BUCKLEYS

MANUFACTURERS OF SPECIALIST TEST EQUIPMENT

# Underwater Corrosion Probes
# UCP1A & UCP1B

## Operating Instructions

English Version


**Please read carefully before use**

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# Description

**The UCP 1A and 1B contact probes are versatile instruments which are used to carry out under water cathodic potential measurements.**

The unit is designed for use with manned or remotely operated vehicles (ROVs). There are two types available for use:

**UCP1A - Contact Probe**

Operation of the UCP1A is carried out by way of a probe tip making contact with the surface under test, and reading the resulting voltage on a suitable high impedance (> 10M Ohms) or digital voltmeter.

The UCP1A has two connections:

- Black Wire - Stainless Steel Probe Tip
- White Wire - Ag/AgCI Half Cell

**UCP1B - Proximity Probe**

Operation of the UCP1B is carried out by way of placing the unit in close proximity to the surface under test, and reading the resulting voltage on a suitable high impedance (>10M ohms) or digital voltmeter. The meter should be connected between the probe and a separate structure negative return.

The UCP1B has two connections:

- Black Wire - Not connected
- White Wire - Ag/AgCI Half Cell

Both types of UCP probe utilise a Silver/Silver Chloride (Ag/AgCI)/Seawater half-cell. The accuracy of the cell should be checked against a K-Series or K-SAT Reference Cell (6004-0111) to ensure that it is still accurate and has not been contaminated in use. Check the condition of the UCP1A Probe Tip to ensure that it is still pointed, replace if necessary (6004-0015/6004-0017).

# Unpacking

Remove the UCP from its packaging and check for damage. If any part is damaged, the carrier and supplier should be notified immediately. All packing material should be kept for inspection and the UCP should not be used.

The package will contain one of the following items depending on which UCP probe that you purchased:

**UCP1A** – Contact Probe, or **UCP1B** – Proximity Probe

If the probe type is not what you expect please contact your supplier.

# Maintenance

**Replacement of electrode**

Unscrew the two recessed nylon screws on either side of the body.

Carefully pull the front and rear assemblies apart.

> **Note:** Take care not to break the connecting flexible wire that connects to the Probe tip in the UCP1A contact probe.

Unscrew the old Half Cell.

Check that there is no moisture in the Cell's recess and clean if necessary.

Check the O-ring (size 011) for damage and replace if necessary. Smear with a small amount of silicone grease and fit on the new reference cell.

Screw the new Half Cell into the body until the O-ring just bottoms, then tighten by a further half a turn.

Reassemble the unit.

> **Note:** Take care not to trap or break the interconnecting wire that connects to the Probe tip in the UCP1A contact probe.

Refit and tighten the two nylon screws on either side of the body.

**Long Term Storage**

Flush well in clean seawater to remove any contamination from the Nose Cone and allow to dry.

If salt encrustation is seen on the nose cone, remove the Ag/AgCl half-cell and briefly wash in fresh water but immediately after, thoroughly rinse in salt water (3% salinity).

**Recommissioning**

Soak the UCP for 2 hours in a seawater solution (3% salinity).
Carry out verification checks (see page 7).

# Calibration

There are two types of UCP probe, the **1A** 'Contact Probe' and the **1B** 'Proximity Probe'.

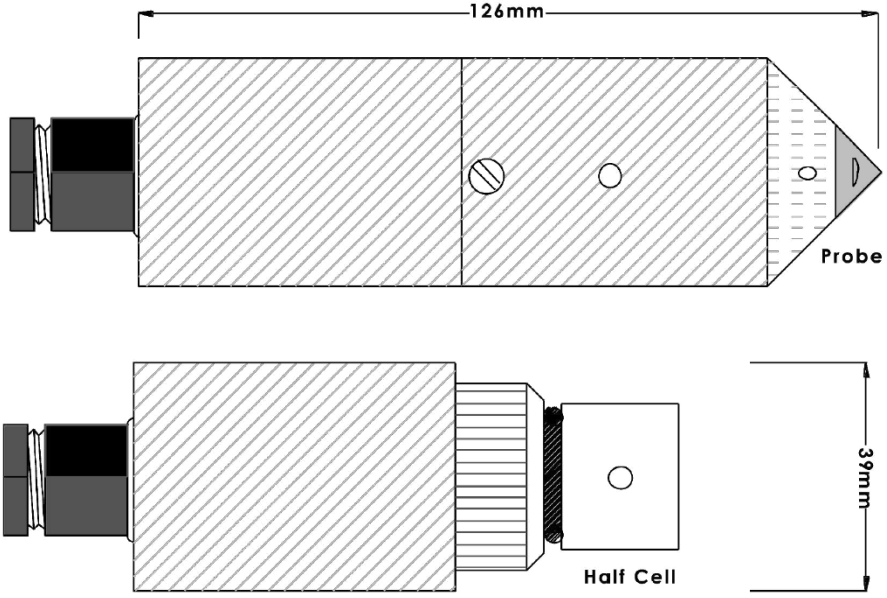



**Fig.1 - UCP 1A Contact Probe**

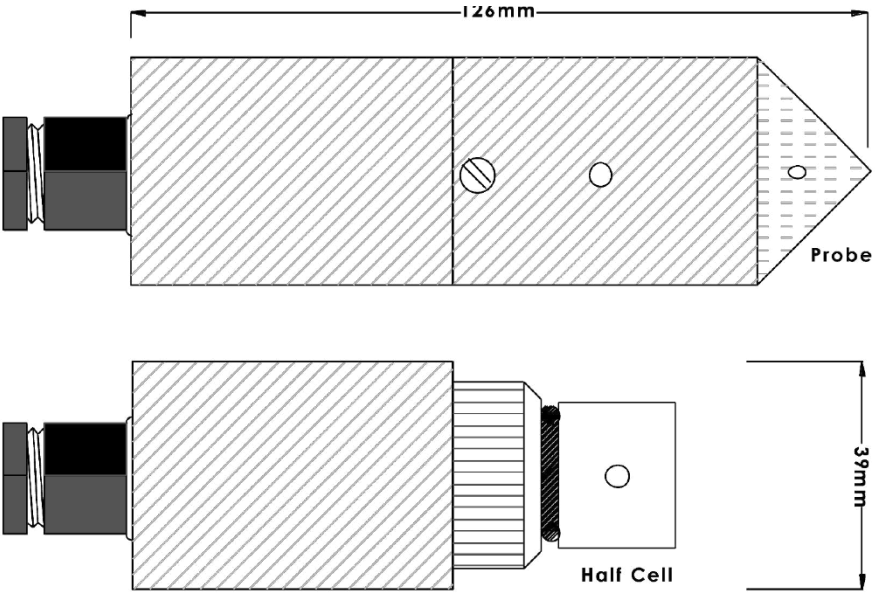
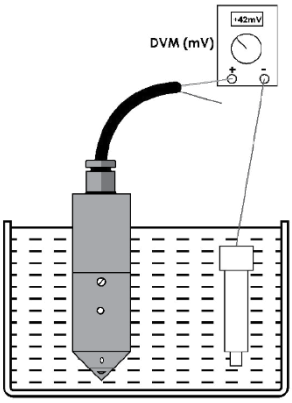



**Fig.2 - UCP 1B Proximity Probe**

Both types use the same type of replaceable silver/silver chloride/seawater half-cell.

### Verification of the Ag/AgCl Half-Cell




Plastic container filled with 3% Salinity artificial seawater solution.

K-series or K-SAT Reference Electrode. (Use a glass type or plastic screw in with an adaptor)

**Note 1:** Remember to remove the plastic cap on the plastic reference electrode).

**Note 2:** No bare wires should be exposed to the seawater.

**Fig.3 - Half-cell verification**

Screw the adaptor lead (6004-0018) onto the reference electrode (plastic screw on type). Submerge the UCP and reference electrode in the 3% seawater solution.

Connect the white lead from the UCP to the Positive terminal of the DVM (see Fig. 3 on page 7).

Connect the lead from the K-series reference electrode to the negative terminal of the DVM.

Allow the electrodes to reach a stable temperature and potential (15 - 30 minutes).

The voltage difference between the reference electrode and the internal silver/slver chloride electrode can be read directly off the DVM display.

**Measurement result**

Verify a nominal potential of +42mV ± 10mV for a K-Series cell, or +54mV ± 10mV for a K-SAT cell.

**Note:** The values recorded for the Silver/Silver Chloride Electrode are dependent upon the Salinity and Temperature of the Seawater at the time of measurement.

**Test using Zinc test blocks**

Verification of the operation of the UCP1A can be carried out using a Zinc test block.

Connect the white connection from the UCP1A to the positive terminal of the DVM, and the black connection to the negative.

Soak the UCP1A for 2 hours in a seawater solution. The salt concentration has a great effect on the readings, so does the state of the test block.

A tarnished Zinc block will give a lower reading than clean one. Do not leave the test block in the seawater – remove it after use.

Touch the tip of the UCP1A to the Zinc Block while it is immersed on the 3% salt solution.

Potential measurements taken should be logged to check if any significant variation occurs. Differences in the order of 10mV between readings are quite

possible and will mainly be caused by variations in water salinity at different locations or due to changes in water temperature.

As a guide, readings taken in a 3% salt solution at ambient temperature of 25°C are as follows:

Zinc (Zn) = 1.00V - 1.08V

For the UCP1B connect the white lead from the UCP to the positive terminal of the mV meter and negative terminal of the meter to a zinc block.

**Note:** The connection to the zinc block needs to be above the waterline.

When the UCP1B is submerged in the water in close proximity to the zinc block the readings will be as shown for the UCP1A above.

The UCP1B should also be soaked for 2 hours in the 3% seawater solution prior to taking any measurements.

# Disposal information

Producer registration number: WEE/HJ0051TQ

This product must be disposed of in accordance with UK WEEE regulations.

For further information on UK WEEE regulations click on: www.gov.uk/government/publications/weee-regulations-2013-government-guidance-notes

# Contact details

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# Distributor details

# Product registration

**Thank you for choosing a Buckleys product, we are sure it will provide you with many years of reliable service.**

Please register this product via Buckleys' website and download the Warranty Registration Certificate.

**Register your product in 5 minutes**
Once your product is registered, you will receive the following benefits:

- **FREE** annual service & calibration reminders by email
- **Latest** industry news relating to your product
- Be the **first** to hear about our new products

**We strive to improve the quality of our products and service.**
Registering your product helps us monitor overall quality of our products, service and dealer network. Additionally, if we ever need to contact you regarding your product, we are able to do so immediately.

We will also send you annual service/calibration reminders by email to help ensure your product is always in perfect working order.

To register your product, simply visit:

**www.buckleysinternational.com/registration**

...Complete the online form and click on SUBMIT.