Dual Hotplate Oven

User Manual

1 Operation

2 Mechanical

3 Electrical

Appendix

1:1 Safety Instructions and Warnings

Operating and maintenance personnel

The operating and maintenance personnel are those people responsible for the transport, assembly, installation, operation, setting up, maintenance and cleaning of the device as well as for troubleshooting.

The device may only be operated by trained and authorised personnel.

The different responsibilities in the operation of the device must be clearly defined and observed so that no confusion with respect to responsibilities arises, thus endangering safety.

Whenever any work (operation, maintenance, repair, etc.) is carried out, the shut-down procedure specified in this operating manual must be followed.

The cleaning, maintenance and repair work described in this operating manual is explained in such a way that it can be understood by qualified technicians with training in: - Electrical engineering/electronics - Mechanical engineering/cleaning and maintenance These technicians are to be equipped with the proper tools and test materials. 13 Edition 8/98

The operator may not apply any working methods that impair the safety of the device.

The operator must immediately report any changes in the device that impair safety to the responsible executive.

The device may only be operated when it is in perfect working order.

Shut-down procedure for maintenance and repair of the any components must be observed at all times

Allow the shelves to cool before touching
Do not vent the chamber when Hot

The system is connected to a 400v 3ph supply. Isolate before opening the electrical enclosure

High voltage

1:2 Quick start guide

DO

Connect to a 3ph+N+E electrical supply with a 16A breaker
Connect to a clean filtered compressed air supply 5-8 bar
Connect to a Nitrogen supply 1-2bar
Connect the earth to the factory earth bond
Connect the pump exhaust to a vent outside the building
Adjust the gas pressure regulator to 5 psi
Lock the wheels before use
Allow at least 30cm clear space behind the system to ensure adequate air flow
Clean the main o ring and face before closing the chamber door
Wipe the inside of the chamber with IPA when cool
Use the up/ down Eurotherm keys to change the screen
Always wear gloves when working inside the oven
Run the system in auto, its all pre-programmed

Do Not

Move the system when its running
Open the door unless the temperature is below 200 deg C
Wipe with solvent when the shelves are warm
Operate with the outer covers removed
Cover the cabinet exhaust fans
Alter the regulated gas pressure without checking the purge valve setting
Alter the vacuum gauge set points without checking first
Use grease or oil anywhere in or on this oven

If in doubt about any aspect regarding the operation or maintenance of this equipment please contact

Wordentec Ltd

Telephone : 01409 281 853
Email : info@wordentec.com

1:3 System Specification

1:4 Installation

Location

This system should be installed in a clean, dry environment with adequate room for safe, efficient operation. Please refer to the safety instructions for specific guidance. This machine is heavy (250kgs) and top heavy!, please ensure the floor is level and capable of bearing this weight before installation. After locating the machine Lock the wheels with the integrated brake mechanism.

Electrical

The main Power inlet cable is a 2.5mm2, HO7RNF industrial 5 core cable, supplied with a 16A 5 pin industrial plug. The Cable must be connected to a 380 - 415v 3 phase + neutral + earth 16A per phase dedicated isolator backed by a type D breaker *high inrush.* This Isolator should be within easy reach of the system and visible to an engineer carrying out any service work. Where this is not possible the isolator must have the facility to be locked in the off position.
We recommend that a substantial (10 mm2), low inductance, ground strap (independent of supply PE) is connected to the system earth bolt located in the system frame.
Note: *This machine is fitted with line power filters that have an inherent earth leakage current characteristic. This can cause problems if supply circuits are RCD protected.*

Compressed air

The compressed air inlet is located at the rear facing lower edge of the electrical cabinet. This 6mm bulkhead will accept either 6mm or (with adaptor) 8mm flexible or rigid pipe. Air supply should be 6-8 bar with an in-line filter regulator.

Nitrogen Supply

The system should be supplied with nitrogen gas at low pressure (1-2 bar) for purging and chamber vent gas. The chamber vent connection is directly to the Vent Valve

Rotary Pump Exhaust

The rotary pump exhaust must be connected to the kf40 exhaust connection of the ACP40 pump

1:5 Controls

Main Isolator and Emergency Stop

The main isolator is located at the side of the system control panel.

Before switching on please ensure the system is connected in accordance with the instructions in the previous chapter

When the switch is turned in a clockwise direction on the system will start. There is a short delay as the vacuum gauge and Nanodac process controller perform a self test.

Press the green reset button at the front of the system to reset the safety system after a power off. A successful reset will result in the green reset lamp being lit. The system will be fully operational after approximately 30 seconds

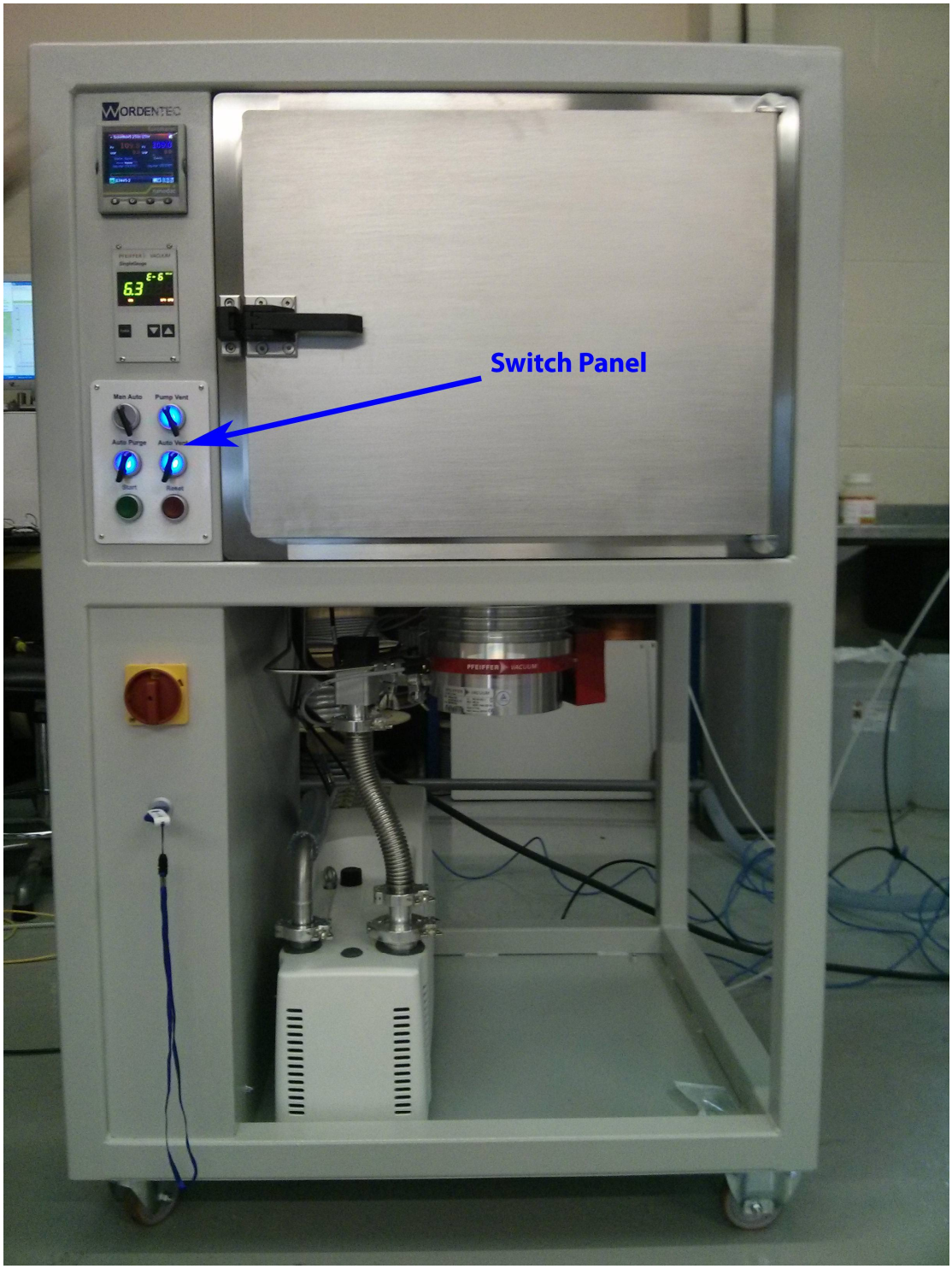
To switch the system off please vent the chamber before turning the isolator to the off position. This is to protect the seals within the turbomolecular pump.

If the isolator is switched off at high vacuum the turbo will use its own regenerative power to control the turbo slow down. When the power is restored we suggest that the chamber is vented.

In an emergency the Main isolator can be used to safely isolate the machine and stop the Oven

Switch Panel

The main system control is via Switch panel located at the front of the system
The panel has 4 dual position switches and 2 push buttons



Switch Panel

1) Manual / Auto

When this switch is pointing toward the manual position the adjacent switch (2) is enabled allowing the operator to manually pump and vent the chamber. In this position the process start push button is disabled.

When pointing toward the auto position the blue lamp inside the switch will illuminate and the adjacent pump / vent switch is disabled.
When the system is set to auto the green process start button will illuminate indicating the system is in automatic mode and ready to run a process
The action of switching from auto to manual will instantly abort the Process, the Nanodac controller will reset and the pumps will revert to the condition set at switch (2)

2) Pump / Vent

This switch is enabled when switch (1) is in the manual position. If the chamber door is closed when this switch is set to pump the system will commence its pump down sequence. The blue lamp inside the switch will flash on and off until the pumping system is at high vacuum and the turbo controller is at normal operation. At this point the lamp will stop flashing and remain on constantly

When switched to the vent position the vent sequence will start. The vent sequence has a long pause at the beginning to allow the turbo pump to slow down to 60% of its normal operating speed. During this wait period the valve will close , the pumps will switch off and the blue lamp will flash on and off to indicate the system is in waiting to vent mode. (*This can be cancelled at any time by switching back to pump*)
At the end of the wait time the lamp will stop flashing and the system will vent to atmospheric pressure so that the door can be opened

3) Auto Purge if fitted (when *not fitted the usb interface is in this location*)

When switch (3) is turned clockwise and the blue lamp inside is illuminated the system will perform a purge sequence as part of the outgassing process.

Approximately 45minutes after the start of the process the first auto purge will start. Nitrogen will bleed into the system until the chamber pressure is above the second pressure setpoint (SP2) The valve will close and the pressure will recover. This sequence will repeat 5 times and before continuing with the programmed heat profile.

The entire sequence will repeat once more at the end of the process.

When this switch is fully anticlockwise (lamp off) the auto purge feature is ignored

4) Auto Vent

When switch (4) is turned clockwise and the blue lamp inside is illuminated the system will automatically perform the vent sequence as part of the process.

When this switch is fully anticlockwise (lamp off) the auto vent feature is disabled and at the end of the process the system will remain at high vacuum with the pumps running.

5) Start

When the system is in auto mode the process start button is enabled .The green start button lamp will illuminate. Pressing the button will start the process defined in the nanodac controller. A process can be started at atmospheric pressure or from high vacuum. The system will perform the pump down procedure as necessary. Whilst in process the green lamp will flash. When the process is complete the lamp will reset to on

6) Reset

When in Error this button will flash as specified below and can be used to reset some faults

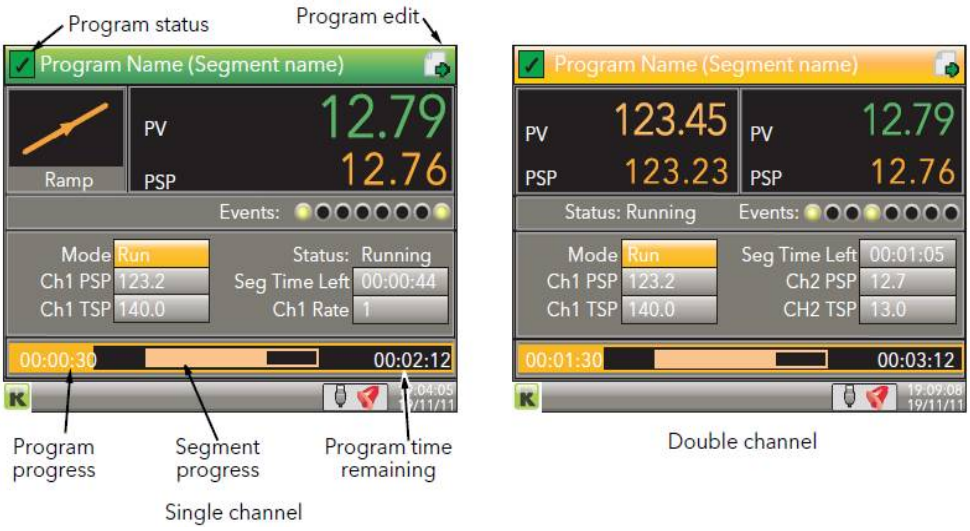
Fault Condition	Ends Process	Light Sequence	To Reset
Low Nitrogen Pressure	No	Blinks 1 time every 5 seconds	Automatic reset on return of pressure
Nanodac Fault / Excessive temperature deviation	Yes	Blinks 2 times every 5 seconds	Rectify fault then press Alarm Reset
Backing Valve Fails to Open	Yes	Flashes 3 times every 5 seconds	Rectify fault then press Alarm Reset
TC400 Fault	Yes	Flashes 4 times every 5 seconds	Rectify fault then press Alarm Reset
Pump-down Fault	Yes	Continuously on	Rectify fault then press Alarm Reset

1:6 Normal Operation

This system is designed to work in automatic mode with either an automatic or manual vent and purge .

With all switches in the automatic position (lights on) and the door closed the oven is ready to run the stored Nanodac heat profile. During the process the run button will flash steadily. At the end of the process the system will vent and be ready to run again.

The nanodac can store an almost unlimited number of process, please ensure you have selected the correct process before starting the cycle. Use the up / down arrow keys of the nanodac controller to scroll to the process page to check the correct process has been selected



1:7 System Fine Tuning

The system has been set up with a set of parameters that will suit most applications within its temperature and pressure range.
There are a number of settings that that can be adjusted or tuned to better suit a particular process.
We will deal with the Nanodac process parameters and PID settings later in this manual. This section deals with the vacuum system and process automation.

1:7:1 Pressure Setpoints

The system uses two pressure setpoints that are defined in the TPG vacuum gauge controller.
These setpoint relays can be set for any pressure level within the scope of the gauge connected.
Some caution should be used if altering the settings of this instrument as the process will not proceed without vacuum gauge input.
The setpoints configured here are not the start process setpoint. This is configured in the nanodac controller.

SP1:

This is set to a high pressure level and its function is to enable the heating contactor when the pressure falls below a defined pressure ensuring that heating is always disabled when the chamber is at atmospheric pressure.
There is an indicator on the front panel of the controller for the status of the setpoint relay SP1

There are two settings to configure, a falling set point and a rising setpoint
SP1 –L: defines when the setpoint is reached as the chamber pressure is falling
SP1-H : defines when the setpoint relay will turn off as the pressure rises

The default settings are
SP1-L -------- 5.0E-01
SP1-H---------9.0E-01

SP2:
This is set to a low pressure level and its function is to provide a start pressure signal to the process
When the pressure falls below a defined pressure the setpoint relay switches on
There is an indicator on the front panel of the controller for the status of the setpoint relay SP2

There are two settings to configure, a falling set point and a rising setpoint
SP1 –L: defines when the setpoint is reached as the chamber pressure is falling
SP1-H : defines when the setpoint relay will turn off as the pressure rises

The default settings are
SP1-L -------- 5.0E-05
SP1-H---------5.0E-03

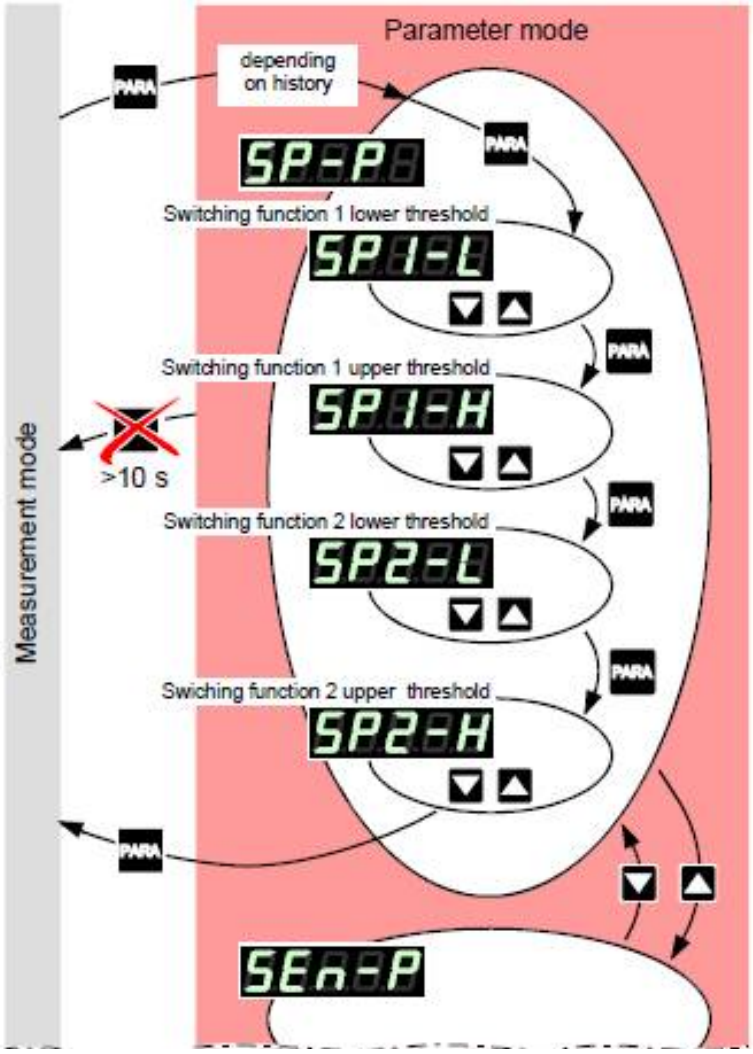
Please note that setting SP2 too high may stall the turbopump and stop the process .We suggest a pressure no higher than 2.5E-02 is used.

How to set the pressure setpoints

TPG 261

Switching Function Parameters

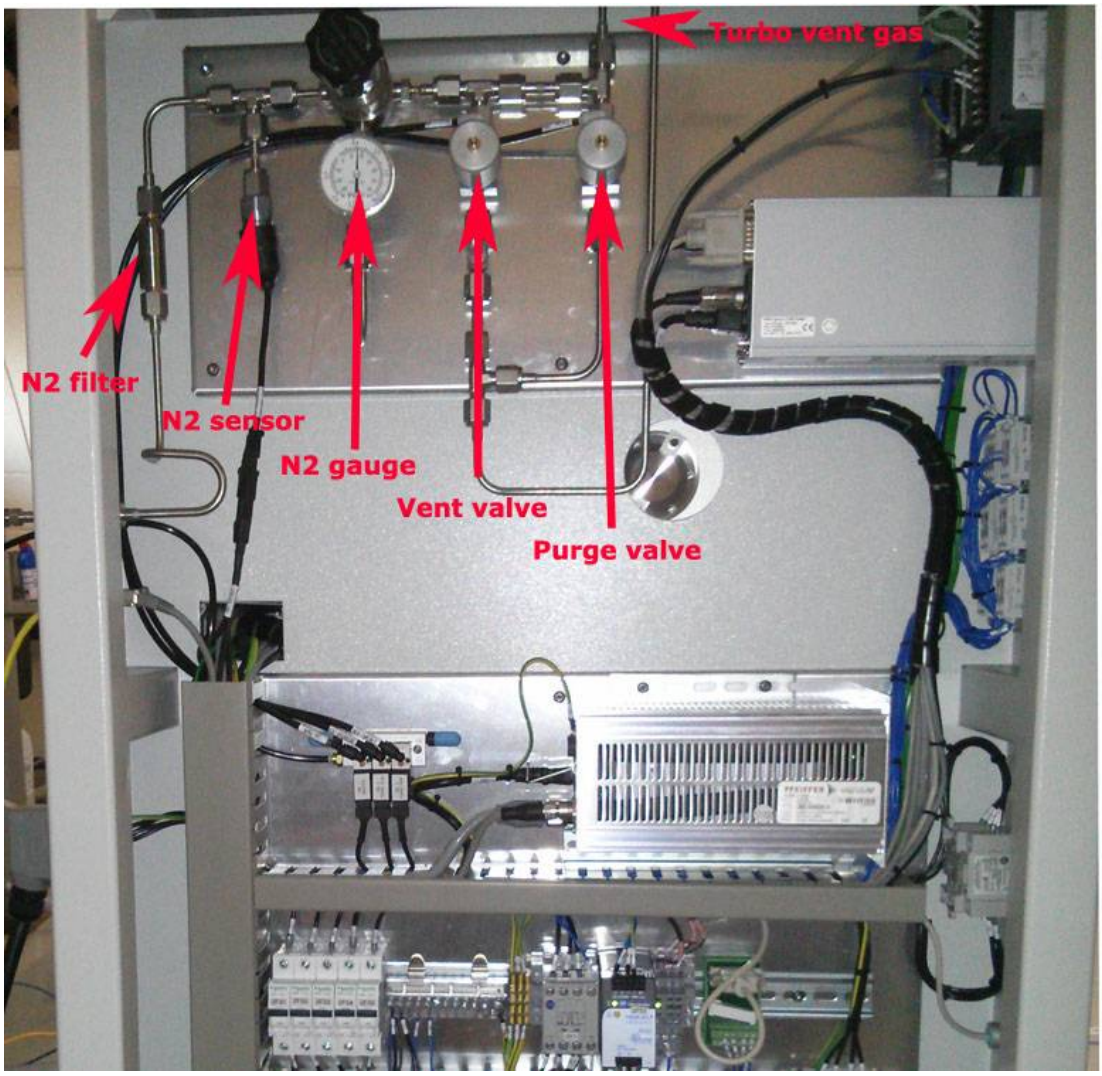
The switching function parameter group (setpoint parameters) is used for displaying, entering and editing threshold values of the two switching functions.



1:7:2 Vent pressure

The system is connected to a high pressure nitrogen supply. This supply is monitored and distributed to the nitrogen gas inlets.

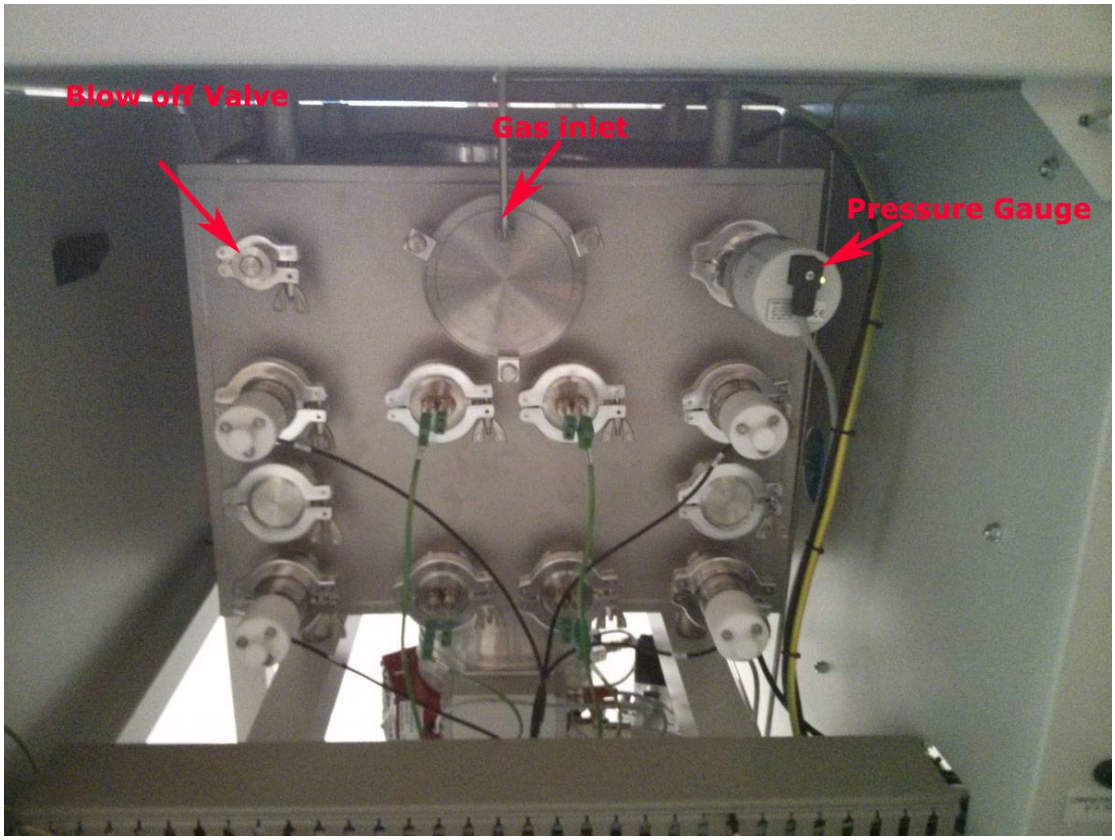
1) Turbopump vent gas
2) Chamber vent gas
3) Chamber purge gas (cleaning cycle)



The gas must be regulated down to approximately 5psi. to ensure the system vents correctly with a slight overpressure.
Adjust the pressure carefully using the regulator the pressure is displayed on the gauge
Once set it is important that the purge gas flow is checked to ensure the gas inrush doesn't stall the turbopump and that the gas flow is sufficient to satisfy pressure setpoint SP2

The system is protected from a chamber overpressure by a blow off valve located at the rear of the chamber,
We suggest that this valve is checked as part of routine maintenance.

If the process is using very high vent pressures for gas assisted cooling we suggest that the overpressure valve is exhausted into the pump exhaust line.



To prevent dangerous levels of nitrogen gas building up in a small room the system is has a maximum vent timer.

The vent valve will close after 15 minutes or when the chamber door has been opened.

1:7:3 Turbopump vent

The turbo must be allowed to slow down before venting or damage may occur

The turbo pump vent valve is controlled by the turbo pump system and should not require any adjustment.

TC400 / DCU. The system is programmed to vent in the following order

1) Wait for the turbo speed to reach 60% of the normal operation speed
2) Pulse the nitrogen purge valve
3) Open the turbo vent valve
4) Open the main chamber vent valve
5) Close vent after 15 minutes or when the chamber door has opened

The exact speed switch point and duration of the turbo pump open and pulse times are adjustable in the turbo pump DCU located in the electrical enclosure

TC400 Parameters

Number	Designation	Value	Function
794	Parameterset	1	Extended parameter set
024	Configuration output DO1	6	Pump on
025	Operation mode backing pump	1	Intermittend mode
046	Configuration Relay 2	15	Pumping station
047	Configuration Relay 3	13	Backing pump
710	Switching off threshold (intermittend)	65w	Backing pump power saving function
711	Switching on threshold (intermittend)	110w	
720	Venting rot. speed at delayed venting	60%	Vent start speed
721	Venting time at delayed venting	300s	Vent duration

1:7:4 Chamber Purge Pressure (option)

If the auto purge switch is enabled the system will carry out a pump / purge routine at the start and end of the process. The default pressure setting for this is set at 5.0E-03 but can be easily adjusted to better suit a different process requirement.

The default purge sequence is

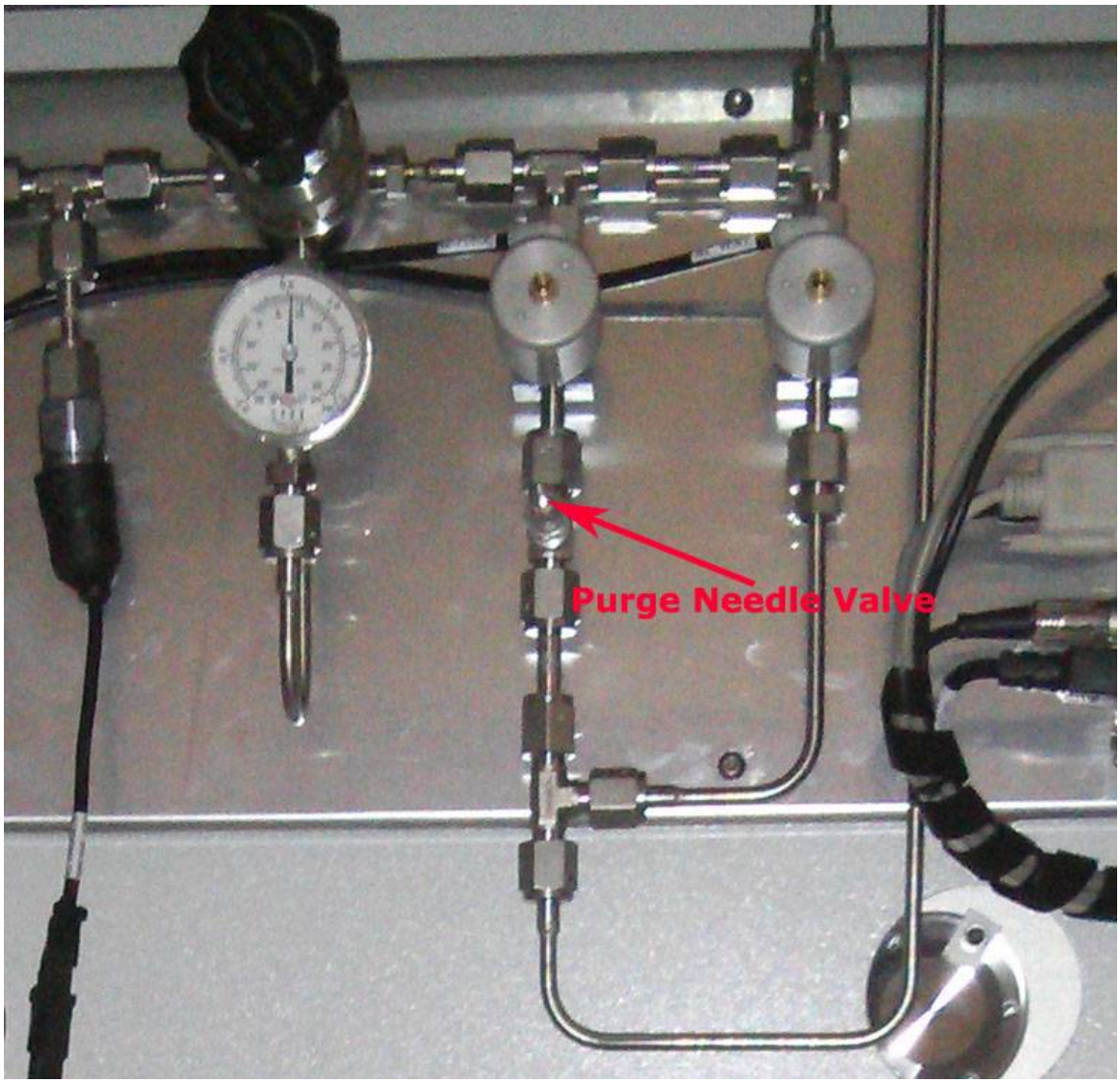
1) Process start
2) Pumping / heating for 45 minutes
3) Wait for the pressure to be <5.0E-05
4) Open the isolation valve and allow the pressure to rise above SP2
5) Close the isolation valve and wait for the chamber pressure to recover
6) Repeat 5 times (or value set at 1:7:5)
7) Continue process until the last heat segment has finished
8) Repeat items (3) to (6)

Adjustment is carried out by opening the purge isolation valve and then carefully opening or closing the purge control needle valve to achieve the desired purge pressure as defined at SP2 of the gauge controller

Using the override switch

1) Set the gauge controller to the new value (SP2)
2) Pump the system down <5.0E-05 (SP2 on)
3) Close the purge needle valve (fully clockwise)
4) Press the override switch to open the isolation valve
5) Wait for the pressure to stabilise
6) Open the purge valve slowly until SP2 switches off
7) Release the override button allow the pressure to recover
8) Test again several times to ensure the pressure setpoint is reached and the turbopump doesn't go into alarm

We suggest that the purge pressure should be between 1.0E-4 and 5.0E-02 to avoid damaging the turbo pump or making the process unreliable



1:7:5 Chamber Purge Cycle Counter

If the auto purge switch is enabled the system will carry out a pump / purge routine 45 minutes into the start and at the end of the process. The default pressure setting for this is set at 5.0E-03 and it is programmed to repeat the cycle 5 times.

The number of times the cycle is repeated can be easily adjusted to better suit a different process requirement.

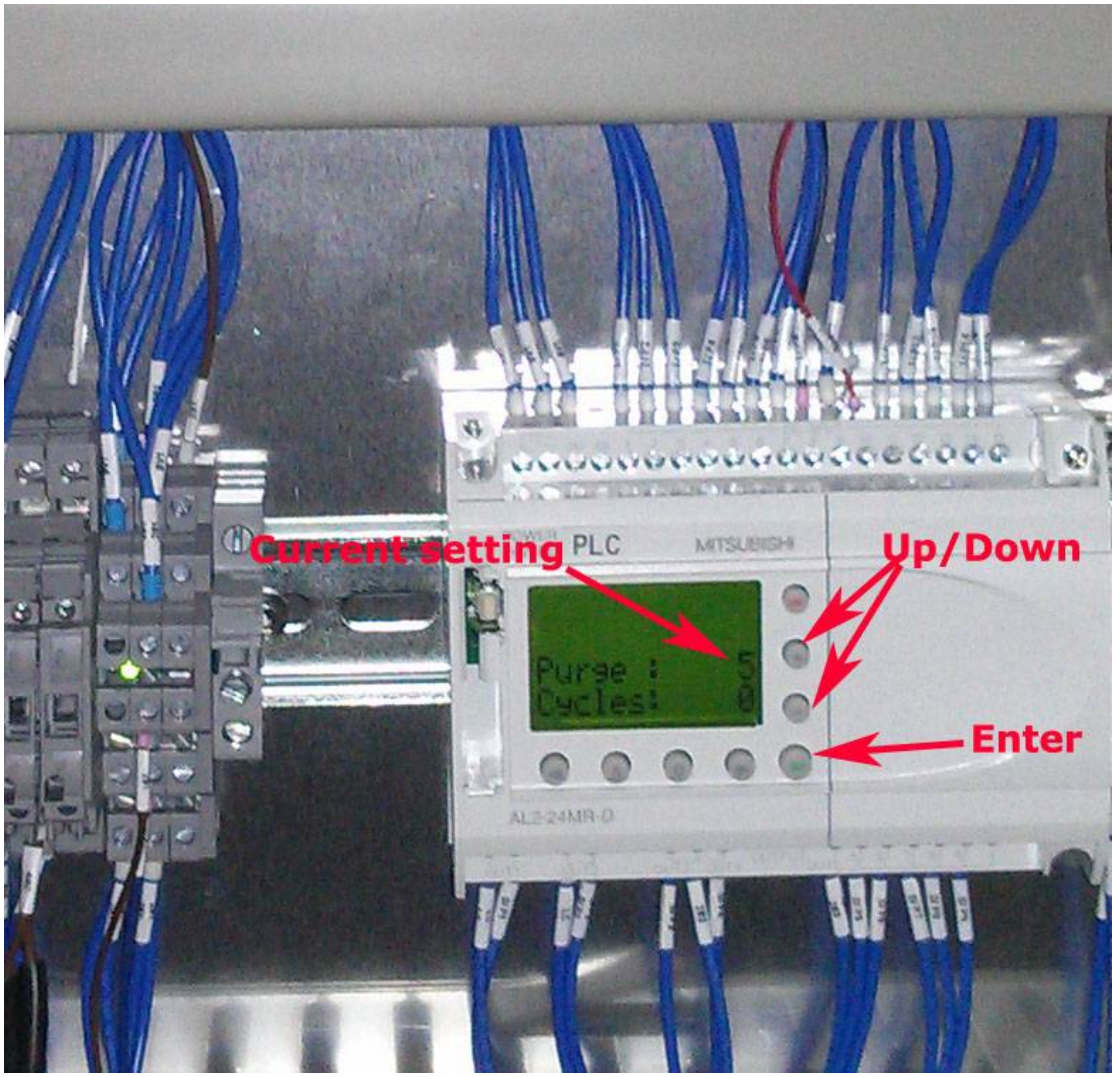
The adjustment is made using the front panel switches of the PLC unit located within the electrical enclosure

Procedure

1) Open the electrical enclosure at the side of the system
2) Locate the PLc unit as shown below
3) Use the up / down buttons to select the number of cycles
4) Press the ok button

The system will perform the number of cycles displayed at the start and end of the process.

We suggest that changes should not be made during a process



1:8 Nanodac Controls

Whilst the machine is running the operator can get information about the process by scrolling through the nanodac display screens using the up / down keys.
This has no effect on the process so the operator can choose the screen that shows the most relevant information

The information can be displayed in the form of

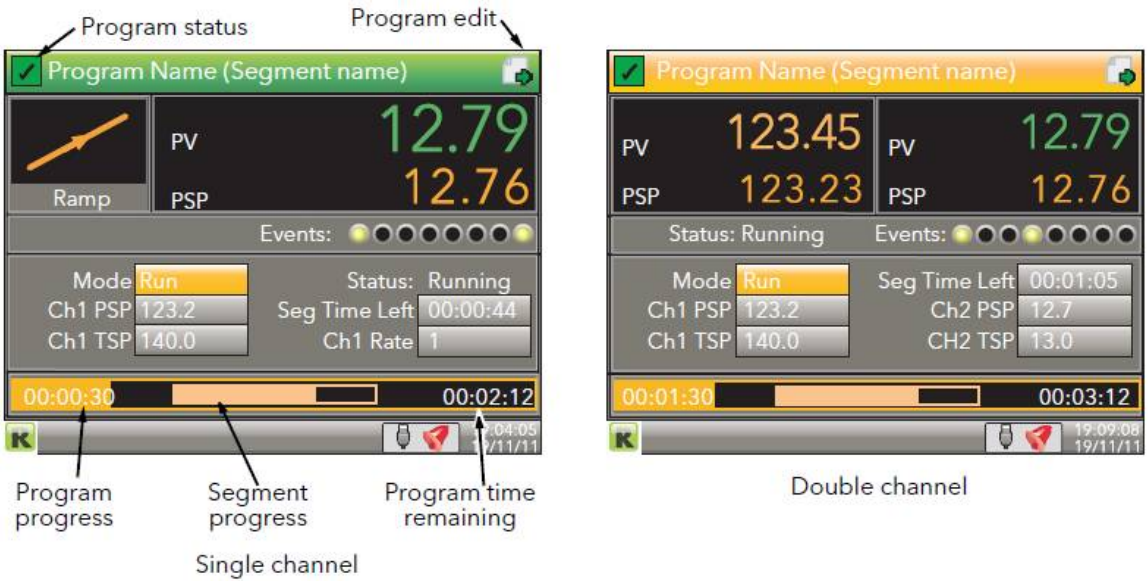
1) Horizontal chart recorder
2) Vertical chart recorder
3) Bar graph
4) Text display
5) Process Screen
6) Program display

The nanodac can be operated and programmed though the front panel buttons however we do not advise using this method.
It is easy to select new processes and make small adjustments but for anything more detailed we suggest that the adjustments are made using the I-tools software

1:8:1 Selecting a Stored Process

Operator Level or higher
The nanodac controller can store up to 25 different processes, further processes can be stored on a USB stick and imported into the controller.
To select a stored process

1. Use the up / down buttons on the nanodac controller to scroll through the screens until the program screen is displayed (below)



2. Press and hold the scroll button for 5 seconds to access the process select screen
3. Use the up / down keys to select the desired process and press the enter button.
4. Use the page button to return to the program screen and check the banner at the top of the program screen shows the correct program name.

1:8:2 USB Archiving

Operator level or higher

1. Plug USB Flash Drive into front USB port (maximum 8Gb)
2. From the Main Menu move to Demand Archiving and select using the Scroll key
3. The Settings Menu should read as follows (apart from the date of the last archive):

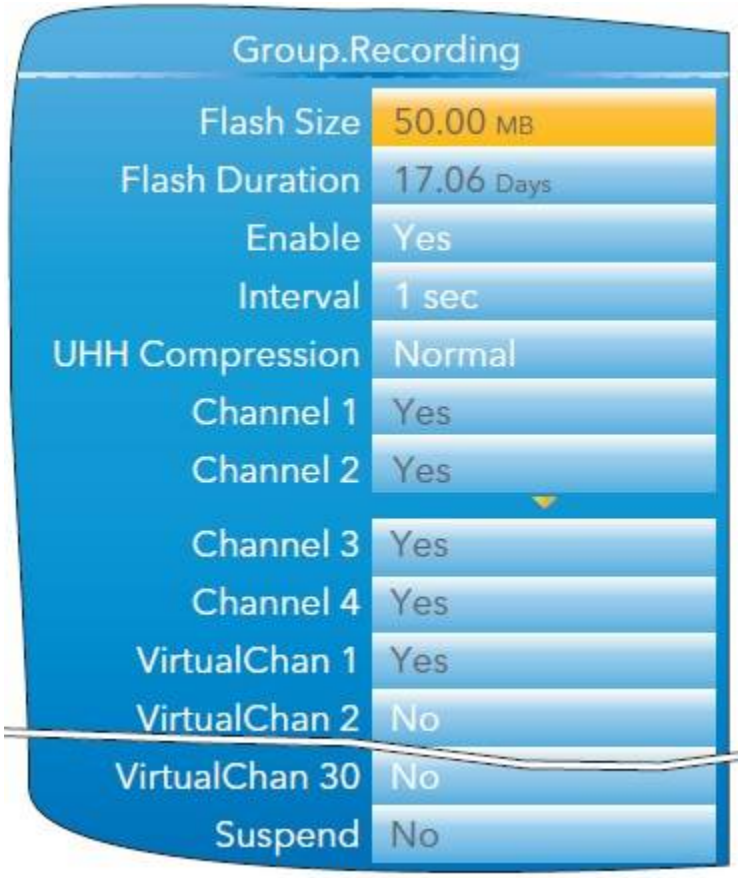
4. Move to Archive and select
5. Select the required time period
6. Wait for the status to change from Transferring to Complete
7. Remove the USB Flash Drive
8. Log out

The Nanodac will archive in CSV and Eurotherm's own format this can be changed in Network.Archiving if required

1:8:3 Data Logging / Settings

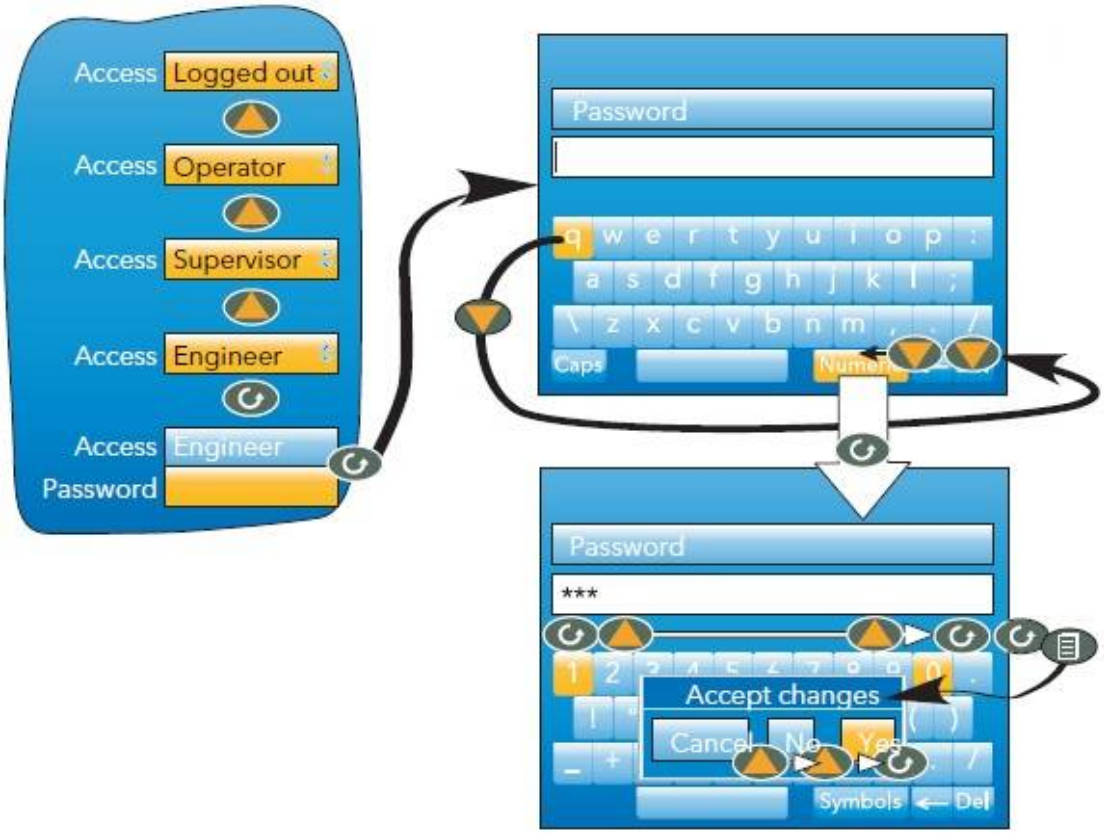
Engineer Level

1. From the main menu move to Configuration, select using the Scroll key
2. Move to and select Group
3. Within Group select Recording
4. In Recording you can then change the Interval using select to confirm
5. Under Flash Duration you will then see the number of days before the any old data is overwritten
6. Once Changed Log out



1:8:4 Logging In

1. From the Main menu move to Log in and select using the Scroll key
2. Move to the required access level and select
3. Select the password field, if not Ignore Steps 4 -5
4. Enter the password and press the menu button to accept
5. Next select one of the choices on screen: Cancel to retry the password,



6. Once finished return to the Main menu to Log out
7. When logged out the main screen is displayed

Passwords

Level	Password
Operator	None Set
Supervisor	None Set
Engineer	16648

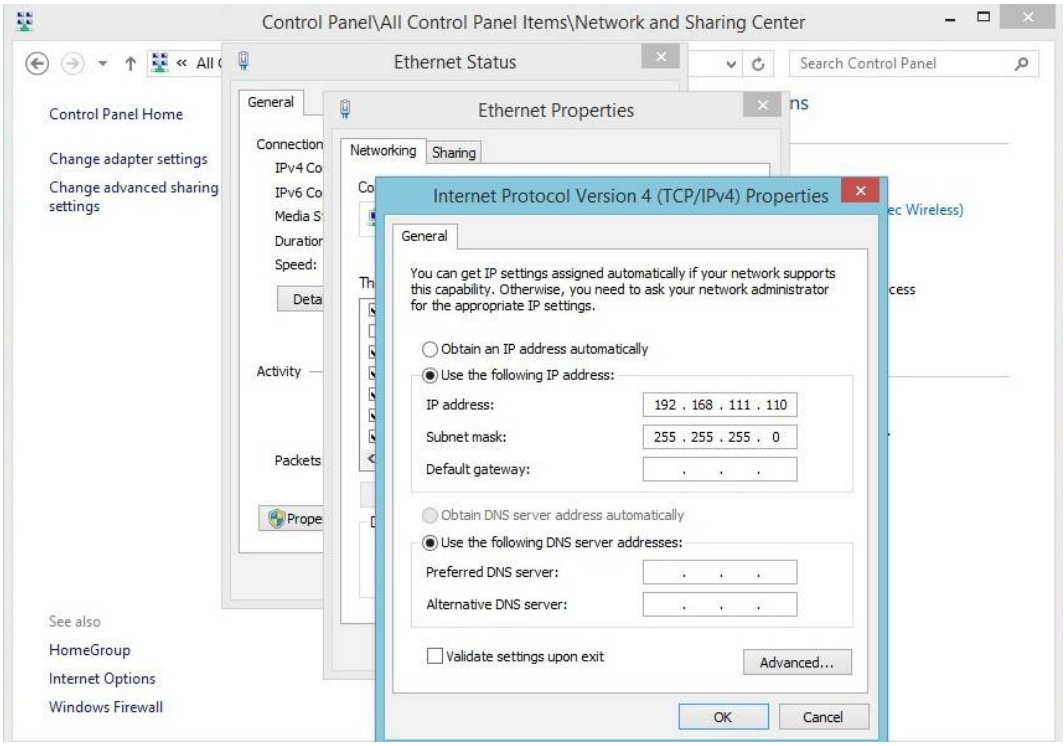
1:8:5 itools Connection Set up

The best way to alter the process set points is to use Eurotherm's iTools software. In the commercial section of this disc there is a copy of iTools. We have also included the original disc in the documentation package.

Connecting to the Nanodac Controller

Ethernet Port

1. Connect the PC and Nanodac with an Ethernet cable
2. Open Control Panel on the PC
3. In Control Panel open the Network and Sharing Center
4. Select Ethernet and then Properties
5. Select Internet Protocol Version 4, then click the Properties button
6. In Properties select “Use the following IP address” and fill in the form as pictured

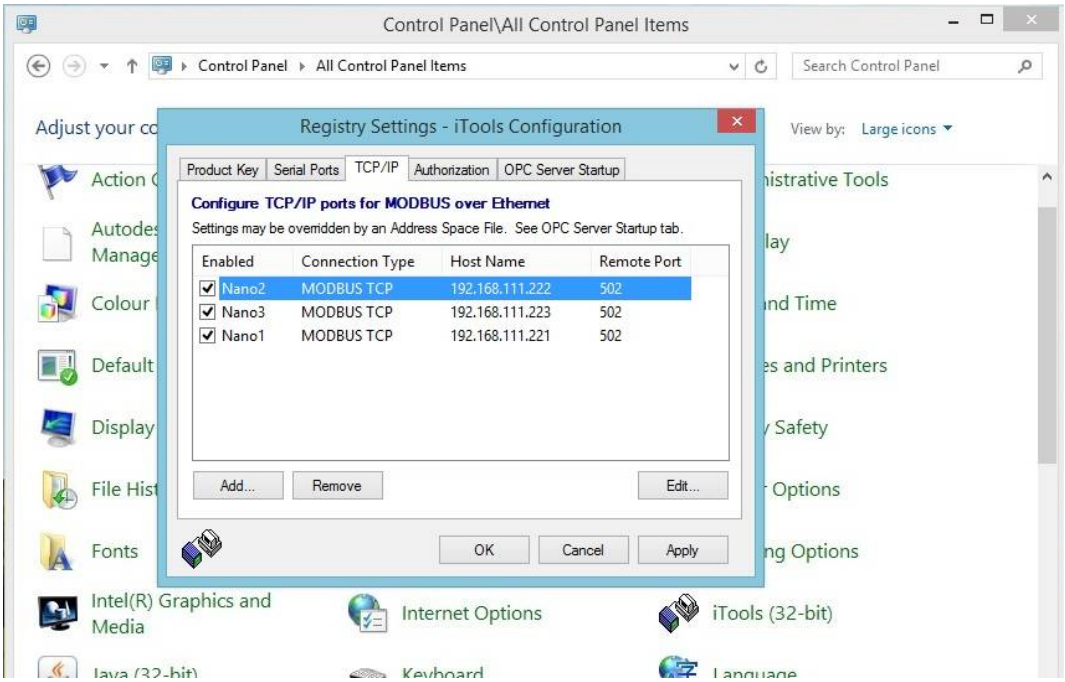


7. Click OK then close all subsequent pages to acknowledge settings
8. Exit Control Panel

If the Ethernet Port is needed for connection to a network at a later date follow these instructions except “ Obtain an IP address automatically” must be selected

iTools Settings

1. Connect the PC and Nanodac with an ethernet cable
2. Open Control Panel on the PC
3. From Control Panel select iTools (32-bit)
4. Under the Serial Ports tab check a COM port is enabled and present
5. Under the TCP / IP tab select add. In the new box enter a name



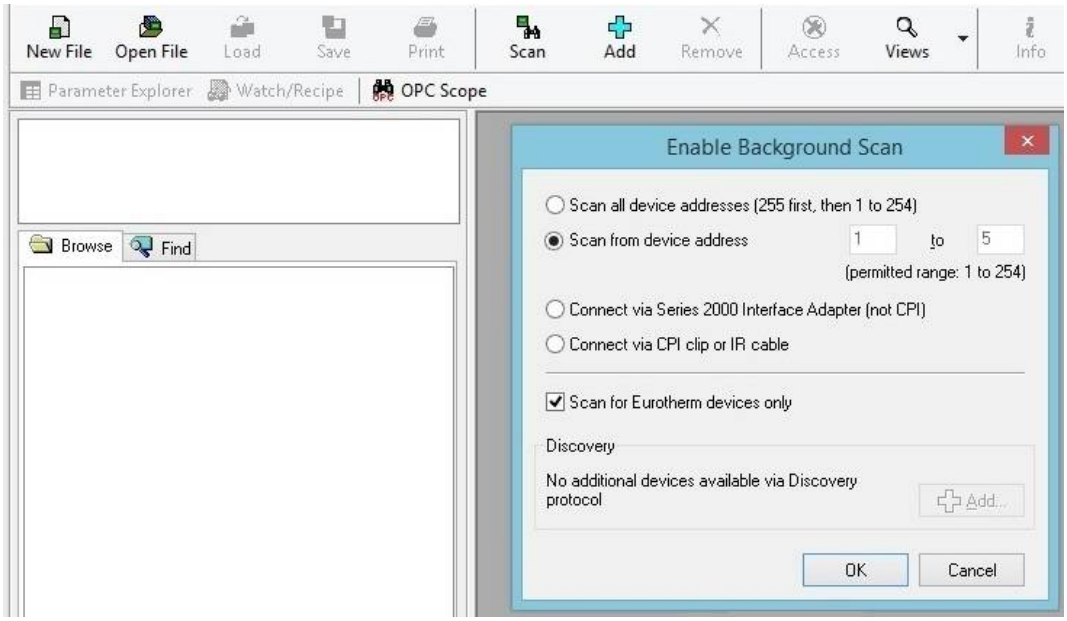
6. In the dialogue box click Add and enter the details for the connection shown
7. Restart Computer

1:8:6 itools Connecting After Set up

Ensure COM port is present and enabled but not plugged in to another device and the Nanodac access level is Logged out.

If connecting with Windows7 or above then you will need to scan all device addresses first, click the scan button to cancel, then scan from device address.

8. Start iTools Engineering Studio
9. Select Scan either using the icon on the toolbar or Device-Enable Background Scan
10. Select Scan from device address



11. Populate with 1 to 5 if not already shown then click OK
12. The device should now be shown I the Panel on the left and in icon form at the bottom of the main window

    Wait for the sync arrows to disappear then it should be ready to program

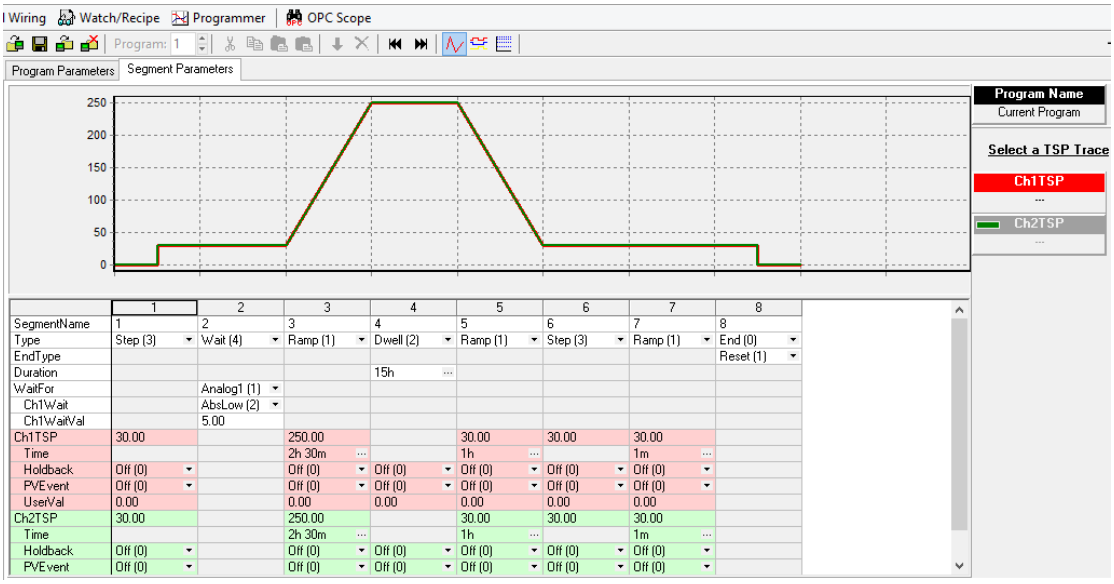
1:8:7 itools Creating or Modifying Programs

Connect to the Nanodac through iTools and wait for it to synchronise with the PC

From the main window select Programmer.

Once the programmer has loaded, the window will look similar to below.

It is now possible to edit the active program. To edit a different program you will need to select load and choose a file from the internal memory or from the PC

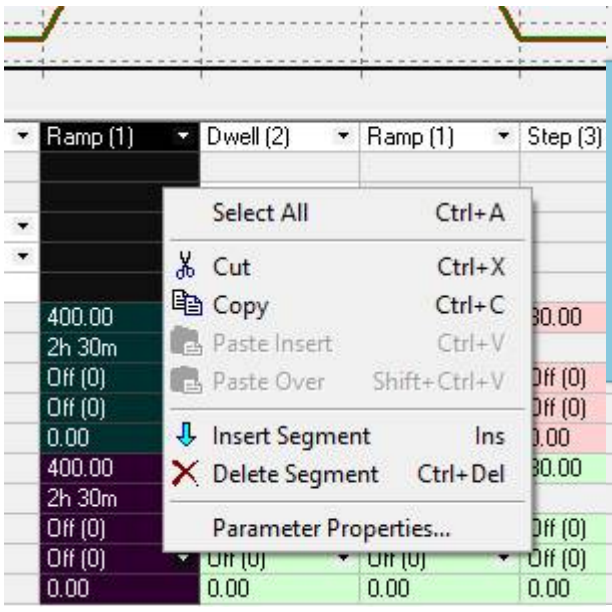


	1	2	3	4	5	6	7	8
SegmentName	1	2	3	4	5	6	7	8
Type	Step (3)	Wait (4)	Ramp (1)	Dwell (2)	Ramp (1)	Step (3)	Ramp (1)	End (0)
EndType								Reset (1)
Duration				15h				
WaitFor		Analog1 (1)						
Ch1Wait		AbsLow (2)						
Ch1WaitVal		5.00						
Ch1TSP	30.00		250.00		30.00	30.00	30.00	
Time			2h 30m		1h		1m	
Holdback	Off (0)		Off (0)	Off (0)	Off (0)	Off (0)	Off (0)	
PVEvent	Off (0)		Off (0)	Off (0)	Off (0)	Off (0)	Off (0)	
UserVal	0.00		0.00	0.00	0.00	0.00	0.00	
Ch2TSP	30.00		250.00		30.00	30.00	30.00	
Time			2h 30m		1h		1m	
Holdback	Off (0)		Off (0)	Off (0)	Off (0)	Off (0)	Off (0)	
PVEvent	Off (0)		Off (0)	Off (0)	Off (0)	Off (0)	Off (0)	

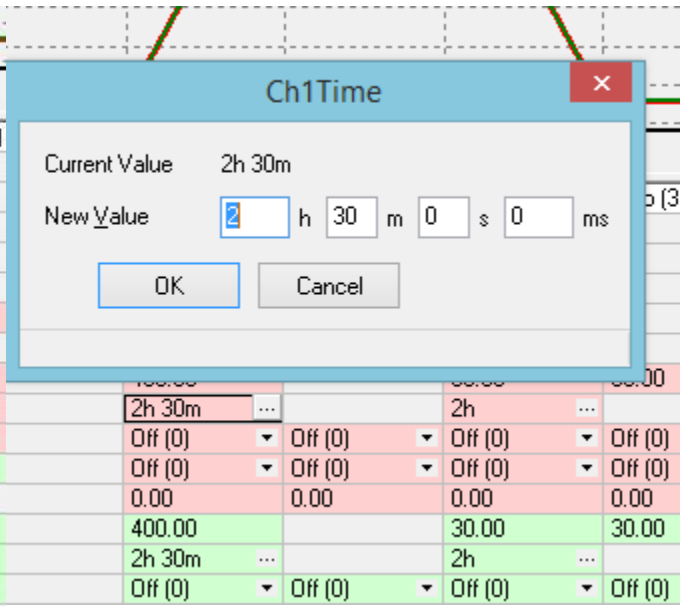
From this screen it's possible to adjust temperatures and ramp rates and also to insert or delete program segments. **It is important that you do not delete segments 1-2 and 6-8 as they are vital to a program working.**

Shown below are the windows to edit ramp duration and the right click menu

If you right click on a segment it's possible to insert a segment after it or to



Right Click Menu



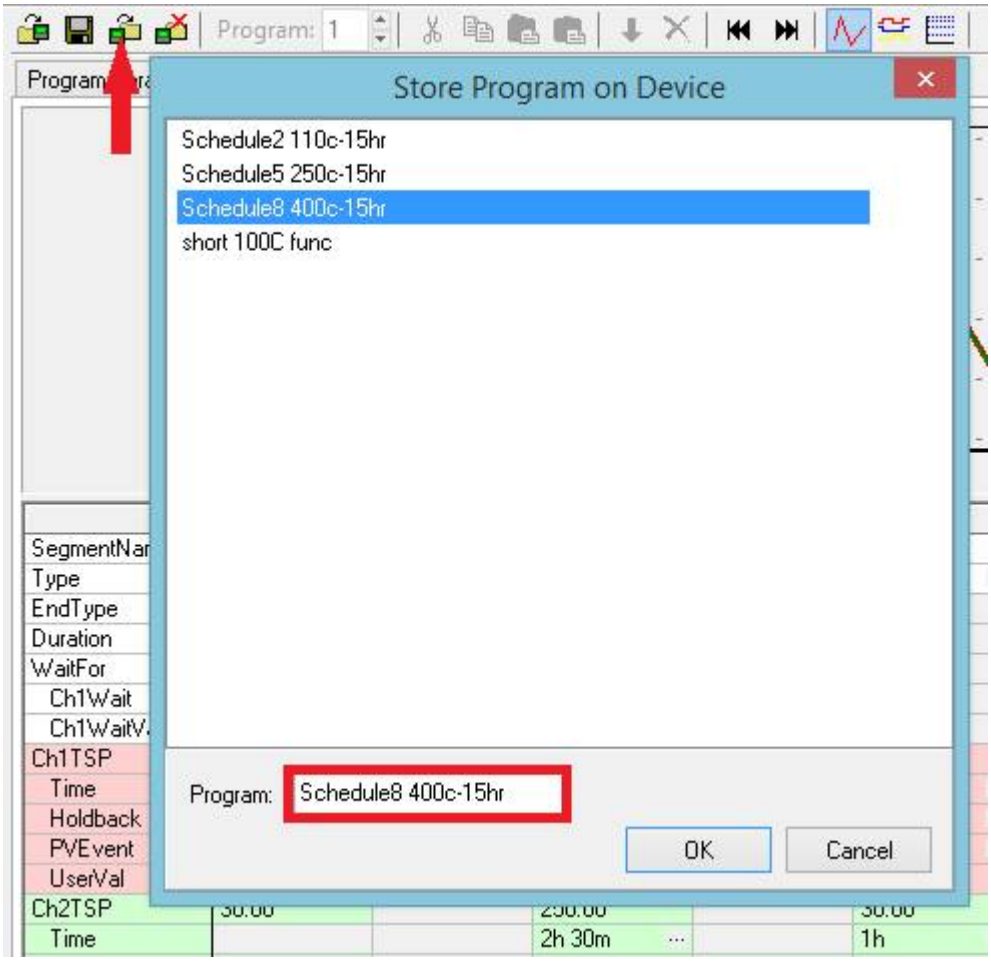
Adjusting Ramp Duration

1:8:9 itools Saving a Program

To save a file to the nanodac after editing you need to click on the " Store current program on device button "(shown with a red arrow).

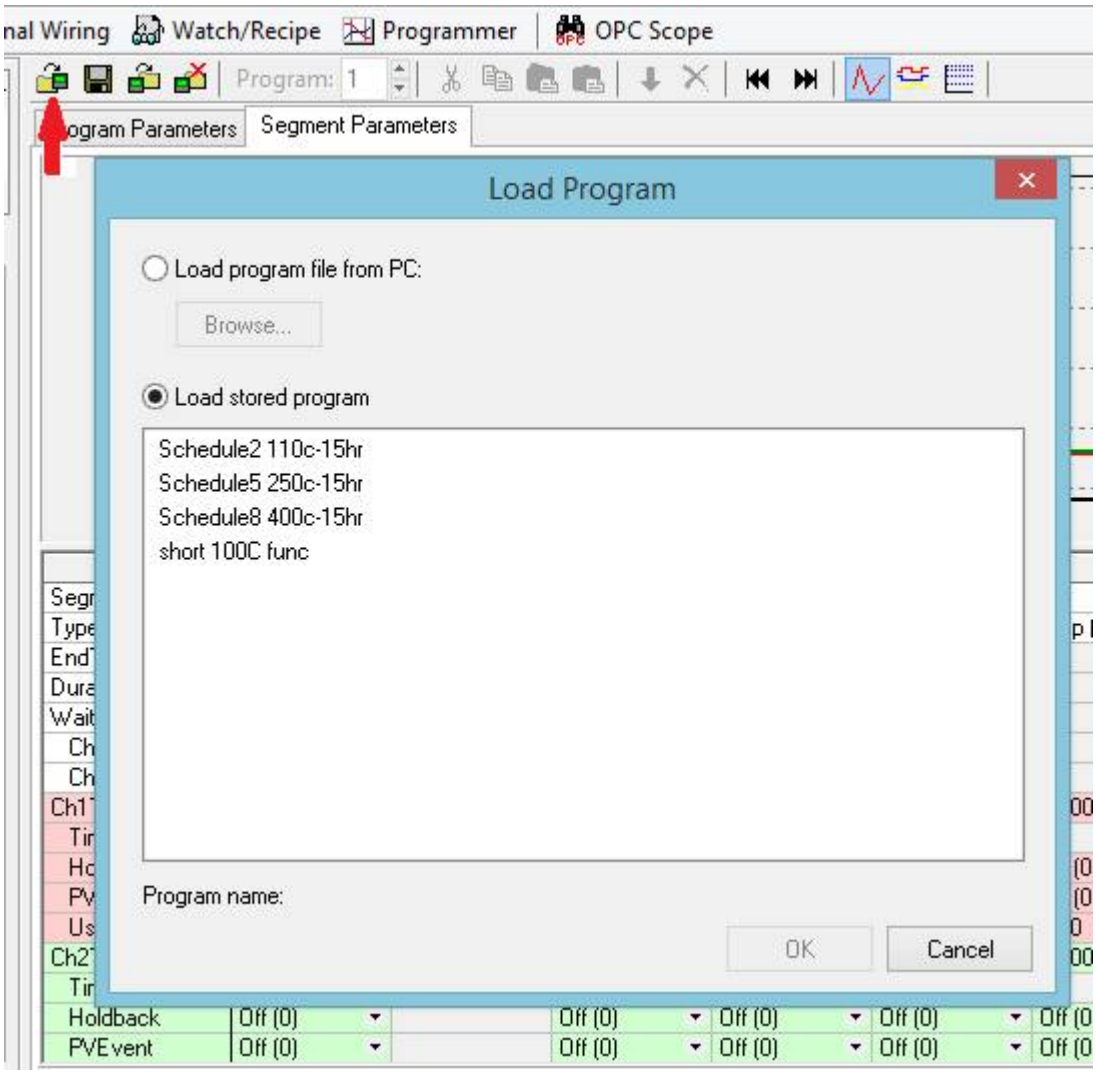
The more conventional save button will save the program as a file on your computer.

Once the save window is shown you can either save the file as one of the programs listed or, alternatively, to save as a different program type a new name in the program box (shown in the red box). Clicking OK will then save the file.



1:8:9 itools Loading an Alternate Program

To load an alternate program to edit, click the" Load program" button arrowed.
Once the load box has opened select one of the programs from the Nanodac, the default option, or choose a file from the PC.
Clicking OK to acknowledge your choice



Please see the nanodac operation manual for more detailed instructions for all aspects of nanodac operation and programming.

1:9 Recovery

The system controllers are individually configured at the factory and a full set of backup files are supplied with this documentation.

These files will restore configuration in the event of a controller change or other disaster. It will also restore the factory default processes.

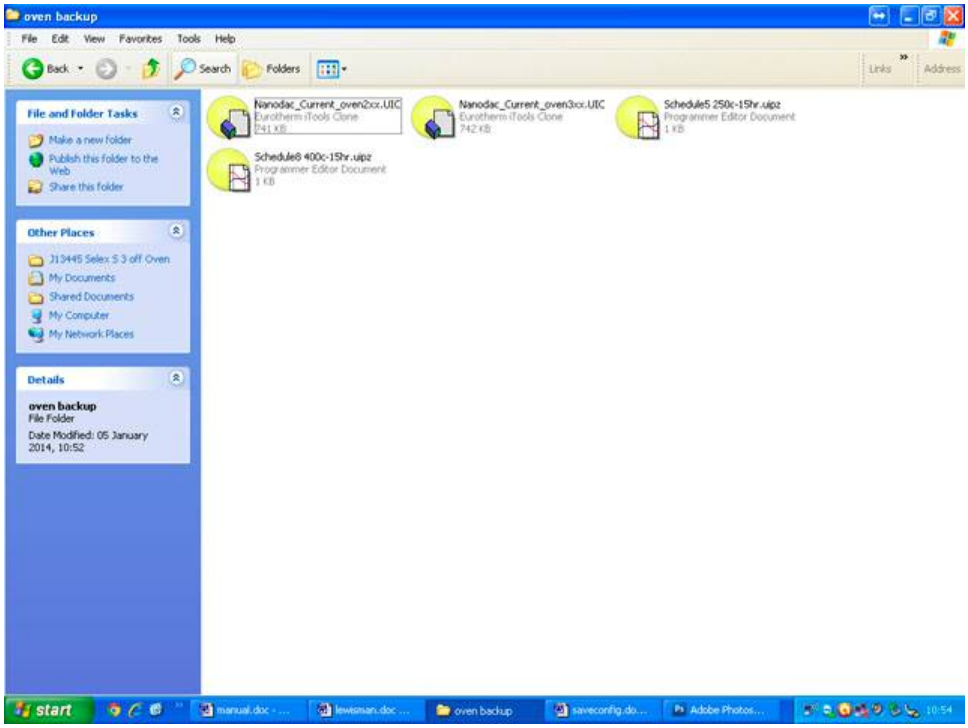
We suggest that any new processes created or modified are stored on the usb, network or local pc so that they can easily be transferred into the replacement controller.

This is an easy operation within I-tools, just save the modified process using the save button within the program editor (*see the previous chapter or the nanodac manual*). This will save that individual process in "*.upiz" format within the specified directory on the PC.

The process can also easily be transferred to a USB stick as described in the previous I-tools section of this manual or there is a more detailed explanation in the nanodac manual.

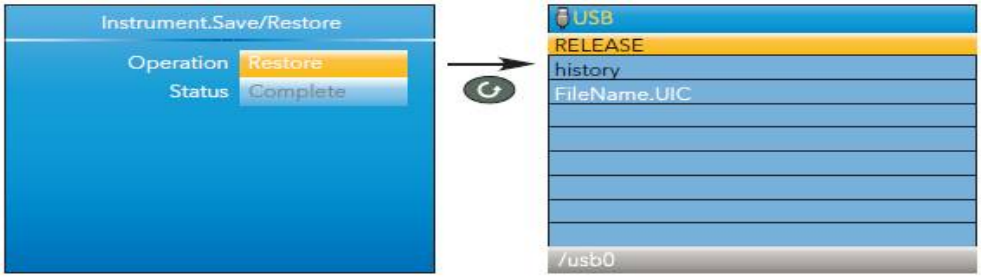
If changes to the configuration file have been made we suggest a complete clone file is created within I-tools and a record of this change is made . A configuration file (*.UIC) will contain all of the information stored in the controller including processes, data log, pid info etc.

The clone file does not alter the network configuration if the backup is carried out via the LAN port.



1:9:1 Restore the nanodac configuration via USB

This allows the user to save and / or restore instrument clone configurations to a memory stick inserted into the USB connector at the rear of the unit. The format of the saved / restored files is iTools clone files (*.uic)
Selecting 'Restore' presents a list of clone files in the configured directory on the USB device. In the example below, the file is located in the basic usb0 directory - it has not been saved to a particular configuration directory.
When 'Save' is selected, the virtual keyboard must be used to enter the filename. If the file already exists on the USB device, a warning appears offering 'Cancel' or 'Overwrite' alternatives.
Notes:
1. The ability to save and restore is disabled if OEM security is enabled.
2. Configuration save / restore is available only when the unit is logged into at 'Engineer' access level. Code 13445
3. During USB cloning (USB save / restore), the priority of modbus slave comms is lowered. This allows
the save / restore process to complete in a minimal time (around 60 seconds). During this period,
modbus slave comms response times will be extended and may result in the master device timing-out.



Save/Restore display
Operation Select 'Save' or 'Restore'. Use the up / down arrow keys to highlight the required .UIC file, then use the scroll key to initiate the operation.
Status Shows the status of the operation, as follows:
Inactive: Neither saving or restoring a clone file has occurred since the last time the instrument was power cycled.
Complete: Indicates that the cloning process has completed.
Restoring: Restore operation is currently in progress.
Saving: A clone file is currently being saved.
Cold started: A power-cycle of the product occurred whilst a restore operation was in progress. The product configuration is unreliable and has been reset to factory default..

1:9:1 Restore the nanodac configuration via I-tools

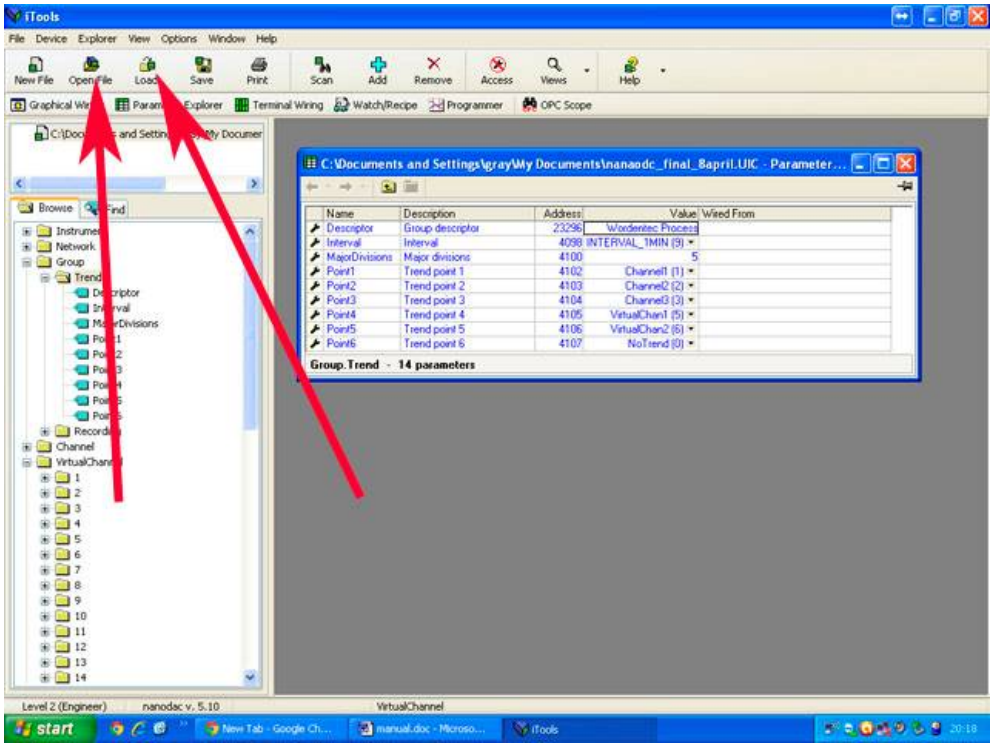
The best way to restore a nanodac is through the I-tools interface. The stored backup file (*.UIC) , frequently called the clone file can be transferred into a new or repaired nanodac controller with a few button clicks.

Please see the previous section “connecting via I-tools” or refer to the nanodac user manual.

If changes to the configuration file have been made we suggest a complete clone file is created within I-tools and a record of this change is made . A configuration file (*.UIC) will contain all of the information stored in the controller including processes, data log, pid info etc.

To load a clone file

1) Connect to the nanodac via the lan port
2) When synchronised click the open file icon as below
3) Navigate to the saved file and click ok
4) Click the load file icon as indicated below
5) The system will warn the operator that the instrument will be accessed
6) Click ok and wait for the installation to complete
7) When complete disconnect the PC



1:9:3 Restore the PLC from backup

The system uses a mitsubishi PLC to control the pump and valve sequences.
If the PLC is changed the new PLC will need to be programmed.

This PLC is programmed via a special lead supplied with the system, the mitsubishi software is also supplied on a CD with this documentation.

Using a windows PC open the mitsubishi alpha software suite. Connect the controller to the PC using the special USB cable.
Navigate to the backup (*.vls) file and download to the controller.
The system will confirm the download has completed.

1:9:4 Remote support

The re-programming can be carried out by Wordentec via remote support.
We currently are using “Team Viewer 9”.
To access remote support the customer must download and install teamviewer onto a PC and connect to the internet.
If the PC can connect to google.com we can connect to it using the teamviewer software
(there must be enough network interfaces to establish 2 simultaneous connections)

2: Mechanical

2:1 Cleaning

The pumping system and chamber walls are protected by a set of stainless steel shields:
1) Rear shield
2) Centre Shield
3) Turbo heat shields
4) Door shield
After a period of use these may become contaminated by the process and require some cleaning.
For day to day cleaning we suggest this should be done using a vacuum cleaner and / or clean laboratory wipes and IPA.
This **must** be done only when the shelves and internal shields are at ambient temperature.

If the shields are very contaminated, they will have to be removed for chemical cleaning or blasting. Please ensure any blasted shields are completely free of all blasting media before re-fitting.
The oven shelves should be kept clean and free from any build up of Contamination

The chamber shields are secured to the side of the chamber with special stainless steel vented screws. These are identified by a small hole drilled through the center. These screws are fitted to eliminate pumping problems caused by trapped volumes of air inside the tapped screw holes.

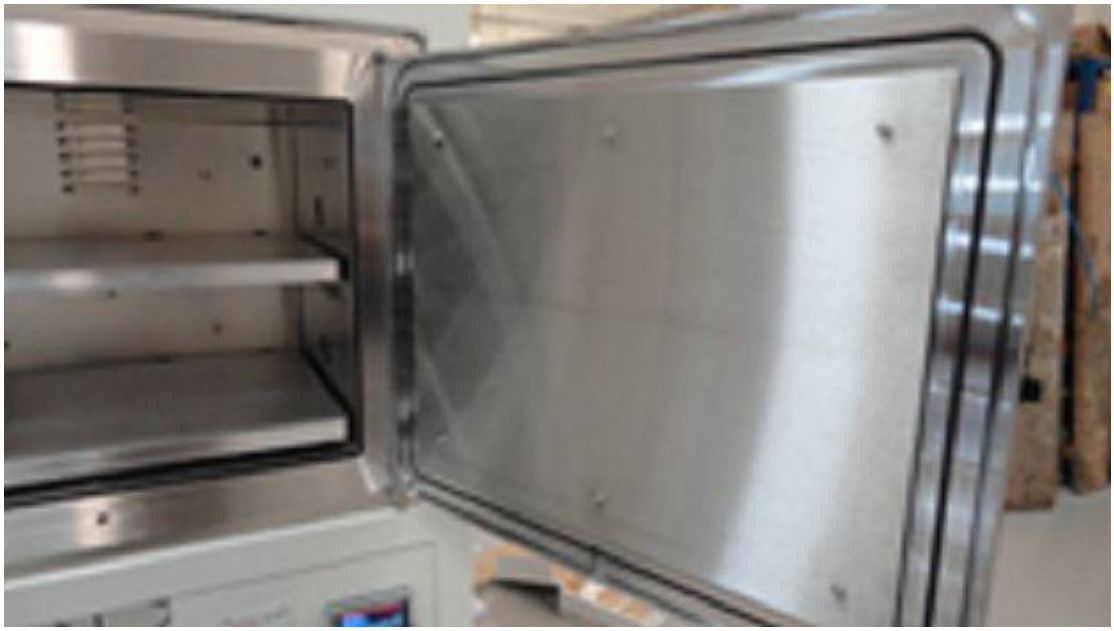
Please replace any damaged screws with vented screws from your spares kit.
The chamber door seals must be kept clean. Pleas wipe with some IPA or similar when contaminated. Please replace the door seal if it becomes damaged. Only use viton seals.

The system has two chamber door seals to reduce the leak rate across the door aperture, the central void between the two seals is maintained by the ACP rotary pump. Please ensure this part of the system and the corresponding face of the chamber door is kept clean to avoid any damage to the pump system.
Please remember to check the turbo pump aperture at the bottom of the chamber for foreign objects caught in the protective splinter shield

2:1:1 **Removal of the Chamber Shields and Shelves**

To remove the shields:
Make sure the power is switched off, disconnected from the supply and the oven is cool.

1) Remove the 6 nuts holding the door shield to the chamber door and slide the shield clear



2) In the centre of both shelves loosen the thermocouple clamp screw a few turns using an allen key

3) Unscrew the rear top frame panel, tilt back and unplug the cooling fans

before lifting clear