Installation, Operation, and Maintenance Manual

MCX™ Pocket Photometer

Field Portable Colorimeter

Catalog No. 1000000697

⚠ WARNING

Read this Manual BEFORE using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

Keep this Manual for future reference.

THINK SAFETY FIRST

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Manual Part No. 5000000720
Rev 0.4 09/2026

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Attention Owners and Users

Thank you for choosing the Pocket MCX. When operated and maintained according to this manual, the instrument will provide safe, reliable measurement performance.

All users share responsibility for proper operation. Read this manual completely before use. Follow all instructions and comply with applicable local, state, and federal regulations.

If the instrument or any component appears damaged, discontinue use immediately and contact qualified service personnel. For assistance or questions, contact Customer

Service at 888-203-7248 or visit HFscientific.com.

Product Identification

Record the instrument identification and purchase details for reference and service needs.

(Serial No., Date Purchased, Distributor, Notes)

Model:	**Date of purchase: Seller**
Serial #:	**Name/address:**

1.0 Specifications

Call customer service if you need assistance with technical details.

Measurement Range	0.03–1.5 mg/L NH_3; 0.03–7.5 mg/L NH_2Cl (as Cl_2); 0.01–1.5 mg/L Free Ammonia
Accuracy	±0.03 mg/L (Expressed as “N”)
Resolution	0.01 mg/L
Instrument Response Time	< 5 s
Chemistry Reaction Time	6-12 min depending on sample temperature
Display	7-segment LCD
Operating Temperature	0–50°C (32–122°F)
Sample Temperature	0–50°C (32–122°F)
Chemistry Storage Temperature	0–40°C (32–102°F)
Relative Humidity	0–90% non-condensing
Power	4 × AAA batteries (~300 readings)
Insulation Rating	Pollution Degree 2
Instrument Weight	0.5 kg (1.1 lb.)
Shipping Weight	1.3 kg (2.8 lb.)
Warranty	2 years from invoice

2.0 Product Overview

2.1 Safety Information

This section describes important safety notices and hazard classifications used throughout this manual. Read all instructions before operating the Pocket MCX. Failure to follow safety precautions may result in personal injury, chemical exposure, or instrument damage.

Hazard Definitions:

⚠ DANGER

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ CAUTION

Indicates a potentially or hazardous situation that may result in minor or moderate injury.

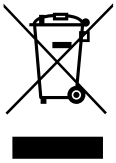
NOTICE

Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

2.1.1 Precautionary Labels

Read all safety labels and tags attached to the instrument and reagent kit. Symbols that appear on the Pocket MCX or in this manual indicate the following:

This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.



Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at not charge to the user.

2.1.2 Operational Safety

⚠ WARNING

Chemical Exposure Hazard

The HF scientific reagent kit contains chemicals that may cause skin or eye irritation.

- Wear gloves, safety glasses, and a lab coat.
- Avoid contact with skin and eyes.
- Do not ingest reagents.
- In case of contact, rinse immediately with plenty of water.

⚠ CAUTION

Cuvette Handling

Improper cuvette handling can affect measurement accuracy.

- Hold cuvettes only by the top at the fog line area.
- Do not touch or scratch optical faces.
- Replace cuvettes that are cracked, cloudy, or contaminated.

⚠ CAUTION

Cross-Contamination Hazard

- Reagent bottles are color-coded; re-cap each bottle with its original cap immediately after dispensing.
- Do not interchange droppers or caps.
- Use only HF scientific-approved reagents.

NOTICE

Instrument Protection

- Keep the sample well clean and dry.
- Protect the instrument from direct sunlight or temperature extremes.
- Place the instrument on a stable, level surface during operation.

2.1.3 Battery Safety

⚠ CAUTION

Battery Handling

- Install batteries with correct polarity.
- Do not mix old and new batteries.
- Remove batteries during long-term storage.
- Replace leaking or damaged batteries immediately.

2.2 Instrument Description

The Pocket MCX is a field-portable colorimeter for measuring ammonia-related nitrogen species in water. Using the Indophenol colorimetric method and a 615 nm LED, the instrument measures:

- Total Ammonia (NH_3)
- Monochloramine (NH_2Cl, displayed in Cl_2 units)
- Free Ammonia (calculated from Total and Monochloramine)

The instrument is used with the HF scientific reagent kit containing Chlorinating Solution, Buffer, and Indicator.

2.3 Unpacking and Inspection

Verify the shipment includes:

Item	Quantity
Pocket MCX (with 4 AAA batteries installed)	1
Instruction Card (inside case)	1
Instrument Carrying Case	1
Calibration and Certificate of Conformity	1
Disposable Cuvettes with Caps	4

Inspect all components for damage. For missing or damaged items, contact HF scientific or your distributor.

Handling notes: Touch cuvettes only on the top at the fog line. Scratches or fingerprints on the optical faces will affect accuracy.

2.4 Instrument Overview

The instrument consists of:

- **Sample well**
- **LCD display**
- **Keypad** (ON/OFF, MODE, ZERO, READ

Figure 1: Instrument

Reagent bottles are color-coded:

- Chlorinating Solution — **Red**
- Buffer — **Blue**
- Indicator — **Yellow**

After dispensing drops, replace each cap on the same bottle to prevent cross-contamination.

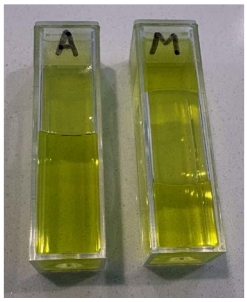
Figure 2: Chemistry

3.0 Instrument Operation

Operate the instrument on a stable surface. Keep handling movement minimal.

Prep Work

1. Collect your sample.
2. Get two cuvettes and two caps.
3. Mark one cuvette with an “A” and one with “M” on the fog line.
4. Wipe off all four sides of the cuvettes.



General Steps

1. Press **ON/OFF**.
2. Fill both cuvettes up to the fog line (4mL) with the sample water.
3. Place one of the cuvettes in the device with the “A” pointed to the arrow and press zero (display will show zeros).
4. Add one drop of Chlorinating solution (red cap) to the cuvette marked with “A”.
5. Invert 3 times to mix in the solution.
6. Add 4 drops of buffer solution to both cuvettes cap and invert 3 times.
7. Add 2 drops of Indicating solution to both cuvettes cap and invert 10-15 times to fully mix up solution.
8. Set a timer for 6 minutes at 24°C/74°F (see chart below for proper reaction times).
9. Once the reaction time is complete press mode button if necessary to change to NH3 and insert the cuvette marked with “A” and press read.
10. NH3 will blink and the reading will be displayed.
11. Press mode to switch to NH2Cl.
12. Insert the cuvette marked “M” and press read.
13. NH2Cl will blink and reading will be displayed.
14. After both readings are taken press mode to display Free Ammonia.
15. Four flashing zeros = no calculated results.

NOTICE

Values remain available only while powered on.

Do not:

- Change reagent order.
- Over/under-dose reagents.
- Reuse contaminated cuvettes.

⚠ CAUTION

Dispose of reagents per local regulations.

Wear appropriate PPE.

The instrument will automatically shut off after **25 minutes** of inactivity.

3.1 Reaction Development, Temperature & Condensation

- Colder samples require longer development time.
- Use the chart below to determine reaction time.
- Color stable for 30 minutes.

Celsius	Fahrenheit	Reaction Time Needed (Minutes)
1°C - 4°C	34°F - 39°F	12
5°C - 9°C	40°F - 49°F	10
10°C - 15°C	50°F - 59°F	8
16°C - 23°C	60°F - 74°F	7
24°C +	75°F +	6

Remove bubbles and condensation by inverting the cuvette before reading.

3.2 Calibration

The Pocket MCX is factory-calibrated and ready for immediate use.

If recalibration is required, contact Customer Service (888-203-7248).

Table 1: Dosing and Reagent sequence

Steps		NH3 Total Ammonia	NH2Cl Monochloramine	FREE Ammonia NH3
1	Add Chlorinating Solution	1 Drop	N/A	Obtain reading for NH3 and NH2Cl, then use mode button to toggle to FREE to get reading
2	Add Buffer Solution	4 Drops	4 Drops	
3	Add Indicator	2 Drops	2 Drops	
4	Wait for Development (time)	See Chart	See Chart	

4.0 Troubleshooting

Low Battery Indicator

A solid battery icon indicates batteries should be replaced soon.

A flashing icon indicates imminent failure.

If voltage is too low, the instrument will shut off automatically.

Error Messages

- **Err on startup** → Contact technical service
- **Err during ZERO or READ** → Improper zero; Turn off, restart measurement
- **Flashing 3.0 (NH_3) or 10.0 (NH_2Cl)** → Overrange reading

Inconsistent or Slowly Increasing Readings

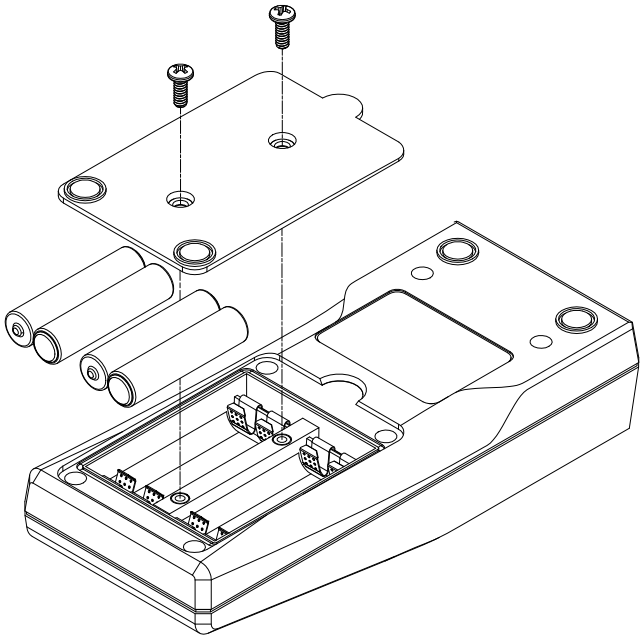
- Remove bubbles.
- Wipe the sides of the cuvette; ensure no condensation.
- Ensure sample volume is correct (to fog line).
- Ensure reagent dosing matches Table 1.
- Allow full development time, especially in cold temperatures.

5.0 Routine Maintenance

Use only clean, scratch-free cuvettes. Discard cuvettes with fingerprints, fogging, or damage.

Battery Replacement

1. Turn instrument off; place face-down on a soft surface.
2. Remove the two screws securing the battery cover.
3. Remove old batteries; install four **AAA batteries** with correct polarity.
4. Reinstall cover; tighten screws evenly to maintain the seal.
5. Dispose of batteries per local regulations.



⚠ WARNING

Incorrect battery installation may cause the release of explosive gases. Make sure the batteries are of the same approved chemical type and installed in correct orientation. Do not mix new and used batteries.

6.0 Accessories and Replacement Parts

Item	Catalog Number
Disposable cuvettes with caps (100 pack)	1000002022
Full Reagent Kit: • (1) Chlorinating 15mL • (2) Buffer 15mL • (1) Indicator 15mL	1000000698

7.0 Pocket MCX – Quick Reference Guide

Field Portable Colorimeter

1. Prepare the Instrument

1. Press **ON/OFF**.
2. Use **MODE** to select:
   - **NH_3** = Total Ammonia
   - **NH_2Cl** = Monochloramine
3. Use clean, dry cuvettes only.
4. Fill cuvette to the **fog line (~4 mL)**.

2. Zero the Instrument

1. Insert clean sample (no reagents added).
2. Align clear optical face with arrow.
3. Press **ZERO**.
4. Display will show **0.00**.

3. Add Reagents (in order)

After each addition

Standard order:

1. Chlorinating Solution – 1 drops (red cap)
2. Buffer – 4 drops (blue cap)
3. Indicator – 2 drops (yellow cap)

- Cap cuvette
- Invert 3 times

***Do not change the order or dosing.**

4. Color Development

- Allow reaction to develop: **Typical: 6 minutes at 24°C (74°F)**
- Cold samples (<70°F) require longer - refer to chart.

5. Read the Sample

1. Wipe cuvette clean and dry.
2. Insert with the “M” (for **NH_2Cl**) or the “A” (for **NH_3**) facing the arrow.
3. Press **READ**.
4. Display blinks the selected mode (**NH_3** or **NH_2Cl**) and then shows result (mg/L).
5. Press **MODE** to read free ammonia.

6. Tips for Best Results

- Remove bubbles before reading.
- Wipe off condensation just before measurement.
- Do not overfill the cuvette.
- Touch only the fogged part.
- Use clean unstained unscratched cuvettes for best accuracy.

7. Troubleshooting Quick List

Err at startup:

Instrument fault → Contact service.

Err during ZERO/READ:

Improper zero → Repeat procedure.

Flashing 3.0 (NH_3) or 10.0 (NH_2Cl):

Overrange → Dilute sample and re-test.

Slowly increasing readings:

Allow more reaction time or check for bubbles/fingerprints.

Flashing battery icon:

Replace all **4× AAA** batteries.

8. Battery Replacement

1. Turn instrument off.
2. Remove back cover screws.
3. Replace batteries (4× AAA), correct polarity.
4. Reinstall cover and tighten evenly.

9. Reagent Cap Colors

- Red = Chlorinating
- Blue = Buffer
- Yellow = Indicator

Always return caps to the correct bottle.

10. Typical Test Sequence (One Glance)

ON → MODE → Fill cuvette → ZERO →

Add reagents (mix after each) →

Wait 6 min → READ

8.0 HF scientific Municipal Market Products Limited Warranty

The online warranty for this product is located on the Watts website (https://www.watts.com/resources/warranty-information), and in the event that the terms or conditions of this manual conflict with the online warranty, the terms and conditions of the online warranty shall control. HF scientific, LLC (the “Company”) warrants each municipal market instrument product to be free from defects in material and workmanship under normal usage for a period of one (1) year from first use or two (2) years from date of the Company’s invoice from the original sale of the product, whichever occurs first. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge. Parts which by their nature are normally required to be replaced periodically, consistent with normal maintenance, specifically reagents, desiccant, sensors, electrodes and fuses, are excluded. Also excluded are accessories and supply-type items.

Proof of purchase from the Company (Company invoice or paid order confirmation) and/or first use (commissioning) must be provided when making a product warranty claim.

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