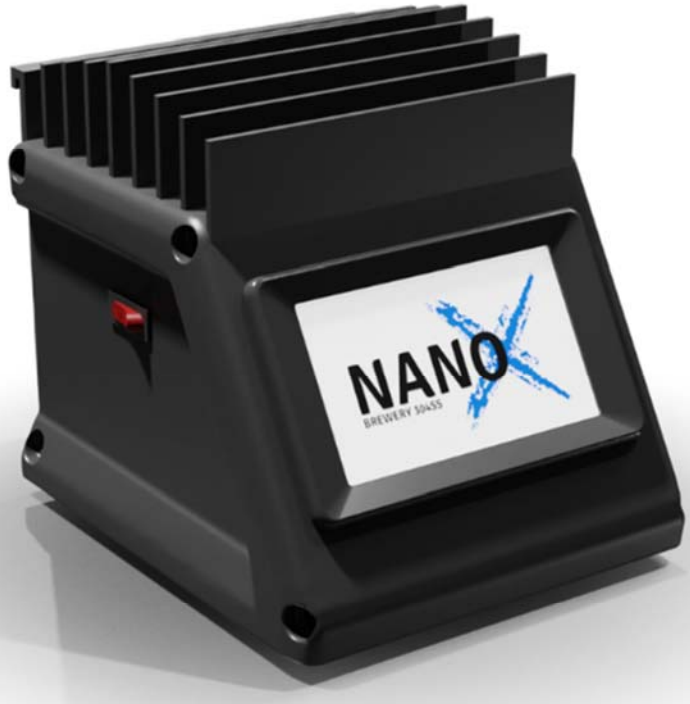
INSTRUCTION MANUAL

NANO BOSS TOUCHSCREEN PID CONTROLLER



AUSTRALIAN DESIGNED & MANUFACTURED

OVERVIEW

The NANO Boss brewing controller is an extremely accurate PID controller with vessel tuning to map the temperature profile for 3 different sized vessels through the operational temperature range without temperature fluctuations. The Mash and Boil has 10 programmable profiles.
Mash profile can be programmed for auto pump start per profile, delay start and pre-start temperature. Manual mode operation provides adjustable temperature, temperature heating rate, pump on/off and time completion. Fluidic transfer option controls 4 relays, 10Amp pumps or solenoids operation.

Model Current Ratings:

240VAC Unit Voltage	**NANO Boss Controller**
	Maximum Heater Power
10A	2400 Watts
15A	3600 Watts
32A	7280 Watts

WARNING

The NANO Boss controller must be used with an earth leakage device or **residual-current device** (RCD). RCD is a safety device. Refer to your local electrician for further information.

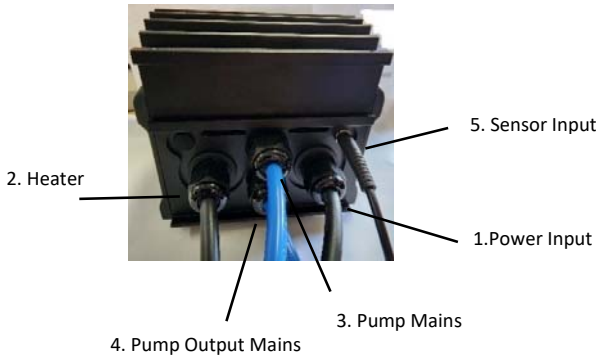
SAFTEY CONSIDERATIONS

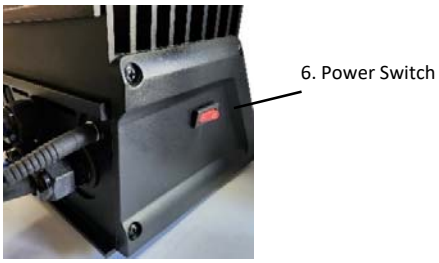
- Power requirements: Ensure the maximum heater power does not exceed the model current rating
- Avoid exposure of the controller to direct water contact
- Make sure plugs are secure and dry
- Make sure all electrical work is carried out by qualified personnel in accordance with local laws and regulations. Improper alterations may lead to electrical shock or fire.
- Only use temperature sensors supplied by the manufacturer.

Please read these Instructions before use. Retain this manual for future reference.

UNIT SET UP

1. Connect the power cable (1) to the appropriate mains inlet (model specific: either 10 Amps, 15 Amps or 32 Amps).
2. Connect the mains output (2) to your heater element.
3. Connect the pump mains (3) to a 10 Amp wall socket.
4. Connect the pump output (4) to the pump motor.
5. Connect the temperature sensor (5) to the 3.5mm socket.
6. Power Switch

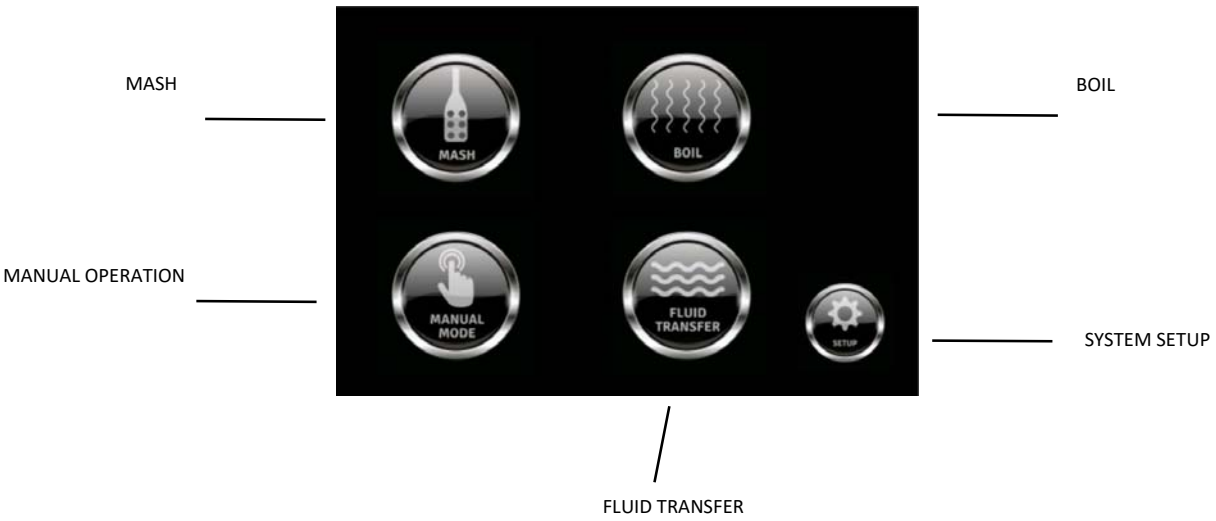




OPERATIONAL OVERVIEW

Power on the unit using the red switch on the left side with the temperature sensor connected. The home touch screen will appear.

Home Screen



MODE OPTIONS

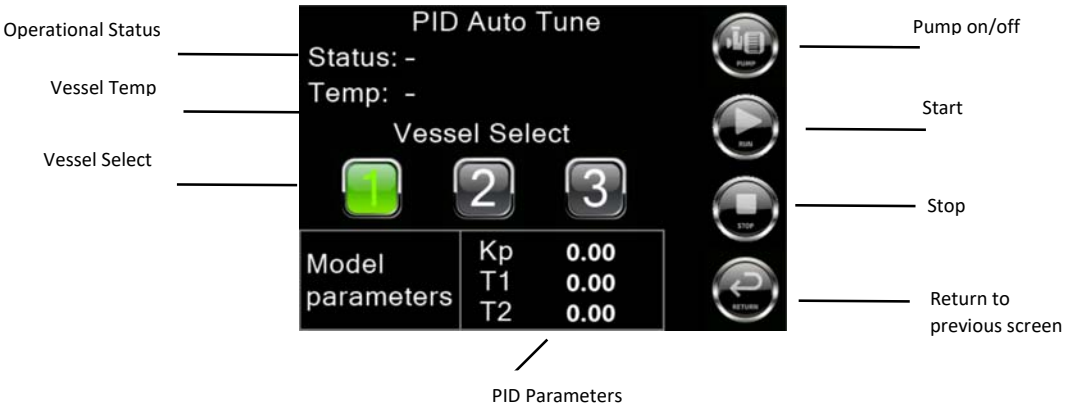
Mash Profile	10 configurable mash profiles, each with 5 steps, delay start and set start temperature
Boil Profile	10 configurable boil profiles, each profile with 6 steps
Manual Mode operation	For manual control of target temperature, rate of heating (%), timer (hours and minutes), pump on/off
Fluid Transfer	4 solenoid control (on/off)
Set Up	System configuration, tuning and software update

VESSEL TUNING

When starting the unit for the first time, perform a vessel tune to improve the accuracy of the temperature sensor for your size vessel. There are 3 vessel settings that can be tuned. The green button indicates the active vessel.

The Vessel Tuning Screen is located under the Set Up menu.

Vessel Tuning Screen



Vessel Setup:

- Fill your vessel with water before starting this function
- The start temperature of the water must be less than < 30°C
- Push SETUP Icon , then the THERMOMETER Icon . Select Vessel 1.
- Press RUN Icon
- The vessel will then perform an auto tune. The cycle will complete once the water temperature drops back to 70°C. Depending upon the size of the vessel, this may take some time.

- The process may be repeated for other vessels by selecting Vessel 2 or Vessel 3.
- Settings for each vessel will be stored. **Record the model parameters for each vessel as displayed on the screen for future reference and backup.*
- Tuning should be performed at regular intervals to maintain temperature accuracy.

Vessel	Kp	T1	T2
1			
2			
3			

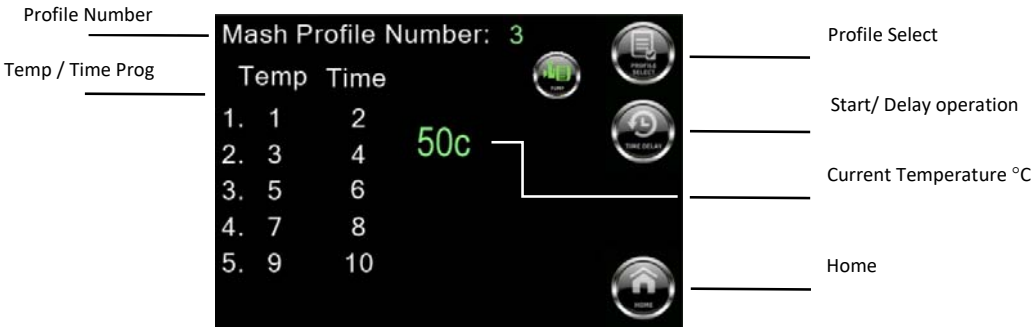
Manual Mode Setup and Operation

Manual mode allows manual control over the heater, timer and pump operation.
To commence the manual operation, the timer **MUST** have a value in either hours or minutes for operation to commence.

- **Scroll Menu**, Displays operational information
- **Temperature**, Displays current operational temperature
- **Target Temperature***, is adjustable
- **Rate***, The heating rate of the element is adjustable. Default is 60.00
- **%PWR**, Indicates the power to the heater element during operation
- **Timer***, Hours and Minutes adjustable.
  *Adjustable by touching the value you wish to edit, and a keyboard will appear on screen.
- **Pump Icon**  Turns the pump on/off
- **Pause Icon**  Pauses the heater operation
- **Stop Icon**  Stops the current heater and pump operations
- **Home Icon**  Returns to the home screen

On completion of the manual cycle, the heater and pump will turn off.

Mash Setup and Operation



Mash

Mash contains 10 programmable profiles, with adjustable Time, Temperature and Pump. Profile runs can be programmed for delayed start and set hold temperature.

Mash Setup:

- Select Mash Icon 
- Select the profile select Icon  , then choose a profile number
- By touching the Temp or time numbers on the touch screen, a keyboard will appear
- Enter your temp 1 value first, select OK to step to Time, enter your value, then select OK and repeat for all 5 steps.

** Entering a 0 in Temp will exit programming, allowing you to program a 1-4 step profile*.

- Select the pump icon to turn off/on for each profile step.

Mash Start:

- Select the time delay Icon to start operation 

- Start **Time Delay** can manually be programmed or configured from the Setup icon.
- **Holding Temperature**, set a pre-start temperature when time delay is active.

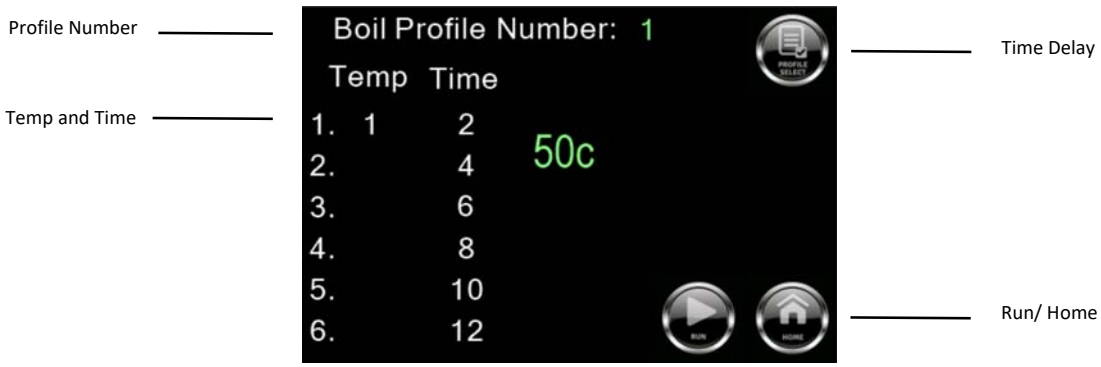
- **Current Temp**, sensor probe temperature reading
- **Rem Time**, Remaining delay Time and heating temperature message
- Select Run Icon  to start Mash operation and Return Icon  to return to the Mash screen

The Mash run will complete once all steps have been processed and **Time Complete** will be displayed. Touch **Time complete** to clear the splash screen.

Boil Setup and Operation

Boil contains 10 programmable profiles, adjustable Temperature, Time and current sensor temperature. Before starting, go to **Setup** to configure the Boil temp to your desired boil temperature, eg 100°C.

For a target temperature of 100°C, it recommended that the temperature in the Boil Profile be set 2°C lower at 98°C to begin with, to ensure the commencement of the profile. The heater will continue to heat the liquid to the Boil set temperature during the profile operation.



Example: Boil Temp 100°C, Profile Temp 98°C

Boil Setup:

- Select Boil Icon 
- Select the profile select Icon  , then choose a profile number
- By touching the Temp or time numbers on the touch screen, a keyboard will appear
- Enter your temp value first, select OK to step to Time, enter your Time value, repeat each time steps for all 6 steps.
- Entering a 0 in Time will exit programming, allowing you to program a 1-5 step profile.
- Touch the Run icon to commence operation

Once the temperature reaches 98°C, at each step in the profile you will be prompted to add an ingredient. The Boil run will complete, once all steps have been processed and **Time Complete** will be displayed. Touch **Time complete** to clear the splash screen.

Fluid Transfer Operation

Fluid Transfer

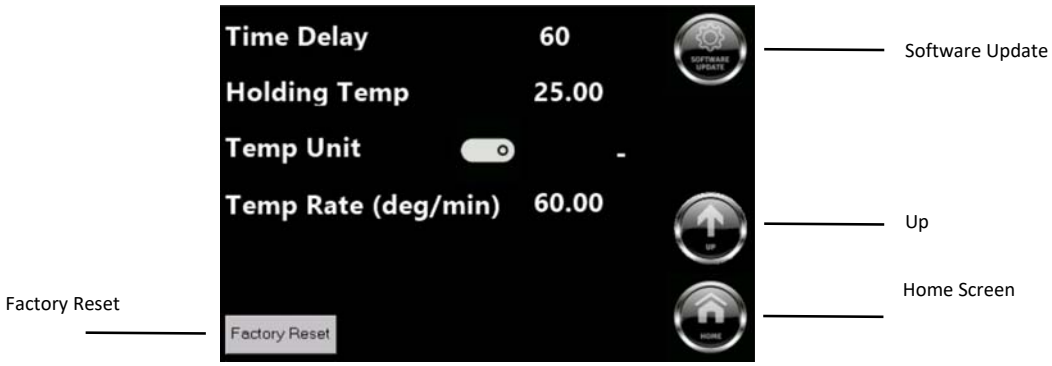
Fluid transfer solenoid control requires an additional wireless solenoid controller module. The NANO Boss can communicate via Wi-Fi up to 50m, direct line of sight. In the event that the Wi-Fi connection is lost, the wireless controller module turns off all solenoids as a safety mechanism. The wireless solenoid controller also confirms correct solenoid activation back to the NANO Boss.

- **Solenoid Icon**  , Display solenoid on/off
- **Relay connection Icon**  Pressing the icon searches for a wireless relay module to connect
- **Stop Icon**  turns off all solenoids
- **Return Icon**  to returns to the Home screen

SETUP

Settings and configuration

- **Temp Offset –** N/A
- **Buzzer on/off –** Turns the buzzer on and off for alerts
- **Boil Temp –** Sets the target boil temperature (recommend 100°C)
- **Temp Cal –** N/A
- **Temp out range –** Alarm when the temperature drifts greater than set value
- **PreTemp Alarm –** Pre alarm alert when current temperature is approaching target temperature (eg. Set to alarm at 5°C below target temperature)



- **Time Delay –** Set the Mash delay timer, No time Delay = 0
- **Holding Temp –** When time delay is set the vessel will maintain the set value temperature
- **Temp Unit –** Set Degrees Celsius or Fahrenheit
- **Temp Rate (deg/min) –** Sets the heating rate, also adjustable in Manual mode
- **Factory Reset –** All configured setting will be defaulted back to factory settings

TROUBLESHOOTING

Alarm on start-up	Sensor not connected
X.XX Temperature	Sensor not connected, System fault or faulty sensor
LCD screen not starting	Contact supplier
LCD screen not responding	Clean screen, possible screen damage
Heater not operational	Check power and element connections, contact supplier for assistance

SPECIFICATIONS

Voltage Input: 85-264Vac
Temperature sensor: 1% accuracy
Electrical plugs rating: IP66 AU certified
LCD: Resistive Touch screen
Electrical Compliance: IT AV EN/UL/IEC 62368-1

Wi-Fi
2.4 Ghhz Wi-Fi + Bluetooth for system communication
802.11b/g/n
Bit rate: 802.11n up to 150 Mbps

Bluetooth
Bluetooth V4.2 BR/EDR and Bluetooth LE

Controller, Relay Modules Wall Mounting

DIN rail, 2 x 2.5mm x 10mm screws
Minimum DIN rail length per controller/ relay module 140mm

Contents

1 x NANO Boss Controller

1 x 3M 1% Temperature Sensor

1 x Choice between a 1/2" Weld-less fitting, or 1.5" Tri Clover Temperature Housing

NANO Boss Dimensions

W 140mm x D 153mm x H 134mm