CCI Thermal Technologies INC.

Heating and Filtration Solutions

Cata-Dyne™ LH Line Heater & Micro Line Heater

The Cata-Dyne™ LH Line Heater

The Cata-Dyne™ LH Line Heater is an advanced pipeline heating system. It prevents equipment freezing and possible hydrate formation during pressure reduction at natural gas regulating sites. The LH Line Heater heats the gas stream using infrared radiant heat transfer, eliminating the use of burners, glycol fluid and high maintenance heat exchange systems. It is also used to condition fuel gas for natural gas fired turbines or engines, and for heating gas and diluent streams in a variety of process applications. Custom engineered units for non-standard applications are available.

The Cata-Dyne™ LH Line Heater's use of direct infrared heat transfer eliminates the need for traditional gas fired glycol bath systems. The elimination of glycol based heat transfer systems results in a more environmentally favorable installation. High field maintenance and operating costs are all eliminated by the Cata-Dyne™ LH Line Heater.

The heart of each LH Line Heater is the industry standard Cata-Dyne™ WX Gas Catalytic Heater. The Cata-Dyne™ WX Heater brings its trademark quality, durability and performance efficiency to provide the most consistently reliable and efficient low emission radiant heat source available. The Cata-Dyne™ WX Heater conforms to the ANSI Z83.20a-2010/CSA 2.34a-2010 standard for Gas-Fired Low Intensity Heaters.

The LH Line Heater is available in five standard sizes ranging from 40,000 to 160,000 Btu input (see Table 1). The Cata-Dyne™ LH Line Heater is designed and built for Class I, Division 1 or 2, Group D hazardous locations. This allows the LH Line Heater to be installed directly in classified areas for a compact installation compared to traditional fired glycol water bath systems.

Line Heater Features

- Infrared radiant energy provided by the silent Cata-Dyne™ WX Gas Catalytic Heater is NOx free providing the cleanest and quietest heating system available.
- The flanged multi-pass coil heat exchanger is designed and built to the ASME B31.3 Code for Process Piping with Canadian Registration Number (CRN).
- Enclosures feature galvanized steel structures with stainless-steel cladding, limiting corrosion and maintenance.
- Control options from manual stop/start with and without temperature control to remote start/stop and automated feedback pneumatic or electric temperature control.
- Automatic units feature engineered control panels with PLC control systems.
- Infrared heat is accurately controlled to meet process temperature requirements while economizing operating costs.
- Standard high temperature shutdowns, optional low flow shutdowns available.
- Fuel gas system designed and built in accordance with CSA/Can – B149.1 and NFPA 54.
- Electrical system designed and built in accordance with CSA/Can – C22.2 and NEC (NFPA 70).
- Catalytic heaters conform to ANSI Z83.20a-2010/ CSA 2.34a-2010 standard for Gas-Fired Low Intensity Heaters and are CSA and FM certified for use in Class I, Division 1 or 2, Group D hazardous locations.

Hybrid Design Capabilities

Only CCI Thermal offers the optional Catalytic/Electric Hybrid Line Heater. A secondary electric gas circulation heater is used to augment the capabilities of the base catalytic line heater. The hybrid design provides enhanced responsiveness to gas flow transients and deeper turn-down capabilities.

Applications

Cata-Dyne™ Line Heaters are used for a variety of applications in the oil & gas, pipeline, midstream, gas distribution, and power generation industries.

Common applications include:

- Heating high pressure natural gas prior to pressure reduction to prevent equipment freezing and the formation of hydrates.
- Conditioning fuel gas for natural gas fired turbines and engines.
- Heating of gas and diluent streams in a variety of process applications.

Superior Technology

- The industry's cleanest operating catalytic heater. The catalytic oxidation process is NOx free, producing only CO_2 and water as combustion byproducts.
- Maximized heat transfer surface area due to minimal coil spacing and the maximum number of series passes possible in a fixed vertical space.
- Vertically stacked heaters are the ideal configuration for effective thermal draft ventilation of heater faces and removal of CO_2 and water vapour byproduct of the catalytic oxidation process.

External Enclosures

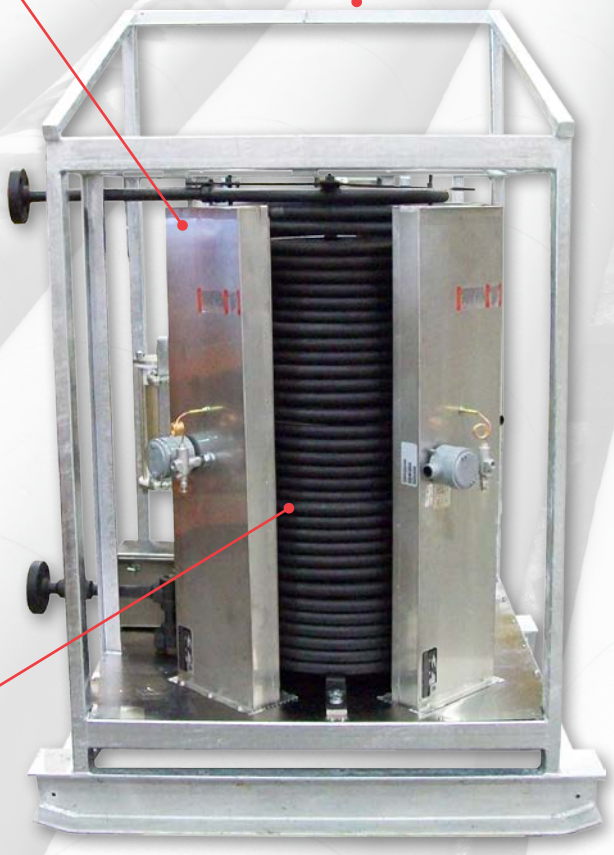
Enclosures feature galvanized steel structures with stainless-steel cladding, limiting corrosion and maintenance.

Cata-Dyne™ WX Gas Catalytic Heater

Infrared radiant energy provided by the silent Cata-Dyne™ WX Gas Catalytic Heater is NOx free providing the cleanest and quietest heating system available.

Cata-Dyne™ Explosion-proof Catalytic Heaters conform to ANSI Z83.20a-2010/CSA 2.34a-2010 standard for Gas-Fired Low Intensity Heaters and are CSA and FM certified for use in Class I, Division 1 or 2, Group D hazardous locations.

Vertically positioned heaters produce the most effective thermal draft, ventilation of heater faces and removal of water vapour created by the catalytic oxidation process.



Heat Exchanger Coil

The flanged multi-pass coil heat exchanger is designed and built to the ASME B31.3 Code for Process Piping with Canadian Registration Number. Available ANSI 600 and 900 flange ratings.

High velocity turbulent flow through uniform diameter passage. Maximized heat transfer surface area due to minimal coil spacing and increased number of series passes possible in a fixed vertical space.

Electrical System

Electrical system designed and built in accordance with CSA/Can – C22.2 and NEC (NFPA 70). Available DC or AC startup.

High Temperature Shutdowns

Standard high temperature shutdowns, optional low flow shutdowns available.

Control Options

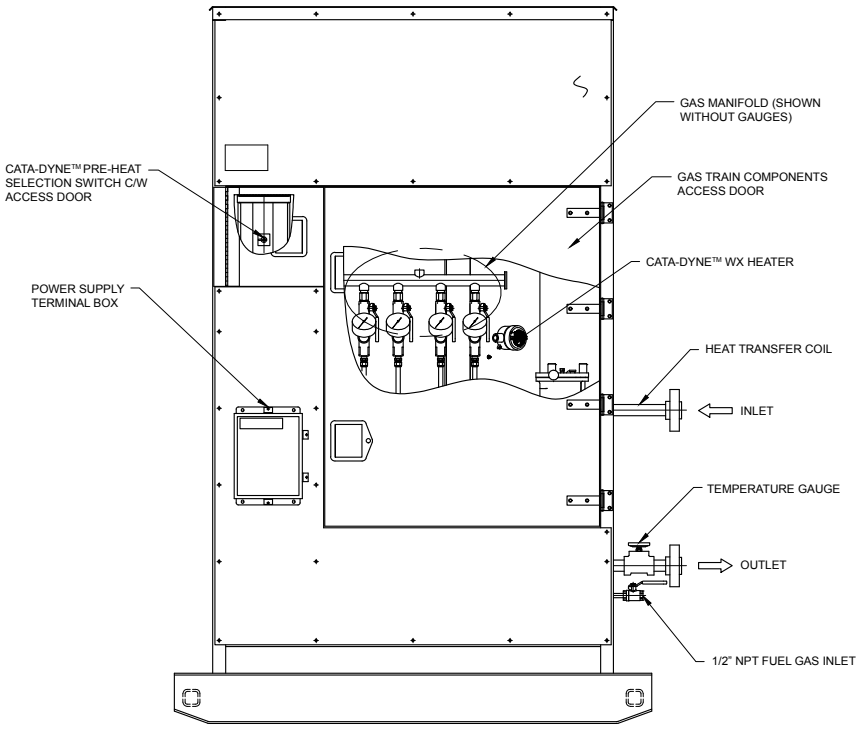
Control options from manual stop/start with and without temperature control to remote start/stop and automated feedback pneumatic or electric temperature control.

Automatic units feature engineered control panels with PLC control systems.

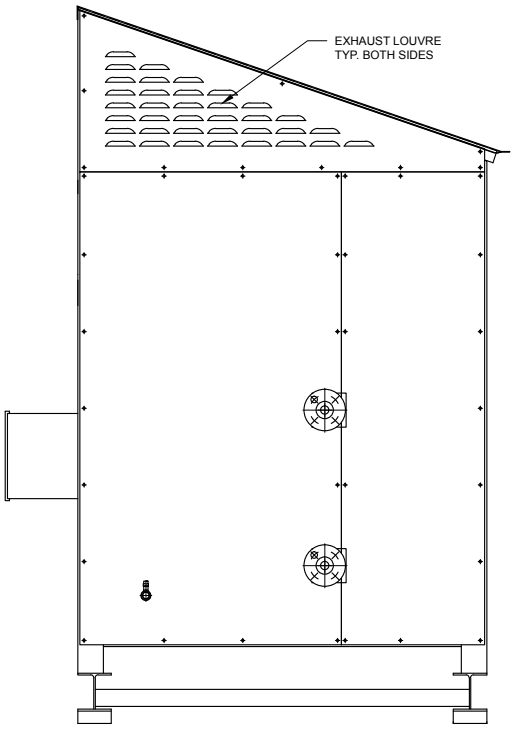
Fuel System Design

Fuel gas system designed and built in accordance with CSA/Can – B149.1 and NFPA 54.

Integral Flo-Dri fuel gas filter ensures high quality fuel gas.



FRONT VIEW



SIDE VIEW

TABLE 1: Cata-Dyne™ LH Series Standard Model Sizing

Model	Heater Input (Btu/hr)		External Dimensions in (mm)
	Minimum	Maximum	Length x Width x Height
LH-40	10,000	40,000	56 x 48 x 84 (1420 x 1219 x 2130)
LH-60	15,000	60,000	
LH-80	20,000	80,000	
LH-100	25,000	100,000	78 x 68 x 90 (1980 x 1725 x 2286)
LH-160	40,000	160,000	

Note:
1. Custom designs and Btu ratings are available upon request.
2. Heater output between minimum and maximum values is manually selected on manual and sequential models.
3. Automatic zone control is only available with the automatic model.

Model Coding

Prefix	Model	Start-up Type	Temp. Control	Start-up Voltage	Flange Size (in)	Flange Rating (ANSI)
LH	40	M	NT	12	1	600

40	40,000 Btu/hr
60	60,000 Btu/hr
80	80,000 Btu/hr
100	100,000 Btu/hr
160	160,000 Btu/hr

M	Manual
S	Sequential
A	Automatic*

*Engineered option

NT	Fixed heat output, outlet temperature not controlled
T*	Variable heat output, low/high, outlet temperature controlled

*Variable control from 40% to 100% of heater output.

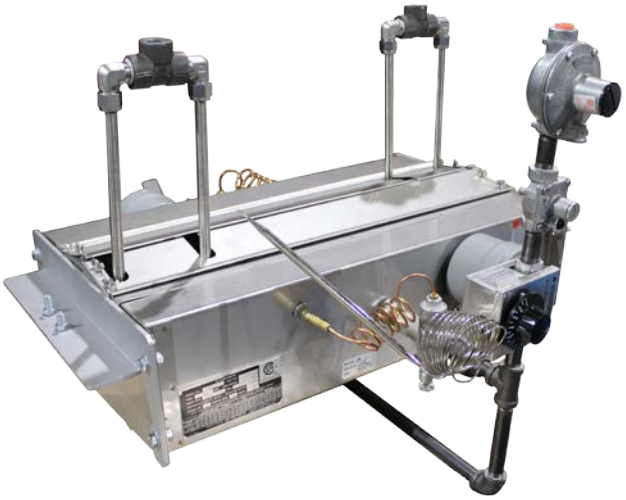
12	VDC
120	VAC
208	VAC
240	VAC
480	VAC
600	VAC

*Custom on LH-160

1
2
3

600
900

The Cata-Dyne™ Micro Line Heater



The Cata-Dyne™ Micro Line Heater prevents equipment freezing and possible hydrate formation during pressure reduction at natural gas regulating sites. The Micro Line Heater heats the gas stream using infrared radiant heat transfer from Cata-Dyne™ WX heaters. The Cata-Dyne™ Micro Line Heater's use of direct infrared heat transfer results in an environmentally favorable installation free of burners, heat transfer fluids and noise. High field maintenance and operating costs are all eliminated by the Cata-Dyne™ Micro Line Heater.

Custom engineered units for non-standard applications are available.

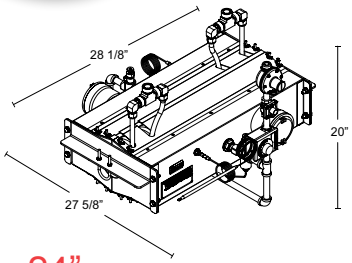
Features

- Allows for installation in existing facility by mounting onto 1" and 2" piping reducing installation costs
- Certified for use in Class I, Division 1 & 2, Group D locations
- Conforms to CSA B149.1 & B149.3
- Meets ANSI Z83.20a-2010/CSA 2.34a-2010
- Sizes available from 10,000 to 40,000 Btu input
- Handles between 40 to 130 Mcf/D of Natural Gas with pressure reductions as high as 1200 psi down to 50 psi without freeze-offs
- Simple thermostat controls allowing for easy adjustment

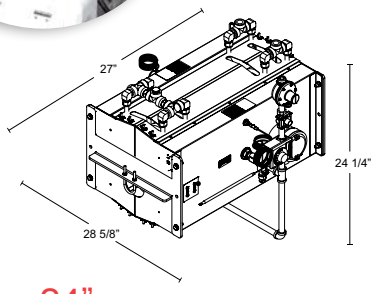
Benefits

- Ideal for lower flow conditions where Glycol Water Bath systems are not practical
- Approximately ¼ of the cost of standard ethylene glycol water bath system
- No ethylene glycol
- Simple start-up allows for system to be shut-down and started as required during low/zero flow conditions
- Reduced maintenance

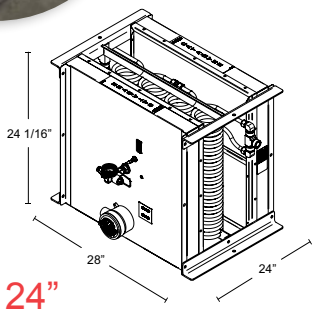
Standard Heater Sizes



6" x 24"
Single Coil



12" x 24"
Double Coil



24" x 24"
Quad Coil

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