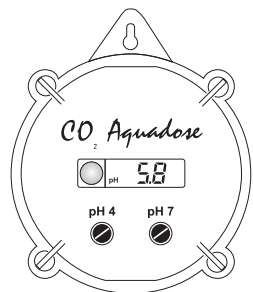


Instruction Manual

CO₂ Aquadose

(HI 981402C)

On-line, pH Monitor for CO₂ Dosing Control



WARRANTY

This instrument is guaranteed for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. **The electrode is warranted for a period of six months.** This warranty is limited to repair or replacement free of charge. Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact the dealer from whom you purchased the instrument. If under warranty, report the model number, date of purchase, serial number and the nature of the failure. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization Number from the Customer Service department and then send it with shipment costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

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Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

Dear Customer,

Thank you for choosing a Hanna product.

Please read this instruction manual carefully before using the meter. If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com.

This instrument is in compliance with the CE directives.

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully. If any damage has occurred during shipment, immediately notify your Dealer or the nearest Hanna Customer Service Center.

Each meter is supplied with:

- HI 1230B/2C pH electrode with ceramic junction, gel, BNC protective sheath and 2 m (6.6') cable
- pH 4 and pH 7 buffer sachets
- Calibration screwdriver
- 12 Vdc power adapter
- Instruction manual

Note: Conserve all packing material until the instrument has been observed to function correctly. Any defective item must be returned in its original packing.

GENERAL DESCRIPTION

The CO₂ Aquadose is an accurate and safe instrument specially designed to dose CO₂ in planted aquariums.

- Accurate: optimal dosing, based on pH measurement.
- Safe: operated with 12 Vdc power to prevent the risk of electric shock in combination with water.

This instrument is the ideal device to control the CO₂ level and flow in your aquarium as it is done by pH control.

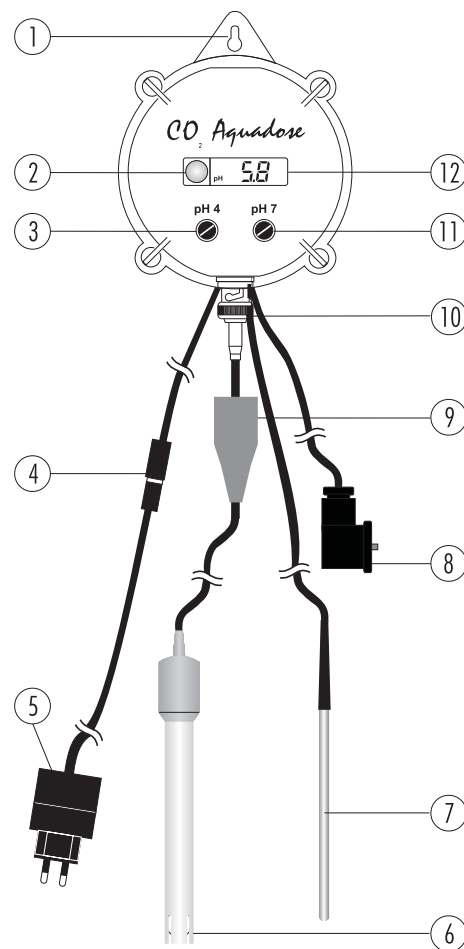
When the measured pH value exceeds the (user selectable) setpoint, the red alarm LED starts blinking and the instrument provides 12Vdc on the plug (#8 on the functional description figure) to activate the valve of your CO₂ dosing system.

The dosing of CO₂ stops automatically when the desired pH value is reached.

The pH measurements are highly accurate and the meter can be calibrated at one or two points.

- Featuring: setpoint selection, alarm LED, direct powering of the magnetvalve, IP54 sealed housing (vapors and humidity), waterproof BNC protection.

FUNCTIONAL DESCRIPTION



1. Molded eye
2. Alarm LED
3. pH 4 calibration trimmer
4. Power supply connector
5. 12 Vdc power adapter
6. HI 1230B/2C pH electrode with 2 m (6.6') cable
7. HI 1283 matching pin with 2 m (6.6') cable
8. Plug (DIN43650-B) for 12 Vdc magnetvalve power feeding, 1 m (3.3') cable
9. Protective sheath
10. BNC connector
11. pH 7 calibration trimmer
12. Liquid Crystal Display

SPECIFICATIONS

| | |
|-----------------------|---|
| Range | 0.0 to 14.0 pH |
| Resolution | 0.1 pH |
| Accuracy (@25°C/77°F) | ±0.2 pH |
| Typical EMC Deviation | ±0.2 pH |
| Calibration | Manual, 2 point, through trimmers |
| Setpoint | Set at 6.1 pH - user adjustable from 5.0 to 8.0 pH |
| Hysteresis | 0.1 pH around setpoint |
| Alarm | LED blinks when measure exceeds setpoint value |
| Output Contact | Power on when measure > setpoint; supporting max. 12 Vdc/500 mA magnetvalve (*) |
| pH Electrode | HI 1230B/2C (included) |
| Casing | IP54 |
| Power supply | 12 Vdc power adapter (included) |
| Dimensions | 86 x 94 x 33 mm (3.4 x 3.7 x 1.3") |
| Weight | 160 g (5.6 oz.) |

(*) Limited by supplied power adapter. If higher power output is needed, use proper power adapter.

pH ELECTRODE CONNECTION & MAINTENANCE

For maximum protection against vapors and humidity, the BNC connector is shielded behind a waterproof sheath.

- Slide the protective sheath down. Connect the pH electrode to the BNC connector and then slide the protective sheath back up. To ensure maximum waterproof protection, make sure the connector is completely covered.
- Do not be alarmed if white crystals appear around the electrode protective cap. This is normal with pH electrodes and they dissolve when rinsed with water.
- If the electrode is dry, soak the tip in a storage (HI 70300) or pH 7 (HI 7007) solution for 1 hour to reactivate it.
- To minimize clogging and provide longer life for the pH electrode, it is recommended to clean it monthly. Immerse the tip of the electrode in HI 7061 cleaning solution for one hour and then rinse it with tap water.
- When not in use, rinse the electrode with water and store it with a few drops of HI 70300 storage solution in the protective cap. Always replace the protective cap after use. NEVER USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.



TAKING MEASUREMENTS

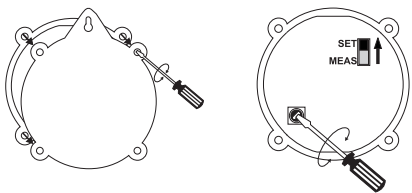
- Turn the meter on by connecting the supplied 12 Vdc power adapter to the meter and to the mains.
- Remove the protective cap from the pH electrode and immerse the tip (approx. 4 cm/1½") in the sample, together with the matching pin.
- The LCD will show the pH value. Allow the reading to stabilize and the instrument will start continuous monitoring.

Note: To prevent damages to the electrode, remove the pH electrode from the sample before turning the meter off.

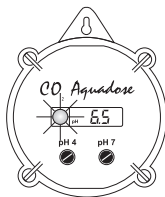
ADJUSTING THE SETPOINT (factory setting = 6.1 pH)

The meter allows the user to select the setpoint value for alarm and power output activation.

- To access the MEAS/SET switch and the setpoint adjustment trimmer, unscrew the 4 screws located on the back of the meter and remove the rear panel.
- Move the switch to the SET position.
- With the supplied screwdriver adjust the setpoint trimmer to display the desired value in the range 5 to 8 pH.



- Move back the switch to the MEAS position.
- Reattach the back making sure that the gasket is in place before tightening the 4 screws.
- Whenever the pH reading exceeds the selected setpoint value, the red alarm LED blinks and the power contact output is activated for driving an external magnetvalve, and thus triggering the CO₂ dosing system.



CALIBRATION

For the greatest accuracy, it is recommended to calibrate the instrument at least once a month. Calibration should also be performed after replacing the pH electrode.

- Pour small quantities of pH 7.0 (HI 7007) and pH 4.0 (HI 7004) solutions into two clean beakers. For accurate calibration use two beakers for each buffer solution, the first one for rinsing the electrode tip and the second one for calibration.
- Turn the meter on and make sure that the MEAS/SET switch is on MEAS position.
- Remove the protective cap, rinse and immerse the electrode in pH 7.0 buffer solution, together with the matching pin. Stir gently and wait for the reading to stabilize.

Note: The electrode should be submerged approximately 4 cm (1½") in the solution.

- First adjust the "pH 7" trimmer with the supplied screwdriver until the LCD shows "pH 7.0".
- Rinse pH electrode and matching pin, immerse them in the pH 4.0 buffer solution and stir gently.
- Then wait a couple of minutes and adjust the "pH 4" trimmer until the LCD shows "pH 4.0".

The pH calibration is now complete.

ACCESSORIES

- HI 1230B/2C Double junction, plastic body, gel-filled pH electrode with BNC connector, protective sheath and 2 m (6.6') cable
- HI 1283 (*) Matching pin with 2 m (6.6') cable
- HI 70004P pH 4.01 solution, 20 mL sachet (25 pcs)
- HI 70007P pH 7.01 solution, 20 mL sachet (25 pcs)
- HI 7004M pH 4.01 solution, 230 mL bottle
- HI 7007M pH 7.01 solution, 230 mL bottle
- HI 7004L pH 4.01 solution, 500 mL bottle
- HI 7007L pH 7.01 solution, 500 mL bottle
- HI 70300M Electrode storage solution, 230 mL bottle
- HI 70300L Electrode storage solution, 500 mL bottle
- HI 7061M Electrode cleaning solution, 230 mL bottle
- HI 7061L Electrode cleaning solution, 500 mL bottle
- HI 710005 12 Vdc power adapter, US plug
- HI 710006 12 Vdc power adapter, European plug
- HI 710012 12 Vdc power adapter, Australian plug
- HI 710013 12 Vdc power adapter, South African plug
- HI 710014 12 Vdc power adapter, UK plug
- HI 710005/8 12 Vdc/800 mA power adapter, US plug
- HI 710006/8 12 Vdc/800 mA power adapter, European plug
- HI 731326 Calibration screwdriver (20 pcs)

(*) To be substituted by authorized technical personnel only.

CE DECLARATION OF CONFORMITY



DECLARATION OF CONFORMITY

We
Hanna Instruments Italia Srl
viale delle Industrie, 12/A
35030 Ronchi di Villafranca - PD
ITALY

herewith certify that the pH meter:

HI 981402C CO₂ Aquadose

has been tested and found to be in compliance with EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC according to the following applicable normatives:

EN 61000-6-1: Electromagnetic Compatibility - Generic Immunity Standard

IEC 61000-4-2 Electrostatic Discharge

IEC 61000-4-3 RF Radiated

IEC 61000-4-4 Fast Transient

EN 61000-6-3: Electromagnetic Compatibility - Generic Emission Standard

EN 55022 Radiated, Class B

EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use

Date of Issue: 7.4.2005

A. Marsilio - Technical Director
On behalf of
Hanna Instruments S.r.l.

Recommendations for Users

Before using this product, make sure that it is entirely suitable for the environment in which it is used. Operation of this instrument in residential areas could cause unacceptable interferences to radio and TV equipment.

The glass bulb at the end of the electrode is sensitive to electrostatic discharges. Avoid touching this glass bulb at all times. During operation, ESD wrist straps should be worn to avoid possible damage to the electrode by electrostatic discharges.

Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance.

To avoid electrical shock, do not use this instrument when voltages at the measurement surface exceed 24 Vac or 60 Vdc. To avoid damages or burns, do not perform any measurement in microwave ovens.