Thermo
SCIENTIFIC

Modular Dri-Bath

Operation Manual
and Parts List

Model	Voltage
DB16524	100V
DB16525	120V
DB16520	240V
DB16520-26	240 w/European Cord

LT810X1 • 1/11/07

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Safety Information

Alert Signals

Warning
Warnings alert you to a possibility of personal injury.

Caution
Cautions alert you to a possibility of damage to the equipment.

Note
Notes alert you to pertinent facts and conditions.

Your Thermo Scientific Modular Dri-Bath has been designed with function, reliability and safety in mind. This manual contains important operating and safety information. You must carefully read and understand the contents of this manual prior to the use of this equipment. It is your responsibility to install your Thermo Scientific Modular dri-bath in conformance with local electrical codes. For safe operation, please pay attention to the alert signals throughout the manual.

Warnings

To avoid electrical shock always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.

2. Disconnect from the power supply prior to maintenance and servicing.

3. Use only blocks designed for use in this dri-bath. Do not use sand, salt, water or other bath material in the chamber of this dri-bath. Improper use may create fire or shock hazard.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.

2. Refer servicing to qualified personnel.

3. “Caution: Hot Surface. Avoid Contact.” The heating blocks and the tray will become hot during operation and will remain hot for a period of time after operation. To avoid burns, use the handle supplied to remove heated blocks from the dri-bath.

Please note the following WARNINGS:

Warning

This warning is presented for compliance with California Proposition 65 and other regulatory agencies and only applies to the insulation in this product. This product contains refractory ceramic, refractory ceramic fiber or fiberglass insulation, which can produce respirable dust or fibers during disassembly. Dust or fibers can cause irritation and can aggravate preexisting respiratory diseases. Refractory ceramic and refractory ceramic fibers (after reaching 1000°C) contain crystalline silica, which can cause lung damage (silicosis). The International Agency for Research on Cancer (IARC) has classified refractory ceramic fiber and fiberglass as possibly carcinogenic (Group 2B), and crystalline silica as carcinogenic to humans (Group 1).

The insulating materials can be located in the door, the hearth collar, in the chamber of the product or under the hot plate top. Tests performed by the manufacturer indicate that there is no risk of exposure to dust or respirable fibers resulting from operation of this product under normal conditions. However, there may be a risk of exposure to respirable dust or fibers when repairing or maintaining the insulating materials, or when otherwise disturbing them in a manner which causes release of dust or fibers. By using proper handling procedures and protective equipment you can work safely with these insulating materials and minimize any exposure. Refer to the appropriate Material Safety Data Sheets (MSDS) for information regarding proper handling and recommended protective equipment. For additional MSDS copies, or additional information concerning the handling of refractory ceramic products, please contact the Customer Service Department at 1-800-553-0039.

Introduction

Warning
Use only blocks designed for use in this dri-bath. Do not use sand, salt, water or other bath material in the chamber of this dri-bath. Improper use may create fire or shock hazard.

Intended Use

To provide a controlled dry heat environment within the range of ambient +5° to 110°C for test tubes containing in vitro diagnostic specimens being used for qualitative or quantitative test procedures. Please refer to the clinical laboratory method specified by the reagent manufacturer or established by medical technology for specific product applications.

Principles of Operation

The DB16500 Dri-Bath is designed to heat thermally conducting blocks which have been fabricated to conform to test tubes of various sizes. the unit consists of a heating chamber constructed to allow the fast, uniform conduction of heat to the blocks. A resistive heater is attached to the bottom side of the chamber. the four sides of the chamber conduct heat also, so as to minimize heat losses from the sides of the blocks. the output of the heater is controlled by a precision temperature sensor and an automatic solid state electronic temperature controller. the controller has been accurately calibrated to a temperature scale graduated in 2° increments, and includes compensation for temperature differences between the heater and mid-size test tubes. Temperature selection (within the specified operating range) is accomplished by turning a knob to the desired setting.

The unit is equipped with an ON/OFF switch and two lights: one to indicate that the power is ON the other to indicate when heat is being applied to the chamber. All housed in a sturdy metallic enclosure with cord and plug attached, the unit operates on ordinary 100, 120 or 240 volt AC supply, depending on model.

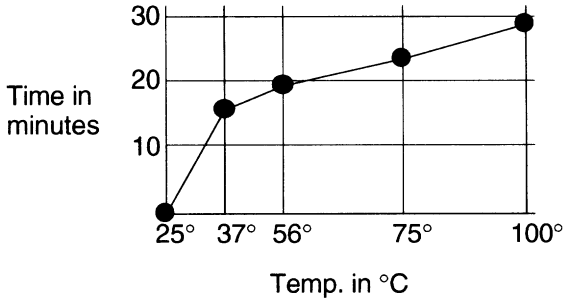
Performance Characteristics and Specifications

Operating Range: Ambient +5°C to 100°C
Temperature Uniformity: ±0.5 C
Temperature Stability: ±0.1°C
Ambient Operating Range: ±20°C - 30°C

Model DB16525 is Underwriters Laboratory listed.

Model	Volts	Amps	Watts	Hz
DB16524	100	3.25	325	50/60
DB16525	120	3.75	450	50/60
DB16520	240	1.875	450	50/60
DB16520-26	240	1.875	450	50/60

Heat-up time of unloaded dri-bath containing three blocks from a cold start.



Tube Size	No. Tubes	Ml. Capacity	Temp.	Time (Mins)	Temp.	Time (Mins.)	Temp.	Time (Mins)
13 X 75	20	4.5	37°C	8	56°C	10	100°C	15
20 X 150	12	12.2	37°C	15	56°C	20	100°C	25

Heat-up time of test tube contents with dri-bath at set temperature. The dri-bath blocks were filled to capacity and contents temperatures were measured and timed.

Note
Solution level should not exceed block level and thermometer tips should be placed in identical positions in the tube. Allow bath to stabilize before reading.

Definitions

Dri-Bath Uniformity

The maximum temperature difference between any two points (wells) in the dri-bath blocks. Uniformity may be determined by inserting the proper sizes test tubes containing equal amounts of solution and calibrated thermometer into ant two wells. The temperature difference is the uniformity rating.

Dri-Bath Accuracy:

The temperature difference between the dial scale setting and the temperature of your test tube contents. model DB16525 has a factory calibrated accuracy of ±2 °C.

Dri-Bath Stability

Refers to the stability of the test tube temperature contents after the temperature has stabilized. may be measured by inserting a calibrated thermometer scaled to 0.1°C into any given tube.

Table 2: Tube Load Capacity

Tube Diameter	6mm	10mm	12mm	13mm	15mm	16mm	18mm	20mm	25mm
Tube Capacity	.62m	l2.4ml	4.1ml	4.5ml	6.3ml	7.39ml	9.8ml	12.2ml	19.9ml

Installation and Operation

Warning
Use a properly grounded electrical outlet of correct voltage and current handling capacity.

Warning
Do not use in the presence of flammable or combustible materials; fire or explosion may result. this device contains components which may ignite such materials.

To avoid burns, use the handle supplied to remove heated blocks from the dri-bath.

Caution
Caution: Hot Surface. Avoid Contact." The heating blocks and the heating block tray will become hot during operation and will remain hot for a period of time after operation. To avoid burns, use the handle supplied to remove heated blocks fro the dri-bath.

Installation

Remove the dri-bath from the carton. Check the voltage specifications located on the back of the unit. Plug into the properly grounded receptacle.

Operation

Insert three heating blocks in the dri-bath well. Set the temperature pointer on the control knob to the desired temperature. Fill three test tubes to the proper milliliter capacity and place one test tube in the center of each block. Solution should not exceed block well level. Wait until dri-bath temperature has stabilized. insert a calibrated thermometer reading is within ±1°C of your control knob setting. Repeat this process with the other tubes. Adjust control knob to your desired operating temperature.

Once your temperature setting is correct, you may leave the control knob at that setting. Turn the dri-bath ON and OFF with the ON/OFF switch. Allow time for your dri-bath to heat to the specified temperature after you turn it ON.

Recalibration Procedures

Equipment Required

1 Regular Tip 7/32” screwdriver

1 NIST Traceable Calibrated Thermometer, Range: 0-150°C, divisions of 0.1°C.

1 Test Tube

This dri-bath was initially calibrated by measuring temperatures in a 15 mm test tube filled to block level with n-butyl pthalate and by adjusting the control so that temperature matches dial setting. If the temperatures obtained differ appreciably (±2°C or more) from the dial setting, the control can be recalibrated as follows. In steps g and j be sure to allow temperature to stabilize between subsequent adjustments (approximately 10-12 minutes).

a. Turn the switch to the OFF position. Allow the unit to cool to room temperature if hot.

b. There are two screwdriver adjustments accessible in the rear of the unit. Turn them both fully counterclockwise, then turn them clockwise about one-half rotation (about 135°).

c. Fill an intermediate size test tube to block level with water if use is limited to lower temperatures. If temperatures above 100°C are exceeded, calibration must be made with a liquid having a higher boiling point than water, such as n-butyl pthalate. Place the test tube in the block and a thermometer in the the tube.

d. Turn the switch to the ON position.

e. Turn the knob to the 46°C setting.

f. Allow the temperature to fully stabilize.

g. Looking at the unit from the rear, turn the adjustment on the right to correct the test tube temperature to 46C (turning it clockwise increases temperature).

h. Turn the knob to the 89°C setting.

i. Allow the temperature to fully stabilize.

j. Turn the adjustment on the right to correct the test tube temperature to 49°C (turning it clockwise increases temperature).

k. Repeat steps e, f, and g.

Maintenance and Servicing

Warning
Disconnect from power supply before servicing.

Refer servicing to qualified personnel.

Cleaning

To clean the dri-bath, unplug from power supply. Use a moist cleaning cloth to clean case and block well. Dry thoroughly. *Do not immerse the dri-bath.*

Troubleshooting

Problem	Possible Cause	Corrective Action
Erratic temperature.	Noisy environment.	Contact Customer Service.
	Defective circuit board.	Replace circuit board.
Will not heat.	Defective circuit board.	Replace circuit board.
	Thermal fuse open.	Replace thermal fuse.
	Defective triac.	Replace triac.
Temperature varies from block to block	Poor transfer of heat from chamber to block.	Clean bottom of chamber and blocks.

Notes

Do not place dri-bath in a draft, in direct sunlight or near equipment which emits heat as this may result in fluctuating temperatures.

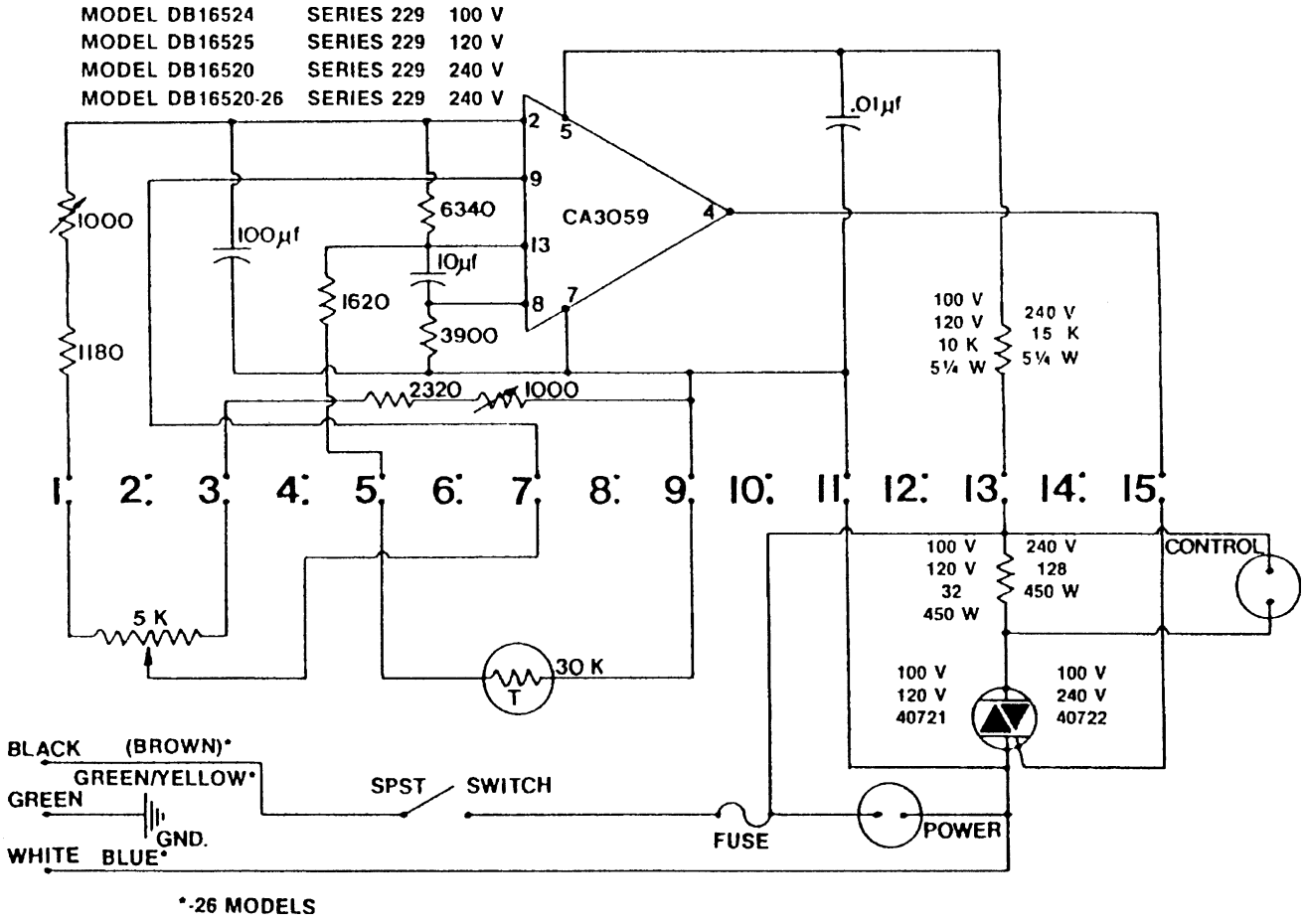
Test tube liquid levels should not exceed the level of the well depth.

Placing a full load of cold tubes into the dri-bath will extend recovery time.

Identical test results should not be expected with dri-bats because they reduce heat loss.

Surface contact of the blocks with the bath well is essential. Particles in the bath well can impede good surface contact.

Wiring Diagram



Replacement Parts List

MODELS DB16524, 100V & DB16525, 120V	MODELS DB16520 & -26, 240V	DESCRIPTION	NO. REQUIRED
CS199X1A	CS199X1A	Block Well	1
JN199X1	JN199X1	Block Well Insulation	1
PT229X1B	PT229X2A	Well, base & element & thermistor assembly	1
PLX48	PLX49	Power Light	1
BC229X1A	BC229X1A	Bracket, Triac Assembly	1
CR163X1	CR163X2	Cord & Plug	1
--	CR260X1	Cord & Plug (DB16520-26)	1
PC165X1A	PC165X2A	Printed Circuit Board	1
KBX84	KBX84	Control Knob	1
SWX45	SWX45	Off-On Switch	1
RS130X1	RS130X1	Potentiometer	1
TRX77	TRX77	Terminal (18 connectors)	1
TRX68	TRX68	Terminal (9 connectors)	1
HNX7	HNX7	Handle, case	2
CE229X1A	CE229X1A	PCB Terminal	1
HN165X1	HN165X1	Handle, For Lifting Blocks	1

PART NUMBER	TUBE SIZE (mm)	WELL SIZE (mm)	NO. OF WELLS
BK165X3A	6	6.52	30
BK165X4A	10	10.49	20
BK165X12A	12	12.70	20
BK165X5A	13	13.84	20
BK165X6A	15	15.875	12
BK165X7A	16	16.66	12
BK165X13A	18	18.64	12
BK165X8A	20	20.65	12
BK165X9A	25	25.80	6
BK165X17A	1.5 ml Eppendorf Tube (tapered hole)	- - - - - -	20
BK165X20A	0.5 ml Eppendorf Tube (tapered hole)	- - - - - -	20

Ordering Procedures

Please refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit.

All parts listed herein may be ordered from the **Thermo Scientific** dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed we ask that you check first with your dealer. If the dealer cannot handle your request, then contact our Customer Service Department at 563-556-2241 or 800-553-0039.

Prior to returning any materials, please contact our Customer Service Department for a “Return Materials Authorization” number (RMA). Material returned without an RMA number will be refused.

One Year Limited Warranty

This Thermo Scientific product is warranted to be free of defects in materials and workmanship for one (1) year from the first to occur of (i) the date the product is sold by the manufacturer or (ii) the date the product is purchased by the original retail customer (the “Commencement Date”). Except as expressly stated above, the MANUFACTURER MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of the manufacturer must perform all warranty inspections. In the event of a defect covered by the warranty, we shall, as our sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold within the continental United States or Canada, the manufacturer shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

The warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than the manufacturer or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Thermo Scientific products.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, the manufacturer will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to the factory, it shall be sent prepaid and a prior written authorization from the manufacturer assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL THE MANUFACTURER BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

For the name of the authorized Thermo Scientific product dealer nearest you or any additional information, contact us:

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