



GREEN
FUEL
CATALYST

Installation Manual

Fuel Catalyst FHD5-NG to FHD180-NG

For Natural Gas and Propane Powered Systems

Made in USA



Patented Fitch® fuel catalyst technology

Contents

1. INTRODUCTION	3
1.1. About.....	3
1.2. Intended Use.....	3
1.3. Approvals and Certification.....	3
1.4. Disposal.....	3
2. SAFETY	3
2.1. Fire Protection.....	3
2.2. Safety Equipment.....	3
2.3. Qualified Personnel.....	4
2.4. Warning.....	4
3. GENERAL EQUIPMENT INFORMATION	5
3.1. Technical Specification.....	5
3.2. Maximum Fuel Flow Rate per Catalyst Model.....	5
3.3. Common Catalyst Models, Dimensions, and Weights.....	6
3.4. Catalyst Sample Drawing.....	6
4. INSTALLATION	7
4.1. Pre-Installation Procedure.....	7
4.2. Mounting Location.....	7
4.3. Unpacking.....	7
4.4. Installation Procedure.....	7
4.5. Testing the Catalyst Efficiency.....	7
4.5.1. Key Performance Indicators.....	7
4.5.2. Typical Adjustments.....	7
4.5.3. Typical Adjustments for Commercial Boiler Applications.....	8
4.6. Sample Installation Drawing with Bypass Line.....	8
4.7. Post Installation Checklist.....	8
5. OPERATION AND SERVICE	9
6. Appendix	10
6.1. Material Safety Data Sheet.....	10
• To be supplied with equipment.....	10
6.2. Symbols, Abbreviations and Convention.....	11
7. IMPORTANT NOTES	12

1. INTRODUCTION

1.1. About

Patented Fitch® catalyst technology consists of a Heterogeneous Metallic Alloy Composition (HMAC) which reduces activation energy of the chemical combustion reactions. Catalyst reverses the naturally occurring hydrocarbon fuel biodegradation (Oxidation-Reduction) process by inducing selective hydrogen abstraction and redistribution (Hydrogenation) that promotes selective Oxidation (formation of Alcohols, Aldehydes). Catalyst interacts with natural gas enhancing oxygenation (burning), and in the process is converting the non-methane components into molecules with more oxygen and hydrogen that burn much faster, and cleaner.

1.2. Intended Use

Fuel catalyst is a permanent fuel treatment that reforms fuel (natural gas or propane), creating a more combustible, clean burning product. Catalyst can be incorporated into an Existing Fuel System. Catalyst provides at least 2% fuel consumption reduction

Catalyst has no moving parts, no additives, no magnets, no electrical hook-ups, and does not require any maintenance, lasting for 20,000 operating hours.

1.3. Approvals and Certification

Manufacturers Declaration of conformity according to PED 2014/68/EU Annex II – Table 1 for flammable gases and Table 3 for flammable liquids standards.

1.4. Disposal

To see the catalyst chemical composition, please go to section 6.1 (material safety data sheet). Dispose catalyst in accordance with your local currently valid rules.

2. SAFETY

Catalyst installation into gas system is simple. All that is required, is to have a few hand tools and close following to the instruction manual guide. However, it is essential to do the installation carefully and safely. We recommend that you read the next few lines with the greatest attention.

2.1. Fire Protection

Every installation must conform to local and/or provincial and/or international piping and fire codes.

2.2. Safety Equipment

During the installation make sure that involved personnel is properly protected, and is wearing PPE (personal protective equipment) such as, but not limited to, protective clothing, helmet, safety shoes, goggles, welding shield, safety gloves. Check your material safety data sheet for any instructions or suggestions.

2.3. Qualified Personnel

Catalyst may only be installed, commissioned, operated and maintained by properly trained and authorized personnel. This document is provided to help you establish operating conditions, which will permit safe and efficient use of this product.

2.4. Warning

Ignoring safety rules risks creating a hazard to your health and to those around you!

3. GENERAL EQUIPMENT INFORMATION

Catalyst assembly is designed to meet the toughest hydrocarbon treatment conditions while providing maintenance personnel with an equipment that is easy to handle and maintain.

3.1. Technical Specification

- a. Schedule 40 Steel housing
- b. Available with NPT or straight for welding
- c. Available with nipple size to suit application (3/8", 3/4", 2", 3", 4", 6", 8", 10", and 12")
- d. Maximum allowable working pressure 350 PSI (24 Bar) at 300 °F (148 °C)
- e. Available with nipple size to suit application
- f. Pressure drop: 1.5 PSI (0.10 Bar)
- g. Acrylic yellow paint
- h. Fuel: Natural gas or Propane only
- i. 20,000 operating hours design
- j. Product is made to customer specification

3.2. Maximum Fuel Flow Rate per Catalyst Model

Catalyst model	Natural gas Nm ³ /h	Propane Liter/h	Catalyst model	Natural gas Nm ³ /h	Propane Liter/h
HO50-5 NG	134	192	FHD70-10 NG	11232	16153
HO75-5 NG	201	288	FHD80-10 NG	12837	18461
HO100-5 NG	267	385	FHD90-10 NG	14441	20769
FHD5-6 NG	802	1154	FHD100-10 NG	16046	23076
FHD10 -6 NG	1605	2308	FHD110-10 NG	17651	25384
FHD15-6 NG	2407	3461	FHD120-10 NG	19255	27692
FHD20-6 NG	3209	4615	FHD130-10 NG	20860	29999
FHD25-6 NG	402	5769	FHD140-10 NG	22465	32307
FHD30-10 NG	4814	6923	FHD150-10 NG	24069	34614
FHD40-10 NG	6418	9231	FHD160-10 NG	25674	36922
FHD50-10 NG	8023	11538	FHD170-10 NG	28883	41537
FHD60-10 NG	9628	13846	FHD180-10 NG	32092	46153

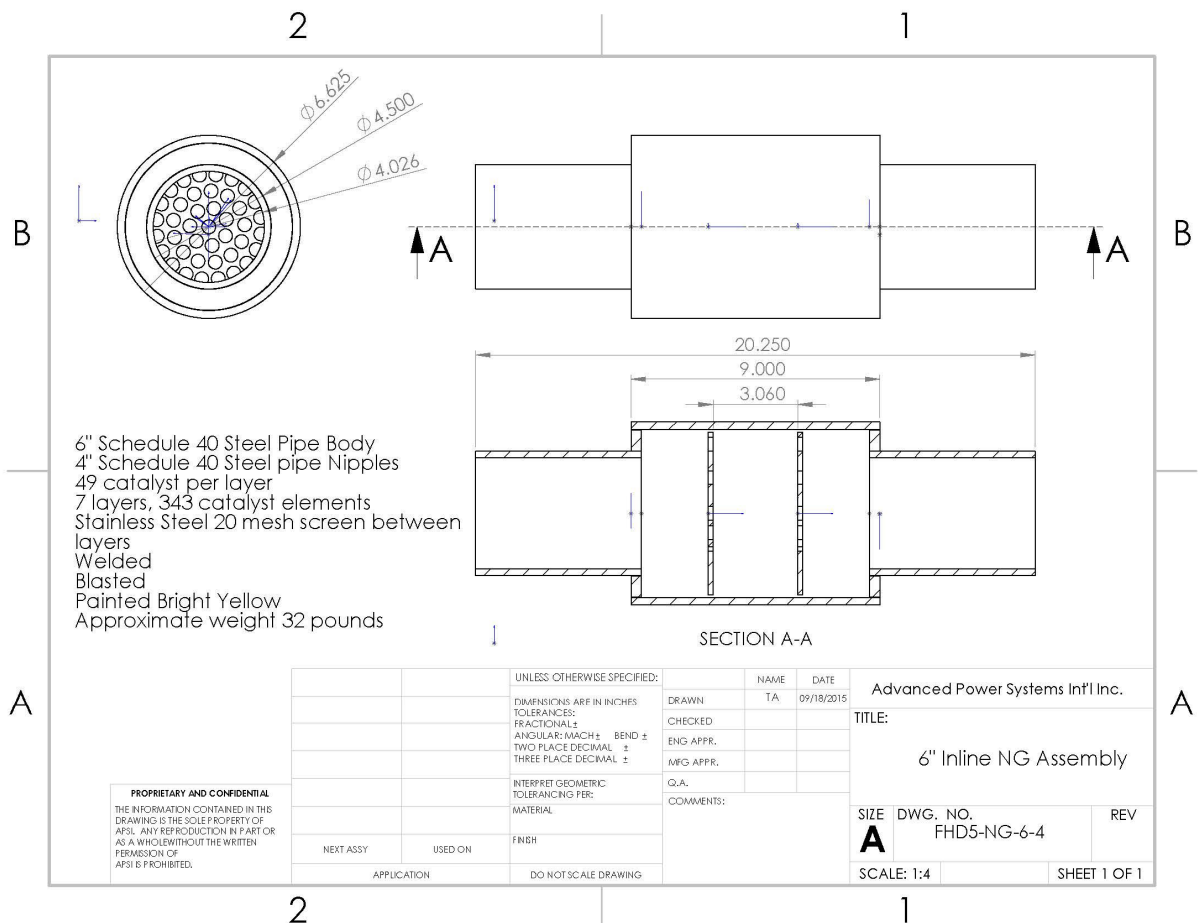
3.3. Common Catalyst Models, Dimensions, and Weights

Catalyst model	Diameter Inches	Length Inches	XX Nipple size Inches	Weight LBS
HO50-5-xxNG	5	13.5	2/3/4	19
HO75-5-xxNG	5	14.6	2/3/4	23
HO100-5-xxNG	5	15.6	2/3/4	28
FHD5-6-xxNG	6	19	2/3/4	32
FHD10-6-xxNG	6	23.5	2/3/4	50
FHD15-6-xxNG	6	25	2/3/4	75
FHD20-6-xxNG	6	29	2/3/4	140
FHD25-6-xxNG	6	29.5	2/3/4	147
FHD30-10-xxNG	10	32.5	2/3/4/6	158

Note:

Estimated wet weight may vary, due to different fuel physical characteristics. Also, the amount of catalyst elements inside the core may slightly vary.

3.4. Catalyst Sample Drawing



4. INSTALLATION

Take all necessary precautions when installing in gas fired systems.

4.1. Pre-Installation Procedure

Clean the boiler then establish a baseline. Measure the exhaust gas composition and combustion efficiency and ensure the system is functioning to the burner manufacturer's recommendation before installing the catalyst.

4.2. Mounting Location

Locate a suitable location in the gas supply line. We recommend to install the catalyst into the gas supply line as close as possible to the application (burner/furnace/engine etc.), but not exceeding 20 m from the application. Always install the catalyst with an optional bypass valve to ensure easy replacement, handling and servicing. Catalyst can be installed horizontally or vertically.

4.3. Unpacking

Unpack the fuel catalyst and discard any shipping materials.

4.4. Installation Procedure

Install the catalyst at the selected location in compliance with building/piping codes. We recommend to equip the catalyst unit with support legs in order to avoid unnecessary stress to the piping connections. If the catalyst unit is installed in the low-pressure side, adjustment of the pressure regulator might be needed to get the necessary gas pressure, due to pressure drop from the catalyst unit.

4.5. Testing the Catalyst Efficiency

Once the catalyst is installed, check for leaks and let the burner run at 100 percent for approx. 48 hours. Then take new exhaust gas and combustion efficiency measurements and compare them with the baseline data. After at least 120 Hours or 1 week in operation, make the necessary adjustments to bring the burner to manufacturer's recommendation and maximum combustion efficiency. Compare the new efficiency results with the baseline data.

4.5.1. Key Performance Indicators

- | | |
|----------------------|-----------------------------------|
| a. Stack temperature | g. Excess air |
| b. O ₂ | h. Efficiency |
| c. CO | i. Particulate |
| d. CO ₂ | j. Fuel Flow |
| e. NO _x | k. Produced energy |
| f. SO _x | l. Other indicators as applicable |

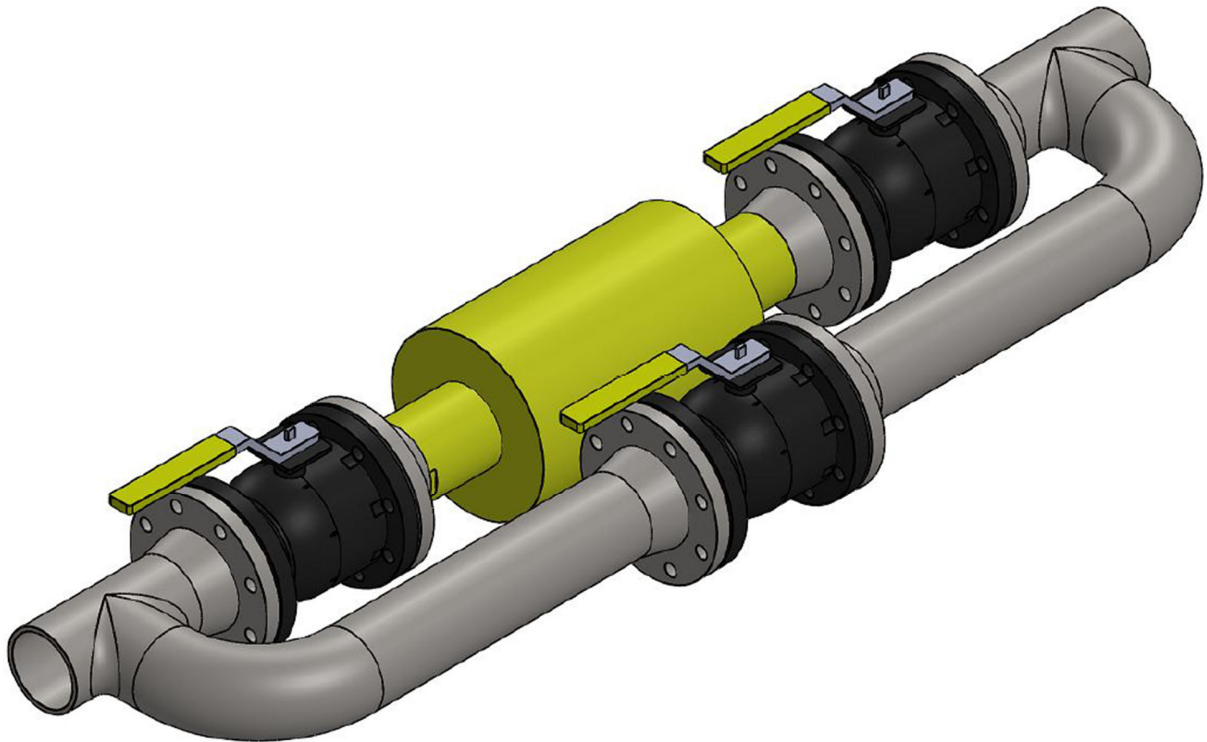
4.5.2. Typical Adjustments

- For pressure systems reduce pump pressure and the nozzle size to reduce gas flow and stack temperature.
- For air atomizing systems adjust modulation to reduce gas flow and stack temperature.
- Adjust for optimal stack temperature, minimal soot and minimal CO.
- Change air flow to optimum excess air.

4.5.3. Typical Adjustments for Commercial Boiler Applications

- a. Take a new exhaust gas and combustion efficiency measurement.
- b. Make the necessary adjustments to bring the burner to manufacturers recommended reading.

4.6. Sample Installation Drawing with Bypass Line



4.7. Post Installation Checklist

Check for properly secured inlet and outlet connections. Check for properly installed bypass valves if applicable. Check for broken or damaged piping, if found, repair or replace immediately. Check for leaks.

5. OPERATION AND SERVICE

Green Fuel Catalysts for natural gas and propane systems has no moving parts, no additives, no magnets, no electrical hook-ups, and is maintenance free.

The Green Fuel Catalyst device is guaranteed to be free from defects in material and workmanship for a period of 20,000 operating hours from the date of installation.

6. Appendix

6.1. Material Safety Data Sheet

- To be supplied with equipment

6.2. Symbols, Abbreviations and Convention

°C	Degrees Celsius
°F	Degrees Fahrenheit
ASME	American Society of Mechanical Engineers
CU.	Cubic
EU	European Union
FT.	Feet
GFC	Green Fuel Catalyst
HMAC	Heterogeneous Metallic Alloy Composition
Kgf	kilogram-force
LBS	Pound
LPM	Liters Per Minute
M.	meter
MAWP	Maximum allowable working pressure
MAX.	Maximum
MIN.	Minimum
MSDS	Material Safety Data Sheet
nom.	nominal
PED	Pressurized equipment directive
PSI	Pound per Square Inch
Temp.	Temperature
Thk.	thickness

7. IMPORTANT NOTES

For any questions, please contact your local distributor.

Any variations from these instructions should also be pre-approved by manufacturer.

info@greenfuelcatalyst.com

Copyright © 2020 Green Fuel Catalyst Inducont Ltd. All rights reserved