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Installation, Operation, & Maintenance
Manual Model 7622
Flame Check



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1. General Information

Introduction:

Groth Biogas's flame checks are designed to inhibit flame propagation in gas piping systems and to protect low pressure tanks containing flammable liquids. They protect low flash point liquids from externally caused sources of heat and ignition, providing increased fire protection and safety.

The flame check products consist of two main components, the arrester body and the flame element. The body serves as the connecting interface to the piping system. In the event that a flame front is traveling through the pipe, the flame element is instrumental in stopping the flame passage. The geometry of the flame element absorbs the heat from the vapor flow, cooling the vapor to prevent auto-ignition on the protected side.

The flame element is comprised of small wafers of wire mesh and perforated plates aligned so that an approaching flame front is slowed down and then quenched before it can propagate to the protected side of the device. The small perforated wafers layered with wire mesh are used to promote heat absorption and turbulence and are constructed of corrosion resistant materials. The assembly as a whole, is also engineered for minimum pressure drop.

A flame arrester should be treated as a safety device and maintained by a knowledgeable repair technician. Carefully read and understand this manual before installing or servicing this product.

Applications:

The Groth Model 7622 Flame Check is used in many applications in the Biogas Industry. Below are the most common. Please contact Groth Biogas for questions related to equipment usage.

- Vent lines on any pressure or vacuum lines to atmosphere to protect upstream fuel. Often used with below Groth Biogas items
 - PVRVs
 - Back Pressure Regulators (Groth Biogas Model 8860s and 8400)
 - Any other venting or breathing equipment not manufactured by Groth Biogas
- Any pilot gas lines for Waste Gas Burners, Boilers, or any direct ignition source (Natural Gas or Propane)
 - Waste Gas Burners (Groth Biogas Model 8391 and 8392)
 - Any other equipment providing a pilot gas for ignition

For information not contained in this manual, please contact:

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2. Inspection and Installation

All Groth Biogas' flame checks are bi-directional and the installation on a tank or piping system depends to a great extent on the design of the system. Groth model 7622B flame check may be installed in any orientation (horizontal, vertical, etc.). This product is used in gas lines where flow can be easily shut off. They are normally supplied with either threaded or flanged connections. As with any new equipment, prior to installation, an inspection should be made to ensure all thread protectors and packing materials are removed. Also inspect the unit to ensure the unit is not damaged due to rough handling during shipment or job site accident. All connections should be tight.

Note: This series of flame arresters has ANSI FNPT threaded connections or can be coupled with ANSI 150#, PN 10 OR PN 16 flanges. Each unit is pneumatically leak tested to 15 PSIG at the factory.

The following application guidelines should be observed at installation:

TABLE 1: Flame Check Application Guidelines

FNPT Size	Gas Type (IEC) *	Gas Group *	Max Run Up Length (Pipe diameters = L/D)	Max Pre-Ignition Pressure (PSIA)
½"	IIA or IIB3	D or C	50 (25")	23.2
¾"	IIA or IIB3	D or C	50 (37.5")	23.2
1"	IIA or IIB3	D or C	50 (50")	23.2
1 ½"	IIA or IIB3	D or C	50 (75")	23.2
2"	IIA or IIB3	D or C	50 (100")	23.2

**Methane Gas Type (IEC) and Gas Group are IIA and D respectively. Propane is also IIA and D.*

Note: Groth Biogas' flame arresters have been tested by a 3rd party ATEX approved test facility. This device is considered an integral part of a "Shut Down Operation" system and is therefore not designed for stabilized burn.

1. Remove any flange protectors and discard all packing material. Inspect flange faces and flame element for damage or contamination.
2. If flange option is used, Inspect the gasket seating surface of the tank nozzle or piping. It must be clean, flat, free of scratches, corrosion and tool marks.
3. Teflon tape is recommended for installation due to the possible clogging of the flame element when pipe sealant or paste is used.
4. Set the arrester between the mating pipe or flanges and ensure there will not be too much stress on the flame check body.
5. Make up the final torque and check that all connections are tight and that the body of the flame check is secure as well.

WARNING: After installation, all connections should be inspected for vapor leakage. This may be accomplished by static pressure test, gas detector, or "bubble" test using a liquid leak detector.

3. Operation

The main operational goal of the Groth Model 7622 Flame Check is to protect deflagration flames from propagating in any biogas piping in smaller pipes (1/2" – 2") to protect the upstream equipment and digesters. To ensure effective operation following the Installation and Maintenance sections of this document are critical.

4. Maintenance

For maximum operating efficiency, the element of a flame arrester must be inspected for clogging at regular intervals. Frequency of inspection and maintenance should be based on the experience gained in each application. For servicing this unit, the flame check should be removed from the line. It is recommended that the arrester be removed for inspection of the element at least once per year or any time that one of the following conditions occurs:

- Excessive pressure drop is encountered at a known flow rate.
 - A flame front is detected.
1. Purge the line or tank with an inert gas before attempting to remove the arrester for maintenance.

CAUTION: The connecting pipeline must be free of all hazardous or flammable vapors before inspection procedures begin. Before disassembling consult Material Safety Data Sheets (MSDS) for all products that were exposed to in service. The components should be cleaned according to MSDS procedures. Take appropriate safety precautions regarding eye protection, skin contact & respiration.

2. Refer to Fig. 1 which illustrates a typical flame check element assembly.

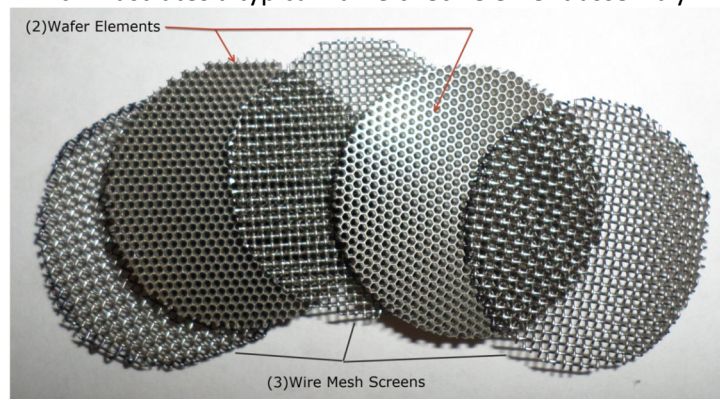


FIGURE 1 - TYPICAL MODEL 7622 FLAME CHECK ELEMENT

3. Loosen the piping connections and withdraw the FULL housing.

WARNING: Failure to replace a damaged or clogged flame element can render the flame arrester ineffective

WARNING: The full housing must be removed from the line because the wafers will tend

to come out of alignment and cause the unit to lose its seal and become ineffective if the housing is separated in the horizontal position.

WARNING: Be sure not to lose any of the internal components when inspecting or cleaning. Components may be easy to drop and be located. It is recommended to have spare internal components for each unit on site.

4. Verify that the element openings are not clogged by viewing a light source through the element passages. If the flame element is dirty or clogged it can be cleaned by one of the following methods:
 - a. Compressed air
 - b. High pressure steam or water purge
 - c. Solvent wash followed by compressed air

WARNING: Never try to clean the element by inserting a sharp tool or probe into the orifices. Any damage to the integrity of these passages can render the flame arrester ineffective.

CAUTION: If compressed air, steam, or high pressure water jet is used to clean clogged element passageways, restrict access to the area to prevent injury from blown debris exiting the element. Use appropriate personal safety equipment for the cleaning method used.

TIP: The best method of cleaning and frequency should be based on the experience gained in each application.

5. Inspect the sealing gasket for damage and replace if necessary. (See Table 2 for replacement kit part numbers.)
6. Install a gasket in the counter bore of the coupling. Position the element housing to align with the counter bore. Make sure the flame elements are centered while the coupling halves are screwed together. **Improper alignment of the element wafers during the reassembly process may render the unit ineffective at stopping the flame and could cause a leak path.**
7. If the arrester is in high temperature service or stainless steel mating components are used, apply an anti-seize compound such as moly-disulfide to the threaded connections. Use this anti-seize sparingly and do not allow excess compound to clog the flame bank.
8. Make up the final torque and check that all connections are tight and that the flame check body is secure.

5. Spare Parts

Flame Bank Kits (KFBs) are recommended by Groth Biogas for any 7622 Flame Check that is on site. Please contact sales@grothbiogas.com for pricing and availability. Each KFB includes the flame arrester elements (3 – wire mesh screens & 2 – wafer elements) as well as one non-asbestos gasket. Kit P/Ns are shown below based on the size of the Flame Check.

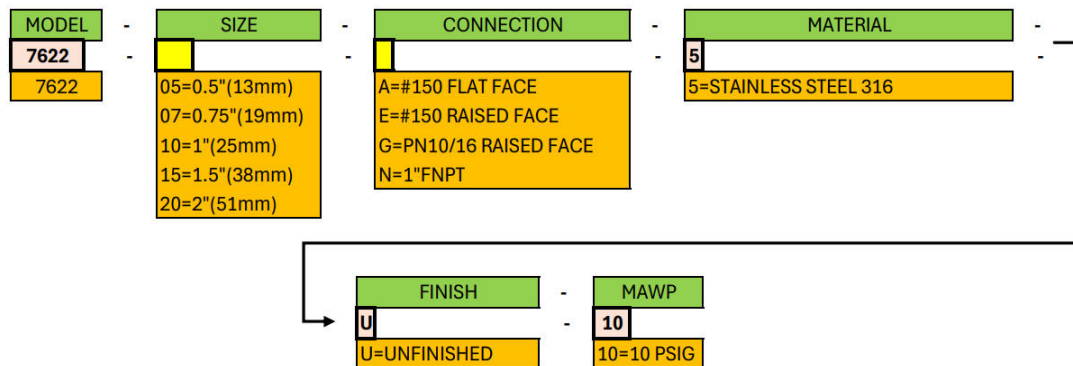
Table 2 – Flame Bank Kits (Spare Parts Kits for 7622 Flame Check)

Size	Element Material	Gas Group (NEC/ATEX)	Kit P/N
1/2"	316 SS	D Gas / IIA	KFB7622055
3/4"	316 SS	D Gas / IIA	KFB7622755
1"	316 SS	D Gas / IIA	KFB7622015
1 1/2"	316 SS	D Gas / IIA	KFB7622
2"	316 SS	D Gas / IIA	KFB7622

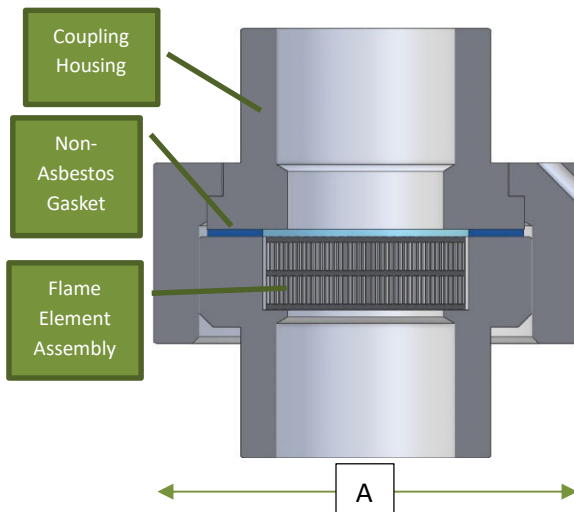
To ensure the appropriate kit for the application, please contact Groth Biogas with the existing equipment's Serial Number, Model Number, Size, and Gas Group. If not a biogas project, we can connect you with Groth Corporation to better address the application.

6. Model Number Identification

Please contact Groth Biogas with any questions about Model Number ID and equipment details.



7. General Arrangement Drawing



Size FNPT – Inch (mm)	A – Width Inch (mm)	B – Height Inch (mm)	Assembly Weight lbs (kg)
0.50 (13)	1.61 (40.1)	1.63 (41.4)	0.75 (0.34)
0.75 (19)	1.93 (49.0)	1.85 (47.0)	1.07 (0.49)
1.00 (25)	2.28 (57.9)	1.97 (50.0)	1.54 (0.70)
1.50 (38)	3.01 (76.5)	2.28 (57.9)	3.16 (1.43)
2.00 (51)	3.62 (92.0)	2.48 (63.0)	5.00 (2.27)