UNDERGROUND TANK EQUIPMENT

TANK TEST KITS

Part #	Description
ETM	Underground Tank Test Kit
JN-CP Test Kit	Anode Test Kit
30101	Anode Test Kit
RE-5C	Replacement Copper Sulfate Electrode

ETM

30101

CP Test Kit

A multi functional digital multi meter combined with the accessories needed to test pipe to soil potentials for adequate cathodic protection.

Features:
- DM 133 Multimeter with Test Leads
- Copper Sulfate Half Cell Electrode
- Heavy Duty "Clamp" Style Test Leads
- Instructions

SENSIT Technologies

RE-5C

JN-CP Test Kit

DIELECTRIC CONNECTIONS

Dielectric Insulated Unions

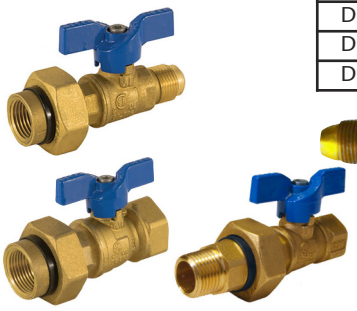
Part #	Size
AAR-012-INS	1/2"
AAR-034-INS	3/4"

RegO Dielectric Pigtails

Part #	Size
D912J12	ELECTRICALLY ISOLATED PIGTAIL FOR UNDERGROUND CONTAINERS 1/4" MALE NPT X MALE POL
D912J20	
D912J30	
D912P12	ELECTRICALLY ISOLATED PIGTAIL FOR UNDERGROUND CONTAINERS MALE POL X MALE POL
D912P20	
D912P30	

Jomar Dielectric Ball Valves

Part #	Size
T-204DU-012	1/2" FPT X 1/2" FPT
T-204DU-012FX012	1/2" MALE FLARE X 1/2" MNPT
T-204DU-012MX012F	1/2" MNPT X 1/2" FNPT
T-204DU-034	3/4" FPT X 3/4" FPT
T-204DU-034MX034F	3/4" MNPT X 3/4" FNPT



CATHODIC PROTECTION

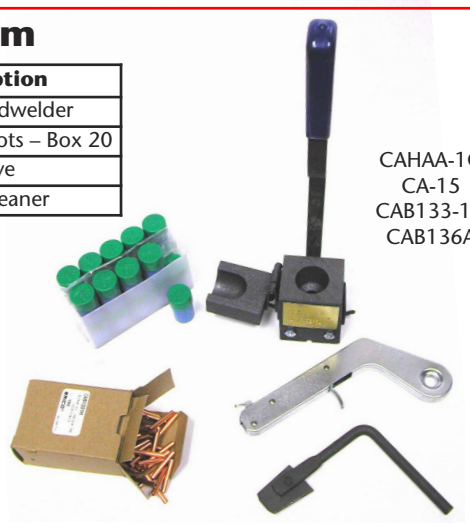
Anode

Magnesium anode bag with attached 10' #12 electric wire. The anode must be activated with water before backfilling.

Part #	Description
H1-17	17# Anode bag
H1-9	9# Anode bag

Cadweld System

Item No.	Description
CAHAA-1G	Vertical Cadwelder
CA-15	Weld Metal Shots – Box 20
CAB133-1H	Sleeve
CAB136A	Mold Cleaner



CAHAA-1G
CA-15
CAB133-1H
CAB136A

PIPE & CABLE LOCATOR

Cable Hound DSP Pipe & Cable Locator

Part #	Description
99-0118	Transmitter, DSP Receiver, Tone Probe, GroundRod, CH Headphones, and Carrying Case

FEATURES

- Improved depth and distance capabilities
- New receiver utilizes state-of-the-art **D**igital **S**ignal **P**rocessing for a sharper, more defined signal while filtering out electrical interference
- Auto-Off switch on the Transmitter and Receiver improves battery life
- Quality padded headphones - for use in noisy environments - are included in each DSP Kit
- Improved case with batteries in a separate compartment for easy replacement

COMBUSTIBLE GAS DETECTORS

Trak-It® III

Combustible Gas Indicator

Durable design and easy operation makes finding gas leaks fast and accurate.

The Sensit Trak-It® III CGI large easy-to-read display continuously updates the user of gas concentrations. Sensitivity as low as 0.1% LEL assist in locating those hard to find leaks while loud audible alarms make this instrument perfect for confined space entry. A variable speed pump allows location (pinpointing) of underground leaks faster and more accurate than conventional CGI's. Infrared downloading allows easy tracking of calibration and operation data for record keeping purposes.

Gases Sensed (partial list): Propane, Combustibles -LEL & %Gas, Oxygen, Carbon Monoxide, Hydrogen Sulfide

Features:
- Internal pump
- Lowest cost, long life sensor
- LED warning lights.

Specifications:
Part #: JN-TRAC-IT3-A
Size: 6.5" x 4" x 4.25"
Weight: 2.8 pounds
Construction: Stainless Steel Housing
Battery Life: 20 hrs. continuous

Sensit® TKX

Combustible Gas Leak Detector

Features:
- Audio and visual leak indicator
- Adjustable tick rate
- High sensitivity
- 1 year warranty

Specifications:
Part #: JN-TKX-7Size: 3.5" x 10" x 1.6"
Weight: 1.3 lb.
Construction: High impact ABS
Power: 3 'C' alkaline batteries
Battery Life: 8 hrs continuous operation
Gooseneck: 16" reach
Sensor: Solid State

Calibration Kit

CALIBRATION IS IMPORTANT. Calibration kits are used to verify and set an instrument to a known sample of gas. All gas detectors should be calibrated on a periodic basis to insure the proper operation and accuracy of the product.

Sensit® Gold CGI

Combustible Gas Indicator

Find gas leaks quickly, low maintenance, and easy to use

Durable design and easy operation makes finding gas leaks fast and accurate. Operator controlled tick rate assists in finding leaks on exposed piping or underground faster than ever. The high-tech sensors provide a long life with the lowest replacement cost. Includes hard carrying case, 2 piece polycarbonate bar-hole probe and batteries.

Features:
- Audible/Visual alarms
- Display up to 4 gases
- Adjustable tick rate
- Long Life Rotary Vane Pump
- Lowest Cost, Long Life Sensors

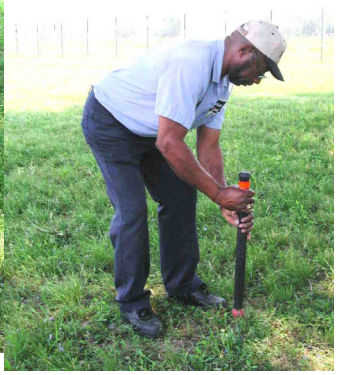
Specifications:
Part #: JN-SG00600-A
Size: 11.5" x 3" x 2.32"
Weight: 1.2 lbs.
Power: Alkaline batteries
Battery Life: 16 hrs continuous operation
Gooseneck: 16" reac
Sensor: Solid State

SENSIT Technologies

Slide-Hammer

For boring test holes near buried gas lines or underground tank. 44" bar allows for sufficient depth in order to drop a gas detector probe into the ground for testing. Use with Sensit Technologies combustible gas detectors incorporating a bar-hole test feature.

M-Pact-O
Part # 28-44



Not All Magnesium Anodes Are Alike

There is a reason today to be concerned about the Quality of magnesium anode ingots. The reason is due primarily because all U.S. foundries producing high quality anodes were driven out of business by 2002 by low cost foreign foundries. This lead to a big problem – foreign producer's anode ingots had very poor performance qualities. We know this to be fact because in late 2002 MESA began 3rd party testing the anodes from the major foreign foundries and none of them met the minimum industry performance standards.

MESA spent the next 2 years working to identify foreign producers capable of producing good anode ingots. During his period, confirmed by the testing program, we rejected over 30,000 ingots in our quest to supply only quality anodes. Through this search MESA was able to identify 2 foundries that were committed to casting quality ingots. Today we are still working closely with them as our primary suppliers of magnesium ingots. They worked diligently to develop the processes necessary to always meet the cathodic protection industry performance standards. In fact MESA's anodes are now regularly exceeding the minimum acceptable Current Efficiency values by as much as 15%.

What Constitutes a Quality Anode?

There are several factors that affect performance of a magnesium anode. They are chemical composition, open circuit voltage potential (OCVP) and current capacity also known as current efficiency (CE).

Chemical Composition

Quality anodes must be cast to meet the chemistry identified by ASTM Standard B843-07 (Specification for Magnesium Alloy Anode for Cathodic Protection). This means they must be made to a specific chemistry recipe. It's important to know that simply meeting the recipe does not guarantee a good anode. The casting process definitely affects the critical operation of the anode.

Open Circuit Voltage Potential (OCVP)

The open circuit voltage potential is a measurement of the anodes ability to produce a voltage to overcome the native potentials of steel and to ultimately provide cathodic protection. It is key that the open circuit potential meets or exceeds the minimum standard -1.55/-1.75 volts H-1/HP with respect to a copper/copper sulfate electrode. Lower readings may require additional anode(s) to reach the necessary protected voltage.

Current Capacity / Efficiency (CE)

Current capacity or efficiency of an anode, very simply defined, is a measurement of the anodes ability to "utilize itself". Think of the anode as a flashlight battery using its voltage until depleted. A normal current capacity rating for magnesium is 500 Amp/hour/lb or 50% current efficiency. Higher current efficiency yields longer anode life and more cost-effective anodes. Lesser efficiencies result in both extra anode and installation costs because early replacement is required.

If any of these three factors is insufficient then the anode is subject to poor operating performance and/or premature failure during its service life.

Analysis of Alternate Suppliers Quality

In August 2003 MESA acquired 5 magnesium anodes from 5 prominent U.S. anode manufacturing companies. [Note: Manufacturers perform final assembly of the ingots, adding copper lead wires, mag backfill, and outer packaging for shipping.] All 5 anodes failed to meet the minimum current efficiency and only one met the minimum open circuit voltage potential. The results were not surprising since MESA has been testing major foreign foundry ingots having similar results.

To get a more current status of anode quality, MESA commissioned in October 2007 an outside company to buy and test anodes from the 6 major U.S. manufacturers. The report was completed in March 2008 and showed 4 anodes failed the current efficiency minimum and 3 anodes failed to meet the minimum open circuit voltage potential. This proves that many of the anodes marketed today still DO NOT MEET industry minimum quality requirements.

The Testing of Magnesium Anodes

The only way to know if you have an anode that meets the above mentioned minimum standards for OCVP and CE is to run the ASTM G97 test (Laboratory Evaluation of Magnesium Sacrificial Anode Test Specimens for Underground Applications). This is a precise 14-day test that only a few testing facilities in the US are capable of performing correctly. Costs associated with each test can run between $600 - $1,100 per anode. As mentioned earlier, MESA has pre-qualified select foundries that have casting processes in place to produce quality anode ingot. These foundries perform their own internal chemical composition and G97 testing and provide these results to us. To verify our supplier's results, MESA always tests one ingot, via a qualified 3rd party laboratory, out of each truckload/container we order. Failure results in a rejection of the entire shipment.

Summary – Lowest Cost vs. Real Cost

We know, because of the aforementioned test results, that there are anodes being sold by others that DO NOT meet the minimum standards for magnesium anodes. The MESA VALUE PROMISE states that we will lead the CP industry in service and quality. That is why we spend so much time, money, and energy developing foundry relationships that "we know" and "we confirm" (3rd party lab) are turning out a high quality raw ingot to industry specifications. This coupled with MESA's own high standards for final anode fabrication allows us to confidently assure our customers that every anode supplied by MESA will perform to industry expected standards. Does this cost more?. You bet it does! But if compared to a competitor's anode that doesn't perform to minimum standards, our extra initial cost is canceled out minimum four-fold over the 30 year life of the MESA anode. Buying a MESA anode through GEC helps your company "maintain your industry leading position" with quality and service second to none.

[Hypothetical Cost example at 2%/yr inflation and NO raw material increase: MESA good anode $90 + $250 to install = $340 per tank to last 30 years. BAD anode $75 + $250 to install but only lasts 10 years — so install new anode now $90 + $300 to install but only last another 10 years — so install new anode now $110 + $360 to install = total cost for 30 years of protection $1,185 per tank.]

Technical information provided by MESA Quality Focused, *Service Driven.*

16906 Copper Sulfate Crystals .75 lbs.
RE-5C Copper Sulfate Electrode

COPPER SULFATE CRYSTALS & ELECTRODES

Note: Under average conditions, an electrode should be emptied and cleaned out every two or three months. However, if the electrode is allowed to remain in prolonged contact with low resistivity soil or water, more frequent rejuvenation may be desirable. For consistent results, manufacturers recommend using the highest purity $CuSo_4$ Crystal's possible.

Precautions:

• STORAGE: $CuSo_4$ will deteriorate over time. Electrodes, which are purchased in bulk and stored for later use, should always be checked before placing into service. Copper rods can become tarnished or pitted by deteriorating $CuSo_4$ and the $CuSo_4$ will become unusable. The copper in this condition will become contaminated, which will cause inaccurate readings. $CuSo_4$ should have a rich, deep blue color. If the crystals appear to have become whitened or have the appearance of being dehydrated, discard in a safe manner and replace with fresh. Do not store the electrodes in a damp atmosphere. Some types of fungus or mold can contaminate the ceramic plug assemblies. Always rotate your stock using the "FIFO" (First In, First Out) method.

• Common Source of Error: The voltmeter used in conjunction with reference electrodes should be of sufficiently high impedance (10 megohms or greater) so that contact resistance, which can occur between electrode and soil, does not affect readings. When taking readings, the ceramic plug must come in contact with soil. Vegetation such as grass should be moved out of the way. Grass or other items will add resistance and result in inaccurate readings. Reference electrodes are designed to be durable, but over time, the ceramic plug assembly will become contaminated by foreign materials and become worn or cracked. At this point, the replacement of the ceramic plug assembly is highly recommended. If the $CuSo_4$ mixture within the electrode becomes cloudy white, reverse osmosis has occurred and rejuvenation is recommended.

ANODE INSTALLATION

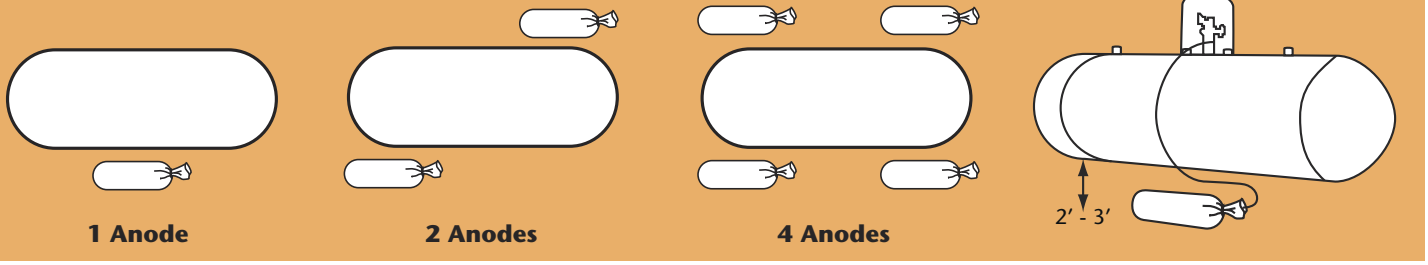
How Many Do I Need??

Soil Type:	Fertile Soils, Clay, Sandy Loam			Sand, Gravel, Rocky Areas		
Tank Cap. (gal)	0 to 5000 ohm-cm			5000 to 10000 ohm-cm		
	Size	Qty.	Alloy	Size	Qty.	Alloy
120	9#	1	H-1	9#	1	H-1
150						
250					2	
325						
500	17#					
1000/850		2			4	
1500						
2000		3			6	

*Based on 90% effective external coating, 2 ma/ft2 current density, and 30 year anode life.

Where Do They Go??

- Single anode is installed, it should be located near the tank center on either side of tank.
- Multiple anodes are installed, space them evenly around the tank.
- Install anodes two to three feet fromthe tank and at least as deep as the centerline of the tank, he deeper the better.
- Remove outer box and plastic bag, bury the cloth bagged anode and activate with 5 gallons of water.



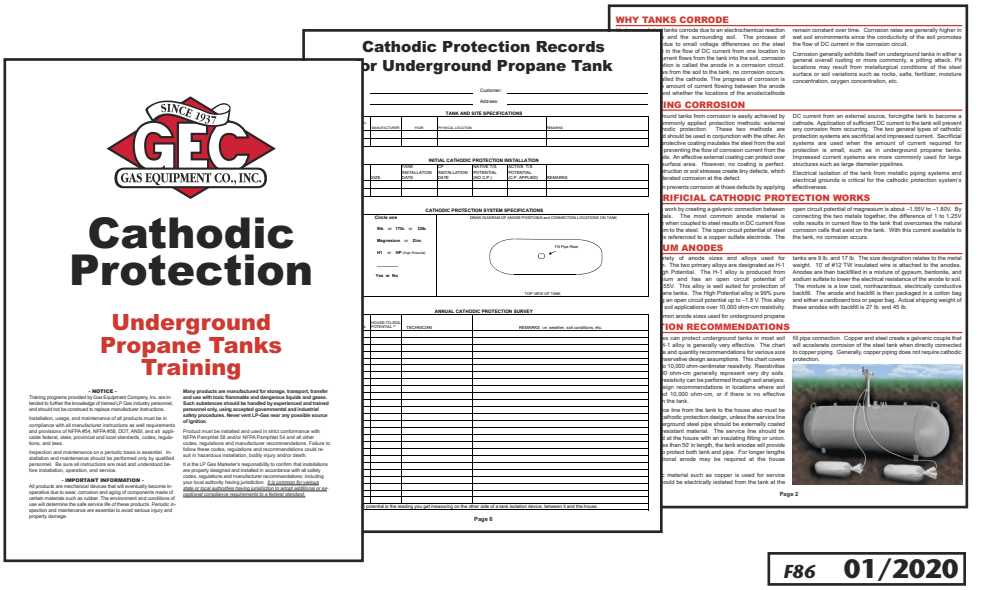
1 Anode | 2 Anodes | 4 Anodes

Technical information provided by MESA — Quality Focused, Service Driven.

CATHODIC PROTECTION TRAINING

Gas Equipment Company offers **FREE** Underground Propane Tank Cathodic Protection training.

Call your branch to schedule your **FREE** training class today.



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