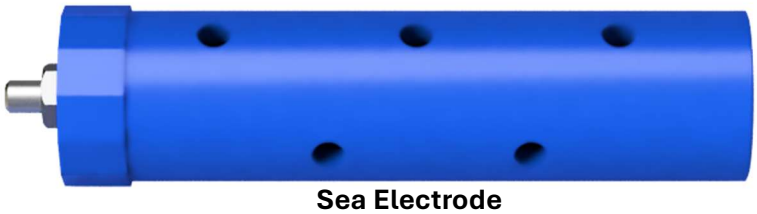
TINKER & RASOR

CORROSION MITIGATION INSTRUMENTATION

SC-4 LAND & SEA KIT

Portable Silver–Silver Chloride (Ag/AgCl) Reference Electrode Kit

Land Electrode



Sea Electrode

1. Introduction

The Tinker & Rasor SC-4 Land & Sea Kit is a portable Silver–Silver Chloride (Ag/AgCl) Reference Electrode kit designed for accurate structure-to-electrolyte potential measurements in saltwater and saline soil environments.

This kit provides a complete solution for performing cathodic protection measurements in both land and sea applications. The included components are designed for reliable field use, allowing technicians to obtain consistent and accurate readings in a wide range of environments. Proper handling, maintenance, and use of the electrodes will ensure dependable performance and long service life.

KIT CONTENTS

Tinker & Rasor Part Number	Description	Used With
029-271	10” Blue Carrying Case	
082-088	SC-4 Carrying Case Insert	
085-200	Portable Silver-Silver Chloride **Sea** Electrode	Sea Electrode
085-201	Portable Silver-Silver Chloride **Land** Electrode	Land Electrode
085-135	W-7 Waterproof Adapter	Both Electrodes
049-030	4 oz. Seawater Equivalent (0.5 M) Gel	Land Electrode
001-022	1 lb. (0.45 kg) Brass Weight	Sea Electrode
026-053	8 ft (2.4 m) Black W-7 Cable	W-7 Adapter

Note:
Inspect the kit upon receipt to ensure all components are included and in good condition. If the contents differ from what is listed or if any items are missing or damaged, contact the distributor or representative from whom the kit was purchased immediately.

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2. Safety Information – WARNING!

The seawater equivalent gel and the silver/silver chloride element must be handled with care. Avoid contact with skin, eyes, or clothing, and wear gloves and safety glasses when refilling, servicing, or handling internal components of the electrode. Refer to the Tinker & Rasor SDS for safety details.
For SDS information, visit www.tinker-rasor.com/sds.

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3. Important Notes

These guidelines are important to ensure proper operation, accurate measurements, and long service life of the electrode. Failure to follow these notes may result in reduced performance or damage to the electrode.

- Do not use electrodes in low chloride environments as this can cause significant performance issues
- Ensure all threaded components and adapters are properly tightened to prevent leakage or water intrusion
- Do not bend, scratch, or damage the chloridized silver element
- Always rinse electrodes after use to prevent contamination buildup
- Do not allow the Portable Land Electrode tip to dry out
- Avoid use in oil-contaminated or chemically contaminated environments

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4. Applications

The SC-4 Land & Sea Kit is designed for daily field use in marine and saline environments where reliable structure-to-electrolyte potential measurements are required. It is suitable for both above ground and submerged applications where consistent reference stability is critical.

- Offshore platforms
- Offshore pipelines
- Seawater docks (SSP)
- Ships and marine vessels
- Coastal and submerged structures

5. Specifications

SC-4 Kit Specifications:

Specification	Details
Carrying Case Dimensions	9.37" × 7.71" × 4.38" (23.8 × 19.6 × 11.1 cm)
Kit Weight	4.50 lbs. (2.04 kg)
Case Environment Rating	IP67 Waterproof & Dustproof
Included Accessories	W-7 Waterproof Adapter, 1 lb. (0.45 kg) Brass Weight, Seawater Gel, 8 ft (2.4 m) Black Cable

Land & Sea Electrode Specifications:

Specification	Detail
Chemistry	Silver-Silver Chloride (Ag-AgCl)
Element	99.9% Pure Silver
Electrical Connection	¼-20 Threaded Stud
Designed For	High Chloride Environments
Dimensions	**Land Electrode** 1.25” W x 6.25” L (3.175 cm x 15.875 cm)
	Sea Electrode 1.25” W x 6.25” L (3.175 cm x 15.875 cm)
Weight	**Land Electrode** 0.30 lb. (0.14 kg)
	Sea Electrode 0.15 lb. (0.07 kg)
Material	High Impact ABS Tube
Stability	±5 mV vs Standard
Temperature Range	32°F to 135°F (0°C to 57.2°C)
Maintenance	User Maintained

6. Land Electrode

The land electrode is designed for use in soil and other non-submerged environments where a stable reference is required for accurate measurements. Each electrode is pre-charged with seawater equivalent gel and ready for use. Proper handling, cleaning, and storage are essential to maintain performance and extend the service life of the electrode.

1. Storage

- Always keep the red protective cap installed when not in use to prevent and protect the ceramic tip from drying

2. Cleaning After Use

- Rinse ceramic plug thoroughly with clean water
- Wipe gently if needed
- Immediately reinstall protective cap

3. Normal Gel Presence

- A small amount of gel may collect inside the protective cap. This is normal!
- Wipe tip clean prior to use

5. Recharging the Electrode

- Handle the silver rod carefully
- Avoid contamination
- If contaminated, rinse with clean water
- Do not bend, scratch, chip, or sand the chloridized silver rod

6. Measurements in Dry Soils

- Apply fresh water to the test location before measurement
- Ensures proper electrode-to-soil contact

7. SEA ELECTRODE INSTRUCTIONS

The sea electrode is designed for use in seawater and fully submerged environments where stable and accurate reference measurements are required. The electrode is ready for use when properly assembled with the W-7 adapter and cable. Proper setup, cleaning, and handling are essential to maintain performance and extend the service life of the electrode.

1. Initial Setup

- Install W-7 Waterproof Adapter (see W-7 section below)
- Ensure W-7 O-ring is fully compressed
- Attach 1 lb. brass weight for stability before deployment

2. Position the Electrode

- Lower the reference electrode into the water next to the structure being measured

3. Connect to a Multimeter

- Set multimeter to DC Volts
- Connect the reference electrode lead (black) to the COM (black) terminal

4. Measurement

- Connect the red lead from the multimeter to the structure
- Record the voltage reading displayed

Reference Note:
A typical cathodic protection reading in seawater (Ag/AgCl reference) ranges from -0.900 V to -1.000 V

5. Cleaning After Use

- Handle carefully to avoid chipping or damaging the rods chloridized coating
- Rinse thoroughly with clean tap water after each use
- Do not bend, remove, or scratch the chloridized silver rod
- Dark brown/black rod appearance is normal

6. Operating Precautions

- Do not use in oil-contaminated water as oil contamination may coat the silver element and affect performance

7. Storage

- Clean and store in protective case after use

8. W-7 WATERPROOF ADAPTER INSTRUCTIONS

The W-7 Waterproof Adapter allows Portable Ag-AgCl & Cu–$CuSO_4$ Electrodes to be used safely in wet or submerged environments without exposing the electrical connection to water.

Using the W-7 Adapter

1. Thread the W-7 onto the electrode, stopping about **½ turn** before compressing the O-ring
2. Strip **¼ inch** from #18 AWG wire, slide the small O-ring over the insulation, and insert the wire into the brass hex fitting
3. Tighten the hex nut firmly
4. Hand-tighten the adapter to fully compress the large O-ring and seal

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8. Common Causes of Inaccurate Readings

Inaccurate or unstable readings are typically the result of poor contact, contamination, or improper setup. Common causes include:

- Low meter input impedance (**< 10 MΩ**)
- Poor electrical connection to the structure
- Dry soil or inadequate electrolyte contact (land use)
- Electrode not fully submerged or unstable (sea use)
- Contamination of the electrode tip (oil, dirt, or chemicals)
- Loose or improperly connected test leads
- Using the electrode in low chloride environments

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9. Troubleshooting

If inaccurate or unstable readings are observed, perform the following checks:

- Verify all electrical connections are secure and clean
- Ensure proper contact with soil or full submersion in water
- For dry soil conditions, add fresh water to improve contact
- Rinse the electrode thoroughly to remove contamination
- Confirm the W-7 adapter and connections are properly tightened
- Check multimeter settings and battery condition

If issues persist after performing these checks, contact a Tinker & Rasor representative for assistance.

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10. Product Support

For replacement parts or product assistance, visit www.tinker-rasor.com/portable or contact a Tinker & Rasor representative. Office Hours: **Monday–Friday, 7:30 AM – 4:00 PM (CST).**