

# Cata-Dyne™

## Gas Catalytic Explosion-Proof Heaters

### General Information

Cata-Dyne™ gas catalytic explosion-proof heaters are available in 23 different models with Btu ratings ranging from 1,000 to 48,000 Btu/hr (0.3 kW - 14.0 kW). In addition, these heaters can be banked together to obtain any Btu (kW) rating desired.

CCI Thermal's Cata-Dyne™ heaters are competitively priced, simple to install and operate, and require minimal maintenance under normal operating conditions. These heaters are economical to operate and highly efficient.

The Cata-Dyne™ WX Series explosion-proof heater is a revolutionary product with uniform heat distribution, high fuel efficiencies, more radiant power and a certified explosion-proof rating. It is 33% more fuel efficient than older models producing the same energy output.

Most Cata-Dyne™ heaters for oil and gas applications are started with either 12 V or 120 V electrical elements (24, 208, 240, 480 and 600 V are also available,) but power is only required during the initial startup. No power is needed to operate the heaters or their controls once the heater has started and the catalytic reaction has been established.

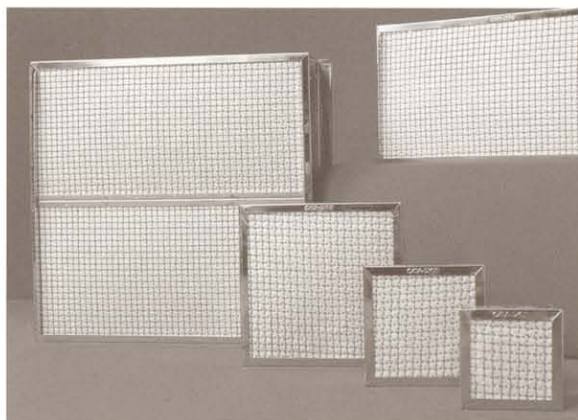
### Operating Principles

The heart of the Cata-Dyne™ heater is the unique patented catalyst pad. These pads are constructed of ceramic fibers and contain chemicals that form the basis of the exothermic catalytic reaction. The first action to occur is the preheating of the catalyst pad by a low watt density electrical element.

The temperature of the catalyst pad is raised to an activity temperature of 120°C (250°F). Once this temperature is achieved, fuel enters the back of the Cata-Dyne™ heater and is dispersed through the catalyst pad. At the same time, oxygen from the air diffuses through the front of the heater. Once the fuel and oxygen converge in the pad, a catalytic reaction takes place resulting in flameless combustion and the creation of infrared energy. Once oxidation begins, the catalytic reaction will continue until either the fuel supply or the oxygen is eliminated.

The unique Cata-Dyne™ catalyst pad contains a chemical formula that gives Cata-Dyne™ its explosion-proof characteristics. Our technology governs the rate of reaction of the oxidation process and ensures that the catalyst does not become an ignition point — even when the heater is operating in a potentially explosive atmosphere.

Our ongoing customer service initiatives include comprehensive product training seminars specifically designed for field operators, engineers, estimators and procurement officers.



### Applications

Cata-Dyne™ products have an unbeatable track record for hazardous area heating applications. They can be used in Class I, Division 1, Group D industrial indoor locations where a source of infrared radiant heat is required, provided adequate ventilation is available. This makes the Cata-Dyne™ flameless explosion-proof catalytic gas infrared heater the leading choice in many applications, including:

**Oil and gas production and exploration**

**Petrochemical storage and distribution**

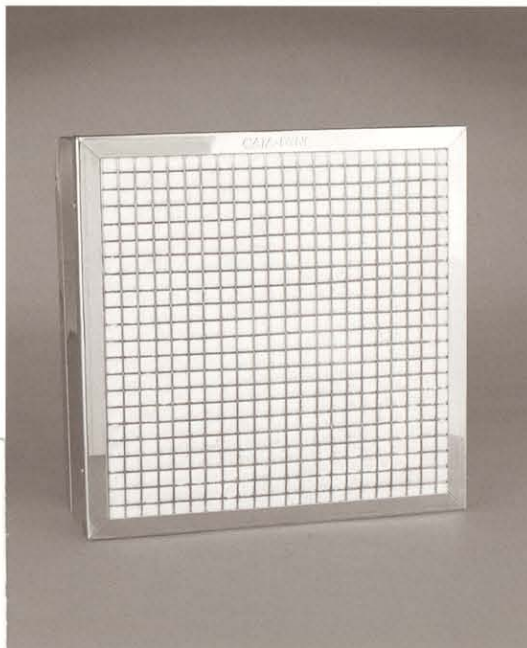
**Separators and dehydrators**

**Meter runs**

**Compressed Natural Gas (CNG) facilities**

**Liquid Propane Gas (LPG) facilities**

**General industrial areas**





## CCI Thermal Cata-Dyne™

### General Uses

Cata-Dyne™ heaters are utilized for three basic types of heating:

- Spot heating
- Space heating
- Combination of space and spot heating

### Space Heating

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

- A separate heat load calculation should be done for each building in which a Cata-Dyne™ 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 this section).
- 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 ft. - 3 ft. (0.3 m - 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 16,000 Btu/hr (4.684 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 this section 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.



### 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, a minimum 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 6 x 24 for long narrow objects or WX 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.
- Maintain nameplate clearances from combustible materials such as wood, cloth, paper, etc.
- Insulate and protect plastic, rubber and similar materials from direct intense infrared heat

### Certification

The WX Series Cata-Dyne™ explosion-proof, flameless infrared catalytic gas heater is certified by the Canadian Standards Association (CSA) and Factory Mutual Global (FM), for use in Class I, Divisions 1, Group D hazardous locations – temperature code T2C at an ambient temperature of 40°C (104°F).

The Cata-Dyne™ MKII heater is approved by the Canadian Standards Association (CSA) for use in Class I, Division 1 and 2, Group D hazardous (classified) locations.

Models listed are certified for industrial use only, for either natural gas or propane gas.



ISO 9001:  
2000 Registered Firm

# Products

## WX Series

### Standard Features

Cata-Dyne™ heaters are designed to provide years of trouble-free service.

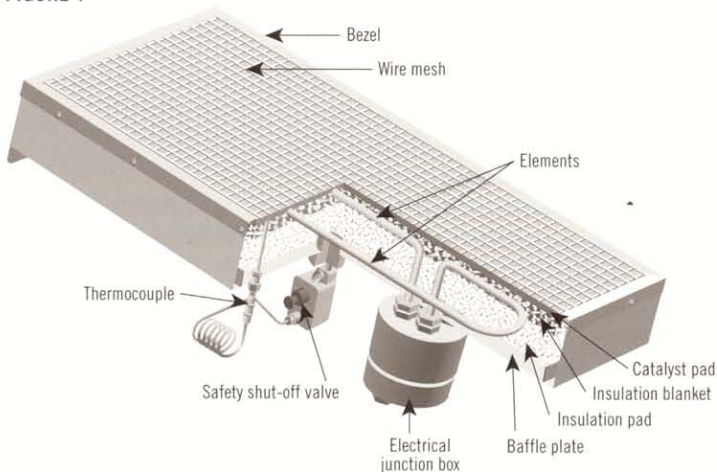
Complete written start-up procedures are supplied with all Cata-Dyne™ heaters.

Cata-Dyne™ explosion-proof infrared heaters have a variety of applications in the oil and gas industry, and are designed for economical and efficient operation plus simplicity of installation. This has been accomplished by ensuring that as many components as possible have the same specifications for thread sizes, hole diameters, accessories, etc.

The following is a list of the standard equipment supplied with each Cata-Dyne™ heater:

1. **Cata-Dyne™ patented explosion-proof catalyst pad**
2. **Appliance regulator – 3/8 in. NPT, 1/2 psi inlet pressure and 7 in. w.c. outlet pressure (natural gas models only)**
3. **Manual shut-off ball valve – 3/8 in. NPT**
4. **100% safety shut-off valve (SSOV), 3/8 in. NPT and thermocouple**
5. **Heater boxes constructed of 300 series stainless steel for maximum corrosion protection**
6. **Standard 3/8 in. NPT gas connections**
7. **Electrical junction boxes (3/4 in. NPT) rated for use in Class I, Divisions 1 & 2, Group D, hazardous locations**

FIGURE 1



### Additional Features

- All Cata-Dyne™ heaters are designed to run on either clean natural gas or propane. They provide an unbeatable combination of economy, longevity and workmanship.
- Cata-Dyne™ heaters can be banked to obtain any Btu/hr (kW) rating desired.
- Cata-Dyne™ heaters start with either a 12 V vehicle battery or with other standard electrical current.
- Once started, Cata-Dyne™ heaters do not require electrical power to operate, making them ideal for remote locations.
- Each design change and new accessory is carefully examined and thoroughly tested to ensure excellence and continuity of the Cata-Dyne™ product line. Customers can be confident that their products will be supported for many years to come.

TABLE 1 WX Series Rating

Model	Btu/hr	kW	V
WX 6 x 6*	1,000	0.293	12 or 120
WX 6 x 24	4,000	1.171	12 or 120
WX 8 x 8	1,778	0.521	12 or 120
WX 10 x 12	3,333	0.976	12 or 120
WX 12 x 12	4,000	1.171	12 or 120
WX 12 x 24	8,000	2.343	12 or 120
WX 12 x 36	12,000	3.514	120
WX 12 x 48	16,000	4.686	12 or 120
WX 12 x 60	20,000	5.857	120
WX 12 x 72	24,000	7.029	120
WX 18 x 24	12,000	3.514	12 or 120
WX 18 x 36	18,000	5.272	120
WX 18 x 48	24,000	7.029	120
WX 18 x 60	30,000	8.786	120
WX 18 x 72	36,000	10.543	120
WX 24 x 24	16,000	4.686	12 or 120
WX 24 x 30	20,000	5.857	120
WX 24 x 36	24,000	7.029	120
WX 24 x 48	32,000	9.372	120
WX 24 x 60	40,000	11.715	120
WX 24 x 72	48,000	14.058	120

\*NOTE: The WX 6 x 6 is not available in propane.

Please see the Accessories section of the catalogue for all related parts.



## Cata-Dyne™ MKII

The Cata-Dyne™ MKII explosion-proof infrared heater is an exciting new product designed to meet a variety of specific customer needs.

- Model sizes: 12 x 12 (4,000 Btu/hr, 1.171 kW), 12 x 24 (8,000 Btu/hr, 2.343 kW) and 24 x 24 (16,000 Btu/hr, 4.686 kW).
- Electrical: 12 V/360 W or 120 V/500 W.
- Fuel: Natural gas (3.5 in., 0.86 kPa; 4.5 in., 1.12 kPa and 7 in., 1.73 kPa w.c. pressure) and propane gas (11 in., 2.72 kPa w.c. pressure).
- Comes with WX Series explosion-proof catalyst pad.

### Standard/Optional Features

#### Side Mounted Operator Controls

All of the gas control components (safety shut-off valve/thermocouple assembly, thermostat controller, gas appliance and service regulators, inline manual shut-off valves, and inline gas filtration system) and all electrical connections for the Cata-Dyne™ MKII are side mounted for easy installation.

The side mounting allows for easy access to the controls during both start-up and regular maintenance.

The rating nameplate and operation instructions are also side mounted to allow for easier readability.

To ensure in-house quality, the MKII incorporates CCI Thermal's patented *x-Max*® explosion-proof housing.

The explosion-proof junction box is approved for use in Class I, Division 1 and 2, Group D hazardous (classified) locations and has an extra outlet to allow for alternate orientation of electrical connections when the heater is installed.

#### Shorter Thermocouple with Polymer Corrosion Protection

The standard thermocouple in CCI's WX heater is 36 in. long; the MKII's is 14 in. long. The shorter thermocouple improves the electromagnetic connection between the safety shut-off valve (SSOV) and the thermocouple providing an enhanced signal.

The improved reliability helps reduce the tendency for operators to tamper with the SSOV.

The thermocouple lead is covered with a hermetically sealed coating custom designed for CCI Thermal.

To further protect the internal components of the SSOV/thermocouple assembly, the thermocouple's bushing-thread is covered with an adhesive lined polymer environmental seal.

The protective plating and polymer seal increases the life of the thermocouple when it is operating in atmospheres where corrosive substances such as hydrogen sulfide are present.

### Single Element

Each Cata-Dyne™ MKII heater has a single start-up element with the same power wattage rating as standard WX heaters of the same model size incorporating the double element design.

Wiring connections to the side mounted element connections are to each terminal pin; no bus bars are required.

### Redesigned Internal Gas Distribution System

A new gas distribution system has been fitted into the 12 x 12 and 12 x 24 MKII models to improve gas dispersion.

The gas dispersion system in the 24 x 24 MKII model has also been reconfigured with an improved design.

Improved gas dispersion optimizes the flameless combustion occurring at the heater's catalytic surface meaning more uniform surface temperatures.

TABLE 2 Cata-Dyne™ MKII Rating

Model	Btu/hr	kW	V
MK 12 x 12	4,000	1.171	12 or 120
MK 12 x 24	8,000	2.343	12 or 120
MK 24 x 24	16,000	4.686	12 or 120

Please see the Accessories Section of the catalogue for all related parts.

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