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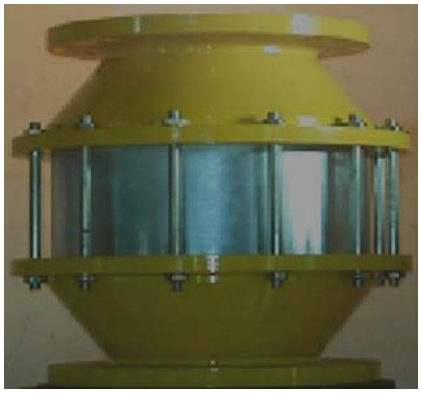
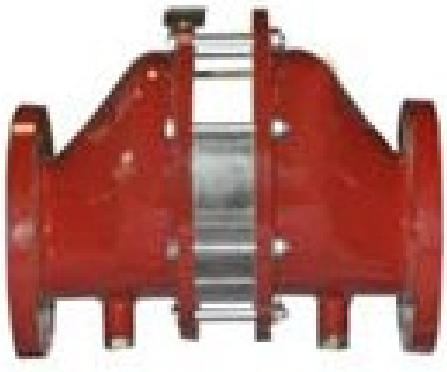
INLINE DETONATION FLAME ARRESTER

MODEL NO: 20503

DETONATION FLAME ARRESTER ATEX CERTIFIED
TANK PRESSURE PROTECTION DEVICES THAT PROTECTS ENVIRONMENT, EQUIPMENT AND HUMAN LIVES





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Designs and Functions

Flame Arrester are classified according to the locations with respect to the equipment's they are protecting. Detonation flame arresters are devices designed to withstand and extinguish the high speed and high pressure flame front that characterizes a detonation transmission through a piping system. Therefore, a detonation arrester must be able to withstand the mechanical effects of a detonation shock wave while stopping the flame. Some designs have a "shock absorber" in front of the flame arresting element to reduce both the high pressure shock wave and the dynamic energy and to split the flame front before it reaches the flame arrester element. Detonations occurring in piping have velocities of about 6000 ft/s, or greater, and in closed process vessels and equipment can generate pressures from 20 times the initial pressure. Detonation flame arresters are available as both unidirectional or bidirectional types.

When installed in a vent manifold system and tank vents the flame arresters may be unidirectional or bidirectional, depending on the manufacturer's recommendations. They should preferably be installed in a vertical orientation, so that if liquid is present, the Arrester will drain. If they are installed in a horizontal orientation, they should be provided with drain connections. Most detonation arresters have crimped metal ribbon arrester elements. Arrester elements for Detonation arresters are usually longer than for deflagration arresters.

PRECON 20503 in line detonation flame arresters are designed to prevent flame transmission in gas piping systems that contain flammable gas/vapor mixtures. The arrester must prevent flame transmission under certain specified conditions while permitting free flow of gas/vapor through the system. Thus it protects vulnerable equipment or components of the system from explosion pressures caused by gas/vapor ignition in another part of the system. The deflagration flame arrester must be used under only those operating conditions for which it is designed and tested. The flame arresters consist of two main components: the arrester bases and the arrester bank housing assembly. The base serve as the connecting interface to the piping system and the arrester housing supports the flame element. Both components are essential in stopping the passage of the flame. The flame element is comprised of small parallel passageways aligned so that an approaching flame front is slowed down and then stopped before it can transmit to the protected side of the device. All PRECON flame element utilize spiral wound, crimped ribbon constructed of corrosion resistant materials, to ensure the best flame quenching performance with minimum pressure drop.

The flame quenching gap and number of elements depends on the explosion group, pressure and temperature. For selecting an appropriate protective device, the explosion group according to MESG value must be considered.

Limits for use

The operational Temperature T_0 -20 to 60 deg C when tested at atmospheric conditions.
The operational Pressure P_0 = 1.1 bar absolute.
The detonation flame arrester tested at P_0 1.1 bar absolute shall be limited in the same or smaller pipe size and the application is limited to gas – air mixture with an MESG equal to or greater certified for each gas group.

Installation

Zone : 0 Where ignitable concentrations of flammable gases, vapors, or liquids:
Are present continuously or for long periods of time under normal operating.

Zone: 1 Where ignitable concentrations of flammable gases, vapors, or liquids:
- Are likely to exist under normal operating conditions
- May exist frequently because of repair, maintenance operations, or leakage.

Zone: 2 Where ignitable concentrations of flammable gases, vapors, or liquids:
- Are not likely to exist under normal operating conditions
- Occur for only a short period of time.
- Become hazardous only in case of an accident or some unusual operating condition.

PRINCIPAL OF OPERATION

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Flame arresters are passive devices with no moving parts. They prevent the propagation of flame from the exposed side of the unit to the protected side by the use of metal matrix creating a torturous path called a flame cell or element. All detonation flame arresters operate on the same principle: removing heat from the flame as it attempts to travel through narrow passages with walls of metal or other heat-conductive material, but unlike flame arresters, detonation flame arresters must be built to withstand extreme pressures that travel at supersonic velocities, 1,500 psi (10 MPa) at 2500 m/s.

Detonation flame arresters made by most manufacturers employ layers of metal ribbons with crimped corrugations. The internal narrow passages of the crimped corrugations make up the element matrix. These passages are measured as the hydraulic diameter and are made smaller for gases having smaller maximum experimental safe gaps (MESG).

Under normal operating conditions the flame arrester permits a relatively free flow of gas or vapor through the piping system. If the mixture is ignited and the flame begins to travel back through the piping, the arrester will prohibit the flame from moving back to the gas source.

Detonation Flame Arrester

A **detonation flame arrester** is a device fitted to the opening of an enclosure or to the connecting pipe work of a system of enclosures and whose intended function is to allow flow but prevent the transmission of flame propagating at supersonic velocity.

Detonation Flame Arrester products were created in response to environmental regulations which required liquid product storage terminals and hydrocarbon processing plants to control evaporative hydrocarbon emissions from loading and storage operations.

This process is called vapor control. Two types of recognized vapor control technologies are commonly used;

Carbon adsorption vapor recovery and vapor destruction or combustion. Vapor destruction systems include elevated flare systems, enclosed flare systems, burner and catalytic incineration systems, and waste gas boilers. Both systems require flame or detonation flame arresters to maximize safety.

Detonation flame arresters are used in many industries, including refining, pharmaceutical, chemical, and petrochemical, pulp and paper, oil exploration and production, sewage treatment, landfills, mining, power generation, and bulk liquids transportation.

Facts about Detonation Arresters:

- Provides a screen of protection between two areas in a pipeline.
- Protect one tank or one area of a pipeline from a detonation or explosion from another tank or area of pipeline.
- Quenches a detonation or deflagration traveling down the pipeline.
- Stop detonation from spreading to other areas attached to the same pipeline.
- Designed to withstand higher pressures than the deflagration flame arrester and quench detonations.
- Designed to withstand these conditions and can be utilize in any piping configuration.

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IN-LINE DETONATION (DET-4)

Flame arrester element geometry maximizes flame quenching capability while minimizing pressure drop.

Proven spiral-wound, crimped ribbon, flame element provides reliable flame protection.

Modular design allows easy and cost effective flame bank maintenance.

Drains and instrument ports available upon request.
Exterior painting or coating available

DIN or ASME/ANSI drilling available

Sizes 2" through 12".
Housing standard material: carbon steel (WCB/CS), stainless steel (CF8M/316), Aluminum

Flame element standard material: 316 stainless steel
Other materials available upon request

Good for Explosion gas group IIA1, IIA, IIB1,IIB2 & IIB3.

Certified to ATEX Directive 94/9/EC in compliance with EN ISO 16852:2010

Certificate No: IBExU16ATEX2081 X (IIB3)	Size: 2” NB to 12” NB	To: 60 Deg C

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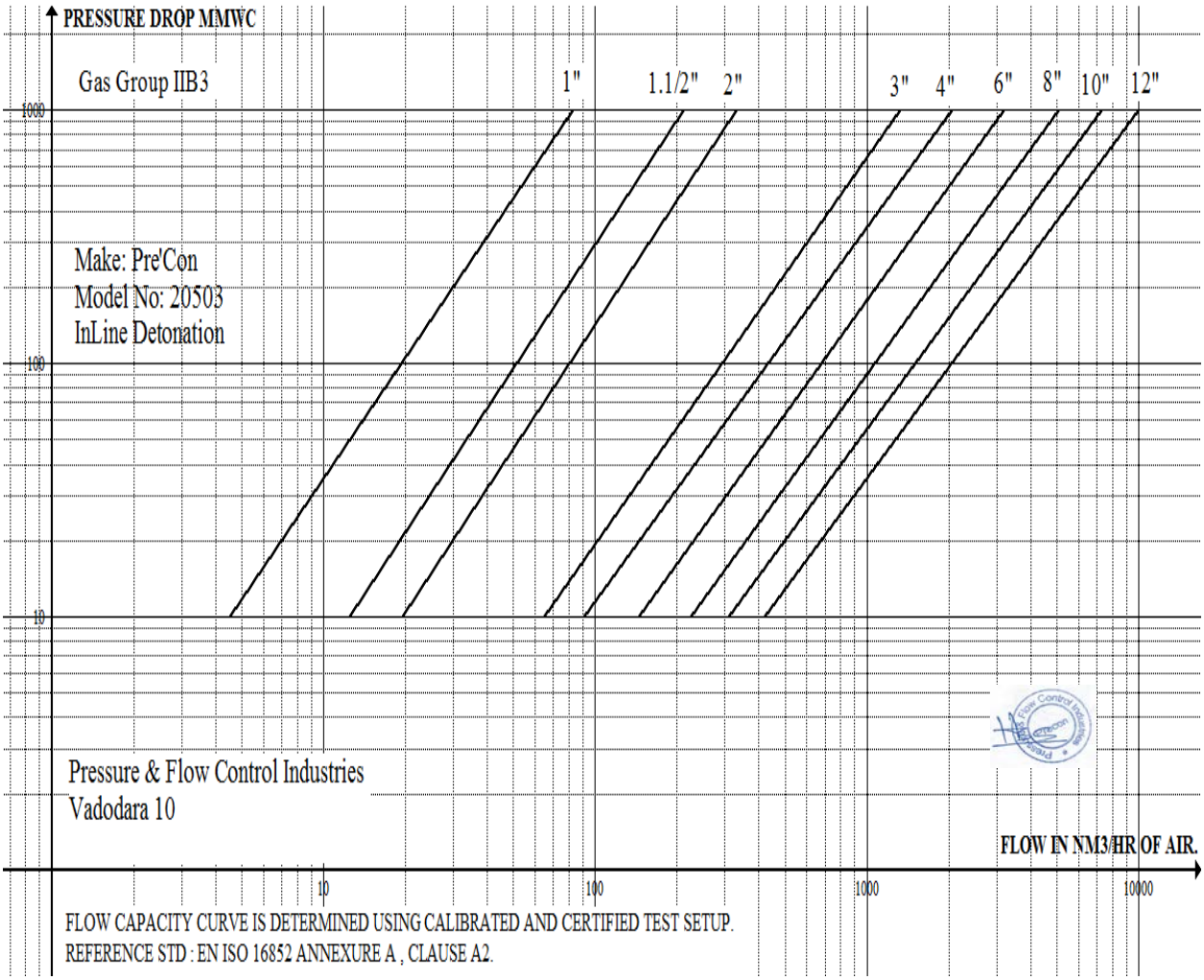
FLOW CAPACITY CURVE



FLOW CAPACITY CURVE IS DETERMINED USING CALIBRATED AND CERTIFIED TEST SETUP.
REFERENCE STD : EN ISO 16852 ANNEXURE A , CLAUSE A2.

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Model D Coding & Ordering Information
Base Model No: 2050

Table 1 : TYPE

In Line Detonation	3

Table 2 Selection of Material

Description	A	B	C
Body	Cast Steel	A 351 Gr CF8/SS304	A 351 Gr CF8M/SS316
Shell	A 106 Gr B	SS 304	SS 316
Flame Element	SS 316/SS 316L	SS316/SS 316L	SS316/SS 316L
Gasket	NAM 39	PTFE	PTFE
Fasteners	C/S zinc plated	SS 304	SS 304

ANY SPECIAL MATERIAL AVAILABLE ON REQUEST.

Table 3 Explosion Group

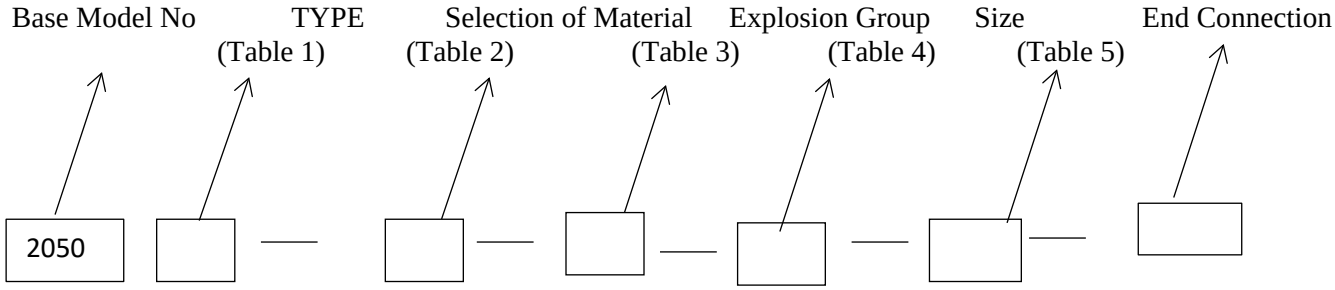
MESG	Explosion Group (IEC)
>0.9 mm	IIA
≥ 0.65 mm	IIB3
<0.5 mm	IIC

Table 4 Size

15 mm	20 mm	25 mm	40 mm	50 mm	65 mm	80 mm	100 mm	150 mm	200 mm	250 mm	300 mm

Table 5 End connection

BS 10 Table D,E,F	BS
DIN PN 6, PN 10, PN 16	DIN
ANSI 150 FF/RF, 300 RF	ANSI



ORDERING INFORMATION