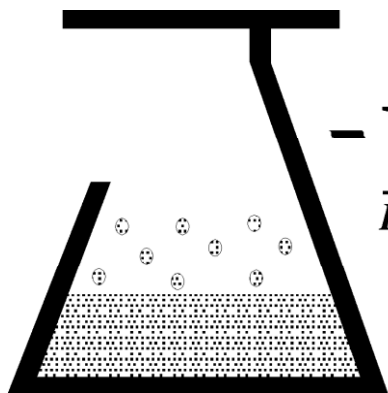


Custom Products for Research

Kugelrohr Short Path Distillation



- KEM Scientific, Inc.
Instruments for Science from Scientists

Warranty

J-KEM Scientific, Inc. warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 12 months from date of purchase. If the unit should malfunction, it must be returned to the factory for evaluation. If the unit is found to be defective upon examination by J-KEM, it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive current, heat, moisture, vibration, corrosive materials, or misuse. Components which wear or are damaged by misuse are not warranted. This includes syringes and valves

THERE ARE NO WARRANTIES EXCEPT AS STATED HEREIN. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL J-KEM SCIENTIFIC, INC. BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES. THE BUYER'S SOLE REMEDY FOR ANY BREACH OF THIS AGREEMENT BY J-KEM SCIENTIFIC, INC. OR ANY BREACH OF ANY WARRANTY BY J-KEM SCIENTIFIC, INC. SHALL NOT EXCEED THE PURCHASE PRICE PAID BY THE PURCHASER TO J-KEM SCIENTIFIC, INC. FOR THE UNIT OR UNITS OF EQUIPMENT DIRECTLY AFFECTED BY SUCH BREACH.

Service

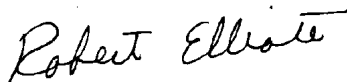
J-KEM Scientific maintains its own service facility and technical staff to service all parts of the controller, usually in 24 hours. For service, contact:

J-KEM Scientific, Inc 6970 Olive Blvd. St. Louis, MO 63130	Phone: (314) 863-5536 Fax: (314) 863-6070	Web site: http://www.jkem.com Email: info@jkem.com
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Here's an offer you can't refuse

J-KEM's goal is to make the finest products available to the research community, period. We understand that research continuously changes, as a result this instrument is designed to allow customized upgrades to its software simply and in your own lab. Your controller is designed to take advantage of a new memory technology that allows new software (containing new or modified program features) to be uploaded directly to the controller's memory via e-mail. Upgradeable programming allows the controller to change as the requirements of your research change.

If you want the program to work a different way, or if you need a new feature added to the program, call us!! We're ready to work with you.

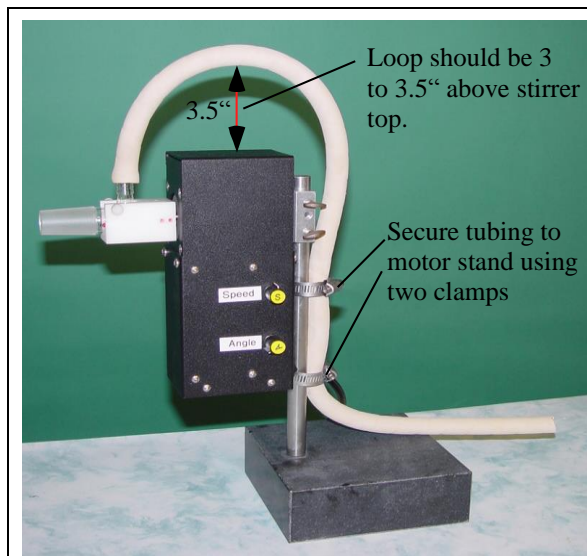


President

Hardware Description



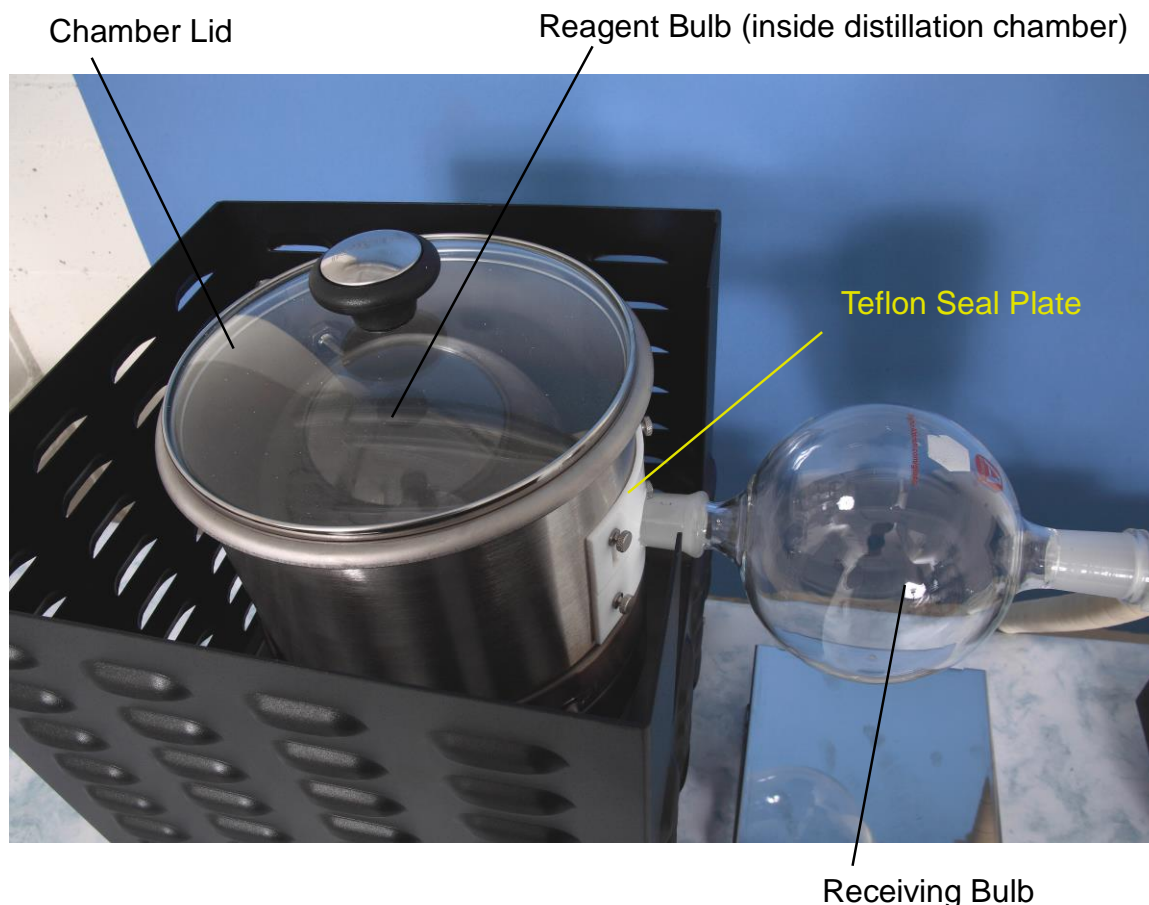
The Kugelrohr consists of a temperature regulated distillation chamber and a programmable stirrer. The distillation chamber is used to heat the air surrounding the reagent flask providing homogeneous and gentle heat source. The programmable stirrer is used to rotate the connected reagent and receiving bulb in a back-and-forth motion around the long axis of the flasks. The rotation of the flasks continuously reforms a thin film of the reagent on the walls of the reagent flask which promotes distillation and minimizes the amount of time that the reagent material is heated.



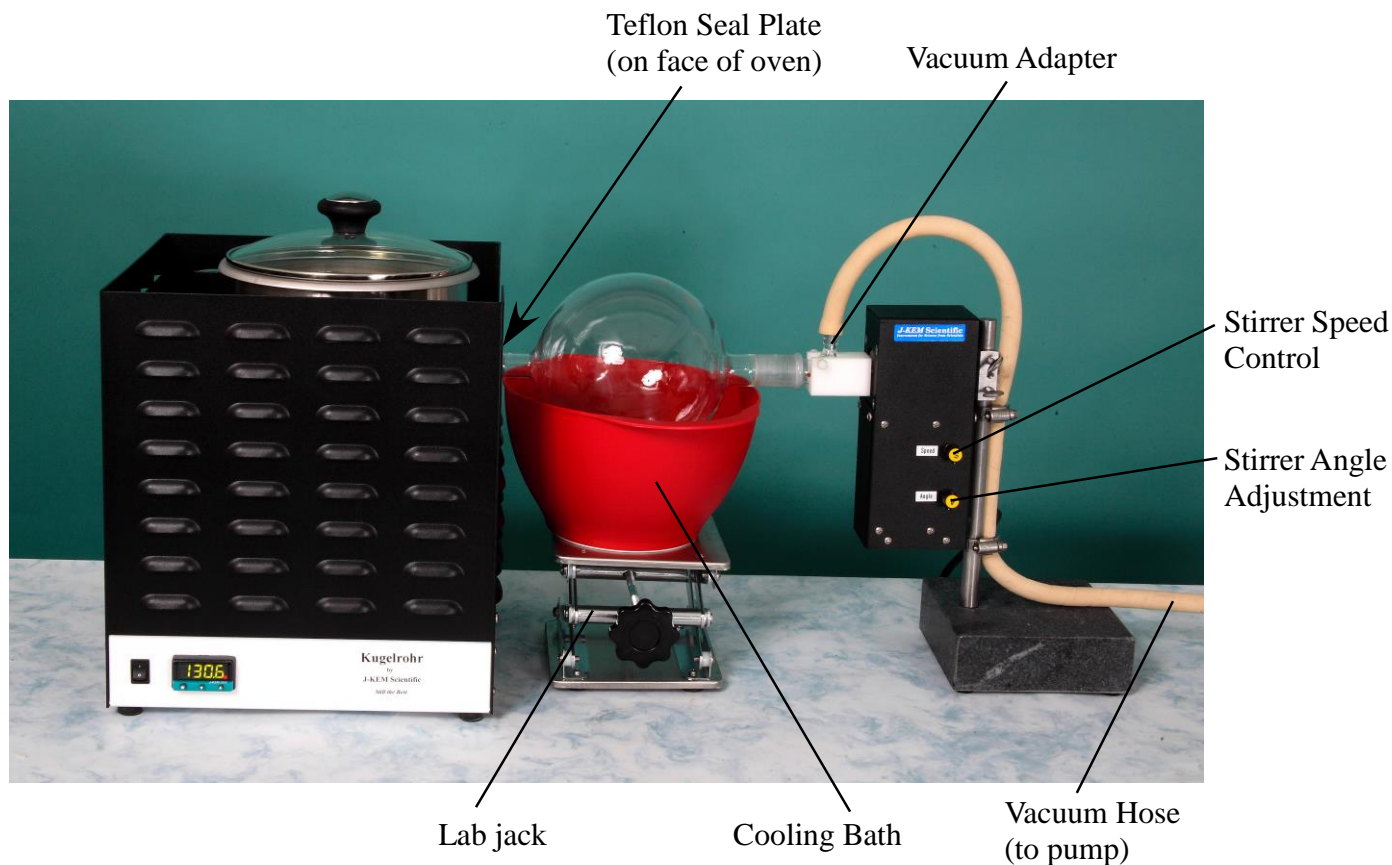
For the stirrer to run properly, it's important that the vacuum tubing does not restrict rotation. Secure the supplied length of vacuum tubing to the post of the stirrer stand as shown, making sure that the connection is tight enough that the tube will not move, but not so tight as to restrict the vacuum. The vacuum tube should form a 3 to 3.5" loop above the stirrer unit as shown.

The programmable stirrer has two controls, the first regulates the rate of rotation and the second the degree of rotation of the reagent and receiving flasks.

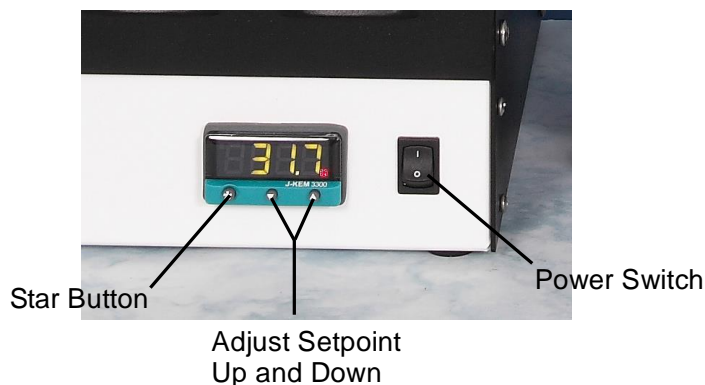
Distillation Reactor Setup



- 1 Loosen the screws holding the Teflon seal plate and slide the movable upper plate all the way up.
- 2 Position the reagent flask inside of the heater then position the female ground glass joint such that it extends out of the hole in the Teflon seal plate. The Kugelrohr can fit any size flask from a 5 ml to a 2 liter flask.
- 3 Connect a receiving bulb to the joint of the reagent flask. The receiving bulb should be at least 3 times the volume of the expected distillate.
- 4 Slide the Teflon seal plate down and around the neck of the reagent flasks neck, then tighten the screws.
- 5 Position the stirring module so that the male ground glass joint coming from the vacuum adapter connects into the joint of the receiving bulb. Adjust the height of the stirring module on its ring stand until the receiving bulb is perfectly horizontal.



- 6 Position a cooling bath beneath the receiving bulb, then using the lab jack, raise it so that the bottom half of the bulb is inside the bath. Fill the bath with dry ice/acetone, or ethanol/ethanol, or any appropriate cooling solution. This causes the vaporized distillate to condense in the receiving bulb and not be lost to the vacuum pump.
- 7 Turn on the power switch on the stirring module. As a safety feature, when power is applied, the stirrer does not immediately begin to stir. Before stirring will start, you must rotate the knob marked Speed, all the way counter clock wise (the slowest speed) to reset the stirring circuit. Now rotate the speed knob clockwise until the flasks are moving at the desired rate. The degree of rotation of the flasks can be set by adjusting the knob marked Angle.
- 8 Once the desired rate and angle of rotation is set, turn on the vacuum source.



- 9 To heat the reagent flask, turn on the power switch on the face of the distillation chamber. To enter a setpoint (i.e., the desired heater temperature), hold in the 'star button', then while holding the star button, press the Up arrow to increase and the Down arrow to decrease the setpoint temperature. The setpoint temperature appears in the display anytime that the star button is pressed. When no keys are pressed, the sensed temperature in the distillation chamber is displayed.