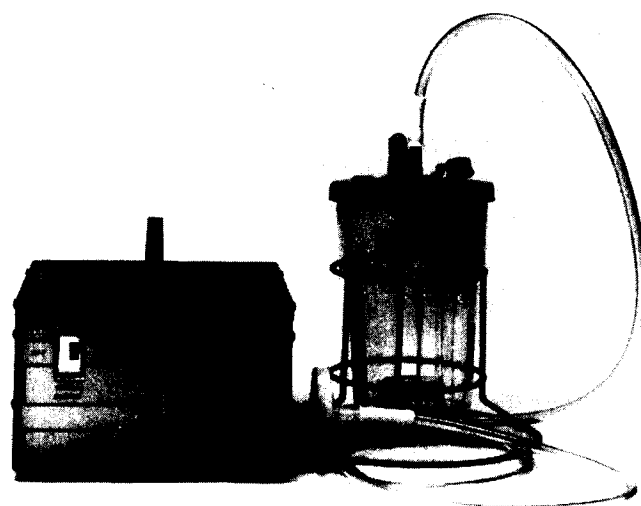
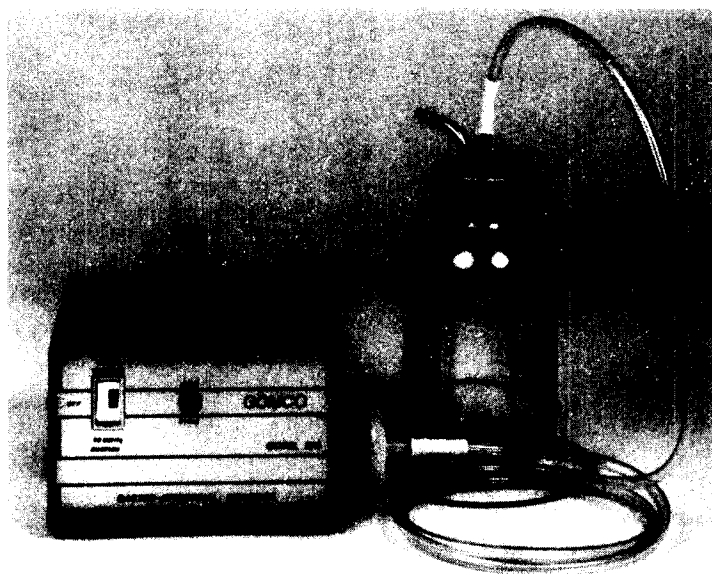


JULY 1995

GOMCO PORTABLE GASTRIC DRAINAGE PUMP MODELS 270 & 2701



OPERATION, MAINTENANCE AND SERVICE MANUAL

INDEX

- 1.0 GENERAL INFORMATION**
- 2.0 SPECIFICATIONS**
- 3.0 SET-UP**
- 4.0 OPERATING PROCEDURE**
- 5.0 OPERATING PRINCIPLE**
- 6.0 MAINTENANCE AND SERVICE**
- 7.0 ILLUSTRATIONS**
- 8.0 TROUBLE SHOOTING**
- 9.0 REPLACEMENT PARTS LIST**

1.0 GENERAL INFORMATION:

1.1 Purpose:

Gomco Models 270 and 2701 are portable drainage pumps designed to assure gentle suction for specialized uses as gastric lavage, abdominal decompression, duodenal and fistula drainage following prostatectomy. The suction system includes two preset drainage levels of 90mm and 120mm of mercury vacuum.

1.2 Features — Model 270:

Supplied with model 270 as standard equipment are:

1. One (1) 1200 ml glass collection container with overflow protection cap assembly.
2. One (1) wire formed bottle holder.
3. Bacteria filter to prevent fluid and aerosol contamination.
4. One disposable tubing package containing 2-six foot lengths of clear flexible PVC tubing.
5. Compact case with lighted selector switch, pump cycle light and hospital grade plug.

1.2.1 Overflow Protection:

The 1200 ml collection bottle assembly supplied with this pump includes a cap and float assembly (See Illustration No. 4). When collected patient fluids reach a predetermined level, the vacuum supply to the collection bottle is shut off by the cap and float.

1.2.2 Bacteria Filter:

The high efficiency bacteria filter is custom engineered to prevent fluid and aerosol contamination of portable suction units. This filter features a hydrophobic, microporous membrane which filters air with maximum efficiency (0.3 micron particles in air), while blocking the flow of aqueous fluids and aerosol contaminants. The Gomco high efficiency filter protects against suction pump contamination in the case of canister overflow as it helps prevent the overflow from reaching the pump.

1.3 Features — Model 2701:

Supplied with model 2701 as standard equipment are:

1. One 1100 ml disposable collection container with overflow protection cap.
2. One wire formed container holder.
3. Bacteria filter.
4. One disposable tubing package containing 2-six foot lengths of clear flexible PVC tubing.
5. Compact case with lighted selector switch, pump cycle light and hospital grade plug.

1.3.1 Overflow protection:

The 1100 ml disposable collection container supplied with this pump includes a multi-stage filter (1) hydrophobic membrane stops flow of aqueous solutions (acts as overflow protection), (2) glass prefilter allows filter to handle most laser/electrocautery applications.

1.3.2 Bacteria Filter:

The high efficiency bacteria filter is custom engineered to prevent fluid and aerosol contamination of portable suction units. This filter features a hydrophobic, microporous membrane which filters air with maximum efficiency (0.3 micron particles in air), while blocking the flow of aqueous fluids and aerosol contaminants. The Gomco high efficiency filter protects against suction pump contamination in the case of canister overflow as it helps prevent the overflow from reaching the pump.

2.0 SPECIFICATIONS:

- 2.1 **Vacuum:**
 - * At 90mm setting: 90mm to 99mm Hg.
 - at 120mm setting: 120mm to 132mm Hg.
- 2.2 **Flow Rate (Air):**
 - At 90mm setting: .25 liters/minute
 - At 120mm setting: .30 liters/minute
- 2.3 **Electrical Requirements:**
 - 115 volts 50/60 Hz. (1.5 amps max.)
 - 230 volts 50/60 Hz. (1.3 amps max.)
- 2.4 **Pump Cylinder:**
 - 155 to 160 OHMS resistance
- 2.5 **Dimensions:**
 - Case Only — (D) 8" x (w) 8" x (H) 7"
 - Overall — (D) 8" x (W) 11" x (H) 7"
- 2.6 **Weight:**
 - Shipping - 15 pounds
 - Net - 10 pounds
- 2.7 **Duty:**
 - Continuous

* NOTE: Vacuum should be measured after the pump has been running for 15 minutes to normalize the pump cylinder temperature.

3.0 SET-UP:

- 3.1 **Collection Bottle Assembly — Glass Bottle:**
 - (See Illustration No. 4)
 - 1. Check the bottle top edges for nicks. If the bottle top is nicked, it will not seal.
 - 2. Check that the cap gasket is properly positioned inside the cover.
 - 3. Check that the float moves freely.
 - 4. Screw the cover assembly securely onto the bottle, making sure that the gasket seals.
 - 5. Place the bottle assembly into the wire form bottle holder.
 - 6. Connect one length of tubing, enclosed in the tubing package, to the bacteria filter and to the vertical fitting on the bottle cap and float assembly marked "to pump".
 - 7. Connect the other length of tubing to the long bent metal tube of the cap assembly.
- 3.2 **Collection Bottle Assembly — DCU:**
 - 1. Make sure filter shut-off is in place in under side of lid.
 - 2. Place bottle on a flat surface and lay cap assembly on bottle. Push down on cap to snap lid to bottle.
 - 3. Place bottle into wire form bottle holder.
 - 4. Connect one length of tubing, enclosed in the tubing package, to the bacteria filter and to the vertical fitting of the cap marked vacuum.
 - 5. Connect the other length of tubing to the elbow marked "patient".

4.0 OPERATING PROCEDURE:

(See Illustration No. 3)

1. The selector switch should be in the center "off" position.
2. Plug the line cord into a grounded electrical outlet, making sure that it is the same voltage as indicated on the unit nameplate.
3. Be sure the collection bottle is assembled properly, see 3.0, and that the length of tubing from the bottle to the bacteria filter is dry.
4. Push the selector switch on the front control panel to the desired vacuum range, up for 120mm Hg and down for 90mm Hg. The red light within the switch will remain lit indicating the unit is on.
5. During operation, the amber "pump cycle" lamp will blink intermittently to indicate the intermittent pumping action. After four or five minutes of operation, the selected vacuum level will be reached.
6. Prior to using your pump on a patient, insure the vacuum by submerging the end of the patient tube into a container of water. Aspiration of water into the collection bottle should be noticed.
7. The pump is now ready for use.
8. During patient use, the level of the collected contents within the collection bottle should be frequently checked and emptied.

5.0 OPERATING PRINCIPLE:

The mild negative pressure of this unit is induced by the expansion and contraction of air within an airtight cylinder. The expansion and contraction of the air in the cylinder is controlled by pressure and suction valves and a solid state timing device to produce a mild suction. Contained within the air tight pump cylinder is a heating element wound with a resistance wire. During the "on" time 120 volts is applied to the heating element for a period of 2 to 3.5 seconds, depending upon the selected vacuum range, controlled by the solid state timer. The resistance wire heats the air within the cylinder and expanded air is expelled into atmosphere through the pressure (check) valve. The amber pump cycle lamp in the front control panel (See Illustration No. 3) is lit during this time. During the "off" time, voltage to the heating element is interrupted by the solid state timer for a period of 19 to 22 seconds. The pressure valve closes during this period and the remaining air within the cylinder cools and contracts causing a partial vacuum which opens the suction (check) valve. Air from within the collection bottle is drawn into the cylinder to fill the vacuum. During this "off" time, the amber pump cycle lamp in the front control panel remains off and this is when suction actually occurs.

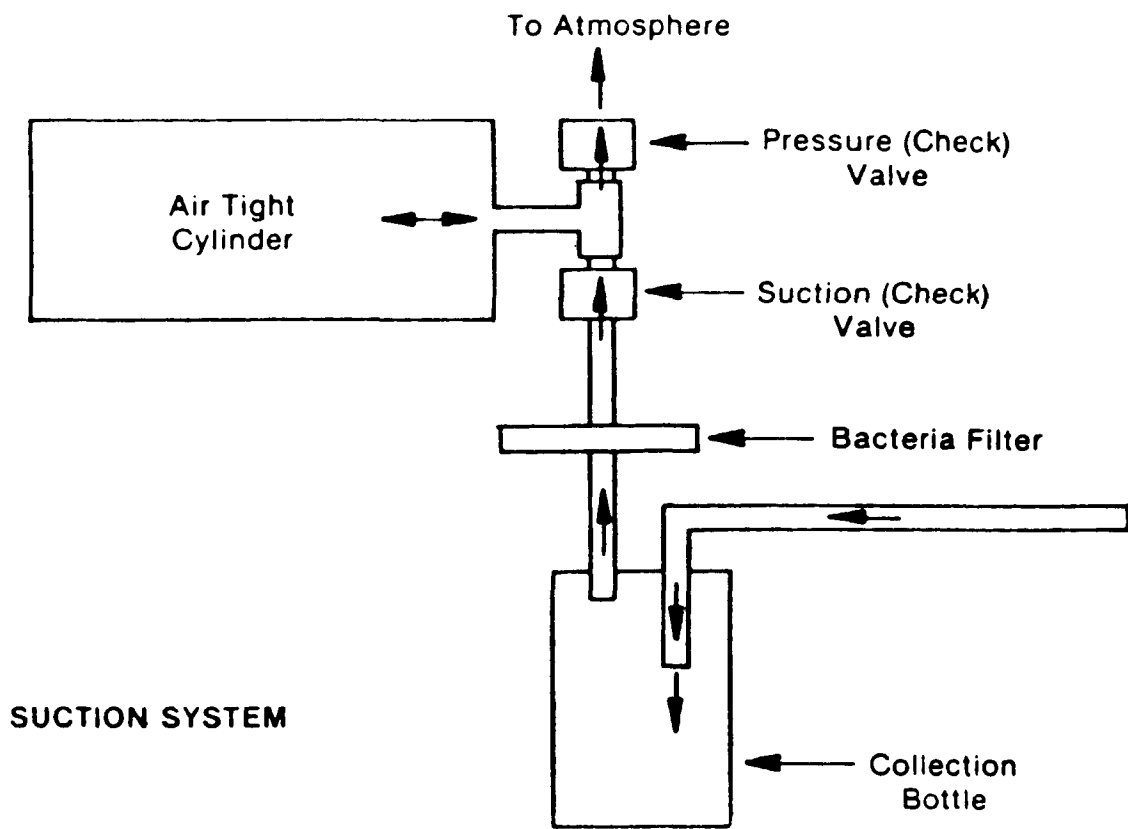
6.0 MAINTENANCE AND SERVICE

6.1 Pump:

The pump of this unit has no moving parts and therefore requires no maintenance. In the event flooding of the pump occurs, the element in the pump cylinder and the valves will need replacing. Attempting to continue to run a flooded pump may cause damage to the control circuit.

6.2 Pump Cylinder Replacement:

1. Disconnect the unit from its power source.
2. Remove the case top cover by removing the four self tapping screws.
3. Disconnect the valve and manifold assembly from the cylinder tubing connector.
4. Remove the power cord ground wire from the case ground screw.
5. Remove the cylinder ground wire from the ground screw.
6. Remove the two cylinder mounting screws from the bottom side of the case.
7. Unsolder the two cylinder wires at the cylinder cover terminals and remove.
8. Install the new cylinder in reverse order.



6.2.1 **Element Replacement** (See Illustration No. 6)

1. Remove pump cylinder as described in 6.2.
2. Remove the six slotted head machine screws fastening the cylinder cover to the cylinder.
3. Tap the edge of the pump cover with a plastic mallet to break it free.
4. Lift the cover off with heating element attached.
5. Remove the two element leads running thru the cover terminals by unsoldering them from the top side of the cover. Pry-up the two small tabs securing the wire to the terminals. The center terminal holes should be clear of solder.
6. Loosen the hex nut locking the element rod to the cover and unscrew the element from the cover.
7. Screw the new element into cover center hole approximately flush with the top surface of the cover. Tighten the element lock nut against cover.
8. Pass the two element leads thru the cover terminals and wind each lead around the small terminal tabs and bend both tabs down to secure the wires. Solder the two leads and solder closed the center terminal holes.
9. Check resistance to make sure of proper contact — 155 to 160 OHMS.
10. Place gasket to the seal surface of the cylinder. Apply a small drop of RTV sealant on top side of the cylinder cover at the center element rod hole to prevent any leaks.
11. Insert the element into the cylinder and place the cover onto the cylinder while aligning screw holes. Replace the six cover mounting screws and tighten. Note — care must be taken when handling the element and cover assembly to prevent damage to the fragile element.
12. Install cylinder as described in pump cylinder replacement—6.2.

6.3 **Suction and Pressure Valves:**

The check valves used in this unit are factory sealed, therefore require no maintenance (See Illustration No. 8)

6.3.1 **Suction and Pressure Valve Replacement:**

1. Disconnect the unit from its power source.
2. Remove the case top cover by removing the four self tapping screws.
3. Disconnect the white silicone rubber tubing from the pump cylinder tubing connector.
4. Disconnect the rubber tubing from the suction valve.
5. Unscrew both valves from the valve manifold.
6. Lightly lubricate the threads of the new valves with petroleum jelly or equivalent and screw the valves into the manifold. **Note:** Care must be taken when replacing valves to prevent thread damage due to cross threading and overtightening. Valves should only be installed finger tight.
7. Install the valve and manifold assembly in reverse order.

6.4 **Bacteria Filter:**

The bacteria filter should be replaced after one month of patient use or when a reduction of the air flow rate is noticed. It must be replaced in the event fluids have entered it, such as in collection bottle overflow.

6.4.1 Bacteria Filter Replacement:

1. Unscrew the filter from the vacuum and filter connection (See Illustration No. 1 or No. 2) by hand turning in a counter-clockwise direction.
2. Screw a new filter into the vacuum and filter connection by turning in a clockwise direction finger tight.

Note: Care must be taken when replacing the filter to prevent thread damage due to cross threading and overtightening.

6.5 Glass Collection Bottle and Cap Assembly Sterilization:

1. Remove the cap assembly from the bottle.
 2. Dispose of drainage fluids and materials in the bottle.
 3. Soak the bottle and cap assembly in a warm detergent solution. Wash all the parts with a nylon bristle brush, rinse thoroughly with water and aerate.
 4. Autoclave at 250° F for 15 minutes following the autoclave manufacturer's recommended procedure.
- Caution:** Do not flash autoclave the glass collection bottle. If desired, sterilize with ethylene oxide gas. Follow manufacturer's direction for recommended procedure.

6.6 Control Circuit:

The pump cycles are controlled by a solid state printed circuit board (See Illustration No. 7) Shts. 1 thru 5 for schematic and parts list). The timing is factory set and needs no adjustment.

Control Circuit Description (PN-2311) Illustration No. 7

The SF 120A-774 is an On/Off recycling timer which provides a fixed "Off" time of 19 to 22 seconds and a selectable "On" time of either 3.4 to 3.75 seconds or 2.1 to 2.25 seconds. The 2.1 to 2.25 second "On" time can be selected by shorting terminals 4 and 5 together. When power is applied, the "On" time occurs first.

A 9V power supply is supplied by D1, R1, C6, C7, C8, and Z1. C7 and C8 are used for high frequency noise filtering. C6 is the filter capacitor for the ½ wave voltage supplied through D1, and R1. Z1 is the regulating zener diode.

The circuit timing is accomplished by using a MC14541 programmable timer, IC1. This IC has a built in oscillator chip whose timing components are connected between pins 1, 2, and 3. The pin 3 connection used is determined by IC2, a MC4016 bilateral switch. The sections of this switch that are turned on, determine the timing components which are used.

During the "Off" time interval, P3, R7, R11, and C2 comprise the timing components. These are selected by a high signal on pin 6 of IC2.

The longer "On" time timing components are P2, R6, R12, and C3. These are selected by a high signal on pin 12 of IC2. When a shorter "On" time is desired, P2, and R6 are parallel by P1 and R5 by applying a high signal on pin 13 of IC2. Since "On" time is relatively short, resistor R14, a zero OHM resistor, is connected between pin 5 of IC2 and common during test. This prevents the timer from going into the "Off" time until both "On" times have been calibrated. This resistor is then removed.

The output of the timer is connected through a full wave bridge, BR1, and SCR. Q1. The gate drive to the SCR is controlled by R2, Q2, R4, and pin 8 of IC1. When pin 8 is low, transistor Q2 is off, and gate current to Q1 is supplied to Q1 via R2. The timer is then in the "On" state. When pin 8 of IC1 is high, transistor Q2 is "On", shorting the gate current of Q1 to common. This provides the "Off" time.

IC1 is programmed by the connection of pin 12 and 13 either a high or low state. For this circuit the IC is programmed to divide the oscillator frequency by 1024. Since the Q output of IC1 will change state in one half of that number of counts, the number of 512 is used to calculate the oscillator frequency. Therefore, the oscillator frequency measured at pin 1 of IC1 should be 24.98 Hz for the "Off" time, 143.22 Hz for the long "On" time, and 227.56 Hz for the short "On" time.

6.6.1 Control Circuit Specifications:

1. Mode of operation — continuous On-Off recycling with power applied to the input terminals. The load is energized during the “On” time period (See Illustration No. 7).
2. Input voltage — 120 Volts \pm 15%, 50/60 Hz.
3. Time Delays —
4. Load 160 OHMS resistive.

	AT 120 MM SETTING	AT 90 MM SETTING
ON TIME	3.4 to 3.75 sec.	2.1 to 2.25 sec.
OFF TIME	19 to 22 sec.	19 to 22 sec.

6.6.2 Control Circuit Replacement:

1. Disconnect the unit from its power source.
2. Remove the case top cover by removing the four self tapping screws.
3. Disconnect all the wires from the P.C. board by pulling off the quick connect terminals (Do not pull on wires. Make sure you have a firm hold on the terminal).
4. Remove the two P.C. board mounting screws from the bottom side of the case.
5. Install the new P.C. board in reverse order. (See Illustration No. 1 for wiring detail.)

7.0 ILLUSTRATIONS

No. 1 - Final Assembly 270

No. 2 - Final Assembly 2701

No. 3 - Front Panel Assembly

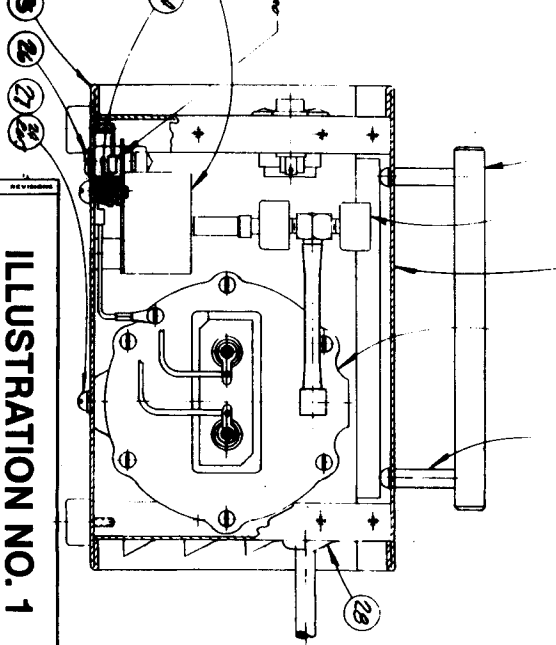
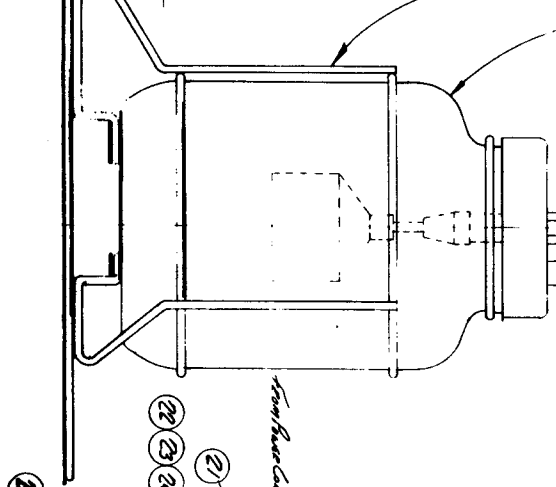
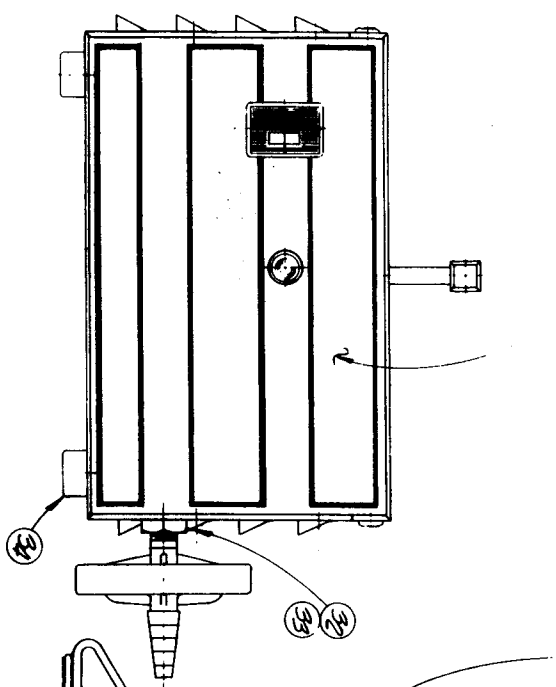
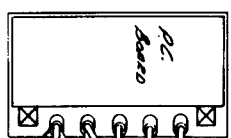
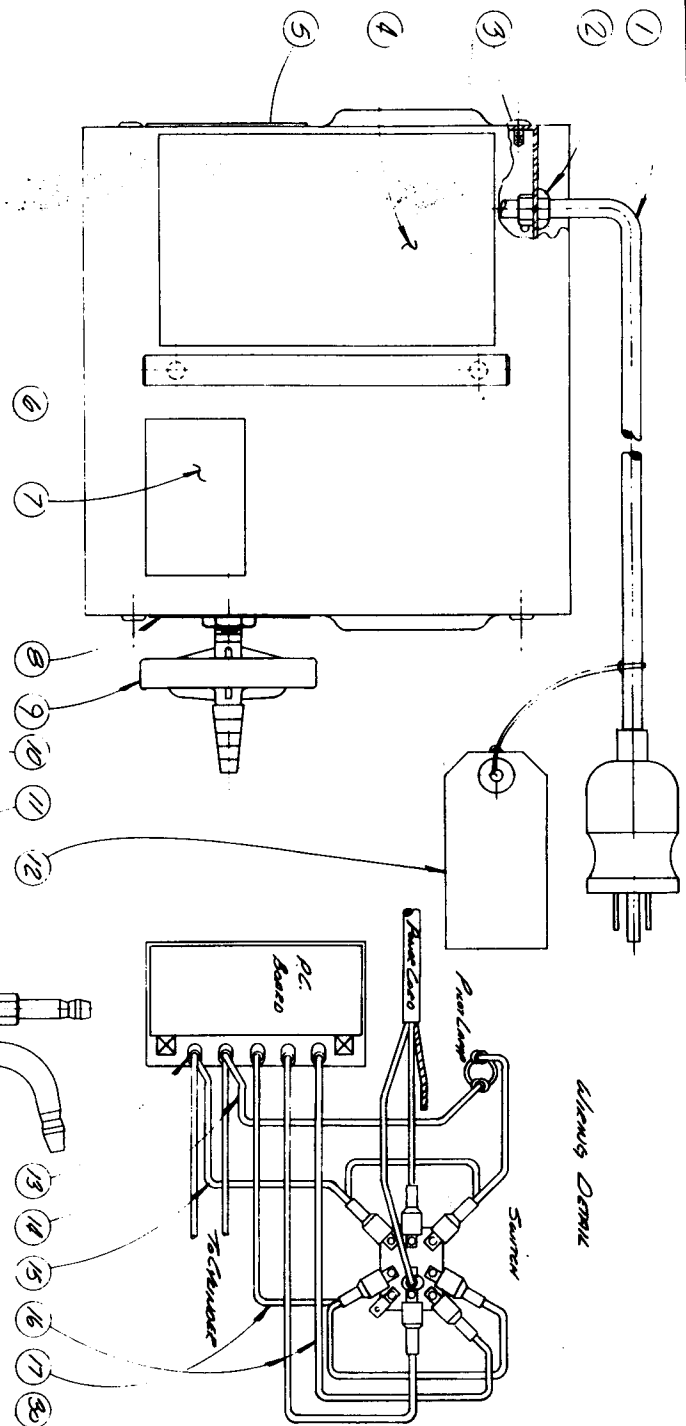
No. 4 - Collection Bottle Assembly

No. 5 - DCU

No. 6 - Pump Cylinder Assembly

No. 7 - Control Circuit

No. 8 - Valve and Manifold Assembly



Part No.		Description		Quantity	
1	1	Power Cord	2500 A	1	1
2	2	Control Panel	2500 A	1	1
3	3	Switch	2500 A	1	1
4	4	Main Unit	2500 A	1	1
5	5	Display	2500 A	1	1
6	6	Base	2500 A	1	1
7	7	Handle	2500 A	1	1
8	8	Foot	2500 A	1	1
9	9	Wheel	2500 A	1	1
10	10	Bracket	2500 A	1	1
11	11	Screw	2500 A	1	1
12	12	Plug	2500 A	1	1
13	13	Side Panel	2500 A	1	1
14	14	Handle	2500 A	1	1
15	15	Screw	2500 A	1	1
16	16	Bracket	2500 A	1	1
17	17	Screw	2500 A	1	1
18	18	Plug	2500 A	1	1
19	19	Screw	2500 A	1	1
20	20	Plug	2500 A	1	1
21	21	Front Panel	2500 A	1	1
22	22	Handle	2500 A	1	1
23	23	Screw	2500 A	1	1
24	24	Plug	2500 A	1	1
25	25	Base	2500 A	1	1
26	26	Handle	2500 A	1	1
27	27	Screw	2500 A	1	1
28	28	Plug	2500 A	1	1
29	29	Screw	2500 A	1	1
30	30	Plug	2500 A	1	1
31	31	Screw	2500 A	1	1
32	32	Plug	2500 A	1	1

ILLUSTRATION NO. 1

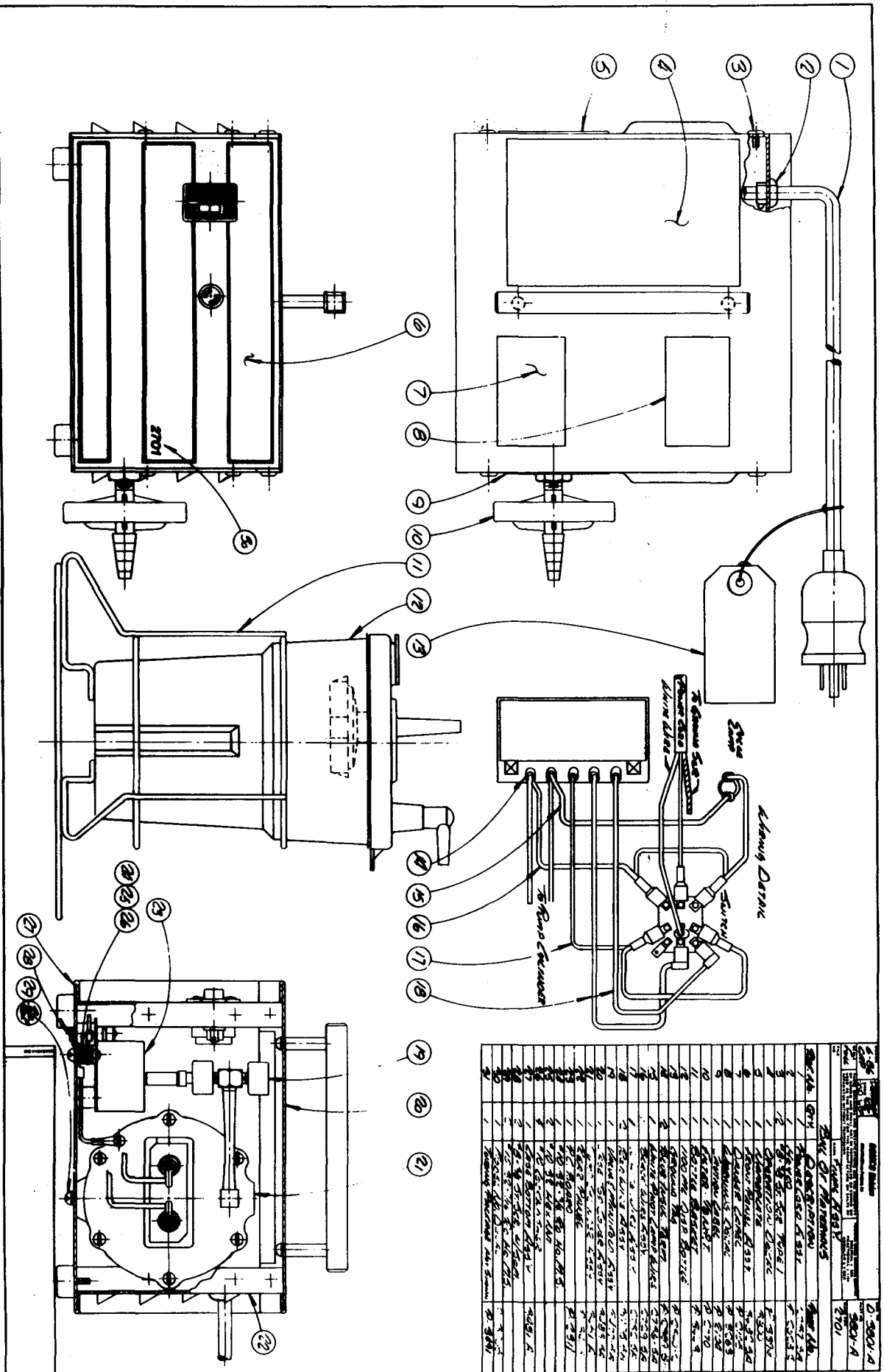
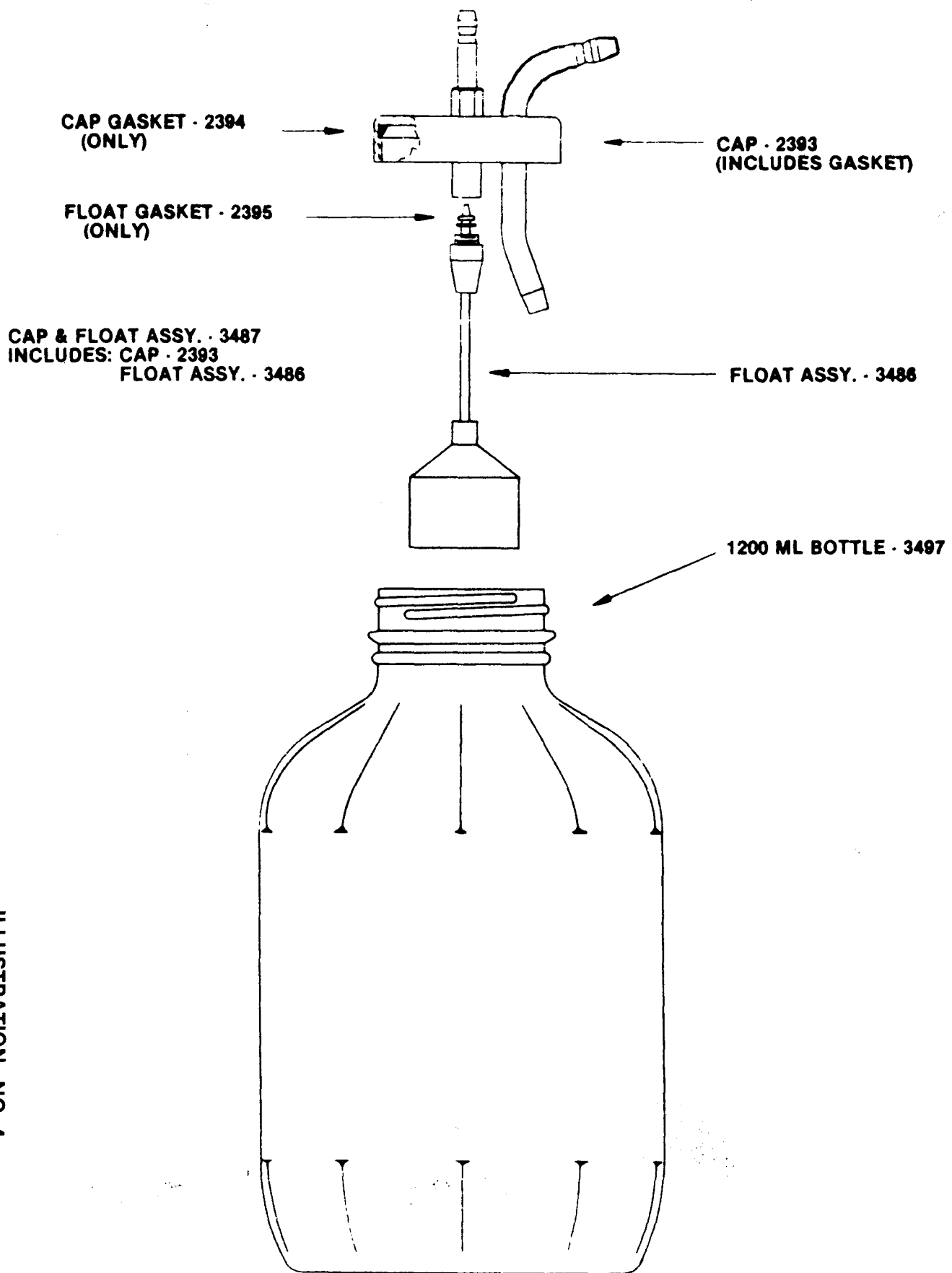
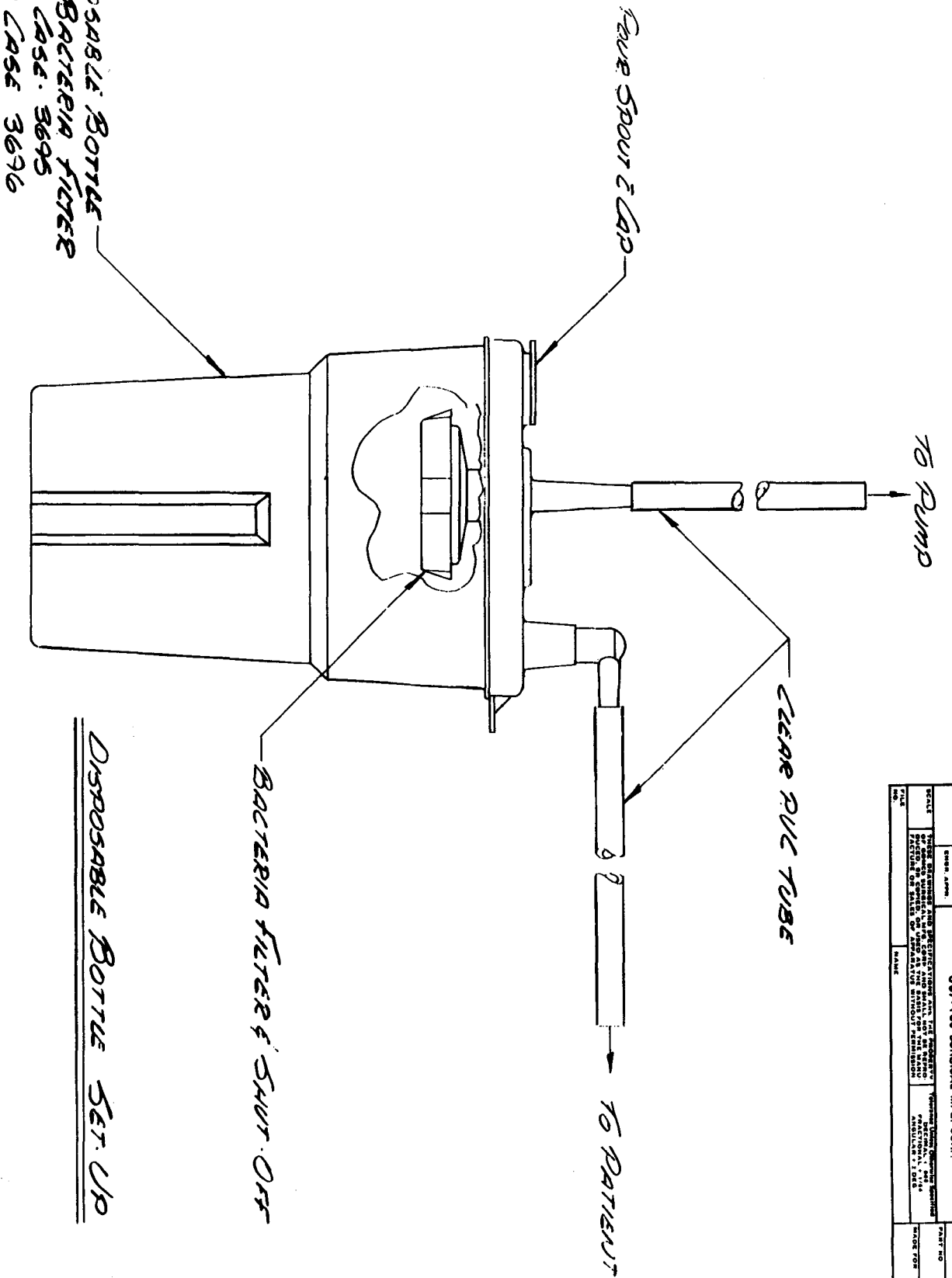


ILLUSTRATION NO. 4



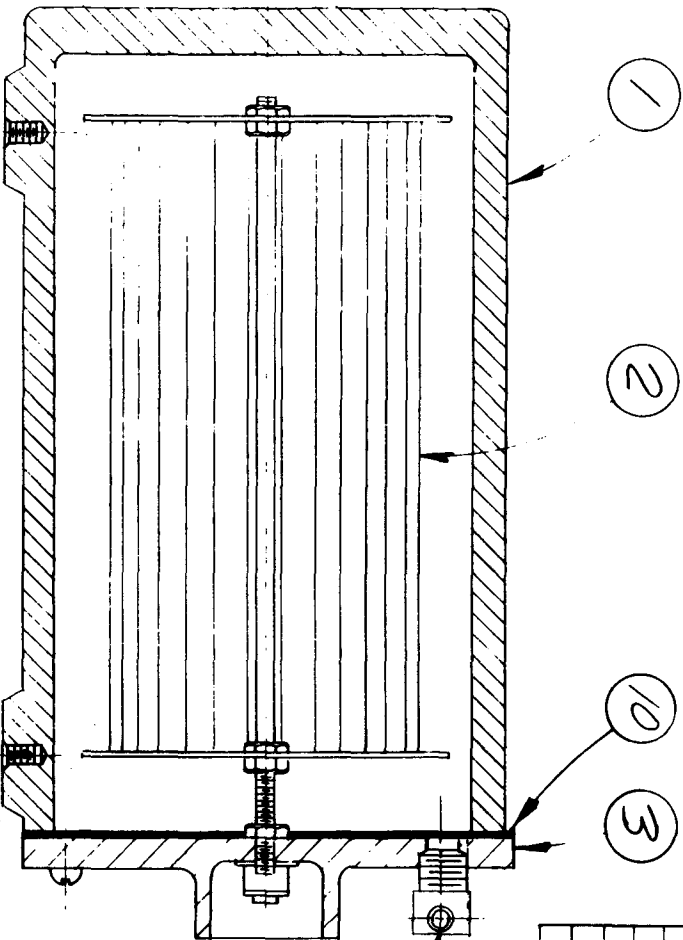
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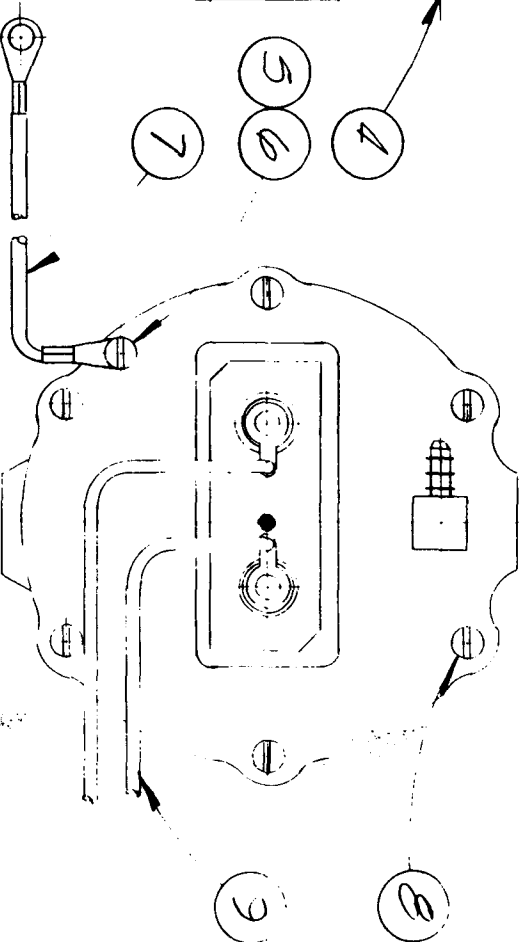
REVISIONS

ILLUSTRATION NO. 5

Next Assy. 3490-A
 Resistance Across Term. 155 to 160 Ω
 Seal Element Rod with Rivet & R.



DATE	CHECKED	GOING Division	DWG. NO.
6-8-61	ENG. APPR.	Ated Hardware Products, Inc.	18 3451 A
SCALE	THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF GOMCO AND SHALL NOT BE REPRODUCED, OR COPIED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALES OF ANY EQUIPMENT WITHOUT PERMISSION.		
FILE	NAME CYLINDER ASSY		
NO.	BILL OF MATERIALS		
ITEM NO.	QTY.	DESCRIPTION	PART NO.
1	1	CYLINDER	2115
2	1	ELEMENT ASSY	2113-5A
3	1	CYLINDER COVER ASSY	3449-5A
4	1	BEARING COVER	P-3450
5	1	#6-18 LG. PIN 40 ST. SCR.	
6	1	#6 LOCKWASHER	
7	1	30400 ALICE ASSY	2118-5A
8	6	#8-32-3/8 LG. RD 40 M.S.	
9	2	BRACE WIRE	2116



④ Ref. E.C.O. # 86-0006 & 24 86 CAP

ILLUSTRATION NO. 6

REV.	DATE	REVISIONS
10	1	3731
		Bill of Materials Cont.

PART NO: 2311-2312

REVISIONS

APP. BY

PRELIMINARY

SPECIFICATIONS

1. MODE OF OPERATION: CONTINUOUS ON-OFF RECTIFYING, WITH POWER APPLIED TO THE INPUT TERMINALS. THE LOAD IS ENERGIZED DURING THE ON TIME PERIOD.

2. INPUT VOLTAGE

2.1 SF120A-774 : 120 VOLTS AC, 5% .50/60 HZ
2.2 SF230A-774 : 230 VOLTS AC, 5% .50/60 HZ

3. TIME DELAYS

3.1 OFF TIME DELAYS : SF120A-774 : 18 TO 22 SECONDS
SF230A-774 : 19 TO 22 SECONDS
3.2 ON TIME DELAYS :

	HIGH	LOW
SF120A-774	3.4 TO 3.75 SEC.	2.1 TO 2.25 SEC
SF230A-774	1.65 SEC. ± 10% .0	1.1 SEC. ± 10% .0

4. LOAD : APPROX. 160 OHMS RESISTIVE

NOTE : SF230A-774 PROVIDES HALF-WAVE RECTIFIED 250 VAC TO THE LOAD

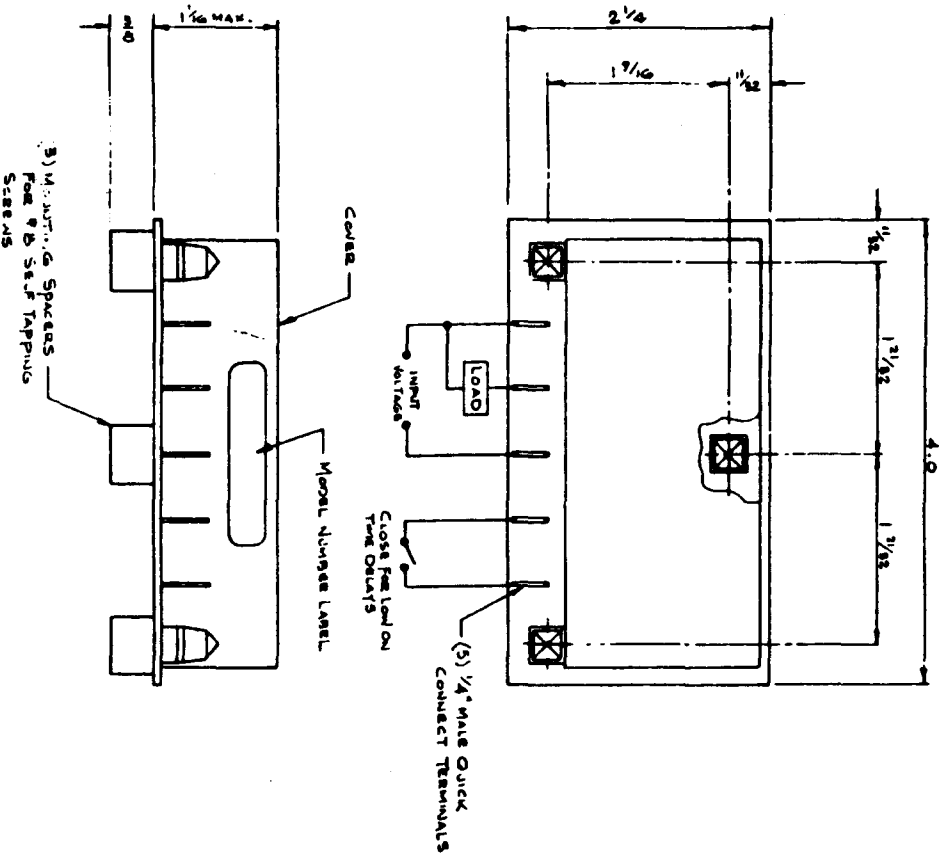


ILLUSTRATION NO. 7 SHEET NO. 1

DWN BY CFS DATE 9-16-80
CHK BY DATE:
APP BY *edd* DATE 2-10-80
SCALE FULL DO NOT SCALE DWG.

DIMENSIONS: IN. MM
1/1000 IN. = 25.40 MM
TOLERANCES
FRACTIONS ± 1/16
2 PLACE DEC ± .01
3 PLACE DEC ± .005
ANGLES ± 1°

TITLE: SOLID STATE TIMER

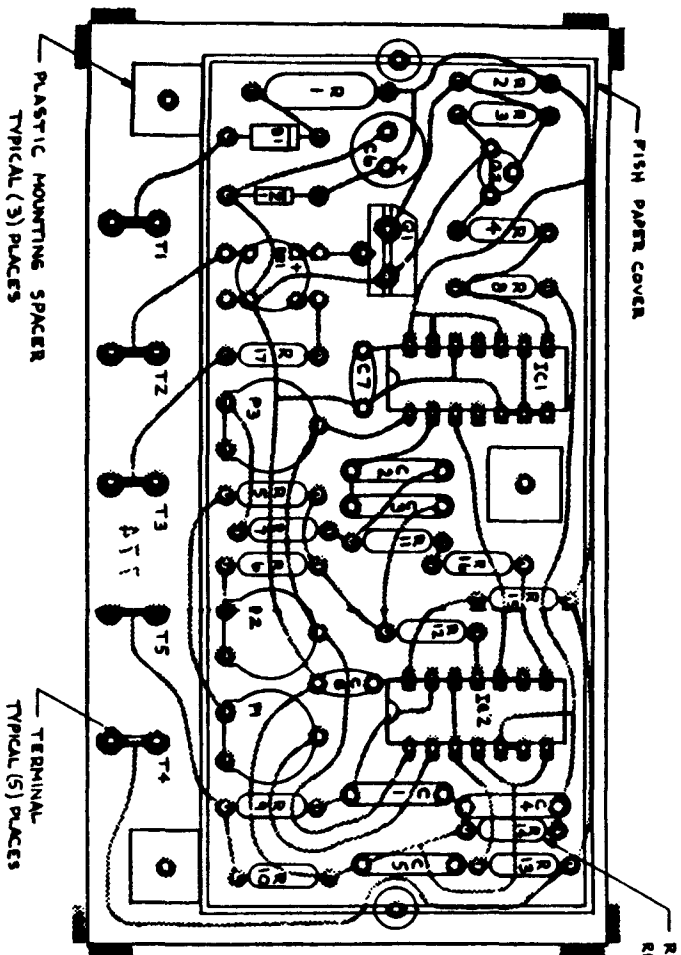
PART NO: 2311-2312

DWG. 1 OF 1 B. A. 12

PART NO:

REVISIONS

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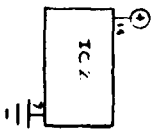
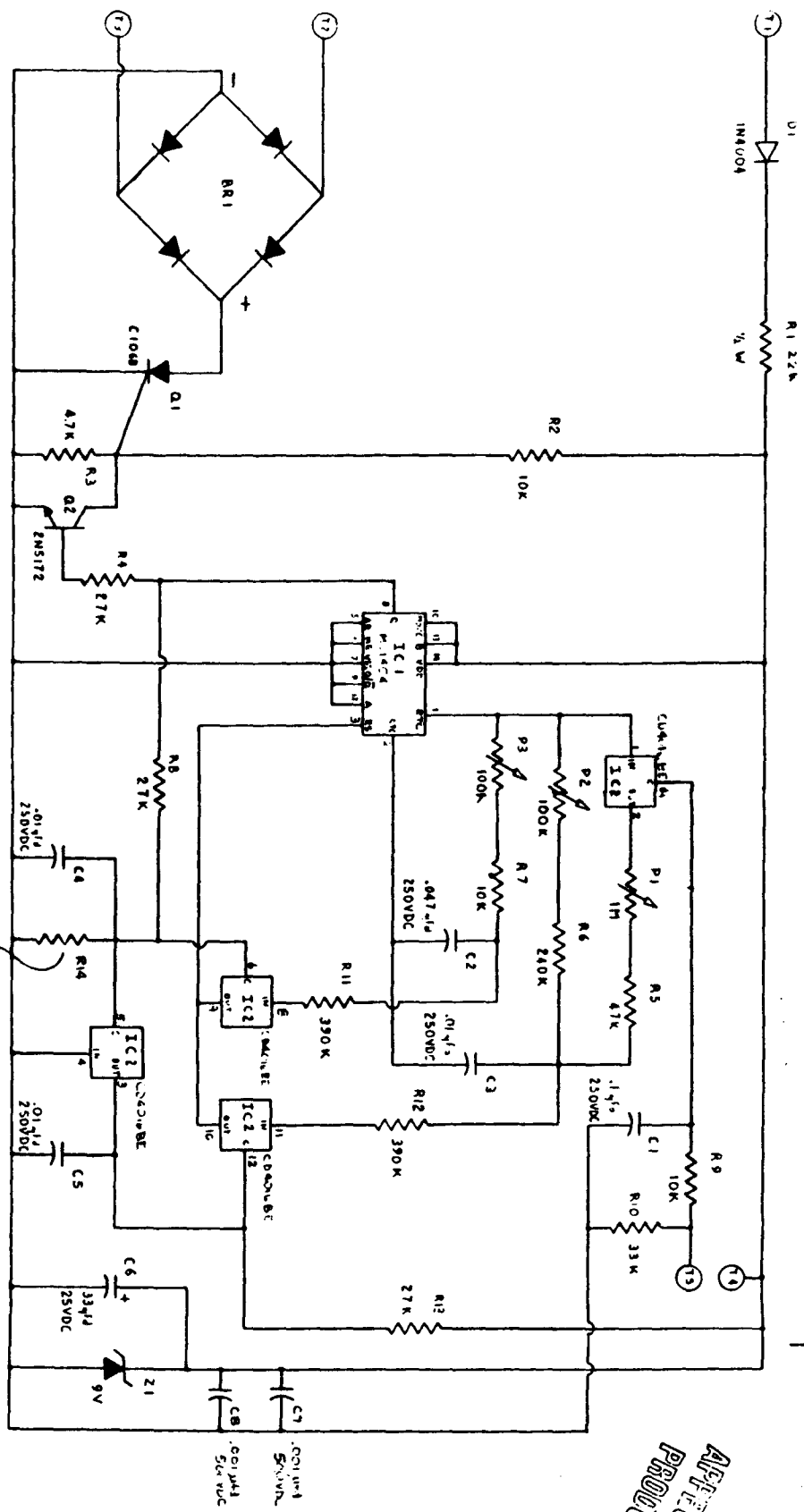


NOTE: R1, R15, R16, R17 ARE 0.1% RESISTORS
AND DO NOT APPEAR ON CIRCUIT
DIAGRAM

APPROVED FOR
PRODUCTION

OWN BY RTF		DATE 4-25-80	TOLERANCES FRACTIONS $\pm \frac{1}{2}$ 2 PLACE DEC $\pm .01$ 3 PLACE DEC $\pm .005$ ANGLES $\pm 1^\circ$	TITLE: COMPONENT LAYOUT	
CHK BY: JFM		DATE 9-26-80		PART NO:	
APP BY: CFS		DATE 12-10-80		DWG. 1 OF 1	
SCALE 2X		DO NOT SCALE DWG			

100-1100-000-000000



APPROVED FOR PRODUCTION

PART NO:	
REVISIONS	APP. BY

DWG. BY: SNA		DATE: 9-25-80		TOLERANCES		TITLE: CIRCUIT DIAGRAM	
CHK. BY: JHK		DATE: 9-26-80		FRACTIONS = 1/10		2 PLACE DEC = .01	
APP. BY: LAD		DATE: 12-14-80		3 PLACE DEC = .005		PART NO	
SCALE: 1/4" = 1"		DO NOT SCALE DWG.		ANGLES = 1°		DWG. 1 OF 1	

BILL OF MATERIALS

REF. N ^o	QTY.	DESCRIPTION
BR1	1	BRIDGE W04MA
C1	1	CAPACITOR .1ufd 250 VDC
C2	1	CAPACITOR .1ufd 250 VDC
C3	1	CAPACITOR .01ufd 250 VDC
C4	1	CAPACITOR .01ufd 250 VDC
C5	1	CAPACITOR .01ufd 250 VDC
C6	1	CAPACITOR 33ufd 25 VDC MSR
C7,C8	2	CAPACITOR .001ufd 500 VDC
D1	1	RECTIFIER DIODE 1N4004
IC1	1	INTEGRATED CIRCUIT MC 14541 B
IC2	1	INTEGRATED CIRCUIT MC 14016 B
P1	1	TRIMPOT 1 MEG. OHM
P2	1	TRIMPOT 100K OHM
P3	1	TRIMPOT 100K OHM
Q1	1	SCR C 106 D
Q2	1	TRANSISTOR 2N5172
R1	1	RESISTOR 22K OHM 1/2 WATT
R2	1	RESISTOR 10K OHM $\frac{1}{4}$ WATT
R3	1	RESISTOR 4.7K OHM $\frac{1}{4}$ WATT
R4	1	RESISTOR 27K OHM $\frac{1}{4}$ WATT
R5	1	RESISTOR 47K OHM $\frac{1}{4}$ WATT
R6	1	RESISTOR 270K OHM $\frac{1}{4}$ WATT
R7	1	RESISTOR 120K OHM $\frac{1}{4}$ WATT
R8	1	RESISTOR 27K OHM $\frac{1}{4}$ WATT
R9	1	RESISTOR 10K OHM $\frac{1}{4}$ WATT

[illegible]

DRAWN 1-86 CAP	CHECKED ENGR. APPR.	GOMCO Division <i>Allied Healthcare Products, Inc.</i>		DWG. NO. A-3477-5A
SCALE FULL	THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF GOMCO AND SHALL NOT BE REPRODUCED, OR COPIED, OR USED AS THE BASIS FOR THE MANUFACTURE OR SALES OF APPARATUS WITHOUT PERMISSION.		Tolerance Unless Otherwise Specified DECIMAL $\pm .005$ FRACTIONAL $\pm 1/64$ ANGULAR ± 2 DEG.	PART NO. 3477-5A
FILE NO.	NAME VALUE & MANIFOLD ASSY.			MADE FOR 270

BILL OF MATERIALS

REF. No.	QTY.	DESCRIPTION	PART No.
1	1	PRESSURE VALVE	3432
2	1	VALUE MANIFOLD	2722
3	1	SILICONE TUBE	9043
4	1	SUCTION VALVE	3433
5	1	EL. COND. TUBE	9040

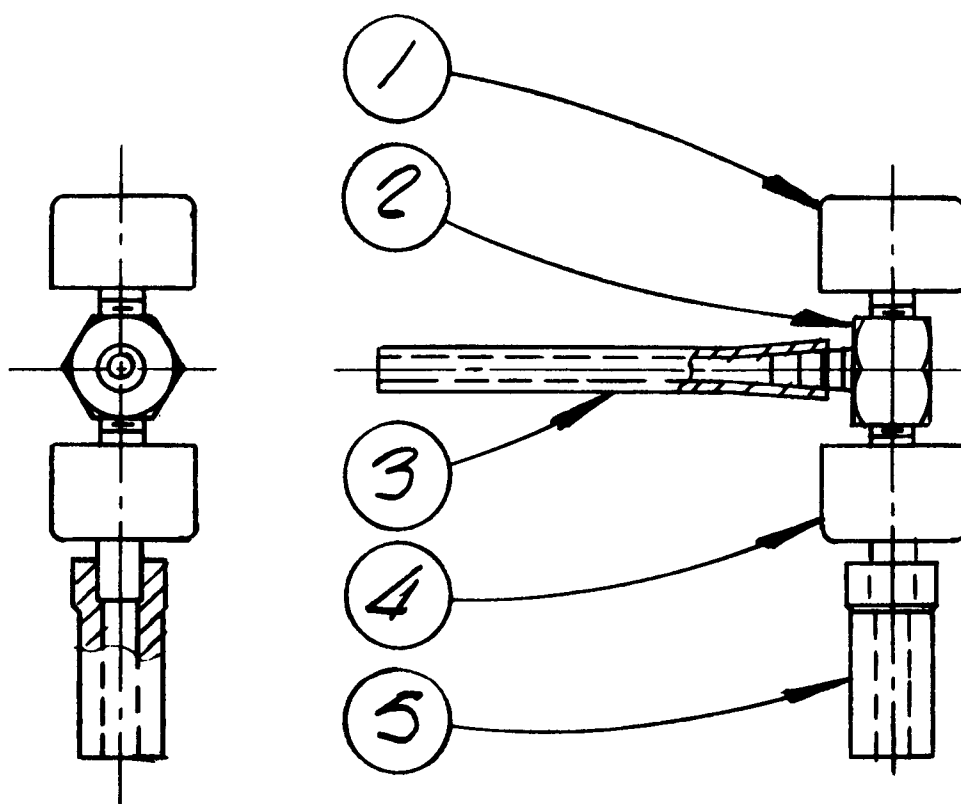


ILLUSTRATION NO. 8

REVISIONS

8.0 TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSES	REMEDY
NO SUCTION BUT PUMP CYCLING PROPERLY	1. SUCTION OR PRESSURE VALVE BAD.	REPLACE, SEE 6.3.1
	2. LOOSE OR OPEN TUBING CONNECTION	CHECK ALL CONNECTIONS
	3. COLLECTION BOTTLE TOP LEAKING	CHECK SET UP — SEE 3.0
LOW SUCTION	1. SUCTION OR PRESSURE VALVE LEAKING	REPLACE, SEE 6.3.1
	2. LOOSE TUBING CONNECTION	CHECK ALL CONNECTIONS
	3. COLLECTION BOTTLE TOP LEAKING	CHECK SET UP — SEE 3.0
	4. HEATING ELEMENT SHORTENED OR BURNED	SEE SPECS. - 2.4
	5. CONTROL CIRCUIT MALFUNCTIONING	SEE SPECS. — 6.6.1
CYCLE LAMP REMAINS ON	1. CONTROL CIRCUIT BURNED OUT	SEE SPECS. — 6.6.1
CYCLE LAMP DOES NOT COME ON	1. CYCLE LAMP BURNED	REPLACE
	2. CONTROL CIRCUIT BURNED OUT	SEE SPECS — 6.6.1
	3. POWER SOURCE BAD	CHECK POWER OUTLET
	4. SELECTOR SWITCH BAD	REPLACE
	5. WIRING INCORRECT	CHECK WIRING (SEE ILL. NO. 1)

REPLACEMENTS PARTS LIST MODELS 270 & 2701

III No.

01-90-3451	Pump Cylinder Assembly	6
Cylinder	01-90-2715	6
Cover Assembly	01-90-3449	6
Element	01-90-2713	6
Elbow (Fitting)	01-90-3450	6
Gasket	01-90-3731	6
01-90-3477	Valve and Manifold Assembly	8
Pressure Valve	01-90-3432	8
Suction Valve	01-90-3433	8
Manifold	01-90-2722	8
Silicone Cylinder Tube	01-90-3475	8
Suction Valve Tube	01-90-3476	8
01-90-3489	1200 ML Collection Bottle Assembly	4
1200 ML Bottle (6/case)	01-90-3497	4
Cap and Float Assembly	01-90-3487	4
01-90-3487	Cap and Float Assembly	4
Cap (Includes Gasket)	01-90-2393	4
Cap Gasket	01-90-2394	4
Float Gasket (Only)	01-90-2395	4
Float Assembly	01-90-3486	4
01-90-2986	Case Top Cover	1-2
01-90-3478	Case Bottom	1-2
01-90-3403	Case Rear Panel	1-2
01-90-3400	Case Front Panel	3
01-90-2271	Handle	1-2
01-90-2270	Handle Spacer	1-2
01-90-2309	Switch	3
01-90-2310	Cycle Lamp	3
01-90-2311	P.C. Board (115 v)	1-2
01-90-2312	P.C. Board (230 v)	1-2
01-90-3100	Bacteria Filter Package (3 each)	1-2
01-90-3491	Tubing Package (2 each, 6 ft.)	Not Shown
01-90-2737	Power Cord Assembly (115v)	1-2
01-90-3109	Power Cord Assembly (230v)	1-2
01-90-3443	Bottle Holder	1-2
01-90-3479	Vacuum and Filter Connection	1-2
01-90-3480	Elbow (Fitting for 3479)	1-2
01-90-2345	Rubber Foot	1-2
01-90-3695	1100 ML DCU 12/Case	5
01-90-3696	1100 ML DCU 48/Case	5

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INSTRUMENTS OF CARE

PART NO. S168-225-001