INSTALLATION & MAINTENANCE INSTRUCTIONS

Flame arresters and their replaceable elements are fitted with nameplates giving the following information:-
Also refer to figures '1' and '2' on page 4 - Nameplate general layouts.

- Full name, address, telephone and fax numbers of manufacturer.
- Model number of flame arrester/element.
- Serial number of flame arrester/element. This is traceable to the year of construction and must be quoted when requesting spare parts.
- Type of flame arrester/element. The specific marking of explosion protection and the gas group for which it may safely be used.
- The ATEX certificate number.
- Maximum operating pressure, operating temperature limits and maximum run up distance between the potential ignition source and the flame arrester.

Caution: Always ensure that the system is at atmospheric pressure and there is no ignitable vapour present that could flash when either installing or maintaining a unit.

Installation

1. It is essential that Elmac in-line deflagration flame arresters are only used in the application and with the gas group for which they were supplied (as stated within our written quotation). In particular, where a maximum distance for the location of a flame arrester from a possible ignition source has been specified in the quotation, then it is imperative that this distance is not exceeded on installation. The ratio of the pipe length between the potential ignition source and the flame arrester to the pipe diameter must not exceed 50:1 and at least 10% of the cross-sectional area of the pipe must be open at the potential ignition source. Materials of construction must be compatible with the gas mix and the environment in which the unit is to operate. This is particularly important if the flame arrester is to be used in corrosive applications. Contact the Elmac technical sales department for advice.

2. For in-line deflagration flame arresters correct positioning of the flame arrester is vital. It is determined not only by the configuration of the associated pipe work, but also by the volatility of the gas mix passing through. As a basic principle an in-line flame arrester should be located as close to the potential source of ignition as possible. As a flame progresses along a pipe it will usually accelerate and thus become more dangerous and difficult to extinguish. In cases where the pipe wall is rough, where there are any bends or changes in section or where there are any obstructions such as valves and the like, then it is to be expected that the flame will accelerate more rapidly than in a smooth walled straight pipe. More volatile gases will tend to permit the more rapid acceleration of the flame and a flame arrestor should only be used for the gas for which it is specified. In the event of any query please contact the Elmac technical sales department for advice.

3. Elmac flame arresters are not suitable for situations where continuous burning of a flame could stabilise on or near to the surface of the element. Under these circumstances it is strongly recommended that a temperature sensor is installed combined with a shutdown system to turn off the gas flow.

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4. Always ensure that the fixings available on the pipe work (e.g. flange type, screw thread) are compatible with that on the flame arrester. For flange fixings, use the correct fasteners and gaskets for the flange size and type. Always use the correct washers as this prevents damage caused by bolt heads and nuts on tightening up. Gaskets should be capable of withstanding the same temperatures and pressures as the flame arresters being installed.

5. In-line deflagration flame arresters should be positioned so that the element is accessible for removal. Models with drain plugs fitted are designed for horizontal installation and should be installed with the drain plugs aligned at the bottom of the unit. Models with pressure connections fitted are designed to allow pressure gauges to be installed on both sides of the element to determine blockage. The pressure connections should be aligned at the top of the flame arrester to allow easy viewing of the gauges.

Maintenance

1. **Maintenance and inspection is the responsibility of the customer and not of Elmac Technologies Limited.**

2. Flame arresters should be inspected on a regular basis to ensure that no build up of solids or liquids occurs in the element as this will adversely affect the performance of the unit during process flow conditions. The maintenance interval must be determined by the user and is governed by the amount and type of particulates in the system in which the unit is installed. The user should check the element in the first few months of operation to find out how quickly particulates accumulate. After cleaning, the element should be thoroughly inspected for damage and if damaged it must be replaced. Flame arresters should also be inspected if a flashback is known or suspected to have occurred.

3. The element will have to be removed from the flame arrester for inspection. For in-line flame arresters provided with a jacking arrangement, the jacking screws are solely for splitting flanges slightly to remove the element. They are not for lifting large weights of pipe work. **Element assemblies can be heavy and will require adequate equipment and manpower to prevent injury when handling.**

4. Elements may be cleaned with any suitable solvent followed by a blow through with compressed air. Steam cleaning may also be effective. If the arrester element cannot be cleaned satisfactorily, it must be replaced. Elmac flame arresters containing elements with a crimped metal ribbon construction will lose efficiency under process flow conditions if the edges of the metal ribbon are damaged or folded over during cleaning or normal operation. Elmac elements can withstand numerous flashbacks without damage but if any distortion is observed, then the element should be replaced. It is advisable to hold spares in stock in site stores. Always use Elmac replacement parts and quote the flame arrester serial number when ordering spare elements or other parts.

5. Removal and replacement of elements should be undertaken with care and all washers, spacers and fasteners must be replaced exactly as originally fitted to prevent leakage of gases and provide unrestricted gas flow through the unit. **To ensure a gas tight seal, element gaskets should be replaced every time the flame arrester body is loosened or dismantled for element maintenance and must be replaced exactly as originally fitted.**

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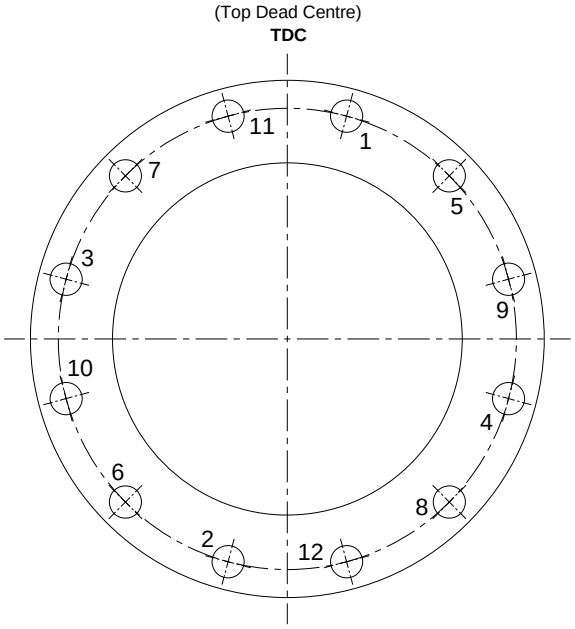
Always use the new gaskets supplied with spare elements and ensure that mating faces are clean. Some Elmac elements are designed to fit several types of flange so it is important to centralise the element between the flanges before tightening up fasteners. Fasteners should be well lubricated with general purpose grease and tightened to the torque settings as tabulate below and using the torquing sequence also detailed below. **Excessive or uneven torquing can cause permanent damage to gaskets and housings.**

Torque Settings & Sequence:-

Bolt Size	Socket/Spanner Size (mm)	Torque settings - Nm (lbf.ft)			
		Step 1	Step 2	Step 3	Full Torque
M12	19	40Nm (30lbf.ft)	N/A.	N/A.	70Nm (51lbf.ft)
M16	24	50Nm (37lbf.ft)	N/A.	N/A.	100Nm (73lbf.ft)
M20	30	50Nm (37lbf.ft)	100Nm (73lbf.ft)	N/A.	140Nm (103lbf.ft)
M24	36	50Nm (37lbf.ft)	100Nm (73lbf.ft)	150Nm (110lbf.ft)	200Nm (147lbf.ft)
M27	41	50Nm (37lbf.ft)	100Nm (73lbf.ft)	150Nm (110lbf.ft)	200Nm (147lbf.ft)
M30	46	50Nm (37lbf.ft)	110Nm (81lbf.ft)	170Nm (125lbf.ft)	220Nm (162lbf.ft)
M33	50	70Nm (51lbf.ft)	140Nm (103lbf.ft)	210Nm (154lbf.ft)	280Nm (206lbf.ft)
M36	55	70Nm (51lbf.ft)	160Nm (118lbf.ft)	240Nm (177lbf.ft)	300Nm (221lbf.ft)



Torquing Sequence

Base torque on the above sketch. However, allow for flanges with different number of bolt holes

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Description:	**Installation & Maintenance Instructions for In-Line Deflagration Flame Arresters (ATEX)**		
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Checked By: N.Webb		Date: 24.09.08	

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6. For installations that require frequent maintenance and minimum downtime. It is recommended that the user purchases a spare element and several spare element gaskets. This spare element can be installed immediately and the dirty element can then be cleaned and stored as a spare ready for the next maintenance interval.

IN THE EVENT OF ANY QUERY PLEASE CONTACT OUR TECHNICAL SALES DEPARTMENT

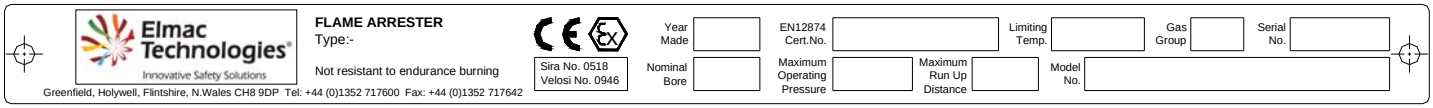

Figure 1 - Flame Arrester Nameplate

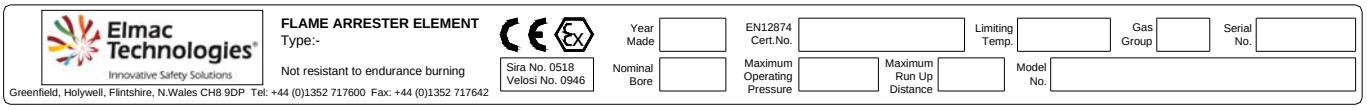

Figure 2 - Element Nameplate

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