HydraProbe Soil Saturation Kit

SoilMoisture

Kit for determining a soil's water percentage at saturation

The soil water content at saturation and bulk density are the two most important parameters for many applications involving irrigation, geotechnical and soil water movement studies. This kit reduces error by wetting the soil sample from the bottom and includes a stand so the apparatus can be placed on a balance. The fixture included with the kit holds a HydraProbe Soil Sensor for accuracy validation and soil specific calibration.

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Part # 51169-100

Analyses Overview

Volumetric soil moisture is more comparable than gravimetric soil moisture because the density of soil can vary widely. Also, volumetric soil moisture better reflects a volume of water that would be applied by an irrigation cycle, thus, soil moisture is expressed as a volumetric water fraction or volumetric percent. The soil water fraction by volume is;

$$\theta = \frac{V_w}{V_{tot}} \quad [1]$$

Where the Greek letter theta, is the symbol used for volumetric soil moisture, V_w is the volume of water in a sample and V_{tot} is the total volume of the sample. Because one gram of water is basically equal to one cubic centimeter which is equal to one milliliter, grams of water can be used in equation [1] for determining V_w. V_w is determined from the weight of the wet soil minis the weight of the soil after drying in the oven.

$$V_w = (Weight\ of\ Wet\ Soil) - (Weight\ of\ Oven\ Dry\ Soil) \quad [2]$$

The wet soil, however, cannot be weighed on a balance without the apparatus so the wet weight of the soil is;

$$Weight\ of\ Wet\ Soil = (Total\ Weight\ of\ Apparatus\ holding\ the\ wet\ soil) - (Weight\ of\ the\ apparatus) - (Weight\ of\ Dry\ Soil) \quad [3]$$

The weight of the dry soil is determined by drying the soil sample for 24 hours at 100 degrees C.

The stand and the water line connectors included in the kit, ensure an accurate weight of the wet soil on a balance. The weight of the stand, the probe, and the assembly are known and can be subtracted from the total weight to obtain the weight of the wet soil, equation [3].

Soil needs to be wetted from the bottom so that all of the air gets pushed out the top. A reservoir and high-quality hoses are included to push water into soil sample from the bottom. A stainless-steel ring with a known volume of 401 cc (V_{tot}) and with screen mesh is included. The stand allows for the whole apparatus to be placed on a balance.

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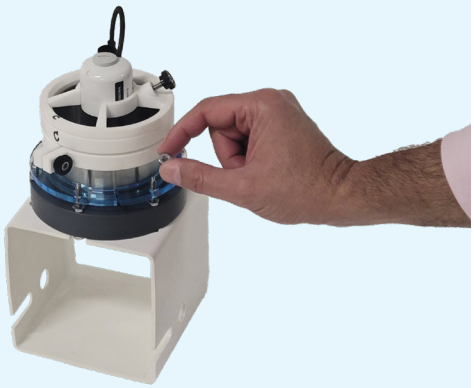
HydraProbe Soil Saturation Kit

Saturation Kit Components

Includes Reservoir for wetting soil from the bottom

Soil Sample Containment

Mesh screen to hold soil sample in place allowing the exchange of water in and out of the sample



Watertight seal

Contents

Image #	Part Number	Item	Description
1	51169-100	Soil Saturation Kit ; Complete kit	Includes stands, reservoir, hoses stainless steel coring ring, base, and accessories
2	51171-301	Fixture for holding HydraProbe in soil sample	Included in complete kit and sold separately
3	51171-401	Thumb screws for fixture	Included in complete kit and sold separately
4	51171-501	Mesh screen filter cloth	Five Included in complete kit and sold separately
5	51171-502	Mesh screen retainer	Five Included in complete kit and sold separately
6	51171-503	Stainless steel ring (7cm/3.5" OD)	Included in complete kit and sold separately
7	2816-1000	Reservoir	Included in complete kit and sold separately
8	1405-3000	Stand	Includes two in complete kit and sold separately
9	1405-006	O-ring retainer, 2 each	Included in complete kit and sold separately
10	1405-007	O-ring washer	Included in complete kit and sold separately
11	1405-CP	Tempe Cell base, 1 each	Included in complete kit and sold separately
	1400-001L3	3cm thread stud, 6 each	
	XFNHX1024CAH	Hex nut, 12 each	
	XFWFW010CAR	Washer, 12 each	
12	2-341	O-ring	Includes two in complete kit and sold separately
13	2-237	O-ring	
14	405-50	Perforated plate	Included in complete kit and sold separately
Not Shown	51171-504	End cap, blue plastic, for 51171-503 Soil Sample Ring.	Includes two in complete kit and sold separately
15		Hoses and connects	Included in complete kit

Other Accessories

Image	Part Number	Item	Description
	93640-01	HydraProbe Soil Sensor, TA Model, SDI-12	Sold Separately
	51171-302	M8-3P 1-to-5 split cable with end caps	Sold Separately
	08065-461	M12 Female 5 Pin to Flying Lead	Sold Separately
	80065E-USA-I-C	Steelhead data logger, External power, w/Cell Module, for internal antenna with SIM card	Sold Separately
	80065-444	AC/DC Wall Mount Adapter, Steelhead, 9V 18W	Sold Separately
	32148A1	SkyView360 SaaS data insight	Sold Separately
	51171-101	HydraProbe Travel Assembly	Sold Separately

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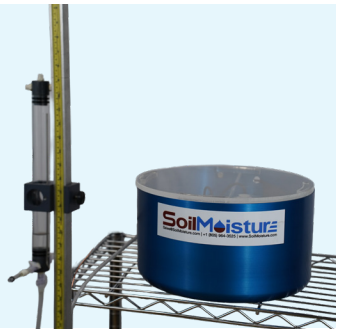
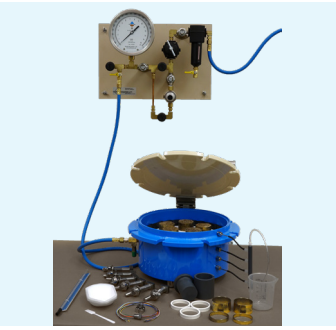
Other Items



The Sand Box Tension Table

For determination of soil water retention curve from 0 to 15 cbar.

Get a quote or learn more on the Stevens Water website:
stevenswater.com/products/hanging-water-column



The MC15-2 Lab Setup

For determining soil water retention curve from 100 to 1500 kPa.

Get a quote or learn more on the SoilMoisture website:
soilmoisture.com/product/mc15-2

Soil Saturation Kit

4 Sample option.

Using one reservoir to saturate 4 samples saves time.

Learn More About the HydraProbe

Scan the QR code or visit the Stevens Water website to learn more about our HydraProbe.

stevenswater.com/products/hydraprobe

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