API AQUAspin™

Simple, Precise Digital Water Testing

CONTENTS

SETUP

BEFORE FIRST USE

- **Ensure the PC and meter have the latest software. A USB connection to a Windows® PC is required.**
  1. Go to: https://softwarecenter.lamotte.com
  2. Select WaterLink® Connect 2 software and then click "Free Download".
  3. A prompt will appear if firmware updates are available. Select Update. Testing and data transfer will not be possible until firmware has been updated.

- **Create your API AQUASPIN retailer login username and password by visiting https://www.apifishcare.com/store-register and clicking "Create account."**
  1. You will need to enter the serial number of your meter to create your account. The serial number can be found on the bottom of your AQUASPIN meter or on your warranty card. Enter the serial number with hyphen(s) included.

CHARGE THE BATTERY

1. Use the USB cable and the adapter to plug the meter into an AC outlet or use the USB cable (included) with a car charger (not included) to charge the battery. (Anker PowerDrive 2, DC 12/24V, 5V = 4.8A, Part Number A2310 recommended.)
2. The battery icon on the screen will show the battery status. Charge the battery until the battery indicator is full.

SOFTWARE UPDATES

Occasionally, the AQUASPIN meter will require updates and your PC will prompt you to do these updates by allowing you to "Update Now" or "Remind Me Later". If Remind Me Later is chosen, the update prompt will be displayed again in 23 hours. To update the software, open WaterLink Connect 2 on your computer, go to Settings > Service Settings > Get Updates.

Make sure your AQUASPIN meter is connected and then run the updates. Updates can take up to 30 minutes and you will want to dedicate that time to doing the update and nothing else on your computer to allow the update to not be disrupted.

PC CONNECTION

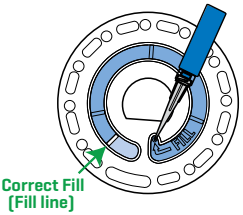
When the API AQUASPIN meter is connected to a PC via USB cable, the onboard touchscreen becomes disabled and operation of the meter is performed using the API AQUASPIN website application. This application can be accessed at: http://apifishcare.com/aquaspin/ via the API AQUASPIN website application, results from the meter will show on the computer screen, and can be saved to a customer's account and emailed with API product recommendations.

Customers must create an account from the link they receive in their API product recommendations email for their account creation to be finalized.

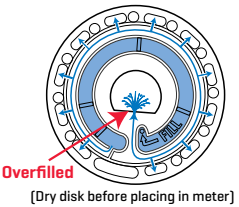
FILLING DISKS

When the syringe is placed in the water sample and the plunger is pulled all the way up, the syringe will hold more than enough water to adequately fill the disk.

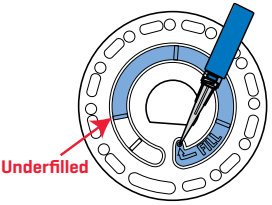
1. Fill the included syringe with the water sample. Then, locate the fill hole on the disk and slowly, with even pressure, begin to fill the disk with the syringe held vertically. The sample water will fill the chambers between the baffles in a counter-clockwise order. Each chamber will fill from the bottom to the top. Sample water should be added until the sample water in the fourth chamber fills to the top of the chamber slightly past the embossed fill line (it is ok to fill slightly past the fill line).



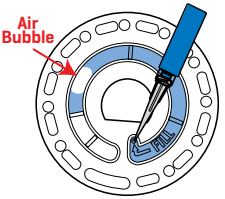
2. If the disk is overfilled, sample water will flow out of the overflow hole in the center of the disk. If this happens, be sure to dry the disk completely before running the test.



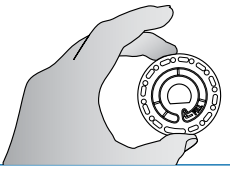
3. DO NOT underfill the disk. If the disk is under filled, the reagent chambers will not fill entirely and results will be inaccurate.



4. Do not introduce air bubbles into the disk. The reagent chambers will not fill entirely and results will be inaccurate. As soon as a bubble starts to form, pull back on the plunger to draw the bubble out of the disk. Begin the filling process again.

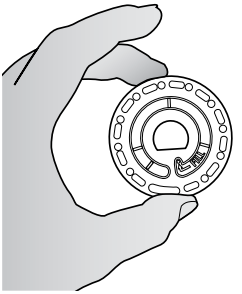


5. Wet disks should be dried thoroughly with the included lint-free wipe. The disk should be handled on the edges only. The disk should be filled and used within 10 minutes. They cannot be filled ahead of time. Refer to Step 4 under the TESTING section for next steps.



GENERAL OPERATING PROCEDURES

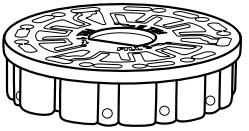
DISK HANDLING



The disk should be handled only by the edges. Avoid touching the top or bottom of the disk. The light passes through the non-frosted areas of the disk so these areas must be kept free of smudges and fingerprints. Wet disks should never be placed in the meter. Wet disks should be dried with a lint-free cloth before placing them into the chamber.

The disk is positioned in the chamber by aligning the D-shaped hole in the center of the disk over the D-shaped hub in the photometer chamber. The disk should be placed gently on the hub. There is no need to firmly press the disk down onto the hub. Universal disk cover should then be placed over the disk before running the test.

DISK STORAGE



Disks are sensitive to moisture and UV light. Avoid opening more packs than are needed. Disks have a limited shelf life and should not be exposed to the humidity in the air more than necessary.

Do not transport the meter with a disk in the chamber.

Store disks at 70°-80 °F (21°-27 °C).

METER

When a filled disk is placed in the chamber with universal disk cover and the lid is closed, the meter spins at high speed to distribute the sample to the test wells. Next the meter slows to maximize the pumping action of the stainless steel mixing beads as the reagents mix with the sample water. Each reaction is then read at the proper time and wavelength for that reagent system.

The button located in the lower center of the top of the meter turns the instrument on and off.

The blue on/off button indicator light indicates the status of the instrument.

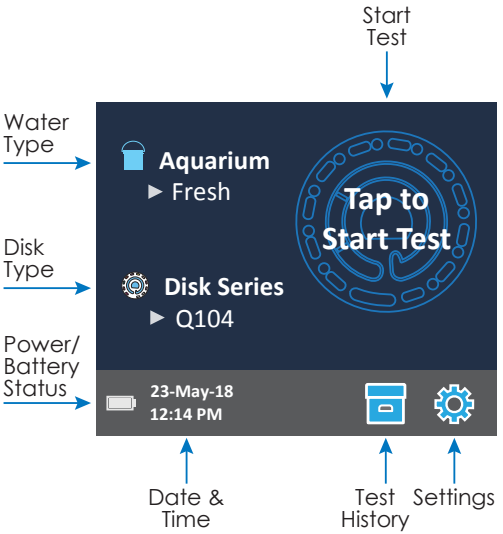
Steady blue light – the blue LED will remain steady to indicate that the meter is on and ready to run a test.

Blinking blue light (three blinks/second) – a test is in progress and the disk is spinning. Do not open the lid when the disk is spinning.

Care should be taken when closing the lid. Do not slam the lid. Wiring between the lid and the body of the photometer passes through the hinge. The meter will not run with the lid open.

METER TOUCHSCREEN DISPLAY

When the button is pressed to turn the meter on, the Test Screen will be displayed.



The display screen is touch-activated. To make a selection, tap the icon or word on the screen with a fingertip, fingernail, pencil eraser, or stylus.

- Gently wipe smudges from the screen with the Cloth Wipe.
- Do not touch the screen with a sharp object.
- Do not place objects on the screen that will scratch or damage it.
- Avoid touching the screen with wet fingers.

TESTING: CONNECTED TO A PC VIA USB

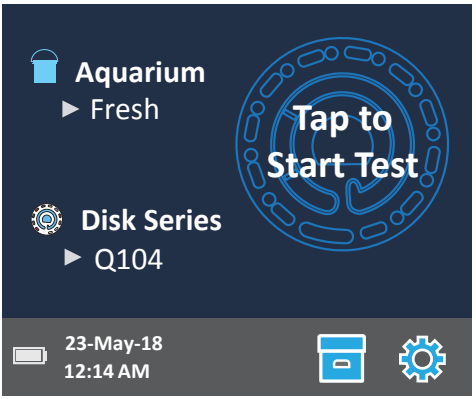
When the API AQUASPIN is connected to your PC via USB cable, the meter touchscreen will become disabled and operation of the meter is performed using the API AQUASPIN website.

1. Connect your AQUASPIN meter to your PC via the USB cable.
2. Next, initiate the AQUASPIN program by signing into your account at: https://www.apifishcare.com/login

3. Refer to the FILLING section (page 4) for this step.
4. Place the filled disk into the AQUASPIN meter and cover the disk with the Universal Disk Cover. Close the meter lid.
5. Once signed into your retailer account, ask the customer if they have an AQUASPIN Advise account.
    a. If the customer already has an account, enter their email address under the CONSUMER ACCOUNT LOOKUP section and select the tank name they are testing.
    b. If the customer does not have an account, enter their email address and tank type under the REGISTER NEW CONSUMER ACCOUNT section.
6. Next, select the disk type (the disk type can be found on the foil packet). Then, hit RUN TEST button on the computer screen. The meter will automatically begin the test.
7. After a few minutes, the results will populate on the computer screen accompanied by API product recommendations.
8. An option to email the results and recommendations to the customer is then made available and the results are saved to the customer's AQUASPIN Advise account.
9. REMOVE THE DISK FROM THE CHAMBER. DISPOSE OF THE DISK. Disks left in the chamber can leak and damage the device. Do not store the disk cover on the hub.

NOTE: Remove salt residue daily. Salt will damage the meter and cause inaccurate results. See the CLEANING section in the manual.

TESTING: NOT CONNECTED TO A COMPUTER*



1. Press the power button and hold in the button until the meter turns on.
2. Select an Aquarium type. Tap to confirm.
3. Select a Disk Series type. Tap to confirm. (Disk Series type can be found on the disk foil packaging). NOTE: Disk Series are limited by Water type selection.

4. Remove a disk from the packaging.
5. Use the syringe to fill the disk with the water sample.
6. Insert the disk. Cover the disk with the Universal Disk Cover. Close the lid.
7. Tap the "Tap to Start Test" text on the screen. If you wish to cancel the test, tap the "X" on the screen. If the test is cancelled discard the disk.
8. The results will be displayed.
9. Choose an option.
    a. Tap "water drop" to return to the Test Screen.
    b. Tap the highlighted "Floppy Disk" to save test results to the test log if Auto Save is not enabled.
10. REMOVE THE DISK FROM THE CHAMBER. DISPOSE OF THE DISK. Disks left in the chamber can leak and damage the device. Do not store the disk cover on the hub.
11. Press and hold the power button for 2 seconds to turn the meter off.

NOTE: Remove salt residue daily. Salt will damage the meter and cause inaccurate results. See the CLEANING section in the manual.

NOTE: For water samples over 100 °F (38 °C) subtract 0.1 from pH result or, for the most accurate result, wait until water sample is below 90 °F (32 °C) to test.

NOTE: For the most accurate results samples should be at 50°-104°F(10°-40°C).

*This method of testing will not allow the customer to receive history of their aquarium testing or product recommendations. TESTING: CONNECTED TO A COMPUTER VIA USB is the preferred method of testing.

OUT OF RANGE TEST RESULTS

Test results that are out of range of the reagent system will be RED. If the concentration for one test factor is significantly out of range, the accuracy of the results for the other test factors may be affected. For details see RANGES and SALTWATER SAMPLE DILUTION.

SALTWATER SAMPLE DILUTION

Test results that are out of range of a reagent system will be RED. If results for Nitrate, Nitrite, Ammonia or Phosphate are out of range, the water sample must be diluted with saltwater to obtain accurate results. The salinity concentration of the sample must be maintained for the reagent system to function properly. The water sample cannot be diluted with tap water or water that does not contain salt.

Preparation of the Saltwater

1. Prepare 1 liter of synthetic seawater in distilled or deionized water according to the manufacturer's instructions.
2. Test the prepared seawater with a saltwater Spin disk. Compare the results to the manufacturer's specifications for Alkalinity, Calcium, Magnesium, and pH. The results should meet the manufacturer's specifications. The results for Nitrate, Nitrite, Ammonia and Phosphate should be 0 ppm.

Dilution Procedure

If a test result for Nitrate, Nitrite, Ammonia or Phosphate is RED, the result is out of the range of the reagent system and must be diluted and retested to obtain a reading which is in the concentration range for the test.

The sample water and saltwater can be measured with any accurate measuring device (graduated cylinder, pipet, or measuring spoon) if the ratio of sample water to salt water is maintained. For example, mix 1 mL of sample water and 9 mL of saltwater or mix 1 teaspoon of sample water and 9 teaspoons of saltwater.

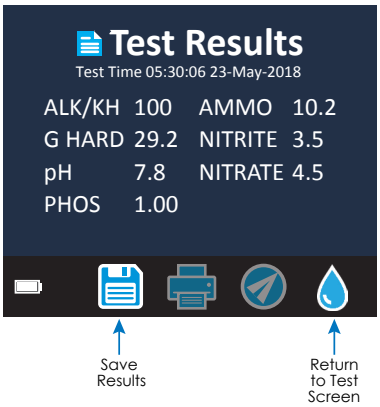
1. Add 1 mL of sample water to a container.
2. Add 9 mL of saltwater to the container.
3. Mix by swirling or stirring with a clean stirrer.
4. Test the diluted sample.
5. Multiply the results on the screen for Nitrite, Nitrate, Ammonia, and Phosphate by Results for Calcium, Magnesium and pH are not valid for the diluted sample.

For a smaller dilution, mix 1 mL of sample water with 1 mL of saltwater. Multiply the test result by 2.

For a larger dilution, mix 1 mL of sample water with 19 mL of saltwater. Multiply the test result by 20.

Ranges Enabled must be ON for the out of range test results to be displayed in RED.

TEST HISTORY SETTING

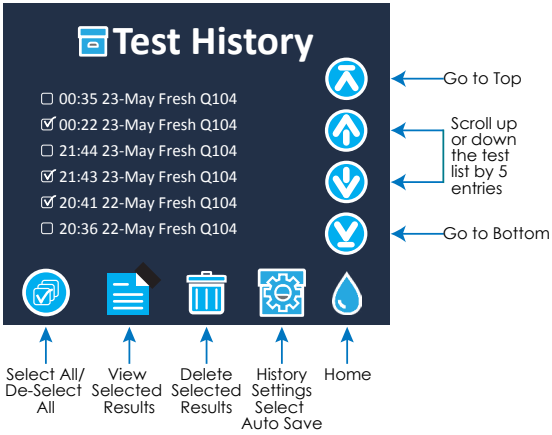


Printing results and transferring results via Bluetooth are not an option with the API AQUASPIN photometer. Printing testing results and product recommendations can be done via the API AQUASPIN website. Register for your store account here: https://www.apifishcare.com/store-register. If you already have a store account, login here: https://www.apifishcare.com/login.

The API AQUASPIN meter can log test results for 250 water samples in the Test History. The results for the most recent sample will be located at the top of the list. All results can be logged automatically, or results for an individual sample can be logged manually after the sample has been tested.

To turn on automatic logging, tap on the Test Screen. Tap . Select Auto-Save Tests. Tap and to return to the test screen. When Auto Save is selected will not be highlighted on the Test Results screen.

To manually log results for one sample at a time, Auto-Save Tests must be disabled. If Auto-Save Tests is disabled will be highlighted on the Test Results screen. After the test has been run, tap to save the results for that water sample to the Test History.



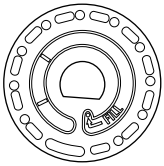
Logged results are viewed in Test History. Controls for viewing and managing single or multiple test records are located on the Test History screen. Tap the checkbox next to a test record to select it, then tap one of the buttons along the bottom to perform an action with the selected records.

If the ⚠ symbol is displayed the default blank was used because the disk was under filled or there was an air bubble.

SYRINGE

A plastic syringe is used to fill the disks. A precision tip on the syringe fits into the fill hole on the disk. The syringe tip should not be removed from the syringe. Syringes should be cleaned between water samples. Pump air in and out of the syringe a few times to clear the previous sample, or rinse the syringe with a small amount of the next water sample before filling it with the next sample. Replace the syringes when the tips become worn, or the plungers don't move smoothly. See Accessories and Replacement Parts.

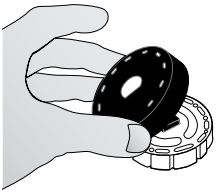
REAGENT DISK



The API AQUASPIN uses a disk reagent system. The dried reagents are packaged in single test amounts in a sealed, polystyrene disk. Stainless steel mixing beads in the reaction chambers mix the sample water and the dried reagents. Tests for all factors in the series are performed at one time. It is not possible to isolate the well for a single factor and perform a test for one test factor only. Disks should not be filled in the meter chamber.

UNIVERSAL DISK COVER

The black Universal Disk Cover (1719) is placed over the disk in the photometer chamber to reduce interference from stray light. The disk cover is positioned over the disk by aligning the D-shaped hole in the center of the disk over the D-shaped hub in the photometer chamber. The disk cover should be placed gently on the hub. There is no need to firmly press the disk cover down onto the hub. The test will be aborted if the disk cover is not used. Do not store the disk cover on the hub.



METER CHECK DISK

The Meter Check Disk (Code 1705) is used to evaluate the meter calibration and calibrate the meter if the calibration check fails:

IMPORTANT!!

Do not attempt to separate the components of the Meter Check Disk (Code 1705). The Meter Check Disk consists of a disk with a permanently attached cover. Do not fill the Meter Check Disk with water. Water is not used in the Meter Check Disk.

For use of the Meter Check Disk see TROUBLESHOOTING WITH THE METER CHECK DISK.

USB CABLE

A USB cable connects the API AQUASPIN to a PC. When used with the AC Power Adapter, it connects the meter to an AC outlet.

WARNING: only use the wall adapter that is supplied with the kit. Make no substitutions.

BATTERY

A fully charged battery will last for approximately 150 tests under average conditions. The battery life will vary based on usage patterns. The meter should be turned off after testing to prolong the battery life. The standard life cycle of a lithium ion battery is 500 cycles. The battery will fully charge in approximately 6 hours. The battery is designed to be charged overnight and should be charged indoors only. The battery is rated at 12 V and 8.1 AH capacity. Power the meter from the battery pack or from AC power. The USB cable and AC adapter are used to plug the meter into an AC outlet. WARNING: only use the AC adapter supplied with this equipment. Do not substitute.

The battery charge status is indicated by the battery icon on the display. The battery icon will indicate when the battery charge is full, partial, low, empty or charging. The empty battery icon will flash to indicate that meter should be connected to AC power source. If the meter continues to be used at low battery power without connecting it an AC power source, the meter will go into an auto-shutdown mode. In this mode the meter will be locked until the meter is connected to an AC source and the battery is charged to a sufficient voltage. While charging, the charging battery icon will be displayed. The meter should remain pluggedin until the battery is fully charged. When the battery is completely charged, the charging icon will change to the full battery icon.

SETTINGS

Tap to enter the SETTINGS menu. After changing a setting press confirm the change. Tap to return to the test screen at any time.

Brightness The brightness level of the display can be adjusted from 00 to 10. Tap and to adjust the brightness. Tap to exit to the Settings menu.

Date/Time The Year, Month, Day, Format, Hour, Minute, AM/PM can be set. Tap or to adjust the displayed value. Tap to move to the next value. After the last value has been chosen (minutes for 24 hour format, AM/PM for 12 hour format) tap to return to the Settings menu. Tap to exit to the Settings menu at any time.

Set Language There is one language option – English. Tap to exit to the Settings menu.

Calibration Tap to run an angle calibration to evaluate the alignment of the hub and disk. Tap to exit to the Settings menu.

Power Options There are three power options: Auto Dim Time, Auto Off Time, and Power. Tap the options then tap a selection. Tap selection. Tap to exit to the Settings menu.

Other Settings About section lists the Serial Number, Firmware Version, Bluetooth MAC address, Bluetooth Version and Test Count. (Bluetooth is not available on the API AQUASPIN.) The Test Count shows the number of complete tests that have been performed over the lifetime of the meter. Tap to return to the Settings menu.

Ranges Enabled allows the option of having test results that are out of the range of the reagent system displayed in red. The default setting is ON. Tap to return to the Settings menu.

TROUBLESHOOTING

METER TROUBLESHOOTING GUIDE

Problem	Reason	Solution
Meter Check Disk	Meter Check Disk in chamber instead of reagent disk	Select "Continue" to go to Test Results screen. Select "Abort" to go to Testing screen and run test with reagent disk.
⚠ On Test Results and Test History screens	Problem with default blank due to under filled disk or air bubble. Test results are questionable.	Fill disk correctly (see FILLING). On Test Results screen tap ! for details.
Range Error	Raw data out of range	Contact Support
Output Error	Decreased light intensity. Possibly dirty lens	Clean lens (see CLEANING). Follow Range Check Procedure. If error message persists, contact Support.

Consistently unexpected high results for metals	Metals may actually be present	Repeat test with distilled water. If the results still show that metals are present, contact Support.
Alkalinity result of 0 ppm	Usually due to an underfilled disk.	Review the disk filling procedures and test again. If problem persists, contact Support.
Low Nitrate or Nitrate-N results	Recent treatment with chlorine neutralizer containing sodium thiosulfate interferes with test reaction	Retest in 2 – 3 days
Unexpected results	Dirty disk cover	Gently clean disk cover apertures with pipe cleaner or lint free cloth.
Disk type is not an option in Disk Series	Software or meter firmware is out of date.	Update WaterLink Connect 2 at softwarecenter.lamotte.com
High pH results	Water sample temperature above 100 °F (38 °C) interferes with pH reagent	For water samples over 100 °F (38 °C) subtract 0.1 from pH result or, for the most accurate result, wait until water sample is below 90 °F (32 °C) to test
Disk not spinning	Lid open, meter not powered on, low battery, disk or disk cover pressed down too tightly on hub	Close lid, power on meter, charge the battery or plug meter into a stable power source, remove the disk/disk cover and place back in the chamber more gently
	Fast electrical transients may disrupt operation of the API AQUASPIN meter	Restart the test to resume normal operation
Trouble connecting to computer by USB	Broken connection	Press and hold power button for 1 second.
Meter won't turn on	Needs reset or evaluated	Contact Support

METER CHECK DISK TROUBLESHOOTING GUIDE

IMPORTANT!!

Do not attempt to separate the components of the Meter Check Disk (Code 1705). The Meter Check Disk consists of a disk with a permanently attached cover. Do not fill the Meter Check Disk with water. Water is not used in the Meter Check Disk.

CALIBRATION OPERATIONS

The Meter Check Disk (MCD) is used to perform two calibration operations – Check Calibration and Start Calibration. The Start Calibration procedure should only be performed if the meter fails the Check Calibration procedure.

Check Calibration

Meters are calibrated at the time of manufacture. However, it is possible for the calibration settings to be lost due to power anomalies or other circumstances. The Meter Check Disk is used in the Check Calibration procedure to determine whether the alignment of the hub and disk are correct. For some meters, it also evaluates the brightness of the individual LEDs.

1. Follow the CLEANING procedure to clean the light chamber and optic lenses.
2. From the main test page, tap to select Settings.
3. Tap **Calibration**.
4. Tap **Check Calibration**.
5. Remove the Meter Check Disk (Code 1705) from the foil pouch. DO NOT remove the black cover from the disk. Insert the Meter Check Disk (MCD) into the meter and close the lid.
6. Tap **Start**.
7. The meter will briefly spin. When it is complete, six channel values will be displayed. Compare the displayed channel values to those printed on the MCD pouch. If the displayed channel values are within the ranges provided on the Meter Check Disk pouch, the meter is calibrated and performing normally. If the displayed channel values are not within the ranges provided on the Meter Check Disk pouch, perform the Start Calibration procedure.

   NOTE: Range specifications are specific to the disk identified by the serial number on the pouch. The range specifications will vary from disk to disk. The exact readings from a specific disk may vary from meter to meter.
8. Tap to return to the test screen.
9. Remove the MCD from the meter and return to the foil pouch for storage.

Start Calibration

The Start Calibration procedure calibrates the alignment of the hub and disk for all meters and sets the brightness of the individual LEDs for compatible meters. Before performing this calibration procedure, run the Check Calibration procedure to determine whether the meter is calibrated and operating normally. The Start Calibration procedure should only be completed if the meter fails the Check Calibration procedure.

1. Follow the CLEANING procedure to clean the light chamber and optic lenses.
2. From the main test screen, tap to select Settings.
3. Tap **Calibration**.
4. Tap **Start Calibration**.
5. Remove the Meter Check Disk (Code 1705) from the foil pouch. DO NOT remove the black cover from the disk. Insert the Meter Check Disk. Close the lid.
6. Tap **Start**.
7. When the calibration is complete the message "Angle Calibration Successful" will appear. Meters that can also perform an LED calibration will display "LED Calibration Successful".
8. Tap to return to the test screen.

Angle Calibration checks the alignment of the hub and disk. The LED Calibration sets the brightness of the individual LEDs. The results are reported as pass or fail. If the measurements pass, the settings will be saved, and the meter is calibrated. If the analysis fails, contact Support.

AQUASPIN WEB APPLICATION ASSISTANCE

For questions or comments regarding API AQUASPIN website, please contact: Mars Fishcare by calling 1-800-847-0659 or by emailing APITechServices@effem.com.

For meter troubleshooting, please contact: LaMotte® Company by calling 1-800-344-3100 ext. 3 or by emailing softwaresupport@lamotte.com.

HELPFUL HINTS

- DO NOT fill disk while in the meter. Fill the disk on a clean, dry surface.
- The disk should not contain any large air bubbles. Air bubbles will cause erroneous results.
- Empty syringe of previous water sample before filling with next water sample.
- Remove the filled disk from the meter after testing.
- Disks are sensitive to moisture and UV light. Only open new disk packaging when needed for a new test.
- Store new, packaged disks between 70°-80° F (21° – 27° C).
- Disks cannot be used more than once.
- Do not touch top or bottom of disk. Handle disk by the edge.
- Fill the disk on a dark surface to more easily see the sample water.
- Only the Universal Disk Cover (Code 1719) can be used with the API AQUASPIN.
- Keep the chamber clean and dry. Gently swab LED and photodiode lenses located around the hub with a cotton swab dampened with streak-free window cleaner. Do not use alcohol. It will leave a thin film over the lenses when dry.
- Hold syringe vertically when filling disks.
- Do not store the disk cover on the hub.

RANGES

AQUASPIN Freshwater Disk (Code FW01)

Test Factor	Display Abbreviation	Range	Accuracy	Minimum Detection Limit
Alkalinity (KH)	ALK	0 – 250 ppm	+/- 15%	15 ppm
Ammonia	AMMO	0 – 3.0 ppm	+/- 0.2 ppm < 2.0, +/- 0.4 ppm > 2.0	0.2 ppm
General Hardness (GH)	G HARD	0 – 500 ppm	+/- 15%	20 ppm

Nitrate	NITRATE	0 – 300 ppm	+/- 30%	5 ppm
Nitrite	NITRITE	0 – 2.0 ppm	+/- 0.2 ppm	0.1 ppm
pH	pH	4.5 – 10.0	+/- 0.2 units	NA
Phosphate	PHOS	0 - 2.0 ppm	+/- 0.2 ppm	0.2 ppm

AQUASPIN Saltwater Disk (Code SW01)

Test Factor	Display Abbreviation	Range	Accuracy	Minimum Detection Limit
Alkalinity (KH)	ALK	0 – 300 ppm	+/- 15%	15 ppm
Ammonia	AMMO	0 – 3.0 ppm	+/- 0.2 ppm < 1, +/- 0.4 ppm >1	0.2 ppm
Calcium	CAL	200 - 800 ppm	+/-15 %	NA
Magnesium	MAG	500 – 2200 ppm	+/- 15 %	NA
Nitrate	NITRATE	0 – 60 ppm	+/- 25%	5 ppm
Nitrite	NITRITE	0 – 2.0 ppm	+/- 0.2 ppm	0.1 ppm
pH	pH	6.5 – 10.0	+/- 0.2 units	NA
Phosphate	PHOS	0 – 2.0 ppm	+/- 0.2 ppm	0.2 ppm

NOTE: Colored reagents may be visible in the disk before adding sample water.

If the concentration of Calcium or Magnesium is out of the range listed above, the accuracy of the results for Ammonia and Alkalinity will be affected.

Nitrite levels greater than the range above will affect the Nitrate results. Calcium and Ammonia results will be affected if salinity is not within 17 – 45 ppt.

To order more disks or additional meters, shop here: www.shop.apifishcare.com

CONVERSIONS

Ammonia (NH_3)

Ammonia in water occurs in two forms: toxic unionized ammonia (NH_3) and the relatively non-toxic ionized form, ammonium ion (NH_4^+). This test method measures both forms as ammonia (NH_3) to give the total ammonia concentration in water. The actual proportion of each compound depends on temperature, salinity, and pH. A greater concentration of unionized ammonia is present when the pH value and salinity increase.

1. Consult the table to find the percentage that corresponds to the temperature, pH, and salinity of the sample.
2. To express the test result as ppm Unionized Ammonia (NH_3), multiply the Total Ammonia test result by the percentage from the table.
3. To express the test result as ppm Ionized Ammonia (NH_4^+), subtract the Unionized Ammonia determined in step 2 from the Total Ammonia.

pH	10°C		15°C		20°C		25°C	
	Fresh water[1]	Salt water[2]	Fresh water	Salt water	Fresh water	Salt water	Fresh water	Salt water
7.0	0.19	—	0.27	—	0.40	—	0.55	—
7.1	0.23	—	0.34	—	0.50	—	0.70	—
7.2	0.29	—	0.43	—	0.63	—	0.88	—
7.3	0.37	—	0.54	—	0.79	—	1.10	—
7.4	0.47	—	0.68	—	0.99	—	1.38	—
7.5	0.59	0.459	0.85	0.665	1.24	0.963	1.73	1.39
7.6	0.74	0.577	1.07	0.836	1.56	1.21	2.17	1.75
7.7	0.92	0.726	1.35	1.05	1.96	1.52	2.72	2.19
7.8	1.16	0.912	1.69	1.32	2.45	1.90	3.39	2.74
7.9	1.46	1.15	2.12	1.66	3.06	2.39	4.24	3.43
8.0	1.83	1.44	2.65	2.07	3.83	2.98	5.28	4.28
8.1	2.29	1.80	3.32	2.60	4.77	3.73	6.55	5.32
8.2	2.86	2.26	4.14	3.25	5.94	4.65	8.11	6.61
8.3	3.58	2.83	5.16	4.06	7.36	5.78	10.00	8.18
8.4	4.46	3.54	6.41	5.05	9.09	7.17	12.27	10.10
8.5	5.55	4.41	7.98	6.28	11.18	8.87	14.97	12.40

[1]Freshwater data from Trussel (1972).

[2]Seawater values from Bower & Bidwell (1978). Salinity for Seawater values = 34% at an ionic strength of 0.701 m.

FOR EXAMPLE:

A fresh water sample at 20°C has a pH of 8.5 and the test result is 1.0 ppm as Total Ammonia.

1. The percentage from the table is 11.18% (or 0.1118).
2. 1 ppm Total Ammonia x 0.1118 = 0.1118 ppm Unionized Ammonia
3.

Total Ammonia		1.0000 ppm
Unionized Ammonia	−	0.1118 ppm
Ionized Ammonia	=	0.8882 ppm

To convert Ammonia (NH_3) to Ammonia-Nitrogen (NH_3-N) multiply by 0.823

To convert Nitrite (NO_2) to Nitrite-Nitrogen (NO_2-N) multiply by 0.304

To convert Nitrate (NO_3) to Nitrate-Nitrogen (NO_3-N) multiply by 0.226

SPECIFICATIONS

Instrument Type	Centrifugal Fluidics Photometer
Wavelengths (interference filters)	390 nm, 428 nm, 470 nm, 525 nm, 568 nm, 635 nm
Display	Color Capacitive Touchscreen, 3.5 in, 320 x 240 pixel resolution
Wavelength Accuracy	±2 nm
Wavelength Bandwidth	10 typical
Photometric Range	-2 to 2 AU
Photometric Precision	±0.01 AU at 1.0 AU
Photometric Accuracy	±0.01 AU at 1.0 AU
Sample Chamber	Accepts prefilled disk
Light Source	6 LEDS
Detectors	6 silicon photodiodes
Pre-Programmed Tests	Yes, with automatic wavelength selection
Languages	English
Temperature	Operation: 0-50 °C; storage – 40-60 °C
Operation Humidity Range	0- 90 % RH, non-condensing
Communication	USB-C, Bluetooth low energy technology (BLE)
Calibration	Factory set
Firmware	Updatable.
Software	WaterLink Connect 2
Power Requirements	USB wall adapter, USB computer connection or internal lithium ion rechargeable battery
Battery Type	Lithium ion
Minimum Capacity	12 V/2.6 AH
Charge Life	Approximately 150 tests
Battery Life	Approximately 500 charges
Full Charge	6 hours
Water Resistance	Rubber over-molded base, rubber USB Port Plug, gasketed display and hinge.
Electrical Rating	Rated voltage 5V⎓, Rated power of input current (1.6 A) at USB C
Auto Off	Yes, default 15 (only with battery power)
Power Save	Yes, default OFF
Data Logger	250 test results stored for download to PC

Certifications	EZ-BLE™ PRoC™ Module, CYBLE-022001-00 RF Radio:	FCC (USA):	FCC ID: WAP2001
		Industry Canada (IC) Certification:	License IC: 7922A-2001
		CE (Europe):	Complies with Directive 1999/5/EC
		MIC (Japan):	005-101007
		KC (Korea):	MSIP-CRM-Cyp-2001
	EMC:	EU: ETSI EN 301489-1 US: FCC PART 15 B CAN ICES-3 (B)/NMB-3(B) AS/NZS: CSPR 22	
	Safety:	EU: EN61010-1:2010 AS/NZS: national differences	
Dimensions	21.6 X 12.4 X 10.4 cm (L X W X H) 8.5 X 4.9 X 4.2 in		
Weight	0.79 Kg, 1.74 lb		

ACCESSORIES AND REPLACEMENT PARTS

Description	Code
API AQUASPIN Meter	ASO1
Syringe with tips (3)	1189-3
Syringe tips (3)	1189-TIP
Cleaning Tissues	0669
Meter Check Disk	1705
Universal Disk Cover	1719
USB Cable	1712
AC Adapter	1713
Cloth Wipe	3580-WIPE-GEN
Carrying Case	OC01
API AQUASPIN Manual	AP-3580-MN
API AQUASPIN Quick Reference Guide	AP-3580-QG
API AQUASPIN Counter Mat	AP-3580-MAT
API AQUASPIN Banner	AP-3580-BAN
API AQUASPIN Decal	AP-3580-DECAL

MAINTENANCE

CLEANING

The optical system of the API AQUASPIN must be kept clean and dry for optimal performance. Dry the disk with a lint-free wipe before placing it in the chamber to avoid introducing moisture. For best results, store the instrument in an area that is dry and free from aggressive chemical vapors. Clean the exterior housing with a damp, lint-free cloth. Do not allow water to enter the light chamber or any other parts of the meter. To clean the light chamber and optic lenses, point a can of compressed air into the light chamber and the lid and blow the pressurized air into the light chamber and lid. Focus the pressurized air around the LEDs which are the small round lenses positioned at 2:00, 4:00, 6:00, 8:00, 10:00 and 12:00 in the lid. The photodiodes are located on the bottom of the chamber around the hub. This area must be kept clean and dry. Use a cotton swab dampened with streak-free window cleaner to gently swab the LED and photodiode lenses. Do not use alcohol; it will leave a thin residue over the optics when dry.

Remove smudges due to routine use from the touchscreen with the Cloth Wipe (Code 3580-WIPE-GEN). Use a cloth dampened with alcohol for more thorough cleaning when necessary. Do not use streak-free window cleaner, or similar cleaners, on the touchscreen.

RETURNS

Should it be necessary to return the meter, pack the meter carefully in a suitable container with adequate packing material. A return authorization number must be obtained from LaMotte Company by calling 800- 344-3100, ext. 3 (US only) or 410-778-3100, ext. 3, faxing 410-778-6394, or emailing softwaresupport@lamotte.com. Often a problem can be resolved over the phone or by email. If a return of the meter is necessary, attach a letter with the return authorization number, meter serial number, a brief description of problem and contact information including phone and FAX numbers to the shipping carton.

METER DISPOSAL

Waste Electrical and Electronic Equipment (WEEE)

Natural resources were used in the production of this equipment. This equipment may contain materials that are hazardous to health and the environment. To avoid harm to the environment and natural resources, the use of appropriate take-back systems is recommended. The crossed out wheeled bin symbol on the meter encourages the use of these systems when disposing of this equipment.

Take-back systems will allow the materials to be reused or recycled in a way that will not harm the environment. For more information on approved collection, reuse, and recycling systems contact local or regional waste administration or recycling services. Do not incinerate the equipment.

DISK DISPOSAL

The disks cannot be reused. Over time, the water in reacted disks will evaporate. Disks can be recycled. Warning: Recyclers should check with the local authorities. Some states may require that no chemical residue remains on the plastic or may not be able to accept plastic waste with stainless steel mixing beads.

GENERAL INFORMATION

PACKAGING AND RETURNS

Experienced packaging personnel at LaMotte Company assure adequate

protection against normal hazards encountered in transportation of shipments. After the product leaves the manufacturer, all responsibility for its safe delivery is assured by the transportation company. Damage claims must be filed immediately with the transportation company to receive compensation for damaged goods. Should it be necessary to return the instrument, pack the instrument carefully in a suitable container with adequate packing material. A return authorization number must be obtained from LaMotte Company by calling 1-800-344-3100 or 1-410-778-3100, ext. 3 or emailing tech@lamotte. com. Attach a letter with the authorization number to the shipping carton which describes the kind of trouble experienced.

GENERAL PRECAUTIONS

Read the instruction manual before attempting to set up or use the instrument. Failure to do so could result in personal injury or damage to the meter. The API AQUASPIN should not be stored or used in a damp or excessively corrosive environment. Care should be taken to prevent water or reagents from entering the photometer chamber. Wet disks should never be put into the photometer chamber.

SAFETY PRECAUTIONS

Read the safety precautions on the labels of all reagent containers and packaging prior to use. Ensure that the protection provided by this equipment is not impaired. Do not install or use this equipment in a manner that is not indicated in this manual.

LIMITS OF LIABILITY

Under no circumstances shall LaMotte Company be liable for loss of life, property, profits, or other damages incurred through the use or misuse of its products.

CE MARK

The API AQUASPIN meter has been independently tested and has earned the European CE Mark of compliance for electromagnetic compatibility and safety.

This meter complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This meter may not cause harmful interference, and (2) this meter must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital meter, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARRANTY

LaMotte Company warrants this instrument to be free of defects in parts and workmanship for 2 years from the date of shipment. Keep the proof of purchase for warranty verification. If it should become necessary to return the instrument during the warranty period, contact our Technical Service Department at 1-800-344-3100 or 1-410-778-3100, ext. 3 or softwaresupport@lamotte.com for a return authorization number or visit www.lamotte.com for troubleshooting help. The sender is responsible for shipping charges, freight, insurance, and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. LaMotte Company specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental, or consequential damages. LaMotte Company's total liability is limited to repair or replacement of the product with a new or refurbished meter as determined by LaMotte Company. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Serial Number _____

ORDERING

To purchase more API reagent disks, additional AQUASPIN meters, or the Storage and Carrying Case, shop through the link here: www.shop.apifishcare.com.

To purchase spare parts, contact LaMotte Company by calling 1-800-344-3100. ext. 3, or by emailing softwaresupport@lamotte.com.

Questions or Comments?
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