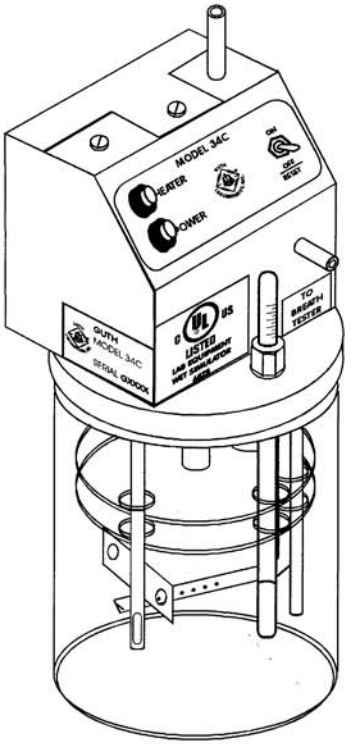
MODEL 34C SIMULATOR

OPERATION MANUAL



Guth Laboratories, Inc., 590 North 67th Street, Harrisburg, PA 17111-4511

TELEPHONE 717-564-5470 / 800-233-2338
FAX 717-564-2555
WEB SITE www.guthlabs.com

MANUAL PRICE $5.00

INTRODUCTION

The Guth Model 34 C Alcohol Breath Simulator is a State-of-the-Art, electronically temperature controlled, water-alcohol instrument for the purpose of providing a precise calibration standard. The water-alcohol solution placed in the simulator is maintained at a temperature of 34°C +/- .05°C.

The Guth Model 34 C Simulator is approved by the National Highway Traffic Safety Administration (NHTSA), published on their Conforming Products List (CPL), and is listed with Underwriters Laboratories, Inc. (UL), as meeting United States Safety Standards, and Canadian Safety Standards (CSS).

CERTIFIED* SIMULATOR SOLUTION STANDARD

PLEASE NOTE: It is imperative your Simulator Solution be of the highest quality in order to acquire the scientific and legal standards of acceptance.

To establish a precise and accurate calibration standard when using a Guth simulator, GUTH LABORATORIES, INC. recommends using Guth Certified Simulator Solution in order to maintain the highest standards available. Guth Laboratories, Inc., a pioneer and leader in the science of alcohol breath testing, has provided Certified Simulator Solution to state, municipal, and local law enforcement agencies for many years.

Guth Certified Simulator Solutions are prepared in standard concentrations of .02%, .04%, .05%, .08%, .10%, .15%, .20%, .30%, and .40%. Other special concentrations may be available. Please contact Guth Laboratories, Inc. for availability and pricing:

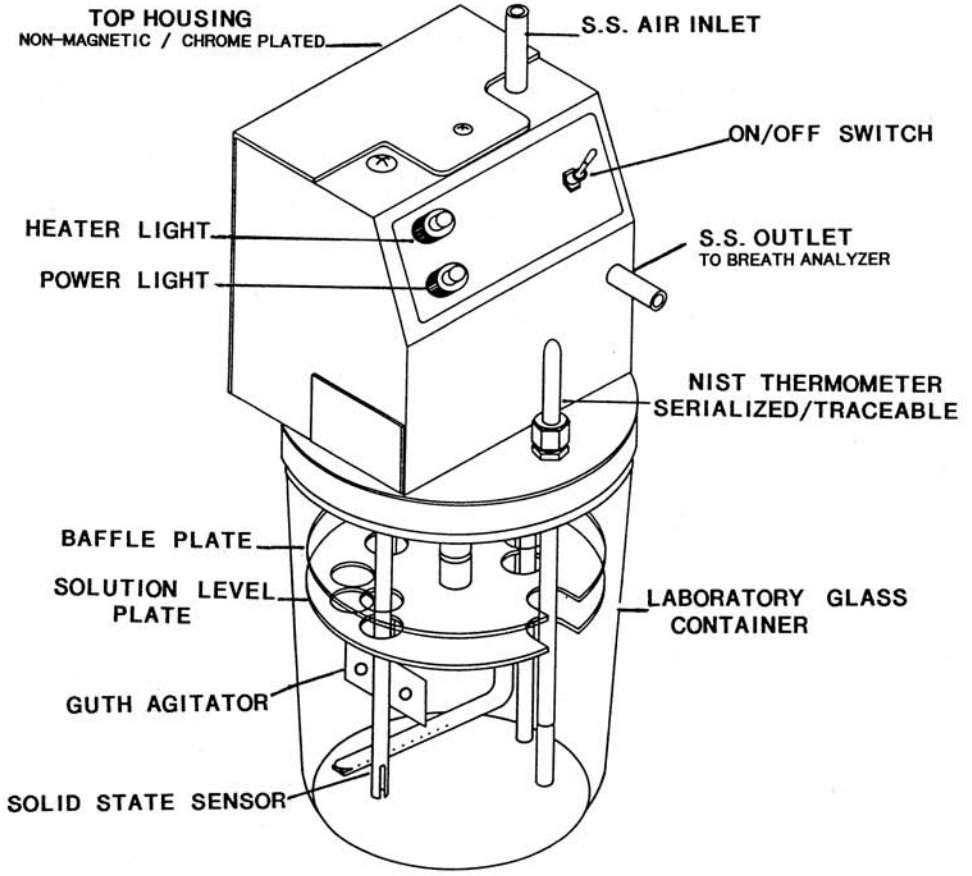
Toll free: (800) 233-2338 FAX: (717) 564-2555

or visit our web site at www.guthlabs.com

STORAGE: Store Simulator Solution in a cool location. Do not place solution in a freezer - **DO NOT REFRIGERATE SIMULATOR.**

Certified* Guth Certified Simulator Solutions are tested by laboratory quality gas chromatograph.

GUTH
MODEL 34C
SIMULATOR

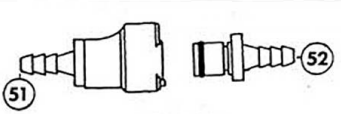


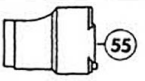
EXCLUSIVE FEATURES OF THE GUTH MODEL 34C SIMULATOR

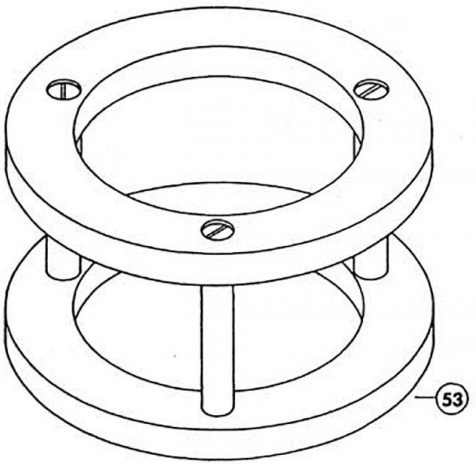
- SOLID STATE CONTROLLER: Mercury column is eliminated
- Maintains a precision of 34°C +/- 05°C
- Will not heat if the probe is damaged (shorted or open circuit)
- ADJUSTABLE TEMPERATURE POTENTIOMETERS
- NIST TRACEABLE SERIALIZED MERCURY-IN-GLASS REFERENCE THERMOMETER
- GUTH GRADUATED LABORATORY GLASS CONTAINER: Will not aspirate air into the simulator if the container is tightened properly
- NON-MAGNETIC METAL TOP HOUSING ASSEMBLY: Provides uniform headspace heating
- POWER SWITCH: On / off - Double pole, double throw (DPDT)
- FUSE: Provides protection in the event of an electrical malfunction; mounted externally on top housing offering convenient replacement
- POWER LAMP / HEATER LAMP: Long life indicator neon lamps (one to indicate the unit is turned ON, and one to indicate power is being supplied to the heating element)
- RELIABLE AGITATOR MOTOR
- AGITATOR PADDLE: Designed by Guth Laboratories, Inc. Offers maximum circulation and uniformity of solution
- HEATER ELEMENT: Electronically protected from overheating when removed from solution or when sensor probe is open or shorted
- RFI PROTECTED: The heating element will turn off when the simulator is subject to a RF field of 10 volts / meter or greater

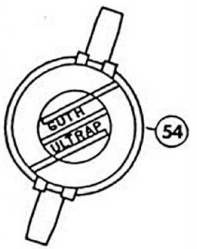
OPTIONS

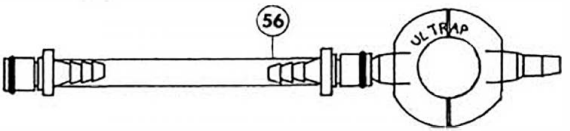
ITEM	PART NO.	DESCRIPTION
51	GU-1151-SF	SURE-LOK CONNECTOR FEMALE
52	GU-1152-SM	SURE-LOK CONNECTOR MALE
53	GU-1101-SS	SIMULSTAND
54	GU-0100-00	GUTH ULTRAP MOUTHPIECE
55	GU-1151-SS	SURE-LOK (SPECIAL) FEMALE
56	GU-1150-CO	EBT CALIBRATION OPTION











INSTRUCTIONS FOR USE OF THE GUTH MODEL 34 C ALCOHOL BREATH SIMULATOR:

UNDERWRITERS LABORATORIES, INC. (UL) LISTED

1. Add tubing and male connector to the simulator.

2. Remove the glass container from the simulator top housing. To prevent breakage, do not strike mercury thermometer against the Guth laboratory container.

3. Pour 500 ml of certified solution into the simulator container. The Guth laboratory glass container has a 500 ml +/- fill mark. The solution should never be less than 500 ml prior to inserting the top housing.

4. Reassemble the simulator by replacing the container into the top housing. Be sure the container is properly seated to the top housing. DO NOT OVERTIGHTEN.

5. Turn the power ON and allow the solution to heat to 34°C. This will require approximately 15 minutes. The heater lamp is lit when the heating element is heating. The heater lamp is OFF when the simulator has reached the proper temperature of 34°C. (It is normal for the heater lamp to rapidly turn on and off automatically as the simulator cycles.)

6. After proper operating temperature is obtained, the simulator is ready for use. Attach tubing to front of the simulator marked "TO BREATH TESTER". When manually operating the simulator, take a deep breath and blow into the air inlet atop of simulator. Blow for a 4 - 7 second duration.

   The blowing technique should imitate a person providing a breath sample into the breath test instrument. After the breath test sample is introduced into the breath analyzer, the breath analyzer performs the analysis and provides a final result.

   Rather than the blowing technique, the following alternative methods also fulfill the requirement of providing air through the tubing attached to the simulator: a simulator bellows pump, a pump-powered air source, or an atomizer.

   If a low reading is obtained, check all tubing for leaks. Be sure the glass container is properly tightened to the metal top housing. DO NOT OVERTIGHTEN. Repeat the testing procedure.

NOTE: The steps, as outlined above, are a basic operational guideline to be modified by the end user in accordance with their state, local, or corporate guidelines.

IF THE SIMULATOR DOES NOT HEAT TO 34°C
AND YOU ARE USING A GUTH CERTIFIED, SERIALIZED NIST
REFERENCE THERMOMETER:

A. Inspect the thermometer for mercury separation.

1. If there is no separation, return the unit to Guth Laboratories, Inc. (See instructions on page 15).

2. If there is a separation...Try another NIST thermometer (or) follow the instructions for rejoining a mercury separation.

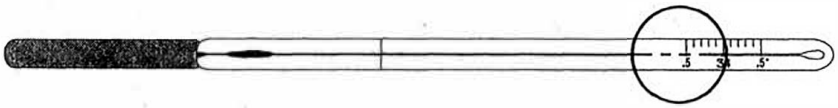
CAUTION: If a mercury thermometer is accidently broken, be very careful. Mercury is poisonous. DO NOT allow direct contact with the skin or mouth! Use rubber gloves to clean any spill.

INSTRUCTIONS FOR REJOINING MERCURY SEPARATIONS IN GLASS THERMOMETERS

All Guth precision thermometers are sealed under extremely high nitrogen pressure while drawing the mercury into the lower portion of the capillary. This process, when coupled with acid washed tubing and triple distilled mercury, although costly, greatly reduces the frequency of separations in the capillary portion of the thermometer.

Many instructions for rejoining separations begin with "the mercury may be retracted into the bulb by immersing it in a suitable mixture of dry ice and alcohol..." This statement is NOT specific enough. Determine the type of separation from the illustrations provided and proceed according to these instructions.

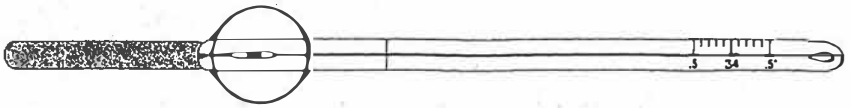
SEPARATION AT THE UPPER PORTION OF MERCURY COLUMN



All well constructed thermometers contain an expansion chamber or bubble at the extreme top of the capillary. This chamber serves a twofold purpose; one, to accommodate an overflow of mercury when the thermometer is subjected to temperatures in excess of its scale range and two, as a means of rejoining this type of separation.

While holding the thermometer in a vertical position, slowly heat the bulb under WARM tap water until the separated segments and a portion of the main (intact) column enter the top chamber. (Extreme care must be taken to insure that the mercury does NOT fill more than HALF to THREE-QUARTERS of the chamber volume; **otherwise, breakage of the bulb will result**). The nitrogen pressure will force a rejoining of the mercury. While holding the thermometer vertically, examine

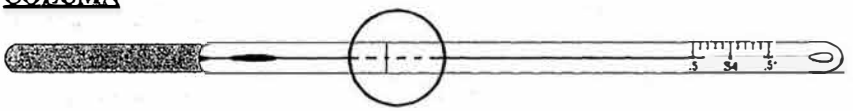
SEPARATION IN THE CONTRACTION CHAMBER



Separation of mercury in the contraction chamber is an entirely different problem. Many thermometers contain scale ranges which begin well above ambient temperatures. These thermometers are provided with a contraction chamber or enlargement which prevents the mercury from entering the bulb at ambient temperatures. Unusual handling of the thermometer may cause a separation in the contraction chamber.

The procedure to rejoin this mercury is relatively simple. If the separated mercury is in the form of a very slight amount, invert the thermometer and tap gently against the palm of the hand. *(It is recommended that protection be used in the palm of the hand - paper towel, cloth, etc. against glass breakage.)* This will cause a greater separation, adding volume and weight to the separated portion. The thermometer should then be righted and gripped firmly in the hand at a 270 degree angle with bulb outward. Sharply swing the thermometer downward at one's side in a 270 to 180 degree arc. The centrifugal force thus generated will join the separated mercury to the main portion. If the original separation contained a large volume, only the latter step of swinging the thermometer downward need be followed.

SEPARATION IN THE LOWER AND MIDDLE PORTION OF THE COLUMN

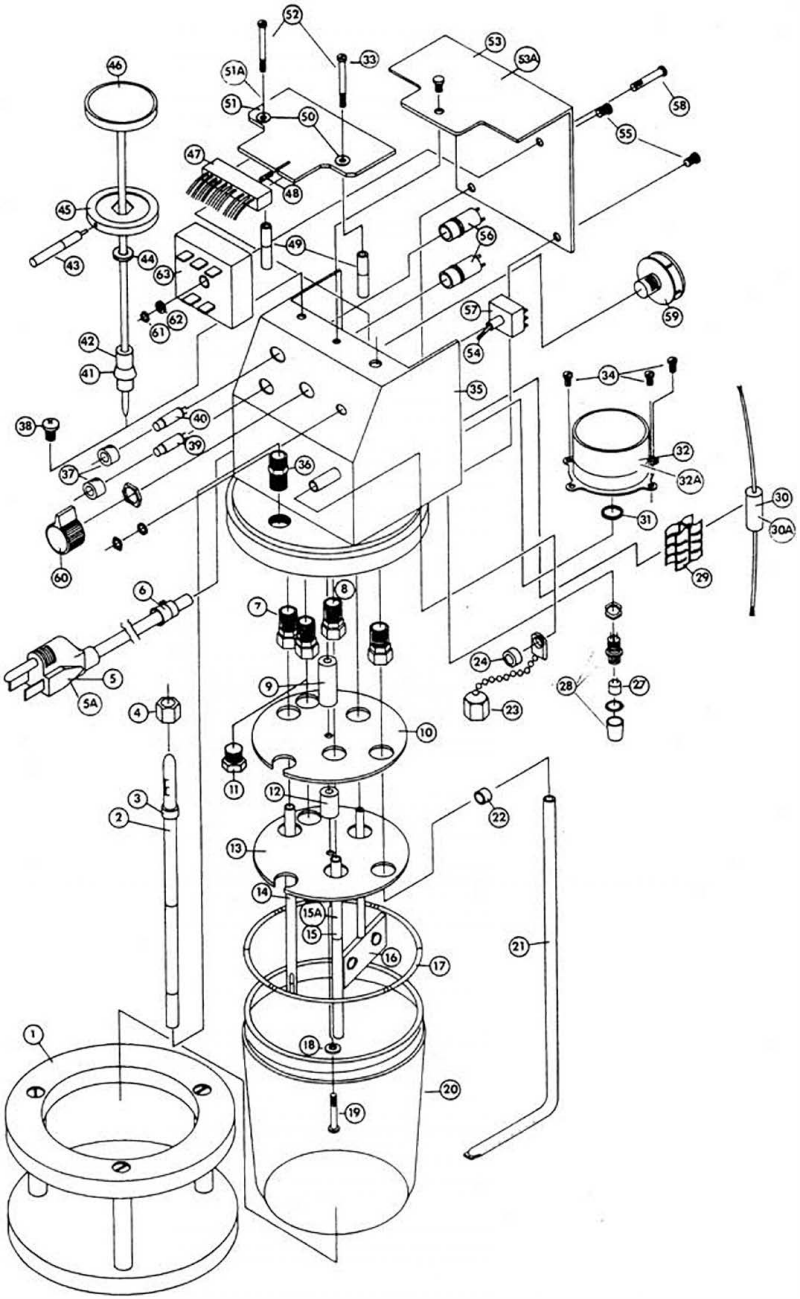


Separations of this type are less frequent and more difficult to repair. There are more variables, and no one explanation will cover all types of thermometers.

The general procedure is to subject the bulb only to a temperature (in an ice bath or freezer) sufficient to retract all the mercury into the bulb. A slow and careful return to ambient temperature will return an intact column. Our experience has shown that additional problems may be caused in these procedures, and we point out the following cautions:

Allow thermometer to return to ambient or room air slowly or breakage may occur. This breakage is caused by mercury thawing in the capillary more slowly than the mercury in the bulb thereby creating an impasse to the expanding mercury. In order to avoid this breakage, extreme care must be taken to allow the mercury in the bulb to liquify at the same rate as the mercury in the capillary.

While holding the thermometer vertically, allow it to return to ambient temperatures. Extreme care must be taken to insure the thermometer is not jarred or at the slightest angle while the nitrogen gas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MODEL 34C PARTS LIST

ITEM	PART NUMBER	DESCRIPTION
1	GU-1101-SS	SIMULSTAND
2	GU-1109-ST	NIST THERMOMETER
3	GU-1109-SG	SILICON GROMMET
4	GU-1109-TN	NIST THERMOMETER NUT
5	G1-1116-PC	120V POWER CORD
6	GU-1118-SR	STRAIN RELIEF
7	GU-1121-MF	METAL FITTING
8	GU-1129-HF	HEATER NYLON FITTING W/ NUT
9	GL-1146-ST	LONG SPACER W/ THREADS
10	GB-1152-BP	LEXAN BAFFLE PLATE
11	GU-1126-MP	METAL PLUG FOR DIAL THERMOMETER
12	GS-1157-SO	SHORT SPACER W/O THREADS
13		
14	GP-1122-TP	COMPLETE TEMPERATURE PROBE
15	G1-1123-HS *	120V HEATER W/ SENSOR
16	GU-1127-AS	AGITATOR & SHAFT
17	GU-1125-CG	CONTAINER GASKET
18	GU-1155-NW	NYLON WASHER
19	GU-1154-SS	STAINLESS SCREW FOR BAFFLE PLATE
20	GU-1125-SJ	SIMULATOR CONTAINER
21	GI-1106-BP	34C STAINLESS INLET TUBE
22	GU-1121-FE	METAL FERRULE
23	GU-1107-CC	CAP & CHAIN ASSEMBLY
24	GU-1109-SG	SILICON GROMMET

*Item 15 replaces early version (Rev. A) heater element - Use Black Wires Only.

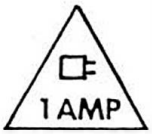
ITEM	PART NUMBER	DESCRIPTION
27	GU-1104-BF	FUSE 1.0 AMP
28	GU-1103-FA	FUSE ASSEMBLY
29	GC-1128-CA	CLIP ASSEMBLY
30	G1-1132-17	8200 OHM 5 WATT RESISTOR
31	GU-1115-SW	SOLID WASHER / MOTOR
32A	GU-1115-MG	MOTOR GASKET
32	G1-1115-OM	120V MOTOR (SPECIAL)
33	GU-1115-NW	NYLON WASHER PC BOARD SPACER
34	GU-1124-MS	STAINLESS MOTOR MOUNTING SCREW
35	GU-1108-TH *	TOP HOUSING
36	GU-1109-MF	NIST THERMOMETER FITTING
37	GU-1117-LC	LAMP SOCKET COLLARS
38	GS-1148-DS	STAINLESS SCREW REPLACES DIAL
39	GU-1120-AL	AMBER NEON LAMP (POWER)
40	GU-1120-RL	RED NEON LAMP (HEATER)
41	GU-1113-NF	NYLON FERRULE (DIAL)
42	GU-1113-SB	SILICON BUSHING
43	GU-1149-PW	DIAL THERMOMETER CALIBRATION TOOL
44	GU-1155-NW	NYLON WASHER
45	GU-1113-DS	DIAL CALIBRATION SPACER
46	GU-1113-DT	DIAL THERMOMETER
47	GC-1159-EB	EDGE BOARD CONNECTOR
48	GU-1151-PI	POLARIZED INSERT
49	GU-1143-SP	PC BOARD 5/8" SPACER
50	GU-1145-LW	NO. 4 LOCK WASHERS
51	G1-1114-RB	120V REV. B PCB W/ SENSOR CIRCUIT
52	GU-1144-BS	STAINLESS PC BOARD SCREW

* When ordering, a complete description is required.

ITEM	PART NUMBER	DESCRIPTION
53	G1-1108-BC*	120V BACK COVER
54	GU-1119-SS	SWITCH SLEEVE
55	GU-1112-BS	STAINLESS BACK COVER SCREWS
56	GU-1117-LA	LAMP SOCKET ASSEMBLY
57	GU-1119-SA	SWITCH ASSEMBLY
	OPTIONAL PARTS LIST	
58	GU-1156-MS	STAINLESS MOUNTING SCREW FOR TIMER
59	GR-1135-MS	MULTI-CONTROL SWITCH
60	GR-1135-CK	ALUMINUM CONTROL KNOB
61	GU-1156-TN	NUT FOR TIMER
62	GU-1158-MW	MOUNTING WASHER TIMER
63	GU-1153-ST	SOLID STATE TIMER
	220V PARTS LIST	
5A	G2-1116-PC **	220V LINE CORD
15A	G2-1123-HS ***	220V HEATER W/ SENSOR
30A	G2-1134-17	20K 5 WATT RESISTOR
32A	G2-1115-OM	220V MOTOR SPECIAL
35A	REQUIRES DESCRIPTION	SPECIAL TOP HOUSING
51A	G2-1114-RB	220V PC BOARD REV. B
53A	G2-1108-BC ****	220V BACK COVER

* Back cover may vary for different models
** Specify Country
*** Item 15A replaces early version (Rev. A) heater element - Use Black Wires Only
**** Requires Complete Description

UNDERWRITERS LABORATORIES, INC.
UL SYMBOLS AND WARNINGS



FUSE REPLACEMENT:

UNPLUG SIMULATOR PRIOR TO REPLACING FUSE

REPLACE FUSE AS MARKED

CAUTION: **To reduce the risk of electric shock, DO NOT remove back cover. Refer to qualified service personnel!**

Power: 120 VAC 60Hz., 77 watts

Mains supply fluctuation not to exceed ±10% of the nominal voltage.

Do not position instrument so that it is difficult to disconnect the power cord.

Disconnect power cord and empty solution before moving instrument.

Disconnect power cord before changing solution.

Disconnect power cord before replacing fuse.

Fuse Replacement: Buss type GMW 1 amp @ 125 vac Fast Acting

Indoor Use Only

Altitude up to 2000m (6562 ft.)

Temperature 5°C to 33°C (41°F to 91°F)

Maximum Relative Humidity 80% for Temperatures up to 31°C (~88°F), decreasing linearly to 50% Relative Humidity.

Transient Over voltages according to Installation Category II.

Pollution Degree 2 in accordance with IEC 664.

When Instrument is operated at an elevated temperature, the outside of the glass container may become hot.

TROUBLE SHOOTING THE 34C

SYMPTOM:	CHECK THE FOLLOWING:
NO APPARENT POWER	FUSE
HEATER WILL NOT TURN ON	1138IC, TRIAC, HEATER or PROBE - RFI PRESENT
HEATS SLOWLY	HEATER
ERRATIC TEMPERATURE READINGS	PROBE, AC OUTLET
TEMPERATURE ADJUST PROBLEMS	PROBE
SOLUTION PADDLE DOES NOT TURN	REPLACE THE MOTOR
SIMULATOR LEAKS AIR	CONTAINER, GASKET, TUBING and/or FITTINGS
HIGH TEMPERATURE READINGS	AC OUTLET, IMPROPER WIRING, NO GROUND, ADJUST POTS

PREVENTIVE MAINTENANCE
FOR THE GUTH MODEL 34 C

A) Use mild detergent to clean the top housing. Use chrome cleaner for removing stains and heavy soils.

B) Cleaning of parts within the solution chamber:

ALGAE: To kill algae in your simulator, use 1 TABLESPOON of CHLOROX per 1 GALLON of WATER. Soak 3 - 6 hours, rinse with cold water (DO NOT rinse with HOT water). Hot water will shock the sensor and could break the NIST thermometer. Allow the 34 C to AIR dry!

C) Check to see if fuse cap is secure. DO NOT OVER-TIGHTEN!!!

D) Replace the container gasket if uneven wear is noted. It is recommended the gasket be replaced once a year.

E) Inspect the laboratory glass container threads for chips and cracks. Replace if necessary.

RETURNING A SIMULATOR:

If you have been unsuccessful in reuniting the mercury column, or repairing the simulator in the field, please call our Product Service Department for assistance or a RMA (Return Material Authorization) number.

GUTH LABORATORIES, INC.
590 NORTH 67th STREET
HARRISBURG, PA 17111-4511
(717) 564-5470
or
(800) 233-2338

NOTE: When returning the simulator, it is imperative the glass container is attached. This prevents breakage of the glass thermometer, reducing repair cost. Remove the container and carefully wrap the thermometer with proper shipping material (crushed newspaper, bubble pack, etc.). Replace the container. (The container will protect the glass thermometer from breakage.)

RECORDS (SERIAL NUMBERS, CALIBRATIONS AND NOTES)

NIST TRACEABLE THERMOMETER -- SERIAL NUMBER _____

CERTIFIED BY _____ DATE _____

TEST TEMPERATURE _____°C NIST TRUE TEMPERATURE _____°C

MODEL 34C -- SERIAL NUMBER _____

CALIBRATION DATE	CALIBRATED BY

NOTES