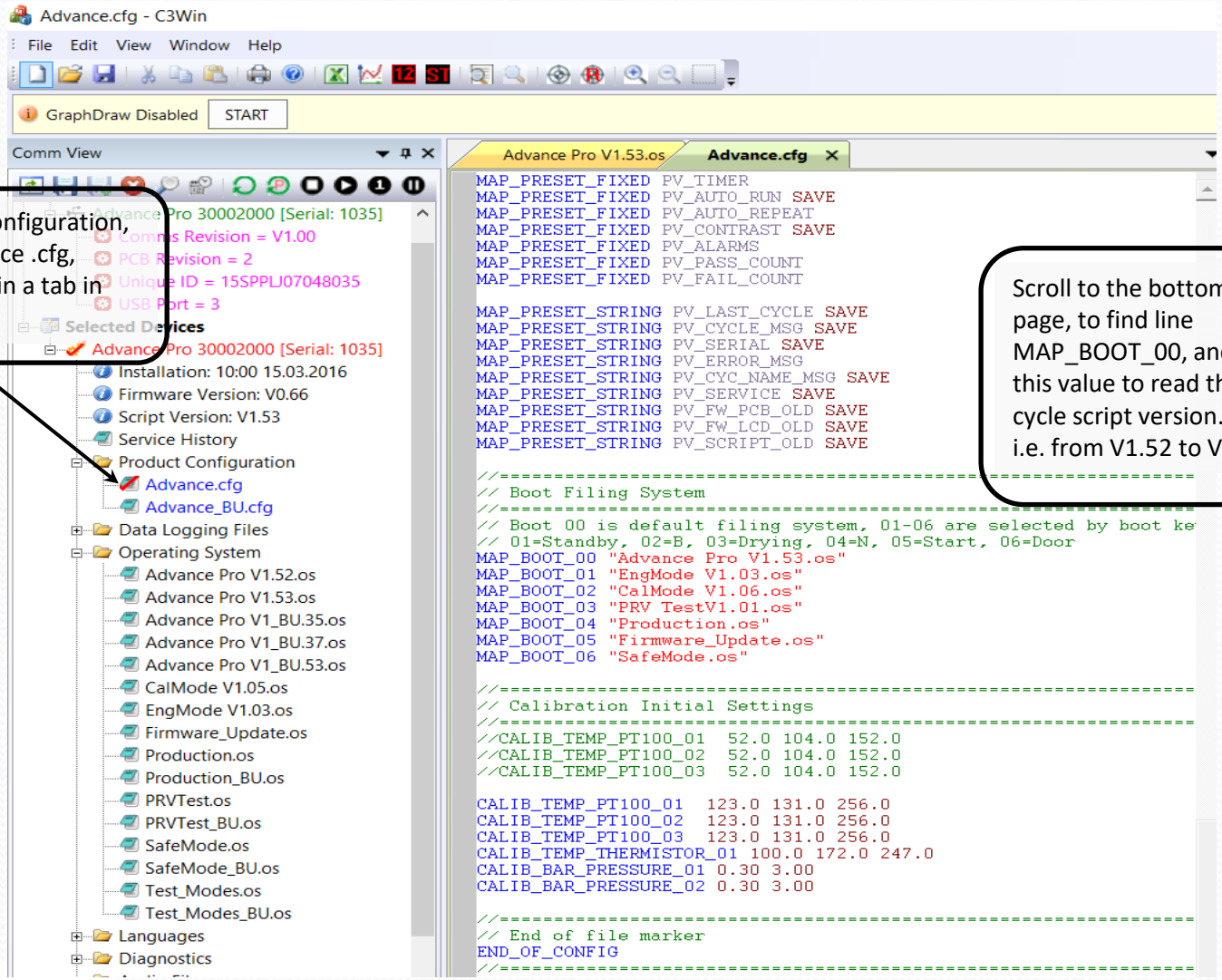
A new tab then opens in the RHS window with the cycle script

Now right click on the unit to highlight then press save in the Comm View

Software (Cycle Script Upgrade)



Software (Cycle Script Upgrade)



Expand Product Configuration, and click on Advance .cfg, which then opens in a tab in the RHS window

Scroll to the bottom of the page, to find line MAP_BOOT_00, and change this value to read the new cycle script version.
i.e. from V1.52 to V1.53 etc…

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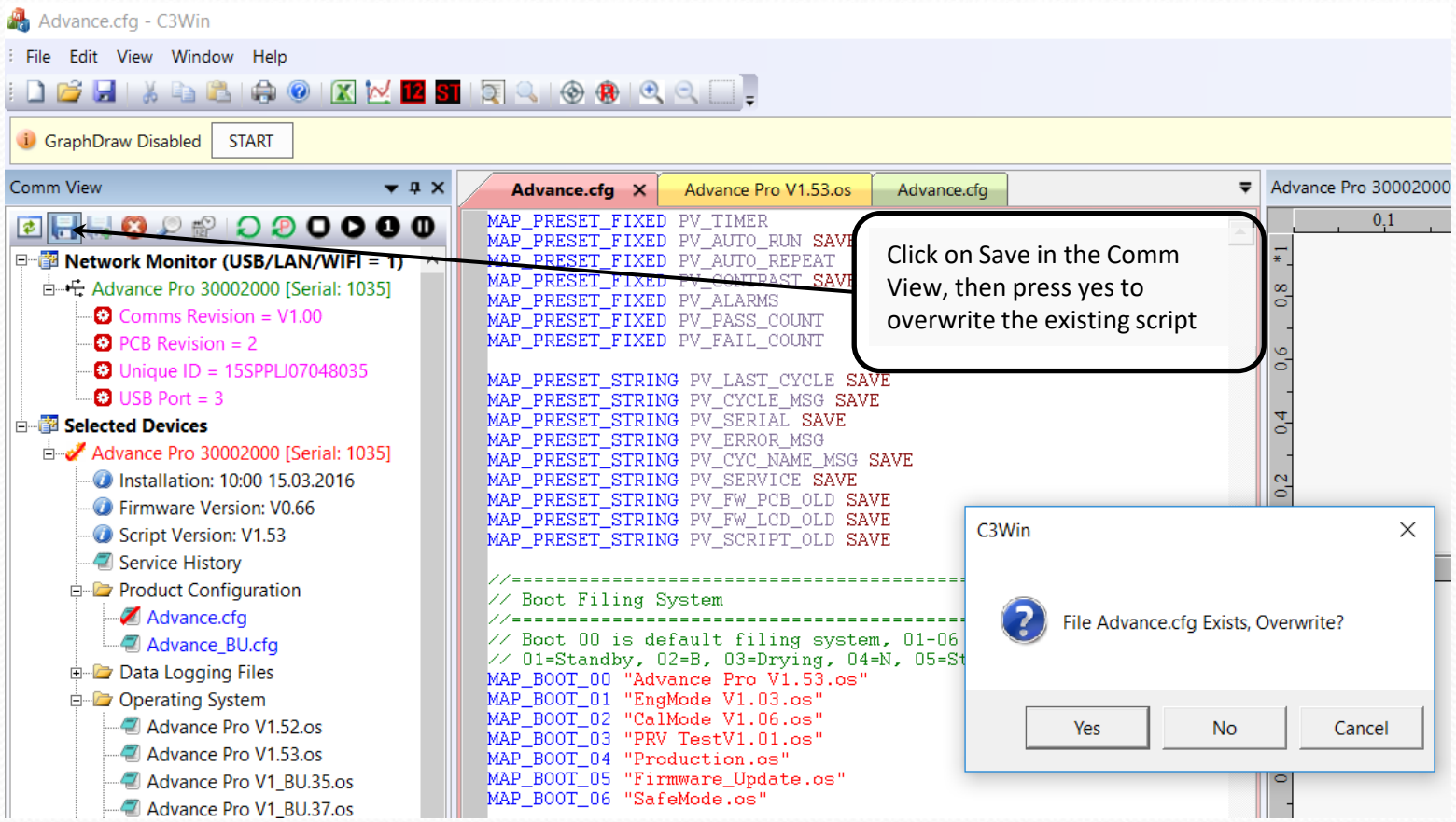
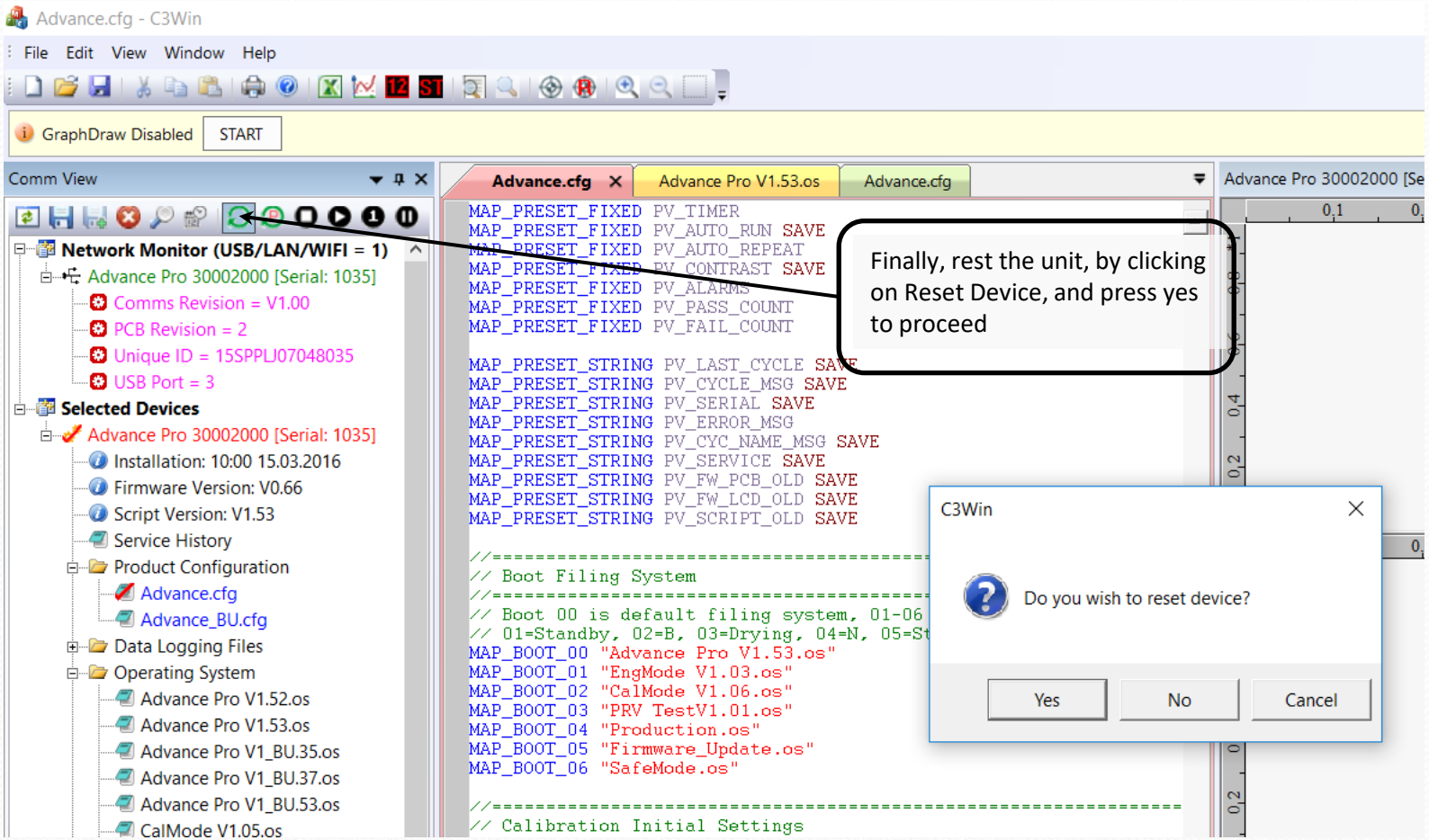
Software (Cycle Script Upgrade)



Software (Cycle Script Upgrade)



Fault Finding

Pages xxxx of the service manual

Fault Codes – Operation Codes

Error code	Description	Reason	Action
1	VACUUM TIME OUT	Too long to reach vacuum set point.	Repeat the cycle. If the problem persists, call service.
2	FILL TIME OUT	Too long to fill the boiler.	Repeat the cycle. If the problem persists, call service.
3	PRESSURE TIME OUT	Too long to reach a positive pressure set point.	Repeat the cycle. If the problem persists, call service.
4	FLUSH TIME OUT	Too long to flush the water out of the boiler/vessel	Repeat the cycle. If the problem persists, call service.
5	AIR BLEED TIME OUT	Too long for air bleed conditions to be complied with.	Repeat the cycle. If the problem persists, call service.
6	121/134 TIME OUT	Too long to reach sterilizing temperature.	Repeat the cycle. If the problem persists, call service.
7	VACUUM DRYING TIME OUT	Too long to reach vacuum set point in drying.	Repeat the cycle. If the problem persists, call service.
8	DRYING PRESSURE RISE TOO LONG	Too long to get back to atmospheric pressure in drying.	Repeat the cycle. If the problem persists, call service.
9	PRESS VS TEMP ERROR	Pressure and temperature do not meet steam table requirements.	Repeat the cycle. If the problem persists, call service.
10	RECOVERY TIME OUT	Too long to return to atmospheric conditions	Repeat the cycle. If the problem persists, call service.
11	OUT OF STERILIZING RANGE	Out of sterilizing range [121-125] or [134 to 138]	Repeat the cycle. If the problem persists, call service.

Fault Codes – Operation Codes

Error code	Description	Reason	Action
12	LAST CYCLE FAILED	The last cycle did not complete, repeat the cycle.	Repeat the cycle. If the problem persists, call service.
13	DOOR ERROR	The door micro-switch indicates a door open situation during a cycle.	Push the door shut & Repeat the cycle. If the problem persists, call service.
14	PRE-STERILIZING ERROR	Steam check failed prior to sterilizing	Repeat the cycle. If the problem persists, call service.
15	ATMOSPHERIC PRESSURE ERROR	Atmospheric pressure not within specified range.	Repeat the cycle. If the problem persists, call service.
16	BOILER OVER TEMPERATURE	The thermistor has exceeded the maximum permitted level of 200°C:	switch machine off and allow unit to coll for 1 hour before repeating the cycle. If the problem persists, call service.
17	USER ABORT	The cycle was aborted by the user before the cycle was completed.	Repeat the cycle with the same load
18	TEMP ALARM	The temperature on the PCB has gone out of limits.	Remove & check case fan filter - replace if excessively dirty. Repeat the cycle. If the problem persists, call service.
19	LEAK	A leak has been detected	Clean gasket and door. Repeat the cycle. If the problem persists, call service.
20	PRE-HEAT TIME OUT	The pre-heat time has taken too long.	Repeat the cycle. If the problem persists, call service.

Fault Codes – System Codes

SE01	Over Pressure	Pressure exceeds 4.5Bar Abs.	Page xxxx
SE02	Pt100 over temperature	Temperature exceeds 250°C.	
SE03	Thermistor over temperature.	Boiler thermistor exceeds 250°C.	
SE04	Watchdog time out.	Software error.	
SE05	Microcontroller hard fault reset.	Software error.	
SE06	Microcontroller memory fault reset.	Software error.	
SE07	Microcontroller bus fault reset.	Software error.	
SE08	Microcontroller bus fault reset.	Software error.	
SE09	Configuration file not selected.	Software error.	
SE10	Configuration file missing.	Software error.	
SE11	Operation system file missing.	Software error.	
SE12	Calibration file missing.	Software error.	
SE13	Preset file missing.	Software error.	

Fault Codes

ERROR 01 - VACUUM TIME OUT.

THE REQUIRED VACUUM LEVEL (-0.7 bar/g) WAS NOT ACHIEVED WITHIN THE TIME ALLOWED (900 seconds)

What to look for:

1. Water in boiler/vessel.
2. Door /Gasket.
3. Pump outlet / Inlet blocked.
4. Another valve stuck open.
5. Valve did not open / blocked
6. Vacuum pump did not operate or it had seal issue.
7. Tubing restricted.
8. Pressure sensor not correctly calibrated.
9. Door sticking – check operation and movement

Fault Codes

ERROR 02 - FILL TIME OUT.

THE BOILER DID NOT FILL WITHIN THE TIME ALLOWED (240s)

Check to see if there is any water in the boiler.
If there is then it's a sensor issue. If there isn't it's a filling issue.
What to look for:

1. Fresh water tank empty due to level sensor fault.
2. Water tank blocked – Try and drain water from tank using drain plug.
3. Boiler water level sensor fault either not connected or probe contaminated.
4. Fill solenoid failed to operate
5. Fill solenoid blocked
6. Water filter blocked.
7. Fill tubes blocked or kinked.
8. Power control module fault

ERROR 03 - PRESSURE TIME OUT.

THE PRESSURE DID NOT RISE TO THE REQUIRED POSITIVE LEVEL WITHIN THE TIME ALLOWED

What to look for:

1. Are there any obvious leaks. Check all possible leak paths such as the gasket, boiler seal or Pressure release valve.
2. Are there any valves open or is there something trapped on the seal.
3. Is the Pressure transducer reading correctly?

Fault Codes

ERROR 04 - FLUSH TIME OUT.

THE PRESSURE DID NOT DROP THE REQUIRED AMOUNT IN THE SET TIME.

What to look for:

1. Check the flush valve is opening.
2. Check the power is reaching the flush valve.
3. Check the power supply.
4. Check the valve port is orientated correctly.

ERROR 05 - AIRBLEED TIME OUT.

DID NOT COMPLY WITH AIRBLEED STEAM TABLES IN SET TIME.

What to look for:

1. Check chamber probe is correctly inserted.
2. Air bleed solenoid valve failed to operate
3. Air bleed solenoid blocked
4. Air bleed tubes blocked
5. Check that chamber [Steam] PT 100 probe is reading correctly.
6. Check chamber pressure transducer is reading correctly.

ERROR 06 - STERILIZING TIME OUT.

EXCEEDED SET TIME TO REACH THE STERILIZATION TEMPERATURE.

What to look for:

1. Leak from either door seal or boiler seal.
2. Valve stuck open. Check level probe is working correctly.
3. Load is too absorbent e.g. Linen materials
4. Gross water/steam leak in pipes / pressure release valve etc. Load mass or surface area too great or receptacles open end up retaining water.
5. Power control module fault

Fault Codes

ERROR 07 - VACUUM TIME OUT AT START OF DRYING

EXCEEDED SET TIME TO REACH -0.15Bar (850mb abs) – 120s

What to look for:

1. Door seal worn or contaminated.
2. Air filter blocked.
3. Air solenoid fault
4. Air bleed tube blocked or collapsed.
5. Flush solenoid fault
6. Door sticking in the pressurized position.
7. Other valve stuck open.

ERROR 08 - DRYING PRESSURE RISE TIME OUT

TOO LONG TO ACHIEVE ATMOSPHERIC PRESSURE AFTER DRYING 0.05Bar (950mb abs) – 900s

What to look for:

1. Air filter blocked.
2. Air filter valve not opening.
3. Pressure transducer's not reading correctly.
4. Fault on control module.

Fault Codes

ERROR 09 - PRESS VS TEMP ERROR.

STEAM TABLE ERROR IN STERILIZING.
The temperature or pressure is reading incorrectly.
What to look for:

1. Steam (Chamber) probe problem.
2. Pressure transducer (Chamber) problem.
3. Calibration Issue.

ERROR 10 - RECOVERY ERROR.

DURING THE RECOVERY PROCESS THE PRESSURE DOES NOT RETURN TO ATMOSPHERIC PRESSURE.
What to look for:

1. A valve problem. Check operation of the valves.
2. Check both pressure readings are reading correctly.
3. Check air filter.
4. Check for any blocked or kinked pipes.

ERROR 11 - STERILIZING RANGE ERROR.

DURING STERILIZING THE STEAM TEMPERATURE WENT OUT OF RANGE (-0 TO +4.0)
What to look for:

1. Are there any obvious leaks? Check all possible leak paths such as the gasket, boiler seal or Pressure release valve.
2. Are there any valves open or is there something trapped on the seal.
3. Check the boiler and drying (chamber) heaters are not continuously being powered which could indicate a control board fault (leaking triac).

Fault Codes

ERROR 12 - LAST CYCLE FAILED.

POWER FAILURE AT ANY TIME DURING THE CYCLE.
Often an indication of a mains power loss to the unit or another fault has occurred.
What to look for:

1. Boiler thermal trip activated.
2. Chamber heater trip has activated.
3. A mains fuse has blown.
4. Excess current being drawn, check solenoid coil resistance and insulation resistance.
5. Machine turned off before the cycle has been completed.

ERROR 13 - DOOR ERROR.

THE DOOR MICRO-SWITCH HAS INDICATED THE DOOR IS OPEN DURING A CYCLE.
What to look for:

1. Check the door micro-switch setting.
2. Check the door micro-switch itself.

ERROR 14 - PRE-STERILIZING ERROR.

PRIOR TO STARTING THE STERILIZING TIMER THE STEAM TABLE CHECK FAILED.
What to look for:

1. Check the calibration of the Steam [chamber] probe.
2. Check the calibration of the chamber pressure transducer.

ERROR 15 - ATMOSPHERIC PRESSURE ERROR.

THE ATMOSPHERIC PRESSURE TRANSDUCER IS SHOWING A VALUE OUT OF RANGE [0.8 to 1.4].
What to look for:

1. Possible calibration or functionality issue with the atmospheric pressure transducer. Either calibrate or replace and calibrate.

Fault Codes

ERROR 16 - BOILER OVER TEMPERATURE ERROR.

THE BOILER THERMISTOR IS REGISTERING A VALUE ABOVE THE MAXIMUM ALLOWED [200°c].

What to look for:

1. Possible leak.
2. Possible boiler Thermistor fault.
3. Possible control module fault [leaking triac].

ERROR 17 - USER ABORTED THE CYCLE.

ERROR 18 - TEMP ALARM.

THE PCB CHIP IS REGISTERING A TEMPERATURE VALUE OUTSIDE THE SET LIMITS.

What to look for:

1. Possible fault with side fan (Not running).
2. Possible fault with side fan (Not running).

ERROR 19 - LEAK.

THE LEAK RATE HAS EXCEEDED THE LIMIT OF 1.3MB/MIN.

What to look for:

1. Gasket
2. Valve stuck open/contaminated
3. Boiler seal
4. Safety valve

ERROR 20 - PRE-HEAT TIME OUT.

THE PRE-HEAT TEMPERATURE HAS NOT BEEN REACHED THE REQUIRED TEMPERATURE IN THE SET TIME.

What to look for:

1. Possible HEATER fault.
2. Possible sensor fault.
3. Possible Module fault.

Fault Codes

FLASHING RED LEDS.

INSUFFICIENT WATER IN FRESH WATER TANK TO RUN A CYCLE OR WASTE WATER TANK FULL.

What to look for:

1. Check that the unit has been filled/drained.
2. Check for oil contamination of the water level probes
3. Check sensor wiring and connectors
4. Power control module fault/level sensor connection to PCB.

DOOR DOES NOT OPEN CORRECTLY.

THIS FAULT MAY TAKE MANY FORMS FROM NOT OPENING TO OPENING WITH A LOUD "POPPING" NOISE.

What to look for:

1. Vacuum or pressure inside the vessel through valves not operating correctly
2. Door latch strike plate worn.

Fault Codes

RUNNING TEMPERATURE IS INCORRECT.

Due to the nature of the control system, any hardware failure will render the unit inoperative; however, calibration drift is very rare. Steam probe is of the platinum resistance type, of proven reliability.
Front-end hardware on the power control module that measures the temperature is of a dynamic comparative nature and relies on a balance between the two input circuits, a single failure will therefore show up as a hard fault.

Before making any adjustment to Temperature and Pressure please check that your measuring equipment is working correctly and has a valid calibration certificate.

THERMAL CUTOUT OPERATES .

ALL UNITS SHOULD HAVE AUTOMATIC RESETTING CUT OUTS.
What to look for:

1. Leaks.
2. Boiler Thermistor faulty.
3. Boiler Thermistor not located correctly on boiler
4. Power control module fault [leaking triac] on either drying heater or boiler.

NO DISPLAY / LOSS OF POWER.

What to look for:

1. Thermal cut-out on boiler or drying heater.
2. No mains (at plug top).
3. Fuses blown.
4. Check mains connections on power control module.
5. Display module fault / not connected.
6. Check power supply output. No output could be caused by a faulty power supply or an overloaded output.
7. Solenoid valve dragging power down.

Fault Codes – System Failure

SYSTEM ERROR 01 [OVER PRESSURE]

THE PRESSURE EXCEEDED 4.5BAR.

What to look for:

1. Check the pressure sensor that caused the error is working correctly and is calibrated.
2. Check the boiler Thermistor is working correctly.
3. Faulty control module [Boiler Triac leaking].

SYSTEM ERROR 02 [PT100 OVER TEMPERATURE]

THE TEMPERATURE OF A PT100 EXCEEDED 250°C.

What to look for:

1. Check all the pt100 sensors. Are these working correctly and calibrated. Change and recalibrate if required.
2. Faulty control module [Boiler Triac leaking].

SYSTEM ERROR 03 [THERMISTOR OVER TEMPERATURE]

THE TEMPERATURE OF THE BOILER THERMISTOR EXCEEDED 250°C.

What to look for:

1. Possible leak.
2. Possible boiler Thermistor fault.
3. Possible control module fault [leaking triac].

SYSTEM ERRORS 4 to 13

These are software related errors. If these occur repeat the cycle. If the fault persists consult Prestige Medical for support.

Calibration (Temperature/Pressure)

Pages xxxx of the service manual

Calibration
Introduction

The Advance Pro's intelligent windows access software, allows you to adjust all sensors on the fly, by means of increasing/decreasing offset values.

Calibration Equipment

Calibration Equipment

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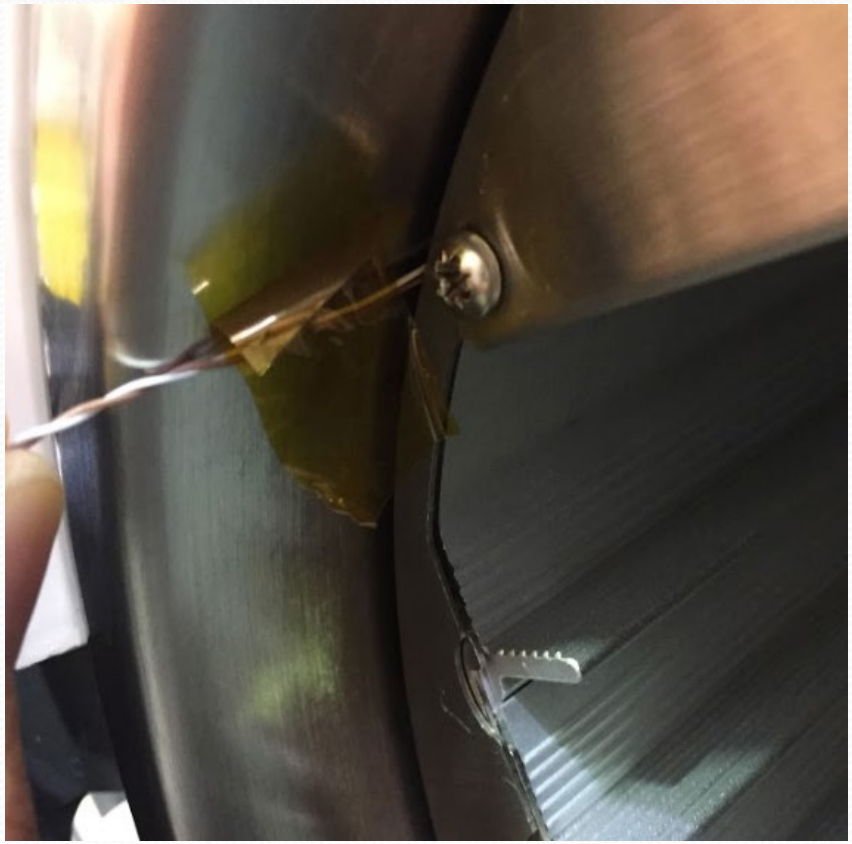
Calibration

The equipment below consists of 2 x thermocouples and 1 x digital pressure gauge. Insert the relevant test equipment using the supplied entry ports



Calibration

Connect your PC/Laptop to the rear USB B Comms port, to access the system

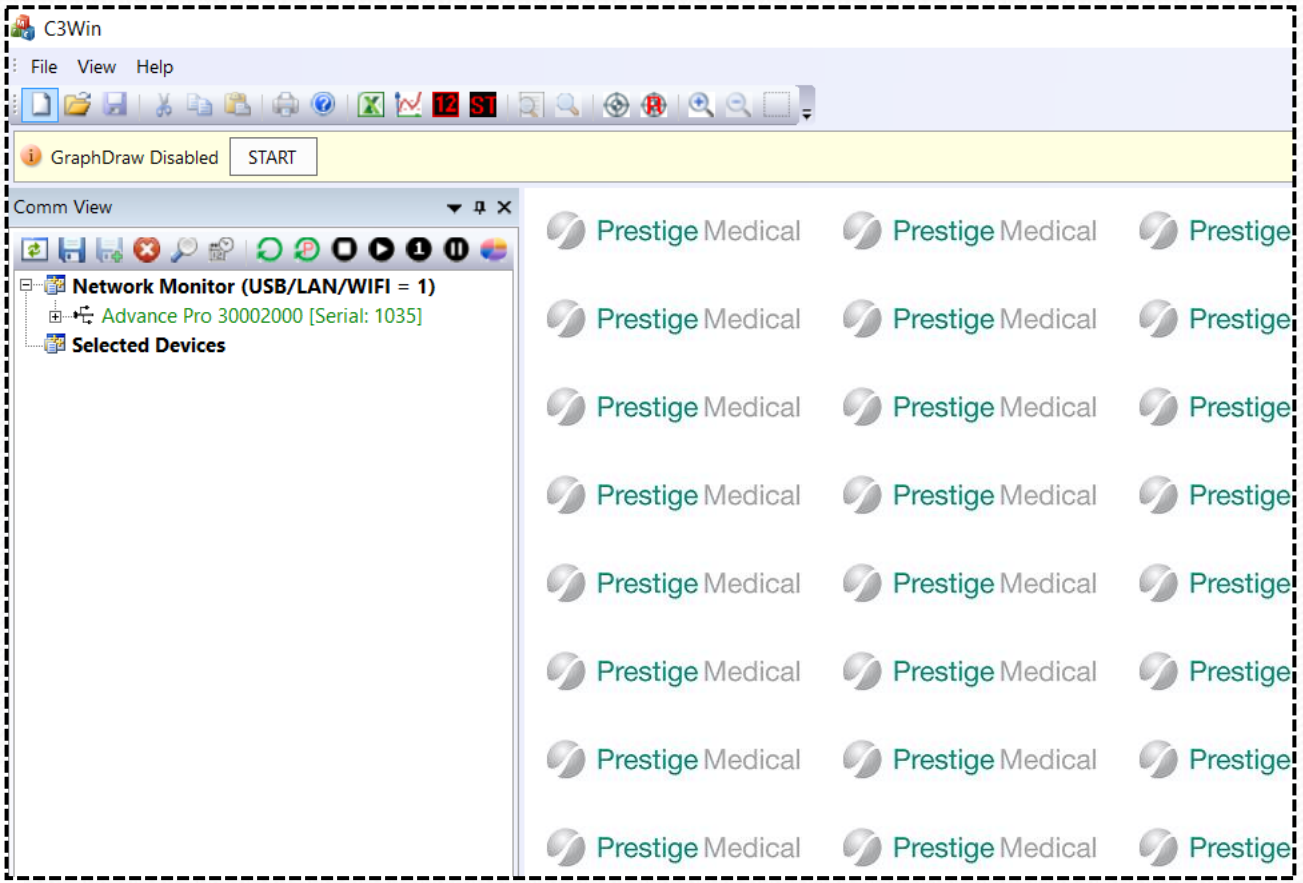
USB B – Engineers Port

Calibration

The Advance Pro's intelligent windows access software, allows you to adjust all sensors on the fly, by means of increasing/decreasing offset values.

See instruction below;

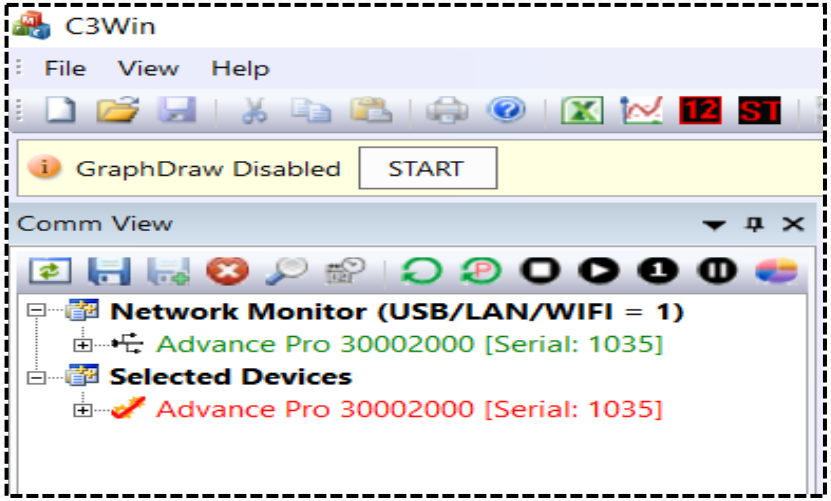
Open the windows program , Which you will find on your desktop
Then the following screen will open;



Calibration

Move the cursor to the machine you require to calibrate e.g. 1035, and Left mouse click to highlight the machine as shown below.

Right click on the highlighted machine.
The unit then appears in the Selected Devices as shown in the screen below.



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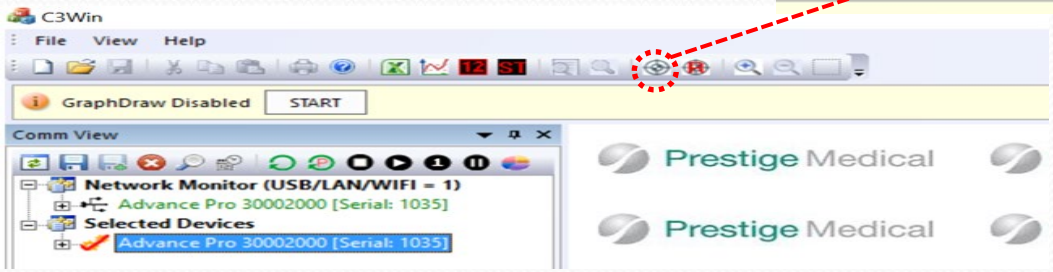
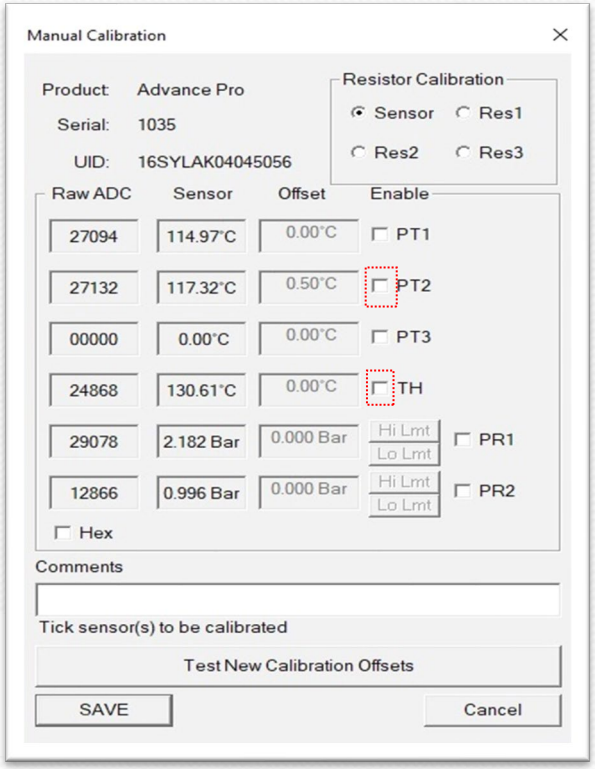
Calibration

On the top toolbox click on the Calibrate icon [highlighted by the red dotted circle].



The calibration screen with now be displayed

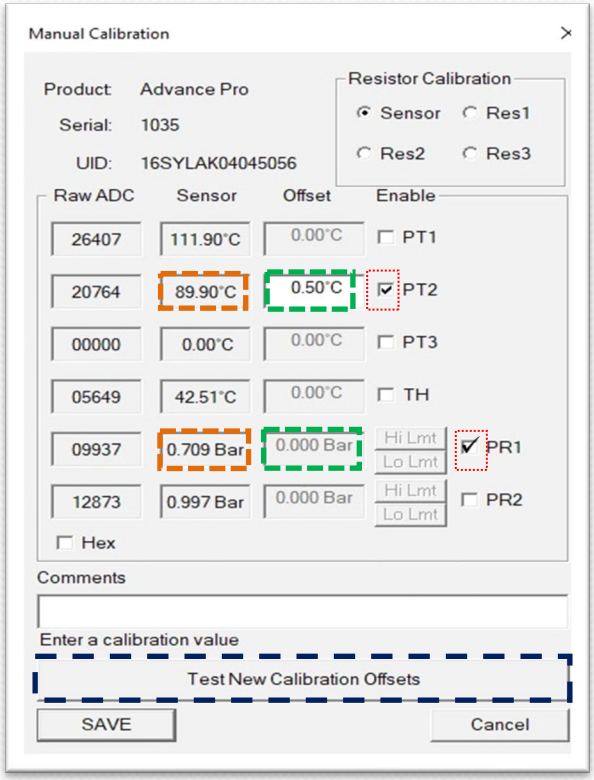
Select the appropriate cycle, and press cycle start (Note Pressing N immediately after cycle start will disable all error traps)



The chamber probe is PT2, and Pressure is PR1, so select either PT2 or PR1.

A tick will now appear in the relevant box, to indicate which sensor is to be adjusted

The offset column displays the current offset value.



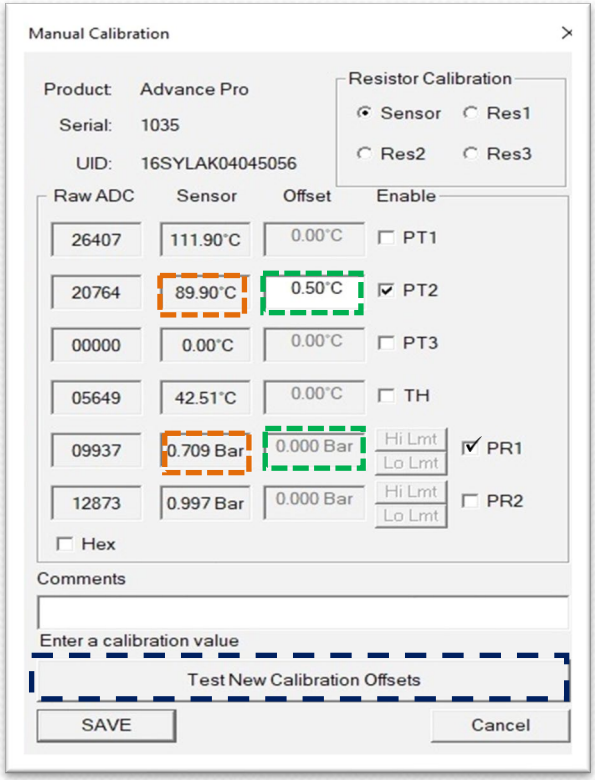
Calibration

There are two methods of calibration;

Zero Offsets

1. Amend current offset to zero, using correct decimal placing… and select 'Test New Calibration Offsets' [highlighted in blue].
2. Run a 134B cycle **(Note: all error traps and sterilisation timers have been disarmed during this cycle)**.
3. Observe the operating temperatures for Temperature and Pressure [highlighted in Orange].
4. During sterilizing compare the readings between the display and your calibrated reference devices. Make note of the errors and adjust the offsets accordingly.

e.g.
Measured Temperature 136.3°C
Displayed Temperature 135.8°C
Offset = 0.50°C
To adjust the offset type 0.50°C in to the green box and then click on the Test New Calibration Offsets button the software will then update, and change and display to read the new temperature, which should now be in-line with calibrated value. If further additions are necessary repeat the procedure (if a further 0.1°C needs adding then change the offset to 0.6 and test again. Once happy click on the Save button and this will store the values on the SD card in the Calibration Log.



Current Offsets

1. You can run the 134 B cycle, with current offsets, then during sterilisation make note of the temp and pressure differences, and amend the current offset.

e.g.
Offset of 0.5°C
Measured Temperature 136.3°C
Displayed Temperature 135.8°C
New Offset = 1.00°C (0.50 + 0.50)

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Allow the unit to stabilise for a few minutes, then, click on the Save button which will store the new values on the SD card , and Calibration Log.

Engineering Modes

Pages xxxx of the service manual

Engineering Modes

Introduction

Engineering modes are provided to ensure that the diagnostic process can proceed smoothly. Each output device can be operated individually, this allows easy pin pointing of parts that are dysfunctional.

ENTERING ENGINEERING MODE

Engineering modes are entered by switching the machine on whilst holding in the Standby switch , this mode is password protected so will be followed by screen 1, now enter the following button sequence N B
Screen 2 is shown briefly and then replaced by screen 3.

To proceed from screen 2 you have the following options.

Press the Start Switch This allows you to enter the current selection (as shown on line 3 of the display).

In the case of screen 3 above the following Information screen will be seen.

Pressing the B button – scrolls forward through the various options as shown on the next slide.

Pressing the button – scrolls backwards through the various options as shown on the next slide.

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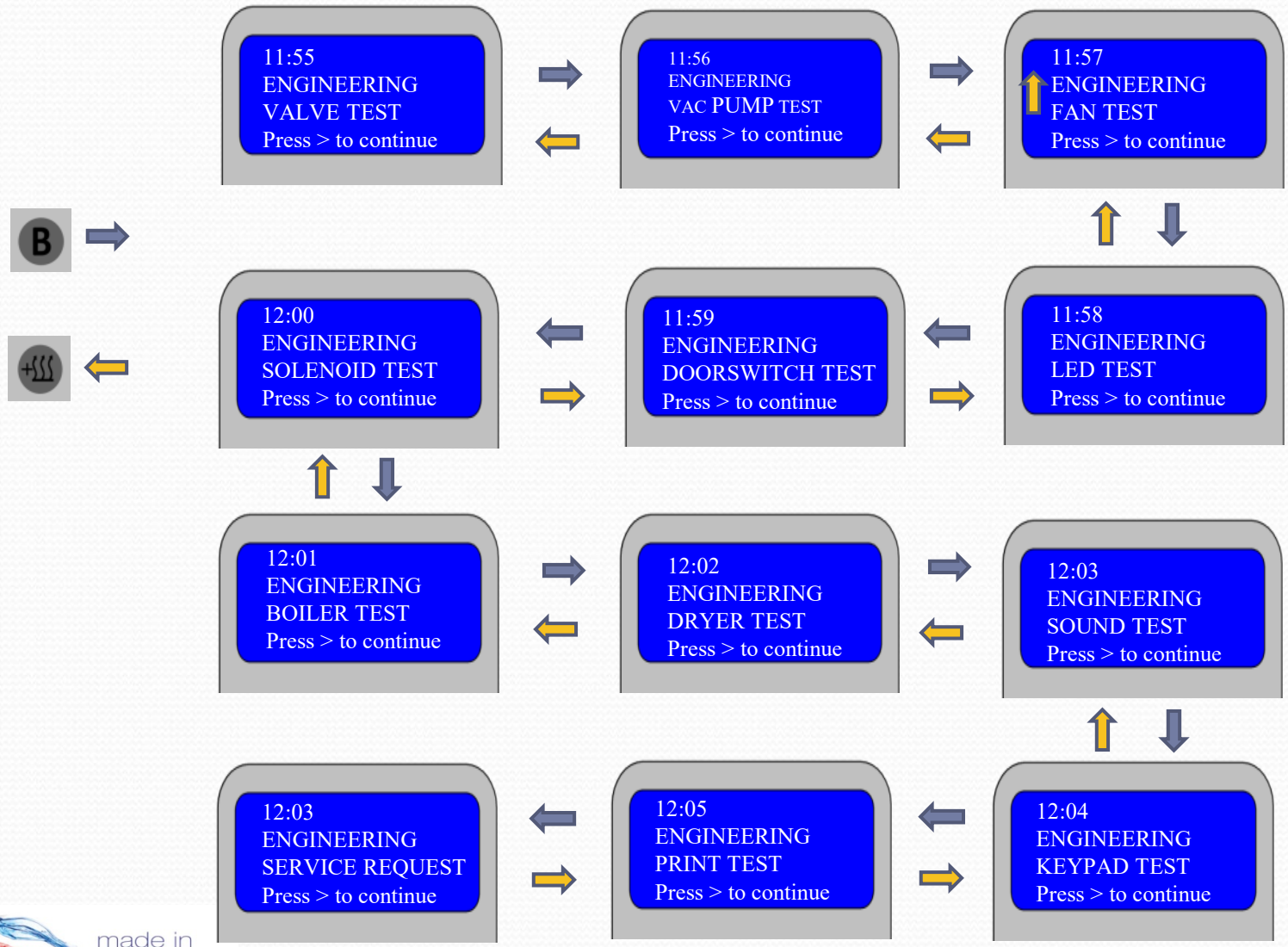
ENGINEERING MODES



ENGINEERING MODES

4.1 Valve Test.

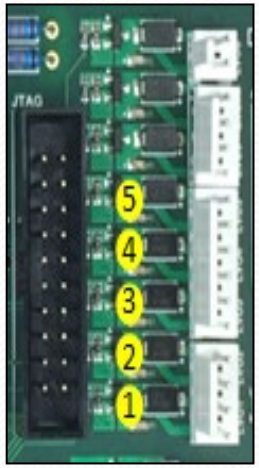
Pressing the cycle start button opens or closes the stated valve. Pressing 

allows you to change the valve. When you change the valve the default is always Valve OFF.

The sequence of the valves is as follows:

When each valve is activated the relevant LED will illuminate, which will assist during diagnosis.

Air bleed 5
Vacuum 4
Flush 2
Fill 1
Air Filter 3



Please note: Pressing the Door Switch takes you back to the main menu.

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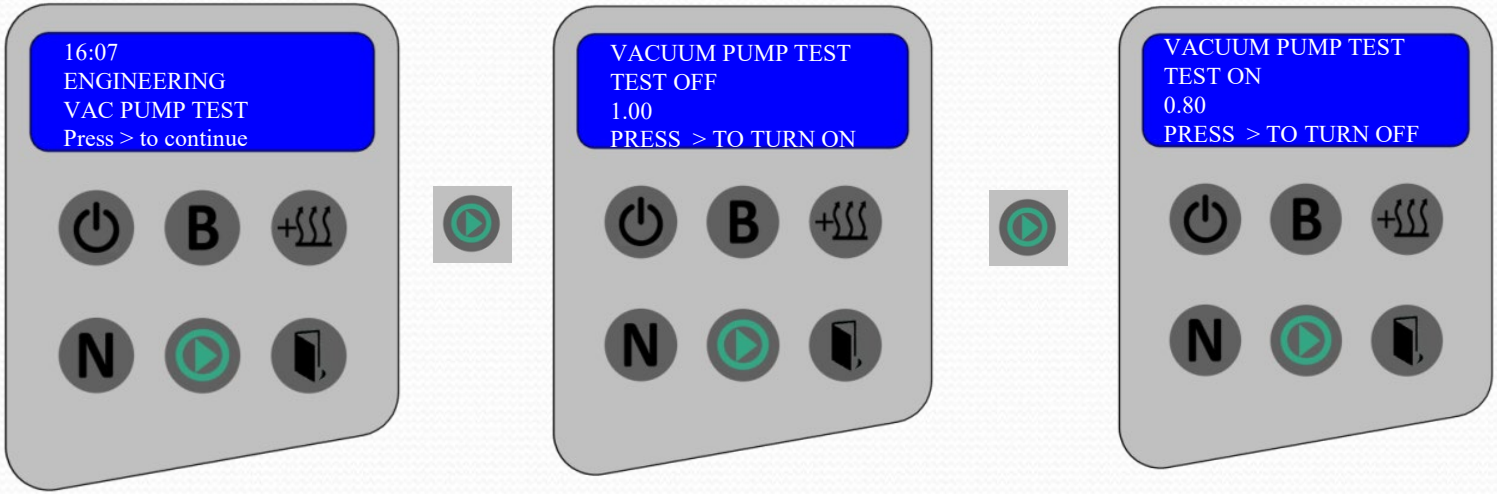
ENGINEERING MODES

4.2 Vacuum Pump Test.

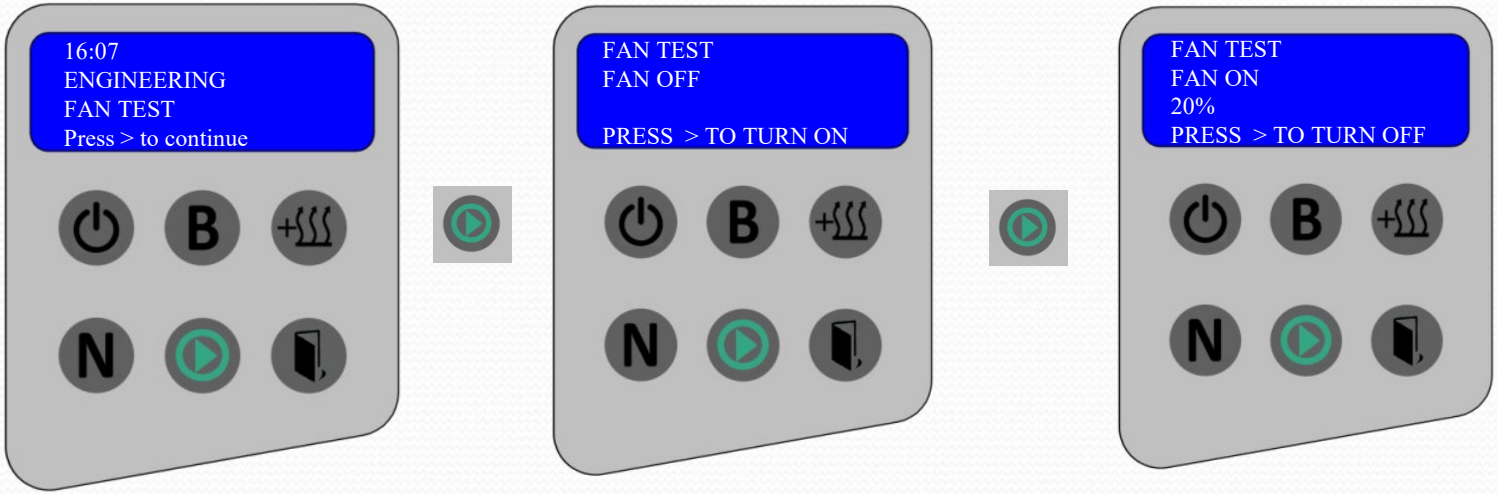


Pressing the Start Switch starts the vacuum pump.
The pressure [Bar Abs] shown on line 3 should start to drop.
Pressing it again will turn the Vacuum pump off.

Please note: Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.3 Fan Test.



Pressing the Start Switch starts the fan [20%].
When the Fan is ON pressing the drying switch increases the fan in 20% steps. 40% , 60%, 80% , 100% then back to 20%.
Pressing the Start Switch again will turn the Fan off.
Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.4 Cycle Progress LED Test.

Pressing the Start Switch starts the LED colour sequence.
The LED'S change colour in the following sequence;

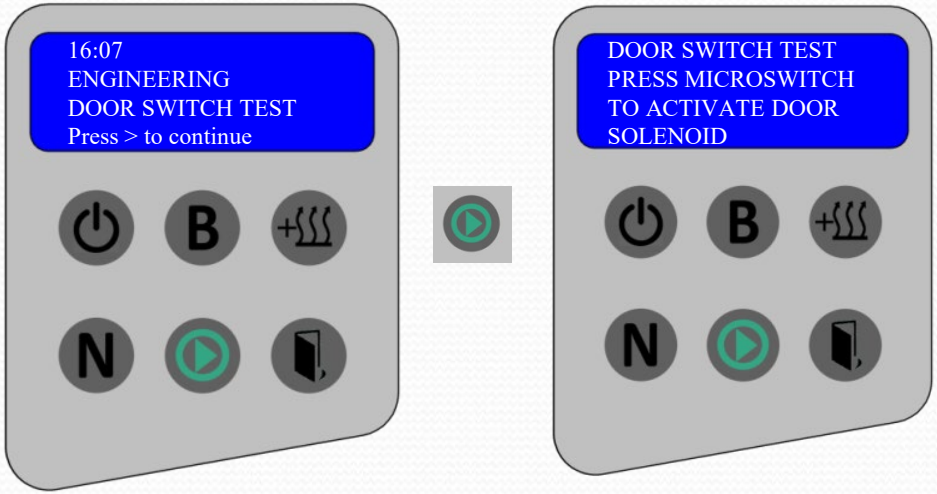
- Blue
- Red
- Green
- Pink
- Yellow

Pressing the Start Switch again will turn the LED'S off.

Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.5 Door Switch Test.

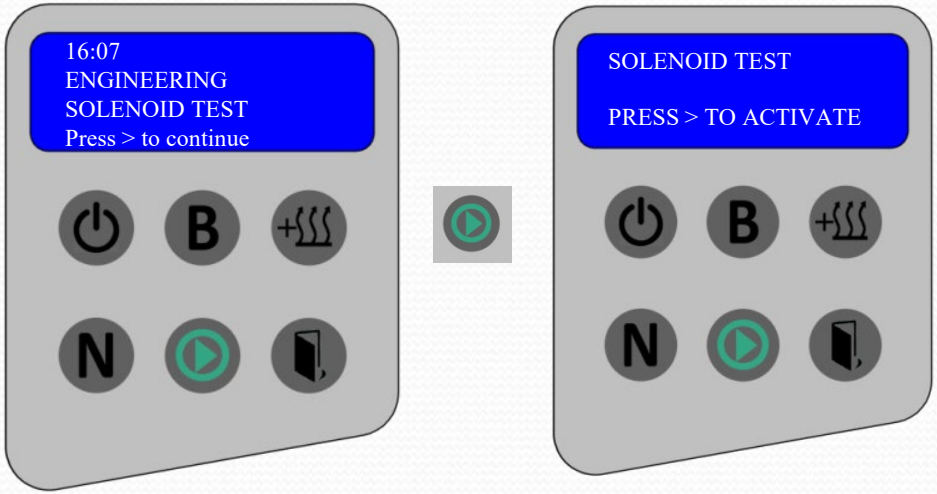


Pressing the Start Switch activates the door solenoid.

If you press and release the door micro switch the solenoid activates.
Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.6 Door Solenoid Test.



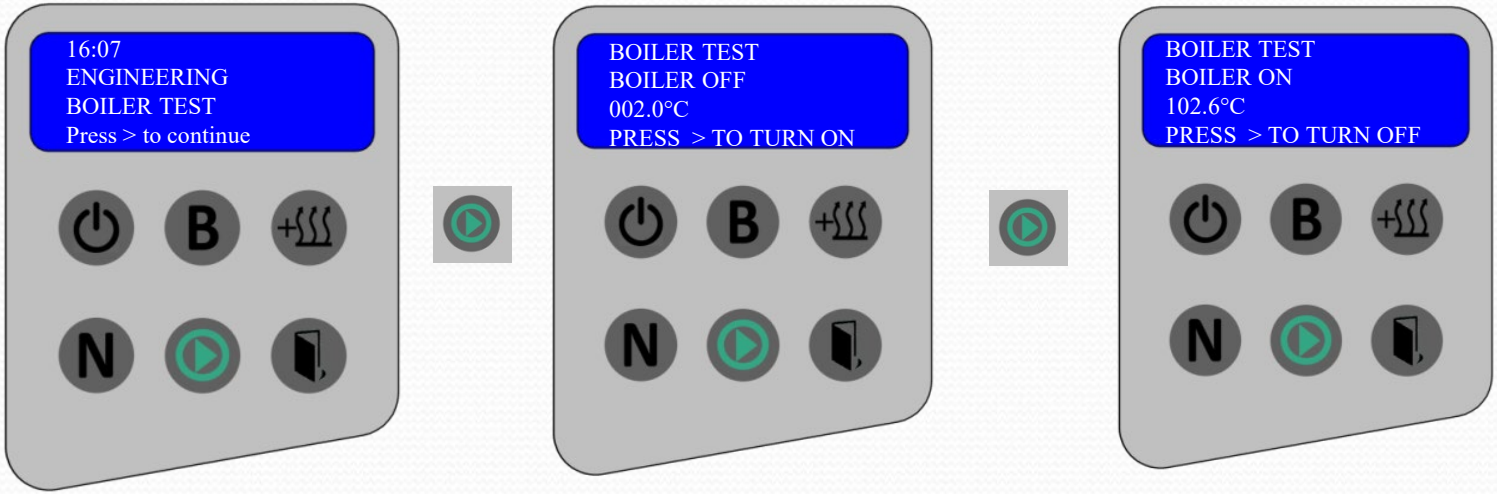
Pressing the Start Switch momentarily activates the door solenoid.

Every time you press the Start Switch the solenoid momentarily activates.

Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.7 Boiler Test.



Pressing the Start Switch turns the boiler heater on. [The temperature shown on line 3 should climb eventually controlling at 150°C.]

Pressing the Start Switch again will turn the boiler heater off.

Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.8 Dryer Test.

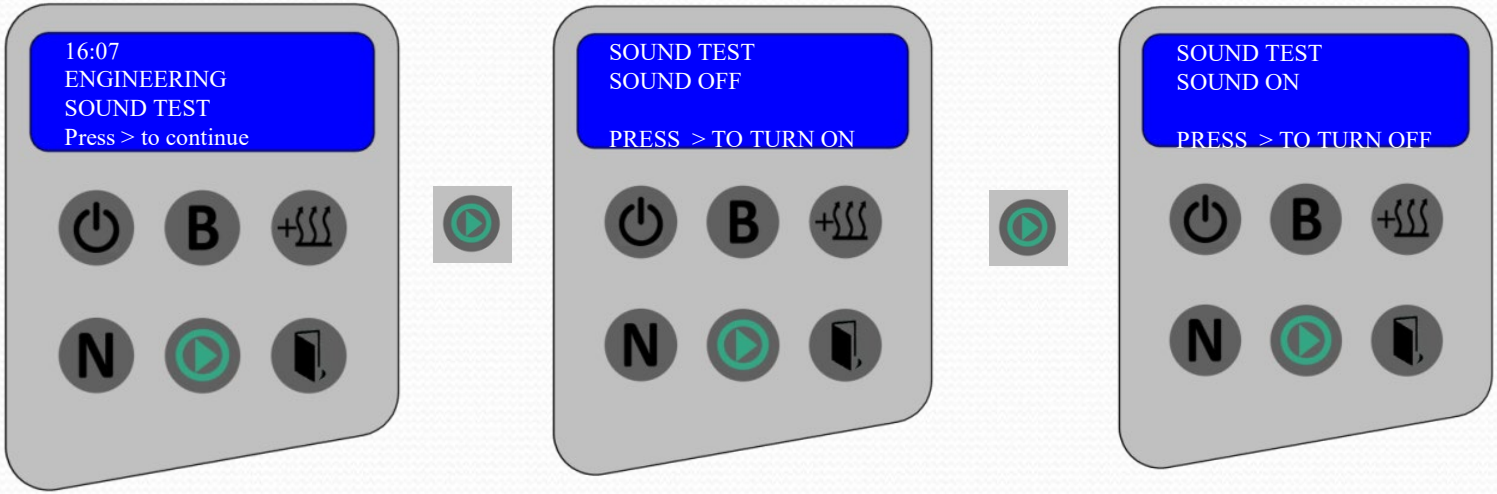
Pressing the Start Switch turns the drying heater on. [The temperature shown on line 3 should climb eventually controlling at 150˚C.]

Pressing the Start Switch again will turn the drying heater off.

Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.9 Sound Test.



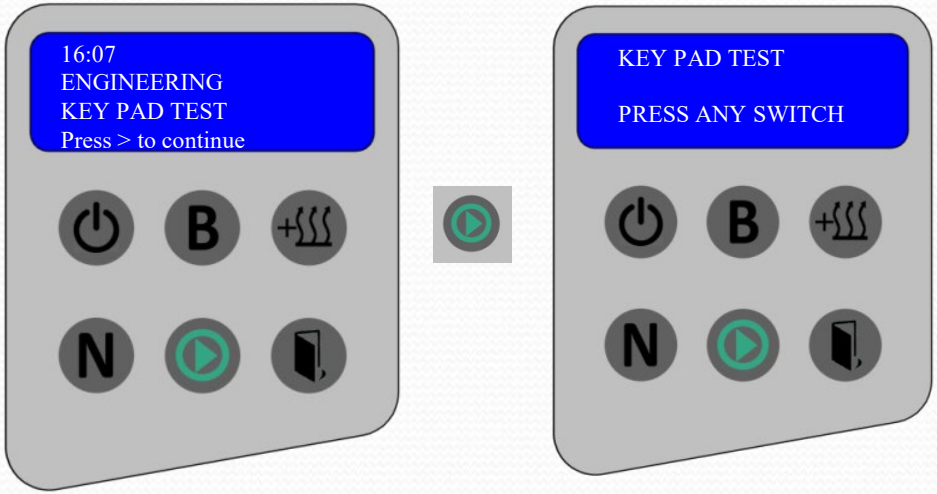
Pressing the Start Switch turns the sound on.

Pressing the Start Switch again will turn the sound off.

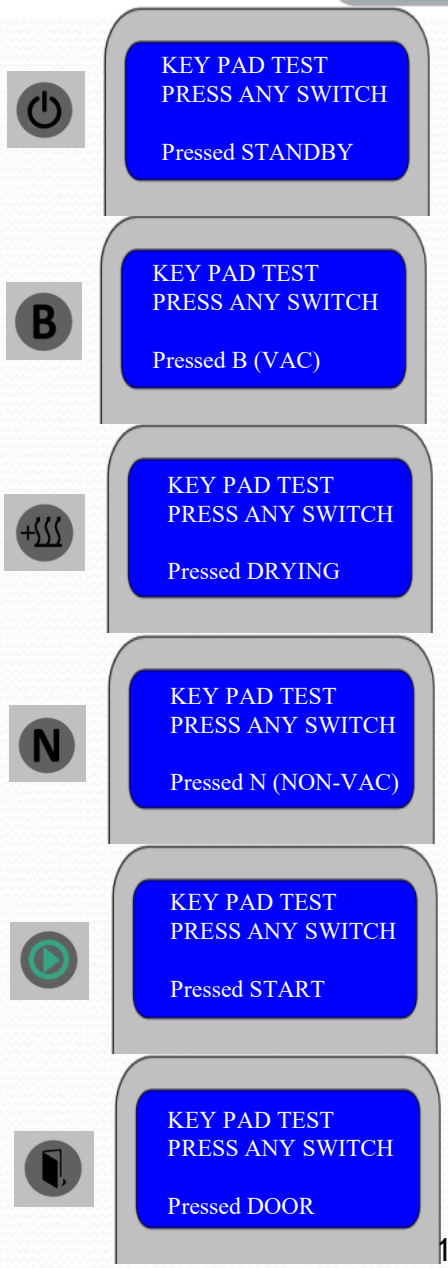
Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.10 Keypad Test.



Pressing the different buttons momentarily displays which button has been depressed, i.e. “Pressed DOOR” [as shown right] then the display returns to main menu.



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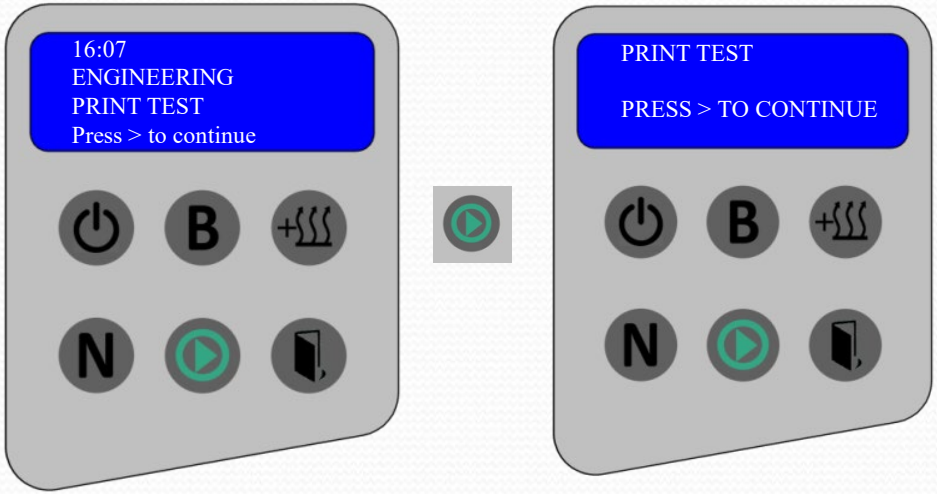
ENGINEERING MODES

4.11 Printer Test.




```
**********
PRINTER TEST MESSAGE
**********
Prestige Medical
Range: Advance Pro
Model: 30005000
Serial : 1039
Firmware PCB: V0.40
Firmware LCD: V0.01
Script OS : V1.02
Date: 19/06/2017
09:45:07
**********
```

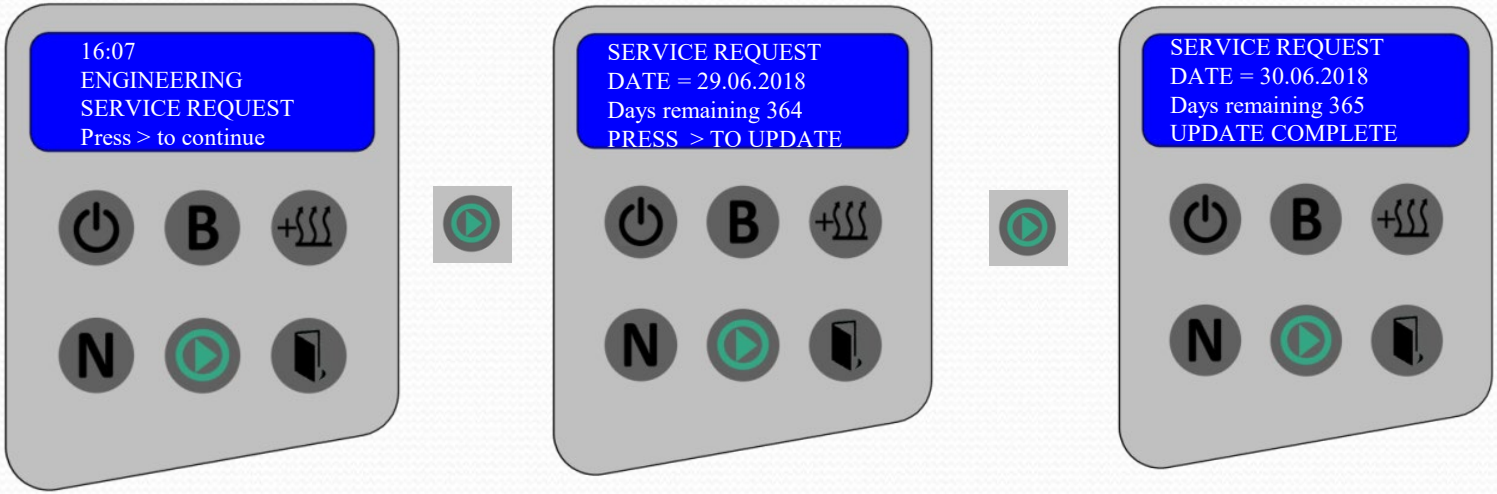
Pressing the Start Switch momentarily shows PRINTING COMPLETE on the third line and this then disappears. A TEST MESSAGE should have been sent to the printer/logger [see above right].

Every time you press the Start Switch a Test Print is executed.

Pressing the Door Switch takes you back to the main menu.

ENGINEERING MODES

4.12 Service Request.



This mode makes it possible to set the next yearly service reminder which the customer will see prompted on the unit's display when a service is overdue. This appears momentarily when going from "Stand by" to "Ready Mode" (see image to right).

When annual maintenance is conducted, then engineer can reset the service date to the relevant interval required.

Pressing the door button returns display to main menu.

Pressure Vessel Inspection

Pressure vessel inspection requires the following to be checked on an annual basis;

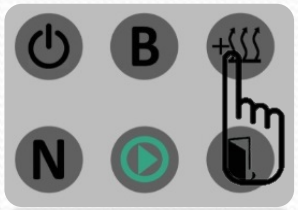
1. Vessel Integrity – Visual check for defects/contamination of the material
2. Door Interlock – visual/function checking operation of the interlock device/assembly
3. Safety Valve – Function check, to ensure the safety operate within the set limit +/- 10% of rated pressure

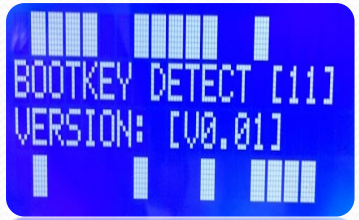
The Advance Pro is equipped with an automated cycle which allows the unit to overtemp, operating the safety valve under load.

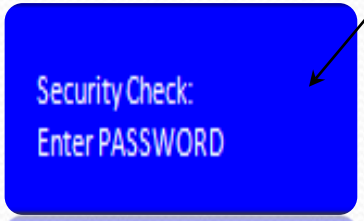
Insert your calibrated instrument (Pressure/Temperature), and access the Safety Valve Test function.

Press & hold the heater control button whilst simultaneously switching the autoclave on, the screen will briefly display the above image and then display the safety valve interface.

Note: This mode is password protected, so Please press the following button sequence, when you see this screen.







Press the start button to proceed with the safety valve over pressure test

or

Press the start button to abort the test either during or once complete

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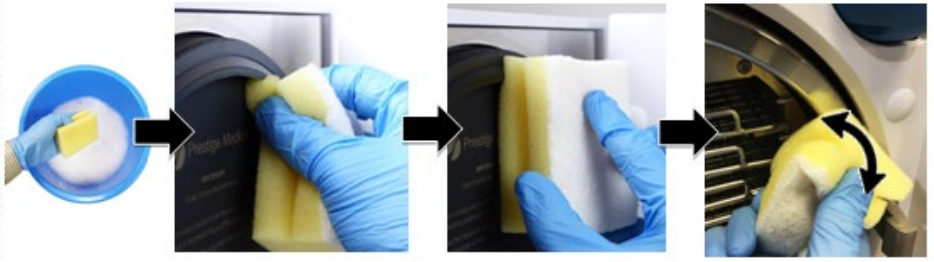
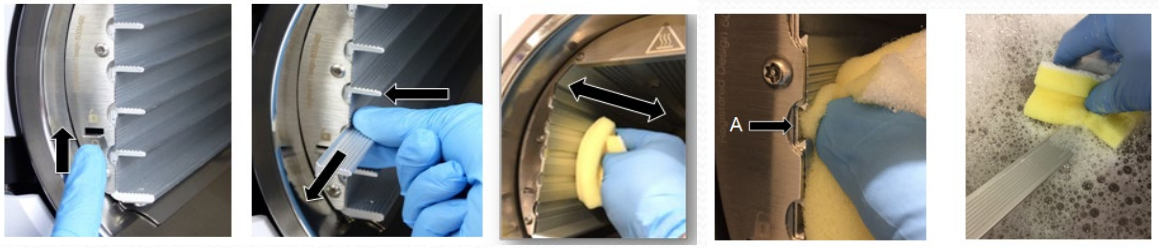
User Maintenance

Daily
Cleaning of gasket and vessel rim



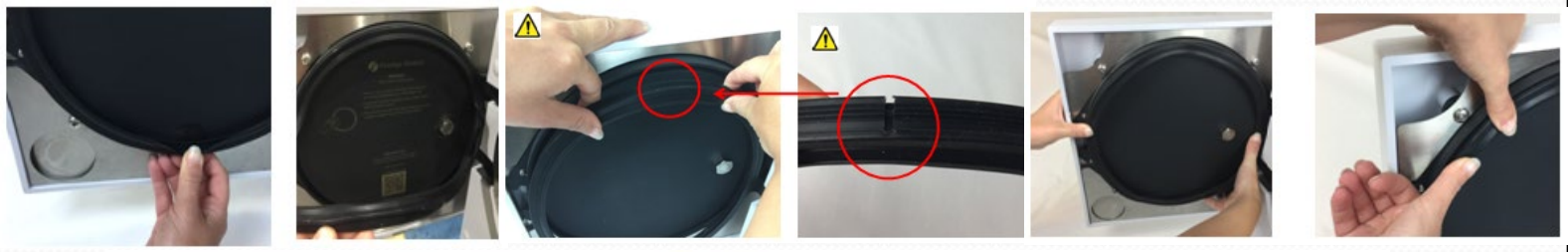
Weekly
Cleaning of flexi-Rack



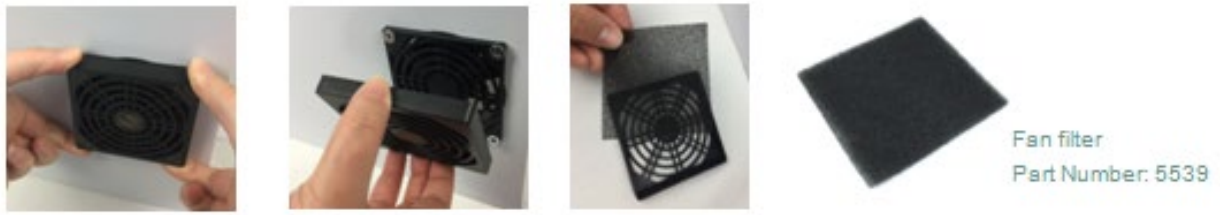
Monthly
Cleaning of Fresh Water Tank (see next slide)

250 Cycles
Internal System (Prompted) (see next slide)

500 Cycles
Replace door gasket
Exterior surface clean



12 Months
External air filter replacement



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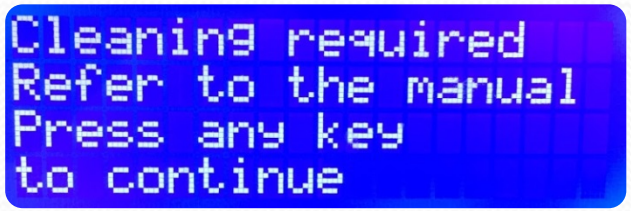
Maintenance Reminders - End User



Cleaning required
This message will be displayed every 250 cycles, and it is expected that the end user carries out the internal system cleaning method.

Every 250 cycles:
Internal system cleaning
The autoclaves internal system has to be cleaned every 250 cycles using the specifically formulated Prestige Medical autoclave cleaning fluid. This fluid removes any harmful oil residue and light mineral staining from the autoclaves inner workings.
Fully drain the fresh water tank and refill with 2 caps of the autoclave cleaning solution and 1 litre of distilled water. Turn the autoclave on as shown in section 7 and close the door check and ensure the waste tank is fully drained. Drain the waste tank if required and continue to select the cleaning cycle as defined in section 8? Once the cleaning cycle has finished please empty the fresh and waste water tanks and refill the fresh water tank with distilled water. Run one more cleaning cycle and drain both tanks after the cycle has completed. Refill the fresh water tank – the unit is now ready for use.

Monthly Maintenance:
Fresh water tank
On a monthly basis, fully drain the fresh water tank and refill with 2 caps of the autoclave cleaning solution and 1 litre of distilled water leave overnight. Drain the fresh water tank then refill with fresh water. Repeat the tank flushing operation twice more to remove any cleaning residue. Always use de-ionised, distilled or sterile water as recommended. **NEVER USE TAP WATER.**

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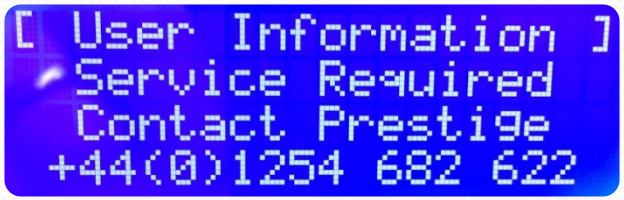
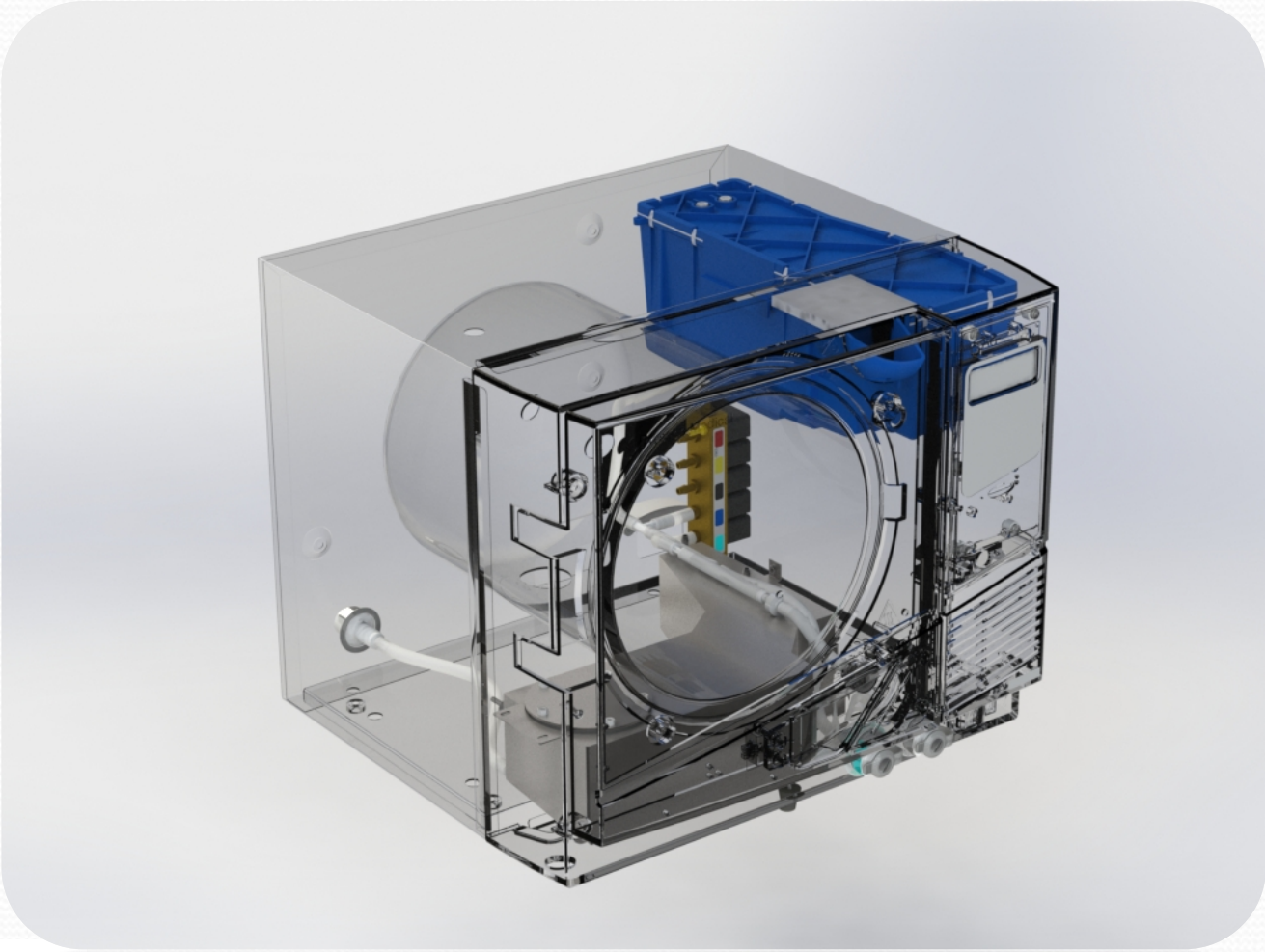
Maintenance Reminders - Service



Service required
A service reminder will appear on the display screen after approximately 12 months past since the last service was carried out by an authorised service engineer.

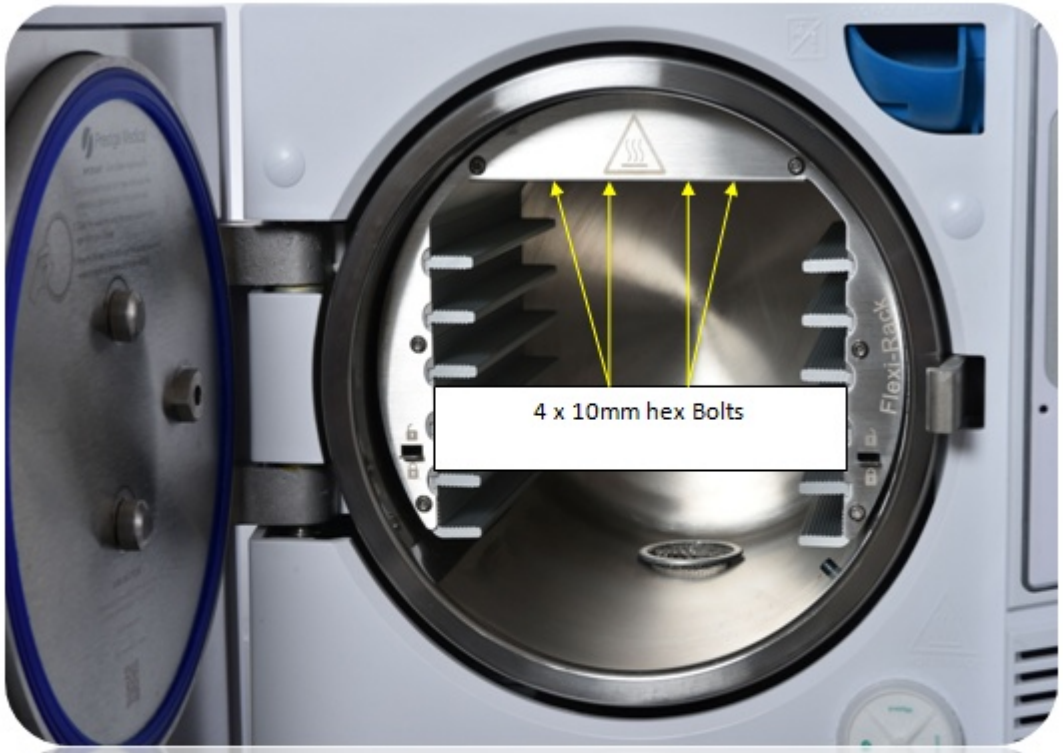
Annually			
Parts to be replaced	**Part Number**	**Visual checks**	**Engineering Tests**
Door gasket	301022E	Electrical connections - Check all connections for loose fit	Valve Test
Door entry port o-ring	271555A	Door microswitch - Check position and adjust if required	Fan Test
Air filter	273096A	Boiler Water Level Sensor - Remove and Clean	Door Solenoid Test
Chamber Probe Grommet	291501B	Chamber probe - Remove and clean	Display Test
Water filter	279553	Waste Water Tank Sensor – Remove and clean	System leak test
Boiler seal	273501D	Pipework and fittings - Check all pipework for contamination	Pressure Vessel Inspection
Strike plate + Shims if req	273128A	Water tank - Remove lid and clean out, replace tank seal	Temperature Calibration
Door grommets x 4	271511B	Asco valve stems - Remove stems and clean	Pressure Calibration
12 Amp fuses x 2	272032B	Vessel - Clean vessel rim / inside vessel, with remove flexi-rack removed	
External fan filter	5539	Flexi -Rack - Remove and clean	
Fresh water tank filter	5102A		
Full service kit	**579000**		

Disassembly/Re-assembly



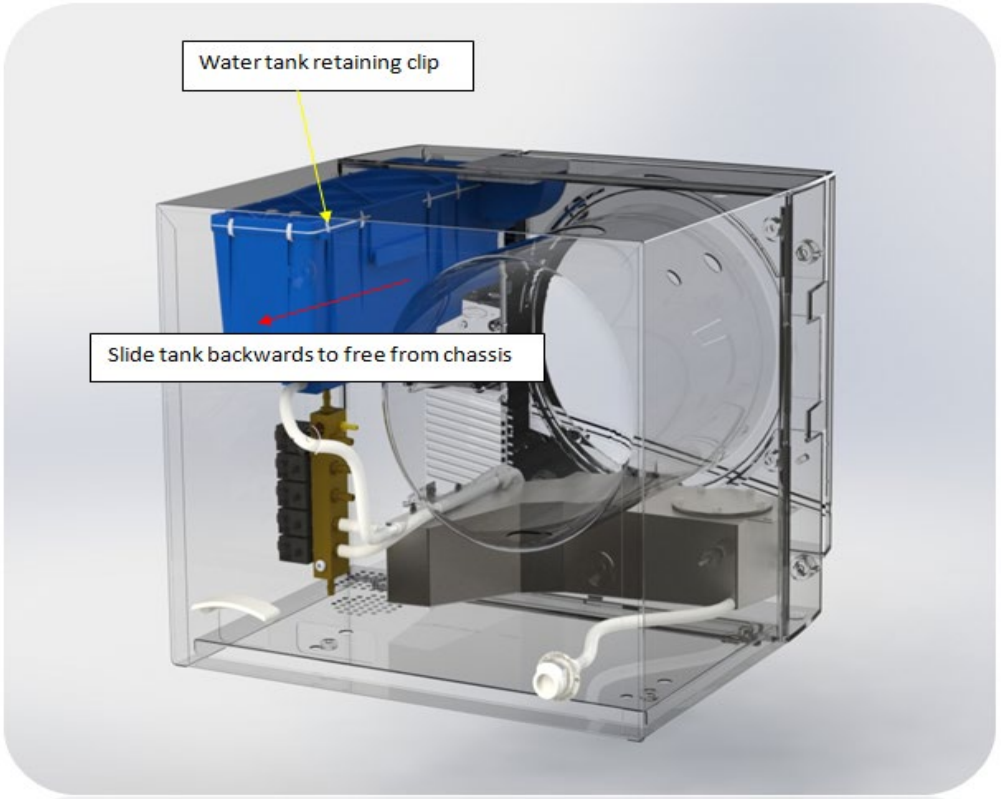
Flexi-Rack

1. Remove 4 x 10mm hex head bolts from top of rack.
2. Rack then drops and slides our forwards (Note: support rack with hand to prevent scratching of the vessel.



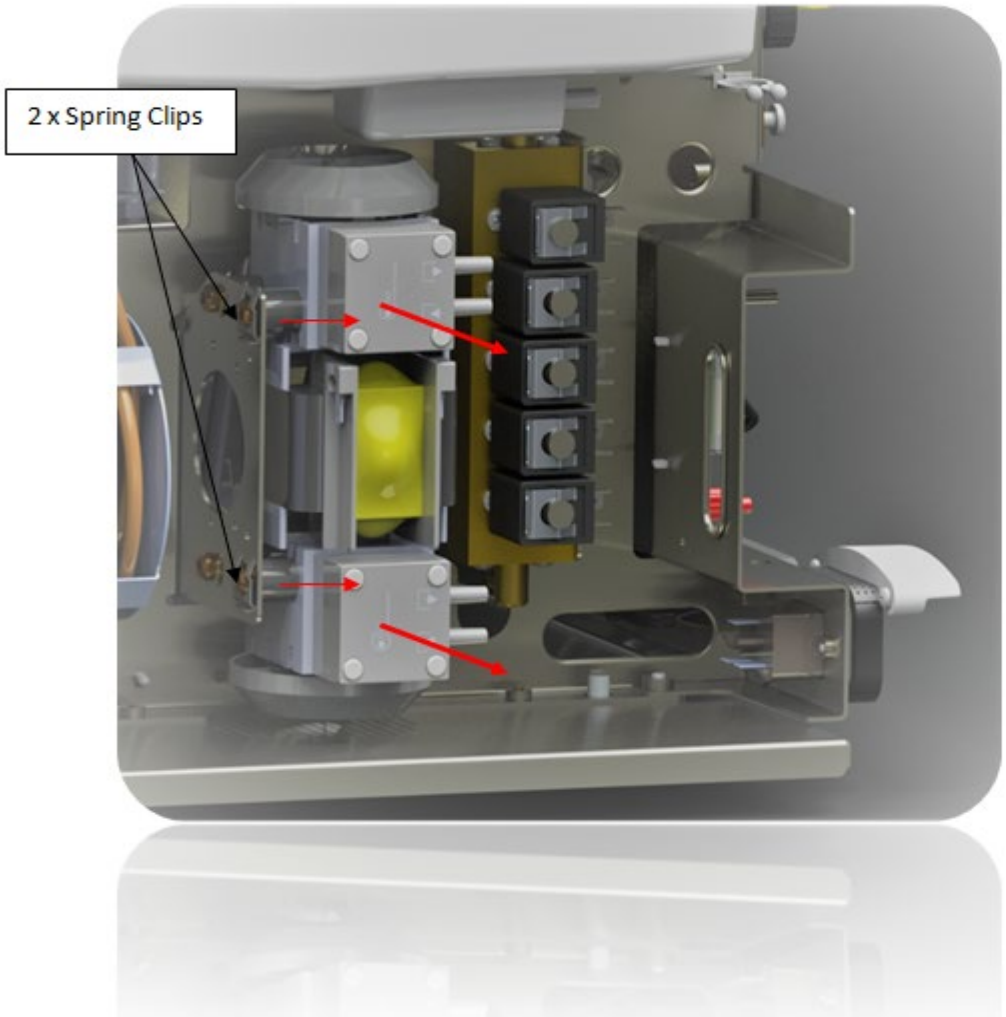
Water Tank

1. Un-clip wiring looms from quick connector at the rear of the tank.
2. Remove retaining clip.
3. Remove water pipe via quick release connector.
4. Slide water tank backwards whilst angling out to LHS (from rear) and lift to clear chassis and bezel.



Vacuum Pump

1. Remove inlet pipe from LHS condenser fitting.
2. Remove outlet pipe from pump T-Piece.
3. Disconnect Gnd, L and N feed to the pump.
4. Remove 2 x spring clips using a pair of long nose pliers.
5. Release pump from bracket, by levering front side out and sliding towards you.



Valve Block

1. Remove vacuum pump to allow more space.
2. Remove solenoid retaining clips and solenoids.
3. Remove top spring clip that secures manifold to bracket.
4. Lever the top of the manifold out and slide upwards to free from the bracket.
5. Move valve block to RHS to remove the pipework (pipework/Manifold are colour coded for reference).

5 x Solenoid Retaining

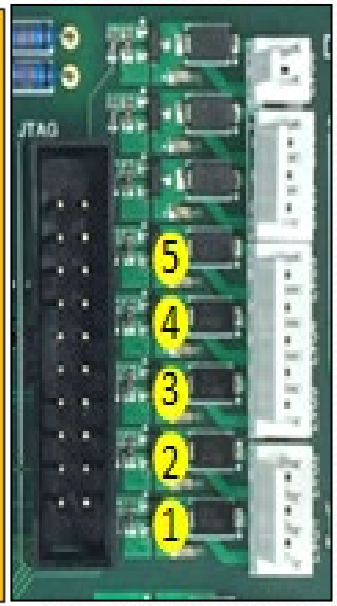
Black – Air Bleed
5

White - Vacuum
4

Yellow - Flush
2

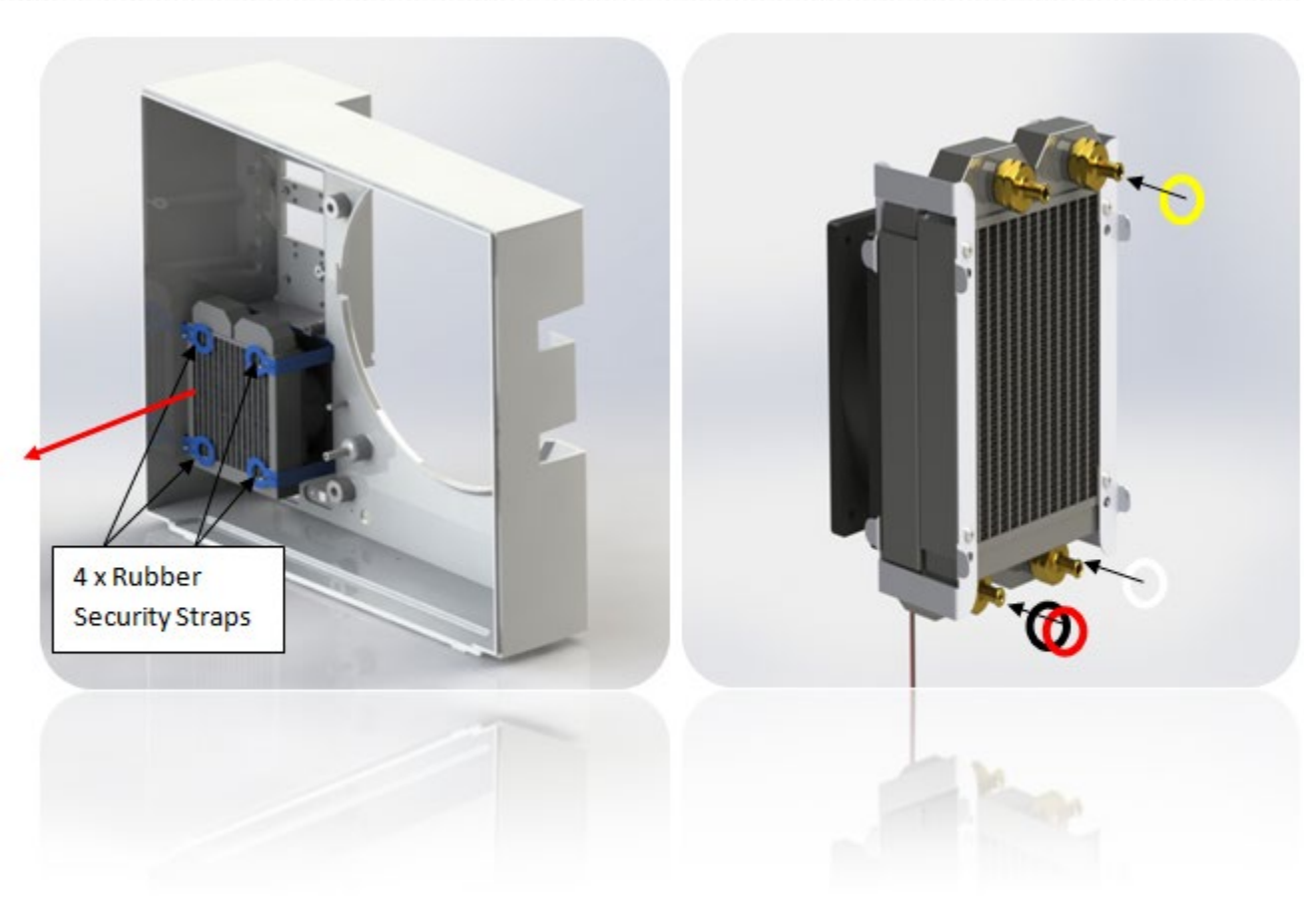
Orange - Fill
1

Pink – Air Filter
3



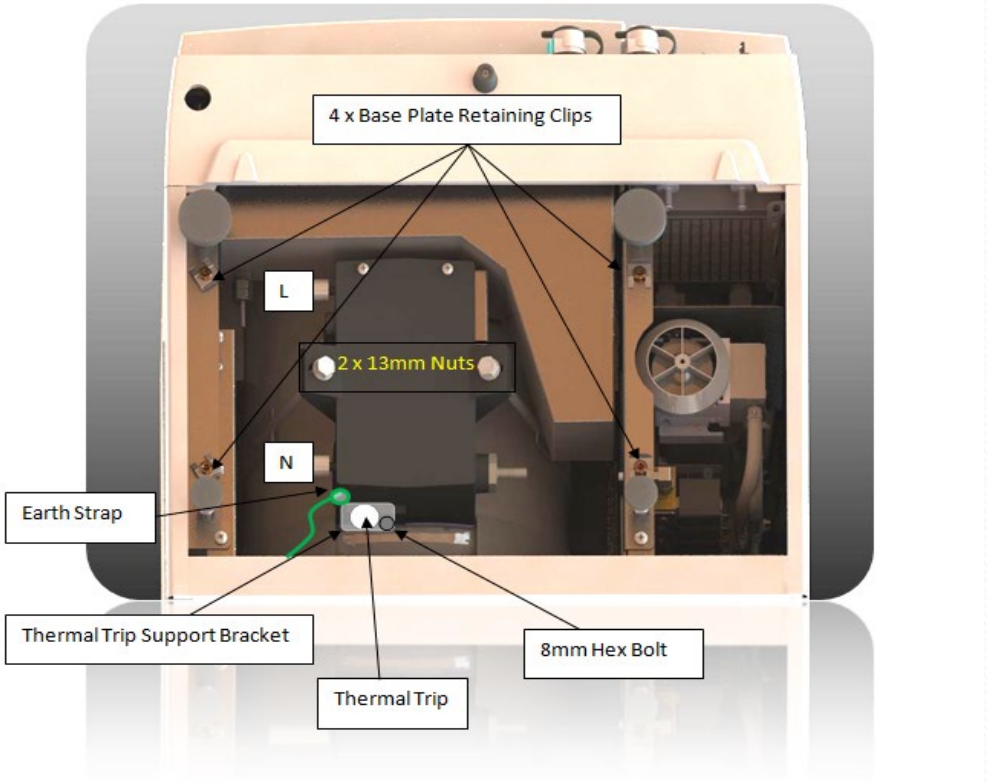
Condenser

1. Remove pipework (pipework and fittings are colour coded for reference).
2. Remove 4 x straps (Note: straps closest to chassis have clips on chassis plate to secure to, which assists with re-assembly).
3. Ease condenser out from the LHS (from rear).



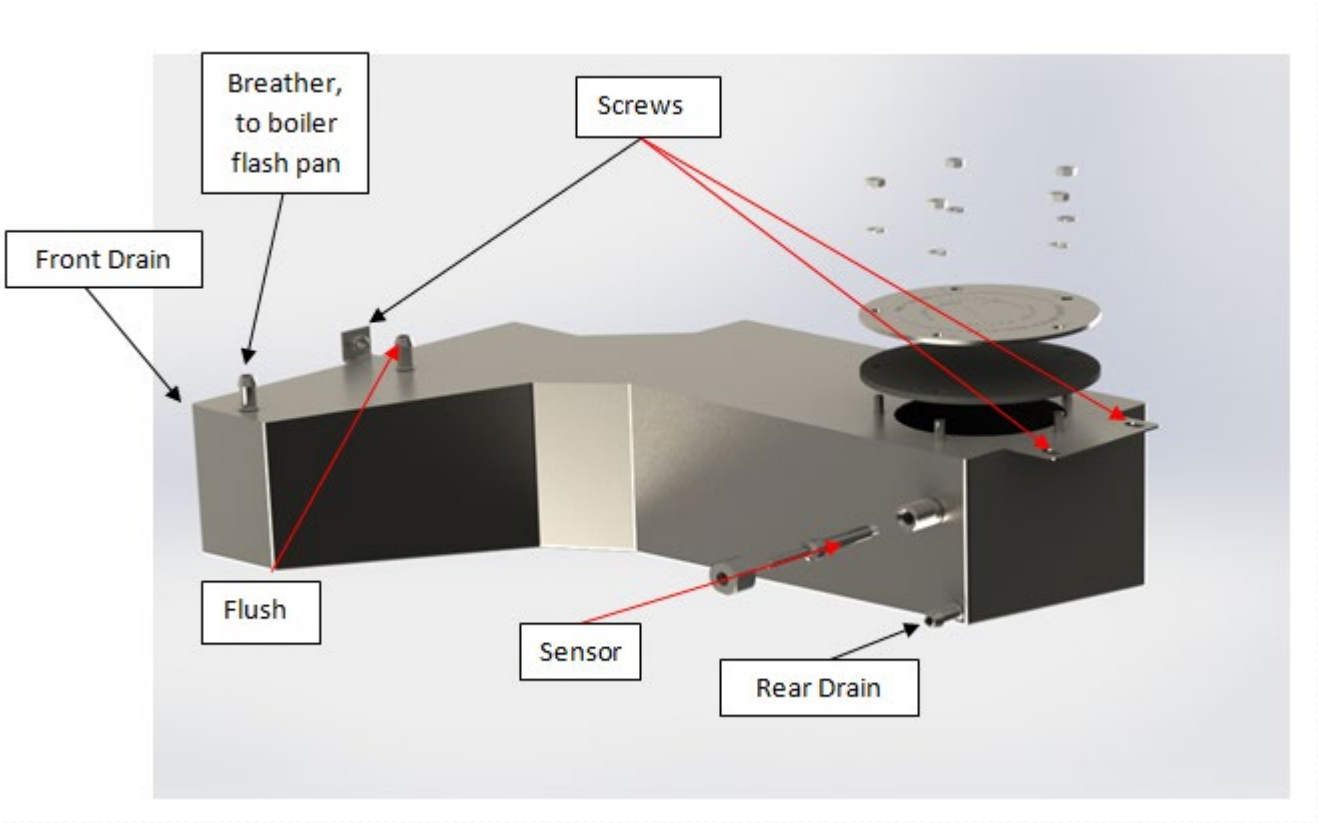
Boiler

1. Rotate the unit upside down.
2. Remove base plate via the 4 x retaining clips.
3. Remove waste tank breather pipe from the boiler side condenser plate.
4. Remove mains L, N feed to boiler.
5. Remove water level sensor (note: retaining nut is finger tight).
6. Remove water fill pipe from the water filter spigot.
7. Remove thermal trip (note: single 8mm hex bolt secures trip via a retaining plate). Loosen this bolt to free the trip.
8. Remove earth harness via the 8mm hex bolt.
9. Remove 2 x 13mm nuts that secure the boiler strap.
10. Remove the Thermistor harness from the PCB, and re-route harness back to the boiler.
11. Lift the boiler away from the vessel, for inspection/clean.



Waste Water Tank

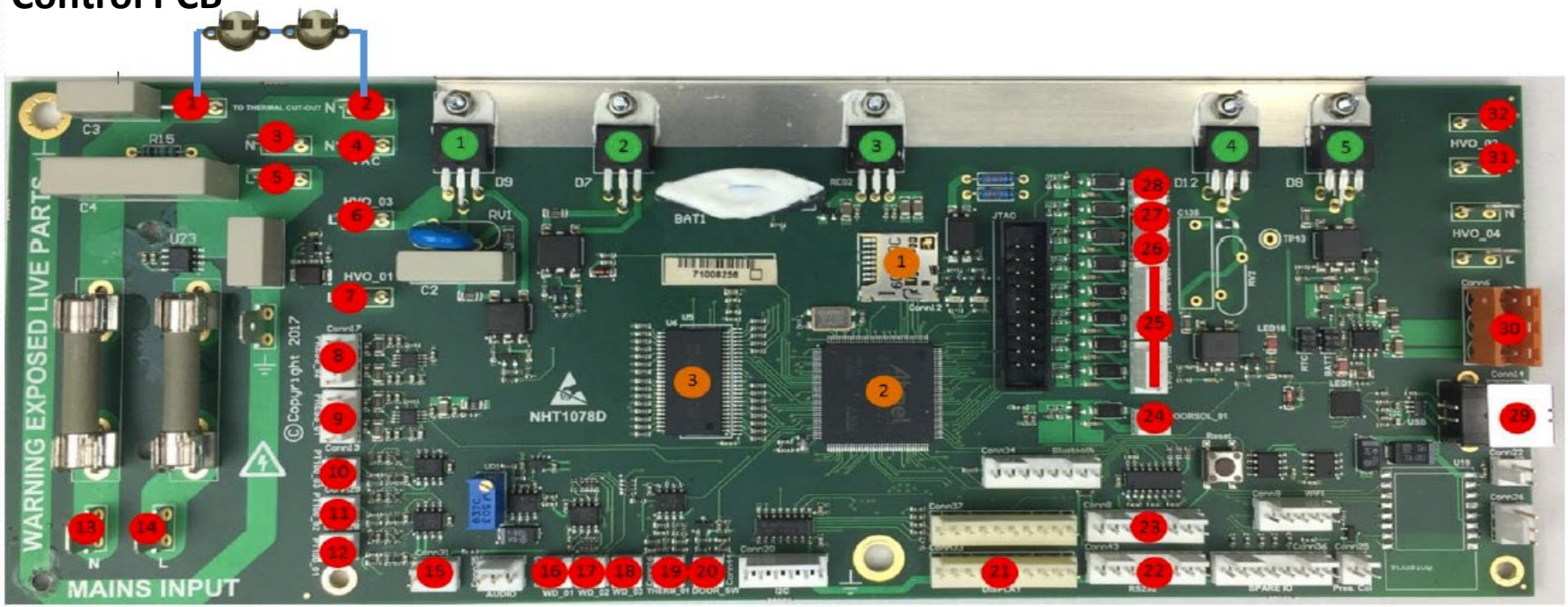
1. Unscrew the water level sensor retaining nut (note: this nut should be hand tight).
2. Remove the drain pipe.
3. Remove 3 x Pozi-drive screws size??? (Note: the 2 LHS screws have retaining clips, to hold the screws in place, to assist with re-installation of the tank).
4. Lift tank up and remove the Air Breather Pipe, and the Dump T-Piece.



NOTE: When re-installing the tank, please follow the below instruction;

1. Re-secure the front drain pipe.
2. Re-secure the dump T-Piece.
3. Angle the tank into position (Note: Ensue the T-Piece does not kink and lies in-line with the fitting)

Control PCB



No.	Description	PCB Label
1	Neutral supply (Boiler & drying heater)	To thermal cut out N
2	Neutral supply (Boiler & drying heater)	To thermal cut out N
3	Neutral (Switchable power supply)	N
4	Neutral supply Vacuum pump	N –VAC
5	Live (Switchable power supply)	L
6	Live supply Vacuum pump	HVO_03
7	Live supply boiler	HVO_01
8	Pressure transducer 1	PRESS_02
9	Pressure transducer 2 (Atmosphere)	PRESS_01
10	SPARE PT100 connection	PT100_03
11	Chamber PT100	PT100_02
12	Drying heater PT100	PT100_01
13	Neutral supply (Mains)	N
14	Live supply (Mains)	L
15	Spare connection	n/a
16	Fresh water level sensor	WD_01
17	Spare	WD_02
18	Waste water level sensor	WD_03

No.	Description	PCB Label
19	Boiler thermistor	THERM_01
20	Door micro switch	DOOR_SW
21	LCD Display	DISPLAY
22	Printer connection	RS232 (CONN43)
23	Card reader (data logger)	RS232 (CONN8)
24	Door solenoid	DOORSOL_01
25	Valve block connection	LV01 – Air filter
		LV02 – Fill valve
		LV03 – Flush valve
		LV04 - Vacuum
		LV05 - Airbleed
26	Spare	LV06
27	Case fan (small)	LV07
28	Main fan (large)	LV08
29	USB "B" connection	CON14
30	PCB power supply connection	CONN6
31	Live power feed drying heater	HVO_02
32	Neutral power feed drying heater	HVO_02

No.	Description	PCB Label
1	Micro SD card (software & unit info)	N/A
2	Microcontroller ATSAME70Q21	N/A
3	SD RAM 1MB	N/A

No.	Description	PCB Label
1	Vacuum pump triac	N/A
2	Boiler heater triac	N/A
3	Voltage regulator	N/A
4	Spare	N/A
5	Drying heater	N/A

PRESS_01 VESSEL PRESS	PT100_02 VESSEL TEMP	WD_02 BOILER W/L
PRESS_02 ATMOS PRESS	PT100_03 MEDIA TEMP	WD_03 WASTE W/L
PT100_01 HEATER TEMP	WD_01 FRESH W/L	THERM_01 BOILER THERM

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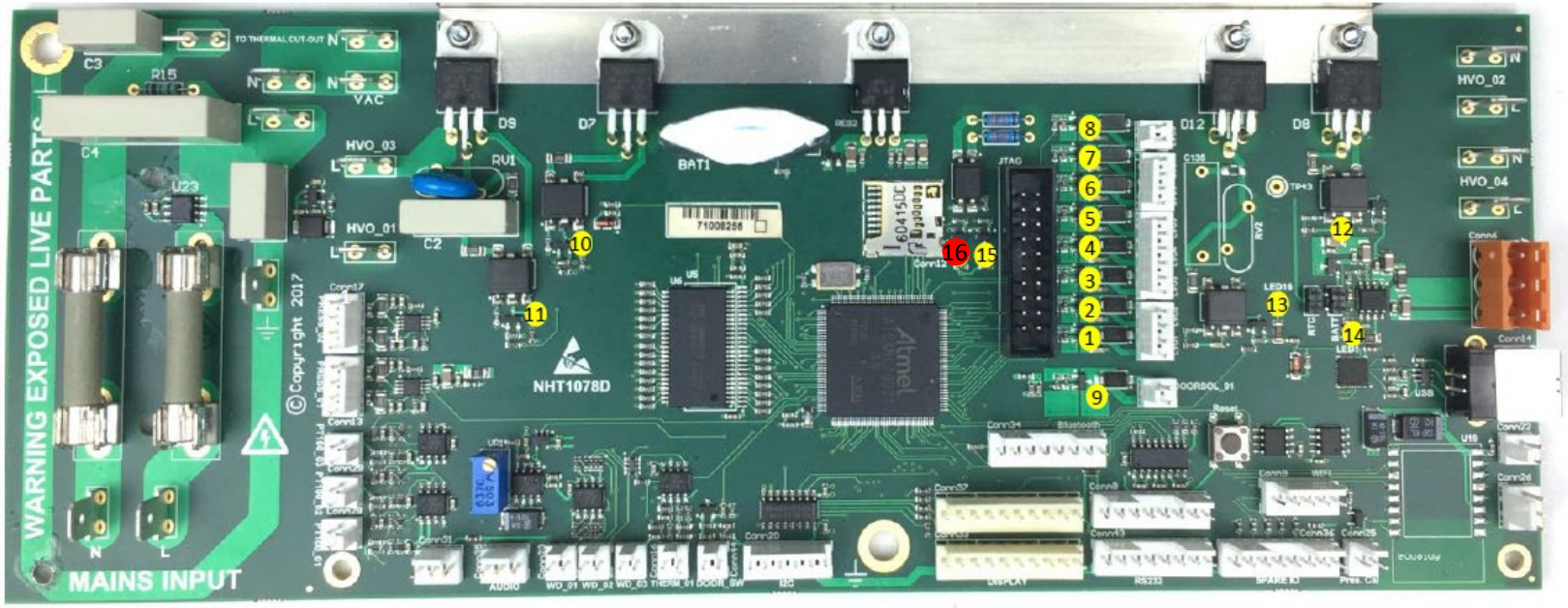
Control PCB



LED IDENTIFICATION MAP

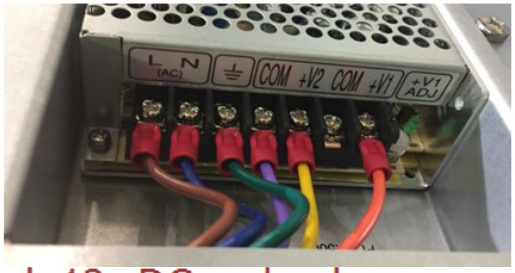
No.	Description
1	Fill valve
2	Flush valve
3	Air filter valve
4	Vac valve
5	Air bleed Valve
6	Spare
7	Fan 2 (case fan)
8	Main fan

No.	Description
8	Main fan
9	Door solenoid
10	Boiler heater (triac)
11	Vac Pump 9 (triac)
12	Chamber Heater (triac)
13	3.5v present
14	Mains power
15	Communication to LCD
16	Software event (unit heart beat)

Pt 100 Resistance Tables

Temp 0°C	Resistance Ω
0	100.00
10	103.90
20	107.79
30	111.67
40	115.54
50	119.40
60	123.24
70	127.07
80	130.89
90	134.70
100	138.50
110	142.29
120	146.06
130	149.82
140	153.58
150	157.31

Electrical Values

Component	Values
• Asco Solenoid valve coil	21.5Ω
• Door solenoid	8.1Ω
• Boiler heater (230v)	24.7Ω
• Internal heater	108Ω
• PT100 (Chamber and boiler sensors)	107.7Ω
• Thermistor (Boiler sensor) at ambient	100kΩ
• Vacuum Pump Coil	26Ω
• Solenoid drive voltages (Door and valve block)	24v (PWM)
• Fan drive voltage	23.0v
• Switchable power supply output voltages Violet common Orange +V1 5v Yellow +V2 24v	
• Printer drive voltage	24v DC no load 12v DC no load

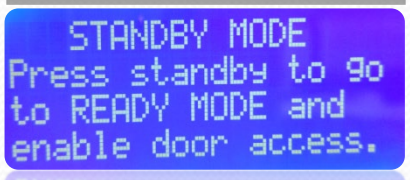
Electrical Values (100K Boiler Thermistor)

T [°C]	R_nom [Ω]	R_min [Ω]	R_max [Ω]
25	**100000**	**99000**	**101000**
30	80223	79243	81206
35	64759	63830	65695
40	52589	51727	53460
45	42951	42161	43751
50	35272	34556	36000
55	29119	28473	29776
60	24161	23581	24752
65	20144	19626	20674
70	16874	16411	17348
75	14198	13786	14622
80	11998	11631	12376
85	10181	9854	10519
90	8674	8382	8976
95	7419	7158	7688
100	6369	6136	6610
105	5487	5279	5703
110	4744	4557	4937
115	4115	3948	4288
120	3581	3431	3737
125	3126	2991	3266
130	2737	2616	2864
135	2404	2294	2518
140	2117	2018	2220

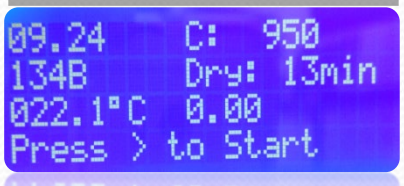
Torque Settings

Component	Nm
M8 Boiler strap	**8**
M8 Vessel to Chassis Plate	4
M8 Chassis Plate to Bezel	20
M6 Fixings	6
M5 Fixings	2.5
Port Door Entry	2
Screw Strike Plate	0.5
Plate door microswitch	1.7
Boiler sensor Fixing Nuts	1.0
Thermal Cut out Switch	0.7

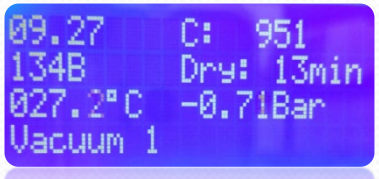
Standby button puts the unit into "Ready Mode"
Air Bleed Valve ON
Boiler ON
Pre-Heat vessel temperature up to 45°C.
2nd Pressure Transducer measures atmospheric pressure



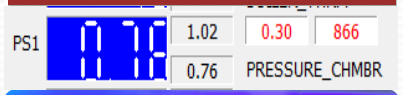
Select the Class B 134 Cycle by pressing button

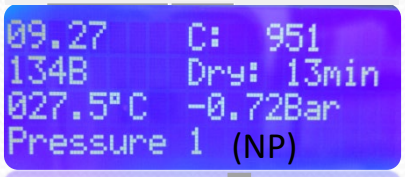


Pressing the start button will now start the selected cycle.



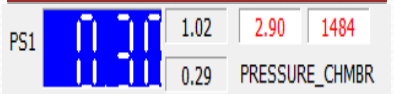
Phase 1 - First Vacuum
The Fan ON
Vacuum valve ON
Vacuum pump ON
Wait For vacuum set point (circa -0.7bar (0.3bar ABS)) to be achieved within 900s, if not VAC_TIMEOUT (Error 01) will occur.
Vacuum Pump OFF
Vacuum Valve OFF

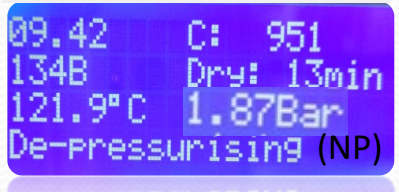




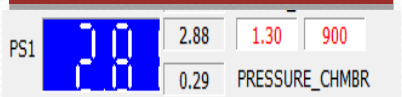
Phase 2 - Fill
Fill Valve ON
Fill Valve OFF
Fill Valve ON
Fill Check 100% within 240s
If not FILL_TIMEOUT (Error 02) will occur

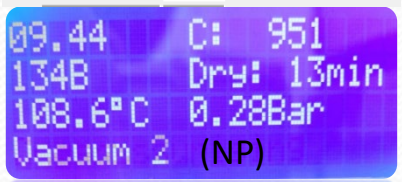
Phase 2 - Pressure Pulse 1
Boiler Heater ON
Wait For pressure set point (circa 1.90bar (2.90barABS)) to be achieved within 2500s, if not PRESS_TIMEOUT (Error 03) will occur



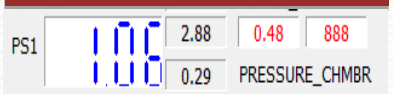


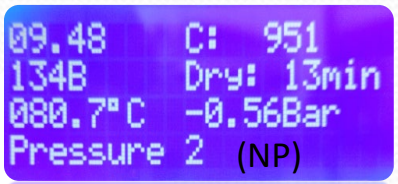
Phase 3 – Depressurization
Boiler OFF
Fan ON
Air Bleed Valve ON
Wait For pressure set point (0.30bar (1.3bar ABS)) to be achieved within 900s, if not then FLUSH_TIMEOUT (Error 4) will occur





Phase 4 – Vacuum 2 Vacuum Valve ON
Chamber Heater ON (110)
Vacuum Pump ON
Air Bleed Valve OFF
Wait For vacuum set point (circa -0.58bar (0.48bar ABS)) to be achieved within 900s, if not VAC_TIMEOUT (Error 01) will occur
Fill Check .....





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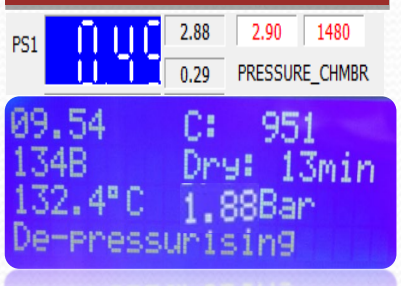
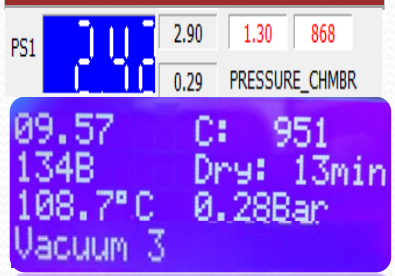
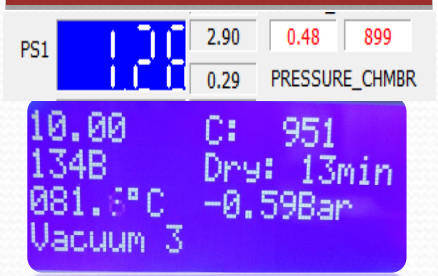
Phase 5 – Pressure Pulse 2
Boiler Heater ON
Wait For pressure set point (circa 1.90bar (2.90barABS)) to be achieved within 2500s, if not PRESS_TIMEOUT (Error 03) will occur



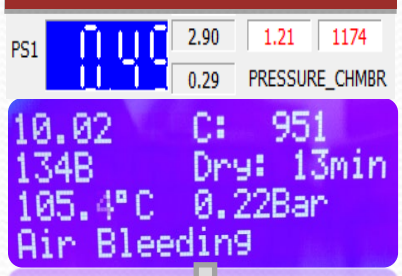
Phase 6 – Depressurization
Boiler OFF
Fan ON
Air Bleed Valve ON
Wait For pressure set point (0.30bar (1.3bar ABS)) to be achieved within 900s, if not then FLUSH_TIMEOUT (Error 04) will occur



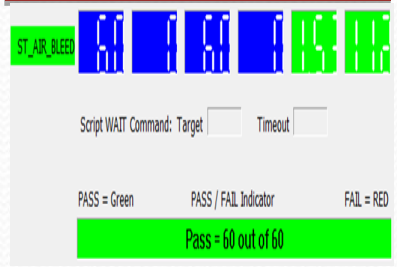
Phase 7 – Vacuum 3 Vacuum Valve ON
Chamber Heater ON (110)
Chamber Heater OFF
Vacuum Pump ON
Air Bleed Valve OFF
Wait For vacuum set point (circa -0.58bar (0.48bar ABS)) to be achieved within 900s, if not VAC_TIMEOUT (Error 01) will occur
Fill Check .....



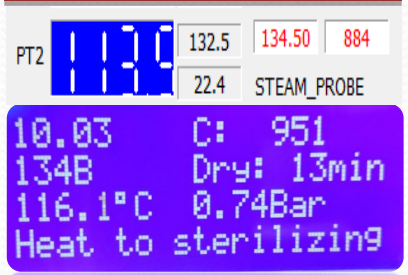
Pressure Pulse 3
Boiler Heater ON
Wait For pressure set point (circa 0.21bar (1.21barABS)) to be achieved within 1200s, if not PRESS_TIMEOUT (Error 03) will occur



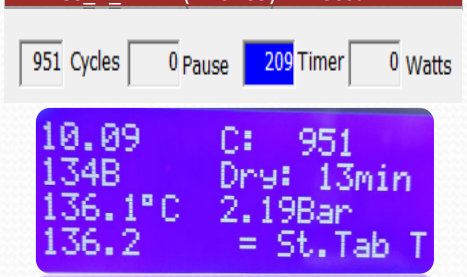
Phase 9 – Air Bleed
Fan ON
St Air Bleed ON
Wait For ST Air Bleed Pass 60 times in 900s
(If >10 Fail Air Bleed Valve ON)
(If >10 Pass Air Bleed Valve OFF)
(If >60 Pass Exit Air Bleed)
(If >120 Fail ABD_TIMEOUT (Error 05) will occur)



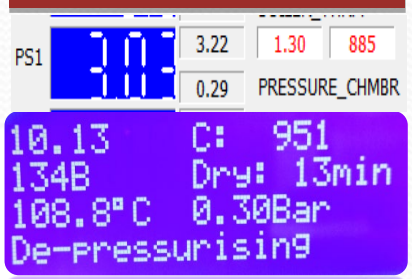
Heat To Sterilizing
Air Bleed Valve OFF
Boiler Heater ON
Wait For Sterilization Temperature set point 134.5 to be achieved within 900s,
if not 121_134 TIMEOUT (Error 06) will occur



Sterilization
Steam Table Check ON
Pre-Sterilizing
>10 Pass in 20s, if not PRE_ST_ERROR
Sterilization
210s
Temp Monitor 134.0 to 138.0 , if not TEMP_STER_ALRM (Error 11) will occur
Pressure Monitor ST 130 to 140 in 1° increments, tolerance 1.5°C, if not PRESS_V_TEMP (Error 09) will occur



Depressurization
Boiler Heater ON
Chamber Heater ON
Fan ON
Flush Valve ON
Wait For pressure set point (0.30bar (1.3bar ABS)) to be achieved within 900s, if not then FLUSH_TIMEOUT (Error 04) will occur



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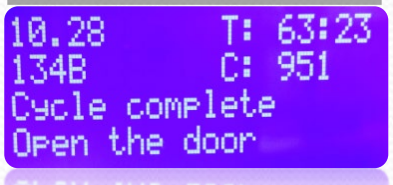
Drying
Flush Valve OFF
Vacuum Valve ON
Vacuum Pump ON
Boiler Heater ON (165˚C)
Chamber Heater ON (180˚C)
Fan ON
Pre Vac 1 -0.15Bar/g (850mb abs) within 120s, if not VACUUM DRYING TIMEOUT (Error 07) will occur.
Vacuum Valve OFF
Vacuum Pump OFF
Air Filter Valve ON
Pressure Rises back to atmospheric -0.05 (950mb abs) within 900s, if not DRYING PRESSURE RISE TO LONG (Error 08) will occur
Pre Vac 2 -0.15Bar/g (850mb abs), if not Vacuum Drying Timeout (Error 07) will occur.
TIMEOUT (Error 07) will occur.
Vacuum Valve OFF
Vacuum Pump OFF
Air Filter Valve ON
Pressure Rises back to atmospheric -0.05 (950mb abs) within 900s, if not DRYING PRESSURE RISE TO LONG (Error 08) will occur
Vacuum Valve ON
Vacuum Pump ON
Drying Time 780s (13minutes)
After 10m Boiler Heater OFF
After 12m Chamber Heater OFF

After 13mins
Vacuum Pump OFF
Vacuum Valve OFF
Air Filter Valve ON
Pressure Rises back to atmospheric -0.05 (950mb abs) within 900s, if not DRYING PRESSURE RISE TO LONG (Error 08) will occur



End of cycle.
Unit returns to ready mode with the Air Filter Valve Open, until the door is opened, then
Air Filter Valve OFF
Air Bleed Valve ON.

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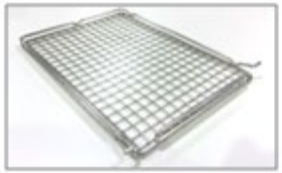
Consumables

Cord set **UK**: (309071)
Cord set **EURO**: (211106)



22 litre pouch tray
(Part No. 309071)

16 litre Pouch tray
(Part No.309066)

Vertical pouch rack kit (sold in pairs)
Part No: 579006)

Air filter (Part no. 279096)

Set of 4 gaskets (Part number 279571)

Fan filter
Part Number: 5539

Autoclave Cleaning kit. Part no. 579005

Printer rolls (Part No.279505): Ten replacement rolls.

Prestige Medical autoclave cleaning fluid (Part No. 279493)

Printer UK (279519)
Printer Euro (279520)

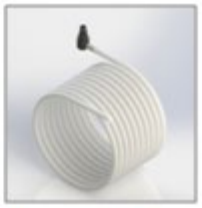
Door tool (Part No.309068)

Tray lifter (Part No.279007)

Helix Test Pack & 250 TST (Part No.5550)

TST strips
(Part No. 259277)

Rapid Drain System
(Part No. 5397)



Rear drain Kit
6m (Part No. 5410)
3m (Part No. 5409)

Stnd drain Kit
(Part No. 5394)

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End