

# CATA-DYNE™ HEATER

## STANDARD HEATER APPLICATIONS

## INSTALLATION & OPERATION INSTRUCTIONS

**WARNING:** 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.



The Cata-Dyne™ heater can be used in all industrial indoor locations where a source of infrared radiant heat is required, providing adequate ventilation is available.

### CERTIFICATION

Model WX (Series X) Cata-Dyne™ Explosion-proof, flameless infrared catalytic gas heaters are certified by the Canadian Standards Association (CSA) for use in Class I, Divisions 1 and 2, Group D hazardous (classified) locations and Factory Mutual Global (FM), for use in Class I, Division 1, Group D hazardous (classified) locations, temperature code T2C at an ambient temperature of 40°C (104°F).

The Model BX (Series G) Cata-Dyne™ heater is certified by CSA and FM for use in general industrial non-hazardous locations. The MKII model (Series X) Explosion-proof, flameless infrared catalytic gas heater is certified by CSA for use in Class I, Divisions 1 and 2, Group D hazardous (classified) locations. Models listed are certified for industrial use only, for either natural gas or propane gas. CSA approved models are equipped for high altitudes: 0 - 4,500 ft. (0-1,370 m) above sea level.

### INSTALLATION

To ensure maximum efficiency of your Cata-Dyne™ heater, it should be installed with the heating surface positioned plus or minus 45° from the vertical plane at a height of no more than 8 ft. (2.44 m). All heaters must be installed in accordance with the latest revisions of the *Canadian Electrical Code*, CAN/CGA-B149.1, the *Natural Gas Installation Code* and/or CAN/CGA-B149.2, the

### Cata-Dyne™ Heater - Models Available

WX Model (Series X)					
Approved for use in Class I, Division 1 and 2, Group D hazardous (classified) locations by both FM and CSA					
Model Number	Specifications (Btu/hr Input Ratings) For Both Natural and Propane Gas		Model Number	Specifications (Btu/hr Input Ratings) For Both Natural and Propane Gas	
	Max. Btu/hr	Max. kW		Max. Btu/hr	Max. kW
WX 6 x 6	1,000 Btu/hr	0.293 kW	WX 18 x 24	12,000 Btu/hr	3.514 kW
WX 6 x 12	2,000 Btu/hr	0.586 kW	WX 18 x 30	15,000 Btu/hr	4.393 kW
WX 6 x 24	4,000 Btu/hr	1.171 kW	WX 18 x 36	18,000 Btu/hr	5.272 kW
WX 6 x 60	10,000 Btu/hr	2.929 kW	WX 18 x 48	24,000 Btu/hr	7.029 kW
WX 8 x 8	1,778 Btu/hr	0.521 kW	WX 18 x 60	30,000 Btu/hr	8.786 kW
WX 10 x 12	3,333 Btu/hr	0.976 kW	WX 18 x 72	36,000 Btu/hr	10.543 kW
WX 12 x 12	4,000 Btu/hr	1.171 kW	WX 24 x 24	16,000 Btu/hr	4.686 kW
WX 12 x 24	8,000 Btu/hr	2.343 kW	WX 24 x 30	20,000 Btu/hr	5.857 kW
WX 12 x 36	12,000 Btu/hr	3.514 kW	WX 24 x 36	24,000 Btu/hr	7.029 kW
WX 12 x 48	16,000 Btu/hr	4.686 kW	WX 24 x 48	32,000 Btu/hr	9.372 kW
WX 12 x 60	20,000 Btu/hr	5.857 kW	WX 24 x 60	40,000 Btu/hr	11.715 kW
WX 12 x 72	24,000 Btu/hr	7.029 kW	WX 24 x 72	48,000 Btu/hr	14.058 kW
BX Model (Series G)					
Approved for use in general industrial non-hazardous locations by both FM and CSA					
Model Number	Specifications (Btu/hr Input Ratings) For Both Natural and Propane Gas		Model Number	Specifications (Btu/hr Input Ratings) For Both Natural and Propane Gas	
	Max. Btu/hr	Max. kW		Max. Btu/hr	Max. kW
BX 6 x 6	1,500 Btu/hr	0.4 kW	BX 18 x 24	18,000 Btu/hr	5.3 kW
BX 6 x 12	3,000 Btu/hr	0.9 kW	BX 18 x 30	22,500 Btu/hr	6.6 kW
BX 6 x 24	6,000 Btu/hr	1.8 kW	BX 18 x 36	27,000 Btu/hr	7.9 kW
BX 8 x 8	3,500 Btu/hr	1.0 kW	BX 18 x 48	36,000 Btu/hr	10.5 kW
BX 10 x 12	5,000 Btu/hr	1.5 kW	BX 18 x 60	45,000 Btu/hr	13.2 kW
BX 12 x 12	6,000 Btu/hr	1.8 kW	BX 18 x 72	54,000 Btu/hr	15.8 kW
BX 12 x 24	12,000 Btu/hr	3.5 kW	BX 24 x 24	24,000 Btu/hr	7.0 kW
BX 12 x 36	18,000 Btu/hr	5.3 kW	BX 24 x 30	30,000 Btu/hr	8.8 kW
BX 12 x 48	24,000 Btu/hr	7.0 kW	BX 24 x 36	36,000 Btu/hr	10.5 kW
BX 12 x 60	30,000 Btu/hr	8.8 kW	BX 24 x 48	48,000 Btu/hr	14.1 kW
BX 12 x 72	36,000 Btu/hr	10.5 kW	BX 24 x 60	60,000 Btu/hr	17.5 kW
			BX 24 x 72	72,000 Btu/hr	21.0 kW
MKII Model (Series X)					
Approved for use in Class I, Division 1 and 2, Group D hazardous (classified) locations by CSA					
Model Number	Specifications (Btu/hr Input Ratings) For Both Natural and Propane Gas				
	Max. Btu/hr	Max. kW			
MKII 12 x 12	4,000 Btu/hr	1.171 kW			
MKII 12 x 24	8,000 Btu/hr	2.343 kW			
MKII 24 x 24	16,000 Btu/hr	4.686 kW			

Model WX Series Heaters are certified for use in Class I, Division 1 and 2, Group D hazardous locations by both FM and CSA/CGA

The WX Series Cata-Dyne™ features an improved efficiency catalyst pad that requires 1/3 less fuel to generate the same heat value as our BX Series Cata-Dyne™ heater.



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Propane Installation Code and/or any local codes and regulations. Before installing the heater, all information on the heater nameplate must be carefully reviewed. The nameplate lists all the fuel and electrical requirements for the heater.

Natural Gas – these heaters are designed to use natural gas (1000 Btu/ft<sup>3</sup>, 37 MJ/m<sup>3</sup>) at 7 in. w.c. (1.73 kPa), 4.5 in. w.c. (1.12 kPa), or 3.5 in. w.c. (0.86 kPa).

Propane – these heaters are designed to use propane gas (2500 Btu/ft<sup>3</sup>, 88 MJ/m<sup>3</sup>) at 11 in. w.c. (2.72 kPa).

## SPECIFICATIONS

### Clearances

Appropriate clearances from the heating surface must be observed during the installation of the Cata-Dyne™ heaters (See Figure 1). Maintain nameplate clearances from combustible materials such as wood, cloth, paper, etc.

### Fuels

The Cata-Dyne™ flameless gas heater is designed to operate on clean, dry natural or propane gas as specified on the heater nameplate.

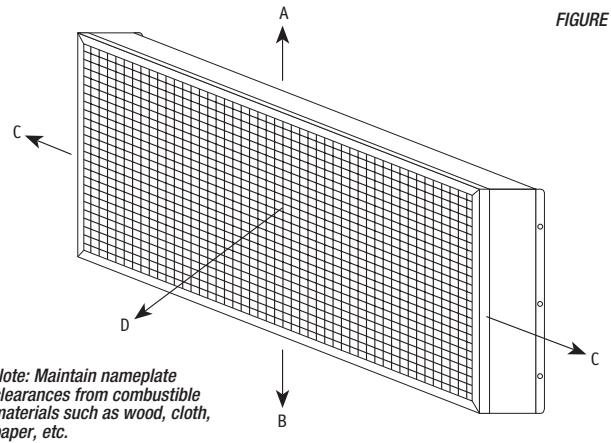


FIGURE 1

HEATER CLEARANCE										
Radiant Surface Position	Radiant Surface			Sides	Top			Bottom		
	Heaters Up To 12,000 Btu/hr	Over 12,000 Up To 48,000 Btu/hr	Over 48,000 Up To 72,000 Btu/hr	All Heaters Up To 72,000 Btu/hr	Heaters Up To 12,000 Btu/hr	Over 12,000 Up To 48,000 Btu/hr	Over 48,000 Up To 72,000 Btu/hr	Heaters Up To 12,000 Btu/hr	Over 12,000 Up To 48,000 Btu/hr	Over 48,000 Up To 72,000 Btu/hr
Vertical (0°)	28 in.	42 in.	60 in.	12 in.	18 in.	18 in.	42 in.	7 in.	12 in.	18 in.
0-45° up	28 in.	42 in.	60 in.	12 in.	18 in.	32 in.	54 in.	0 in.	12 in.	18 in.
0-45° down	28 in.	42 in.	60 in.	12 in.	18 in.	18 in.	18 in.	22 in.	24 in.	42 in.

### Piping

1. A main shut-off valve must be installed upstream of all auxiliary heater controls.
2. The 100% safety shut-off valve and appliance regulator (natural gas heaters only) must be installed in the upright position.
3. The thermostatic temperature controller should be installed with the dial shaft in the horizontal position.
4. The maximum inlet pressure to the 100% safety shut-off valve, thermostatic temperature controller and appliance regulator is 1/2 psi (3.4 kPa). If the inlet pressure is higher than this, a low-pressure service regulator must be installed upstream of these components.
5. The maximum inlet pressure to the low-pressure service regulator is 250 psi (1.7 MPa). If the inlet pressure is higher than this, a high-pressure regulator must be installed upstream.
6. All components should be installed as indicated in Figure 2 (WX and BX models only) or Figure 3 (MKII model only).

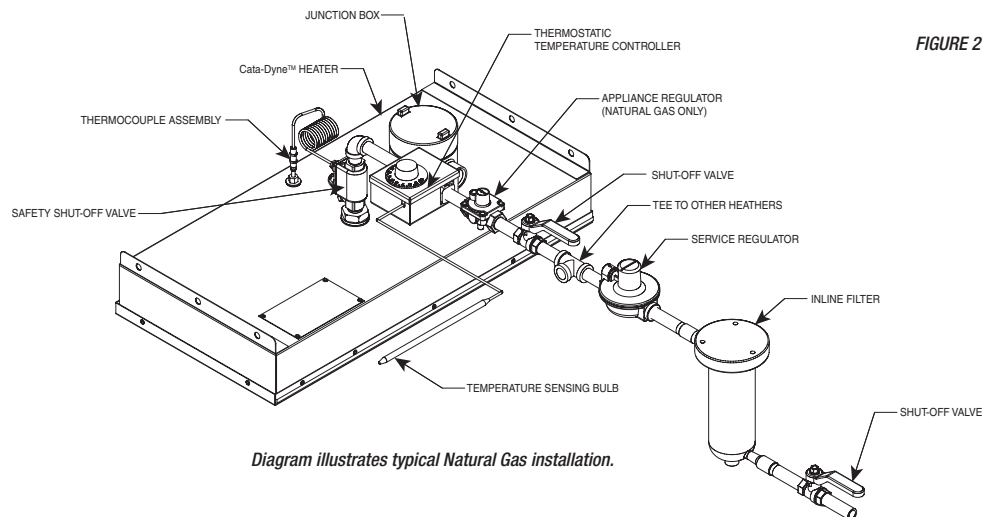


FIGURE 2

## Electrical

1. All wiring is to be installed in accordance with the latest revisions of the Canadian Electrical Code (CEC) and/or any applicable local codes.
2. It is desirable to install an indicating light on all starting systems. This will reduce the possibility of the power being left on once the heater is started, which can severely reduce the lifespan of the heater.
3. Ground connections for 120 V and above heaters are required as indicated in Figures 4 and 5.
4. The number of terminals in the junction box can be two or four depending on the number of elements used in the fabrication of the heater. All MKII models incorporate a single element and therefore have only two terminals. The connection procedure for the different combinations is as described in Figures 4 and 5:

## Ventilation

The catalytic reaction in Cata-Dyne™ heaters occurs when natural gas or propane reacts with oxygen to produce water vapor, carbon dioxide and infrared energy. Ventilation must be provided to allow an adequate supply of oxygen for the reaction.

For every 1.0 ft<sup>2</sup> (0.093 m<sup>2</sup>) of heater surface, 40 ft<sup>3</sup>/hr (1.13 m<sup>3</sup>/hr) of air supply is required. For example, a WX 24 x 24 heater (16,000 Btu/hr / 4.686 kW ) would require 160 ft<sup>3</sup>/hr (4.53 m<sup>3</sup>) of air to ensure proper operation of the Cata-Dyne™ heater.

To reduce the carbon dioxide and water vapor concentrations in the building, a vent hood assembly can be installed to provide positive ventilation from the heater (See Figure 6).

FIGURE 4

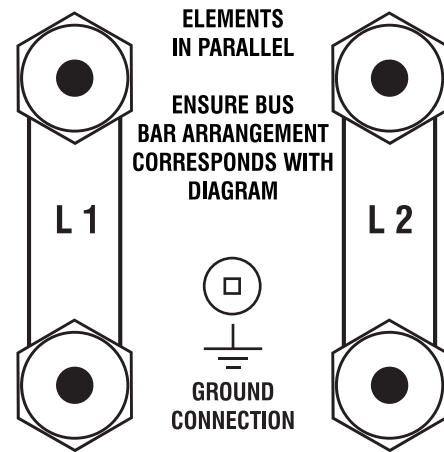


FIGURE 5

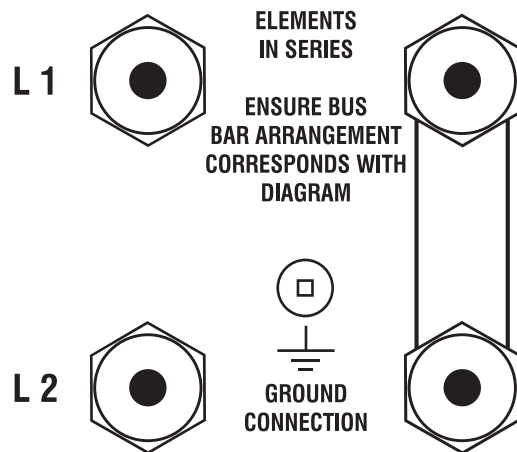


FIGURE 3

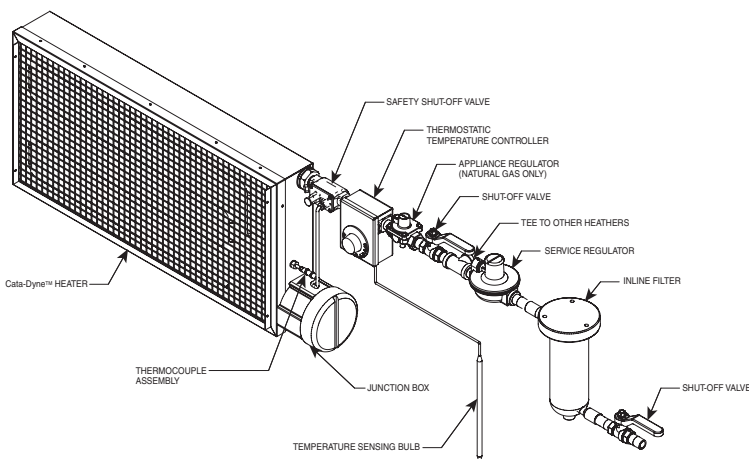
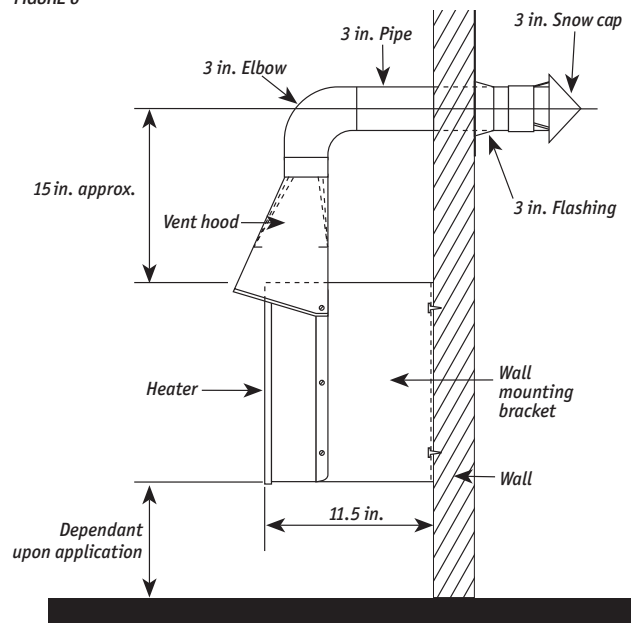


Diagram illustrates typical Natural Gas installation.

FIGURE 6



## OPERATION

All Cata-Dyne™ heaters are supplied with a Safety Shut-Off Valve (SSOV)/Thermocouple assembly to ensure the safe operation of the heater. Under no circumstances should the reset button be held or locked into the depressed position by use of a mechanical restraint. A tamper resistant model SSO V is available if desired.

### Start-up

1. Ensure the heater has been installed according to all instructions and relevant codes.
2. Turn on the main gas supply to the system.
3. If the heater is equipped with a thermostatic temperature controller, rotate the dial completely clockwise to the fully open position.
4. Turn on the power to the electrical elements.
5. After 15 minutes, depress the reset button on the top of the 100% safety shut-off valve. The button should return to the original position and internally open the valve and allow gas to flow to the heater. If the valve does not stay open when the reset button is released, it may be necessary to wait an additional few minutes and then depress the reset button again. This will allow the electrical elements additional time to warm up.
6. When the catalytic reaction is well established, turn off the electrical power to the elements.
7. If the heater is equipped with a thermostatic temperature controller, it can be set to the desired setting after the catalytic reaction has been established for at least one hour.

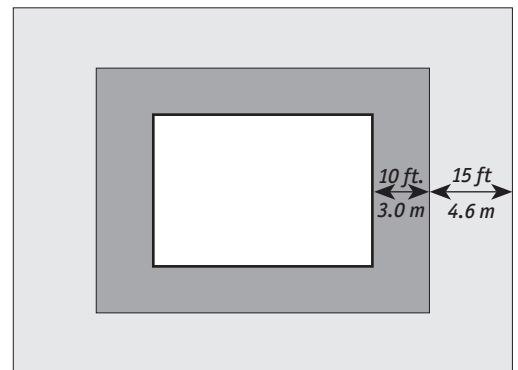
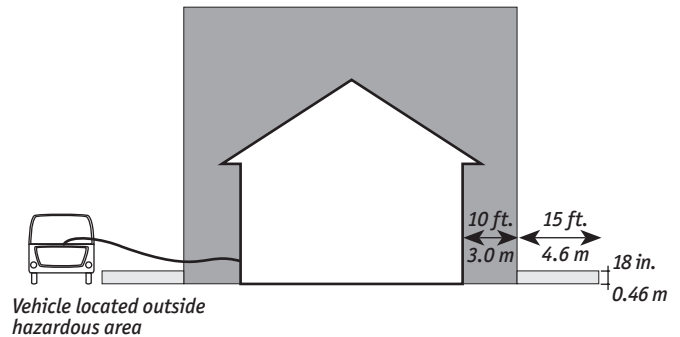
### Shut down

Turn off the gas supply to the heater.

### Multi-heater start-up

Cata-Dyne™ heaters can also be purchased/installed in multi-heater assemblies. If these assemblies are 12 V, each heater must be started individually. This ensures the correct voltage and current will be reaching the heater from the power supply.

## 12 V HAZARDOUS ELECTRICAL INSTALLATIONS

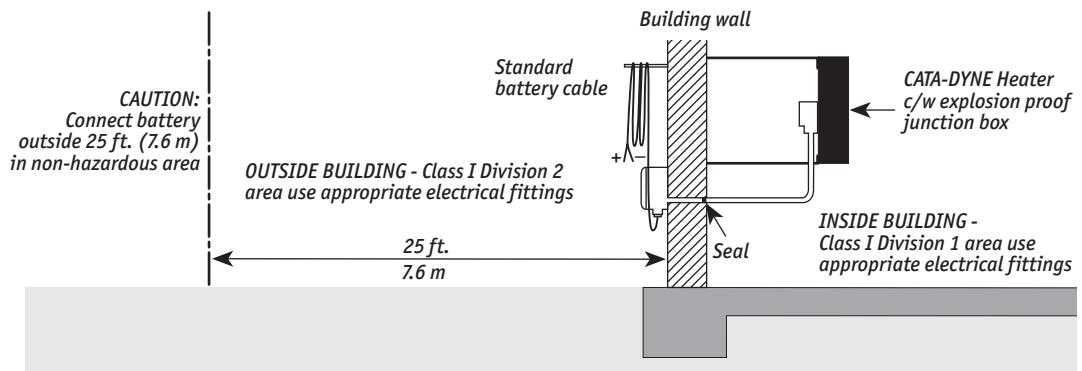


Class I Division 1  
 Class I Division 2  
 Class I Division 2  
 18 in. (0.46 m) from ground  
 Subject to possible transient vapour

Most oil and gas production buildings have an area classification as follows:

1. Class I, Division 1, within the building.
2. Class I, Division 2, outside the building for a distance of 10 ft.(3.0 m) from the building at all elevations.
3. Class I, Division 2, outside the building for a distance of 25 ft.(4.5 m) from the building at an elevation of 18 in. (0.45 m) from the ground.

All electrical apparatus and wiring within this area must conform to the appropriate codes. Connection to the power supply must be outside of the Class I, Division 2 location.



## SPOT HEATING

There are several factors to consider when Cata-Dyne™ heaters are utilized for spot heating.

Infrared energy travels in straight lines from the face of the Cata-Dyne™ heater covering approximately 160° of arc and is inversely proportional to the square of the distance. The heater should therefore be mounted as close as practical (min. of 8 in. (20 cm)) to the object requiring heat for maximum temperature rise.

Match the shape of the object requiring heat with the appropriate Cata-Dyne™ heater, e.g. WX/BX 6 x 24 for long narrow objects or WX/BX 12 x 12 for a square object.

Objects requiring heat should be painted dull, dark colors for maximum infrared absorption and objects not requiring heat should be painted light or reflective colors.

Insulate and protect plastic, rubber and similar materials from direct intense infrared heat.

## SPACE HEATING

A separate heat load calculation should be done for each building in which a Cata-Dyne™ heater will be installed for space heating purposes.

The heat load calculation determines the building heat losses through the structure and allows for air infiltration (refer to the sample Heat Load Calculation in the Cata-Dyne™ catalogue).

Cata-Dyne™ heaters produce low intensity infrared heat that is absorbed by objects within the range of the heat source. The closer the object is to the source of heat, the more heat the object will absorb. Cata-Dyne™ heaters should be placed close to the floor level within the building to heat objects close to the floor.

Ideally, Cata-Dyne™ heaters should be mounted 1-3 ft.(0.3-1 m) from the floor and equally spaced around the building perimeter for space heating applications.

If low mounting is not practical, then overhead mounting may be utilized. Overhead mounted heaters should be sloped face down to a maximum 45° angle to direct the infrared energy towards the floor. Overhead mounting should be restricted to heaters of 30,000 Btu/hr (8.8 kW) capacity and larger.

If the building requires only one heater, place the Cata-Dyne™ heater as close as possible to the center of the longest wall.

For multiple heater installations, space the Cata-Dyne™ heaters as evenly as possible around the perimeter of the building.

Make sure the piping is large enough to handle the gas load (refer to the sample Piping Calculation in the Cata-Dyne™ catalogue for sizing information).

Make sure the electrical starting system has sufficient current carrying capacity and conforms to all applicable electrical codes.

It is advisable to install an indicator light in the electrical circuit to reduce the possibility of the power being left on once the heater is started.

## PERSONAL SAFETY

The Cata-Dyne™ flameless infrared catalytic gas heater does not produce harmful carbon monoxide gas when used with natural gas or propane. Adequate ventilation must be incorporated in any building design to ensure oxygen replenishment and removal of any carbon dioxide. Protective grills should be used on any installation where personnel may come in contact with the face of the heater.

## ORDERING INFORMATION

You can order any of CCI Thermal's products by telephone, fax, mail or e-mail. To assist us in processing your order as quickly and efficiently as possible, please provide us with the following information:

- ◆ Cata-Dyne™ product name
- ◆ Cata-Dyne™ model number
- ◆ Fuel gas - natural gas or propane
- ◆ Starting voltage - 12, 24, 120, 208, 240, 480, or 600 V
- ◆ Accessories required:
  - Protection Grill
  - Wall Mount Brackets
  - Thermostat
  - Regulator
  - Start Up Leads (12 V system only)
  - Vent Hood
  - Other
- ◆ Company name and contact
- ◆ Billing address, phone number, fax or e-mail
- ◆ Shipping address and phone number
- ◆ Shipping instructions
- ◆ Special tagging instructions
- ◆ Date required
- ◆ Method of payment:
  - on account - P.O. number required
  - credit card - Visa or Mastercard number
  - cash or cheque

## GUARANTEE

CCI Thermal warrants all Cata-Dyne™ flameless infrared heaters sold to be free from defects in material or workmanship under normal use and service. The company agrees to repair or replace any Cata-Dyne™ heater which, upon its examination, reveals it to have been defective due to faulty workmanship or material, if returned to our factory, transportation PREPAID, within one (1) year from date of purchase. The company does not assume responsibility for misuse or misapplication of its heaters.

Warranty is void if Cata-Dyne™ heaters are used with sour, dirty or wet gas, or where sulphur content is greater than allowable for utility gas specifications. Warranty is void if, upon our inspection, the heater has been tampered with. Neither CCI Thermal nor the selling dealer shall be held responsible for loss of time, inconvenience, commercial loss or consequential damages relating to the use of Cata-Dyne™ heaters.

## RETURN GOODS POLICY

Prior written approval must be obtained from CCI Thermal for the return of any Cata-Dyne™ product(s). A restocking charge of 15% will apply. All returns must be shipped to our factory in Edmonton, freight prepaid. Final acceptance will be contingent on inspection at our factory.

## REPAIRS

Cata-Dyne™ heaters may require periodic maintenance or repair. Our factory is staffed with technicians who are qualified to perform any required repairs. The procedure to follow to have a heater repaired is as follows.

Send the heater to our factory in Edmonton. Include the following information with the heater:

- ◆ Company name and address
- ◆ Contact name
- ◆ Telephone number/fax number/e-mail
- ◆ P.O. number
- ◆ Advise if an estimate is required prior to starting the repair
- ◆ Details on the repair or conversion required
- ◆ Return shipping instructions

**NOTE:** Under the terms of our certification, all repairs must be performed at our factory in Edmonton.

## TROUBLE SHOOTING

1. Ensure that the fuel matches that listed on the nameplate.
2. Ensure that the voltage matches that listed on the nameplate.
3. Check for any physical damage. All signs of physical damage to the catalyst pad such as holes, tears or a general deterioration of the catalyst bed signal that it is time to have the heater repaired.
4. Check the gas supply pressure at the heater – 7 in. w.c. (1.73 kPa), 4.5 in. w.c. (1.12 kPa), or 3.5 in. w.c. (0.86 kPa) for natural gas and 11 in. w.c. (2.72 kPa) for propane.
5. Check the gas orifice for obstructions or dirt and ensure the size matches that listed on the nameplate. It may be necessary to install a filter upstream of the heater or regulator if the gas supply is dirty. If the fuel supply is constantly dirty and/or wet it would be advisable to use bottled propane fuel.
6. Check the mounting position of the heater. The face of the heater should be preferably in the vertical position and should not vary more than 45° from the vertical position for maximum efficiency.
7. Check for saturation of the catalyst face caused by condensation or rain running down the face of the heater. If the heater has been exposed to water, it is advisable to place the unit in a warm area for a period of a few hours or longer if required. Once the moisture is removed, the heater can be re-installed and re-started.
8. Check the jumper cable size to ensure that the resistance of the cable is not reducing the current to the heater. This would not allow sufficient power to the electrical element to preheat the catalyst to the activity temperature. It is recommended to run the service vehicle at fast idle while starting the heater.
9. Cata-Dyne™ heaters are designed to use clean fuel and to be used in non-contaminated atmospheres. Sulphur compounds in the fuel or atmosphere will poison the catalyst bed over a period of time and render the heater inoperative. If the heater has been exposed to sulphur compounds, it should be sent to the factory for service.
10. Avoid spraying the face of the heater with high-pressure air, steam or water because this can damage the catalyst bed. If physical damage is visible, return the heater to the factory for servicing.
11. Ensure that the temperature controller is correct for the model size, fuel, and pressure specifications for the heater it is fitted to. If the temperature controller is too low, the heater will not have sufficient fuel rating to operate and will stop.

*Separate Installation and Operation Instructions are available for oven and industrial heating applications.*



**CCI Thermal**  
Technologies Inc.

Thermal  
Systems Division  
Cata-Dyne™ Infrared Ovens  
QuikCat™ Infrared Ovens  
DriQuik™ Electric Infrared

Safety Thermal  
Products Division  
Cata-Dyne™ Explosion-Proof  
Infrared Gas Heaters  
Sure Seal Pipeline Systems™

## **SAFETY NOTICE**

### **120/240 Volt Cata-Dyne™ Heaters**

Cata-Dyne™ heaters using 120/240 volt electrical starting elements should have ground fault circuit interrupters (G.F.I.) installed in the electrical circuits to minimize the risk of damage caused by electrical element failure. The G.F.I. must be installed outside of the hazardous location.

Electrical element failures are rare and in most cases are caused by failure to turn off the electrical power to the Cata-Dyne™ heater once it is started. Other potential causes for failure include corrosion and contamination. Installation of a G.F.I. should confine the damage caused by a short circuit within the electrical element to the interior of the element.

In all cases, electrical power must be turned off to Cata-Dyne™ heaters once the heater is started. Failure to do so will cause damage to the heater and will create a potentially hazardous condition.

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# Cata-Dyne™ Technical Bulletin - Flo-Dri Gas Scrubbers

## Ensuring the Efficient Operation of your Cata-Dyne™ Heater

Cata-Dyne™ heaters, as with all other gas appliances, are designed to work on clean natural gas or propane. For optimal performance the operating fuel should have a calorific value of 1,000 Btu/Ft<sup>3</sup> (37 MJ/m<sup>3</sup>) for natural gas or 2,500 Btu/Ft<sup>3</sup> (93 MJ/m<sup>3</sup>) for propane.

The heat generated from a gas-fired catalytic heater is provided by a proprietary catalyst. Contamination in the fuel source may deactivate this catalyst, allowing gas to pass through the heater's catalyst pad uncombusted. Other components of the heater, including the thermocouple, safety shut-off valve (SSOV), thermostat, gas regulators, and insulation will also be adversely affected by fuel contaminants. The most common contaminants of natural gas in the field, such as may be supplied from a natural gas well, are moisture, minerals dissolved in moisture, hydrogen sulphide (H<sub>2</sub>S), oil and other liquids.

The Flo-Dri Gas Scrubber, available from CCI Thermal, is designed to remove these contaminants. The Flo-Dri units contain a desiccant-based filter cartridge. Different filter cartridges are available depending upon the contaminants present in the fuel source. Maximum working pressures of the units are 150 psig (G-10 Model only) and 250 psig (G-25, G-60, G-100, and G-150).

## How the Flo-Dri Gas Scrubber Works

The filtration process occurs in three stages:

1. **Impaction:** As gas enters the lower chamber it expands and impacts moisture droplets against the diffuser. As gas passes through the filter, droplets coalesce forming larger drops that collect at the bottom of the scrubber. These can be drained.
2. **Adsorption:** Gas flows through the desiccant and the filter media adsorbs the contaminants. Flo-Dri has a patented spring-loaded cartridge that prevents channelling, particularly between the sidewalls and the fixed bed of desiccant. As an additional feature, the filter design does not require a steady flow of gas.
3. **Entrapment:** The gas leaves through a special filter that traps any remaining particles. The outlet of larger Flo-Dri filters is furnished with a screen that is designed to remove particles from 0.5 microns and up.



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## Why Clean Fuel is Important

The Cata-Dyne™ heater will be less reliable if it is operated with contaminated fuel. The presence of moisture, minerals or hydrogen sulphide in the fuel supply speeds up the following processes:

- Internal corrosion of the safety shut off valves (SSOV), regulators and thermostats.
- External corrosion of brass and copper components such as the thermocouple particularly in the presence of hydrogen sulphide.
- Sedimentation of minerals inside the SSOV's, regulators and thermostats, causing their malfunction. Mineral deposits inside the SSOV and/or external corrosion to the thermocouple will result in a weaker electromagnetic connection between the thermocouple and SSOV, causing the heater to shut down.
- Hydrogen sulphide is oxidised to elemental sulphur which is deposited on the surface of the catalytic pad and inhibits air diffusion to the pad.
- Over time, hydrogen sulphide deactivates the catalyst, making it less efficient, eventually allowing greater amounts of uncombusted gas to pass through the catalytic pad into the surrounding area, creating a potentially dangerous situation.

## Suggestions to Improve Performance

- The XX (H<sub>2</sub>S) cartridge will only work on dry gas. If there is moisture in the fuel supply, the H<sub>2</sub>S will not be adsorbed. Two filters may be required; the first to remove moisture and the second to remove H<sub>2</sub>S.
- Filters used in conjunction with the Cata-Dyne™ WX Series explosion-proof heater will last longer than filters used with the same size model of the discontinued BX Series explosion-proof heater; e.g., the XX cartridge filter in a G-10 gas scrubber used with a WX 12x24 heater will need to be changed every 87 days, while for a BX 12x24 heater the filter would need to be changed every 58 days, when the H<sub>2</sub>S concentration is 10 ppm.
- Make sure you know the concentration of your contaminants. Use the tables shown to determine how often you will need to change your desiccant filter.
- Many customers ask if there is an allowable minimum concentration of fuel contaminants under which the Cata-Dyne™ heater will operate efficiently. All gas appliances are designed to operate on clean gas; using the Flo-Dri filtration system ensures a pure gas supply. A comparison can be made to a car; it functions best with clean gasoline rather than a mixture of gasoline and impurities.

**Table 1 - Recommended Frequency of Changeouts: XX Cartridge Filter**

- The XX cartridge filter is used for hydrogen sulphide (The gas must be dry. Otherwise the moisture will be adsorbed).
- Filter change schedule is in days for natural gas containing 10 ppm of hydrogen sulphide.

<b>WX Series</b>	<b>Rating Btu/hr</b>	<b>G10 Days</b>	<b>G25 Days</b>	<b>G60 Days</b>	<b>G100 Days</b>	<b>G150 Days</b>
6" x 6"	1,000	696	936	1,680	2,848	11,152
6" x 12"	2,000	348	468	840	1,424	5,576
6" x 24"	4,000	174	234	420	712	2,788
8" x 8"	2,333	298	401	720	1,221	4,780
10" x 12"	3,333	209	281	504	854	3,346
12" x 12"	4,000	174	234	420	712	2,788
<b>12" x 24"</b>	<b>8,000</b>	<b>87</b>	117	210	356	1,394
12" x 36"	12,000	58	78	140	237	929
12" x 48"	16,000	44	59	105	178	697
12" x 60"	20,000	35	47	84	142	558
12" x 72"	24,000	29	39	70	119	465
18" x 24"	12,000	58	78	140	237	929
18" x 30"	15,000	46	62	112	190	743
18" x 36"	18,000	39	52	93	158	620
18" x 48"	24,000	29	39	70	119	465
18" x 60"	30,000	23	31	56	95	372
18" x 72"	36,000	19	26	47	79	310
24" x 24"	16,000	44	59	105	178	697
24" x 30"	20,000	35	47	84	142	558
24" x 36"	24,000	29	39	70	119	465
24" x 48"	32,000	22	29	53	89	349
24" x 60"	40,000	17	23	42	71	279
24" x 72"	48,000	15	20	35	59	232

The table shows cartridge changeout frequencies in days for each model heater and gas scrubber for H<sub>2</sub>S concentrations of 10 ppm in natural gas. To determine the cartridge changeout frequency in days for other H<sub>2</sub>S concentrations, use the formula given in the following example:

- Your installation has a Cata-Dyne™ heater, model WX12x24, 8,000 Btu/hr natural gas using a model G10 Flo-Dri gas scrubber.
- The concentration of H<sub>2</sub>S in your gas supply is 25 ppm.
- The changeout frequency for 10 ppm is 87 days (derived from the table above).
- $87 \text{ days} \times 10 \text{ ppm} / 25 \text{ ppm} = 34.8 \text{ days}$ .
- The filter should be changed approximately every 35 days for the example above.

**Table 2 - Recommended Frequency of Changeouts: AA and MS Cartridge Filters**

- AA and MS cartridge filters are used for moisture and minerals dissolved in moisture.
- Filter change schedule in days for natural gas containing 50 ppm moisture.

WX Series	Rating Btu/hr	G10 Days	G25 Days	G60 Days	G100 Days
6" x 6"	1,000	552	752	1,352	2,328
6" x 12"	2,000	276	376	676	1,164
6" x 24"	4,000	138	188	338	582
8" x 8"	2,333	237	322	580	998
10" x 12"	3,333	166	226	406	698
12" x 12"	4,000	138	188	338	582
12" x 24"	8,000	69	94	169	291
12" x 36"	12,000	46	63	113	194
12" x 48"	16,000	35	47	85	146
12" x 60"	20,000	28	38	68	116
12" x 72"	24,000	23	31	56	97
18" x 24"	12,000	46	63	113	194
18" x 30"	15,000	37	50	90	155
18" x 36"	18,000	31	42	75	129
18" x 48"	24,000	23	31	56	97
18" x 60"	30,000	18	25	45	78
18" x 72"	36,000	15	21	38	65
24" x 24"	16,000	35	47	85	146
24" x 30"	20,000	28	38	68	116
24" x 36"	24,000	23	31	56	97
24" x 48"	32,000	17	24	42	73
24" x 60"	40,000	14	19	34	58
24" x 72"	48,000	12	16	28	49

The table shows cartridge changeout frequencies in days for each model heater and gas scrubber for moisture concentrations of 50 ppm in natural gas. To determine the cartridge changeout frequency in days for other moisture concentrations, use the formula given in the following example:

- Your installation has a Cata-Dyne™ heater, model WX12x24, 8,000 Btu/hr natural gas using a model G10 Flo-Dri gas scrubber.
- The concentration of moisture in your gas supply is 25 ppm.
- The changeout frequency for 50 ppm is 69 days (derived from the table above).
- $69 \text{ days} \times 50 \text{ ppm} / 25 \text{ ppm} = 138 \text{ days}$ .
- The filter should be changed approximately every 138 days for the example above.