Reefmaster
- PIPER -

User manual

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Contents

Important note regarding the use of this manual

Please read this manual carefully and completely before using the Reefmaster PIPER. It contains important information regarding the safe use, installation, and maintenance of the device. Incorrect handling may result in damage to the device or inaccurate readings. Keep this manual for future reference and ensure that all persons using the device are familiar with the instructions. If you have any questions or concerns, please contact us at support@reefmaster.tech or visit www.reefmaster.tech for further information.

1. Warnings

The PIPER may only be operated with the reagents intended for it. It may only be used with the supplied hoses. The hoses may not be shortened, extended, or kinked.

The PIPER may only be operated with the supplied power supply. Use only indoors for aquaristic purposes.

Instructions for safe use:

- Do not expose the PIPER to any heat source.
- The PIPER is designed for reliable operation at normal room temperatures.
- Do not cover the ventilation slots on either side during use.
- Place the PIPER on a stable, flat, and above all, level surface during use.
- Be careful when handling the PIPER to avoid mechanical damage to the connectors.
- Avoid moving the PIPER during operation.
- Do not expose the PIPER or the power supply to direct water.
- Wear the included nitrile gloves during all steps involving the PIPER reagents.

2. Scope of delivery

Accessories:

Reefmaster PIPER

Power supply (12V)

1 aquarium hose holder with 2 pre-installed silicone hoses

3 additional colored silicone hoses

3 screw caps with holes

1 pair of gloves

Consumables:

1 set each of test reagents (Ca, KH, Mg, PO_4, NO_3)

1 bottle of „Cleaning Solution“

bottle each of reference solution
(multi-reference solution, NO_3-reference solution)

3. Technical data

Electrical data

Power supply	Specification
Input voltage	100 – 240 V AC
Output voltage	12 V DC
Frequency	50 / 60 Hz
Leistung	36 W

Dimensions

measuring device	Dimension
Length	259,5 mm
Width	250 mm
Height	213,5 mm

Measuring range

Measured value	Measuring range	Resolution	Accuracy
KH*	4,5 – 11 °KH	0,13 °KH	± 0,13 mg/l
Calcium*	290 – 600 mg/l	9 mg/l	± 9 mg/l
Magnesium*	1000 – 1700 mg/l	10 mg/l	± 10 mg/l
Phosphate	0,00 – 0,8 mg/l	0,01 mg/l	± 0,02 mg/l ± 5% of the measured value
Nitrate	0,00 – 50 mg/l	0,01 mg/l	± 1 mg/l ± 5 % of the measured value

*The concentrations of KH, calcium, and magnesium are determined by titration using a color-change reaction. The incorporation of device-specific correction factors by measuring the reference solutions during initial setup can affect the measuring ranges, resolutions, and accuracies. The measuring ranges are therefore slightly redefined with each reference measurement. The table shows the values preinstalled on the device.

4. Initial setup

4.1 Connect PIPE

Important: Only use the supplied hoses and do not shorten or lengthen them!

Connect aquarium water hose

- Thread the short end of the yellow silicone hose through the top hole in the hose holder slider and connect it to the connector at the bottom of the slider (1).
- Use the screws to adjust the hose holder so that the silicone hose is 3 cm below the sump's water surface. Make sure the hose is not kinked at any point.

- Use the long screw to secure the holder to the desired location on the sump. There are mounting options for both pool aquariums (screw on the side) and aquariums with a horizontal glass bridge (screw on top).

- Then connect the long end of the yellow silicone hose to the "AW" (aquarium water) connection and the white silicone hose to the "SV" (safety valve) connection on the PIPER (2).

Connect osmosis water hose

- Attach the blue silicone hose to the reverse osmosis water storage tank so that the hose is just above the bottom of the tank. Connect the other end of the hose to the "OW" (reverse osmosis water) connection on the PIPER (2).

Connect waste water hose

- Attach the black silicone hose to a suitable wastewater container and connect the other end of the hose to the "DR" (drain) connection on the PIPER (2). Suitable containers are made of polyethylene (HDPE, LDPE), polypropylene, PVC, acrylic, or polycarbonate.

Put on the enclosed gloves for the next two steps.

Connect the cleaning solution hose

- Replace the cap of the "Cleaning Solution" bottle with the included screw cap with a hole. Thread the red silicone tube through the hole to the bottom of the bottle. Connect the other end of the red silicone tube to the "CL" (Cleaning) port on the PIPER (2).

Fill test reagents

- Fill the test reagents into the designated containers in the PIPER (3). Open only one container at a time to avoid contact between two reagents and incorrect filling. A minimum fill level of a few millimeters is required in the reagent bottles. Falling below this level will result in an error message being sent and the test being aborted.

Connect power supply

- Connect the power adapter to the connector marked (4) and connect it to the power supply.

Note: The hose connection for "KH pro" is not used. The option of a larger bottle for the KH reagent for more frequent measurements will be added later.

Please note that a reference measurement must be performed for each water value before first use to ensure accurate measurement results (see 6.4).

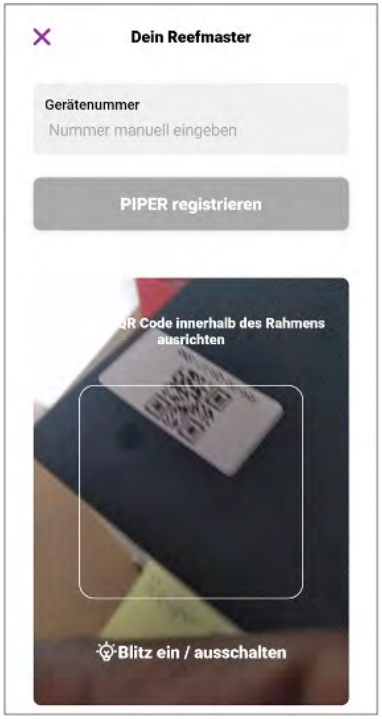
4.2 Install the smartphone app

Controlling the PIPER and viewing the measurement results is easy with the Reefmaster app.
Once you've connected the PIPER to power and the logo light turns purple, you can connect to your PIPER.
To do so, download the Reefmaster app to your smartphone from the iOS or Android app store.

4.3 Register user

When you open the app, a login screen will appear. If you don't have an account yet, click "Create Account" to register. Enter your email address and a password. You will then receive a confirmation code via email, which you must enter in the app. Once you're done, your Reefmaster account will be created, and you can log in. Once you're registered and logged in, you can connect the PIPER to the internet.

4.4 Register PIPER



In the first step, you'll be asked to scan the QR code on the back of the PIPER. Alternatively, you can enter the serial number manually.

4.5 Connect PIPER to the Wi-Fi

The next step requires Bluetooth and location services. Please ensure both services are enabled and the necessary permissions are granted. The app will now search for the Reefmaster PIPER. All available Bluetooth devices within range will be displayed. Select your PIPER; you'll recognize it by the device name beginning with "PIPER."

4.6 Select Wi-Fi

In the next step, select the desired Wi-Fi network to which you want to connect the PIPER.

4.7 Enter Wi-Fi password

Enter the password for the desired Wi-Fi network and tap "Connect." Once the PIPER is successfully connected to the Wi-Fi network, the logo on the device will glow green. You will then be redirected to the measurement overview in the app.

5. Logo Light Status

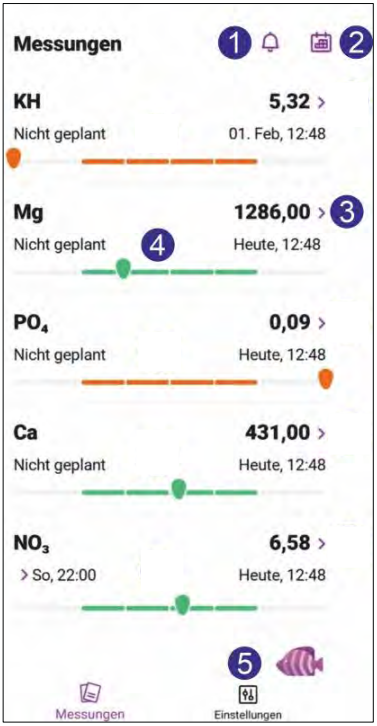
The color of the logo light indicates the current status of your PIPER.

Please do not unplug the PIPER from the power supply while it is in operation. This applies to ongoing measurements (blue), erroneous measurements (red), and measurements during offline mode (purple).

Color	Meaning
White	The PIPER is switched on but not connected to the WLAN.
Green	The PIPER is connected to the WLAN.
Blue	The PIPER performs a measurement or automatic calibration.
Purple	The PIPER is configured for Wi-Fi but is currently disconnected (offline mode). In this mode, it continues to operate with the last saved settings and transmits the results to the smartphone as soon as the Wi-Fi connection is restored.
Red	The PIPER has detected an error during a test and is now ending the test. After the test is complete, check the notifications in your Reefmaster app and follow the instructions. Do not unplug the PIPER from the power supply during this state.

6. Using the app

6.1 Measurements – Overview



The overview screen shows the result and date of the last measurement as well as the time of the next scheduled measurement

(1) Notification Center.

(2) Measurement time settings (see 6.2).

(3) Measurement result details (see 6.3).

(4) Indicates whether the last measurement result is within the ideal range.

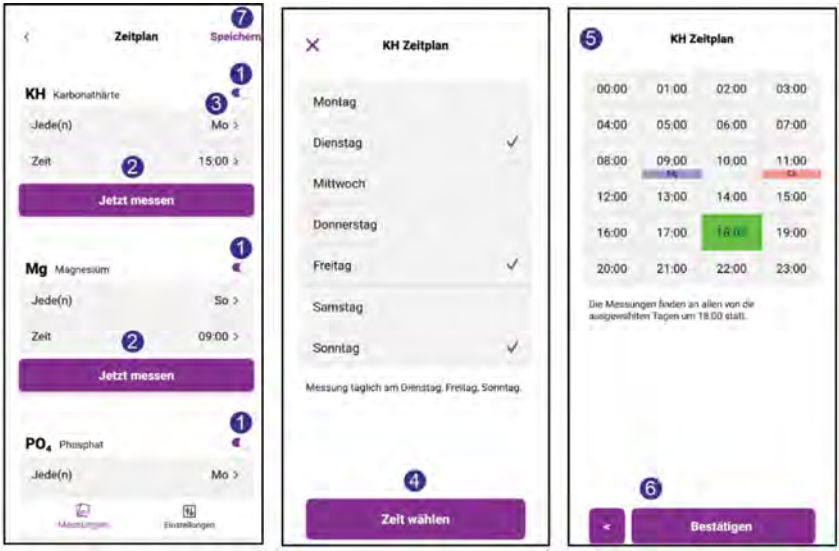
(5) Other settings (see 6.6).

Important: Please note that the first time you use the PIPER, you will see a blank screen because no measurements are available yet.

Therefore, it's best to set up your first tests right away.

Please note that a reference measurement must be performed for each water parameter before using the PIPER for the first time to ensure accurate results (see 6.4).

6.2 Measurements - Schedule



(1) Use the switch to specify whether or not each water value should be measured.

(2) If you want to measure a water value right away, click "Measure now."

(3) Here you can select the days of the week on which the measurement should take place. Clicking this button will navigate you to the selection list of the days you want to measure.

(4) Select the days of the week on which you want to take the corresponding measurement. Clicking "Select time" will navigate you to the time of day at which the measurement will take place. The time of day is the same for all days of the week.

(5) The daily schedule provides an overview of all scheduled measurements. Measurements can be set hourly and each lasts approximately 30–75 minutes.

(6) Once you have set the desired time for the respective measurement, confirm it by clicking the "Confirm" button.

(7) To activate the new schedule, click "Save."

6.3 Measurements – Details

If you click on a measured value in the overview, you will be taken to the detailed view, which shows you the temporal development of the selected measured value.

(1) Here you can view the measurement interval, for example, in a daily, weekly, or monthly view. The weekly and monthly views display the daily averages.

(2) You can switch between individual days, weeks, and months to view previous measurement results.

(3) The data is displayed either as a chart

(4) or in tabular form.

(5) The calendar will take you to the schedule.

(6) Clicking "Measure now" allows you to start a measurement immediately.

(7) Here you can start a reference measurement for this parameter (see 6.4).

6.4 Measurements – Reference

Please note that a reference measurement must be performed for each water value before using the PIPER for the first time to ensure accurate results.

For accurate results, regular reference measurements must be performed. To do so, proceed as follows:

(1) Replace the cap of the desired reference solution (Multi-Reference for KH, Ca, Mg, and PO_4 and NO_3 Reference for NO_3) with one of the caps with a hole.

(2) Thread the short end of the yellow "AW" (aquarium water) tube through the opening to the bottom of the bottle.

(3) Be sure to check that all required test reagents are refilled.

(4) Start the reference measurement in the app. You will receive a notification as soon as the reference measurement has been completed.

To maintain the accuracy of your test results, perform reference measurements regularly. This is especially important after refilling the test reagents to avoid production-related fluctuations.

We generally recommend performing a reference measurement every 4-6 weeks.

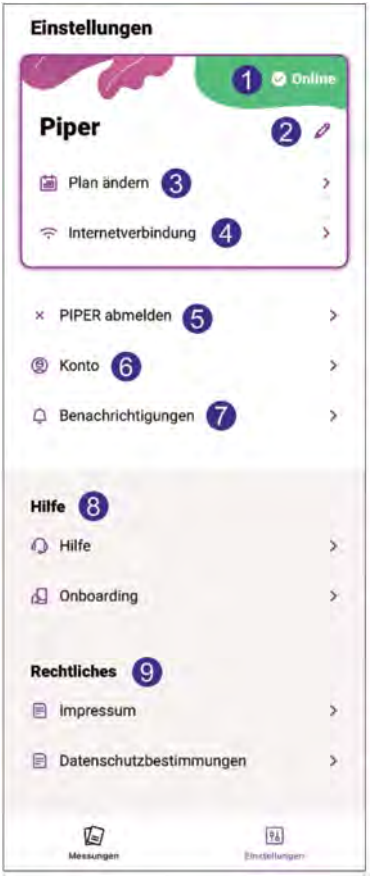
6.5 Measurements - Pump calibration

As mechanical components, pumps for aquarium water and reverse osmosis water can change their flow rate over time. To prevent inaccuracies caused by this, regular pump calibrations must be performed.

Pump calibrations are scheduled in the same way as tests in the app. Please activate both calibrations, Calibration I - AW and Calibration II - OW, in your schedule and specify the day and time for weekly calibration.

If weekly calibrations are not set, accurate measurement results cannot be guaranteed.

6.6 Settings



(1) This displays the current status of your PIPER:
Online: The PIPER is connected to the Wi-Fi network.
Offline: The PIPER is not connected to the Wi-Fi network.
Measurement in progress: The PIPER is currently performing a measurement or automated maintenance. Error: The PIPER has detected an error and is terminating the test.

(2) Click on the pen to rename the PIPER and give it any name you like.

(3) Here you can specify when which water value is measured.

(4) Here you can set up or change the internet connection.

(5) Each account can only be connected to one PIPER. If you want to connect a new PIPER, you must first deregister the previously connected PIPER.

(6) Here you can manage your account settings:

- View your email address
- Change your password
- Delete your account
- Log out of the app

Please note that for data protection reasons, you must send us an email to delete your account.

(7) Here you will find all push notifications sent by the PIPER, such as the start of a test, your test result, or problems such as an empty reagent.

(8) Here you will find further help and support. You can also reconnect your PIPER to the internet.

(9) In this section you will find the legal information and the privacy policy.

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