

**BELL SYSTEM PRACTICES**  
**Outside Plant Construction**  
**and Maintenance**

**SECTION G96.140.1**  
**Issue 1, July, 1956**  
**AT&T Co Standard**

## **MoPeCo VENTILATING HEATERS**

### **DESCRIPTION AND MAINTENANCE**

<b>Contents</b>	<b>Page</b>
1. General .....	1
2. Description .....	2
3. Preparation before Use .....	4
4. Operation .....	5
5. Trouble Shooting .....	5

#### **1. GENERAL**

1.01 This section describes three models of MoPeCo Ventilating Heaters, Model PE propane engine driven and models ACM and DCM—AC and DC electric motor driven, respectively and outlines their operation and maintenance.

1.02 These combination propane operated units are similar in design with the exception of the power unit for driving the blower fan. They are used for ventilating and, when required, for heating manholes.

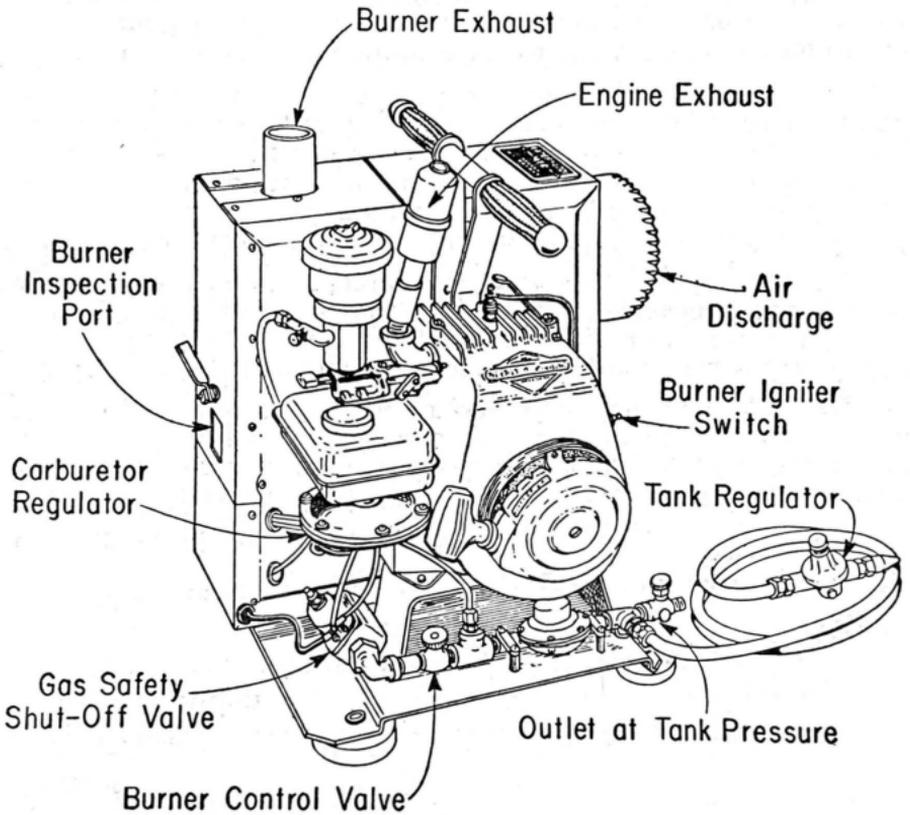
1.03 The air output at the end of the standard 8-inch diameter blower hose can be varied from approximately 300-600 cubic feet per minute for each of the three models. Also, the temperature rise of the ventilating air may be varied from about 10°F. to 70°F. with the rise depending on outside temperatures and the volume of air being heated.

1.04 Operation and maintenance of the 4-cycle engine on the model PE are basically the same as those outlined for 4-cycle engines in Section G96.010.1 of the Bell System Practices with the exception of the carburetor and fuel system.

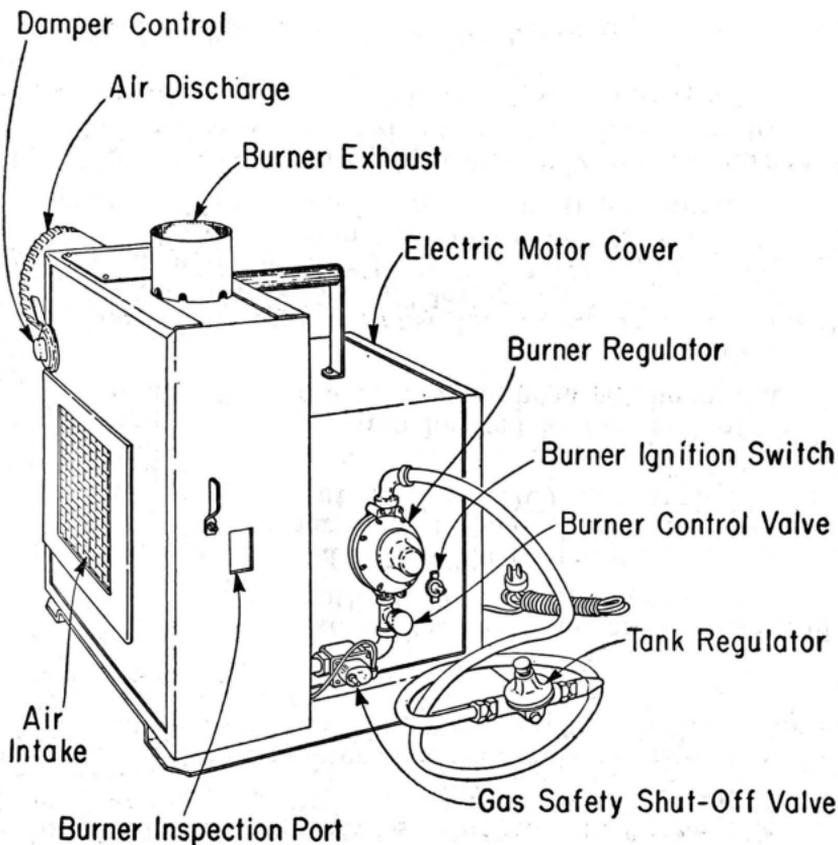
1.05 The amount of air required to adequately ventilate a manhole depends primarily on the size of the manhole and its atmospheric condition both before and during ventilation. Generally, by running the blower at top output for about two minutes the air in the manhole will be purged and the air input can then be reduced to a minimum which will keep the air clear and will provide a comfortable atmosphere for working.

## 2. DESCRIPTION

2.01 The following illustrations show the general appearance of the propane engine driven and electric motor driven units and indicates the essential parts which may be required for replacement purposes.



MoPeCo Ventilating Heater  
Model "PE"



MoPeCo Ventilating Heater  
Model "ACM" or "DCM"

2.02 The driving units consist of the following:

**Model PE**—4-cycle, single cylinder engine, which uses propane gas instead of gasoline as fuel. A "Zero" governor regulator controls the flow of propane gas into the engine. Manual depression of the gas choke starter button is required to permit the initial flow of gas to start the engine.

**Model ACM**—1/4-HP, 115-volt, 60-cycle alternating current electric motor enclosed in a metal housing.

**Model DCM**—1/4-HP, 115-volt, direct current electric motor enclosed in a metal housing.

2.03 Each of the units is provided with the following features to insure safe operation.

- (a) Stainless steel combustion chamber and gas-leak resistant heat exchanger.
- (b) Thermopilot valve which automatically shuts off the gas should the flame be extinguished.
- (c) Air vane type valve which permits propane gas to flow into the burner only when the blower fan is being turned by the power unit. Gas supply is shut off if power unit stops.
- (d) A continuous spark in the burner for automatic ignition of the fuel which insures a continuous flame as long as the power unit operates.

2.04 The heat output of the units is controlled by a turn valve located on the intake side of the thermopilot valve.

2.05 A lever operated damper in the air outlet controls the volume of air of the electric motor driven units. The air output of the engine driven model is controlled by turning the speed adjustment screw on the gasoline carburetor of the engine.

2.06 The 6-inch diameter air outlet is provided with an 8-inch adapter for connecting the standard 8-inch blower hose.

### 3. PREPARATION BEFORE USE

3.01 **Model PE**—Make certain that the crank case and air filter are filled with oil to the proper level.

3.02 **Models ACM and DCM**—No preparation of the motors is required other than to make sure that the proper voltage and type current (AC or DC) are available at the power supply.

3.03 Using the strap clamp located at one end of the hose connect the standard blower hose to the outlet of the unit.

3.04 Locate the unit at least three feet from the manhole opening if possible and lower the discharge end of the hose into the manhole to the desired level. Avoid unnecessary bends in the hose. Position the unit to minimize the possibility of the exhaust gases being blown toward the manhole.

3.05 Close the auxiliary gas outlet valve on the Model PE. This valve is not available on the electric motor driven units. If a connection is to be made to this outlet for operating other equipment the valve should be opened after the ventilating heater is operating satisfactorily.

3.06 Connect the regulator to the propane cylinder and connect the hose from the ventilating heater to the regulator.

## 4. OPERATION

### Blower Operation

#### Model PE

- 4.01 Press down on the propane gas choke button for about 10 seconds.
- 4.02 Pull the rewind starter. The engine should start on the first or second pull.

#### Models ACM and DCM

- 4.03 Connect attachment plug into power supply source. Electric motor should operate.
- 4.04 The amount of air output is controlled in the following manner:

**Model PE**—Turn the speed adjusting screw on the engine.

**Models ACM and DCM**—Operate the damper located in the outlet by means of the lever.

### Burner Operation

4.05 Open the burner valve and press down on the gas safety shut-off button for about 30 seconds. The gas in the burner will ignite as soon as the button is depressed; however, the thermocouple located in the flame must heat sufficiently to keep the thermopilot valve open. If the flame should go out for any reason cooling of the thermocouple automatically closes the thermopilot valve. The flame can be checked through the inspection port located in the end of the housing.

4.06 If the flame goes out after release of the safety shut-off button repeat the above operation.

4.07 Temperature rise of the ventilating air is varied by means of the burner valve. If turned too low the flame will go out since the operation depends on forced air draft.

## 5. TROUBLE SHOOTING

### 5.01 Model PE

(a) **If engine fails to start check the following:**

1. Propane cylinder may be empty.
2. Cylinder outlet valve may be closed.
3. Cylinder regulator set for too low pressure—5 pounds or more required.

4. Excess gas in engine due to stuck propane valve choke. Clean button plunger and lubricate with a drop of oil.
  5. Adjusting screw on propane carburetion adapter out of adjustment. Depress starting button and crank engine a few times. If the motor fires and then quits, open screw a half turn at a time until engine runs. Then adjust valve for best engine operation. If engine fires a few times without choking when it is cranked, close adjustment screw a half turn between cranks until engine runs. Adjust valve for best engine operation.
  6. Poor or no engine spark. Check points and condenser which may need replacement. In rare instances the trouble may be caused by a defective coil.
  7. Fouled spark plug. Clean or replace.
- (b) **If engine fires but will not continue to run, check the following:**
1. Dirty spark plug. Clean.
  2. Gum in carburetor regulator valve seat from propane gas. Clean carburetor valve and seat.
  3. Defective coil, condenser, points or spark plug. Replace.

## 5.02 Models ACM and DCM

- (a) If motor does not start check the following:
1. Inadequate power supply of wrong current source.
  2. Defective cord.
  3. Defective motor.

## 5.03 Burner Operation—all Models

- (a) If burner does not light check the following:
1. Propane cylinder may be empty or valve may be closed.
  2. Plugged burner orifices. Press safety button and if gas is not detected coming from the chimney on top of the heater either the orifices are plugged or the burner regulator is defective. The orifices can be cleaned with a wire or a No. 56 drill. If the trouble is in the regulator it must be replaced.
  3. No spark. Clean or replace spark plug as needed. No spark at end of burner high tension lead would indicate a shorted lead or a defective magneto coil. Replace defective part.
  4. Gas and spark but does not light. Burner ignition plug gap too close-set for .030. Burner orifice dirty—clean (see 2). Engine running too fast—slow down.

- (b) If burner will not remain lit check the following:
  - 1. Gas safety valve has not been held down sufficiently long.
  - 2. Thermocouple does not generate sufficient current—replace.
  - 3. Air duct blocked or restricted or engine running too slow to force sufficient air through duct. Clean obstruction in duct or run engine at higher speed.
- (c) If burner does not deliver enough heat check the following:
  - 1. Burner hand valve not open enough.
  - 2. Too large a volume of air being heated. Slow engine down by setting governor adjusting screw.
  - 3. Oil in regulator from poor propane gas. Clean or replace defective regulator.
- (d) If burner delivers too much heat check the following:
  - 1. Burner hand valve open too much.
  - 2. Engine running too slow.