

OPERATING INSTRUCTIONS

FOR

GOW-MAC MODEL 210-ADL-1 GAS MASTER

0-1 Per Cent Air in Helium

Gow-Mac Instrument Company  
100 Kings Road, Madison, N. J., U. S. A.  
Tel. : 201-377-3450

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GENERAL

This instrument is designed for the measurement of Air in Helium. It comes equipped with two (2) drier towers, two (2) rotameters with needle valves and a detector cell. The detector cell is a Model 9454 containing a flowing reference and a flowing sample. The detector cell uses four (4) type W2 tungsten filaments which form a wheatstone bridge circuit. The galvanometer is a 0-5 milli-volt meter which is used for reading out the percentage of Air impurities in Helium. The wheatstone bridge is powered by a 20 volt solid state power pack. The Gas Master requires 110 volts of alternating current for its operation.

The alternating current frequency may be between 50 to 60 cycles per second.

OPERATING CONTROLS

1. The large panel meter located on the front panel will indicate the per cent impurity of Air in Helium. This meter will also actuate an alarm circuit at any desired point on the indicating meter.
2. The R. H. flowmeter and metering valve on the sloping panel are used to adjust the gas flow through the sample system and the flowmeter on the left, the reference flow. The flow gages are graduated 0-100. 20 Divisions equal 1 C. F. H.
3. The "zero adjust" control is used to electrically balance the detector cell bridge circuit when pure Helium is flowing through both sample and reference systems.

4. The "current adjust" control turns the detector cell bridge current on and also adjusts the current on the wheatstone bridge circuit.
5. The "milliammeter" is for monitoring the bridge current. The "current-adjust" control should be adjusted so that the meter indicates 230 milliamperes passing through it when pure Helium is being passed through both sample and reference systems. The bridge current should be checked, and adjusted if necessary, during the initial warm-up period of the instrument. It is quite normal for the milliammeter current to decrease during the initial warm-up due to the increase of temperature of each filament detector until a temperature equilibrium is reached.
6. The "Sensitivity Control" is located on the top of the instrument chassis. This control is used for calibrating the instrument for a given percentage of Air in Helium.
7. The "alarm reset switch" located on the front panel, is used to reset the alarm circuit after the alarm has been actuated.
8. The "Cannon Connector" on the rear of the instrument chassis is provided to connect a warning signal device. Do not exceed a load of five (5) amperes on the alarm system.
9. There are four (4) gas connections at the rear of the instrument.

These are marked (left to right from rear) :

Reference out 1/4" O. D. , Sample in 1/8" O. D.

Reference in 1/8" O. D. , Sample out 1/4" O. D.

If the instrument is to be permanently connected to a system, it is recommended that the customer provide a means of shutting off the sample gas so that the detector cell can be purged with pure Helium for zero checks.

OPERATING INSTRUCTIONS

- † A. Make gas connections at the rear of the instrument so that pure Helium can pass through both sample and reference systems.
- † B. Plug the instrument service cord into a 110 VAC 50-60 CPS source.
- C. Adjust each flowmeter so that a flow of 1 C. F. H. (20 divisions) is passing through it. Allow the gas to purge for five (5) minutes.
- D. Turn the "current adjust" control so that the milliammeter reads 230 milliamperes. It is recommended that the current be checked periodically during the initial warm-up. After approximately 15 minutes, or after the instrument current has stabilized, proceed as follows:
- E. Adjust the "zero control" until the galvanometer reads "0" per cent air impurity.
- F. The instrument is now zeroed on pure Helium and is now ready for the analysis of the sample gas.



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CALIBRATION

This instrument is calibrated at the factory to read 0-1% Air in Helium. If at any time it is found necessary to recalibrate the instrument, the following steps should be followed:

1. Remove the top cover and locate the Sensitivity Adjust control.
2. Zero the instrument on pure Helium as described under OPERATING INSTRUCTIONS.
3. Purge a certified calibration mix through the sample system and adjust the Sensitivity control so that the panel meter will read the correct per cent of Air impurity in Helium.
4. Lock this position on the Sensitivity control and replace the top cover.

Note: There are two fused circuits in this instrument to protect the instrument from an overload.

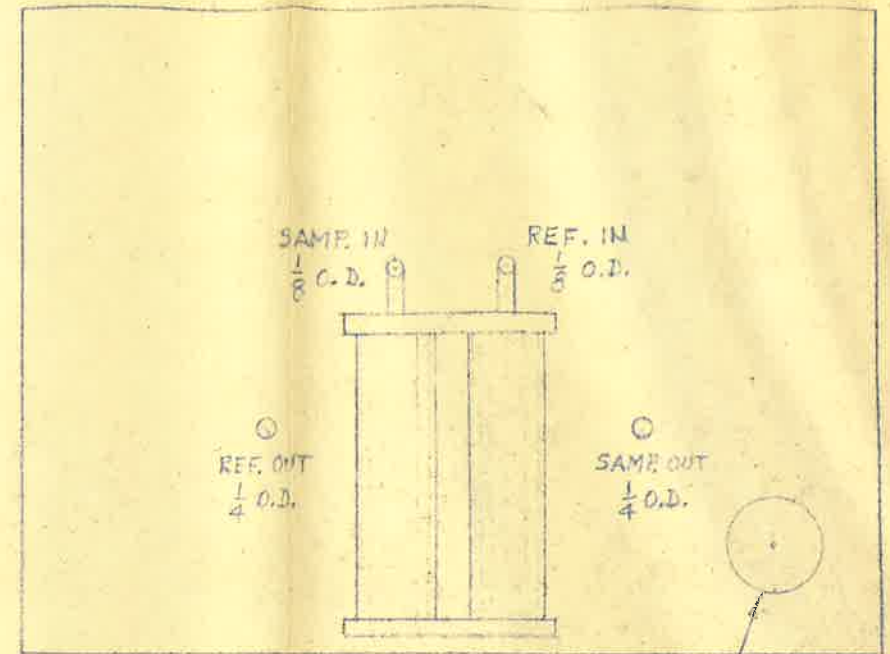
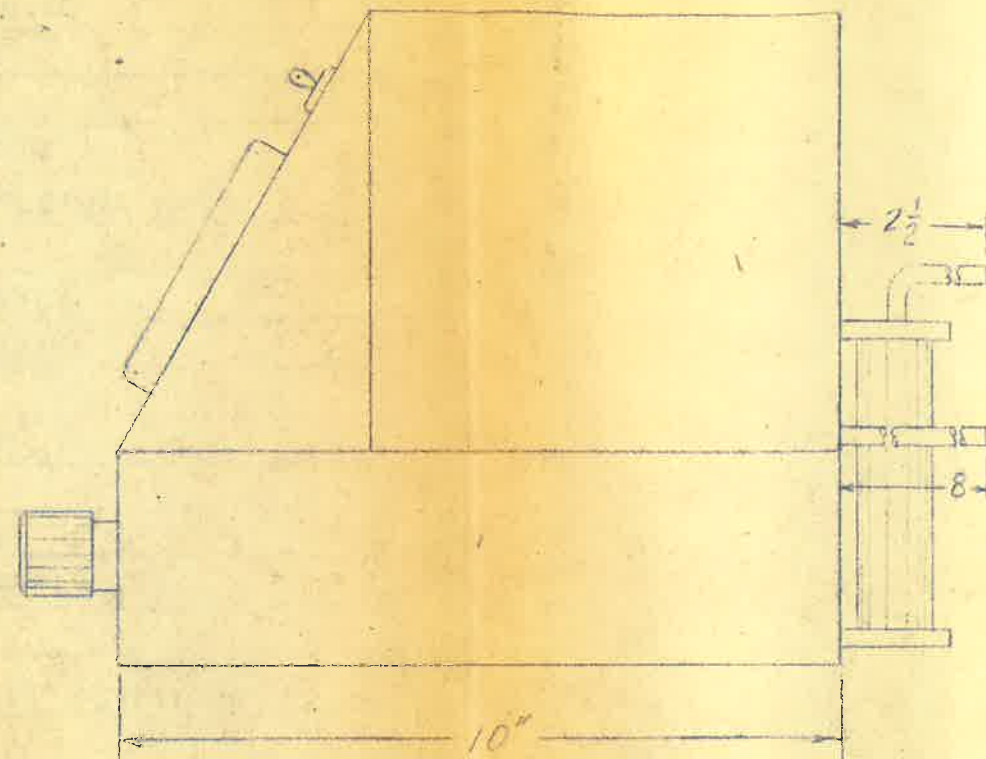
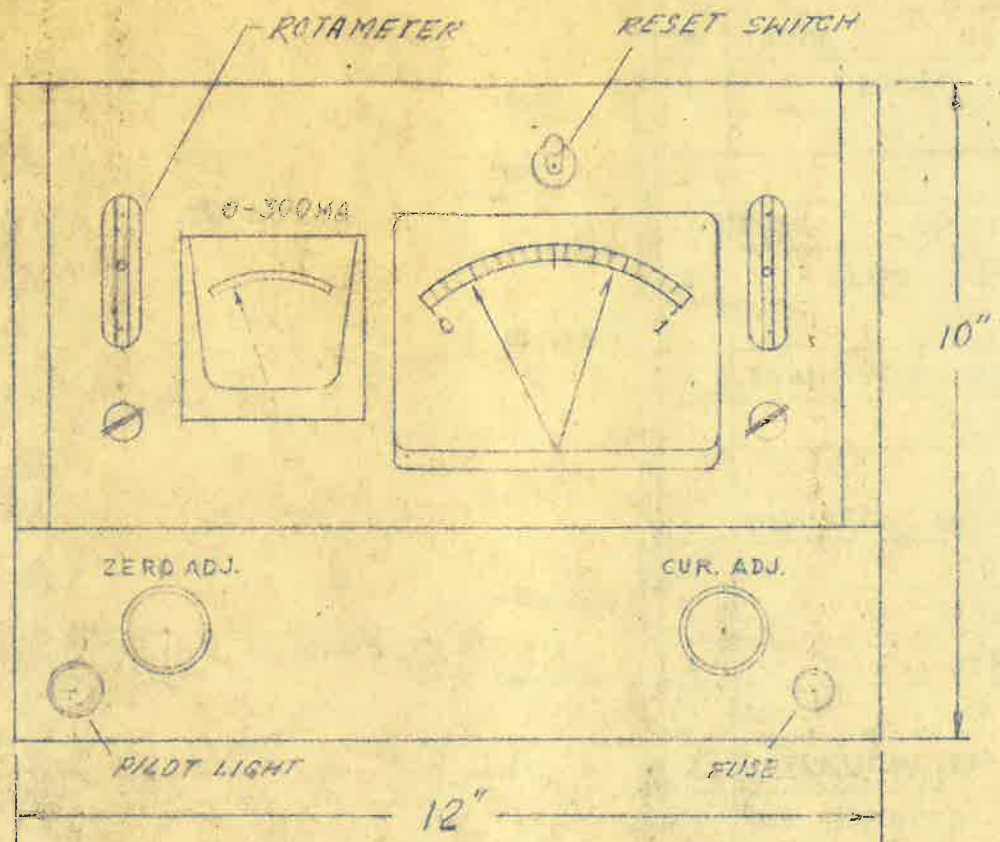
- A. 5 ampere fuse located on the front panel which fuses the alarm circuit from an overload.
- B. 3/10 ampere fuse located under the instrument chassis on the D. C. power pack to prevent an overload of both power pack and detector cell.

April 10/64.

GLS:G

Dwgs. enclosed:   Flow diagram 9423  
                          Wiring schematic 10540  
                          Power Pack schematic 10541  
                          Tubes 10485





'AN' CABLE CONNECTOR  
110 OR 220 V - 50-60 CYC.

GOW-MAC INSTRUMENT CO.  
100 KINGS RD. MADISON, N.J.

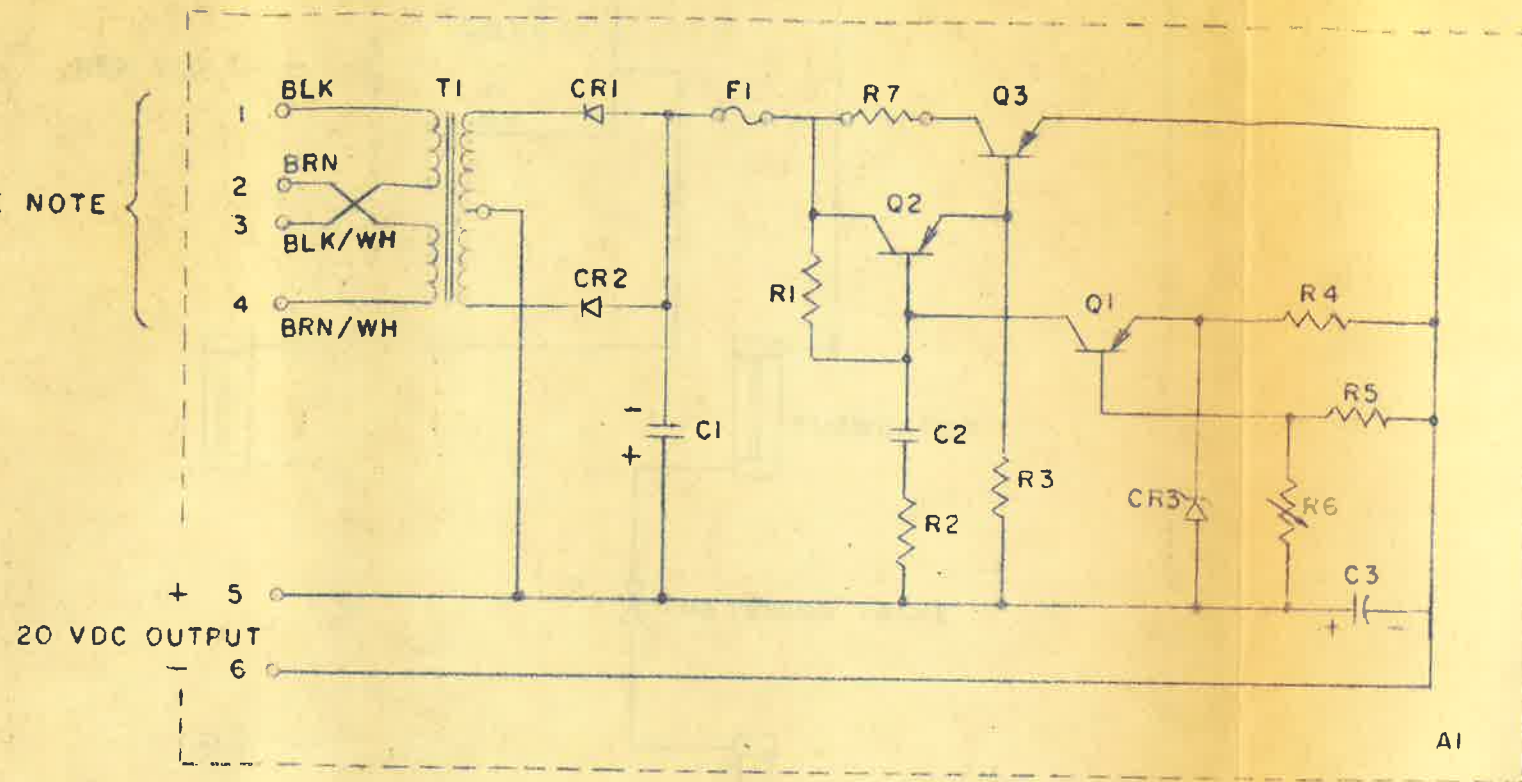
Z10-ADL-1 - GAS MASTER  
ARTHER D. LITTLE

DRAWN ALC  
APP'D  
SCALE 3/8" = 1"  
DATE 12-11-63

S.O.  
11366 10532



SEE NOTE



NOTE -

110V 50-60 CPS LINE - STRAP 1 TO 2, 3 TO 4  
LINE TO 1 AND 4.

220V 50-60 CPS LINE - STRAP 2 TO 3  
LINE TO 1 AND 4

LIST OF MATERIALS

ITEM	AMT.	DESCRIPTION
A1	1	P.C BOARD, 2286
C1	1	CAPACITOR 500 $\mu$ F 50 VDC
C2	1	" 1 $\mu$ F " "
C3	1	" 100 $\mu$ F 25 "
CR1,2	2	DIODE CER 69
CR3	1	" ZENER IN707
F1	1	FUSE AGC 3/10
XF1	2	" CLIPS - LITTLEFUSE 101002
Q1,2	2	TRANSISTOR 2N301
Q3	1	" 2N235A
R1	1	RESISTOR 6.8K
R2	1	" 330
R3	1	" 2.2K
R4	1	" 4.7K
R5	1	" 1K
R6	1	POTENTIOMETER 1K IRC-CTS 110-1000
R7	1	AS REQUIRED
T1		TRANSFORMER D889

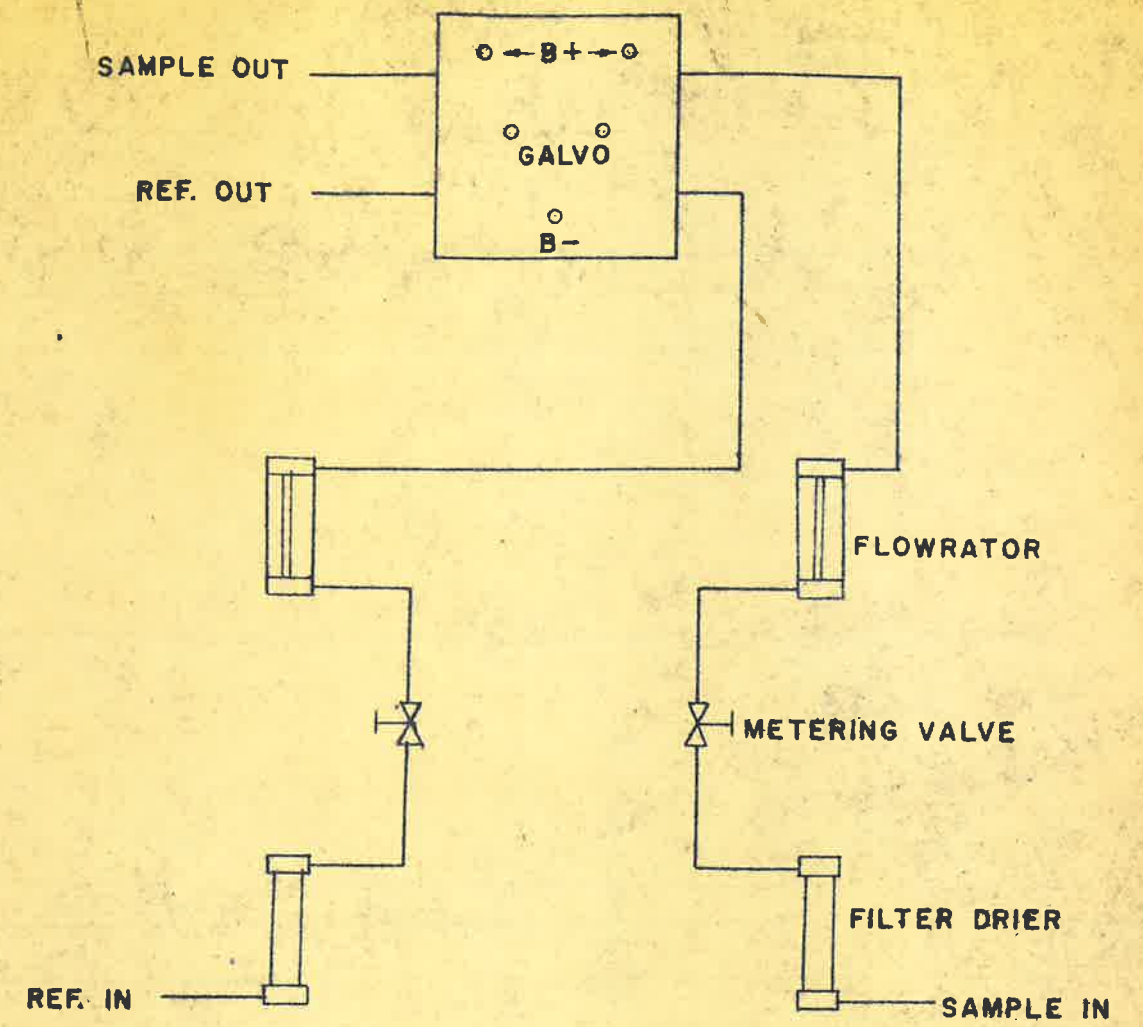
GOW-MAC INSTRUMENT CO.  
100 KINGS RD. MADISON, N.J.

SCHEMATIC  
CV 505 POWER SUPPLY

DRAWN. ALC  
APP'D  
SCALE  
DATE 1-14-64

10541





2 PASS GAS MASTER

GOW-MAC INSTRUMENT CO.  
 100 Kings Road Madison, New Jersey

FLOW DIAGRAM

Drawn: ALC

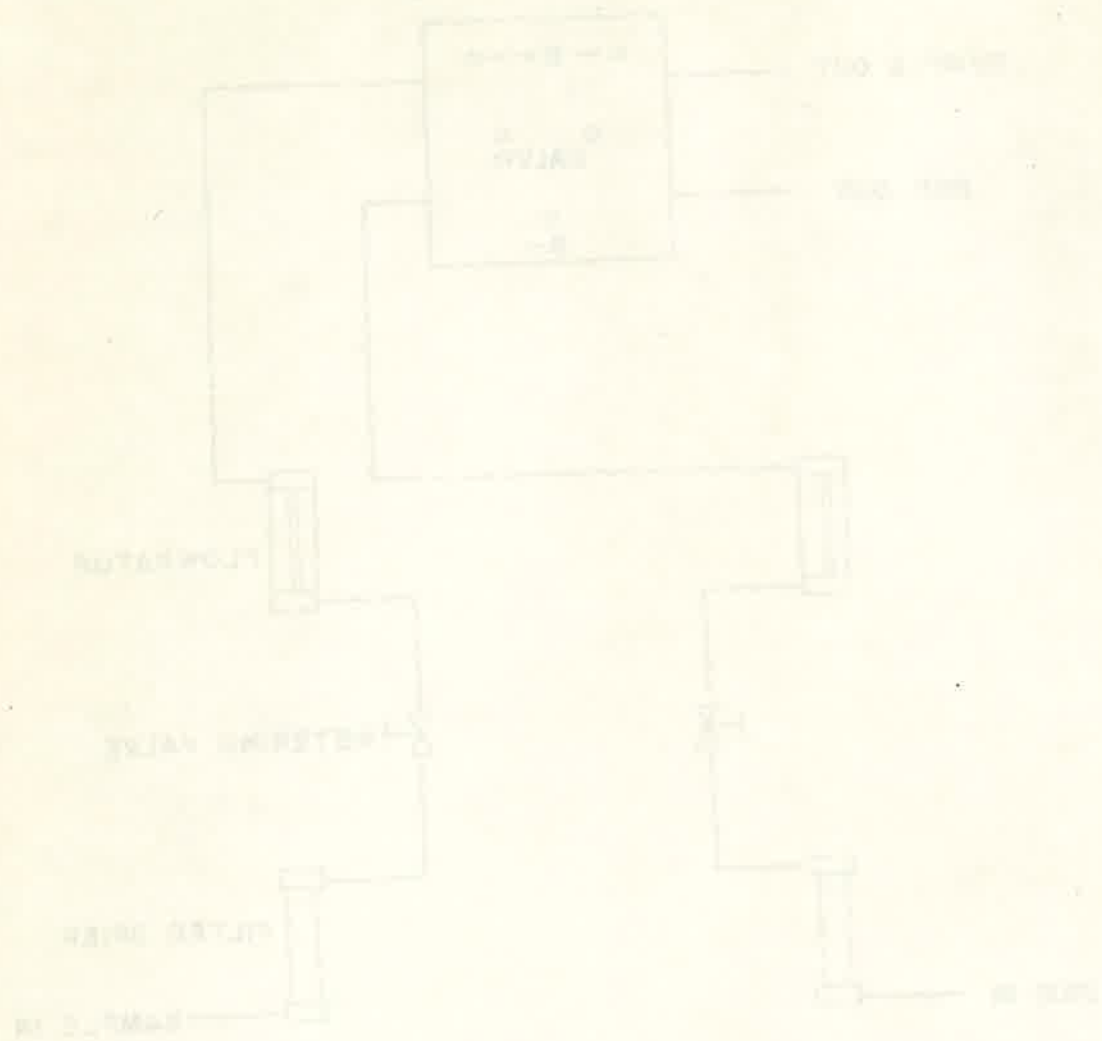
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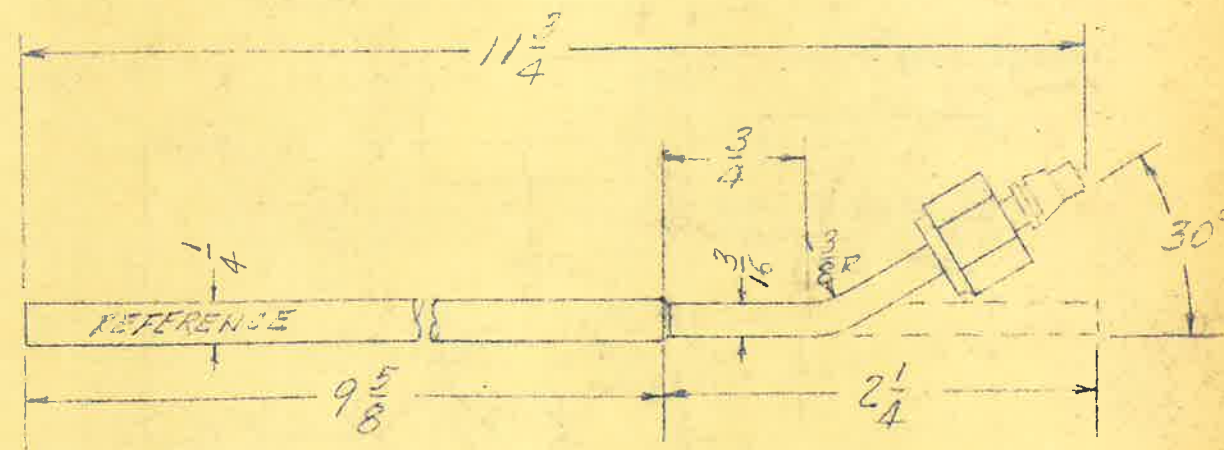
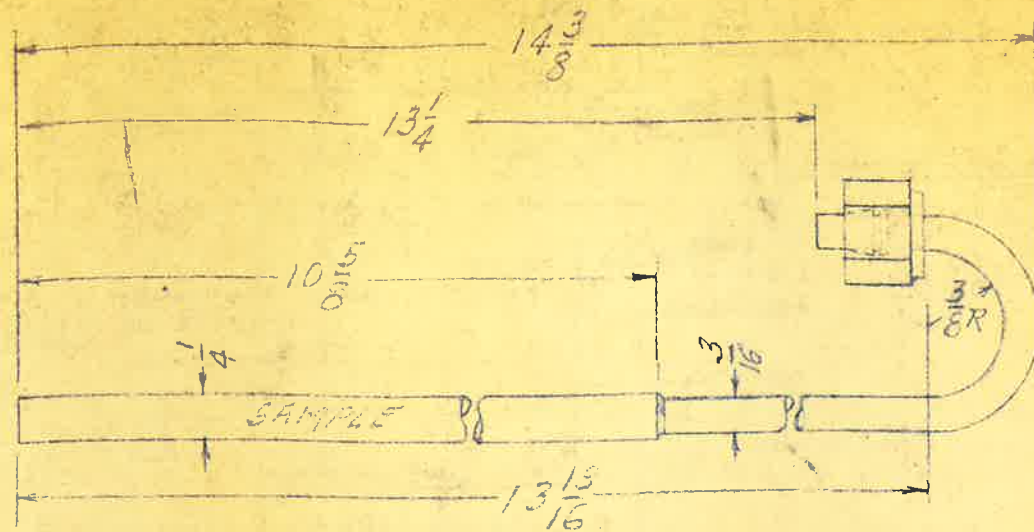
9423





REVISION 240 0243 7

FOR A.D. LITTLE  
 DRAWN BY  
 APPROVED BY  
 DATE



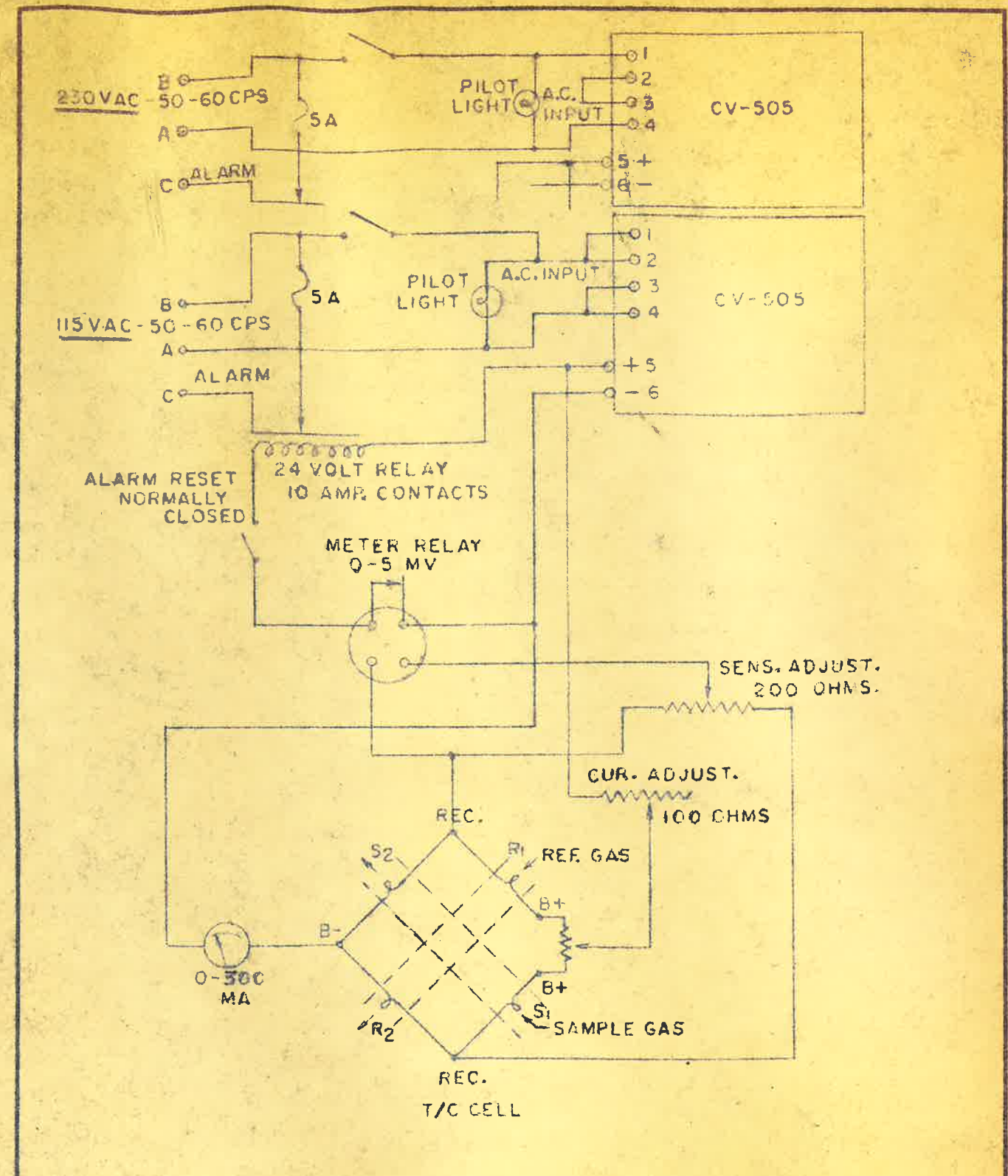
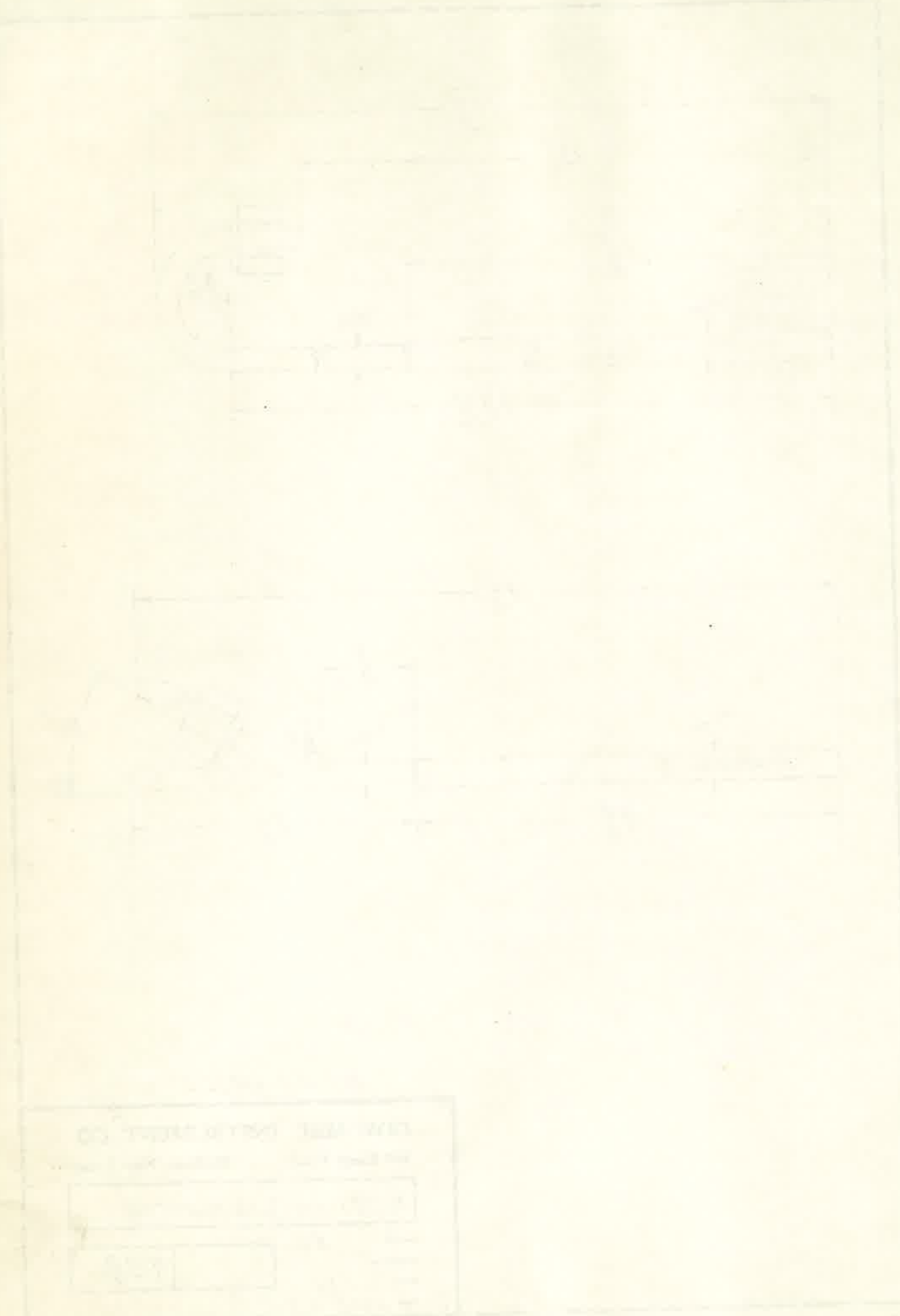
FOR A.D. LITTLE

**GOW-MAC INSTRUMENT CO.**  
 100 Kings Road Madison, New Jersey

TUBES FOR GAS METER

Drawn *ALL*  
 Approved  
 Scale 1:1  
 Date 5-15-63

10486



210-ADL-1 GAS MASTER—115 OR 230 VOLTS

**GOW-MAC INSTRUMENT CO.**  
 100 Kings Road      Madison, New Jersey

WIRING SCHEMATIC

Drawn: ALC  
 Approved: \_\_\_\_\_  
 Scale: \_\_\_\_\_  
 Date: 1-10-64

10540