



**50 ML Oil and Water Retort
Instruction Manual**

Copyright 2009
Fann Instrument Company
Houston, Texas USA

All rights reserved. No part of this work covered by the copyright hereon may be reproduced or copied in any form or by any means -- graphic, electronic or mechanical without first receiving the written permission of Fann Instrument Company, Houston, Texas USA

Printed in USA

NOTE:

Fann reserves the right to make improvements in design, construction and appearance of our products without prior notice.

®**FANN** is a registered trademark of Fann Instrument Company.

Fann Instrument Company
PO Box 4350
Houston, Texas USA 77210
Telephone: 281- 871-4482
Toll Free: 800-347-0450
Fax: 281- 871-4358

TABLE OF CONTENTS

SECTION	PAGE
1 Description	1
2 Safety Considerations	2
3 Operating Procedure	3
4 Care of Equipment.....	5
5 Calculations.....	6
6 Specifications	8
7 Retort Repair.....	9
8 Parts List	15

FIGURES	PAGE
1 Retort Assembly.....	4
2 Retort Kit Assembly	8
3 Retort Wiring, 115 Volts and 230 Volts	11

SECTION 1 DESCRIPTION

The 210463 and 210465 Model Oil and Water retorts provide a simple, easy, accurate, and direct reading method of determining the percentages of water, oil, and solids which make up drilling fluids.

These Oil and Water retorts can also be used to determine the amount of water or solids in oil samples, the water and oil saturation in core samples, or the amount of oil in possibly polluted sea water.

The retorts are electrically heated and thermostatically controlled to shut off when a predetermined temperature ($930^{\circ}\text{F} \pm 70^{\circ}$) ($498^{\circ}\text{C} \pm 21^{\circ}$) as specified by API has been reached. Retorts are available to operate on either 115 volt 50/60 Hz (210465) or 230 volt 50/60 Hz (210463) electrical power. Both retorts have 700 watts of power.

The retorts are packaged in individual carrying cases.

The retort shown in Fig. 1 is composed of a 50 cm^3 sample chamber (1), measuring lid (2) upper boiling chamber and distillation tube (4) containing steel wool (3), and condenser (5). Fig. 2 shows the heating well (38) which contains the cartridge heaters (35 or 36) and the thermostat (31). Water and oil distillate are collected in a standard 50 ml graduate (6).

A special 50 cm^3 receiving tube (41), as called for in the API procedure, is available and should be used when the most accurate reading is required. It is NOT included in the standard retort kits.

SECTION 2 SAFETY CONSIDERATIONS

Safe operation of the Model 210463 and 210465 Oil and Water Retorts requires that the operator be familiar with the proper operation and potential hazards associated with this equipment. Retorting the sample poses the potential hazards of the exposed retort stem and Condenser getting hot enough to cause burns and serious injury.

Burns can result from touching the hot metal parts of the case near the retort chamber during normal operation. The operator should be aware of these hot areas and avoid contact with them.

These Retorts are electrically heated, and as with any electrical device if the wiring is allowed to become faulty electrical shorts can occur causing injury to the operator. These instruments should always be used on a grounded circuit.

Following is a list of suggestions that should be observed to assure safe operation and maintenance of the Retort Kits.

1. Caution should be exercised by all personnel when an Oil and Water Retort Kit is in operation to avoid injury by touching the case near the heating jacket or the retort and condenser assembly while these are hot. Parts of the case can operate at a temperature where it may cause burns if touched. Safeguard the retort after the test ends long enough for it to cool. It can still cause burns even after it has been turned off.
2. The practice of removing the retort and condenser assembly and cooling it under water is a very dangerous procedure and is not recommended because of the danger of severe burns if touched or accidentally dropped. Also use extreme caution when placing a hot retort in water. The water will be turned into steam when the water contacts the hot retort. The steam can cause burns.
3. Make sure the electrical source is fused and grounded. Verify the power cord on the Oil and Water Retort Kit is in good condition and has the proper ground connection.
4. Electrical problems in the wiring or heaters may not be obvious by external observation of the retort. If the retort repeatedly blows a fuse, trips a circuit breaker or heats too slowly or erratically, electrical repairs are indicated. Refer to Section 7 for repair procedures.
5. Clean the sample chambers (upper and lower) thoroughly after each test, especially the spout. The wire brush (P/N 205850) can be used for spout cleaning. For hard, baked – on materials, a long #31 drill bit (P/N 206118) with handle (P/N 206119) should be used, ensuring that the entrance to the spout inside the sample chamber is clean.
6. After each test, replace the steel wool in the upper chamber to prevent solids buildup.
7. Inspect the threads on the sample chambers (upper and lower) before each test. Check for signs of “bellling” of the threads or for movement (rattling) when the threads are being engaged. These symptoms are signs of abnormal strain and structural weakening of the threads and could lead to explosive separation under abnormal pressure conditions.
8. Remove from service each retort, especially for offshore operations, at least once every six months for thorough examination and cleaning.

Repair of the Retort may require the removal of some or all of the insulation. The condition of the insulation could be in a deteriorated condition requiring the use of a breathing mask.

CAUTION

A BREATHING MASK SHOULD BE WORN WHEN DISASSEMBLING THE INSULATION AND CLEANING THE INSIDE OF THE RETORT CASE. DO NOT ATTEMPT TO REUSE DETERIORATED INSULATION.

For electrical repair procedures, refer to Section 7.

SECTION 3 OPERATING PROCEDURE

- A. Prepare the retort for service by performing steps A through D under Section 4, CARE OF EQUIPMENT.
- B. Lift retort assembly, (parts 1, 2, 4, 5), out of heating compartment. (Refer to Fig. 1.)
- C. Unscrew the sample chamber from the Upper Chamber using the square bar Retort Wrench (7).
- D. Pack the upper chamber (4) with steel wool (3). Refer to Fig. 1.
- E. Fill sample chamber (1) with sample and replace lid (2), allowing excess sample to escape. Wipe excess sample from outside of chamber and lid.

NOTE: This is a point where error is often introduced. Be sure that no air is trapped in the chamber. An accurate charge of sample is very essential.

- F. Clean and lubricate retort threads with high temperature lubricant (12).
- G. Screw sample chamber (1) with lid (2) into upper chamber (4) and hand tighten using the square bar retort wrench (7).
- H. Replace retort assembly in heating compartment and put insulating cover in place.
- I. Add a drop of wetting agent (11) to the graduate (6), or the special receiver (41) and place either the graduate or receiver under the drain port of condenser (5).
- J. Turn heater on by connecting power cord (8) or (9) then moving the handle of the ON/OFF switch (16) upward to the **ON** position.
- K. Allow the retort to heat until the pilot lamp (18) goes out. Refer to Fig. 2. This will indicate that the retort has reached the temperature for distillation to be completed. The thermostat will automatically turn off the power to the retort heater at the correct temperature regardless of the voltage available.

The distillation should be complete in approximately 45 to 60 minutes if power is 115 or 230 volts. A lower voltage may take longer, while at a higher voltage the distillation may be completed in a shorter time.

- L. After completion of test, move the ON/OFF switch (16) downward to the **OFF** position.
- M. Read the volume of oil and water. Another drop of wetting agent at this time will often improve the meniscus for easier reading.

NOTE: Nearly 100% recovery of refined oil will be obtained with this retort. If the drilling fluid is made up with crude oil, a calibration run should be made on the drilling fluid containing a known percentage of the crude oil used. Refer to Section 5 for the **FACTOR** to be used in calculating the correct per cent oil in the drilling fluid.

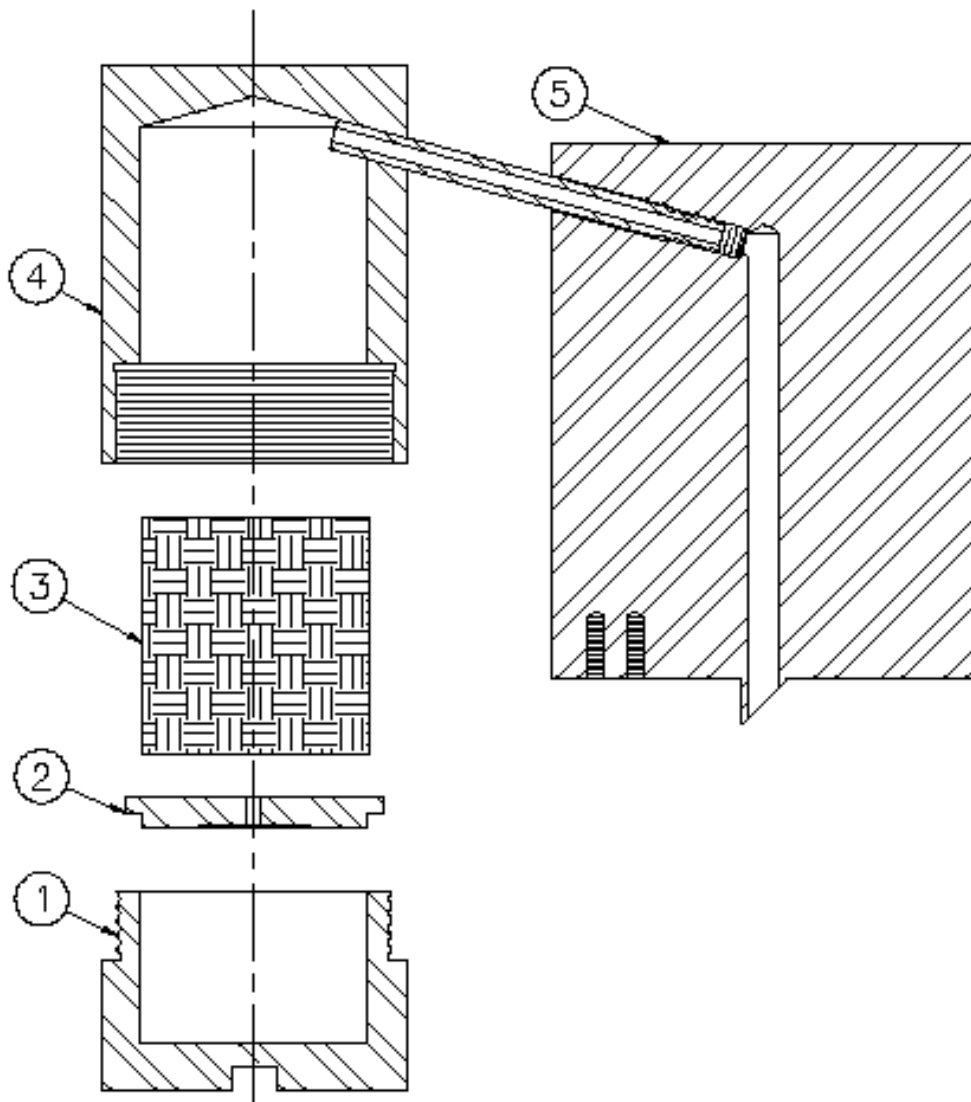


Fig. 1 – RETORT ASSEMBLY

SECTION 4 CARE OF EQUIPMENT

- A. Use the spatula (13) and scrape the dried sample from the chamber (1) and lid (2) to assure correct sample measurement. Refer to Fig. 1.
- B. Remove steel wool (3) using the corkscrew (15), and clean chamber with spatula (13). Replace any steel wool caked with dried sample with new steel wool (3).
- C. Clean the retorts drain tube (4) and condenser (5) with a pipe cleaner (10).
- D. Clean and lubricate the retort threads with high temperature lubricant (12). This is extremely important to prevent seizing of the threads.

SECTION 5 CALCULATIONS

Assumptions have been made to allow the following equations to be valid. These assumptions are described below, and the equations should be adapted to the actual sample being used.

Equation A. Nearly 100% recovery of refined oil will be obtained with this retort. If the drilling fluid is made up with crude oil, calibration runs should be made on a drilling fluid containing a known percentage of the crude used. Recovery on some crude may be as low as 60%. However, allowing the retort to remain at maximum temperature for a longer period should improve recovery on paraffin or asphaltic oil. Adjust the cm^3 of oil recovered by the correction factor obtained from the equation below.

$$FACTOR = \frac{\% \text{ oil in known sample}}{\% \text{ oil recovered}}$$

Equations A, B, and C. The [2] is for 50 ml Retort. Use [10] for 10 ml Retort.

Equation D. [84] is for Specific Gravity of oil. If the oil in the drilling fluid is known, use its specific gravity.

Equation E. [1] is for Specific Gravity of Water. If the drilling fluid has a high salinity, determine the actual specific gravity from the filtrate from a low pressure filter test, and use in place of the [1].

Equation F. [6] times the drilling fluid weight in lb/gal. changes the weight retort sample in Grams. Use [6] for 50 ml retort, and [1.2] for 10 ml retort.

Equation H. [50] is for the volume in cm^3 of the drilling fluid in the sample chamber. Use [50] for 50 ml retort and [10] for 10 ml retort.

In equation K [58.8] is for the difference in the assumed specific gravity based on the high gravity solids being 4.3 and the low gravity solids being 2.6. This equals 1.7 for a division factor or multiply by .588 x 100. Percent = 58.8. If Specific gravities of the solids are known to be other than 4.3 or 2.6, re-calculate this factor using the actual specific gravity.

Calculate the volume percentages of water, oil and solids as follows:

A. % Oil by volume = cm^3 oil recovered X Factor (if used) X 2.

NOTE: Refer to explanation of Equation A start of this Section.

B. % Water by volume = cm^3 water X 2

C. % Solids by volume = $100 - (\text{cm}^3 \text{ oil} + \text{cm}^3 \text{ water}) \times 2$

Calculate weight percentages of the water and oil and the specific gravity of the solids as follows:

D. Grams Oil = cm^3 oil X 0.84

E. Grams water = cm^3 water

F. Grams Drilling Fluid = lb/gal drilling fluid weight X 6.0

G. Grams solids = F - (D + E)

H. cm^3 solids = $50 - (\text{cm}^3 \text{ oil} + \text{cm}^3 \text{ water})$

I. Average specific gravity of solids = $\frac{G}{H}$

J. Solids % by weight = $\frac{G}{F} \times 100$

K. High gravity (4.3) solids % by volume = $(I - 2.6) \times 58.8$

L. Low gravity (2.6) solids % by volume = $100 - K$

NOTE: AVERAGE SPECIFIC GRAVITY OF SOLIDS MUST FALL BETWEEN 2.6 AND 4.3. IF IT IS OUT OF THIS RANGE, AN ERROR HAS BEEN MADE IN TEST OR CALCULATIONS. AN APPROXIMATION OF THE RELATIVE PROPORTION OF CLAY AND BARITE CAN BE OBTAINED FROM TABLE 1.

TABLE 1

SP.GR SOLIDS	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.3
% BY WT. BARITE	0	18	34	48	60	71	81	89	100
% BY WT. CLAY	100	82	66	52	40	29	19	11	0

SECTION 6 SPECIFICATIONS

TYPE & SIZE

Part No.	Style	Size in. (cm)	WT-LB (kg)
210465 AND 210463	Stainless Steel Case	9-1/4 x 8 x 10-7/8 (23.5 x 20.3 x 27.6)	25 (11.36)

POWER REQUIREMENTS

Part No.	Voltage	Watts
210465	115 V AC	700 @ 115 V
210463	230 V AC	700 @ 230 V

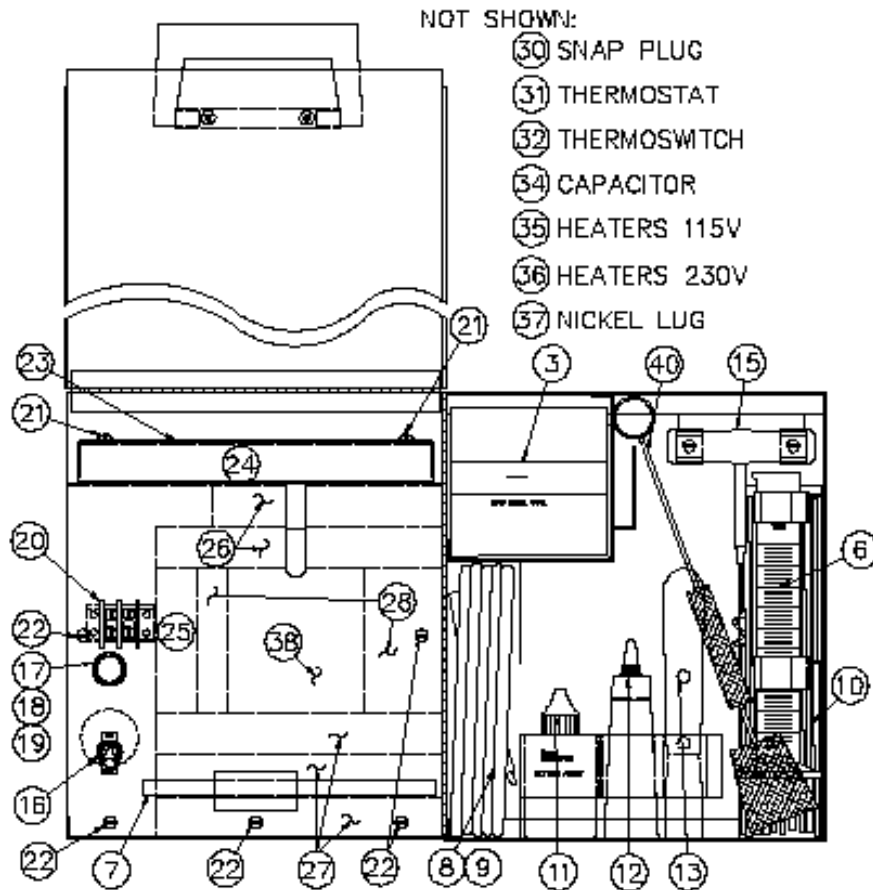


Fig. 2 RETORT KIT ASSEMBLY

SECTION 7 RETORT REPAIR

Failure of the retort to properly heat is caused by one or more of the following:

- Cartridge heater
- Thermostat
- Thermostat Switch
- Main Switch
- Burned or broken wires or wire connections

The replacement procedure for any of the above requires disassembly of the retort. Refer to Fig. 2 for mechanical disassembly and assembly and Fig. 3 for the electrical wiring. Replacement wire must have high temperature insulation such as Part No. 205772. This is an eighteen gauge American Wire Gauge appliance wire.

CAUTION: DISCONNECT THE POWER CORD BEFORE BEGINNING REPAIR.

A. Disassembly

1. Disconnect Retort by unplugging the cable, Item (8) or (9) from the outlet.
2. Open case cover and remove Retort and condenser assembly (1, 2, 3, 4, and 5).
3. Remove three 6-32 x 1-1/2 long screws (21) then remove the retort sheet metal cover (23) and the 1 inch thick insulator including the insulating strip at the back (24).
4. Remove five 6-32 x 1/4 long screws (22) from the front and bottom edge of the front/top panel, then lay the panel forward.
5. Disconnect the following wires. - Refer to Fig. 2 and 3.
 - Two wires from the ON-OFF switch that come from male receptacle (screw terminals).
 - Two wires each terminal (one from each heater) from both top terminals of terminal strip (20).
 - Two wires one terminal (pilot light and thermostat switch) and other terminal (pilot light and power switch) from the bottom two terminals of terminal strip (20).
 - Ground wire at the mounting screw of the power receptacle (29) screw and nut terminal (230 volt model) or center screw terminal (115 Volt Model).

CAUTION

THE LOOSE INSULATION IN THE RETORT MAY GIVE OFF DUST WHEN HANDLED.
TAKE PRECAUTIONS NOT TO BREATHE ANY OF THIS DUST. WEAR A MASK OVER
NOSE AND MOUTH IF DUST IS IN THE AIR.

6. Remove two sheet metal screws holding the two top pieces of insulation (26) together, and remove the top piece over the heater block.
7. Remove the heater wires from the groove in the insulator, and straighten them, then remove the second piece of insulation.
8. If the heaters are to be replaced and are not stuck in the adapter block, they can be removed and replaced without further disassembly. If they are stuck the adapter block will have to be removed. Refer to Section 7D-1c.
9. Carefully remove the loose insulation from around retort adapter. Do not try to reuse this insulation if it is found to be in a dusty and deteriorated condition.
10. Remove the side support insulator block (25).
11. Lift the heater block (38), heaters (35) or (36), lower insulator (27), and thermostat (31) as an assembly out of the case.

B. Inspection

While the retort is disassembled any item needing repair should be repaired or replaced before re-assembly. In addition, check and repair or replace the following:

- Cracked or broken insulator blocks (24, 25, 26, and 27).
- Burned or bare wires. Replace with high temperature wire (39) and high temperature lugs (37). Crimp lug tightly onto the wire. Use lug crimping pliers. Do not attempt to use solder.
- Defective thermostat switch. Replace with switch (32), or replace thermostat (31).
- Burned or loose ground wire or lug. Make sure ground wire lug is connected to heater block.
- Replace all burned or damaged wiring. Wiring connections are shown in Fig. 3. Use only high temperature wire (39) and nickel lugs (37). Crimp lug tightly onto the wire. (Use lug crimping pliers) Do not attempt to use solder.

C. Assembly

Re-assemble in the opposite order of disassembly noting the following:

1. Assemble the heater block assembly into the bottom of the stainless steel case.
2. Install the side insulator (25).
3. Make sure the loose insulating material (28) is in a usable condition and completely fills all the space on all sides of the heater block. If the insulation is starting to deteriorate, replace it.
4. If new heater are being installed, insert them in the holes in the Adapter Block. Make sure the new heaters are of the proper voltage (115 or 230) as required. The new heaters must have new terminal lugs (37) crimped onto them.
5. Install the grooved top insulator block. The heater leads must be properly routed in the grooves of the top insulators and must not be pinched or kinked.
6. Install the second top insulator and secure it to the grooved insulator board with the two sheet metal screws.

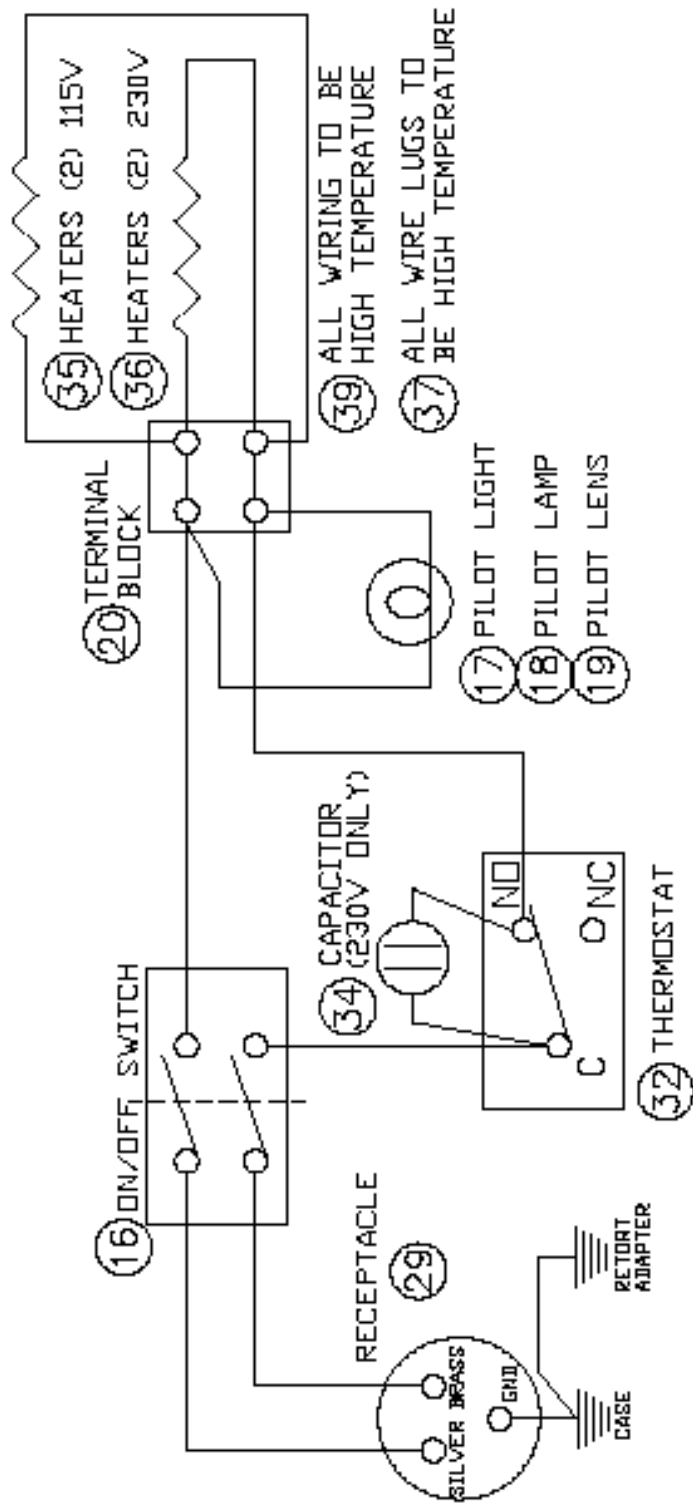


Fig. 3 – RETORT WIRING, 115 VOLTS AND 230 VOLTS

7. Make sure all wiring connections are tight and all crimp connections are properly made using recommended crimping pliers as follows: Refer to Fig. 3.

Ground wire from Heater Adapter block mounting screw to receptacle mount screw in receptacle.

Terminal Strip (20)

Wire of each heater to left top

Second wire of each heater to right top

Wire from Thermostat switch and wire from pilot light to left bottom

Wire from power switch (16) and wire from pilot light to right bottom

Wire from thermostat to power Switch (16)

8 Install the following:

Panel/Top Assembly, 5 screws (22).

Lid assembly, 3 screws (21).

Retort Assembly (1, 2, 3, 4, and 5)

Power Cable (8 or 9).

9 When re-assembly is complete test retort and adjust the thermostat as described in Section 7-H.

D. Adapter Block Assembly

The Adapter Block assembly must be dis-assembled to repair or replace the following:

Heaters if the old heater is stuck in the adapter block

Thermostat switch replacement or thermostat repair or replacement

1. Dis-assembly

a. Remove the "Fish Paper" glued to the bottom of the lower insulator, and then remove the thermostat assembly (31) (**on older models**). On new models remove screw holding thermostat mounting bracket to the insulator block.

b. Remove two 3 inch long screws holding the lower insulators (27) and the ground wire to the Adapter Block (38).

c. If the heaters are stuck in the Adapter Block try to pull the heaters out by their leads. If the leads break off, either the heater can be drilled out using a 5/8 drill bit, or a smaller hole, about 1/4, can be drilled from the opposite side, then a punch can be used to drive out the heater.

2. Assemble the Adapter Block as follows:

a. The thermostat into the Adapter Block as described in Section 7-E3, 4, and 5 or 7-F4, 5, and 6

b. Install the three insulator boards to the Adapter Block using the two 8/32 x 3 inches long screws (some units use one screw and 8/32 all thread and nuts). Make sure the lug of the ground wire is attached by one of these screws or to the all thread.

E. Thermostat Removal and Replacement (Item 31)

1. Remove the fish paper (33) covering the thermostat (**on old models only**). On new models remove the screw holding the thermostat mounting bracket to the insulation block.
2. Pull the thermostat assembly out of the heater block and disconnect the two wires.
3. Connect the two wires to the thermostat switch. Make sure to transfer the capacitor (if used, 230 Volt Model) to the new thermostat. Make sure the wires are installed on the common (C) and the normally open (NO) terminals.
4. Assemble the new thermostat in the heater block.
5. Replace and glue new "fish paper" to the insulator covering the thermostat (**on old models only**). On new models reinstall screw holding the thermostat mounting bracket to the insulation block.
6. Adjust the new thermostat to shut off as described in Section. 7G, and if adjustment is required, use the procedure outlined in Section 7-H.

F. Thermostat switch replacement (Item 32)

1. Remove the thermostat from the heater block to change the switch. Refer to Section 7D-1a.
2. Remove the wires from the thermostat switch.
3. Remove the two 6-32 screws holding the switch to the ell bracket.
4. Transfer the wires and capacitor (if used) to the new switch. Make sure the wires are installed on the common (C) and the normally open (NO) terminals.
5. Mount the new switch to the ell bracket with the two 6-32 screws removed in item 3. Press switch away from ell while tightening screws.
6. Replace and glue new "fish paper" to the insulator covering thermostat.
7. Adjust the new thermostat switch to shut off as described in Section. 7G, and if adjustment is required, use the procedure outlined in Section 7H.

G. The thermostat should allow the retort to reach approx. 930°F (499°C) \pm 70°F (21°C). (Observe when the pilot light goes out). If not adjust the thermostat.

H. The thermostat setting can be checked using a digital thermometer capable of at least 999°F (537 °C) equipped with a small diameter 1/16 inch (1.6 mm) thermocouple. To perform this test:

1. Remove the condenser (5) from the retort assembly.
2. Disassemble the retort and remove the steel wool (3) and the lid (2).
3. Feed the thermocouple in through the drain tube and through the top section of the retort (4), then position so that its end is at the bottom of the sample chamber (1) and screw the retort back together.
4. Install the retort (1, and 4) and the thermocouple into the heating well and connect the thermocouple to its thermometer.
5. Heat the retort using the normal procedure and observe the thermometer reading when the pilot light goes out and comes back on. Record the highest and lowest reading for at least three cycles. The difference between the two should be less than 80 °F (27 °C) and the average should be 930 F \pm 20 °F (499 \pm 7 °C)

6. If adjustment must be made on thermostat, remove plug (30) in top of heating assembly and turn thermostat shaft clockwise with screwdriver to lower temperature or counterclockwise to raise temperature.
7. Adjustments must be made by starting below the cutoff point and raising the temperature in small steps (approximately 1/8 turn) until the proper setting is reached. The retort should not coast higher than 970°F (521°C).
8. After the thermostat is properly adjusted, allow the retort assembly to cool then remove the thermocouple, and reassemble the retort as normal.

I. Pilot Light Replacement

1. Remove lens (19) then bulb (18) by pressing inward and turning.
2. Replace with new bulb and re-assemble lens.

J. Switch replacement

1. Disassemble retort as described in Section 7-A Steps 1 through 4.
2. Remove wires and capacitor (34) (if used) from screw terminals of old switch (16) noting terminal location and switch position. Remove old switch from panel.
3. Mount new switch in panel, then replace wires and capacitor (if used) on terminals as noted above. Refer to Fig. 3.
4. Reassemble retort in reverse order, Steps 4 through 1.

**SECTION 8
REPLACEMENT PARTS LIST**

Item No.	Part No.	Description
1,2,4	210470	Chamber Complete, 50 ml Retort
1	210481	Chamber, Sample
2		Lid, Chamber (Also part of 210470)
4		Chamber, Upper with Drain Tube
3	210440	Steel Wool, 1/4 pound
5	210439	Condenser, 50 ML Retort
6	208776	Cylinder, Graduated, 50 ML "TC"
7	210473	Wrench, 3/8 Square Bar, Retort Chamber
8	208865	Cable, Power 230 Volt
9	205769	Cable, Power 115 Volt
10	210458	Pipe Cleaner
11	209938	Wetting Agent, 1 oz. Dropper Bottle
12	210435	Thread Lubricant, High Temperature, 1 oz.
13	210433	Spatula
14	205728	Clip, Large
15	210439	Corkscrew, Steel Wool Remover
16	205743	Switch, Toggle, DPST (Main Power)
17	205758	Holder, Lamp
18	205759	Lamp, Neon, NE51, 115 Volt
19	205757	Lens, Clear
20	205147	Terminal Strip, 2 position
21	100090866	6-32 x 1-1/2 long THMS
22	203392	6-32 x 1/4 long RHMS

Item No.	Part No.	Description
23	---	Lid, 50 ml Retort, Stainless Steel
24, 25 26, 27	210471	Insulators, 50 ml Retort (Complete Set)
24	210480	Insulator Block, Lid (Also part of 210471)
25	210482	Insulator Block, Side (Also part of 210471)
26	210483	Insulator Block, Top (Also part of 210471)
27	210484	Insulator Block, Bottom (Also part of 210471)
28	210459	Insulation, Bulk 20 oz.
29	205719	Receptacle, Male (3 Conductor)
30	204295	Closure Snap, 5/8 inch
31	205802	Thermostat, Complete
32	205755	Switch, Thermostat
33	204325	Fish Paper (1 sq.ft.)
34	209523	Capacitor, 5000PF, 1000 Volts
35	205737	Heater, Cartridge, 350 Watt, 115 Volt
36	205738	Heater, Cartridge, 350 Watt, 230 Volt
37	204289	Lug, Wire Nickel High Temperature
38	210474	Adapter, 50 ML Retort (Heater Block)
39	205772	Wire, Appliance, 18 gauge, High temperature
40	205855	Brush, Test Tube
41	205258	Receiver, Retort, 50 cm ³ °
42	210466	Instructions, 50 ML Retort

- ° THIS RECEIVER TUBE IS NOT FURNISHED AS A PART OF THIS KIT.

Warranty

Fann Instrument Company warrants its products to be free from defects in material and workmanship for a period of 12 months from the time of shipment. If repair or adjustment is necessary, and has not been the result of abuse or misuse within the 12-month period, please return, freight prepaid, and correction of the defect will be made without charge.

Out of warranty products will be repaired for a nominal charge.

Please refer to the accompanying warranty statement enclosed with the product

Return of Items

For your protection, items being returned must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Fann will not be responsible for damage resulting from careless or insufficient packing.

Before returning items for any reason, authorization must be obtained from Fann Instrument Company. When applying for authorization, please include information regarding the reason the items are to be returned.

Our correspondence address is:

Fann Instrument Company

P.O. Box 4350

Houston, Texas USA 77210

Telephone: 281-871-4482

Toll Free: 800-347-0450

FAX: 281-871-4446

Email: fanmail@fann.com

Our shipping address is:

Fann Instrument Company

15112 Morales Road, Gate 7

Houston, Texas 77032 USA