DIXONS PORTABLE AUTOCLAVES

NEXUS

Stainless Steel
Fully Automatic Electric Model

Operators Manual

Issue 3

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Notes

Foreword

Before using this Dixons Portable Autoclave please read this booklet carefully. Please ensure that all persons likely to use this product are correctly trained in its use in accordance with these instructions.

Your Dixons Portable Autoclave, operated in accordance with the manufacturers instructions, will give years of trouble free service without the need for any major servicing.

Every Dixons Portable Autoclave has been manufactured to the highest quality standards by a company complying with BS EN ISO 9000 and is fully tested and ready for immediate use.

Dixons Portable Autoclaves are suitable for sterilisation of:

- Laboratory equipment (glass and metal)
- Culture media
- Pharmaceutical preparations in sealed containers
- Surgical and Veterinary instruments
- Dressings and drapes

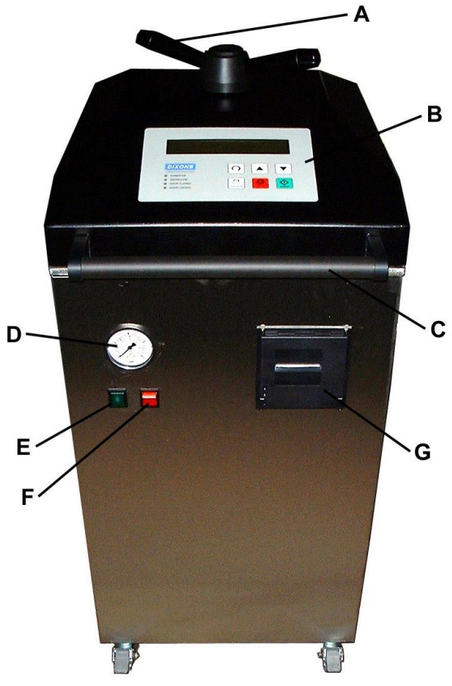
For the sterilisation of dressings and drapes it is recommended that a Dressing Drum or Wire Mesh Basket be used. These are available as a part of the range of accessories.

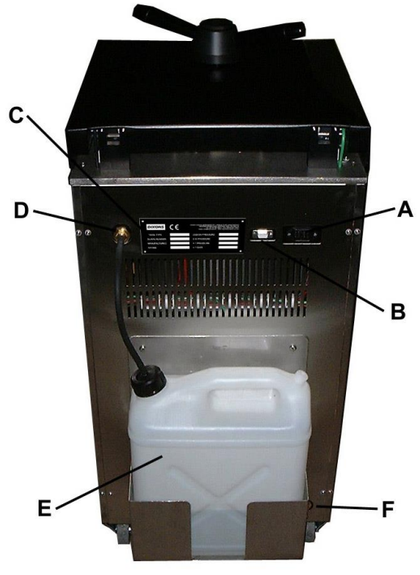
All Dixons Portable Autoclaves are particularly suitable for destructive sterilisation, as the operator is not restricted to a set cycle time. This can be adjusted to suit the application.

This users manual consists of seven sections:

1. Introduction
2. Installation
3. Operation
4. Error Messages
5. Troubleshooting
6. Maintenance
7. Specifications
8. Technical Data

1 - Introduction





A- Lid Locking Handle
B - Keyboard
C - Lid Lifting Handle
D - Pressure Gauge
E - Power On Indicator
F - On / Off Switch
G - Printer (Optional)

A - IEC Power Inlet
B - RS232 Output
C - Rating Plate
D - Freesteam Outlet
E - Condensate Bottle
F - Manual Chamber Drain Outlet

NOTE: The lid can only be unlocked with power to the autoclave. If the lid is accidently locked you will not be able to unlock the lid until power is supplied. Do not force the lid locking handle as this may cause damage to the autoclave.

L	Live input
E	Earth connection
	Note - frame must be bonded to earth for correct operation of water level probes
N	Neutral input
HL	Heater output live
HN	Heater output neutral
VL	Not used
VN	Not used
FL	Cooling fan live
FN	Cooling fan neutral
DV1	Not used
DV2	Not used
FS1	Freesteam valve solenoid (24V AC)
FS2	Freesteam valve solenoid (24V AC)
LR+	Interlock bolt solenoid (24V +Ve)
LR-	Interlock bolt solenoid (24V -Ve)
DL1	Not used
DL2	Not used

Printer

Dip Switch Settings

1	Off
2	Off
3	Off
4	Off
5	On
6	Off
7	On
8	On

This will apply across all programs. Use the UP and DOWN buttons to change the temperature. Once the parameters have been set turn off the switch to return to standby mode.

4 & 5 When switched in combination the delay before an abort due to load under temperature can be set. The settings are as follows:

Dip Switch 4	Dip Switch 5	Delay
OFF	OFF	10 seconds
OFF	ON	30 seconds
ON	OFF	60 seconds
ON	ON	180 seconds

6 When switched on the printer is disabled. The 'PRINT' option will be removed from the *program selection mode* screens and output will be disabled from PL3. Once turned back off the 'PRINT' option will appear on the *program selection mode* screens and output will be fed to PL3.

7 When switched on the print output is reversed. This means that as the paper is fed out of the printer the data will be upside down, but when torn off and turned around will read chronologically from top to bottom. Once turned back off the print output is turned back around. This means that as the paper is fed out of the printer the data will be the right way up, but when torn off will read chronologically from bottom to top.

8 When switched on the output from the load and chamber probes is ignored but the rest of the machine operates as normal. The controller receives a temperature signal that rises by 1°C per second when the heater output is on and falls by 1°C per socond when the heater output is off. This provides a quick method of demonstrating the functions of the autoclave without having to sit through a full length cycle. WARNING - DISCONNECT HEATER CONNECTIONS WHEN USING THIS MODE TO AVOID DANGER OF HIGH WATER TEMPERATURES.

Power Board - 6240 issue 2

PL1 Transformer connections
- 1 Live
- 2 Neutral
- 3 9V
- 4 9V
- 5 22V
- 6 22V

D11 Heater output LED
D12 VL / VN output LED
D13 Cooling fan output LED
D14 DV1 / DV2 output LED
D15 Freesteam valve solenoid output LED
D16 Interlock bolt solenoid output LED

FS1 Control board low voltage supply fuse
FS2 VL / VN output fuse
FS3 Cooling fan fuse
FS4 DV1 / DV2 output fuse
FS5 Freesteam valve solenoid fuse
FS6 Interlock bolt solenoid fuse
Note: All fuses are 20mm x 5mm 250V 1A anti-surge

2 - Installation

Ensure that the following parts are included:

- Autoclave with fittings as per the illustrations in section 1.
- White silicone gasket in chamber lid.
- Operators manual.
- Test certificate.
- Power lead with IEC connector.

Ensure that no damage has occurred to any of the fittings paying special attention to the Pressure Gauge.

Plug the power lead into the IEC power inlet at the back of the autoclave. Connect the other end to a 13A socket. The green indicator light on the front panel will show mains power.

The autoclave is now ready for use.

3 - Operation

Keyboard

SCREEN - Displays messages relating to status and programming at all times
POWER ON - Lights up if the autoclave is powered on
WATER LOW - Lights up if the water level is too low
DOOR CLOSED - Lights up if the door is closed
DOOR LOCKED - Lights up if the door is locked
CYCLE - Moves the cursor to the next item when in programming mode
UP / DOWN - Cycle up or down the available cycles or increases / decreases the value of the selected item when in programming mode
UNLOCK - Unlocks the door interlock bolt
STOP - Aborts a cycle or backs up through menus
START - Starts a cycle

Running A Cycle

Switch the autoclave on using the red illuminated on / off switch on the front panel. Once the autoclave is booted up the controller will go into *standby mode*. The screen will display the following:

```
=======================================
       DIXONS PORTABLE AUTOCLAVES
          21/08/01 - 15:45:10

        http://www.dixons-uk.com
=======================================
```

Check that the WATER LOW indicator is not lit. If it is then open the lid and pour water into the chamber until the indicator goes out. There is a second indicator located below the chamber lid when the lid is opened.

Place the items to be sterilised into the chamber. These can either be placed directly onto the holed trivet plate in the bottom of the chamber, or in wire baskets, dressing drums and bottle racks. These are all available as accessories.

MAIN1 Red
MAIN2 Red
MAIN3 White
MAIN4 White

Dip Switch Functions

1 Preset program lock disable
2 Probe calibration routine
3 Machine setup routine
4 Under temperature abort delay
5 Under temperature abort delay
6 Printer disable
7 Print mode
8 Demonstration mode

Dip Switch Explanations

1 When switched on the preset program lock is disabled. The parameters of the preset programs can now be modified in the same way as the custom programs (see Operators Manual). Once turned back off the preset programs are locked again but will retain any modifications.

2 This routine will only operate while the machine is in *program selection mode*. A PT100 calibration device is required calibrated at 0ºC and 200ºC. If these are not available then DO NOT PROCEDE - TO CARRY OUT THE PROCEDURE WITHOUT THE CALIBRATION DEVICE WILL RENDER THE MACHINE UNUSEABLE. When first entering this mode the unit requires a 0ºC device to be connected to the load probe connections. If the display does not read 0 then press the UP button to calibrate the software to the calibration device. Check that the display now reads 0. Press the CYCLE button to move to the next step. The unit now requires a 200ºC device to be connected to the load probe connections. If the display does not read 200 then press the UP button to calibrate the software. Check that the display now reads 200. Press the CYCLE button to move to the next step. Repeat the above two stages using the chamber probe connections. Once both probes have been calibrated at high and low settings turn off the switch to return to standby mode.

3 This routine will only operate while the machine is in *program selection mode*. When first entering this mode the display shows the serial number currently held in memory. To change the serial number press the UP or DOWN keys. Note - after 10 presses the key will change the number in steps of 10 and then steps of 100 to speed serial number setting. To return to steps of 1 stop pressing the keys for a couple of seconds and then resume. Once the required serial number is displayed press the CYCLE button to store the value and move to the next parameter, cycle count. This shows the total number of cycle the machine has done. On a new machine this should be set to 0. If replacing a board on a used machine then the count should be set to match the number of cycles the machine has done. Use the UP and DOWN buttons to change the counter as described above. Once the required number is displayed press the CYCLE button to move to the next parameter, service due cycle count. This shows the cycle count at which the controller will start displaying the '!! SERVICE IS DUE !!' warning on the splash screen. Set this number no more than 500 higher than the current cycle count value. Use the UP and DOWN buttons to change the counter as described above. Once the required number is displayed press the CYCLE button to move to the next parameter, service due date. This shows the date at which the controller will start displaying the '!! SERVICE IS DUE !!' warning on the splash screen. Set this date no more than 12 months from the current date. Use the UP or DOWN buttons to set each date part and the CYCLE button to move through the date parts. Press the CYCLE button to move to the next parameter, stay warm temperature. This shows the temperature at which the chamber will be held when in stay-warm mode.

8 - Technical Data

The NEXUS controller is comprised of three PCBs. They are as follows:

Board Ref	Location	Description
6238 issue 2	Covering Lid	Display Board
6239 issue 2	Rear of machine LH	Control Board
6240 issue 2	Rear of machine RH	Power Board

The connections and adjustable components are as follows:

Display Board - 6238 issue 2

PL1	Connection to control board
PL2	Connection to keyboard
PL3	Connection to keyboard LEDs
PL4	Connection to low water repeater lamp
RV1	Display contrast adjustment
RV2	Sounder volume adjustment

Control Board - 6239 issue 2

PL2	Connection to display board
PL3	Connection to printer
PL4	Connection to RS232 port
PL5	Connection to power board
PL6	Not used
RV1	High water level probe sensitivity adjustment
RV2	Low water level probe sensitivity adjustment
D3	High water level probe status LED
D4	Low water level probe status LED
LW1	High water level probe
LW2	Low water level probe
P+	Pressure transmitter +Ve
P-	Pressure transmitter -Ve
DL	Interlock bolt switch
0V	Interlock bolt switch common
DC	Door closed switch
0V	Door closed switch common
SP1	Not used
0V	Not used
SP2	Not used
0V	Not used

Load probe connections.
For 2 wire device use terminals 2 & 3 and fit jumpers LK2 and LK3

LOAD1	Red
LOAD2	Red
LOAD3	White
LOAD4	White

Chamber probe connections.
For 2 wire device use terminals 2 & 3 and fit jumpers LK6 and LK7

If possible, the load probe should be placed into the load. This will ensure that the load is maintained at the required temperature during the cycle as the controller uses the readings from this probe to monitor the cycle. If the load is comprised of instruments and glassware or similar items then the load probe can be placed in the black housing in the centre of the chamber lid. The green lead can be coiled behind the probe to avoid damage.

Close the lid and rotate the lid locking handle clockwise through 90°. It will hit a stop when fully rotated. The DOOR CLOSED and DOOR LOCKED indicators will now be lit.

To select a cycle press either the UP or DOWN button. The controller will go into *program selection mode*. The screen will display the parameters of the most recently run cycle as follows:

```
======================================
PROGRAM: INSTRUMENTS/GLASSWARE 01
TIME: 00:15:00  TEMP: 121 C  PRINT: Y
FREESTEAM: 03:00  THERMAL LOCK: 100 C
COOL: Y  STAY-WARM: N
======================================
```

To select the program required, press the UP or DOWN buttons until the required program is shown. There are 12 preset programs (3 each Fluids/Media, Instruments/Glassware, Porous Load, Make Safe) and 12 custom cycles.

Once the screen shows the required program press the START button. If the door is correctly closed and locked and there is sufficient water in the chamber then the controller will go into *cycle run mode*. The screen will display the parameters of the cycle and its status throughout the cycle as follows:

```
======================================
CYCLE: 00:15:00 @ 121 C
CHAMBER: 034.3 C  LOAD: 025.3 C
STATUS: HEATING - PRE FREESTEAM

======================================
```

The stages of the cycle are as follows: Heating - Pre Freesteam, Freesteaming, Heating - Post Freesteam, Sterilising, Cooling and Cycle Complete.

Once the cycle has completed the controller will give out a beeping sound and the screen will display the following:

```
======================================
CYCLE: 00:15:00 @ 121 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: CYCLE COMPLETE - OK
UNLOCK THEN OPEN DOOR AND REMOVE LOAD
======================================
```

Press the UNLOCK button. This will remove the interlock bolt that is locking the door. The DOOR LOCKED indicator will now go out. Rotate the lid locking handle anti-clockwise through 90°. It will hit a stop when fully rotated. The DOOR CLOSED indicator will now go out. Open the lid and remove the load.

The controller will now return to *standby mode* ready for the next cycle.

Stopping A Cycle

If you wish to abort a cycle at any time press the STOP button. The screen will display the following:

```
=======================================
CYCLE: 00:15:00 @ 121 C
           ?? ABORT CYCLE ??
    PRESS STOP AGAIN TO CONFIRM ABORT

=======================================
```

This will be displayed for 5 seconds. If no confirmation is received the controller will return to *cycle run mode* and continue with the cycle. If you wish to abort the cycle you must press the STOP button again within this 5 second period. The screen will then display the following:

```
=======================================
CYCLE: 00:15:00 @ 121 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! CYCLE ABORTED !!
!! WARNING - LOAD NOT STERILE !!
=======================================
```

Press the UNLOCK button. This will remove the interlock bolt that is locking the door. The DOOR LOCKED indicator will now go out. Rotate the lid locking handle anti-clockwise through 90º. It will hit a stop when fully rotated. The DOOR CLOSED indicator will now go out. Open the lid and remove the load.

The UNLOCK button will only work once the temperature and pressure have dropped below the interlock parameters. If the button is pressed before these levels have dropped the screen will display the following:

```
=======================================
CYCLE: 00:15:00 @ 121 C
         CANNOT UNLOCK THE DOOR
       TEMPERATURE AND/OR PRESSURE
     ARE ABOVE INTERLOCK PARAMETERS
=======================================
```

Once the lid has been opened the controller will return to *standby mode* ready for the next cycle.

Programming A Cycle

The custom programs are user programmable. The preset programs are only engineer programmable. If you require the preset programs to be modified please contact your engineer.

To modify the parameters of a program move to the program that you wish to modify as if you were going to run that program using the UP and DOWN buttons as discribed in the 'Running A Cycle' section. To modify the parameters press the CYCLE button to move throught each parameter (the selected parameter will flash) and the UP and DOWN buttons to modify the parameter. To write away the modifications either CYCLE through all the parameters until none are flashing, or press the STOP button at any time.

7 - Specifications

Model Type:	NEXUS 3028 / NEXUS 3028 P
Capacity:	30 litres
Internal Diameter:	280mm
Internal Height:	490mm
Overall Width:	450mm
Overall Depth:	710mm
Overall Height:	1010mm
Net Weight:	80.0Kg
Chamber Material:	Stainless Steel 316 S31
Heat Source:	Internal Electric Element 230V - 50Hz - 2.0kW NEXUS Automatic Cycle Control
Design Pressure:	2.6 bar (38 psi)
Design Temperature:	140ºC
S W Pressure:	2.6 bar (38 psi)
H T Pressure:	4.0 bar (58 psi)
Complies With:	H&SE PM73 (Lid Locking Devices) BS3456 : Part 101 : 1987 (Electrical Safety) CE Marked in compliance with EMC Regulations 1992 BS2646 : Part 1 : 1993 PD5500 : 2000 : Cat 3

6 - Maintenance

To keep this autoclave in safe working order it requires servicing by a competent engineer every 12 months or 500 cycles - whichever is sooner. The controller has a built in service indicator. When in *standby mode* if a service is needed the screen will display the following:

```
======================================
       DIXONS PORTABLE AUTOCLAVES
          21/08/01 - 15:45:10
          !! SERVICE IS DUE !!
        http://www.dixons-uk.com
======================================
```

If the screen displays this message you must contact your engineer and arrange a service as soon as possible.

There are also some general maintenance procedures that should be carried out by the operator on a regular basis. The following maintenance procedures should be carried out approximately once a month.

Lid Gasket - Check the white silicone lid gasket for signs of wear. The lid gasket is a push fit into a groove in the chamber lid. Replace the gasket if it shows any signs of wear.

Locking Blocks - Check the mushroom shaped locking blocks on the head ring for signs of wear. Check also that they are still tightly connected to the head ring. Replce the locking blocks if there is any signs of wear. Tighten if they have worked loose at all.

If either the Lid Gasket or Locking Blocks are replaced then the Locking Block spacings must be checked and adjusted as follows:

1. Measure the thickness of the lid and gasket assembly.
2. Attach the lid locking lugs to the head ring using M10 x 30 socket cap screws.
3. Fit shim washers under each lug so that the height to the underside of the lug is 0.5mm greater than the lid and gasket assembly.

Chamber Water - The chamber water should be changed so that the chamber can be briefly inspected for signs of corrosion or pitting. This also helps to avoid the build up of unpleasant odours. The chamber has a manual drain valve which is located under the autoclave in the middle of the front panel. This is a 1/4 turn ball valve. The drain water is expelled from a port on the rear of the autoclave in the bottom right hand corner. This port is threaded 1/4" BSP female to enable a drain hose to be fitted if required.

The programmable parameters are as follows:

Parameter	Limits	Description
TIME	00:00:00 - 99:59:59	Holding Time (HH:MM:SS). The period for which the chamber and load are at sterilising temperature.
TEMP	100 -138	Sterilising Temperature (°C). The temperature to be attained in all parts of the load throughout the holding time.
PRINT	Y / N	Printer Output (Yes / No). Prints a record of the cycle as it progresses.
FREESTEAM	00:00 - 59:59	Freesteam Time (MM:SS). The period for which the chamber is held at 100°C to allow steam to purge the chamber of air pockets.
THERMAL LOCK	050 - 100	Thermal Interlock Temperature (°C). The temperature that the chamber and load must be below before the door can be opened.
COOL	Y / N	Fan Assisted Cooling (Yes / No). Turns on two powerfull fans at the base of the chamber to speed up the cooling time by blowing cold air across the chamber walls.
STAY-WARM	Y / N	Media Stay-Warm (Yes / No). Keeps the chamber heated at a preset temperature (default 50°C) to keep media in a pourable state.

Date / Time Setting

To set the date and time press and hold the UP and DOWN buttons together. The controller will go into *date and time set mode*. The screen will display the following:

```
======================================
SETUP DATE AND TIME
          21/08/01 - 15:45:10
          DD/MM/YY - HH:MM:SS

======================================
```

To modify the parameters press the CYCLE button to move throught each parameter (the selected parameter will flash) and the UP and DOWN buttons to modify the parameter. To write away the modifications either CYCLE through all the parameters until none are flashing, or press the STOP button at any time.

Printer (Optional)

If your autoclave is fitted with a printer you will get the option to switch output to the printer on or off for each program. The option is highlighted below:

```
======================================
PROGRAM: CUSTOM 01
TIME: 00:15:00  TEMP: 121 C  PRINT: N
FREESTEAM: 01:00  THERMAL LOCK: 080 C
COOL: N  STAY-WARM: N
======================================
```

The green light on the printer shows power supply. The red light shows low paper level. Replacement paper rolls and ribbons are available. The printer will output a record of the cycle parameters and readings for you to keep with your load.

If your autoclave is not fitted with a printer then this parameter will not be shown. The printer is available as a retrofittable part.

Peripherals - RS232

The parameters of the cycle are output through the RS232 port located on the back of the autoclave. This data can be captured using any standard data capture software.

The technical details of this data are as follows:

9600 baud 8 bit 1 stop no parity.

Data is output every second and comprises of sets of hex digits in one continuous ASCII stream. There are no separators between the bytes. Each line is terminated by a carriage return. The data string is comprised of the following fields in the following order:

MODE - DRIVE - PWM_PERIOD - FLAGS - MAIN - LOAD - PRESSURE - REQUIRED_TEMP

The data bytes represent the following:

MODE - 2 Digits
This is the current machine operating mode as follows:
00 Off
10 Power up mode (stays here until a key is pressed)
01 Standby mode
02 Program setup mode
03 Freesteam
04 Heating - pre freesteam
A4 Heating - post freesteam
05 Sterilising
A5 Heating - post freesteam (waiting for load to level out with chamber)
06 Cooling
07 Staywarm
08 Cycle complete
09 Lockout
FF Shut down (the only way out is power off)

DRIVE - 2 Digits
Each bit represents a control output defined as follows, the bit will be a 1 if the output is on:
Bit 0 Heater
Bit 1 Not used
Bit 2 Cooling fans
Bit 3 Not used
Bit 4 Freesteam valve
Bit 5 Interlock solenoid
Bit 6 Not used
Bit 7 Not used
eg. Heater and freesteam valve on only = 00010001 Binary = 11 Hex

PWM_PERIOD - 2 Digits
This hex value represents the mark/space ratio of the pulse width modulated heater. A value of 00 indicates the heater is fully off and a value of FF indicates the heater is fully on.

5 - Troubleshooting

Problem:
The WATER LOW indicator remains lit even though there is clearly water above the trivet plate.

Solution:
The water level probes work by using the water in the chamber to make a low voltage circuit between the probe and the earthed chamber. They are set up using tap water. To enable the use of deionised water a variable resistor must be adjusted for each probe (see section 8) to adjust the sensitivity of the circuit as deionised water is not as conductive as tap water.

Another reason for the problem can be a build up of scale on the tips of the probes. This insulates the probes from making a circuit through the water. Remove the trivet plate and clean off the tips of the water level probes using a scouring pad. They are the two identical white sheathed probes at the back of the chamber.

Problem:
The cycle fails with a WATER LOW FAILURE but the WATER LOW indicator does not light up.

Solution:
This indicates that the lower water level probe is not making a circuit but the upper probe is. It is the lower probes output that causes the WATER LOW FAILURE and the upper probes output that causes the WATER LOW indicator to light. Clean the tips of the water level probes as described above.

Description:
This error means that there was a power failure during the cycle.

Action:
Run the cycle again.

```
=======================================
CYCLE: 00:03:00 @ 134 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! LOAD PROBE FAILURE !!
!! CYCLE FAILURE - LOAD NOT STERILE !!
=======================================
```

Description:
This error means that the load probe has failed.

Action:
Consult an engineer to replace the load probe.

```
=======================================
CYCLE: 00:03:00 @ 134 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! CHAMBER PROBE FAILURE !!
!! CYCLE FAILURE - LOAD NOT STERILE !!
=======================================
```

Description:
This error means that the chamber probe has failed.

Action:
Consult an engineer to replace the chamber probe.

```
=======================================
CYCLE: 00:03:00 @ 134 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! PRESSURE TRANS FAILURE !!
!! CYCLE FAILURE - LOAD NOT STERILE !!
=======================================
```

Description:
This error means that the pressure transmitter has failed.

Action:
Consult an engineer to replace the pressure transmitter.

FLAGS - 2 Digits
These indicate the current status of certain software functions that do not directly relate to an output signal. Each bit if the hex value represents a function as follows:
Bit 0 Set when PWM is running
Bit 1 Set when a cycle is compete
Bit 2 No useful display function
Bit 3 Low water
Bit 4 Door open
Bit 5 Door locked
Bit 6 Emergency stop first press
Bit 7 Lock flag set when unit locks out for any reason

MAIN - 4 Digits
This is the chamber temperature in hex. The value represents the temperature in tenths of a degree centigrade.

LOAD - 4 Digits
This is the load temperature in hex. The value represents the temperature in tenths of a degree centigrade.

PRESSURE - 4 Digits
Binary coded decimal value for the chamber pressure. The first byte is either 1 or 0 where a 1 represents a negative pressure. The next byte is the units of pressure in bar and the next two the tenths and hundredths.

REQUIRED_TEMP - 2 Digits
This is an internally calculated value used by the control system output in hex. The value represents the temperature in tenths of a degree centigrade.

4 - Error Messages

The controller will monitor and diagnose any faults that may occur. These will be reported on screen and on the printout (if a printer is fitted and output is turned on) if appropriate. The error messages and their meanings are as follows:

```
========================================
PROGRAM: INSTRUMENTS/GLASSWARE 01
           CANNOT START CYCLE
      THE DOOR IS OPEN OR UNLOCKED

========================================
```

Description:
This error occurs if you attempt to start a cycle with the door still open or not fully closed so that the interlock bolt has not sprung into position.

Action:
Close door and press the START button again.

```
========================================
PROGRAM: INSTRUMENTS/GLASSWARE 01
           CANNOT START CYCLE
         THE WATER LEVEL IS LOW
   UNLOCK THEN OPEN DOOR AND ADD WATER
========================================
```

Description:
This error occurs if you attempt to start a cycle without enough water in the chamber.

Action:
Press the UNLOCK button. Open the door and fill the chamber with water until the until the LOW WATER indicator goes out. There is a second indicator located below the chamber lid when the lid is opened. Close the door and press the START button again.

```
========================================
CYCLE: 00:15:00 @ 121 C
         CANNOT UNLOCK THE DOOR
          CYCLE IS IN PROGRESS

========================================
```

Description:
This error occurs if you attempt to unlock the door while a cycle is in progress.

Action:
Before the door can be opened the cycle must be stopped. For further details see the 'Stopping A Cycle' section.

```
========================================
CYCLE: 00:15:00 @ 121 C
         CANNOT UNLOCK THE DOOR
       TEMPERATURE AND/OR PRESSURE
     ARE ABOVE INTERLOCK PARAMETERS
========================================
```

Description:
This error occurs if you attempt to unlock the door while the temperature or pressure are above the interlock parameters.

Action:
Before the door can be opened the temperature and pressure must fall below the interlock parameters. The temperature interlock setting is one of the program parameters and the pressure interlock parameter is hard set at 0.1 bar. Wait until the temperature and pressure have dropped and press the UNLOCK button again.

```
========================================
PROGRAM: FLUIDS/MEDIA 02
        CANNOT CHANGE PARAMETERS
       PRESET PROGRAMS ARE LOCKED

========================================
```

Description:
This error occurs if you attempt to modify a preset program.

Action:
Before a preset programs parameters can be modified the preset programs must be unlocked. For instructions on unlocking the preset programs please see the Engineers Manual.

```
========================================
CYCLE: 00:15:00 @ 121 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! UNDER TEMPERATURE FAILURE !!
!! CYCLE FAILURE - LOAD NOT STERILE !!
========================================
```

Description:
This error means that the load has fallen below the required temperature during the cycle. It is most likely that an air pocket has been trapped in the load.

Action:
Run the cycle again. If the problem persists consult an engineer.

```
========================================
CYCLE: 00:03:00 @ 134 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! WATER LOW FAILURE !!
!! CYCLE FAILURE - LOAD NOT STERILE !!
========================================
```

Description:
This error means that the water level has dropped below the minimum allowable level during the cycle and placed the autoclave in danger of boiling dry.

Action:
Refil the autoclave with water and run the cycle again. If the problem persists consult an engineer.

```
========================================
CYCLE: 00:03:00 @ 134 C
CHAMBER: 076.8 C  LOAD: 079.1 C
STATUS: !! POWER FAILURE !!
!! CYCLE FAILURE - LOAD NOT STERILE !!
========================================
```