HUERISTIC DEVICES

Good measures

HD FLIP
USER MANUAL

Version 1.1

Hueristic Devices

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Contents

List of Code Listings

1 Before you begin

Before you start testing , you need to:

Clean the apparatus (measuring tubes and testing chambers) with distilled water.

Dispose any rinse off as well as excess/ leftover solutions into the jar of activated charcoal that has been provided for safe disposal

Keep tissue paper at the ready so that you can wipe the testing chamber dry as well as clean up any excess spillage

2 What your HD Flip Drinking water test kit should contain

- Reagents
- Distilled water
- Jar of activated charcoal
- 15ml measuring tubes
- 50ml measuring tubes
- Spoons for solid reagents
- Testing chambers (Borosil and PVC)
- Titration solution
- Calibration solutions
- Light Box
- Color Cards

3 Testing with HD Pro Water app

3.1 Standard Testing Procedure

Before testing for any parameter, please make sure you remember to:

- Rinse your apparatus with your water sample before beginning a test
- Dispose any rinse off as well as excess/ leftover solutions in the jar of activated charcoal/sponge that has been provided for safe disposal

The standard testing procedure for all tests is almost the same. The variables are marked in * and specified in the tables at the end of the manual.

3.1.1 Titration Procedure:

1. Measure out exactly the required amount* of your sample in a 15 ml measuring tube.
2. Pour this solution into the testing chamber
3. Add the required amount of reagent(s)*
4. Shake well to ensure proper mixing of reagents
5. Add the titration solution for the parameter you are testing for drop by drop, counting the number of drops you have added till the sample solution undergoes the intended colour change*
6. Open the HD Pro app
7. Click on the “Get Blank Form” option on the screen or Scan the barcode provided to get access to the form
8. Click on your respective project name to get the customised form
9. The form should now be downloaded. On the home screen, click on "Fill Blank Form" and select the form to start the test survey
10. If you do not see the parameter you are testing for on the screen, click on the ‘Next’ button at the bottom right corner of the screen to see the other test parameters as the form progresses
11. Click on the parameter name in the form to start the test
12. Enter the number of drops of titration solution used

13. Click on the ‘Enter’ button on your keyboard

14. Your result will be displayed in mg/l

Refer to the Table of Variables at the end of the manual (3.1.1) for variations in measurements.

3.1.2 Colorimetric Test Procedure:

Calibration

Calibration is the process of teaching your phone to relate colour intensity to the quantity of the parameter being tested. Calibration influences the quality of test results that are based on it. There is a one point calibration that needs to be performed once with the calibration solution provided before starting any new parameter or when there is a renewal of reagents.

How to calibrate

1. Take 5ml of calibration solution (10 ml for Nitrate) in a 15ml measuring tube

2. Add the required* amount of reagent (Same amount as is required while testing)

3. Mix well

4. Pour 5 ml of the solution into the testing chamber

5. Place the testing chamber into the holder in the box

6. Open the HD Pro app

7. Click on the “Get Blank Form” option on the screen or Scan the barcode provided to get access to the form

8. Click on your respective project name to get the customised form

9. The form should now be downloaded. On the home screen, click on "Fill Blank Form" and select the form to start the test survey

10. If you do not see the parameter you are testing for on the screen, click on the ‘Next’ button at the bottom right corner of the screen to see the other test parameters

11. Click on the parameter name in the form to start the test

12. On the next page click on "Calibrate"

13. Read the instructions on the screen and press "Start"

14. On the next page click on "Start Timer" and wait the required amount of time for the reaction to take place

15. The camera immediately opens up once the specific time is up

16. Point your phone to align green coloured grid on the screen with your colour card setup as illustrated in the picture at the end of the manual (Fig 1)

17. In case of error, re-calibrate

18. On successful scanning, you will be hinted at the calibrated point and the color shift

19. Press accept

2. Your phone is now calibrated. You can now begin testing samples

Note: Calibration needs to be done only once for every parameter. The "Calibrate" options changes to "Re-calibrate" when calibration is complete. There is no need for re-calibration before testing every sample.

Testing

1. Measure out exactly the required amount* of your sample in a 15 ml measuring tube.

2. Add the required amount of reagent(s)*

3. Shake well to ensure proper mixing of reagents

4. Pour 5 ml of the solution into the testing chamber

5. Place the testing chamber into the holder in the box

Ignore step 6-11 if you have already calibrated and are ready to test

6. Open the HD Pro app

7. Click on the “Get Blank Form” option on the screen

8. Click on your respective project name to get the customised form

9. The form should now be downloaded. Click on the “Get Blank Form” option on the screen or Scan the barcode provided to get access to the form

10. If you do not see the parameter you are testing for on the screen, click on the ‘Next’ button at the bottom right corner of the screen to see the other test parameters

11. Click on the parameter name in the form to start the test

12. Click on "Start Test"

13. Read the instructions on the screen and press "Start"

14. On the next page click on "Start Timer"

15. The camera immediately opens up once the specific time is up

12. Point your phone to align green coloured grid on the screen with your colour card setup as illustrated in the picture (Fig 1)

14. Your result will be displayed in mg/l

Refer to the Table of Variables at the end of the manual (3.1.2) for variations in measurements.

3.1.3 Turbidity and Hazen Units Test Procedure:

1. Take 20 ml of sample water in the 50ml tube.

2. Pour the required* amount of the solution into the testing chamber

3. Place the testing chamber in the space provided in the light box (In case of turbidity, use the blue/black chamber provided)

4. Open the HD Pro app

5. Click on the “Get Blank Form” option on the screen or Scan the barcode provided to get access to the form

6. Click on your respective project name to get the customised form

7. The form should now be downloaded. On the home screen, click on "Fill Blank Form" and select the form to start the test survey

8. If you do not see the parameter you are testing for on the screen, click on the ‘Next’ button at the bottom right corner of the screen to see the other test parameters

9. Click on the parameter name in the form to start the test

10. Click on calibrate

11. You will see a number of standard concentrations on the screen where calibration is required

12. Take the standard solutions provided to you and calibrate for each of the points before starting the test

13. To start calibrating, click on one of the standard points given and place the phone on top of the light box

14. Align the camera to the centre of the chamber as illustrated in the last page of the manual

15. Click on "Analyse"

16. You will hear a number of beeps accompanied by a long beep when the test is complete (Make sure to keep the phone absolutely still on top of the box during the beeping sound)

17. Click on "Accept"

18. Repeat for all points

19. Once each point has been calibrated, you will be able to start testing

20. Follow steps 1-9

21. Go back and click on "Start Test"

22. As soon as the camera opens, align the camera to the center of the chamber (Fig 2)

23. Your result will be displayed in mg/l

Refer to the Table of Variables at the end of the manual (3.1.3) for variations in measurements.

Dilution

If the parameter being tested is in high concentration, the app will prompt you to do a dilution of the sample by showing options for a 5x Dilution

1. Rinse the empty test chamber with distilled water to remove any traces of previous solutions

For a 5x Dilution:
- Measure 2ml of your water sample
- Add 18ml of distilled water, bringing up the total volume to 20ml This is the 10ml of sample you will be testing with

2. Follow Turbidity testing procedure from 2 - 9 and then press "Start Test"

3. Click on the 5x dilution option

5. Complete test in the same manner as specified above

*Refer to the TABLE OF VARIABLES for required measurements and wait times.