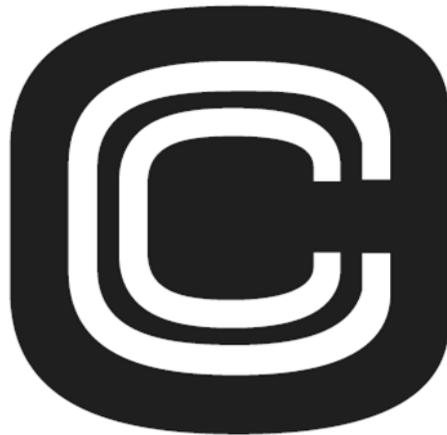


# **INSTALLATION, OPERATION, AND MAINTENANCE MANUAL**

FOR

## **CATCO CATALYTIC HEATERS**



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**CATCO**

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**APPROVED**

Explosionproof for  
Class I, Division 1 or 2  
Group D, T2A  
 $-30 \leq T_a \leq +45$

**FM17US0373X**

## **⚠ WARNING:**

Keep the face of the heater clear from combustible materials.

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

Do not use heater if the catalytic pad becomes torn or damaged. Continuous use may result in injury or death due to fire, explosion, or carbon monoxide poisoning. The heater must be serviced by a licensed and qualified service person.

Do not attempt to clean catalytic pad. Follow cleaning instructions accompanying heater.

# SAFETY

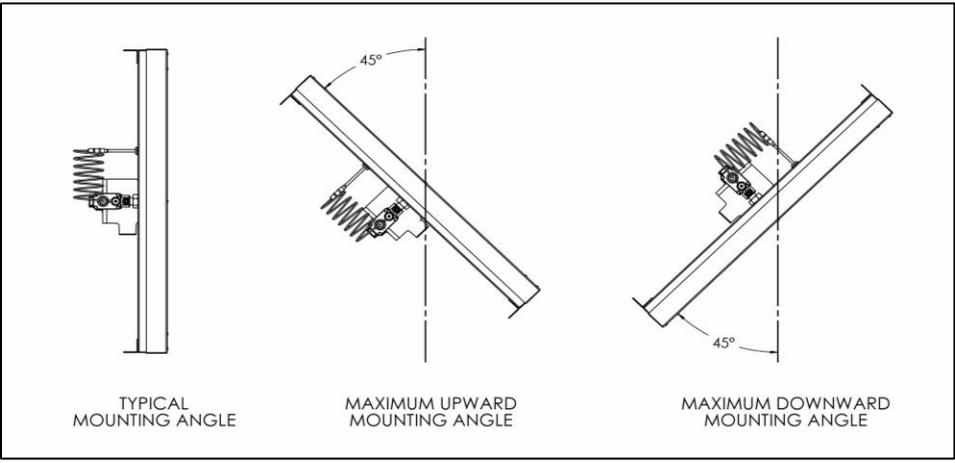
We value the safety of everyone using our products and Catco catalytic heaters have an outstanding track record of safety. They're ideal heating solutions for many applications because they never require or produce a flame or spark during any phase of their operation.

Catco products are intended for industrial use only and should only be installed and operated by professionals with appropriate training in gas, electrical, and general personnel safety. If at any time you need guidance on how to safely install or operate Catco products, please contact your Catco distributor or the factory at 972-563-8065.

# INSTALLATION & MOUNTING

*The installation must conform with local building codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1.*

It's critical the unit be installed so the face of the heater is protected from rain and snow. Install the heater in a fixed position so that it can't be tipped over, dislocated, or otherwise compromised. When installed, the face of the heater shouldn't be angled up or down more than 45° from vertical as shown in Figure 1.



**Figure 1.** Typical and maximum mounting angles.

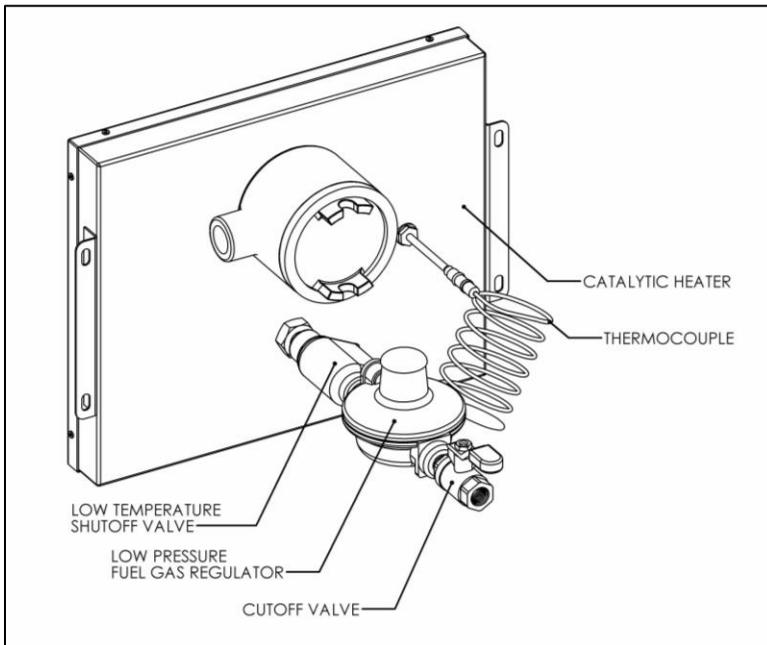
# FUEL GAS SET-UP

Catco catalytic heaters are best operated at a pressure of 4.5 inches water column (wc) for natural gas fueled heaters or 11 inches wc for LP gas fueled heaters. Operating pressures in Table 1 below indicate the **flowing pressure measured at the heater orifice**.

**Table 1.** Input pressure limits for catalytic heaters.

Fuel	Minimum Input Pressure	Standard Input Pressure	Maximum Input Pressure
Natural Gas	2.0 inches wc	4.5 inches wc	6.5 inches wc
LP Gas	5.5 inches wc	11.0 inches wc	15.5 inches wc

Below, Figure 2 shows a common piping arrangement for Catco catalytic heaters.



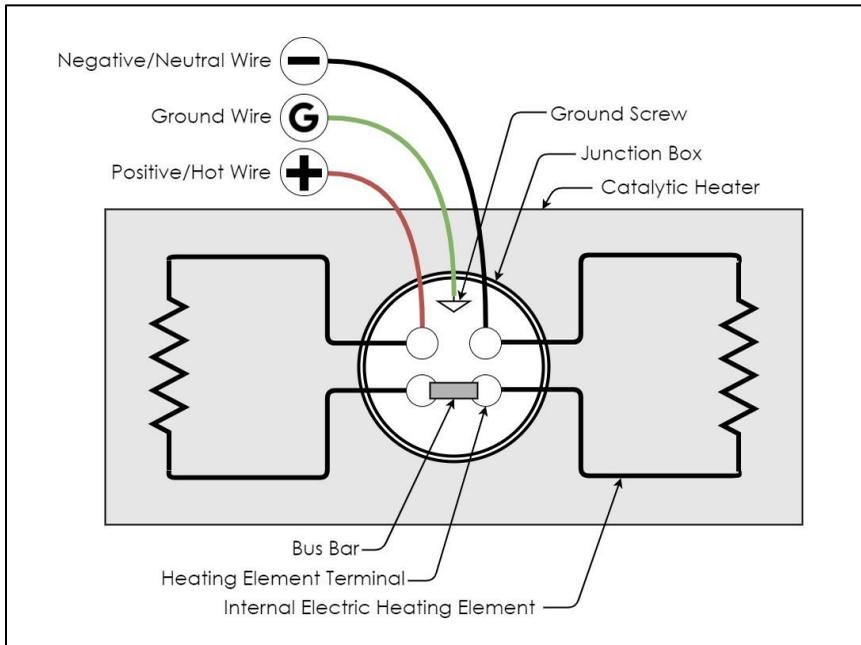
**Figure 2.** Simple fuel gas piping arrangement.

## ELECTRICAL SET-UP

When applicable, the heater must be electrically grounded in accordance with the National Electrical Code, ANSI/NFPA 70 or current Canadian Electrical Code, CSA C22.1.

Before the catalytic reaction can begin, the catalyst bed must be preheated to approximately 250° F (121° C). This is accomplished by energizing internal electric heating elements using the voltage specified on the heater's label. Electrical power is only required during the start-up phase of operation (typically no more than 30 minutes).

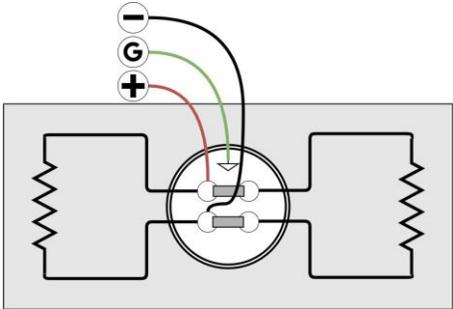
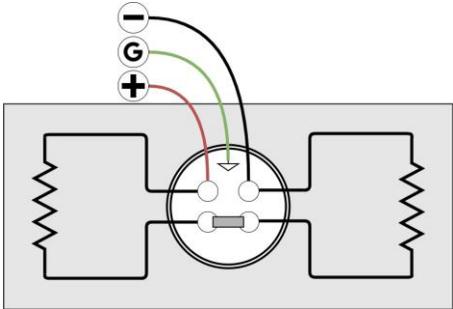
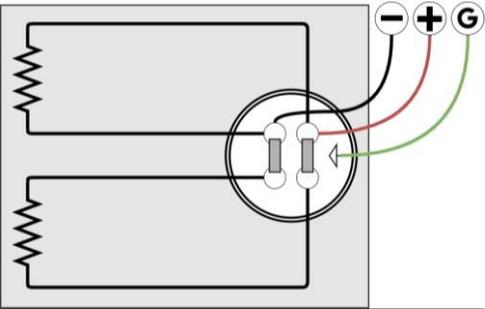
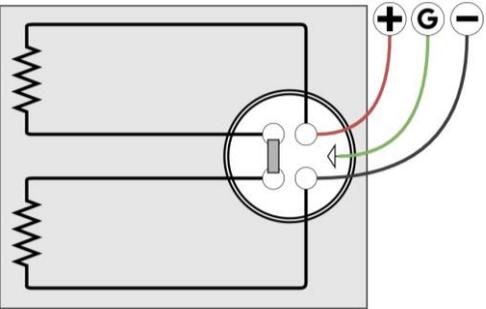
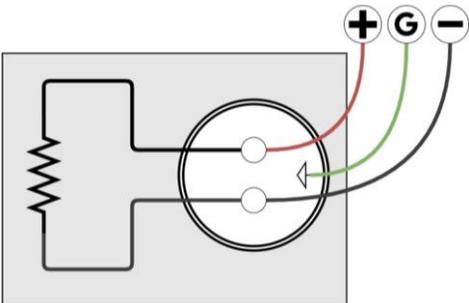
The posts for the electric heating element terminate in the junction box mounted to the back of the heater. Depending on the heater model, there are slight differences between the electrical connections and each one is described below. Figure 4 shows symbols for the wiring diagrams in this section.



**Figure 4.** Legend for wiring diagrams.

When the heater has two heating elements, the posts are connected with either one or two bus bars. Proper connection for all models and element configurations are shown in Table 2 on the following page. Please note that on all models, the location of the hot/positive wire and neutral/negative wire are interchangeable because the heating element connections have no polarity.

**Table 2.** Electrical connections for heating elements

	<b>Parallel (12V or 120V)</b>	<b>Series (24V, 240V, or 480V)</b>
<p><b>Left/Right Configuration</b></p> <p>Models 1224, 1236, 1248, 1260, 1836</p>	 <p>The diagram shows two heating elements connected in parallel to a central terminal block. The terminal block has two terminals. A red wire (marked '+') connects the top terminal to the top terminal of both elements. A green wire (marked 'G') connects the bottom terminal to the bottom terminal of both elements. A black wire (marked '-') connects the bottom terminal to the top terminal of the right element.</p>	 <p>The diagram shows two heating elements connected in series. The terminal block has two terminals. A red wire (marked '+') connects the top terminal to the top terminal of the left element. A green wire (marked 'G') connects the bottom terminal to the bottom terminal of the left element. A black wire (marked '-') connects the bottom terminal to the top terminal of the right element.</p>
<p><b>Top/Bottom Configuration</b></p> <p>Models 1848, 1860, 2424, 2448, 2460, 2472</p>	 <p>The diagram shows two heating elements connected in parallel. The terminal block has two terminals. A red wire (marked '+') connects the top terminal to the top terminal of both elements. A green wire (marked 'G') connects the bottom terminal to the bottom terminal of both elements. A black wire (marked '-') connects the bottom terminal to the top terminal of the right element.</p>	 <p>The diagram shows two heating elements connected in series. The terminal block has two terminals. A red wire (marked '+') connects the top terminal to the top terminal of the left element. A green wire (marked 'G') connects the bottom terminal to the bottom terminal of the left element. A black wire (marked '-') connects the bottom terminal to the top terminal of the right element.</p>
<p><b>Single Element Configuration</b></p> <p>Models 8RD, 12RD, 66, 88, 612, 1012, 624, 1212</p>	 <p>The diagram shows a single heating element connected to a terminal block with two terminals. A red wire (marked '+') connects the top terminal to the top terminal of the element. A green wire (marked 'G') connects the bottom terminal to the bottom terminal of the element. A black wire (marked '-') connects the bottom terminal to the top terminal of the element.</p>	

# HAZARDOUS LOCATION INSTALLATIONS

When installing a Catco heater in a Class I, Division 1 or Division 2, Group D area, ensure that all associated electrical equipment is appropriately rated for the area where it will be installed.

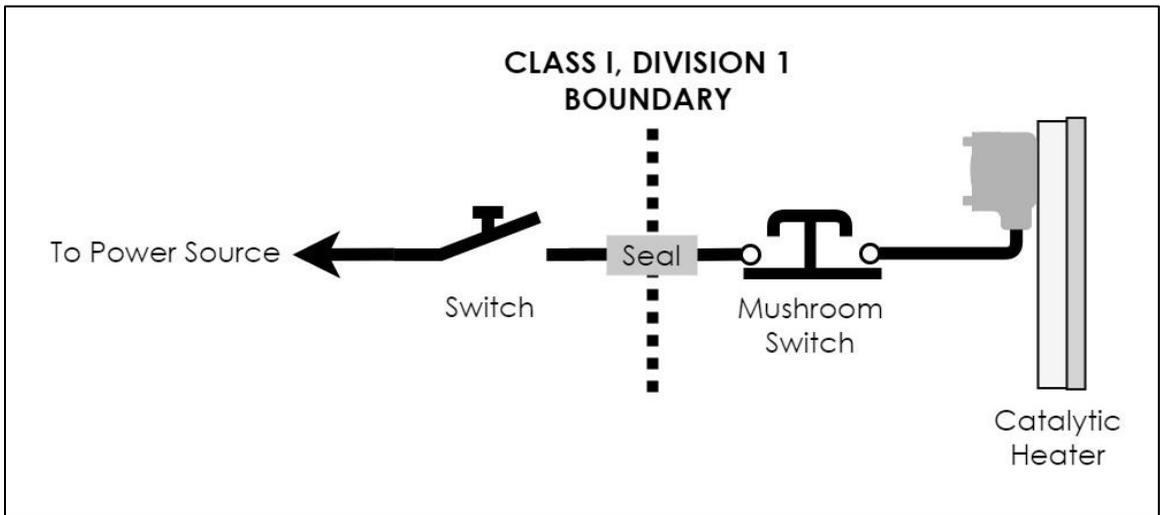
## Class I, Division 1 Installations

In Class I, Division 1 installations the heater shall be supplied with an on/off switch connected by a suitable wiring method in accordance with Article 501.10 of the NEC. The switch, when located within the hazardous area, shall be suitably rated for the intended application. The switch shall be located within the vicinity of the heater as the installation permits. A mushroom, push-button or equivalent emergency shut-off switch shall be located near the unit.

Specific Condition of use:

1. Seal all conduits within 18 inches
2. For supply connection, use wires rated for at least 90° C (194° F)

Figure 5 shows a common Catco catalytic heater installation for a Class I, Division 1 environment.



**Figure 5.** Typical Class I, Division 1 installation.

# OPERATION

## Start-up

1. Verify the unit has been installed in accordance with this instruction manual and all applicable codes.
2. Make sure the electrical supply matches the voltage specified by the product label and turn on the electrical supply.
3. Wait 15 minutes to allow the catalyst bed to come up to temperature (this may take longer in extremely cold weather).
4. Press and release the button on the shutoff valve to start the flow of fuel gas to the heater. This will start the catalytic reaction.
5. Continue electrical power until the catalytic reaction is fully established. This will be indicated by a rapid rise in face temperature and the emission of hot exhaust gases. Under normal conditions, this phase will take 5-10 minutes.
6. Once the reaction is established, turn off the electrical power. The heater is now in normal operation.

## Normal operation

The catalyst material is not consumed or destroyed by the catalytic reaction, and the reaction will continue as long as the heater is provided with a clean fuel supply and adequate combustion air.

## Shut-down

1. Ensure the electrical power is turned off.
2. Turn off the fuel supply.
3. Removing the fuel supply will cause the catalytic reaction to stop. Don't handle the unit until it's sufficiently cooled.

# MAINTENANCE

Catco catalytic heaters contain no moving parts and maintenance is minimal. Sheet metal surfaces may be cleaned to prevent rust or corrosion, but take care to protect the face of the heater from contact with water, cleaners, or other foreign substances. If an area is being cleaned with high pressure water spray or air pressure, shield the face of the heater, as the catalyst can be damaged by water or rough contact. When not in use, heaters should be stored in a clean, dry area or covered to prevent damage from the environment, insects, and rodents.