



OS-250 Overflow/Spill Sensor User's Manual

Catalog No. 78-0500



WEEE/RoHS Compliance Statement

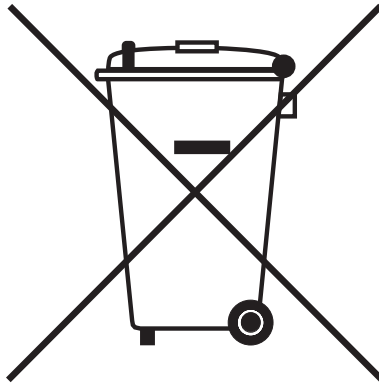
EU Directives WEEE and RoHS

To Our Valued Customers:

We are committed to being a good corporate citizen. As part of that commitment, we strive to maintain an environmentally conscious manufacturing operation. The European Union (EU) has enacted two Directives, the first on product recycling (Waste Electrical and Electronic Equipment, WEEE) and the second limiting the use of certain substances (Restriction on the use of Hazardous Substances, RoHS). Over time, these Directives will be implemented in the national laws of each EU Member State.

Once the final national regulations have been put into place, recycling will be offered for our products which are within the scope of the WEEE Directive. Products falling under the scope of the WEEE Directive available for sale after August 13, 2005 will be identified with a "wheelie bin" symbol.

Two Categories of products covered by the WEEE Directive are currently exempt from the RoHS Directive - Category 8, medical devices (with the exception of implanted or infected products) and Category 9, monitoring and control instruments. Most of our products fall into either Category 8 or 9 and are currently exempt from the RoHS Directive. We will continue to monitor the application of the RoHS Directive to its products and will comply with any changes as they apply.



- **Do Not Dispose Product with Municipal Waste**
 - **Special Collection/Disposal Required**

KDS OS-250 Overflow/Spill Sensor

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KDS OS-250 Overflow/Spill Sensor

Introduction

The OS-250 Overflow/Spill Sensor from KD Scientific provides a simple and effective method for detecting leaks and spills around sensitive equipment (such as a microscope). The integrated switched power controller can be used to rapidly turn off all pump and perfusion systems in the event of a spill. When assembled, the OS-250 can respond to as few as 3 drops of liquid.

FEATURES INCLUDE:

- Cut-able moisture sensitive mats
- Audible and visual alarms
- 8 amp switched power supply
- Rapid response to liquid exposure
- Quiet operation

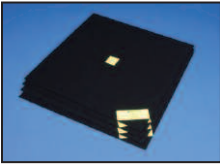
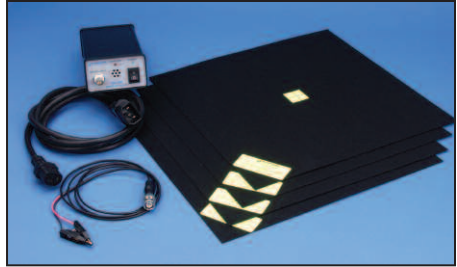
**THIS EQUIPMENT IS NOT DESIGNED NOR INTENDED
FOR USE ON HUMAN SUBJECTS**

KDS OS-250 Overflow/Spill Sensor

Setup

COMPONENTS

The OS-250 System is comprised of moisture sensitive mats (4), the OS-250 controller, a sensor cable with mat-clip, and a line cord for connecting the switched power output of the OS-250 controller to a powered device such as a perfusion system. These components are shown below.



Mats

The moisture sensitive mats represent the heart of this system. Mats are made from a multi-layer, non-woven, carbon impregnated material and can be cut to any size or shape. They are resistant to most organic solvents. They can also be reused following exposure to salt solutions.



OS-250 Controller

The OS-250 controller provides the system's functionality. The front panel houses the input BNC for the sensor cable, an alarm LED, an internal alarm speaker and the power switch. The instrument rear panel houses an outlet for the switched power cable, a connection port for the instrument line cord and a fuse assembly.



Sensor Cable

The sensor cable connects the moisture sensitive mat to the controller. The mat-clip can be attached anywhere on the mat to provide full functionality.

KDS OS-250 Overflow/Spill Sensor

Setup (Cont'd)

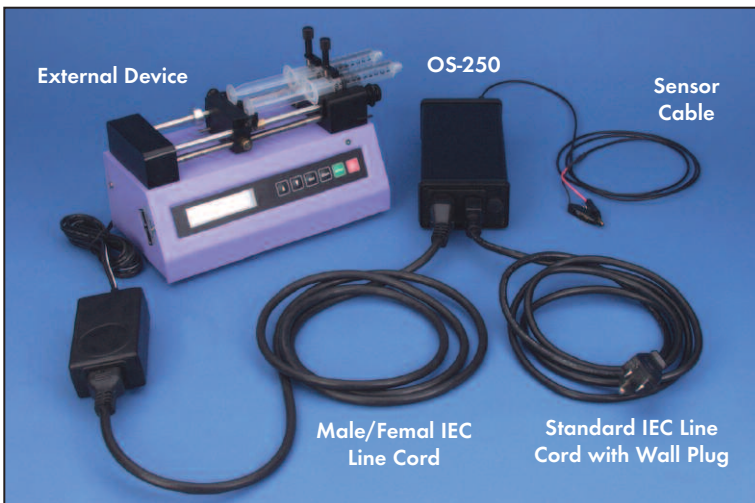
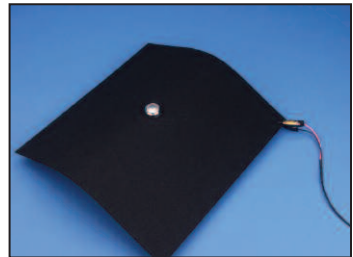
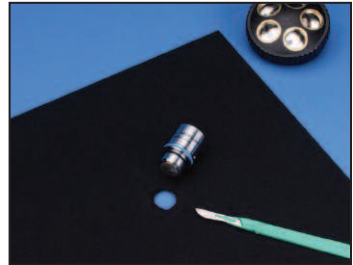
ASSEMBLY

- Begin by cutting a mat to any size and shape necessary for your application and placing it into position.
- Place the controller in a suitable location and attach the sensor cable to the OS-250. Clip the mat-clip anywhere on the moisture sensitive mat.
- The OS-250 is designed to be used as a switchable power source for an external device such as a perfusion system or pump. The OS-250 can only provide this support for devices using standard IEC type line cords. Use of this feature is not required for normal operation.

Begin by removing the line cord from the device that the OS-250 will be powering. Using the supplied male/female IEC line cord, make a connection from your device to the rear of the OS-250.

HINT: Connect the male/female IEC line cord to your device before making a connection to the OS-250. This will help sort out the separate plugs on the back of the OS-250.

- Using the standard IEC line cord (supplied), plug the OS-250 into a wall outlet and turn the power on. The unit is ready to use.



KDS OS-250 Overflow/Spill Sensor

Operation

Operation of the OS-250 is a simple matter. With the unit powered, the presence of 1-3 drops of conducting solution on the mat will initiate an alarm condition. The red LED will flash, the controller will beep, and power to the switched power outlet on the controller rear panel will be shut off. The unit can be reset by either allowing the spill to dry or by replacing the soiled mat.

MAT SENSITIVITY

Moisture sensitive mats are designed to detect the presence of aqueous solutions. This includes pure deionized and nanopure (18.2 MW/cm) waters. Mats have also been shown to detect a limited number of pure organic solvents. Results of liquid drop tests are shown in the table below.

Drop Resistances for Various Compounds

Mats are capable of detecting the presence of some, but not all, pure organic solvents. Resistance values below 430 kW will trigger an alarm condition. Addition of solutes can alter these results. Pure solvents capable of initiating an alarm condition are shown in red.

Liquid	1 Drop	3 Drops
nanopure H ₂ O	200 MW	82 kW
Normal saline	18 MW	6 kW
ETOH	190 MW	19 kW
MeOH	78 kW	31 kW
acetone	245 kW	136 kW
hexane	240 MW	102 MW
chloroform	210 MW	37 MW
decane	330 MW	260 MW
DMSO	420 MW	290 MW

NOTE: *We advise independently testing the performance of all solutions to which the mats will be exposed. (Use a small 1" test clipping from a spare mat.)*

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Operation (Cont'd)

EFFECTS OF HUMIDITY

Extremes in the relative humidity of the local environment can have a dramatic effect on the performance of the moisture sensitive mats. This is not unreasonable since the mat is designed to detect the presence of H₂O. In general, we find the mats perform well when the relative humidity is between 10 and 75%.

Humidity conditions below 10% can require as much as 50% more solution to spill onto the mat before an alarm condition is triggered. In addition, the spill rate can alter the sensitivity of the mat as evaporative losses can keep mat wetting to below the trigger level.

Humidity conditions above 75% can adversely affect the performance of the mat since this humidity level can trigger an alarm condition in the absence of a spill.

RESETTING THE SYSTEM

The OS-250 will signal an alarm whenever the mat resistance (from one side of the mat to the other) drops below 430 kW. The alarm will continue to sound until the mat resistance increases to 760 kW. This hysteresis allows the mat to respond appropriately under border-line conditions.

When an alarm condition has been met, the system can be reset by allowing the mat to dry or by replacing the mat entirely. A heavily wetted mat, or a mat wet by a slowly evaporating liquid can take as much as 24 hours to completely dry. It is more advantageous under these conditions to simply replace the mat.

Usually, mats can be reused after drying. However, a heavily salted or soiled mat may need rinsing before reuse. Simply soak the mat in clean H₂O and allow it to completely dry before use.

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Appendix

Specifications

Power Requirements	90 - 240 VAC, 50/60 Hz, 0.5 VA
Operating Humidity	10 to 75%
Switched Outlet Current	8 A
Enclosure Dimensions (H x W x D)	4.6 x 8.2 x 18.0 cm (1.8 x 3.2 x 7.1 in)
Weight	1.4 kg (3.1 lbs)

WARRANTY AND SERVICE

Warranty

The OS-250 controller and mat-cable is covered by our Warranty to be free from defects in materials and workmanship for a period of one year from the date of shipment. If a failure occurs within this period, we will either repair or replace the faulty component(s). This warranty does not cover failure or damage caused by physical abuse.

In the event that repairs are necessary, shipping charges to the factory are the customer's responsibility. Return charges will be paid by KD Scientific.

Service

We recommend that all questions regarding service be referred to our Technical Support Department.

- Normal business hours are 8:30 AM to 5:00 PM (EST), Monday through Friday
- We are located at 84 October Hill Road, Holliston, MA 01746
- We can be reached by phone at **508.429.6809**
Our Fax Number is **508.893.0160**
- Email us at info@kdsscientific.com or through the contact section of our website at: www.kdsscientific.com

REPLACEMENT PARTS

Catalog Number	Model Number	Product
78-0501	MAT-2	Moisture Sensitive Mats with Sensor Cable, pkg. of 4

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Limited Warranty

KD Scientific Inc. warrants to the first consumer purchaser, for a period of one year from the date of purchase that this unit, when shipped in its original container, will be free from defective workmanship and materials and agree that it will, at its option, either repair or replace the defective unit.

This warranty does not extend to misuse, neglect or abuse, normal wear and tear, accident, modification or unauthorised repair.

KD Scientific will not be liable or in any way responsible for any incidental or consequential economic or property damage. Some States do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

There are no implied warranties of merchantability, or fitness for a particular use, or of any other nature. Some states do not allow this limitation on implied warranty, so the above limitation may not apply to you.

If a defect arises within the warranty period contact KD Scientific Inc. (see address below).

The customer is responsible for shipping charges and must first obtain a Return Material Authorization number (RMA) before the unit will be accepted. If a replacement unit is issued it is covered only for the remainder of the original warranty period dating from the purchase of the original device.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

Note: This pump device is not registered with the FDA and is not for clinical use on human beings.

The OS-250 is manufactured by:

KD Scientific Inc.

84 October Hill Road

Holliston, MA 01746

Phone: 508.429.6809 Fax: 508.893.0160

E-mail: info@kdsscientific.com

Web: www.kdsscientific.com

