RADēCO

"The Industry Standard in Air Sampling."

OPERATION AND MAINTENANCE MANUAL

VARIABLE FLOW "GRAB AIR SAMPLER"

MODEL H-809V

17 West Pkwy
Plainfield CT 06374
(860) 564-1220
(860) 564-6631 Fax
WWW.RADeCOINC.COM

REV 111804

OPERATION AND MAINTENANCE MANUAL

Variable Flow “Grab” Sampler

Model H-809V

CAUTION

CARE MUST BE TAKEN TO PREVENT THIS DEVICE FROM COMING INTO CONTACT WITH FOAM, LIQUID (INCLUDING WATER) AND OTHER FOREIGN SUBSTANCES. SUCH MATERIALS MUST BE PREVENTED FROM REACHING THE FAN SYSTEM INTAKE, MOTOR HOUSING AND ELECTRICAL COMPONENTS. FAILURE TO DO SO COULD RESULT IN AN ELECTRICAL SHOCK, WHICH MAY RESULT IN SEVERE BODILY INJURY OR EVEN DEATH IN EXTREME CASES.

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ATTACHMENTS

GENERAL DESCRIPTION

The Model H-809V is a dependable, lightweight, variable flow "GRAB" type air sampler. Two operational ranges are available permitting users to select the model most adaptable to their sampling requirements. Both have adjustable flow rates and a maximum capability switch. The maximum flow of each model is dependent upon the area and type of filter media used.

The blower motor is cooled by a separate fan and air supply and is not dependent upon the sample air flow as a coolant, allowing heavy filter loading with no damage
to the unit.

A shielded rotometer is provided to indicate airflow through the filter media. It is located between the filter and the blower exhaust, protecting it from erroneous readings during normal operations.

MODEL H-809VI

The Model H-809VI is a low flow range sampler (nominal 1 to 8 CFM) for use with 47mm, 50mm, and 55mm diameter filter holders or with combination holders, which contain one of the above filters and a radioiodine sampling cartridge. When using the combination sample holder, the filter acts to collect the particulate in the air while the cartridge collects the airborne iodine.

The sample airflow range of the unit is determined by the pressure drop of the filter paper (and the radioiodine cartridge) selected by the user for his air sampling procedures. If a “very” high efficiency filter (99% type) is used, the maximum flow will be limited. When these filters are used in conjunction with a high efficiency radioiodine cartridge (such as the RADeCO CP-100), only nominal flow rates may be achieved.

High efficiency filters (90-95% type) do not have as great pressure drop as the 99% type and the maximum flow through the unit will be higher. Since most radioiodine cartridges have desired flow rate vs. collection efficiency characteristics at 2, 3 or 4 CFM (56 to 114 LPM), these filter papers permit adequate flow to be achieved with nominal adjustment latitude.

Since the operational flow range and the calibration of the rotometer are dependent upon the pressure drop through collection system, RADECO, INC makes every effort to calibrate its units to the customer’s actual requirements.

MODEL H-809VII

The Model H-809VII is a higher flow range sampler for use with a four inch (101 mm) diameter filter only. Routinely, the calibration of this unit is from 8 to 28 cubic feet per minute (200 to 800 liters per minute).

SPECIFICATIONS

Note

This symbol alerts the user that important Operating and Maintenance instructions have been included with the unit. Read carefully to avoid any problem.

AIR MOVER:	Two-stage, turbine blower with peripheral exhaust. Develops a head of 68" H_2O at cutoff.
MOTOR:	1 HP, Self-cooling. Universal type.
AIR FLOW INDICATOR:	Calibrated rotometer. Guard protected.
POWER REQUIREMENTS:	115V, 60 Hz, 1ø , 960 watts; 8Amp, 250V, Slo-blo, UL Listed fuse protected.
POWER CABLE:	Three wire, #18 AWG, is provided in 6 foot length.
DIMENSIONS:	8" x 10" x 7" (20 cm x 25 cm x 18 cm)
WEIGHT:	10 pounds (4.5 kg)

The H-809 Series of air samplers are designed to the following standard:

A) Dry Locations Only;
B) Altitude up to 2000 m;
C) Temperatures 5 ºC to 40 ºC;
D) Maximum relative humidity 80% for temperatures up to 31 ºC decreasing linearly to 50% relative humidity at 40 ºC;
E) Main supply voltage fluctuations up to 10% of the nominal voltage;
F) Cat II;
G) Pollution degree 2

OPERATION

The operation of the Model H-809V is relatively simple. Attach filter holder with desired filter media to the sample inlet. Connect the unit to a compatible power source.

Located on the front panel is a three-position toggle switch marked “HIGH-OFF-VARIABLE” and a flow adjust potentiometer marked “ADJUST”. With the “ADJUST” knob in its most counter-clockwise position, flip the toggle switch to “VARIABLE”. Turn the “ADJUST” knob clockwise until the desired flow reading is observed on the rotometer.

CAUTION

> During the first five minutes of operation, an increase in flow will be indicated and it will be necessary to turn the “ADJUST” potentiometer counter-clockwise to reduce the flow back to its initial setting. This is due to temperature vs. performance characteristics of the blower.

Unless there is an abnormal amount of ambient airborne particulate, it is unlikely that the filter loading will significantly change the flow during a normal sampling period. Where dusty areas are encountered, frequent flow adjustments may be required.

If the toggle switch is placed in the HIGH position, the variable control is inoperative and the unit will function at its maximum capacity.

You will note that the sample inlet has threads on its surface and that a special nut now holds the adaptor in a fixed position. It is very important that this nut be at least finger tight up against the face of the housing. The purpose of this nut is to prevent the adaptor from being mashed or pushed back into the fan assembly when the unit or the sample holder is accidentally rammed, bounced, or banged into obstructions.

CALIBRATION

H-809VI

Unless otherwise specified by the customer, this instrument has been calibrated at the factory using a 0750-02 (47mm diameter HD-2061) filter and a RADeCO CP-200 radioiodine sampler cartridge in a 2500-34 sample holder. The calibration documents provided with the unit will state the materials actually used.

The actual filter media being used determines the calibration of the rotometer. If materials other than the above listed are to be used routinely, it is mandatory to recalibrate the rotometer and relocate the index markings. For this recalibration, may we suggest that a quality, low-pressure drop, venturi tube type calibrator, such as all RADeCO Air Flow Calibrators be used.

H-809VII

Unless otherwise specified by the customer, this instrument has been calibrated at the factory using a 0750-09P (4" diameter HD-2061) filter. The calibration documents provided with the unit will state the materials actually used.

CALIBRATION/RECALIBRATION PROCEDURE

1. Remove the rotometer guard and replace the four screws back into the unit housing.

2. Change rotometer (if required).

3. Connect the equipment as shown in the test set-up. Use cartridge and/or filter paper, which will be used in actual sampling operations (Diagram A).

4. Turn on AC power supply.

5. Turn on H-809V.

6. Adjust to 5-7 CFM and allow to run for approximately five minutes.

7. Re-adjust the maximum airflow as required.

8. Scribe (mark) a line one inch below the top of the rotometer. This will be the maximum CFM mark. When recalibrating/resetting a rotometer, top mark is the one inch indicator.

9. Adjust the needle valve until the red ball comes to rest at the one inch mark at the top of the rotometer. Lock needle valve in place.

10. Adjust the variable speed control knob for airflow as follows:

    H-809VI
    1 to 8 CFM in 1 CFM increments, or
    25 to 250 LPM in 25 LPM increments

    H-809VII
    2 to 20 CFM in 2 CFM increments, or

    Calibrate from maximum flow rate to minimum flow rate.

11. Mark the rotometer at each increment.

12. Disconnect set up.

13. Replace rotometer guard.

NOTES

A. If rotometer has been calibrated with a different cartridge/filter combination than actual sampling use, unit should be recalibrated, as the markings are not the same for all combinations.

B. Cartridge and filter paper that will be used in field sampling can be specified when ordering, and the factory will make initial calibrations to that combination.

MAINTENANCE

The Model H-809V Air Sampler is designed to require a very minimum of simple maintenance.

Motor Brushes

The H-809V uses a brush type motor, with a nominal brush life of 600 to 700 hours. The brush assemblies must be changed before they are depleted to prevent damage to the armature. The individual motor brush assemblies are available as Part No. 6050-04 (two per motor). The brushes can be changed using the following procedure.

1. Remove the housing from the rear of the unit by removing the four retaining screws and the hex bolt holding the handle to the black bracket.

2. Remove the plastic motor guard.

3. Remove the brush assembly by backing out the two round head screws retaining the clip, which secures the brush assembly.

4. The brush assembly is now secured to the unit only by the wire leading to the field windings. This wire is secured to the brush assembly by a flat metal connector, which slides into a slot in the brush assembly.

5. With the brush assembly in a vertical position, grip the tab on the flat metal connector with a pair of pliers, place your thumb directly over the end of the brush assembly, and pull the flat connector directly upward from its slot.

6. Reassemble in the reverse order.

Bearings

Bearing replacement requires that the work of an experienced technician with adequate tools.

1. Perform steps 1 through 5 as stated above.

2. The cooling fan on the rear of the rotor shaft is a press fit and this must be carefully removed from the shaft utilizing a puller or careful prying with a large flat-bladed screwdriver.

3. Remove the outer fan cover with its attached sample head adaptor.

4. Remove the nut on the rotor shaft and lift off the washer, the rotating fan, and the spacer.

5. Remove the inner fan cover (stationary fan), and lift off the inner fan.

6. Using a 1/4" nut driver, remove the screws located under the brush mechanisms, which hold the bracket assembly to the overall assembly. The rear bearing is a part of the bracket assembly and must be replaced as a unit.

7. Remove the rotor shaft and the front bearing will be exposed. Remove it from the shaft.

8. To replace the front bearing, use RADeCO Part No. 6050-05 and the rear bearing with Part No. 6050-28.

9. Reassemble in reverse order.

CAUTION

The only problem to be encountered is remounting the cooling fan on the rear end of the rotor shaft. Since this is a press fit, a new cooling fan, Part No. 6050-29, should be used. To use the old fan, the shaft must be scored, lock tight, etc. to prevent the fan from slipping on the rotor shaft.

APPENDIX A
MODEL H-809VI AND H-809VII SPARE PARTS LIST

PART NO.	DESCRIPTION
0100-52	Air Mover Assembly, 115V, 60hz, Replacement Blower Only. No Head Adapter
0100-03*	Air Mover Assembly, 115V, 60Hz (Composed of motor blower, mounting ring, head adaptor, O-ring)

* Starting September 2004, all 809 series Air Samplers with a serial number of 8886 or greater will no longer have the head adapter directly attached to the blower. There is a gasket used to seal the blower to the casing. If replacing a blower, remove the old fan shell, drill out the adapter and reinstall it to the casing with the adapter nut supplied originally with the unit.

0301-44	Back Cover Assembly
0301-46	Mounting Ring of Air Mover Assembly
0301-75	Sampling Housing
0600-14	Clamp, Power Cord
0750-47	Diffuser, Exhaust, Sintered Metal (H-809VI)
0750-48	Diffuser, Exhaust, (H-809VII)
0900-09	Fuse, 8 Amp, Slow Blow (250V), UL Listed
0900-34	Fuse Holder
0900-24	Fuse Carrier
1300-05	Handle
1300-18	Carrying Strap
1350-65	Eye Bolt
1500-05	Rotometer Assembly
1500-23	Rotometer Guard
1700-09	Handle Bracket
1800-04	Support Feet
1850-03	Knob, Flow Adjust

APPENDIX A
SPARE PARTS LIST (CONTINUED)

PART NO.	DESCRIPTION
2060-106	Motor Control Assembly (115V, 60Hz) (Consists of solid state electronics, potentiometer, and switch).
2201-10	O-Ring, Head Adaptor
2201-58	Motor Cooling Gasket
2201-13	Fan Shell Gasket
2500-73	Lock Nut, Head Adaptor
2500-74	Head Adaptor Assembly (with Lock Nut and O-Ring)
2700-02	Switch, SPDT (metal)
6050-04	Motor Brush Assembly
6050-05	Motor Bearing Assembly
6050-06	Rotating Fan (Turbine Blade)
6050-07	Armature
6050-15	Fan Shell
6050-17	Fan, Stationary
6050-19	Motor Housing (Shell)
6050-28	Bracket (contains rear bearings)
6050-29	Cooling Fan
6050-44	Fan End Bracket
6050-122	Tri-Pod Mounting Bracket
8000-46	Power Cord, 18-3

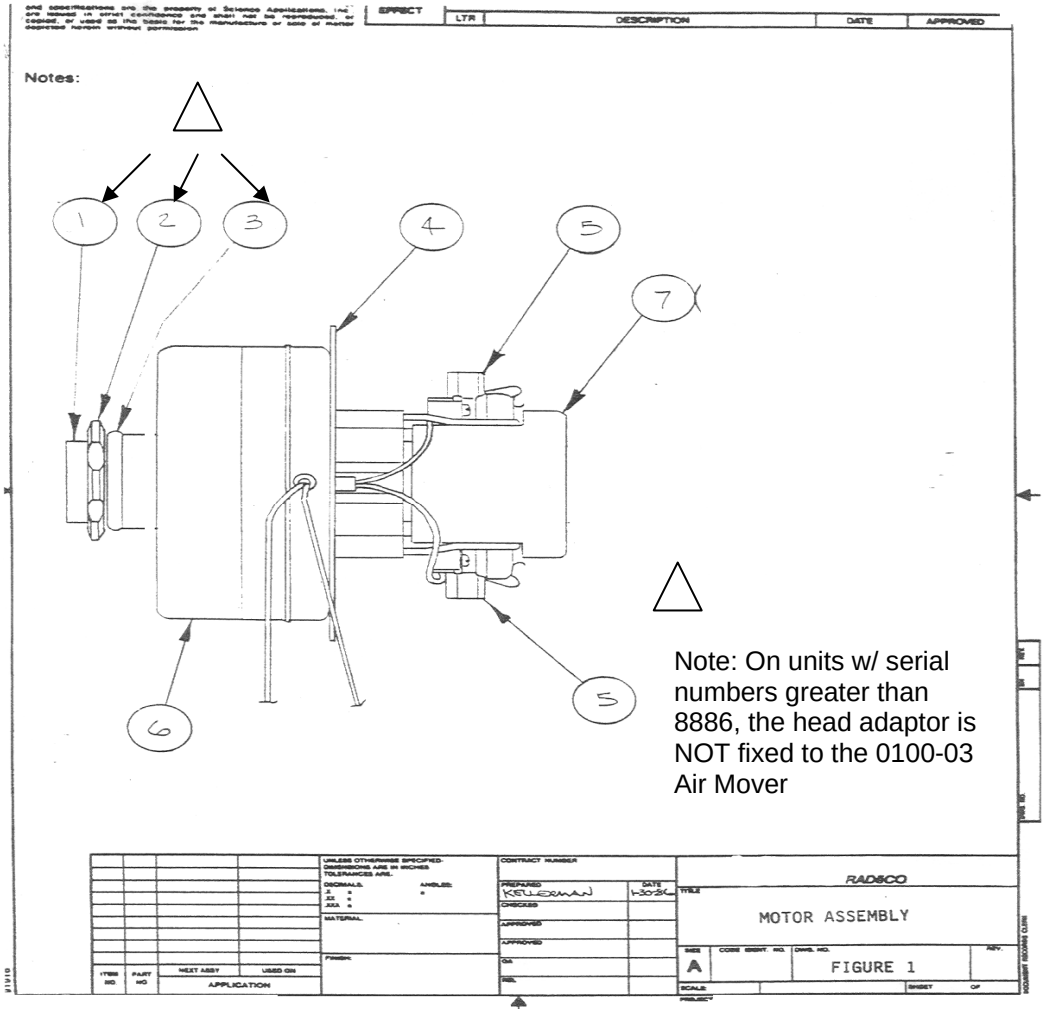
APPENDIX B
MODEL H-809VI AND H-809VII
RECOMMENDED SPARE PARTS FOR ONE YEAR

QUANTITY	PART NUMBER	DESCRIPTION
1	0100-52	Air Mover Assembly, 115V, 60Hz
5	0900-09	Fuse, 8 Amp, Slow Blow, 250V UL Listed
1	1500-05	Rotometer Assembly
1	1500-23	Rotometer Guard
6	1800-04	Support Feet
1	1850-03	Knob, Flow Adjust
1	2060-106	Motor Control Assembly, 115V, 60Hz
2	2700-02	Switch, SPDT (metal)
4	6050-04	Motor Brush Assembly

LEGEND - FIGURE 1
MODEL H-809V MOTOR ASSEMBLY

ITEM NO. (FROM FIGURE 1)	PART NUMBER	DESCRIPTION
1	2500-74	Head Adaptor
2	2500-73	Nut, Head Adaptor
3	2201-10	O-Ring (For Non UL Units)
4	0301-46	Mounting Ring, Air Mover Assembly
5	6050-04	Motor Brush Assembly
6	6050-15	Fan Shell
7	0100-03	Air Mover Assembly,115V, 60Hz

Figure 1

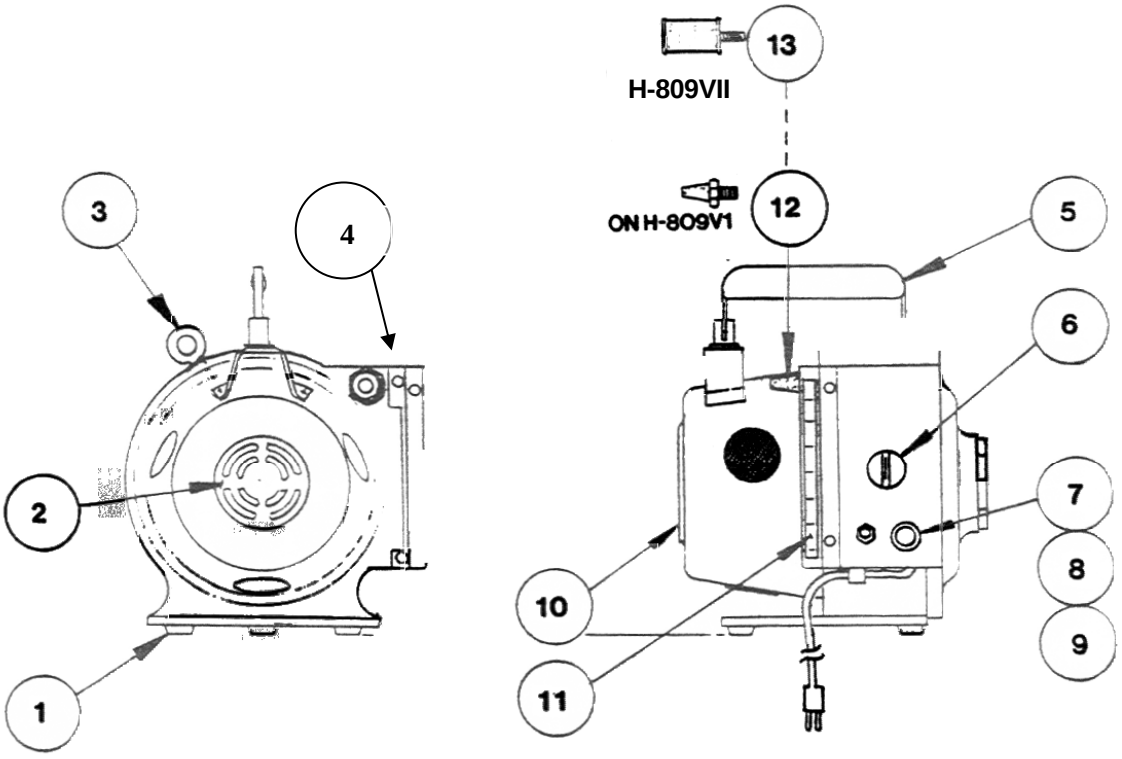

Notes:
1
2
3
4
5
7
6
5
Note: On units w/ serial numbers greater than 8886, the head adaptor is NOT fixed to the 0100-03 Air Mover
RADECO
MOTOR ASSEMBLY
FIGURE 1

LEGEND - FIGURE 2
MODEL H-809V ASSEMBLY

ITEM NO. (FROM FIGURE 2)	PART NUMBER	DESCRIPTION
1	1800-04	Support Feet
2	0100-03	Air Mover Assembly, 115V, 60Hz
3	1350-74	Eye Bolt
4	1500-23	Rotometer Guard
5	1300-05	Handle
6	1850-03	Knob, Flow Adjust
7	0900-09	Fuse, 8 Amp, Slo-Blo, 250V UL Listed
8	0900-24	Fuse Carrier
9	0900-34	Fuse Holder
10	0301-44	Back Cover Assembly
11	1500-05	Rotometer
12	0750-47	Diffuser, Exhaust (H-809VI)
13	0750-48	Diffuser, Exhaust (H-809VII)

EFFECT	LTR	DESCRIPTION	DATE	APPROVED

Notes:



ITEM NO.	PART NO	NEXT ASSY	USED ON
		APPLICATION	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ARE:
DECIMALS: ANGLES:
.X ± ±
.XX ±
.XXX ±
MATERIAL
FINISH

CONTRACT NUMBER

PREPARED	KELLERMAN	DATE 4-2-87
CHECKED		
APPROVED		
APPROVED		
QA		
ENG		

RADSCO

TITLE: H-809V ASSEMBLY

SIZE A | CODE IDENT. NO. | DWG. NO. FIGURE 2 | REV.

SCALE | SHEET OF

PROJECT

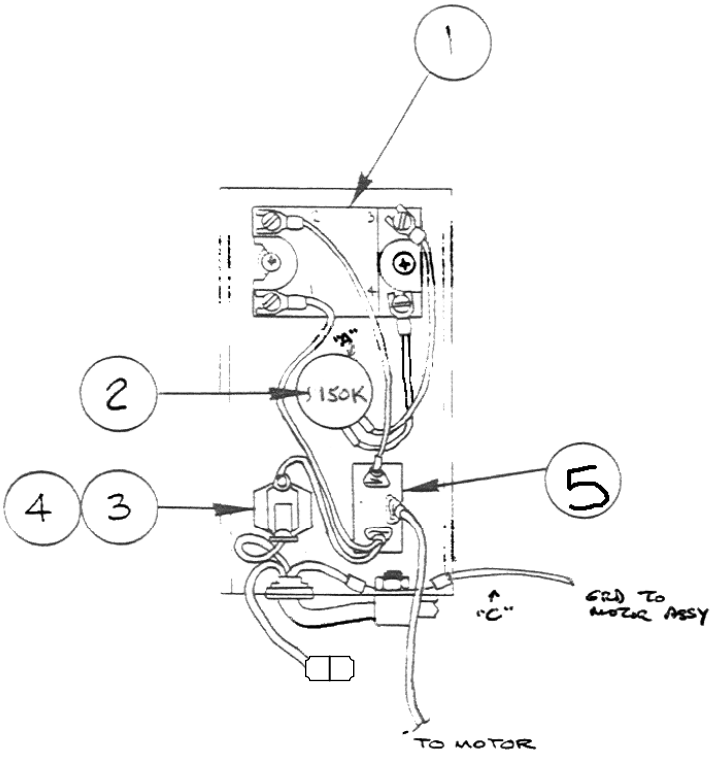
01916

LEGEND - FIGURE 3
MODEL H-809V MOTOR CONTROL ASSEMBLY

ITEM NO. (FROM FIGURE 3)	PART NUMBER	DESCRIPTION
1	0613-51	Proportional Speed Control
2	2110-22	Potentiometer, 150K
3	0900-24	Fuse Carrier
4	0900-34	Fuse Holder
5	2700-02	Switch, SPDT

MODEL EFFECT	REVISION			
	LTR	DESCRIPTION	DATE	APPROVED
		INCMD CHG WIRING TO "AS BUILT" SPEC AS NOTED IN "A", "B", & "C" BELOW.	9/00	SBOR.

Notes:



NEXT ASSY / USED ON: APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: DECIMALS: .X ± .XX ± .XXX ± ANGLES: ± MATERIAL: FINISH:	CONTRACT NUMBER	RADSCO	
		PREPARED KELLERMAN DATE	TITLE: MOTOR CONTROL ASSEMBLY	
		CHECKED		
		APPROVED		
		APPROVED		
		QA	SIZE: A; CODE IDENT. NO.; DWG. NO.: FIGURE 3; REV.	
		RIL	SCALE: ; SHEET:	

DIAGRAM A
CALIBRATION SETUP

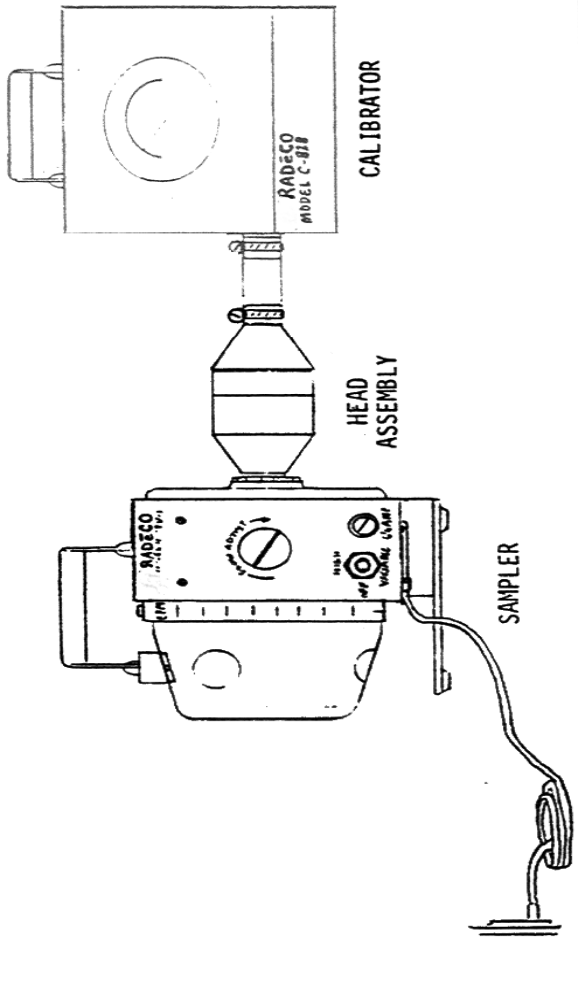


DIAGRAM B
SPEED CONTROL