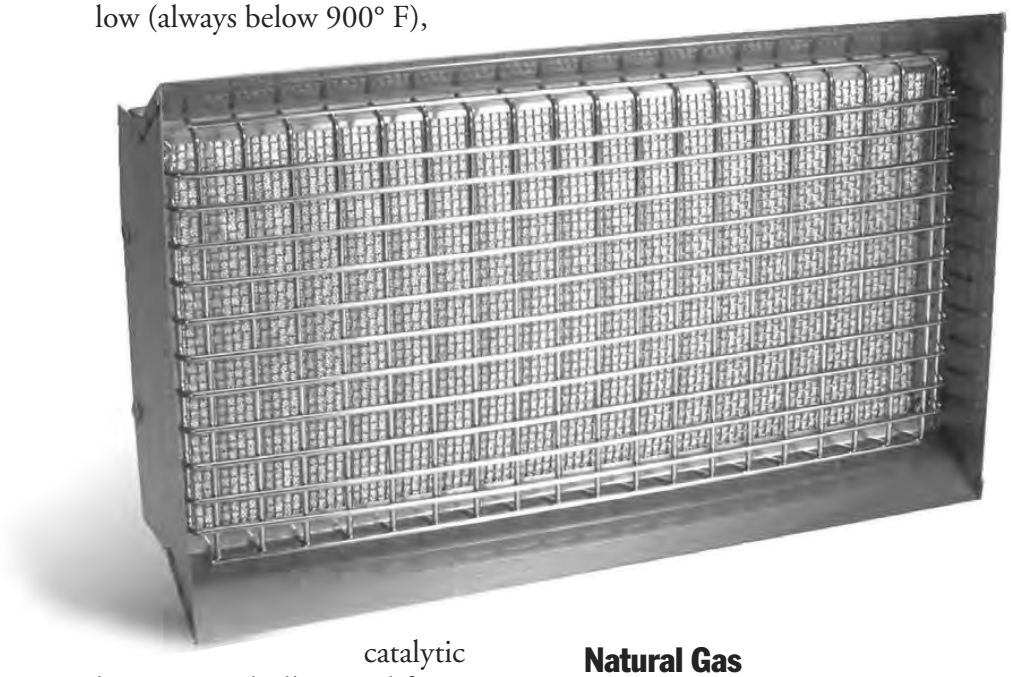
CATCO
CATALYTIC HEATER COMPANY

CATALYTIC HEATERS

OVERVIEW

Catalytic heaters have been used in industrial applications since they were first introduced several decades ago. Using natural gas or propane, they produce flameless heat with most of the heat generated as radiant, infrared energy. Since the maximum operating temperature is relatively low (always below 900° F),



catalytic heaters are ideally suited for use in many hazardous environments.

Since 1982, Catalytic Heater Company has produced **CATCO** catalytic heaters for wide variety of industrial applications. Some of these applications include:

Space Heating:

Catalytic heaters produce very efficient infrared heat for such locations as personnel work areas, hazardous classified areas and equipment storage areas.

Oven and Process Operations:

Catalytic heaters provide an excellent source of radiant heat for paint curing, powder coating, drying, and other process applications.

Natural Gas Regulation and Measurement:

Catalytic heaters are used to prevent freezing and hydrate formation, problems common in regulation and measurement equipment when gas pressures fluctuate. In these applications catalytic heaters are usually mounted to direct radiant heat directly at the problem area. There are **CATCO** enclosures available to mount heaters onto any valve or regulator.

Gas Pre-heating:

Heat exchanger units incorporating catalytic heaters may be used to pre-heat a gas stream, preventing freezing and hydrate formation downstream.

ADVANTAGES OF CATALYTIC HEAT

Catalytic heaters have many advantages over other types of heating. The heat produced is in the form of radiant energy and may be directed to the object requiring heat. Only the object is heated and not the surrounding air.

Simplicity and Durability

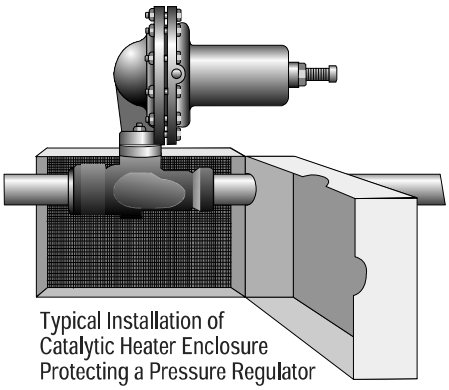
Catalytic heaters have no moving parts to wear out. The catalyst is not consumed during the heating process. Heaters will continue to operate indefinitely, with no maintenance, as long as clean fuel is supplied.

Safety

The surface temperature of the catalytic heater is approximately 700° F, much lower than an open flame (approximately 1300° F, the ignition temperature of natural gas). **CATCO** Catalytic heaters are approved by Factory Mutual and the Canadian Gas Association for operation in hazardous environments. They are a proven, safe substitute for indirect heating applications such as steam tracing and convection heating.

Ease of Installation

Installation is limited to connecting to a suitable gas supply. Heaters may be started using either DC or AC power, making them ideal heating sources for remote locations where electrical power is limited or not available. For natural gas fired heaters, fuel gas is usually readily available on site.



Typical Installation of
Catalytic Heater Enclosure
Protecting a Pressure Regulator

PRINCIPLES OF OPERATION

Best protection in hazardous areas where heat is required without flame

Simply stated, catalytic heating is brought about by using a catalyst to promote the reaction of combustible gasses with oxygen or air, at a much slower rate, to produce heat without flame. When the temperature of the catalyst pad is elevated to 250 F° the combustible gas will burn at a temperature in the range of 600 - 800 F° (Table 1). This is far below the 1200 - 1300 F° ignition point of natural gas. The result is a flameless heat that can be safely put to use in areas where hazards due to explosive vapors may exist. A catalytic heater can operate efficiently on low cost natural gas, propane or butane.

Catalytic heaters produce radiant heat which can be focused on a particular area or object. Radiant heat, like light, is electromagnetic wave energy and travels in straight lines at 186,000 miles per second. Like light energy it can cast shadows, be transmitted, absorbed or reflected by matter, and be focused or dispersed by lenses or prisms of the proper material.

The intensity of heat energy varies with the square of the distance as does light. It will travel any distance without loss as long as it does not contact matter which absorbs it.

The absorption of radiant energy by various materials is a specific property of each material. Thus, each molecular substance has an infrared absorption spectrum that is a fingerprint of that substance. Since the absorption of radiant heat is highly selective, there are opportunities for a wide variety of applications in industry.

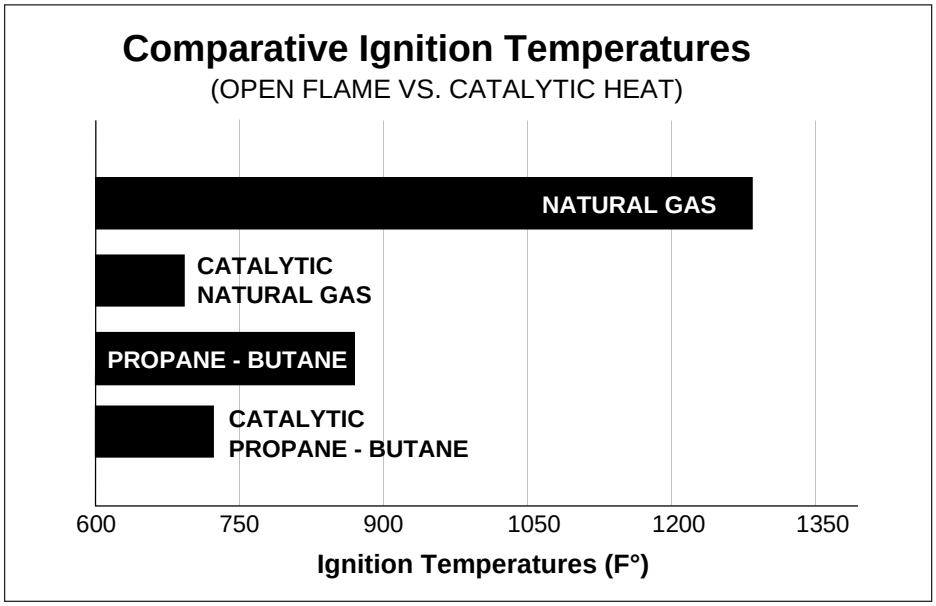


Table 1

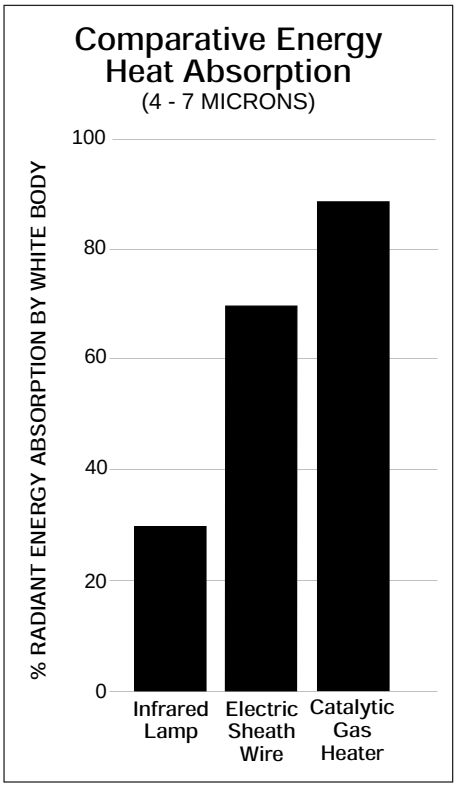


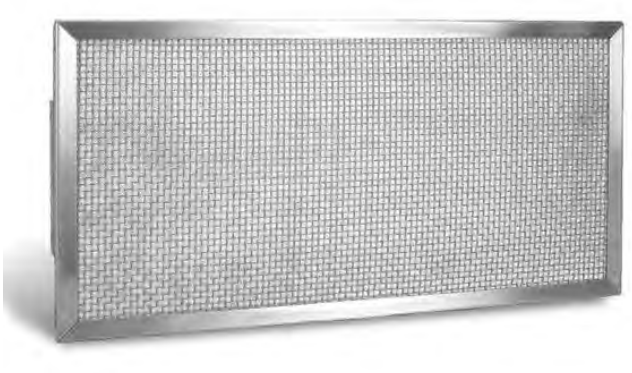
Table 2

In addition, the infrared energy emitted by catalytic heaters is in the lower end of the spectrum which means that nearly all of the energy produced is in the form of usable heat (Table 2). Because of these characteristics, catalytic heaters are highly effective when heating specific objects such as valves and regulators.

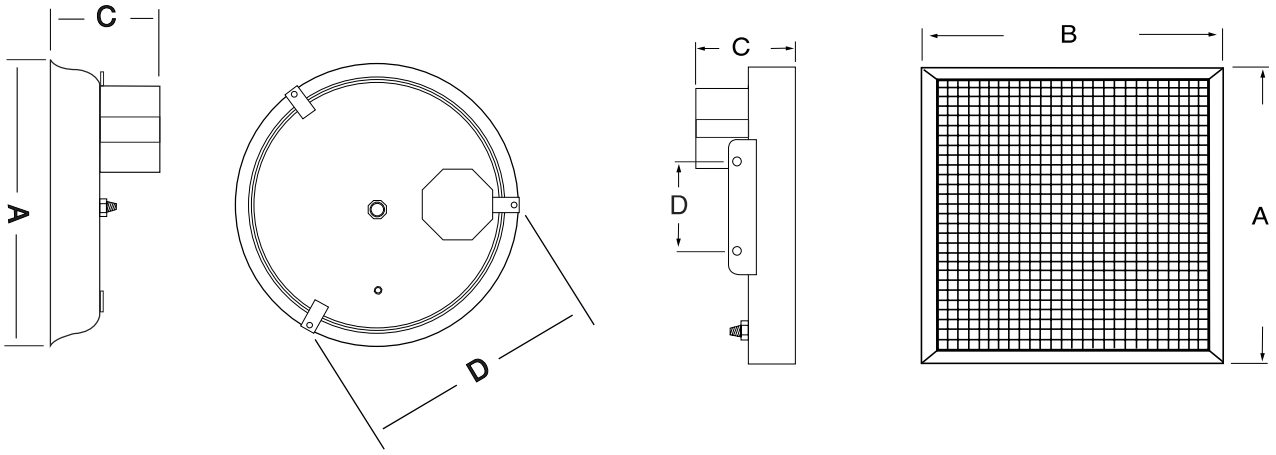
While other forms of heat often waste energy by heating the surrounding air and other objects in the vicinity, catalytic heaters heat only the objects they are directed at. Obviously, this provides greater efficiency, allowing smaller heaters to be used, lowering initial cost and fuel consumption.

Available Models

Model 8 RD & 12 RD heaters



Model 1224 heater



Typical Catalytic Heater

Specifications

Model		8RD	12RD	66	88	612	1012	624	1212	1224	1236	1836	1248	1848	1260	1860	2448	2460
Nominal Size (Inches)		8Diam	12Diam	6X6	8X8	6X12	10X12	6X24	12X12	12X24	12X36	18X36	12X48	18X48	12X60	18X60	24X48	24X60
BTU/hr. Input		2500	5000	1500	2667	3000	5000	6000	6000	12000	18000	27000	24000	36000	30000	45000	48000	60000
Gas Consumption Cu Ft/hr		2.5	5.0	1.5	2.7	3.0	5.0	6.0	6.0	12.0	18.0	12.0	24.0	36.0	30.0	45.0	48.0	60.0
Starting Amps	12V	5.0	5.0	5.0	5.0	8.3	8.3	15.0	8.3	16.6	25.0	30.0	30.0	N/A	N/A	N/A	N/A	N/A
	120V	0.5	0.5	0.5	0.5	0.83	0.83	1.5	0.83	1.67	2.5	2.5	3.75	3.75	3.75	3.75	8.33	8.33
	240V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.83	1.25	1.25	1.87	1.87	1.87	1.87	4.16	4.16
Approx. Weight (lbs.)		4	5	5	5	7	8	10	10	15	20	30	30	40	40	45	45	60
Dimensions (Inches) with standard junction box	A	8 1/2	12	7 1/4	9 1/4	6 1/8	10 1/8	6 1/8	12 1/8	12 1/4	12 1/8	18 1/4	12 1/4	18 1/4	12 1/4	18 1/4	24 1/4	24 1/4
	B	N/A	N/A	6 1/8	8 1/8	12 1/8	13 1/4	24 1/8	12 1/8	24 1/8	36 1/8	36 1/8	48 1/8	48 1/8	60 1/8	60 1/8	48 1/8	60 1/8
	C	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4
	D	6 1/2	10	4 1/2	4 1/2	5	4 1/2	5	5	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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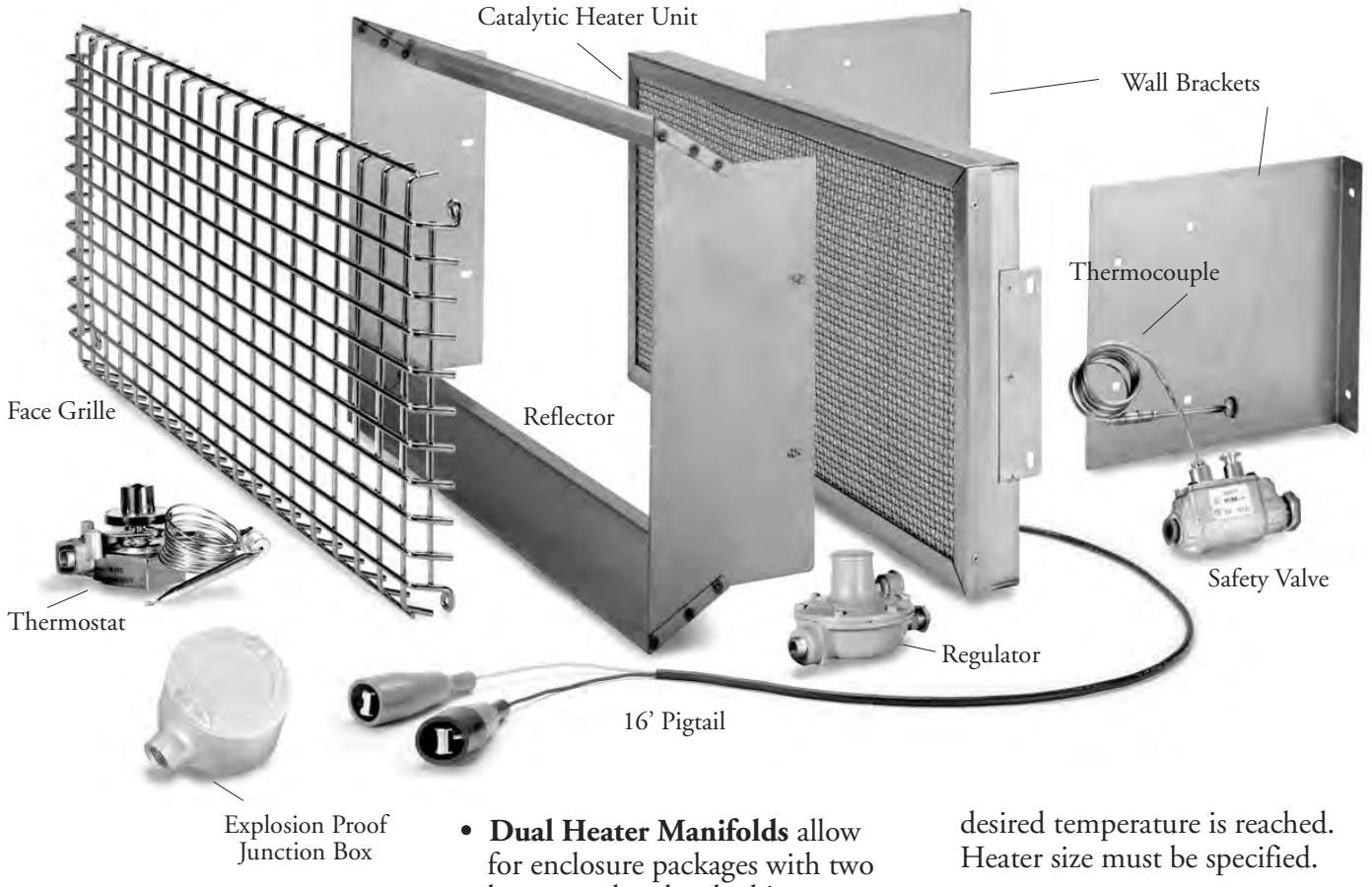
ACCESSORIES AND PARTS *For CATCO Catalytic Heaters*

GENERAL DESCRIPTION

CATCO provides various parts and accessories for use with catalytic heaters. All parts and accessories are designed to enhance the effectiveness and, in some cases, the safe operation of catalytic heaters.

Definitions and Explanations

- **Wall Brackets** are used to mount a heater directly to a wall or bulkhead.
- **Pigtails** are used to make heater startups easier by having a "built in" power cable. 12 volt pigtails are equipped with battery clamp ends, while 120 volt pigtails are equipped with a standard 3 prong male wall plug.
- **Thermocouples** operate in conjunction with the safety valves. If the heater stops operating, the thermocouple allows the safety valve to close.
- **Turndown Valves** allow for manual reduction of heater output by 50%. Heater size must be specified.
- **Thermostats** automatically reduce heater output by 50% when the desired temperature is reached. Heater size must be specified.
- **Reflectors** help to direct radiant heat.



Availability

Most parts and accessories are kept in stock and can usually be shipped same or next day.

- **Dual Heater Manifolds** allow for enclosure packages with two heaters to be plumbed into one regulator.
- **Safety Valves** shut off the gas supply to the heater, should the heaters stop operating.

Accessories

WALL BRACKETS

Part No.	Description
10-005	For 66, 88, 1012 Heaters, Pair
10-010	For 1212, 624, 1224 Heaters, Pair
10-011	For 1230, 1246 Heaters, Pair
10-015	For 1836, 1848, 1560 Heaters, Pair
10-017	For 2448, 2460 Heaters, Pair


Wall Brackets (Pr.)

ELECTRICAL ACCESSORIES

Part No.	Description
20-005	Explosion Proof Junction Box, Single 1/2" NPT Outlet
20-006	Explosion Proof Junction Box, Dual 1/2" NPT Outlet
20-010	Explosion Proof Junction Box, Single 3/4" NPT Outlet
20-020	16' Pigtail, 14-2 Cord, for Standard Junction Box, 12V Heater
20-021	16' Pigtail, 14-2 Cord, for Explosion Proof Junction Box, 12V Heater
20-022	16' Pigtail, 14-2 Cord, for Standard Junction Box, 120V Heater
20-023	16' Pigtail, 14-2 Cord, for Explosion Proof Junction Box, 120V Heater
20-027	16' Pigtail, 8-3 Cord, for Explosion Proof Junction Box, 12/120V Heater


Explosion Proof Junction Box


16' Pigtail

REGULATORS AND MANIFOLDS

Part No.	Description
50-005	Fisher 912/194, 250 psi inlet, 4.5" WC out, 1/4" NPT Connection
50-010	Fisher 912/194, 250 psi inlet, 11" WC out, 1/4" NPT Connection
50-015	Fisher 532, 250 psi inlet, 4.5" WC out, 1/2" NPT Connection
50-016	Fisher 532, 250 psi inlet, 11" WC out, 1/2" NPT Connection
50-025	Fisher 67, 250 psi inlet, 1/4" NPT Connection
50-030	Fisher 67 AFR, 250 psi inlet, 1/4" NPT Connection
50-035	MECO Type P, 6000 psi inlet, 1/4" NPT Connection
50-040	Fisher 1301F, 6000 psi inlet, 1/4" NPT Connection
55-010ST	Dual Heater Manifold, Steel Fittings, With Fisher 912/194 Regulator
55-010SS	Dual Heater Manifold, SS Fittings, With Fisher 912/194 Regulator


Thermocouple

Safety Valve

VALVES AND THERMOSTATS

Part No.	Description
30-006	Safety Valve (Replacement Part)
30-010	Thermocouple (Replacement Part)
30-030	Turndown Valve, 1/4" NPT Connection (specify heater size)
30-035	Ball Valve, Bronze, 1/4" NPT Connection
30-035SS	Ball Valve, Stainless Steel, 1/4" NPT Connection
30-050	Check Valve, Brass, 50 psi (relief valve)
30-050SS	Relief Valve, SS, NUPRO, 50 psi
40-005	Thermostat, Honeywell, 1/4" NPT, 60-100 F° (specify heater size)
40-010	Thermostat, Honeywell, 1/2" NPT, 60-100 F° (specify heater size)
40-020	Thermostat, Honeywell, 1" NPT, 60-100 F° (specify heater size)
40-030	Thermostat, Robertshaw, 1/4" NPT, 60-250 F° (specify heater size)


Regulator


Thermostat

FACE GRILLES AND REFLECTORS

Part No.	Description
60-001	Face Grille, 624 Heater
60-002	Face Grille, 1212 Heater
60-003	Face Grille, 1224 Heater
60-004	Face Grille, 1236 Heater
60-005	Face Grille, 1248 Heater
60-006	Face Grille, 2448 Heater
60-007	Face Grille, 1836 Heater
60-008	60-009 Face Grille, 612 Heater
61-020SS	Reflector, 624 Heater
60-021SS	Reflector, 1212 Heater
61-022SS	Reflector, 1224 Heater
61-023SS	Reflector, 1236 Heater
61-024SS	Reflector, 1248 Heater
61-030SS	Reflector, 2460 Heater


Reflector

Face Grille

A&P 1M 397