JNM TECHNOLOGIES, INC.
WATER RESOURCE SOLUTIONS

Specifications for ACT Soil Water Monitoring Probe

The ACT Soil Water Monitoring Probe (SWM-Probe) is a piezometric monitoring device that allows a treated wastewater dispersal field operator to remotely monitor soil water conditions within a dispersal area. State and EPA rules require that water be applied to non-saturated soils. The saturation level is regulated by depth. The SWM-Probe is installed into the soil profile and is set to a level where it monitors water saturation levels as free water. A magnetic reed-switch type float closes when water levels reach a preset depth below the soil surface or below a water emitting device such as subsurface drip irrigation tubing.

SEE ATTACHED ILLUSTRATIONS

The SWM-Probe is designed to be installed for extended periods of time without daily attention. The materials, design and installation methods are patterned after EPA and ASTM requirements for monitoring wells. The device consists of a PVC housing, commercially processed 0.040" saw cut well screen piping and a Whitman Control Corporation L40/L45 polypropylene magnetic float switch. Subsurface PVC components are solvent welded and the top cover is threaded for ease of removal. The magnetic float is hung in the upper cap and can move freely. It is suspended and centered in the 2" tube that is connected to the well screen located near the bottom of the probe. Free water moves into the probe via the saw-cut well screen. Water will continue to move into the probe parallel to the level of free water in the soil. Water will likewise move back into the soil as free water levels recede. The magnetic float switch closes and opens with the vertical movement of water within the probe. The switch does not require resetting once closed.

INSTALLATION

Probe installation is shown in the illustrations. The depth of the installation will depend on the unsaturated soil depth required by regulatory permit or other governing document.

The installation is done via an oversized hole that can be accomplished in one or two steps. The total depth is chosen based on where the float must be located. Install the 2" cap on the probe piping prior to insertion into the hole. Do not solvent weld the cap to the pipe. It must be removed prior to installing the head. It is recommended that the float not be located in the well screen portion of the probe. It should be located just above the well screen allowing the well screen to penetrate the saturated soil level freely. Course sand and fine gravel should be placed along the probe to approximately 2" above the well screen. A 2" layer of sand should then be placed above the sand/gravel mix and gently packed by hand or packed with water. Add additional sand until the minimum 2" above the sand/gravel layer is achieved. This layer of sand will act as a filter to prevent fines from entering the sand/gravel layer around the well screen. Following the filter sand install bentonite pellets around the probe up to the level where the probe head attaches to the 2" pipe or the white cap. Water should then be slowly poured into the

pellets until saturated. Allow the pellets to swell. If subsidence occurs add additional bentonite pellets and hydrate again.

Attach the probe head to the 2" pipe using solvent weld cement. **Be sure wiring into the probe head is complete**. Allow the solvent weld to set. The remaining annular space can be filled with clean, sifted native soil or a hydraulic malt consisting of 50% clean, sifted soil and bentonite pellets. Mix the malt thoroughly with sufficient water to make the combination liquid enough to pour. Be careful not to make the mixture too lean. Pour the liquid mixture into the annular space. Allow the mix to set and settle. Fill in any remaining space with clean, sifted top soil.

WIRING

A two conductor cable or two individual wire conductors will be needed for each SWM-Probe. A water tight connection is provided on the side of the probe head. Be sure to leave sufficient slack in the conductors outside of the probe head. Connect the two conductors to the two wires connected to the magnetic float. Be sure to use water proof wire nuts to protect this connection. The actual float depth is accomplished via the pass-thru located in the centering disc. The float will hang via its wire conductors. Be sure to adjust the wire length to get the correct float setting. Correct for the difference in depth form the surface to the bottom of the probe head where the centering disc sets.

FINAL

Inspect the installation and placement of the float. Once the probe installation is deemed complete then install the maintenance cap. Secure the two conductors coming from the probe so that they cannot be pulled out. Connect the two wires to the controller and test for continuity. Check to be sure that the magnetic switch will close and open when moved up and down.

Inspect the SWM-Probe annually and more often if soil saturation events occur on a frequent basis. Pull the magnetic float switch out of the probe body and inspect it. Clean with water a be sure that the floating collar moves freely.

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L40/L45 Series

Vertical Mount
Plastic

SEALED TO MEET
NEMA 6

1/8" NPT FITTING
(1/8" BSPT FITTING)
7/16" HEX
(11 mm HEX)

WIRES ARE 20 AWG
24" LONG
(~600 mm LONG)

2 1/8" TALL NOM.
(54 mm TALL NOM.)

FLOAT
1" DIA x 1" TALL
(25 mm DIA x 25 mm TALL)
CYLINDER

General Specifications	L40	L45
FITTING	1/8" NPT	1/8" BSPT
WETTED MATERIALS	CPVC - Gray L40-16-C1-16-NO	CPVC - Gray L45-16-C1-16-NO
	Kynar - White L40-17-C1-17-NO	Kynar - White L45-17-C1-17-NO
	Polypropylene - Blue L40-20-C1-20-NO	Polypropylene - Blue L45-20-C1-20-NO
ELECTRICAL SWITCH RATING	50 VA	50 VA
TEMPERATURE RANGE	-40˚F to +180˚F	-40˚C to +82˚C
MIN. LIQUID SPECIFIC GRAVITY	CPVC - 0.85	CPVC - 0.85
	Kynar - 1.00	Kynar - 1.00
	Polypropylene - 0.70	Polypropylene - 0.70
CRUSH PRESSURE	100 PSI	7 BAR
LEAD WIRES	20 AWG 24" PVC	20 AWG 600mm PVC

Actuation point is roughly midway of float travel in liquid with a specific gravity of about 1.0.

Caution: Customer media and environment must be compatible with construction materials as outlined above.

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