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Models 8800 and 9900 Vent Stack Flame Arrestors

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WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Enardo vent stack flame arrestor must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations, and Emerson Process Management Regulator Technologies Tulsa, LLC instructions.

Failure to correct trouble could result in a hazardous condition. Call a qualified service person to service the unit. Installation, operation and maintenance procedures performed by unqualified person may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Only a qualified person shall install or service the vent stack flame arrestor.

Figure 1. *Model 8800 Vent Stack Flame Arrestor*

Figure 2. *Model 9900 Vent Stack Flame Arrestor*

Introduction

Scope of the Manual

This Instruction Manual provides instructions for installation and maintenance for the Models 8800 and 9900 vent stack flame arrestor.

D103835X012

Specifications

The Specifications section on this page provides specifications for the Models 8800 and 9900 vent stack flame arrestor. Specification is stamped on the nameplate attached to the flame arrestor.

Available Construction

See Figure 3

End Connection:

Models 8800 and 9900: Threaded

Model 9900: Raised Face (RF) or Flat Face (FF)

Inlet Connection Sizes

1 through 6 in. / 25 through 150 mm

NEC Gas Group

D

Housing Materials

Model 8800:

Aluminum

Model 9900:

Carbon Steel
304 Stainless steel
316 Stainless steel

Cell Materials

Aluminum
304 Stainless steel
316 Stainless steel

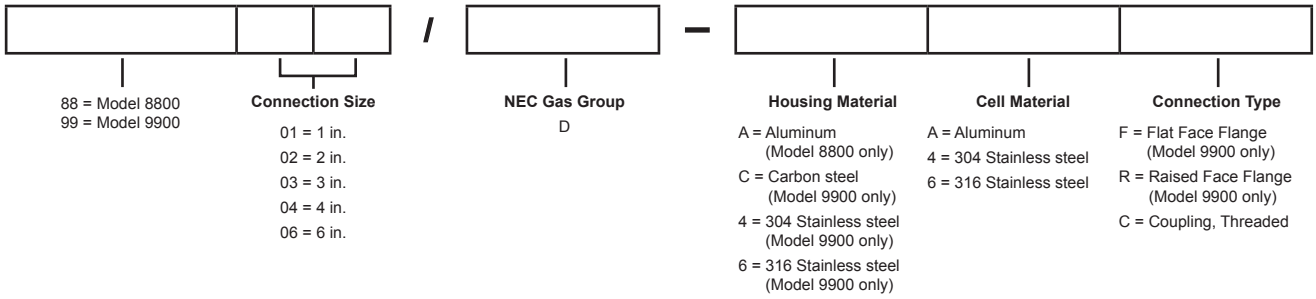

Figure 3. *Models 8800 and 9900 Vent Stack Flame Arrestor Model Number*

Table 1. *Models 8800 and 9900 Vent Stack Flame Arrestor Available Sizes*

MODEL	SIZES AVAILABLE
8800 9900	1 through 6 in. / 25 through 150 mm nominal pipe size

Table 2. *Construction Materials*

HOUSING	CELL	GAS GROUP
Aluminum Carbon steel 304 Stainless steel 316 Stainless steel	Aluminum 304 Stainless steel 316 Stainless steel	D

Table 3. *National Electrical Code (NEC) Gas Group and Maximum Experimental Safe Gap (MESG)*

NEC GAS GROUP	MESG, mm	TEST GAS
Group D	0.90	Propane
G.M.	1.12	Methane

Product Description

The vent stack flame arrestor is used to stop the propagation of confined and unconfined low pressure deflagrations. It prevents an ignited atmospheric vapor cloud from propagating beyond the flame arrestor into the vent line or tank.

Vent stack flame arrestor is installed at the top of an atmospheric vent line or storage tank. They are typically used for the end-of-line applications when the system operating pressure is near atmospheric level and when there is minimal probability of a flame stabilizing on the flame arrestor element for an extended period.

Vent stack flame arrestors allow free venting and flame protection for vertical vent applications. Threaded NPT connections allow removal of the flame cell element without the removal of the venting assembly. Available housing construction are aluminum, carbon steel and stainless steel. The element is available in aluminum or stainless steel.

Principle of Operation

Enardo vent stack flame arrestors are designed to allow free venting in combination with flame protection for vertical vent applications. They prevent flame propagation by absorbing and dissipating heat using spiral wound crimped ribbon flame cells. These cells allow maximum flow with maximum protection.

Table 4. *Models 8800 and 9900 Endurance Burn Time*

NEC GAS GROUP	MAXIMUM INITIAL PRESSURE, psia / kPa	ENDURANCE BURN TIME, Minutes
D	15.4 / 106	5

Factors Affecting Flame Arrestor Performance

Gas Group

WARNING

Methanol is classified by the NEC as a Group D vapor. However, our lab tests indicate that methanol exhibits characteristics unlike other Group D vapors under certain conditions. It is recommend that an arrestor rated for Group C vapors be specified for methanol service.

The type of gas in the system determines its gas grouping and therefore predetermines the type of arrestor element required. The element must be designed to accommodate the specific gas group that could possibly ignite and propagate in the system. The more explosive gases require the flame cell to absorb the heat more quickly and efficiently. The National Electrical Code (NEC) groups gases into A, B, C, D and G.M. categories depending on the Maximum Experimental Safe Gap (MESG) of the gas. Refer to Table 3 for the MESG for Group D.

Maximum Experimental Safe Gap (MESG)

WARNING

Verify that the flame arrestor being installed has the appropriate gas group rating for your process. This information is shown on the nameplate attached to the element housing. Do not remove or alter this nameplate.

MESG is the measurement of the maximum gap between two equatorial flanges on a metal sphere that will prevent a flame from being transmitted from the sphere to the surrounding flammable mixture. MESG is dependent on gas composition. The stochiometric mixture (the ideal air/fuel ratio for the most efficient combustion) is used to determine the minimum MESG for a given gas.

Maximum Initial Operating Pressure

Maximum initial operating pressure is the pressure of the system at or near static flow conditions. High pressure deflagrations can occur more easily at higher system operating pressures than at pressures near atmospheric. Elevated pressures condense the ignitable gas, giving the flame more matter and energy to release thereby boosting the flame heat intensity. Verify that your system pressure at or near static flow conditions does not exceed the maximum pressure shown on the arrestor's name tag.

Endurance Burn Time

CAUTION

Unlimited burning should not be allowed in any flame arrestor, regardless of its burn time rating. If burning can occur for a period exceeding two minutes starting at ambient temperature, install a temperature alarm and shutdown system.

Endurance burn time is the time it takes for a stabilized flame, at greatest heat saturation conditions, to heat the arrestor element above the auto-ignition temperature of the process gas stream resulting in flame propagation through the arrestor. Refer to Table 4 for the endurance burn time for Group D.

Installation

WARNING

Always make sure there is no ignitable gas that could flash when either installing or maintaining the unit.

No instrument, tubing or other device shall circumvent the flame arrestor in such a manner to allow a flame path to exist around the flame element of the arrestor. When instrumentation is installed in such a manner that it creates a path circumventing the flame element of an arrestor, measures must be taken to prevent passage of flame through the instrumentation device and/or system. Instrumentation must be capable of withstanding the maximum and minimum pressures and temperatures to which the device may be exposed.

Connections

Enardo flame arrestors are normally provided with optional connections including flanged and threaded couplings.

Standard compressed fiber gaskets that withstands temperatures of 450°F / 232°C are standard. Graphite gaskets with higher temperature ratings are available as options.

Piping Expansions and Reductions Adjacent to Flame Arrestors

An Enardo flame arrestor may be installed on any vapor vent line that is smaller than or equal to the nominal pipe diameter of the arrestor's connection flanges or couplings.

Maintenance

1. Keep the cell element clean to prevent loss of efficiency in absorbing heat. Clean the cell element to prevent the openings from becoming clogged with particulate matter.
2. Remove the vent stack flame arrestor from the pipe.
3. Loosen and remove the wing nut on top of the lid. Lift the lid from the unit.
4. Clean the element with a suitable solvent, then blow dry using compressed air.
5. Replace and tighten the wing nut. Replace the vent stack flame arrestor on the pipe.
6. Be careful not to damage or dent the cell openings as this would hamper the effectiveness of the unit. Do not clean the arrestor elements by rodding to remove blockages, as this practice could damage the elements and seriously impair the arrestor's performance. If the arrestor element cannot be cleaned satisfactorily, replace it.
7. The cleaning interval should be governed by the amount and type of particulate in the system to which it is installed and must be determined by the user. To determine the maintenance interval, check the element in the first few months of operation to find how quickly particulate accumulates in the cells.

Note

Under no circumstance should the element bank be disassembled from its shell for cleaning or replacement.

8. After cleaning, thoroughly inspect the element for damage. If damaged, replace it. Replace The element section as a complete assembly.

Recommended Spare Parts

For installations that require frequent maintenance and minimum downtime it is recommended that the user purchase a spare element assembly and several spare element gaskets. The spare element assembly can be installed immediately and the dirty assembly can then be cleaned and be stored as a spare for the next maintenance interval. Element gaskets should be replaced each time the cell assembly is loosened and removed to ensure a gas tight seal.

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