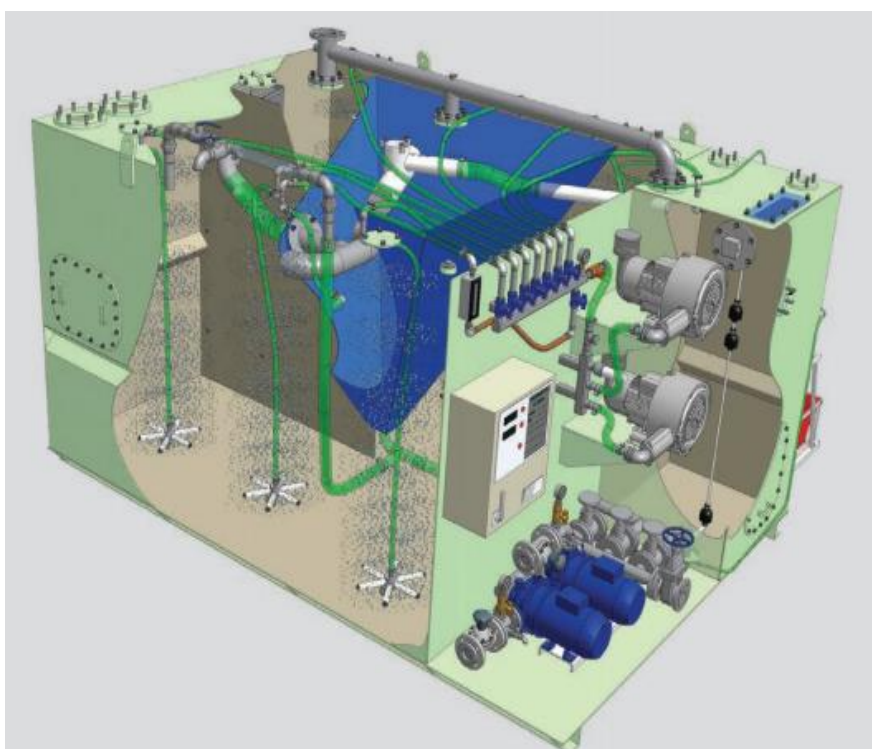


Final Effluent Water Testing

Instruction Booklet



Effluent Water Testing

Instruction Booklet

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Safety and Hygiene

Workplace and Cleanliness

Simple to follow, step by step instructions are provided for the operation of all items and performance of all tests within this kit. It is however important to find a suitably clean and uncluttered area in which to organise and perform each test. Working in this environment will prevent mistakes and avoid contamination of the tests being performed. Ensure that all used items are suitably disinfected and disposed of correctly. Work surfaces should be cleaned with detergent and water before and after testing.

Personal Protective Equipment (PPE)

Due to the nature of the test chemicals contained within this test kit and the potential hazard to health of the samples being tested, it is important to wear gloves and safety glasses when carrying out all tests contained within the kit.

Operational hazards

Colitag and Bacteria Plates (unused)

Unused Colitag (for the measurement of Coliforms/E.Coli) and Bacteria Plates present no hazard to health.

Colitag and Bacteria Plates (used)

Bags containing used/incubated samples for the analysis of Coliforms (thermotolerant coliforms) should be treated as potentially hazardous to health until they have been suitably disinfected (Disinfection Procedure below) and washed/rinsed. These samples could contain cultured bacteria and care should be taken NOT to allow the contents to come into contact with skin or eyes. The health risk is primarily from the ingestion of bacteria after transfer to clothing or hands, not from actual skin contact. If contact is made, remove contaminated clothing and wash thoroughly with a strong detergent. Wash contaminated skin with soap and water.

Samples Being Tested

Again samples being tested could contain Coliform/E.Coli or TVC bacteria and, as such, present a similar risk to used Colitag bags. As such, take the same precautions as detailed above.

Disinfection Procedure

It is necessary to disinfect spent containers used in the determination of Coliforms prior to disposal. It is essential to wear appropriate protective equipment prior to performing the disinfection procedure. This includes gloves, safety glasses and appropriate overalls.

- 1) Fill a 5 litre bucket with at least 1 litre of strong bleach solution (5% activity).
- 2) Transfer all spent sampling bags, syringes and Bacteria Plates to the bucket.
- 3) Leave to sterilise for at least 2 hours.
(Ensure that the bleach solution is in contact with all sides of the containers, inside and out, leaving no air pockets).

Notes Page

[illegible]

Test Procedures

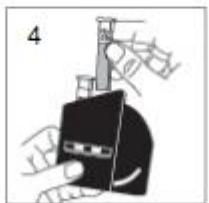
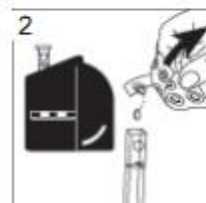
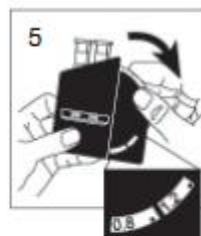
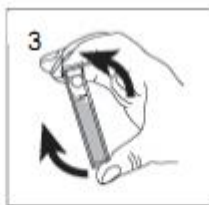
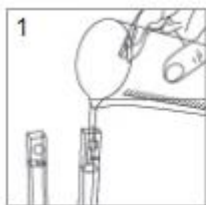
Free Chlorine (DPD)

CHECKIT® Disc	Measurement Range	Order Code
Chlorine Disc	0 - 4.0 mg/l	778421
Chlorine Disc	0 - 1.0 mg/l	717114

Replacement Test Tablets	Order Code (pack of 250)
DPD No. 1 (R) - free chlorine	777934
Rapid dissolving DPD tablets (green printed foil = Type Rapid (R))	

Free chlorine (DPD No. 1 (R)-tablet)

- 1) Fill both cells to the 10 ml mark and
- 2) Place one cell in the left-hand compartment of the comparator as a blank.
- 3) Add one DPD No. 1 (R)-tablet in the other cell, close it with a lid and
- 4) Swirl it until the tablet has dissolved.
- 5) Place this second cell in the right-hand compartment of the comparator
- 6) Match the two colour fields against good light source and read off the result in mg/l free chlorine.



Important: Place the cell with the mark (point) to the viewer in the compartment. It is essential to rinse the cells thoroughly after each test. To obtain maximum accuracy always view and match colour against a good light source. Store CHECKIT® Disc in the dark.

Test Procedures

pH (Phenol Red)

CHECKIT® Disc pH	Measurement Range 6.5 - 8.4 pH	Order Code 778422
Accuracy: +/- 0.1 pH		

Tablets PHENOL RED (R) (pack of 250)	Order Code 777936
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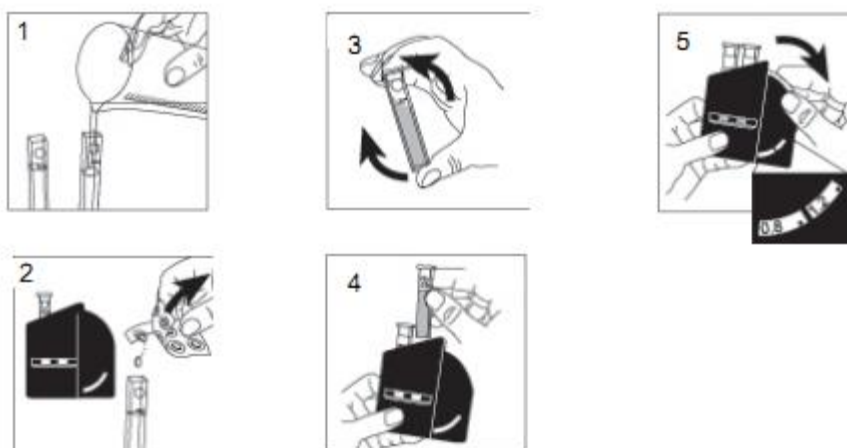
Rapid dissolving PHENOL RED tablets (green printed foil = Type Rapid (R))

pH (PHENOL RED (R))-tablet

- 1) Fill both cells to the 10 ml mark.
- 2) Place one cell in the left-hand compartment of the comparator as a blank.
- 3) Add one pH (PHENOL RED (R))-tablet in the other cell, close it with a lid. Swirl it until the tablet has dissolved.
- 4) Place this second cell in the right-hand compartment of the comparator.
- 5) Match the two colour fields against good light source and read off the result as pH.

Note:

pH values below 6.5 always produce a yellow colouration. pH values above 8.4 always produce a red colouration. Water samples with low values of Total Alkalinity may give wrong pH readings.



Important: Place the cell with the mark (point) to the viewer in the compartment. It is essential to rinse the cells thoroughly after each test. To obtain maximum accuracy always view and match colour against a good light source. Store CHECKIT® Disc in the dark.

Test Procedures

Coliform bacteria in final effluent water (<100cfu/100ml)

Replacement Colilert sachets (25)	Order Code 777932
-----------------------------------	----------------------

This test procedure uses the Colilert sachets, 100ml sample bags, distilled water and sterile 1ml syringes. The test will take 24 hours to perform. It is important to store the samples at 35°C during this period. This test is very sensitive and, as such, it is important to prevent contamination. Ensure that the person performing the sampling and testing has washed hands thoroughly with soap and water. Do not allow the bag to remain open for any period of time, other than to take the sample and add the Colilert sachet. Do not let the sample point touch the bag.

1) Take one of the 100ml sample bags and collect 50 to 100ml of the final effluent water to be tested.

The sample bag contains a tablet to neutralise any chlorine that may be present in the sample. Allow this tablet to dissolve before continuing to step 2.

2) Add 100ml distilled water to another sterile sample bag.

3) Using the 1ml plastic syringe add 1ml of the final effluent sample water to the bag with the 100ml of distilled water.

4) Carefully add the contents of one Colilert Sachet to the diluted 100ml sample. Agitate gently to aid dissolution.

5) Place the sample inside one of the two plastic incubation pots provided and screw on the cap.

6) Incubate the sample at 35.0°C +/-0.5°C for 24 +/- 2 hours.

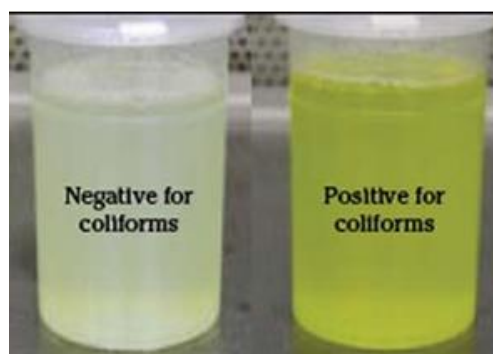
Note: Liquid samples MUST be incubated inside one of the incubation pots provided to prevent water entering the incubator should the liquid leak. Make sure the incubation pot is placed inside the incubator (with the lid off) during incubator warm-up period. Two samples can be placed inside one pot.

7) Sample interpretation

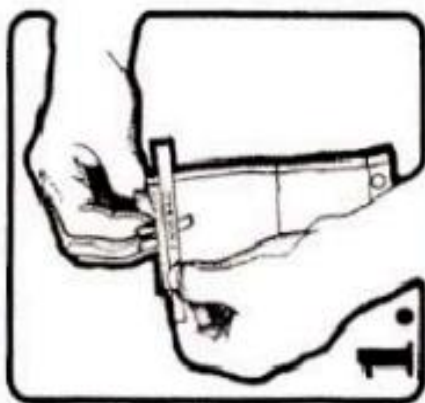
a. Visually check the sample for yellow colour. If sample is yellow, then Coliform bacteria are present and the result recorded as >100cfu/100ml.

c. If no yellow colour in the test sample is observed after the 24 +/- 2 hour incubation period, the sample should be recorded as <100cfu/100ml Coliform bacteria.

d. Product Storage: Store at 4°C to 30°C, (preferably 4°C to 7°C) away from the light. Observe the expiry dates on the packaging.

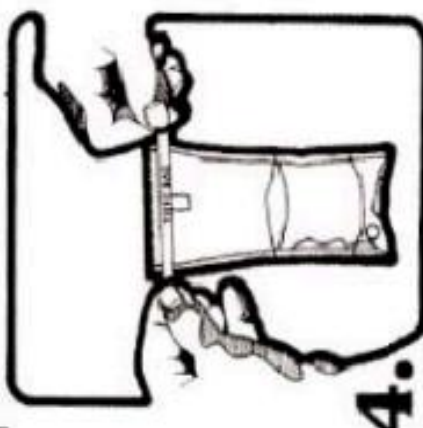


OPENING



1. Tear off top at scored line.

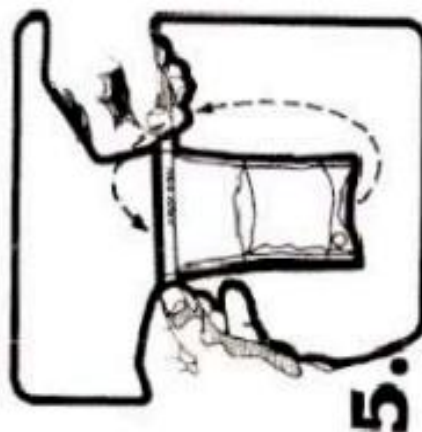
CLOSING



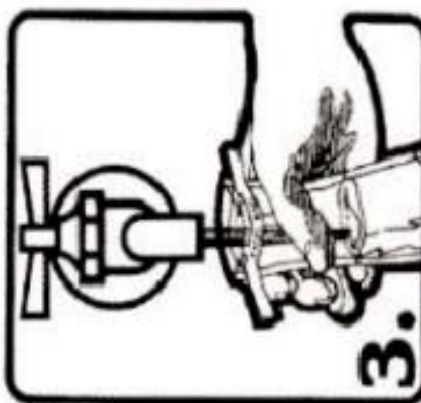
4. Pull wire ends to close bag.



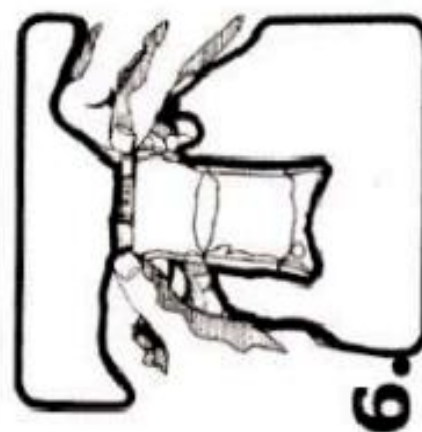
2. Pull tabs outward to open bag. Sometimes a pull on the bottom is also helpful.



5. Whirl bag three complete revolutions. (Do not roll tapes down.) Leave airspace for mixing in lab.



3. Fill bag to required fill line. The 4 oz. fill line will insure that 100 mls are collected.



6. Turn tape inward on opposite face of fold.

Test Procedures

Measurement of Turbidity/Suspended Solids

Turbidity Test Tube

Order Code
778415

- 1) Put together the two pieces of the turbidity tube.
- 2) Fill the tube with sample effluent water until the cross (x) at the bottom of the tube is not visible when looking down the length of the tube.
- 3) Check the level of the tube with graduations on the side and read off the result.
- 4) Record the result a turbidly or suspended solids in NTU.
- 5) Empty and rinse the tube.



Permanganate Value (PV)

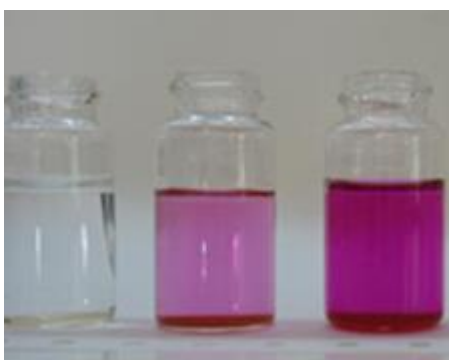
Permanganate Value Test Kit

Order Code
778861

Replacement Tablets
Acidifying SE Tablets (pk. 100)
Permanganate Tablets (pk. 100)
Spare Shaker Tube

Order Code
778868
778863
555714

The permanganate Value is used to determine the quality of final effluents from sewage treatment plants on board ship. Based on the results it will give guidance on quality for discharge of final effluents to the sea.



Test Method

- 1) Add 100ml of final effluent to each container.
- 2) Add two Acidifying SE Tablets to each container and shake it to mix well.
- 3) Add 1 permanganate value tablet to the first sample container, then add 2 permanganate tablets to the second and 3 tablets to the third and shake well to dissolve.
- 4) Wait 30 minutes. Then check how many tubes have remained pink and read the result from the following table:

No. of containers turned pink	Permanganate Value	Final effluent quality	Calculated BOD	Calculated COD
3	0 - 10	Excellent	< 15	< 70
2	10 - 20	Satisfactory	< 30	< 140
1	20 - 30	Above limit	< 45	< 210
0	>30	Above limit	> 45	> 210

General control limits for discharge

BOD = Biochemical Oxygen Demand (<25mg/l)

COD = Chemical Oxygen Demand (<125mg/l)

Portable Incubator

Order Code 777930

User Instructions



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19.	Contents
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Technical Data:

Voltage input: 12V DC, 2.5 Amps

Temperature Range: ambient +5°C to maximum 50°C

Contents:

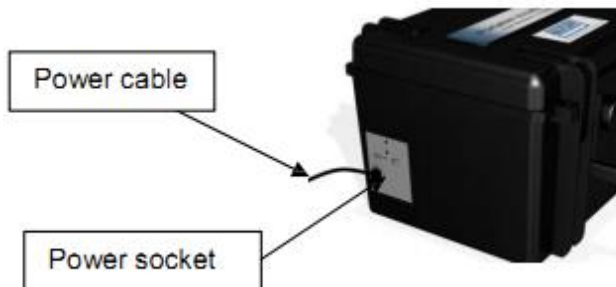
Portable Incubator (Order Code 777930)

External 12V Universal Adaptor

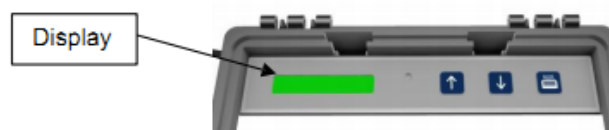
Set of Power Leads for Adaptor (UK, EURO and USA)

Switching On:

To turn the Incubator on, insert the regional power cable to the power socket on the side of the instrument.



When powering on the Incubator, the LCD display will show



L O V I B O N D D I 1 0

w w w . l o v i b o n d . c o m

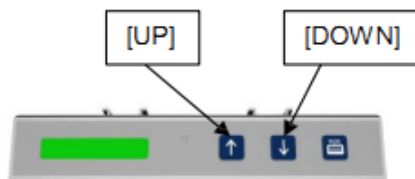
S N : 1 0 2 4 V 1 . 0

Then the screen will show the current temperature setting:

T e m p : 3 0 ° C

Move between screens by
[UP] and [DOWN] keys to show:

pressing



ELAPSED TIME:

E l a p s e d : 0 0 0 : 1 7

TARGET TEMPERATURE:

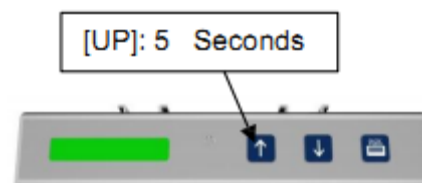
T a r g e t T e m p : 3 5

ALL INFO:

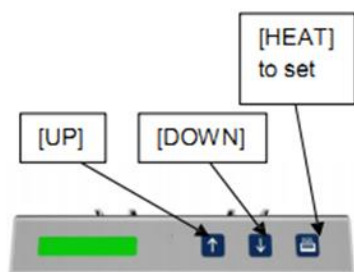
3 0 ° C 0 0 0 : 1 7 3 5 ° C

Setting Target Temperature:

To change the Target Temperature,
press [UP] for 5 seconds then release the key, the screen
will change to:



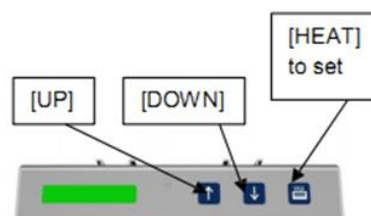
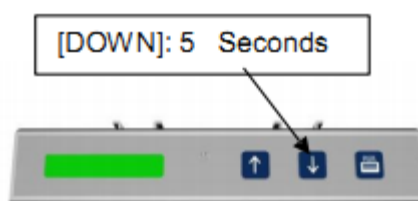
T a r g e t T e m p : 3 5



Press the [UP] and [DOWN] arrow keys
to change the value. The maximum value
is 40°C. Press the [HEAT] key to enter
the value. This value will be stored in the
flash memory and be the default value
when the instrument is switched on.

Setting Incubation Time:

To set the Incubation Time, press [DOWN] for 5 seconds then release the key, the screen will change to:

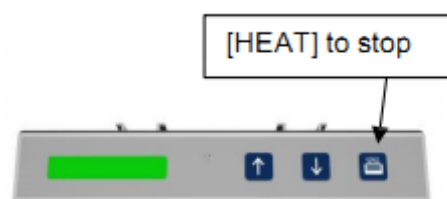


MINUTES : 3 5

Press the [UP] and [DOWN] arrow keys to change the value. Press the [HEAT] key to enter the value. The screen will then change to:

HOURS : 1 5

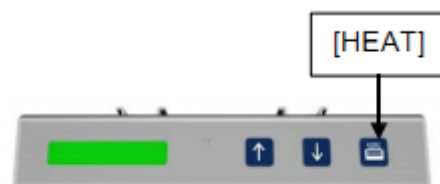
Press the [UP] and [DOWN] arrow keys to change the hours value. Press the [HEAT] key to enter the value



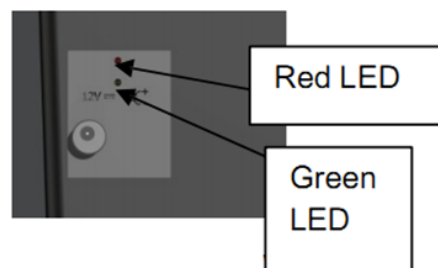
This value will be stored in the flash memory and be the default value when the instrument is switched on. (If this time is set to 0, then heating will continuous until the [HEAT] key is pressed again.)

Starting the Heaters:

Press the [HEAT] key to switch on the heaters and circulating fans.

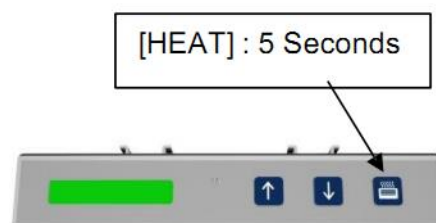


On the side of the instrument, the RED LED will show that the heaters are activated. When the target temperature has been reached, the GREEN LED will come on and the RED LED will switch off. These lights will come on and off to reflect the instrument's heating functions to keep the unit at the required temperature. If both lights stay on, this indicates an ERROR condition and a message will be shown on the display.



Setting the Elapsed Time:

Once the unit has reached the required temperature, press the [HEAT] key for 5 seconds and release to view the elapsed time.



Power Down:

If the incubation time has been set, then the instrument will power down automatically once this time has elapsed. The unit first switches off the heater and LED lights and after 4mins the fan stops and the unit shuts completely off.

Error Warnings:

If there is a power failure while the unit is heating, then an error will be shown when the instrument reboots. Press any key to remove this message.

P O W E R F A I L U R E

If for any reason the instrument resets itself, all heating will be stopped and an error message will be shown for 3 seconds.

E R R O R R E S E T

Spares and Consumables

Description	Tests per kit or unit of supply	Part no.
Permanganate Value test kit (approx. 15 tests)	1	778861
Contents: Shaker tubes x 3, Acidifying SE Tablets pk100, Permanganate Value Tablets pk100		
Replacement consumables		
Shaker tube	1	555714
Acidifying SE Tablets pk100	1	778868
Permanganate Value Tablets pk100	1	778863
Potable Water Test Kit (base kit)	25	778419
(Coliforms & EColi, Incubator, UV lamp, Instruction manual and video, safety gloves, safety glasses)		
Replacement Coliform/E.Coli Test Set	25	777932
1ml Sterile Syringes	30	778483
Free and Total Chlorine (individual items)		
Checkit comparator	1	778420
Checkit Test Cell (minimum 2 required)	1	778457
Checkit Free Chlorine Disc (0 to 4ppm)	1	778421
Checkit Free Chlorine Disc (0 to 1ppm)	1	717114
Chlorine DPD No.1 Tablets (Free) pk 250	1	777934
Chlorine DPD No.3 Tablets (Total) pk 250	1	777935
pH by comparator (requires checkit comparator and 2 test cells)		
Checkit pH Disc (6.5 to 8.4)	1	778422
Phenol Red Tablets (pH) pk 250	1	777936
or pH Pen Meter	1	607800
Turbidity Test Tube	1	778415
Portable Incubator	1	777930
Plastic stirring rods pk 10	1	778648



Wilhelmsen Ships Service AS
PO Box 33
NO 1324 LYSAKER, Norway
Tel: +47 67 58 45 50