Manual

SPI Handheld meter D141

Contents

General information

The SPI handheld meter is specifically designed to carry out measurements in the field.
With the design there is aimed at a good price/quality ratio for this unit

This handheld meter can be used to measure the following parameters:

- Free available chlorine (VBC)
- Total chlorine (Tot. Cl)
- pH
- Hydrogen peroxide (PerO)

Limited warranty
This manual is made with care, although SanEcoTec is not taking any responsibility according the consequential for any failures made in this manual.

1. Introduction

Thank you for buying this handheld meter. This manual is made to help you by installation and use of your handheld meter. We advise to read this manual with care.

You bought our new handheld meter this handheld meter can be used to measure the following parameters:

- Free available chlorine (VBC)
- Total chlorine (Tot. Cl)
- pH
- Hydrogen peroxide (PerO)

Specifications for these parameters:

Measurments	Liquid	Range	Accuracy
VBC	DPD	0-2 mg/l	+/- 0.03 mg/l
Tot. cl	DPD	0-2 mg/l	+/- 0.03 mg/l
pH	Phenol Red	6.8- 8.0 pH	+/- 0.1 pH
PerO	Peroxide color	0-15 ppm	+/- 0.1 ppm
PerO	Peroxide color	15-100 ppm	+/- 1 ppm

These accuracies are based when you take care of all procedures described in this manual.

2. Function and operation

2.1 Warnings:

- This handheld meter is not waterproof, so by usage take care of water in the handheld meter. Let the handheld meter not left in water. Water can cause damage onto the electronic circuits.
- After using the cuvettes take care the cuvettes are cleaned properly and rinsed with water, after rinsing they have to be dried.
- Replace the cuvettes back into the hand case so these cuvettes cannot damage. (Damage of cuvettes cause problems with measurements).

2.2 Technical specifications :

The power for this instrument is made by 3 batteries type AA 1,5V 2500 mAh.

2.3 Performance:

- The handheld meter guarantees a high quality, so take care of this meter with highest responsibility.
- With those batteries can be measured for approximately 300 hours continuously.

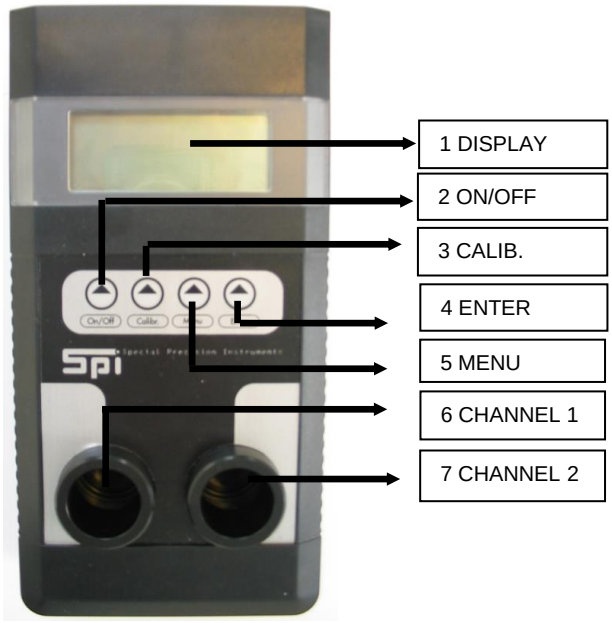
2.4 Surrounding influence :

During measurements the results can have influence of light so by every measurement you have to use the 2 caps to close the cuvettes.

During the measurement of pH you have to take care of temperature disturbing. With the pH measurement made by phenol red the temperature correction is standard at 25ºC.

3. Use of handheld meter

3.1 Handheld meter description:



Parts of the handheld meter :

1	Display.	
2	On/Off.	This button is used to activate the handheld meter.
3	Calib.	This button is used to zero the blanc measurement.
4	Enter.	This button is used to confirm your choice.
5	Menu.	This button is used to switch to the different parameters of your handheld meter.
6	Channel 1.	Supplied with a blue led . This channel can be used for measurement of peroxide and is used as reference (blanc) for chlorine and pH.
7	Channel 2.	Supplied with a green led. This channel can be used for measurement of chlorine and pH and is used as reference (blanc) for peroxide.

4. Spare parts

This handheld meter is delivered include:

- 1 x hand case
- 2 x Caps
- 4 x Cuvettes
- 100 ml Phenol red with pipette
- 1 x graduated cylinder
- 50 ml Peroxide reagent (just PerO measurement)
- 50 ml DPD 1 (just Cl measurement)
- 50 ml Start (just Cl measurement)
- 50 ml Totaal 2 (just Cl measurement)
- 1 x manual

All these spare parts has to be delivered. All these items can be purchased afterwards.

5. To start

5.1 Demand of surrounding:
During measurement the results can have bad influence of light so you use 2 caps to cover the cuvettes during measurement.

5.2 Installation:
Take the handheld meter out of case and check the cuvettes.

5.3 Cleaning cuvettes:
Before every measurement the cuvettes has to be cleaned. The cuvettes you use has to be clean not polluted and clear. If not, clean cuvettes properly in- and outside has to be dried.

Pollution in cuvettes can cause disturbance of measurements.

6. Preparation chemicals

6.1 DPD 1:

- DPD 1 is ready to use solution.

6.2 Start:

- Start is a ready to use solution.

6.3 Totaal 2:

- Totaal 2 is a ready to use solution
- Take care of the tenability of Totaal 2

6.4 Peroxidecolor:

- Peroxide color is a ready to use solution

Take care, All above described solutions has to be stored in the refrigerator.

6.4 Phenol red:

- Phenol red is a ready to use solution.
- It is not necessary to keep it in the fridge.

7. Use

7.1 Zero calibration:

- Before every measurement a zero calibration has to be done.
- You take 2 empty, clean cuvettes (Glass test tubes) with the appropriate colour line and rinse off with the measured water.
- Fill these cuvettes with measurement water (Blanc or control).
- Dry the cuvettes on the outside.
- Place both cuvettes in each channel.
- Place the caps on each channel.
- Activate handheld meter by pushing button “On/Off”
- Select by button “menu” the parameter you want to measure and confirm by pushing button “enter”
- Display shows a number.
- By pushing button “calib.” you confirm the zero calibration.
- Take care, after zero calibration the number in display has to be 0.00.
  If so, the zero calibration is done correct.
- When you have a correct zero calibration you can continue your sample measurements.

7.2 Free available chlorine (Cuvette with red line):

- After zero calibration you can continue your sample measurement.
- The cuvette for Blanc measurement with cap is left in channel 1 (Reference).
- The other cuvette must be empty and fill successively this cuvette with:
  - 5 drops “Start”
  - 5 drops “DPD 1”
  - The cuvette must be filled up to the first line in the cuvette with sampling water. (First line seen from bottom of cuvette).
  - Dry the cuvettes on the outside.
  - Put the cuvette with cap into channel 2 (Measuring channel).
- Read the value from display within 10 seconds and write value down.

7.3 Total chlorine (Cuvette with yellow line):

- After measuring free chlorine you can start measurement of total chlorine.
- The cuvette for Blanc measurement with cap is left in channel 1 (Reference).
- Rinse the cuvette with the yellow/green line with the measured water.
- Fill the cuvette with the yellow line with:
  - 5 drops “Totaal 2”
  - Pour just measured solution (Pink) from free available into this cuvette.
  - Dry the cuvette on the outside.
  - Put the cuvette with cap in channel 2 again.
- Read the value from display within 2 minutes and write value down.

When the “Totaal 2”has a yellowish colour, don’t use them anymore.
Suggestion, wrap the bottle in aluminium foil.

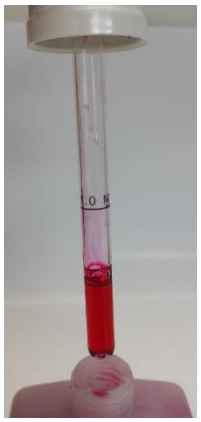
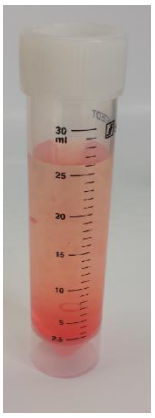
Take care of time, also for this measurement you have to wait for 2 minutes.

Use just 1 cuvette (Always the same cuvette) to fill with “Totaal 2”. This reagent leave Potassium Iodide in cuvette what can affect your free available chlorine measurement.

After finishing all measurements for total chlorine, the cuvettes has to be cleaned properly.

7.4 pH (Cuvette with blue line):

- After zero calibration (see 7.1) you can continue your sample measurement.
- The cuvette for blanc measurement with cap is left in channel 1 (Reference).
- Rinse the blue marked cuvette with the measured water.
- Fill the supplied graduated cylinder with 25 ml sample water (pict. 1)
- Take with the pipette 0.5 ml Phenol Red liquid out of the 100 ml bottle Phenol Red (pict.2)
- Add this 0.5 ml Phenol Red to the sample water in the graduated cylinder (pict.3)
- Put the cap on the graduated cylinder (pict. 4)
- Shake the graduated cylinder gently 3x upside down for a proper mixing (pict.5)
- Fill the blue marked cuvette :
  - up to the first line with the water from the graduated cylinder (First line seen from the bottom cuvette) (pict. 6)
  - Dry the cuvette on the outside.
- Put the cuvette with cap into channel 2 (Measuring channel).
- The display shows the pH, wait until this value is stable and make note of this..

					
Picture 1	***Picture 2***	***Picture 3***	***Picture 4***	***Picture 5***	***Picture 6***

When 3 horizontal stripes are shown in display, the measurement is out of range. By the colour of sampling water it easy to see if your sample is in pH too high or too low.

Pink	pH 8,0 or higher
Yellow	pH 6,8 or lower.

<u>Important :</u>
When the display shows a pH of 8.0 and or 6.8, the measurement is not reliable anymore.
Please use a pH electrode to measure the correct pH.

7.5 Hydrogen peroxide (Cuvette with blue line):

- After zero calibration you can continue your sample measurement.
- The cuvette for blanc measurement with cap is left in channel 2 (Reference).
- Rinse the cuvette with the blue line with the measured water.
- The other cuvette must be empty and fill successively this cuvette with:
  - 5 drops “Peroxide color.”
  - The cuvette must be filled up to the first line in the cuvette with sampling water. (First line seen from bottom cuvette).
  - Dry the cuvettes on the outside.
  - Put the cuvette with cap into channel 1 (Measuring channel).
- Read the value from display within 10 seconds and write value down.

8. Safety regards

All delivered chemicals can cause health injures so take care handling those chemicals.

- R/36/37/38 Irritating for eyes, respiratory organs and skin
- S2 Keep out of reach from children.
- S20 Do not use any food or drinks during usage.
- S45 In case of an accident or when someone feel unwell, contact medical staff immediately.
- Avoid contact with eyes and skin.
- By contact with eyes, immediately rinse with a lot of water and contact medical staff.
- In case of swallow contact medical staff immediately.
- DPD : irritating for eyes, respiratory organs and skin.
- Peroxide: Can promote fire for flammable substances.
  Causes burn.
  Do not eat, drink and smoke during usage.
  Wear protection clothes and protection hand gloves.
  Use protection for eyes and face.

9. Maintenance

9.1 Routine maintenance:

Take successively following actions:

- Clean cuvettes properly
- Clean channels with a dry soft tissue.

10. Storage and transport

10.1 Dismantle:
Replace the handheld meter into original hand case get the cuvettes out of handheld meter, take care there is no water left in handheld meter. Clean cuvettes on proper way and place those into hand case.

10.2 Pack up:
Pack the handheld meter into original hand case and get the cuvettes out of handheld meter.

Notes:

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