



# Keck Interface Probe

Installation and Operation Manual



Rev. 3 02/25/03 Part # 12050096

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# DOCUMENTATION CONVENTIONS

This manual uses the following conventions to present information:



## WARNING

An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.



## CAUTION

A raised hand icon indicates **CAUTION** information that relates to a situation or condition that could lead to equipment malfunction or damage. You should not proceed until you read and thoroughly understand the **CAUTION** message.



## NOTE

A note icon indicates **NOTE** information. Notes provide additional or supplementary information about an activity or concept.

# Chapter 1: System Description

## Function and Theory

The Keck Interface Probe is a portable instrument capable of accurately measuring water and hydrocarbon levels and hydrocarbon layer thickness in monitoring wells. The probe consists of a stainless steel and Teflon® probe attached to a reel-mounted, Tefzel\* coated engineer's tape. The engineer's tape comes in standard or metric graduations and is accurate to 1/100 of a foot. The probe has a float which detects hydrocarbon levels and a pair of stainless steel contacts for sensing conductive fluids.

The probe has an audible buzzer signal and a visible light which are activated when the instrument reaches water or product. The probe features an auto shutoff circuit to prevent battery discharge. This auto shutoff circuit allows the instrument 10 minutes of continuous operation before the unit shuts off.

When the Keck Interface Probe is lowered down a well and contacts any fluid with a specific gravity of .60 or greater, the float will activate the visible and audible signals. If the fluid is non-conductive, the light will be red and a solid tone will sound. If the fluid is water or other conductive fluid, the conductive contacts will cause the light to turn green and the tone will oscillate. If the probe is lowered through the water layer to a non-conductive layer (such as DNAPL) the tone will change and the light will return to red.



To avoid damage to tape and strain relief, do not over tighten reel with probe in storage position.

# System Components

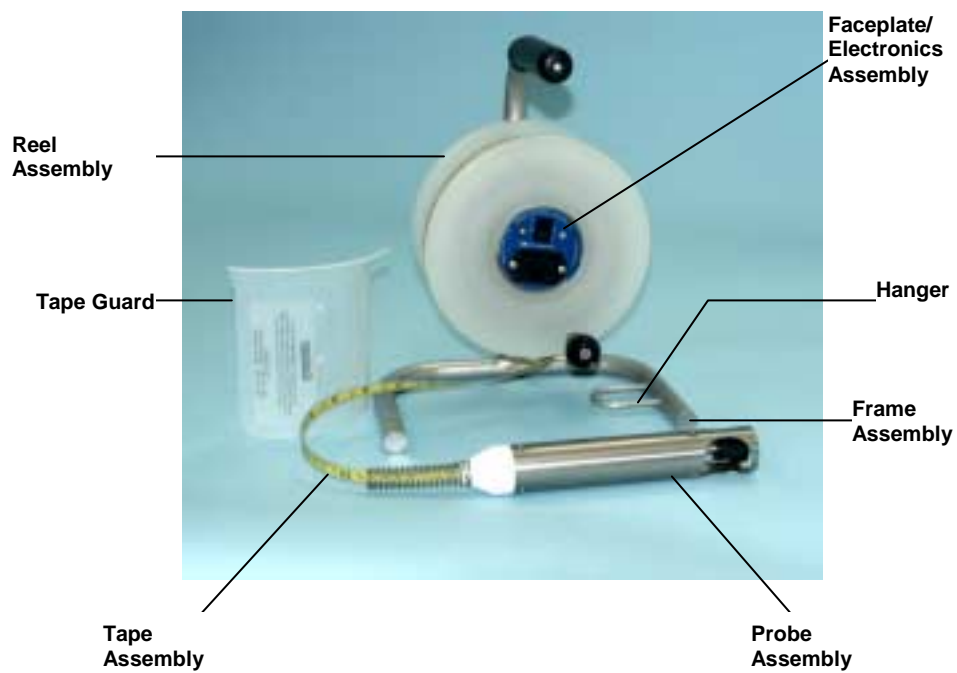


Figure 1 – System Components

## Chapter 2: System Installation

The Keck Interface Probe Frame has a metal loop, the “hanger”, which may be used to hang the probe assembly on the well casing. If the Interface Probe frame will not hang on well head, use the tape guard to prevent damage to the tape.

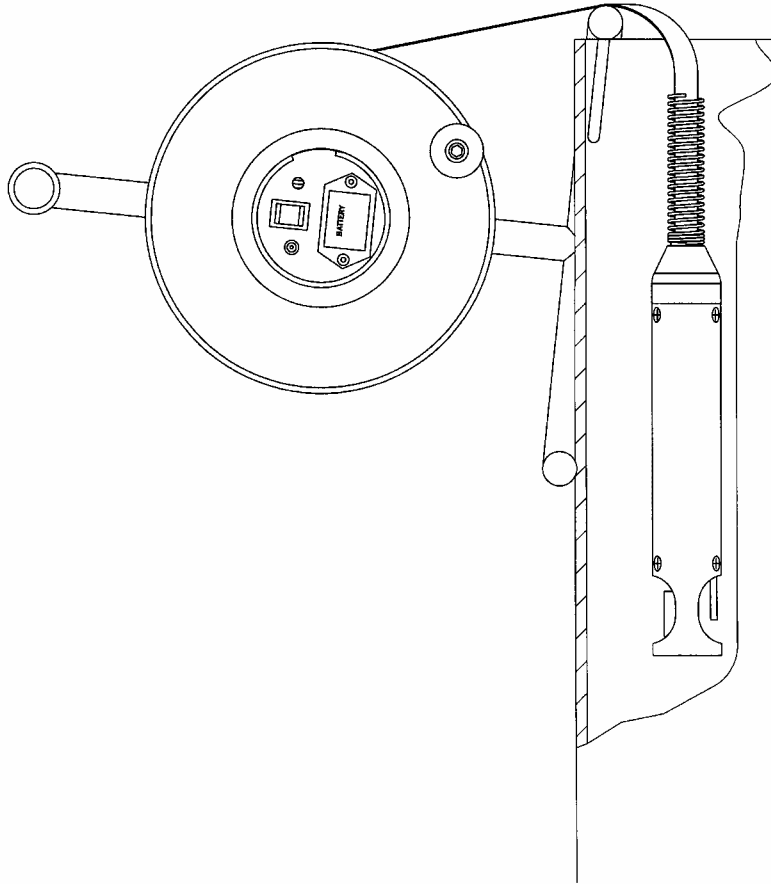


Figure 2 – Reel Frame

## Chapter 3: System Operation

- Step 1** Test the battery. Press the "ON/TEST" button. If the buzzer makes a loud signal and the light is visible, the battery is adequate for normal operation. Pressing the "ON/TEST" button provides 10 minutes of operation.
- Step 2** Test the instrument operation. Remove the probe from the retaining clip and raise the phenolic float. When the float switch triggers, the visible signal will be red and the audible signal will emit a steady tone. With the float still raised, moisten your fingers and touch the float shaft and the conductive contact. If the battery is properly charged, the visible signal will turn green and the tone will oscillate. Successful completion of these tests will indicate that the unit is operating properly.

### Measuring Fluid Levels

- Step 1** Lower the Interface Probe down the well until the signals activate and then read the measurement at the top of the well casing or other reference point. Record this figure as the first fluid level.
- Step 2** Continue to lower the probe until the signals change. Record the measurement at the reference point as the second fluid level.
- Step 3** To determine the product layer thickness, subtract the first reading from the second reading.

### Measuring Water Levels in Product-Free Wells

If the probe immediately emits a green light, nonconductive fluids are absent from the surface of the water.



To avoid damage to tape and strain relief, do not over tighten reel with probe in storage position.

## KECK KIR DNAPL CORRECTION FACTORS

2 <sup>nd</sup> Reading (total depth)	_____ ' + .08'	=	_____ '
	<b>MINUS</b>		—
1 <sup>st</sup> Reading (to product layer)	_____ ' - .08'	=	_____ '
<b>CORRECTED PRODUCT THICKNESS</b>		=	_____ '

Example:      You find that a sinker (DNAPL) begins at 22.36 (1<sup>st</sup> reading) and the total depth of your well is 23.61 (2<sup>nd</sup> reading). Use the above formula to get your correct product thickness.

2 <sup>nd</sup> Reading (total depth)	23.61' + .08'	=	23.69'
	<b>MINUS</b>		—
1 <sup>st</sup> Reading (to product layer)	22.36' - .08'	=	22.28'
<b>CORRECTED PRODUCT THICKNESS</b>		=	1.41'

**Product thickness can be determined by adding .15' to the difference of your original measurements.**



## Chapter 4: System Maintenance

### Battery Replacement

Replace the battery when the audible and visible signals become weak or the unit does not operate.

**Step 1** Gently remove the battery tray.

**Step 2** Remove the old battery and replace it with a new one.



Be aware of the polarity (+, -) of the battery when placing the new battery in the tray.

### Cleaning

The probe can be cleaned with any detergent such as trisodium phosphate (TSP), Alconox or Liquinox. If other detergents are used, take care to select detergents that are compatible with Teflon®, polypropylene, and stainless steel. The reel should not be submerged in any liquid, but may be cleaned with a damp cloth.

If the float becomes covered with silt or mud, remove the float retaining clip, slide the float off the shaft, and clean both the float and the float shaft. Replace the float so the arrow is facing the top of the probe and replace the retaining clip.

The conductive contact can be cleaned with detergent and a small brush.



**THE FLOAT SHAFT AT THE BOTTOM OF THE PROBE IS NOT DESIGNED TO BE REMOVED.**

Field calibration of the probe is not normally required.

## Chapter 5: System Troubleshooting

**Problem:** No signal (audible or visible) from battery test.

**A. The battery is discharged.**

Solution: Check or change battery.

**B. The circuit is malfunctioning.**

Solution: Consult the manufacturer

**Problem:** No signal (audible or visible) from the probe.

**A. The battery is discharged.**

Solution: Check or change battery.

**B. There is an open connection in the tape.**

Solution: Replace tape and top cap. \*\*

**C. The float switch is malfunctioning.**

Solution: Replace the probe. \*\*

**Problem:** No indication of product.

**A. There is a short in the probe.**

Solution: Replace the probe. \*\*

**B. Water is bridging at the bottom of the probe.**

Solution: Clean the probe. **Do not unscrew the float switch.**

## **Troubleshooting** continued...

**Problem:**      **No indication of water.**

**A.**      **The conductive contact is dirty.**

Solution:      Clean the contact.

**B.**      **There is an open connection in the tape.**

Solution:      Replace tape and top cap. \*\*

**C.**      **The circuit is malfunctioning.**

Solution:      Consult the manufacturer.

**Problem:**      **The signal (audible or visible) is intermittent.**

**A.**      **There is an open connection in the tape.**

Solution:      Replace tape and top cap. \*\*

**B.**      **There is a loose connection in the circuit or the probe.**

Solution:      Repair the connection. \*\*

**Problem:**      **The float is damaged or missing.**

Solution:      Replace the float.

\*\*For Technical Assistance, Call Geotech 1-800-275-5325

## Chapter 6: System Specifications

### Probe

Material:	Stainless Steel & Teflon®	
Weight:	19.75 oz.	560 g
Diameter:	1.5 Inches	3.8 cm
Length:	8.9 Inches	22.6 cm
Conductivity Threshold (detects water at) :	>6.7 $\mu$ S	
Minimum detectable hydrocarbon:	.01 foot	

### Tape

Material:	Tefzel coated stainless steel
Length/Weight:	100 foot / 30 meters = 9 lbs 200 foot / 60 meters = 11 lbs 300 foot / 100 meters = 14 lbs
Accuracy:	100 <sup>th</sup> of a foot/100' Per Federal Specification GGG-T-106E

### Reel/Frame

Material:	Polypropylene & Aluminum
Size:	13" H x 11" W x 7" D

### Unit

Battery:	9 volt alkaline	
Self shut – off time:	10 minutes	
Output tone:	500 Hz	
Modulation (water detected):	3.5 Hz	
Operating temperature range:	32 – 140 °F	0 – 60 °C
Storage temperature range:	-40 – 158 °F	-40 – 70 °C
Response time:	<10 milliseconds	

## Chapter 7: System Schematic

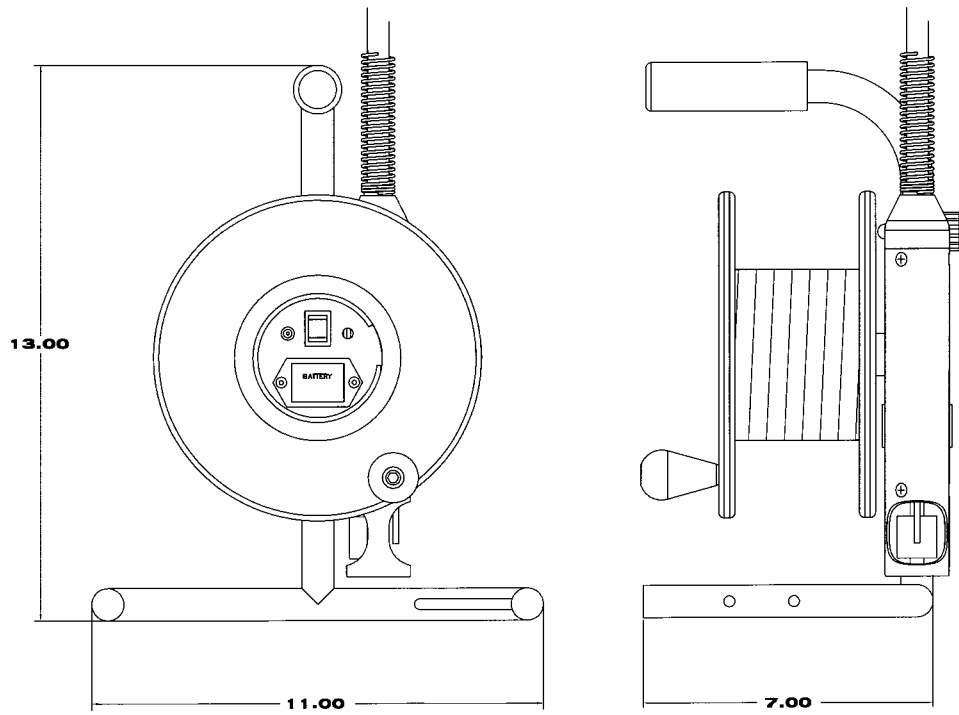
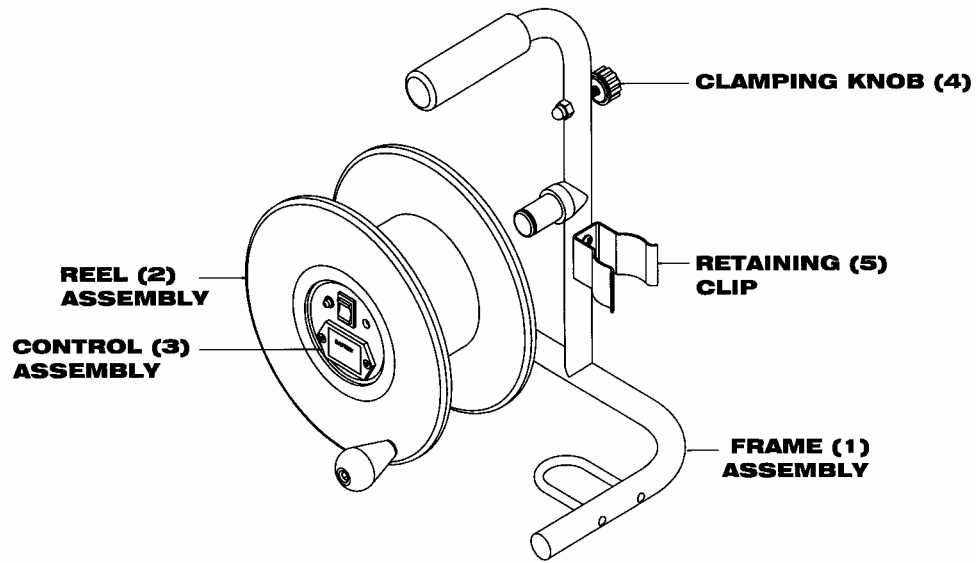


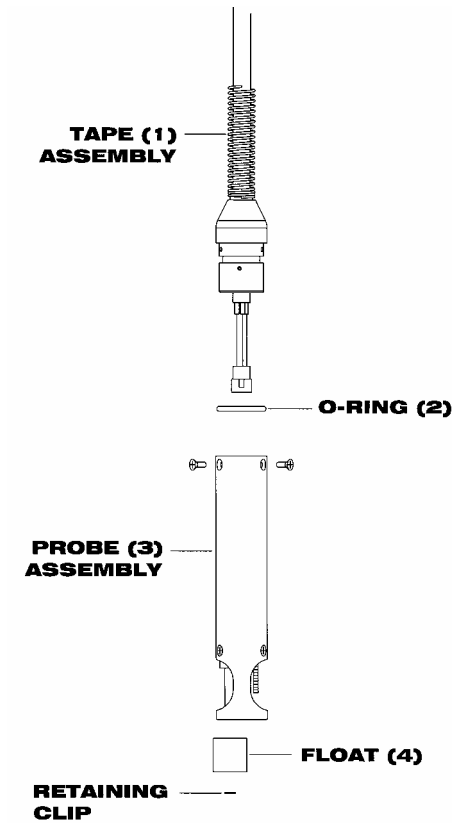
Figure 3 – Front and Side View

## Chapter 8: Replacement Parts List



<u>ITEM #</u>	<u>PARTS DESCRIPTION</u>	<u>PARTS LIST</u>
1	FRAME ASSEMBLY	52050027
2	REEL ASSEMBLY, 100 ft / 30m	52050029
	REEL ASSEMBLY, 200 ft / 60m	52050030
	REEL ASSEMBLY, 300 ft / 100m	52050031
3	CONTROL ASSEMBLY	52050036
4	CLAMPING KNOB	12050094
5	RETAINING CLIP	12050001
6	CARRYING CASE (OPTIONAL / NOT SHOWN)	12050059
7	MANUAL	12050096
8	TAPE GUARD (NOT SHOWN)	12050060

Figure 5 – Frame, Reel, & Control Assembly Parts List



<u>ITEM #</u>	<u>PARTS DESCRIPTION</u>	<u>PARTS LIST</u>
1	TAPE ASSEMBLY, 30m	52050040
	TAPE ASSEMBLY, 60m	52050041
	TAPE ASSEMBLY, 100m	52050011
	TAPE ASSEMBLY, 100 ft	52050032
	TAPE ASSEMBLY, 200 ft	52050033
	TAPE ASSEMBLY, 300 ft	52050034
2	O-RING, VITON, #215	12050028
3	PROBE ASSEMBLY	52050028
4	FLOAT / RETAINING CLIP (PACKAGE OF 2 EACH)	52050038

**Figure 6 – Tape/Probe Parts List**

## Notes



## **The Warranty**

For a period of one (1) year from date of first sale, product is warranted to be free from defects in materials and workmanship. Geotech agrees to repair or replace, at Geotech's option, the portion proving defective, or at our option to refund the purchase price thereof. Geotech will have no warranty obligation if the product is subjected to abnormal operating conditions, accident, abuse, misuse, unauthorized modification, alteration, repair, or replacement of wear parts. User assumes all other risk, if any, including the risk of injury, loss, or damage, direct or consequential, arising out of the use, misuse, or inability to use this product. User agrees to use, maintain and install product in accordance with recommendations and instructions. User is responsible for transportation charges connected to the repair or replacement of product under this warranty.

## **Equipment Return Policy**

A Return Material Authorization number (RMA #) is required prior to return of any equipment to our facilities, please call our 800 number for appropriate location. An RMA # will be issued upon receipt of your request to return equipment, which should include reasons for the return. Your return shipment to us must have this RMA # clearly marked on the outside of the package. Proof of date of purchase is required for processing of all warranty requests.

This policy applies to both equipment sales and repair orders.

FOR A RETURN MATERIAL AUTHORIZATION, PLEASE CALL OUR  
SERVICE DEPARTMENT AT 1-800-833-7958 (CO) OR 1-800-275-5325 (MI).

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date: \_\_\_\_\_

## **Equipment Decontamination**

Prior to return, all equipment must be thoroughly cleaned and decontaminated. Please make note on RMA form, the use of equipment, contaminants equipment was exposed to, and decontamination solutions/methods used.

Geotech reserves the right to refuse any equipment not properly decontaminated. Geotech may also choose to decontaminate equipment for a fee, which will be applied to the repair order invoice.

**Geotech Environmental Equipment, Inc**  
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(303) 320-4764 • **(800) 833-7958** • FAX (303) 322-7242  
email: sales@geotechenv.com website: www.geotechenv.com

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(517) 655-5616 • **(800) 275-5325** • FAX (517) 655-1157