HANNA

BRASS MONKEY GUIDANCE

BRASS MONKEY

HANNA instruments

Hanna BL121

The BL121 Swimming Pool Controller is an all-in-one system for automatically maintaining the pH and chlorine levels. It features a multi-parameter digital probe to ensure stable, accurate measurements and two built-in chemical feed pumps for precise dosing of acid and chlorine. The controller includes advanced features like a dosing consent system to prevent chemical wastage, a built-in data logger for compliance monitoring, scalable analogue outputs for external devices, and real-time graph displays. With programmable alarms and password protection, it provides a reliable and efficient solution for water quality

The automatic tester and dosing system uses an advanced ORP (Oxidation-Reduction Potential) probe to measure the effectiveness of chlorine in the water. ORP is expressed in millivolts (mV) and indicates how efficiently chlorine is sanitising the system, rather than just the amount present.

We recommend maintaining chlorine levels between 1–3 ppm for optimal water quality. ORP provides an accurate reflection of disinfection performance, ensuring safe and hygienic conditions.

pH balance is also crucial for chlorine effectiveness. The system monitors pH, and we advise keeping levels at 7.4 for optimal performance, within an acceptable range of 7.2–7.6.

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Safety Measures

•Do not use chlorine tablets, granular chlorine or other non-liquid chlorine applications with the Hanna
•Do not use the controller in a plunge utilising electrolytic chlorine generation (salt electrolysis).
•Do not add stabiliser (e.g. cyanuric acid) to the plunge while using the controller. To remove stabiliser from the plunge, the plunge must be drained and cleaned.
•Always disconnect the controller from power when making electrical connections.
•Do not access the larger rear panel.
•Do not run other cables with the power cable through the cable gland.

Recommended Chemicals

Chlorine
Sodium Hypochlorite (available in 11-12% or 14-15%)
Acid (to control pH)
Sulphuric Acid no more then 16% strength

The manufacturers instruction manual is supplied on delivery of your Brass Monkey Product.
If you require a copy this can be downloaded at.

https://www.hannainst.com/hubfs/product-manuals/MANBL12X_03_20.pdf

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Chemicals

Spec of chemicals is

- Chlorine: We are currently using [Chlor Force M15], which is Sodium Hypochlorite (available in 11–12% or 14–15%).
- pH Control: I am about to switch the acid to [Bayrol pH liquid], which is Sulphuric Acid (no more than 16% strength)

Chlorine (Sodium Hypochlorite):

Storage:

Store in a cool, dry place, away from sunlight and heat.

Keep it in its original container (HDPE or polyethylene) and ensure it's tightly sealed.

PPE:

Gloves: Wear chemical-resistant gloves (nitrile or rubber).

Eye Protection: Use safety goggles or a face shield.

Clothing: Wear an apron or protective clothing to prevent splashes.

Ventilation: Ensure the area is well-ventilated, or wear a mask if fumes are present.

Sulphuric Acid:

Storage:

Keep it in a cool, dry area, away from heat.

Store in a corrosion-resistant container (polyethylene or polypropylene) and tightly sealed.

PPE:

Gloves: Use rubber or nitrile gloves.

Eye Protection: Safety goggles or a face shield.

Clothing: Wear protective clothing or an apron to protect your skin.

Ventilation: Ensure proper ventilation, or use a mask if needed.

General Tips:

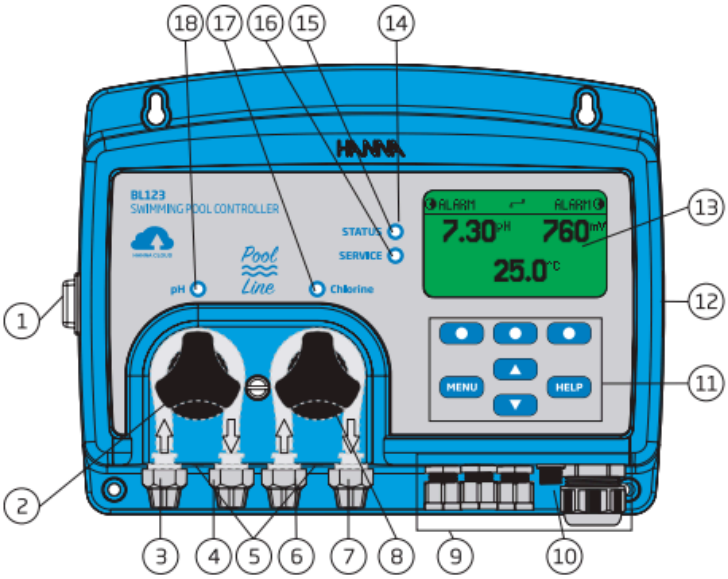
Use a designated, well-ventilated plant room for handling.

Make sure there's easy access to an eyewash station and safety shower if needed.

Always keep neutralising agents handy for spills (e.g., baking soda for acid spills).

Get to know Hanna

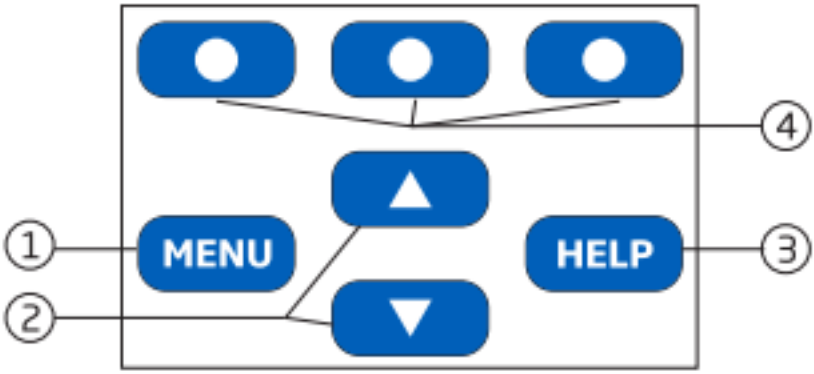
The front panel features a custom display, tactile keypad, and LED indicators. The display shows measurements and temperature, while LEDs signal alarms, service needs (red), and pump activation (blue).



1.Power switch
2. Acid dosing pump
3. IN acid
4. OUT acid
5. Drainage holes
6. IN chlorine
7. OUT chlorine
8. Chlorine dosing pump
9. Cable gland seals
10. Probe connector
11. Keypad area
12. USB port (host)
13. Liquid Crystal Display (LCD)
14. LED area
15. Status LED
16. Service LED
17. Chlorine pump - status LED
18. Acid pump - status LED

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Get to know Hanna

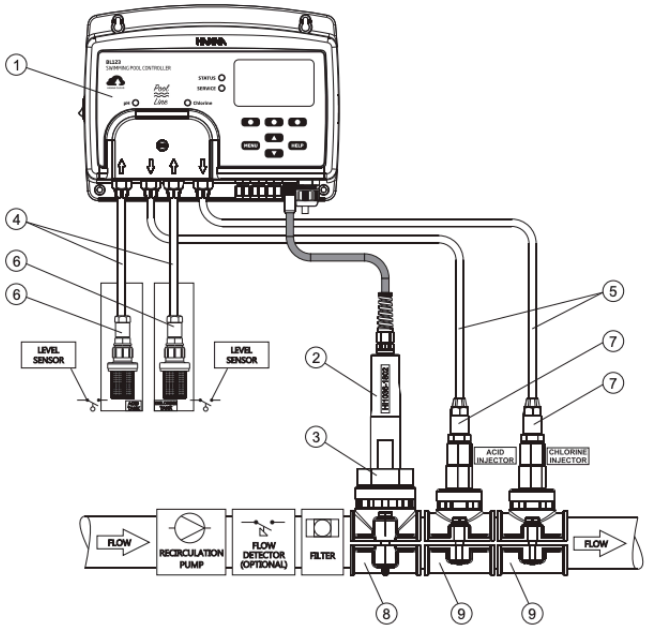


1. **MENU** key – Press MENU key to enter setup mode and access manual pump control; pH/ORP/Temperature options
2. **[?]/[?] keys** – When in MENU mode, press the arrow keys to scroll the menu items / adjust the settings – When in measurement mode, press the arrow keys to change the screen: three parameter screen (pH, ORP, temperature), single parameter screen and plot display
3. **HELP key** – Enter / exit Help menu
4. **Functional keys** – Contextual functionality

Get to know Hanna

In-Line Installation Overview & Components Table

Below is an illustrated reference of a generic, in-line installation scheme with the relevant components.



1.Pool controller - On/Off Switch

2. pH/ORP/temperature electrode 3. Electrode fitting

4.Flexible tubing for pump input

5. Rigid tubing for pump output

6. Aspiration filter

7.Injector, ½" thread

8 Probe saddle for ∅ 50 mm pipe, using1 ¼" thread

9 Injector saddle for pipe, using 1/2" thread

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Operation

The Hanna unit will calibrated and set up by Brass Monkey., ready to be switched on. Once the settings have been checked and the probe has been calibrated the unit is ready to use.

- Ensure the liquid containers are labelled correctly and filled with the correct fluid.
- Ensure the dosing line from the pH pump goes into the correct chemical bottle and the same with the C12 pump (chlorine).
- Ensure the bath is running and out of maintenance mode - if the bath is in maintenance mode exit this by holding the spanner button on the main control board for 3 seconds.

Chlorine and pH Levels

Levels as outlined by PWTAG (Pool Water Treatment and Advisory Group) Technical Note. 71

Chemistry Testing should be done with a photometer or comparator that is checked and calibrated in line with the manufacturer's guidance. The water should be tested (disinfectant levels and pH values) before users get in, then every two hours. For a chlorine-based disinfectant the levels should be:

- *free chlorine,1.0mg-5.0mg/l*
- *• pH value 7.0 - 7.6.*

Brass Monkey advice - Chlorine and pH Levels

1. Free Chlorine: The ideal level is 2-4 ppm.
2. Total Chlorine should be measured so that Combined Chlorine can be calculated. (Total Chlorine - Free Chlorine = Combined Chlorine)

3.The aim is for combined Chlorine to be less then the Free Chlorine

3. PH Balance: The optimal range is 7.2–7.6, with 7.4 being the target.
4. These measurements should be taken:
5. Before opening
6. Regularly throughout the day to ensure levels remain stable.
7. At the end of the day, especially after completing any maintenance tasks.

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Questions

Is ORP the same as Parts per million?

No, ORP is not the same and does not directly influence ppm but they are closely related.

- PPM (Parts Per Million) measures the amount of chlorine in the water.
- ORP (Oxidation-Reduction Potential) measures how effective that chlorine is at sanitising.

You could have a high ppm but low ORP if the chlorine is not working efficiently (due to high pH, organic contaminants). Similarly, you could have a lower ppm but high ORP if conditions are ideal for chlorine to work effectively.

So, while ORP and ppm are linked, one does not directly control the other—ORP reflects how well the available chlorine is disinfecting, while ppm tells you how much chlorine is present.

Do I still need to test the chlorine levels in the bath?

Yes! Absolutely! As ORP and parts per million are not the same you will need to continue testing your water on a regular basis throughout the day. We advise that the PPM should be between 2-4, anything over 5 is dangerous and should result in immediate closure of the bath to resolve. For daily water testing. We recommend the HI-97710c - Most accurate and can be calibrated by the user. You will need the reagents HI -93701-T to go with this for testing.

What to do if I am switching brand or strength of chemicals?

1. The unit does not require recalibration, but the injection lines should be flushed before switching chemicals.
2. Remove the lines from the chemical bottles and place them in a large jug of water (approximately 1 litre).
3. Press the Menu, scroll to Acid Pump, and press the left circle button under On 10s to run the pump for 10 seconds.
4. Continue pressing this button until the lines are flushed of the old chemical.
5. Repeat the process for the C12 pump.
6. You can now swap the bottles over with the new chemicals. Using the On 10s on the pump you can prime the dosing lines.
7. We recommend draining the plunge and refilling it with fresh water to avoid mixing chemicals.
8. This will ensure the dosing system starts with a clean slate.

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Questions

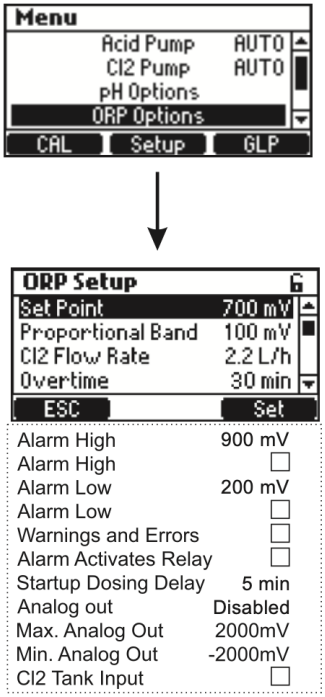
What do I do if my pH or Chlorine levels are not within the parameters you advise?

The set points on the Hanna system are going to be unique to you.

The Hanna set points will be set to the points that will work best for you.

If you find through routine Free Chlorine testing you need to increase the amount of chlorine this can be done by

1. Press Menu on the Hanna unit.
2. Scroll down using the arrows until you reach ORP options.
3. The current ORP setpoint should be 740mV.
4. Press Set, then adjust the number up or down
5. Always re-rest the water after a minimum of 20 minutes to check the effect of the adjustment



How often does Hanna need calibrating?

Calibration should be completed every 12 months.

Always Switch Hanna Off Before Doing Maintenance for Backwashing

Questions

How often should I check the Hanna system?

You should include checking the Hanna system as part of your regular water testing regime.

You should check

- Chemical bottles are not empty
- For any warnings or error messages

Can I recall the test logs?

Yes! You can recall the test logs from the Hanna system at the end of each day.

Please refer to the manual provided by Hanna Instruments for this.

Please note, you will need a USB.

Can I lock the Chlorine and pH set points so only one person can adjust them?

Yes! Please refer to the manual provided by Hanna Instruments for this.

You will need to pick a password, if you forget your password Brass Monkey will not have this on record.

When I go into settings the screen asks me if I want to go into HOLD mode.

Say YES, this will stop the unit from trying to dose whilst you are adjusting settings.

My chemical levels don't seem to be right but I have checked my set points

1. Check that the dosing lines are in the correct chemical baths
2. Check the settings on the Hanna match the parameter tables within this document.

If some settings are Incorrect the Hanna unit might stop dosing, an example of this is if the Alarm High/Low on the temperature setting is enabled and the temperature is hit, the Hanna unit will stop dosing. This is why we disable the alarm.

3. Check that the drain hasn't been left open or if you have a media filter that the handle is in the correct position. If water is slowly escaping to waste the auto top up may maintain the water level and explain why you are seeing a reduction in chlorine levels.

12 Monthly Calibration

Every 12 months the unit will require re-calibrating.

To complete the calibration you will need to have -

- Chemical Safe Gloves
- Chemical Safe Cup
- Towel
- Recalibration Chemical Kit Packets
  - One Red Packet (pH 4.01)
  - One Green Packet (pH 7.01)
  - One Black Packet (470 mV ORP Test Solution)

Getting ready for calibrating -

Step. 7 - See Cap

1. Put the bath into maintenance mode, by pressing the Spanner button on the PCB control box for 5 secs. The hanna will power off.
2. Either side of the probe there will be blue taps. Turn these so the tap is not inline with the pipe. This will isolate the probe.
3. Remove the silver connection collar from the auto doser controller that connects the doser to the probe. (This will prevent the wire from getting twisted and tangled in the next step)
4. The probe can now be twisted out of the pipework
5. Use the chemical safe cup and hold it near the auto doser probe as you unscrew it. This will catch any water that may come out.
6. Put the auto doser in the cup with the spilled water so the probe remains wet (do not have the out of the water for more then 15 minutes)
7. Where you have removed the probe, put the 'cap' in it's place (this is so when we switch the bath back on water doesn't come through.
8. Turn the taps back so they are inline with the pipe
9. Take the bath our of maintenance mode by pressing the spanner button for 5 secs. You can now continue to calibration.

Go to the next page for pH calibration Instructions -

PH CALIBRATION

Before the Hanna is connected to a customers bath it will need to calibrated.This ensures it accurately reads the pH and ORP levels and dispenses the correct dose of chemicals.

Protective Equipment

- Chemical-Safe Gloves
- Chemical-Safe Cup
- Towel
- Beaker of clean tap water

Recalibration Chemical Kit Packets

- 2× Red Packet (pH 4.01)
- 3× Green Packet (pH 7.01)
- 3× Black Packet (470 mV ORP Test Solution)

When you go into settings the screen will ask if you want to go into HOLD mode. This will stop the unit from trying to dose. SAY YES

Step 1: Calibrating with the 7.01 pH Solution (Green Packet)

1. Press "**Menu**" on the auto-doser controller.
2. Scroll to "**pH Options**"
3. Press the **left blue circle** button under "**CAL**" to begin calibration.
4. Open a **7.01 pH** solution packet and fully submerge the end of the probe in the liquid. **Hold it upright and steady.**
5. Wait for the reading on the screen to adjust.
6. Once the numbers begin to stabilise, transfer the probe into a **new** 7.01 pH solution packet. (Using two sachets ensures a more accurate reading.) *If the reading is within 0.01 of the target a second packet is not needed.
7. When the numbers stabilise completely, **"CFM" (Confirm) will appea**r in the lower right corner of the screen. This means the probe is calibrated to approximately **7.01.** (*This process should take around 2–3 minutes.*)
8. Press the r**ight blue circle button under "CFM**" to confirm.

PH CONTINUED

When you go into settings the screen will ask if you want to go into HOLD mode. This will stop the unit from trying to dose. SAY YES

Step 2: Calibrating with the 4.01 pH Solution (Red Packet)

1. The screen will now prompt you to continue with the **4.01 pH solution (red packet).**
2. Open a **4.01 pH solution packe**t and fully submerge the probe in the liquid, holding it upright and steady.
3. Wait for the reading to adjust, then transfer the probe into a new 4.01 pH solution packet. *(This removes any residue from the previous solution, ensuring an accurate reading.)*
4. When the numbers stabilise, **"CFM" (Confirm) will appear i**n the lower right corner of the screen. (*This process should take around 1–2 minutes.*)
5. Press the **right blue circle button under "CFM"** to confirm.

Final Steps

6. Place the probe back into the water.
7. Once both calibration stages are complete, the screen will display **"Calibration Complete"** and return to the main options menu.

Go to the next page for ORP calibration Instructions -

3 –DOUBLE CHECK THE PH READINGS

When you go into settings the screen will ask if you want to go into HOLD mode. This will stop the unit from trying to dose. SAY YES

Once you have completed the pH calibration, you can verify the accuracy of your results by following these steps:

1. **Prepare the Materials:**
    - A new pH 7.01 sachet
    - A beaker of clean (tap) water
2. **Check pH Calibration:**
    - Ensure the screen is on the normal running screen which shows readings of pH, ORP and temp.
    - Place the probe into the pH 7.01 calibration sachet.
    - If the reading is close to 7.01 carry on, if it isn't we can adjust this. *Note the following buttons need to be pressed fairly quickly otherwise the unit will go into calibration mode.
    - MENU
    - PH OPTIONS - press left circle under CAL
    - Press right circle button under PROCESS
    - You can then using up and down arrows adjust level to 7.01
    - Press CFM
    - Press MENU and go back to main screen, your reading should now be 7.01
    - Once done, rinse the sensor in clean water.

Go to the next page for parameter settings -

ORP CALIBRATION

When you go into settings the screen will ask if you want to go into HOLD mode. This will stop the unit from trying to dose. SAY YES

Calibrating the ORP Sensor

Make sure you have rinsed the probe first in Clean water

1. Scroll to **"ORP Set Up"** on the screen.
2. Press the **left blue circle button** under "**CAL**" to begin calibration.
3. Open a black **470 mV ORP** Test Solution packet and fully submerge the probe in the liquid.
4. Use the up and down arrows to adjust the **ORP setting to 470 mV** (matching the packet).
    - *Tip: Holding down the arrows will move the mV number faster.*
5. Transfer the probe into a **second** ORP test solution sachet to ensure any pH solution residue does not interfere.
6. Wait for the mV reading to stabilise. **This can take 3–4 minutes,** as ORP calibration takes slightly longer than pH calibration.
7. Once the reading stabilises and "**CFM**" appears in the lower right corner, press "CFM" to confirm.

1. Final Step – Proper Storage or Installation:

- Once calibration is complete, the sensor must either be:
    - Installed in a running system, or
    - Stored correctly by adding storage solution to the sensor cap before fitting it securely.

(ORP can't be checked in the same way as pH - but it can be recalibrated if required)

Go to the next page for how to check calibration is complete and how to store the sensor

SETTINGS

When you go into settings the screen will ask if you want to go into HOLD mode. This will stop the unit from trying to dose. SAY YES

Check the settings by

1. Menu
2. **Acid Pump - Auto** (if this is shown as OFF press the circle underneath the word Auto at the bottom of the screen)
3. **C12 Pump - Auto** (if this is shown as OFF press the circle underneath the word Auto at the bottom of the screen)
4. **pH Options** - Press the circle button under the word SETUP. Go through the pH set up list and check parameters match the table on the next page. Press ESC when complete.
5. **ORP Options** - Press the circle button under the word SETUP. Go through the pH set up list and check parameters match the table on the next page.Press ESC when complete.
6. **Temperature Options -** Press the circle button under the word SETUP. Go through the temp set up list and check parameters match the table on the next page.

Once complete go back to Menu
And ensure Acid pump is on Auto and C12 Pump is on Auto

Note:
Within the parameters you will notice we disable many of the optional alarms.
We do this because if the Alarm is enabled the unit will stop dosing. It will flash and say warning if there is a problem so checking the Hanna should be a part of the regular testing

Go to the next page for parameter settings -

PARAMETERS 1/2

pH Settings	ORP Settings
Dosing type - Acid	**Set point** 740mV
Set point 7.30pH	**Proportional band:** 100mV
Proportional band: 1.0pH	**C12 Flow rate -** 0.5 L/h
pH Flow rate - 0.5 L/h	**Overtime -** 60 minutes
Overtime - 60 minutes	**Alarm high -** 900mV
Alarm high - 7.8pH	**Alarm high -** Disable (remove the tick in this box)
Alarm high - Disable (remove the tick in this box)	**Alarm low -** 200mV
Alarm low - 6.8pH	**Alarm Low -**Disable (remove the tick in this box)
Alarm Low -Disable (remove the tick in this box)	**Warnings and Errors -** Enabled (there should be a tick in this box)
Warnings and Errors - Enabled (there should be a tick in this box)	**Alarm activates relay -** disable - there should not be a tick in this box
Alarm activates relay - disable - there should not be a tick in this box	**Alarm mask time** - 1minute
Alarm mask time - 5 sec	**Startup dosing delay** - 1minute
Startup dosing delay - 1minute	**Analog out -** A02
Analog out - A01	**Analog Max -** 2000mv
Max Analog out - 14pH	**Analog Min -** 0mV
Min Analog out - 2pH	**C12 Tank Input -** Disabled
Acid tank Input - disabled	

Proportional band + flow rate + Overtime = how slowly the Hanna doses over a set time
Alarm activates relay - This is if there was an external alarm like a flashing light fitted

Go to the next page for parameter settings -

PARAMETERS 2/2

Temp Settings
Alarm High - 50'C
Alarm high - Disabled (remove the tick in this box)
Alarm Low: 0'C
Alarm Low -Disabled (remove the tick in this box)
Warnings and Errors - Enabled
Alarm activates relay -Disable (remove the tick in this box)
Alarm mask time - 5 sec
Unit - Celsius
Analog out - A03
Max Analog out - 105'C
Min Analog out - -5'C

Go to the next page for Installation instructions -

SUPPORT

If you need further support with your system please do not hesitate to contact us.
If you need help with getting the correct set points to ensure the right pH and ppm in your bath

- please confirm to us wha the set points on the unit are
- what your pH and Chlorine test results are

We can then help to guide you on what to adjust your levels too.

- Report an issue
- Ask a question
- Share your logs with us

Raise a support ticket on **brassmonkey.co/support**

or call us on +44 1135 267 255

Weekdays 9:00am - 5:30pm