

# INSTALLATION/OPERATING INSTRUCTIONS For **HEAT-TIMER<sup>®</sup>** MODEL MLS-A SMOKE ALARM

An Approved Air Contaminant Detector for Boilers  
Burning Organic Fuels Such as Oil, Gas and Coal.

The HEAT-TIMER MLS-A SMOKE ALARM is a highly sensitive mechanical device for the instant detection and warning of excessive smoke in flues of heating system boilers in apartment houses and office and institutional buildings as well as boilers used for commercial and processing purposes.

It is applicable to any boiler system that utilizes organic fuels such as gas, oil and coal - where sooty or dirty combustion might exist.

A number of municipalities, such as New York City - for example, require the use of Air Contaminant Detectors in buildings that burn certain organic fuels subject to incomplete combustion. New York City requires the installation of such a device on any boiler that burns 20 gallons or more of fuel oil per hour.

Its basic operation is simple. The Model MLS-A continually shoots a beam of light across an active boiler's flue. If excessive smoke crosses the beam and obstructs the light, an alarm goes off and the boiler shuts off automatically within two minutes. The alarm is triggered whenever smoke in the breeching exceeds a density of #1 Ringelmann, which is a measure of smoke opacity.

## **Equipment supplied:**

- 1 Receiver
- 1 Transmitter w/Test Filter
- 1 Burner Reset & Shutdown
- 1 Visularm Unit
- 2 Retainers (for Natural Draft)

## **Equipment You Might Need**

### For Natural Draft

1" Black Pipe

### For Forced Draft

- 1" Black Pipe
- 2" Black Pipe
- 2" x 2" x 1" Tees (2)
- 2" Close Nipples (2)
- 1" Shoulder Nipples (2)
- Caps for 1" Pipe (2)
- Sight-glass Lenses (2)
- (Order separately)

APPROVED FOR INSTALLATION BY  
THE NEW YORK CITY DEPARTMENT  
OF AIR RESOURCES

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THE NEW YORK CITY DEPARTMENT  
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# INSTALLATION INSTRUCTIONS for Heat-timer MODEL MLS-A SMOKE ALARM

Note: there are separate instructions for a natural draft and forced draft installations

## NATURAL DRAFT INSTALLATION

**1. Select a suitable location for mounting the unit.** An optimum location would be in the breeching as near as possible to the last pass of the boiler. Make certain that there are no openings (such as fans or dampers) forward of this location which might dilute the flue gases.

**2. Prepare Supporting 1" Pipe -** Measure the width of the breeching (including insulation) and add 3 ft. (for an 18" overhang on each side). Cut a 1" black pipe to this total length (see Figure 1).

**3. Drill Holes in Breeching -** Two holes are required, one 1-3/8" in diameter for the 1" supporting pipe and the other, 2" in diameter for the sight lines (see figures 1 & 2). A template to size is provided as an inserted page.

**4. Insert 1" Pipe through both 1-3/8" holes,** adjusting it so that it protrudes an equal length on

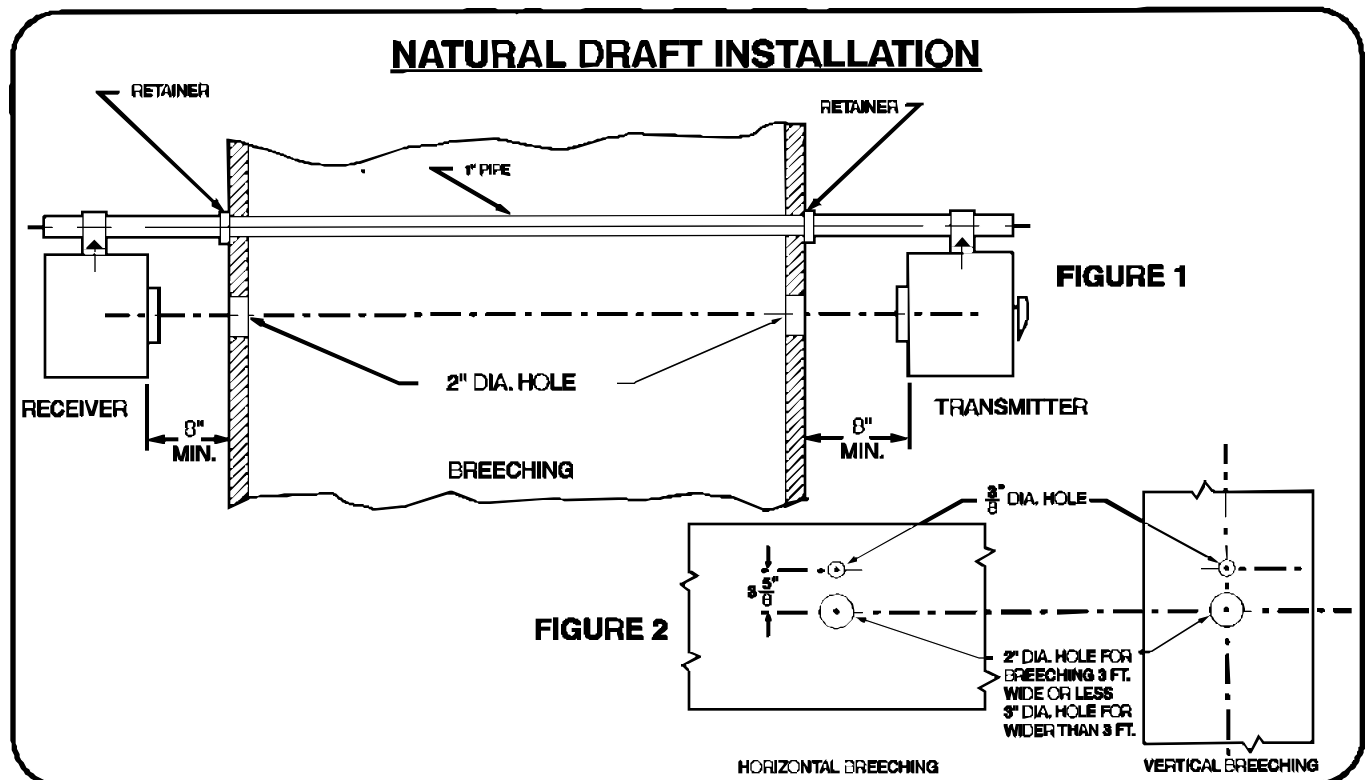
each side (see Figure 1). Place retainers on both sides of the pipe. Press them tightly, locking them in position against the breeching.

**5. Install the Transmitter -** Slide the transmitter unit on one side of the 1" pipe, locating it carefully so that the lens is at least 8" from the breeching and centered on the 2" hole (see Figure 1). Tighten it.

Just note that the transmitter directs its beam of light through the 2" hole on one side of the breeching through the 2" hole on the other side and into the receiver. The holes and units must be lined up properly.

**6. Install the Receiver -** Repeat the same process with the receiver, lining it up carefully on the opposite side.

Continue with "Wiring the Smoke Alarm" - Page 4.



## **FORCED DRAFT INSTALLATION**

**1. Select a suitable location** for mounting the unit. An optimum location would be in the breeching as near as possible to the last pass of the boiler. Make certain that there are no openings (such as fans or dampers) forward of this location which might dilute the flue gases.

**2. Prepare Lengths of 1" and 2" Pipe.**

Measure the width of the breeching (including insulation) and add 14" for the overhang (see figure 3). Cut a 2" black pipe to that total length. Thread the pipe at both ends.

Cut out a section of the 2" pipe equal in length to the inside width of the breeching less 2". Make sure the cutout section is centered on the total length of the pipe. (Refer to Figure 3).

Also prepare two 18" lengths of 1" black pipe, threaded at each end.

**3. Drill Holes in Breeching** - Two 2-3/8" holes, on opposite sides of the breeching, are required to accommodate the 2" pipe. (see Figure 3). These should be centered on the diameter of the breeching. A template to full size is provided on the inserted page.

**4. Insert 2" Pipe** (now cut out) through the

2-3/8" holes in the breeching. Adjust it so that it protrudes an equal length on each side and it will follow that the cutout section will be centered inside the breeching as shown in Figure 3. You must make certain the cutout section faces down. Once correctly fixed in place, weld the 2" pipe to the outside of the breeching for a tight seal.

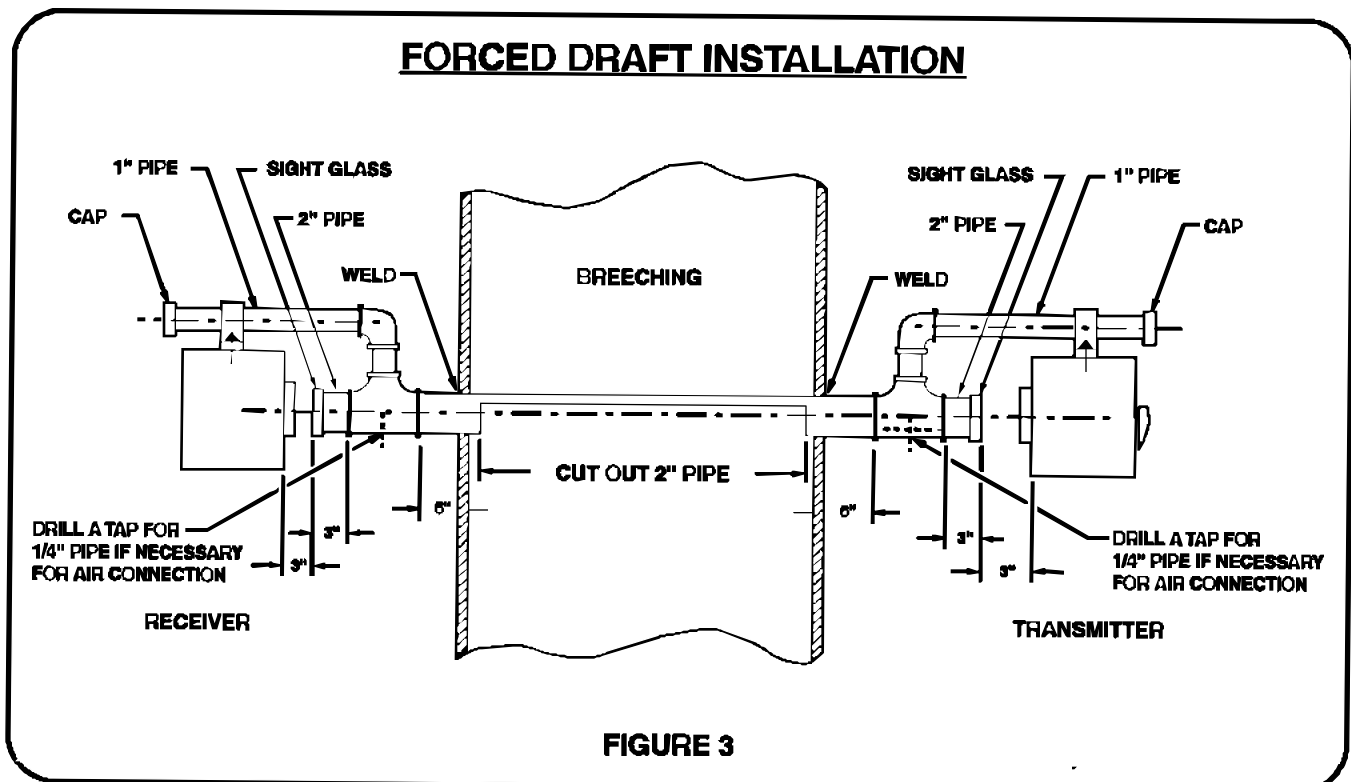
**5. Screw in the 2"x 2"x 1" tee** and a 2" Close nipple on each side of the 2" pipe as shown in Figure 3. Place a sight-glass lens on each end of the 2" nipples.

**6. Screw a 1" shoulder nipple** into the tee, then attach the 1" elbow and insert the 18" length of 1" piped into the elbow. Do this on each side.

**7. Slide Transmitter Unit** on 1" pipe until the lens is 3" from the sight-glass and centered on sight-glass. Now tighten the transmitter in place.

**8. Install the Receiver** the same way, lining it up carefully on the opposite side. When both the transmitter and receiver are installed, place 1" caps on each end of the 1" pipe (see figure 3).

Continue with "Wiring the Smoke Alarm" - Page 4.



**FIGURE 3**

## WIRING THE SMOKE ALARM

This unit is designed for 110V, 60Hz operation only. For complete wiring that includes activating the alarm as well as automatically shutting off the boiler if the smoke density exceeds its set point,

follow the wiring diagrams below. Figure 4 is for a typical installation with a single boiler, and figure 5 for two boilers with a common breeching.

### SINGLE BOILER CONTROL

### TWO - BOILER CONTROL

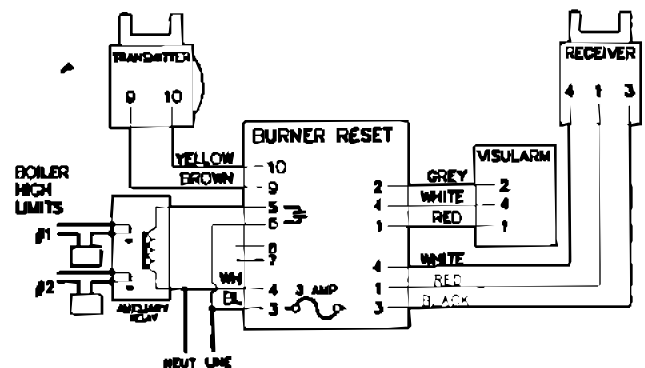
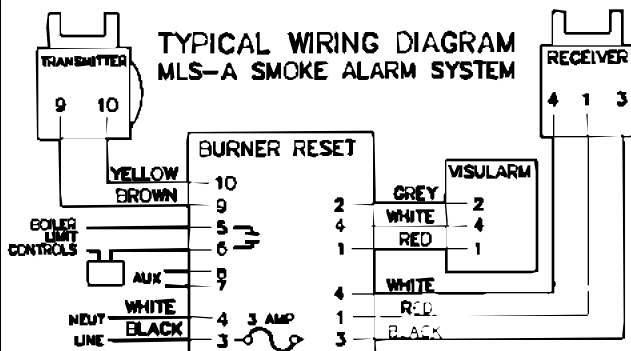


FIGURE 4

FIGURE 5

### Location of the BURNER RESET and VISULARM Units

The burner Reset & Shutdown is typically mounted inside the boiler room while the Visularm Unit is mounted outside. New York City requires that the Visularm Unit be located at the principle work location of the person supervising the boiler operations, or if there is no such location, it be located at an acceptable place outside the boiler room.

### ADJUST for Optimum OPERATION

1. Set knob on transmitter to fully clockwise position.
2. Place the test filter in front of the Transmitter's lens. (The test filter simulates a smoky condition)
3. Slowly rotate the knob counter-clockwise until alarm just sounds.

4. Remove test filter from lens and alarm should stop. If not, readjust.

When this procedure is completed, the unit is fine-tuned to operate with precision. Now, the alarm will sound and the boiler will automatically turn off when the density of smoke in the breeching exceeds a reading of #1 Ringelmann.

### TROUBLE-SHOOTING

If unit does not function, check wiring first and then fuse and circuit breaker. (In Burner-Reset Unit).

### MAINTENANCE

Since dust and soot accumulate on the transmitter and receiver lenses, the alarm will react to them as though they were smoke since they obstruct the light beam. To avoid false alarms due to soot and dust, the units, particularly the lenses, must be cleaned regularly. And after each cleaning the control must be adjusted, using the test filter as outlined above.