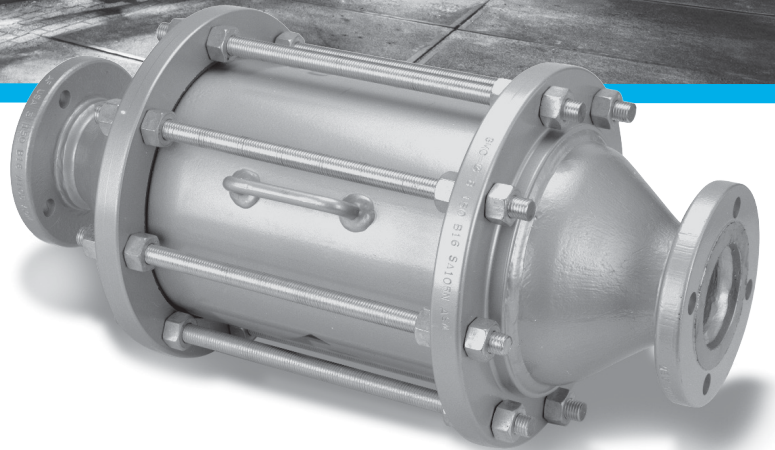


Flame and Detonation Arrestors



Enardo IL Series

Threaded In-Line Flame Arrestor

Introduction

Enardo™ IL Series are designed to stop the propagation of confined low pressure deflagrations. The In-line series prevent flame propagation by absorbing and dissipating heat using spiral wound crimped ribbon flame cells. These cells allow maximum flow with maximum protection.

The Enardo IL Series are typically used for end-of-line and near end-of-line applications when the system operating pressure is near atmospheric levels and when there is minimal probability of a flame stabilizing on the Flame Arrestor element for an extended period. Typical applications include small fuel-assist lines, waste gas on reboilers and small instrumentation lines.

Designed with threaded connections. Standard housing construction is aluminum, carbon steel and stainless steel. The element is available in aluminum or stainless steel. Special material and protective coatings are available on request.

Sizes Available

Gas Group D (IIA): 1/2 to 4 in. / 13 to 100 mm

Construction Materials

Housing: Aluminum (1/2, 3/4 and 1 in. only), Carbon steel and Stainless steel

Cell: Aluminum, 304 Stainless steel, 316 Stainless steel, Hastelloy®

Gas Group: D (IIA)

Additional Technical Data

For more technical information, contact your local Sales Office or log on to:

www.enardo.com

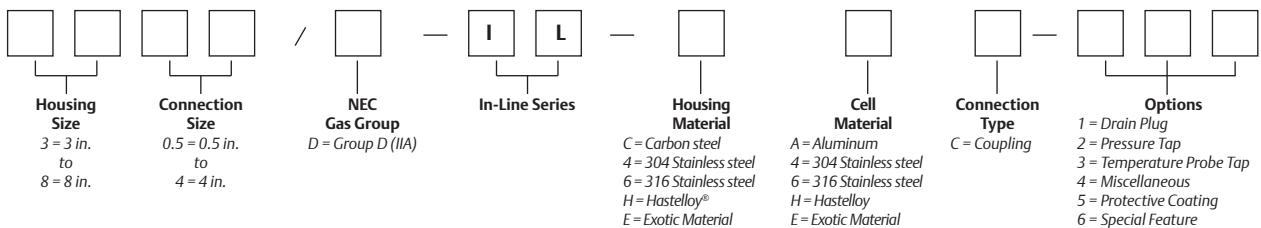
Features

- Maximum Flow
- Less Pressure Drop
- Easy Cleaning
- Less Clogging
- Less Maintenance
- Single Element Design
- Readily accessible and removable flame cell for easy inspection and service (Enardo 602 and larger sizes)
- Economical design
- Bi-directional design
- Available in ANSI, DIN and JIS flanges



Figure 1. Threaded In-Line Flame Arrestor

Key to Enardo IL Series Model Number



Example:



Indicates a Threaded In-Line Flame Arrestor with a 4 in. housing and 2 in. coupling connections. Carbon steel housing material and 304 Stainless steel NEC Group “D” flame cell element.

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Enardo IL Series

Threaded In-Line Flame Arrestor

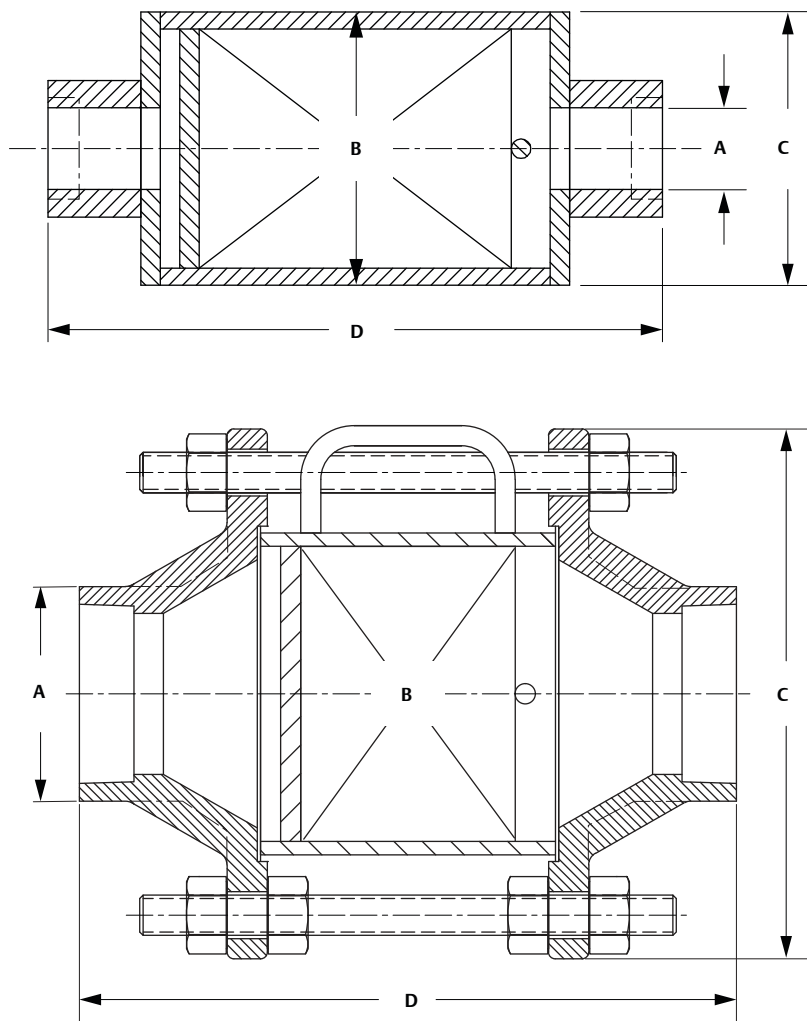


Figure 2. Threaded In-Line Flame Arrestor Dimensions

Table 2. Threaded In-Line Flame Arrestor Dimensions⁽¹⁾

MODEL	A (CONNECTION SIZE)		B (HOUSING SIZE)		C (OUTSIDE DIAMETER)		D (OVERALL LENGTH)		APPROXIMATE WEIGHT (ALUMINUM BODY/CELL)		APPROXIMATE WEIGHT (ALUMINUM CELL)		APPROXIMATE WEIGHT (STAINLESS STEEL)	
	In.	mm	In.	mm	In.	mm	In.	mm	Lbs	kg	Lbs	kg	Lbs	kg
Enardo™ 300.5-IL	0.5	12	3.5	90	3.5	90	7.38	187.5	10	4.5	20	9	25	11
Enardo 300.75-IL	0.75	19	3.5	90	3.5	90	7.50	190.5	10	4.5	20	9	25	11
Enardo 301-IL	1	25	3.5	90	3.5	90	7.88	200.2	10	4.5	20	9	25	11
Enardo 402-IL	2	50	4.5	115	4.5	115	8.50	215.9	N/A	N/A	30	14	35	16
Enardo 602-IL	2	50	6	150	10.38	264	10.5	267	N/A	N/A	43	20	50	23
Enardo 603-IL	3	75	6	150	10.38	264	12.25	311	N/A	N/A	45	21	52	24
Enardo 804-IL	4	100	8	200	12.5	318	13.13	333	N/A	N/A	62	28	73	33

1. Dimensions may vary somewhat from those given above. Allow for a tolerance of ± 1.00 in. / 25 mm. Threaded In-Line lengths vary depending on materials used. Specific dimensions available on request.

Enardo 8800 and Enardo 9900

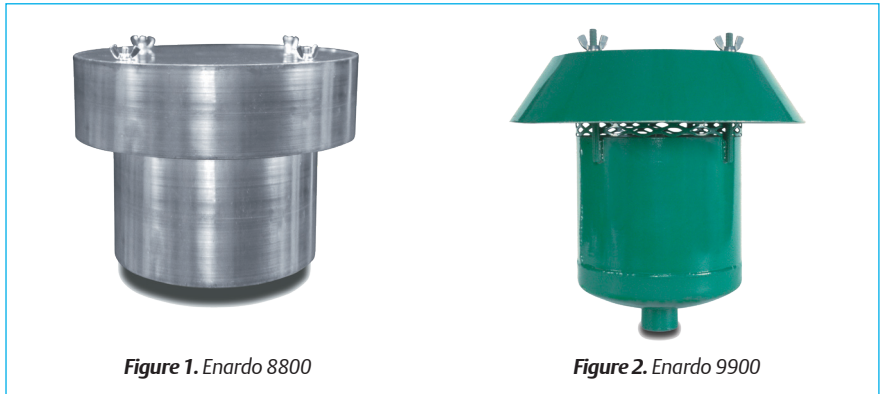
Vent Stack Flame Arrestor

Introduction

Enardo™ 8800 and Enardo 9900 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. 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.

This product 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 levels 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. Designed with threaded NPT connections, this arrestor allows removal of the flame cell element without the removal of the venting assembly. Standard housing construction is aluminum, carbon steel and stainless steel. The element is available in aluminum or stainless steel.



Model Numbers

Enardo 8800
Enardo 9900

Sizes Available

1 to 6 in. / 25 to 150 mm nominal pipe size

Construction Materials

Housing

Enardo 8800: Aluminum
Enardo 9900: Carbon Steel, 304 Stainless steel, 316 Stainless steel

Cell: Aluminum, 304 Stainless steel, 316 Stainless steel

Gas Group: D (IIA)

Additional Technical Data

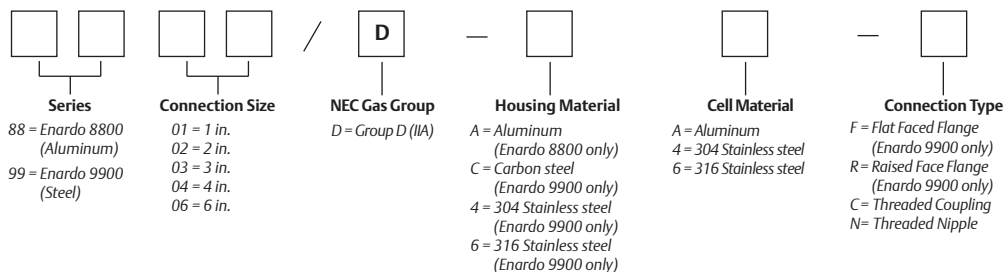
For more technical information, contact your local Sales Office or log on to:

www.enardo.com

Features

- Maximum Flow
- Less Pressure Drop
- Easy Cleaning
- Less Clogging
- Less Maintenance
- Single Element Design
- Readily accessible and removable flame cell for easy inspection and service
- Flanged design available in ANSI, DIN and JIS flanges

Key to Enardo 8800 and Enardo 9900 Model Number



Example:



Indicates an Enardo 8800 Vent Flame Arrestor with an aluminum housing, a 2 in. threaded coupling and 304 Stainless steel NEC Group “D” flame cell element.

Enardo 8800 and Enardo 9900

Vent Stack Flame Arrestor

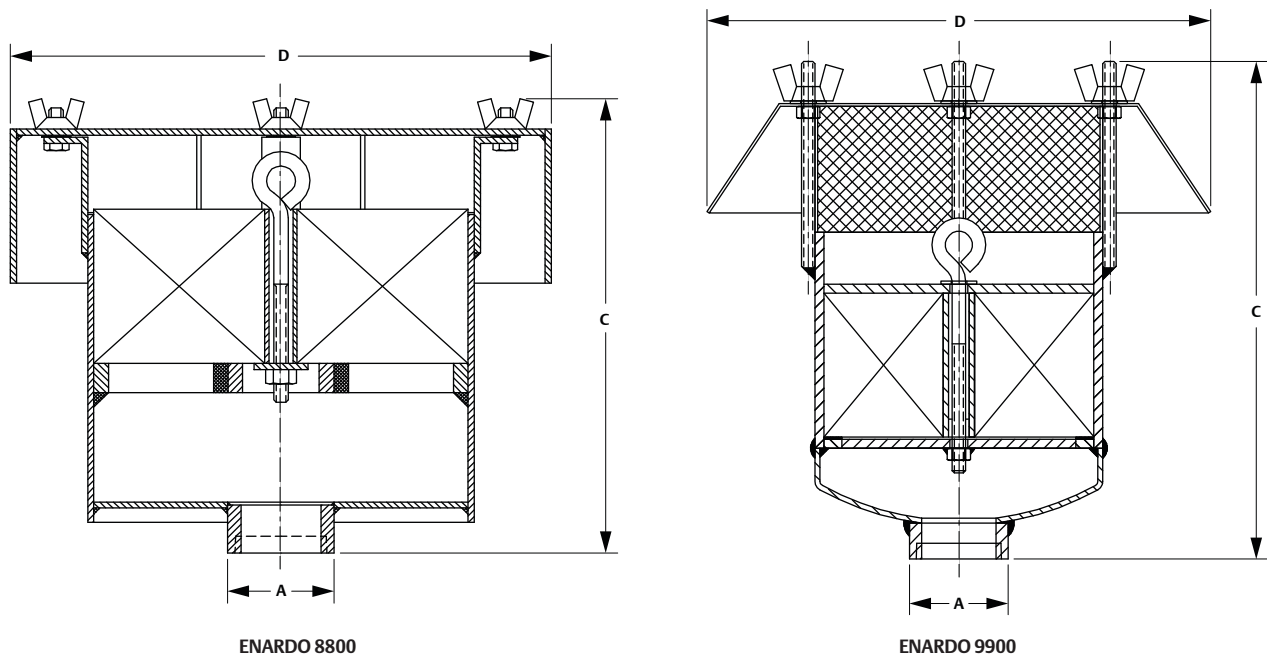


Figure 3. Enardo™ 8800 and Enardo 9900 Dimensions

Table 1. Enardo 8800 Dimensions

MODEL	A (CONNECTION SIZE)		C (OVERALL HEIGHT)		D (OUTSIDE DIAMETER)	
	In.	mm	In.	mm	In.	mm
Enardo 8802	2	50	14-3/8	365	14	356
Enardo 8803	3	75	14-3/8	365	14	356
Enardo 8804	4	100	14-3/8	365	14	356
Enardo 8806	6	150	14-3/8	365	16	406

Table 2. Enardo 9900 Dimensions

MODEL	A (CONNECTION SIZE)		C (OVERALL HEIGHT)		D (OUTSIDE DIAMETER)	
	In.	mm	In.	mm	In.	mm
Enardo 9902	2	50	14-3/8	365	14	356
Enardo 9903	3	75	14-3/8	365	14	356
Enardo 9904	4	100	14-3/8	365	14	356
Enardo 9906	6	150	14-3/8	365	16	406

Enardo FVFA Series

Free Vent Flame Arrestor

Introduction

Enardo™ FVFA Series free vent flame arrestors are designed to allow free venting in combination with flame protection for vertical vent applications. This product is installed at the top of an atmospheric vent line or storage tank. They prevent flame propagation by absorbing and dissipating heat using spiral wound crimped ribbon flame cells. These cells allow maximum flow with maximum protection. The FVFA 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.

FVFA's are typically used for the end of line applications when the system operating pressure is near atmospheric levels and when there is minimal probability of a flame stabilizing on the flame arrestor element for an extended period.

Free vent flame arrestors allow free venting and flame protection for vertical vent applications. Designed with flanged connections, this arrestor allows removal of the flame cell element without their removal of the venting assembly. Standard housing construction is aluminum, carbon steel and stainless steel. The element is available in aluminum or stainless steel. Special material and protective coatings are available on request.

ISO-16852 Certified 2 to 12 in. / 50 to 300 mm IIA (D) and IIB3 (C).



Figure 1. Enardo FVFA

Models and Connection Sizes Available

FVFA:

3/4 through 36 in. / 20 through 900 mm

EN FVFA-ISO 16852 Approved:

2 to 12 in. / 50 to 300 mm

Construction Materials

Housing: Aluminum, Carbon steel, 304 Stainless steel, 316 Stainless steel and Hastelloy®

Cell: Aluminum, 304 Stainless steel, 316 Stainless steel and Hastelloy®

Gas Group

D (IIA), C (IIB3) and B (IIC)

Additional Technical Data

For more technical information, contact your local Sales Office or log on to:

www.enardo.com

Features

- Maximum Flow
- Less Pressure Drop
- Easy Cleaning
- Less Clogging
- Less Maintenance
- Single Element Design
- Fluoropolymer Coated Hardware Provides Outstanding Corrosion and Chemical Resistance
- Easy Accessible and Removable Flame Cell for Easy Inspection and Service
- Standard Temperature Probe on EN Models
- Flanged Design Available in ANSI, DIN and JIS Flanges

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Enardo FVFA Series

Free Vent Flame Arrestor

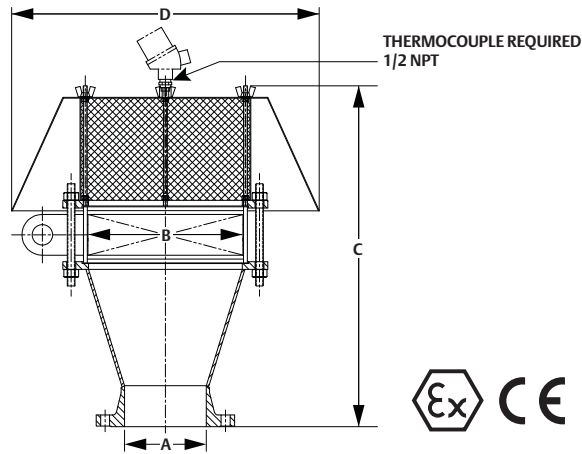


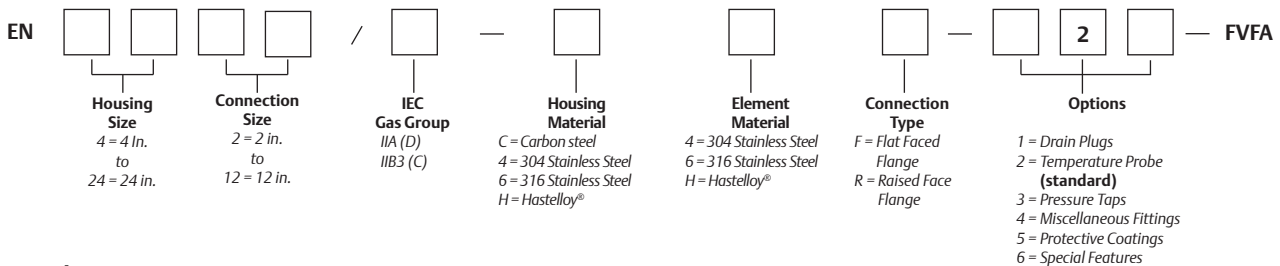
Figure 2. Enardo™ EN FVFA Dimensions

Table 1. Enardo EN FVFA Dimensions⁽¹⁾

MODEL	A (NOMINAL CONNECTION SIZE)		B (HOUSING SIZE)		C (HEIGHT)		D (OUTSIDE DIAMETER)		APPROXIMATE WEIGHT	
	In.	mm	In.	mm	In.	mm	In.	mm	Lb	kg
Enardo EN 0402	2	50	4	100	16.94	430	12	305	59.5	27
Enardo EN 0602	2	50	6	150	18	457	18	457	62	28.5
Enardo EN 0603	3	75	6	150	18	457	18	457	66	30
Enardo EN 0803	3	75	8	200	17.13	455	18	457	80	36.3
Enardo EN 0804	4	100	8	200	18.13	460	18	457	90	41
Enardo EN 1204	4	100	12	300	24.5	622	22	559	142	64.4
Enardo EN 1206	6	150	12	300	25	635	22	559	450	68
Enardo EN 1606	6	150	16	400	32.88	822	30	762	287	130
Enardo EN 1608	8	200	16	400	33.38	848	30	762	298	135
Enardo EN 2008	8	200	20	500	35.75	908	36	914	434	197
Enardo EN 2010	10	250	20	500	35.75	908	36	914	443	201
Enardo EN 2410	10	250	24	600	39	990	44	1118	653	296
Enardo EN 2412	12	300	24	600	39.5	1005	44	1118	675	306

1. Dimensions may vary somewhat from those given above. Allow for a tolerance of ± 1.00 in. / 25 mm. Specific dimensions available on request.

Key to Enardo EN FVFA Model Number



Example:



Indicates a Free Vent Flame Arrestor with a 20 in. Carbon steel housing and 10 in. raised faced flange connection and a 304 Stainless steel IEC Group “IIA” flame cell element. It also has an additional option of a protective coating for corrosive service and standard temperature probe.

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Enardo FVFA Series

Free Vent Flame Arrestor

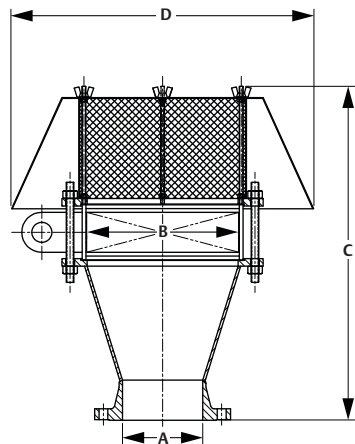


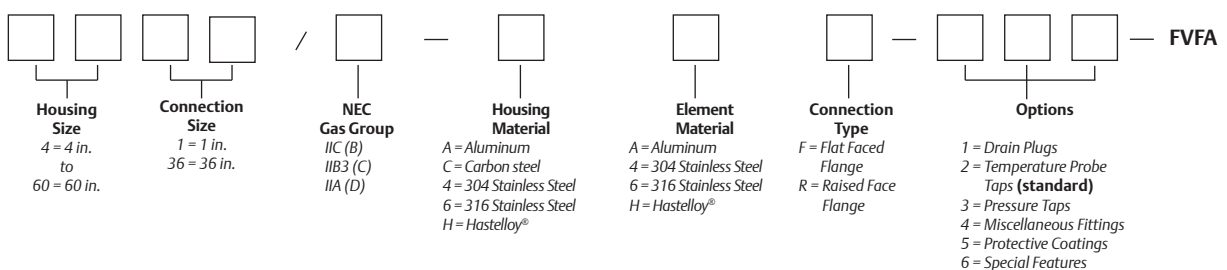
Figure 3. Standard Enardo™ FVFA Dimensions

Table 2. Standard Enardo FVFA Dimensions⁽¹⁾

MODEL	A (NOMINAL CONNECTION SIZE)		B (HOUSING SIZE)		C (HEIGHT)		D (OUTSIDE DIAMETER)		APPROXIMATE WEIGHT	
	In.	mm	In.	mm	In.	mm	In.	mm	Lb	kg
Enardo 401	1	25	4	100	16.63	422	12	305	50	23
Enardo 402	2	50	4	100	17	432	12	305	52	23.5
Enardo 602	2	50	6	150	18	457	18	457	54	24.5
Enardo 802	2	50	8	200	18	457	18	457	77	34.9
Enardo 803	3	75	8	200	18	457	18	457	81	36.7
Enardo 804	4	100	8	200	18	457	18	457	86	39.0
Enardo 1206	6	150	12	300	25.00	635	22	559	149	67.6
Enardo 1608	8	200	16	400	33.38	848	30	762	243	110.2
Enardo 2010	10	250	20	500	35.75	908	36	914	360	163.3
Enardo 2412	12	300	24	600	39.50	1003	44	1118	549	249.0

1. 14 to 36 in. / 350 to 900 mm and over – Dimensions available on request. Dimensions may vary somewhat from those given above. Allow for a tolerance of ±1.00 in. / 25 mm. Specific dimensions available on request.

Key to Enardo FVFA Model Number



Example:

2 0 1 0 / D — A 4 F — 5 — FVFA

Indicates a Free Vent Flame Arrestor with a 20 in. Aluminum housing and 10 in. flat faced flange connection and a 304 Stainless steel NEC Group “D” flame cell element. It also has an additional option of a protective coating for corrosive service.

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Enardo 7 Series

Deflagration Flame Arrestor

Introduction

Enardo™ 7 Series deflagration flame arrestors are designed to stop the propagation of confined low pressure deflagrations. The Enardo 7 Series is typically used for end-of-line and near end-of-line applications when the system operating pressure is near atmospheric levels and when there is minimal probability of a flame stabilizing on the Flame Arrestor element for an extended period.

The Enardo 7 Series prevents flame propagation by absorbing and dissipating heat using spiral wound crimped ribbon flame cells. These cells allow maximum flow with maximum protection.

Designed with flanged connections, this arrestor allows removal of the flame cell element for easy cleaning and replacement without removing the arrestor body from the pipe connection. Standard housing construction is Aluminum, Carbon steel and Stainless steel. The element is available in Aluminum or Stainless steel. Special material and protective coatings are available on request.

ISO-16852 Certified 1 in. / 25 mm through 12 in. / 300 mm, D (IIA) and C (IIB3).

Factory Mutual Approved 2 in. / 50 mm to 12 in. / 300 mm, D (IIA).

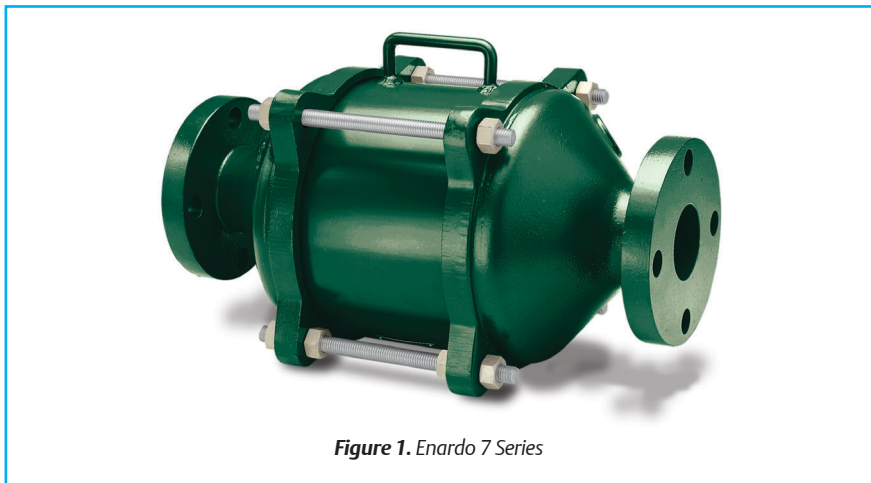


Figure 1. Enardo 7 Series

Models and Available Sizes

Enardo 7 Series Deflagration Flame Arrestor: 1 to 36 in. / 25 to 900 mm

Enardo EN-7 Series ISO-16852 Certified: 1 to 12 in. / 25 to 300 mm⁽¹⁾

Enardo 7 Series Factory Mutual Approved: 2 to 12 in. / 50 to 300 mm

Construction Materials

Housing: Aluminum, Carbon steel, 304 Stainless steel, 316 Stainless steel and Hastelloy®

Cell: Aluminum, 304 Stainless steel, 316 Stainless steel, Hastelloy® and Exotic

Gas Group

D (IIA), C (IIB3) and B (IIC)

Additional Technical Data

For more technical information, contact your local Sales Office or log on to:

www.enardo.com

Features

- Maximum Flow
- Less Pressure Drop
- Easy Cleaning
- Less Clogging
- Less Maintenance
- Single Element Design
- Fluoropolymer Coated Hardware Provides Outstanding Corrosion and Chemical Resistance
- Easy Accessible and Removable Flame Cell for Easy Inspection and Service
- Bi-directional Design
- Standard Temperature Probe on EN Models
- Available in ANSI, DIN and JIS Flanges

Hastelloy® is a mark owned by Haynes International, Inc.
1. Available in carbon steel and stainless steel only.

EN Certified Model

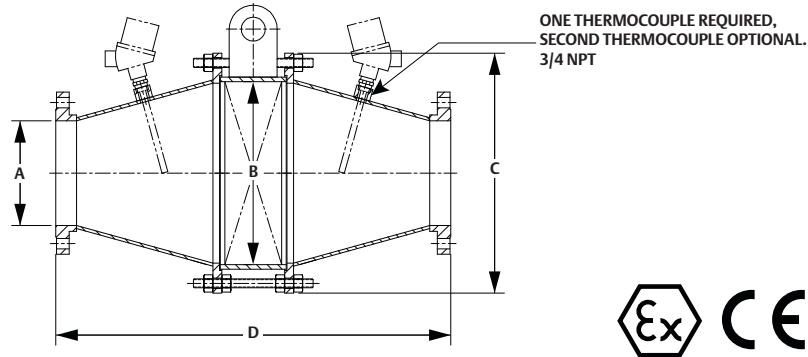


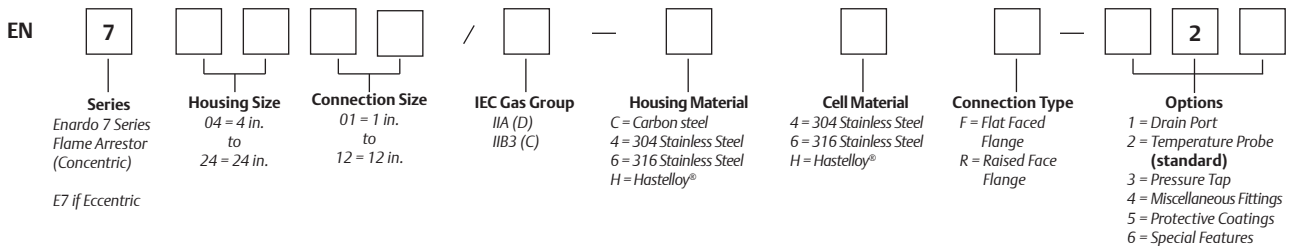
Figure 2. Enardo™ EN-7 Series Flame Arrestor Dimensions

Table 1. Enardo EN-7 Series Flame Arrestor Dimensions⁽¹⁾

MODEL	A (NOMINAL CONNECTION SIZE)		B (HOUSING SIZE)		C (OUTSIDE DIAMETER)		D (OVERALL LENGTH)		APPROXIMATE WEIGHT	
	In.	mm	In.	mm	In.	mm	In.	mm	Lbs	kg
Enardo EN-70402	2	50	4	100	7.75	197	15.25	387	65	29.5
Enardo EN-70602	2	50	6	150	10.25	260	16	406	68	31
Enardo EN-70603	3	75	6	150	10.25	260	16	406	72	32.5
Enardo EN-70803	3	75	8	200	12	305	16	406	95	43
Enardo EN-70804	4	100	8	200	12	305	16	406	101	46
Enardo EN-71204	4	100	12	300	16	406	21	533	168	76
Enardo EN-71206	6	150	12	300	16	406	21	533	181	82
Enardo EN-71606	6	150	16	400	20	508	33	838	278	126
Enardo EN-71608	8	200	16	400	20	508	33	838	298	135
Enardo EN-72008	8	200	20	500	24	610	38	965	386	175
Enardo EN-72010	10	250	20	500	24	610	38	965	443	201
Enardo EN-72410	10	250	24	600	29	737	41	1041	622	282
Enardo EN-72412	12	300	24	600	29	737	41	1041	672	305

1. Dimensions may vary somewhat from those given above. Allow for a tolerance of ± 1.00 in. / 25 mm. Specific dimensions available on request.

Key to Enardo EN-7 Series Flame Arrestor Model Number



Example:

EN 7 2 0 1 0 / IIA — C 4 R — 1 2

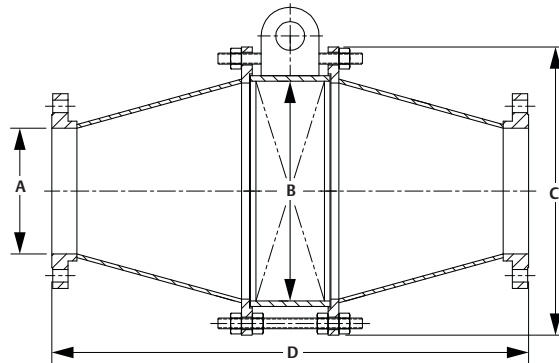
Indicates a 10 in. Concentric Enardo EN-7 Series Deflagration Flame Arrestor with a 20 in. Carbon steel housing. ANSI 150 lbs. raised faced flange connections and 304 Stainless steel IEC Group "IIA" flame cell element. It also has additional options of drain plugs and standard temperature probe.

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Enardo 7 Series

Deflagration Flame Arrestor

Carbon Steel and Stainless Steel Housings



*Not all models are available with FM approval. Consult Flame Arrester Certifications page for more information.

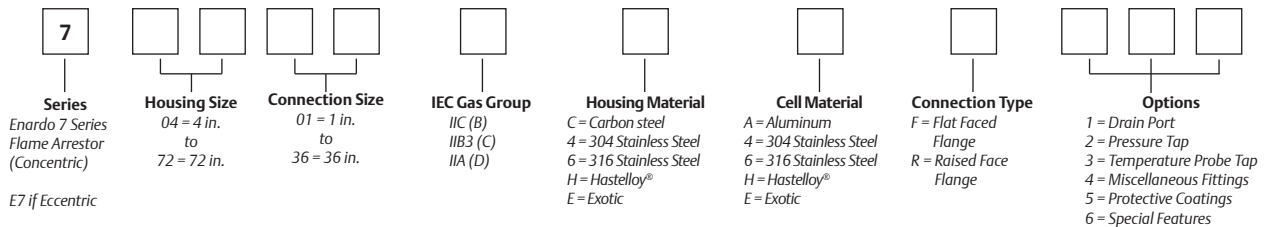
Figure 3. Standard Enardo™ 7 Series Flame Arrester Dimensions

Table 2. Standard Enardo 7 Series Flame Arrester Dimensions⁽¹⁾

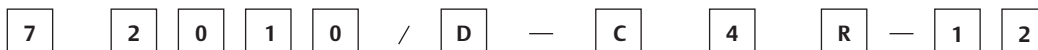
MODEL	A (NOMINAL CONNECTION SIZE)		B (HOUSING SIZE)		C (OUTSIDE DIAMETER)		D (OVERALL LENGTH)		APPROXIMATE WEIGHT (GROUP D MODELS)	
	In.	mm	In.	mm	In.	mm	In.	mm	Lbs	kg
Enardo 70401	1	25	4	100	7.75	197	15.63	397	60	27
Enardo 70402	2	50	4	100	7.75	197	15.25	387	63	29
Enardo 70602	2	50	6	150	10.25	260	16	406	66	30
Enardo 70802	2	50	8	200	12	305	16	406	85	38.6
Enardo 70603	3	75	6	150	10.25	260	16	406	70	31.8
Enardo 70803	3	75	8	200	12	305	16	406	90	40.8
Enardo 70804	4	100	8	200	12	305	16	406	95	43.1
Enardo 71006	6	150	10	250	14	356	21	533	135	61.2
Enardo 71206	6	150	12	300	16	406	21	533	165	74.8
Enardo 71408	8	200	14	350	18	457	25	635	225	102.1
Enardo 71608	8	200	16	400	20	508	33	838	270	122.5
Enardo 71810	10	250	18	450	22	559	30	762	335	152.0
Enardo 72010	10	250	20	500	24	610	38	965	400	181.4
Enardo 72212	12	300	22	550	26	660	34	863	477	216
Enardo 72412	12	300	24	600	29	737	41	1041	590	268

1. 14 inches to 36 in. and over – Dimensions available on request. Dimensions may vary somewhat from those given above. Allow for a tolerance of ±1.00 in. / 25 mm. Specific dimensions available on request.

Key to Enardo 7 Series Flame Arrester Model Number



Example:



Indicates a 10 in. Concentric Enardo 7 Series Deflagration Flame Arrestor with a 20 in. Carbon steel housing, ANSI 150 lbs. raised faced flange connections and 304 S tainless steel NEC Group “D” flame cell element. It also has additional options of drain plugs and temperature probe taps.

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Enardo 8 Series

High Pressure Deflagration Flame Arrestor

Introduction

Enardo™ 8 Series high pressure deflagration flame arrestors are designed to protect against high velocity and pressure flame fronts inherent in applications beyond the performance range of a standard flame arrestor but not yet to the detonation phase of flame development and provide an economical alternative to a detonation arrestor. Enardo 8 Series are designed to surpass standard flame arrestors for applications that include extended lengths of pipe with one bend, elevated operating pressures and extended flame stabilization on the flame cell element. The arrestors are bi-directional and can stop low, medium and high pressure deflagrations. This design utilizes a superior element assembly that dampens the high velocities and pressures associated with deflagrations and detonations while quenching the flame front.

Our design is unique in the ability to provide larger flame channels which requires less frequent maintenance and greater ease in cleaning when service is required, translating to less down time. The element offers maximum flow to pressure drop characteristics enhancing the value of our product in any system.

Designed with flanged connections, this arrestor provides the option of the removal of the flame cell element for easy cleaning and replacement without disconnecting of the pipe connection. Standard housing construction is carbon steel and stainless steel. The element is available in stainless steel. Special material and protective coatings are available on request.

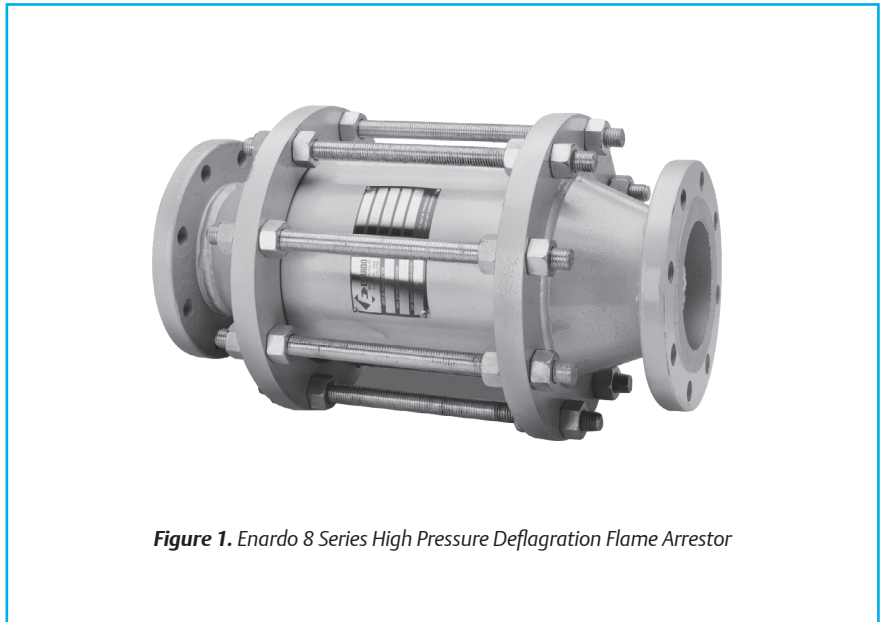


Figure 1. Enardo 8 Series High Pressure Deflagration Flame Arrestor

Flame Arrestor Specifications

Sizes Available

2 to 24 in. / 50 to 600 mm

Construction Materials

Housing

Carbon Steel
304 Stainless steel
316 Stainless steel
Hastelloy®
Exotic

Cell

304 Stainless steel
316 Stainless steel
Hastelloy®

Gas Group

B, C and D

Additional Technical Data

For more technical information, contact your local Sales Office or log on to:

www.enardo.com

Features

- **Maximum flow**
- **Less pressure Drop**
- **Easy Cleaning**
- **Less Clogging**
- **Less Maintenance**
- **Bi-Directional Design**
- **Removable Element design allows for easy inspection, cleaning and replacement**
- **Fluoropolymer coated hardware provides outstanding corrosion and chemical resistance**
- **Standard temperature ports**

Hastelloy® is a mark owned by Haynes International, Inc.

Enardo 8 Series

High Pressure Deflagration Flame Arrestor

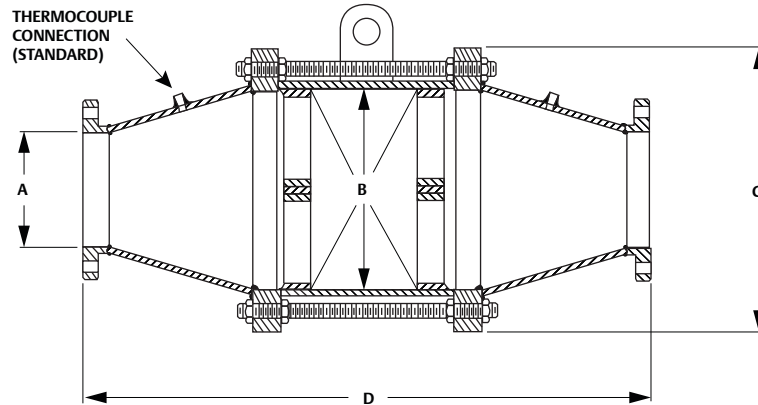


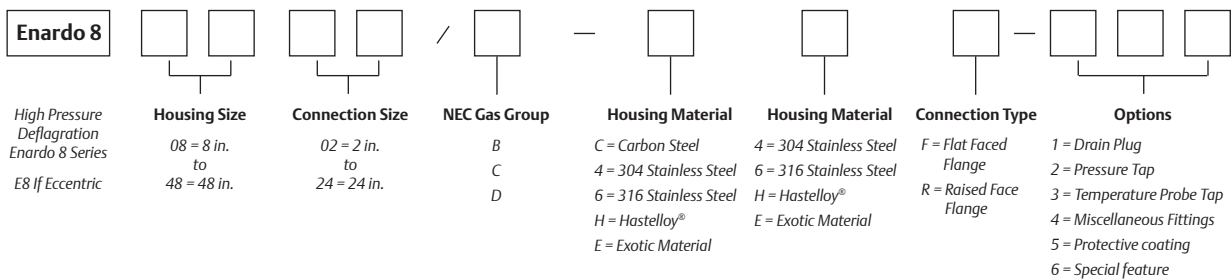
Figure 2. Enardo™ 8 Series Dimensions

Table 1. Enardo 8 Series Dimensions and Weights⁽¹⁾

MODEL	A (CONNECTION SIZE)		B (HOUSING SIZE)		C (OUTSIDE DIAMETER)		D (OVERALL LENGTH)				APPROXIMATE WEIGHT GAS GROUP D	
	In.	mm	In.	mm	In.	mm	Gas Group B/C		Gas Group D		Lbs	kg
							In.	mm	In.	mm		
Enardo 80802	2	50	8	200	12.00	305	22.50	572	20.50	521	123	55.8
Enardo 80803	3	75	8	200	12.00	305	22.50	572	20.50	521	125	56.7
Enardo 80804	4	100	8	200	12.00	305	22.50	572	20.50	521	130	59.0
Enardo 81206	6	150	12	300	17.00	432	29.00	737	29.00	737	335	152.0
Enardo 81608	8	200	16	400	21.50	546	43.00	1092	43.00	1092	645	292.6
Enardo 82010	10	250	20	500	26.00	660	46.00	1168	46.00	1168	960	435.4
Enardo 82412	12	300	24	600	30.00	762	49.00	1245	49.00	1245	1210	548.8

1. Dimensions may vary somewhat from those given above. Allow for a tolerance of ± 1.00 in. / 25 mm. Specific dimensions available on request

Key to Enardo 8 Series Deflagration Arrestor Model Number



Example:



Indicates a 6 in. Concentric Enardo 8 Series High Pressure Deflagration Flame Arrestor with a 12 in. carbon steel housing, ANSI 150 lbs. raised face flange connections and 304 stainless steel NEC Group “D” flame cell element. It also has additional options of drain plugs and temperature probe taps.

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Enardo DFA Series

Detonation Flame Arrestor

Introduction

Enardo™ DFA Series detonation flame arrestors represent the best value in flame arrestor protection. They prevent flame propagation by absorbing and dissipating heat using spiral wound crimped ribbon flame cells. These cells allow maximum flow with maximum protection. They provide protection against flame propagation in piping systems that are manifolded or have long run-up distances. This design utilizes a superior element assembly that dampens the high velocities and pressures associated with deflagrations and detonations while quenching the flame front. Our design is unique in the ability to provide larger flame channels which requires less frequent maintenance and greater ease in cleaning when service is required, translating to less down time. The element offers maximum flow to pressure drop characteristics enhancing the value of our product in any system.

They are typically used for extended pipe length or multiple pipe bend configurations to stop high pressures and flame velocities associated with detonations and overdriven detonations. In addition, it stops confined and unconfined, low and high pressure deflagrations. All units are bi-directional and are proven to stop an ignited flammable vapor mixture approaching from either direction that can be traveling at subsonic or supersonic velocities.

Designed with flanged connections, this Arrestor provides the option of the removal of the flame cell element for easy cleaning and replacement without disconnecting of the pipe connection. Special material and protective coatings are available on request.

U.S. Coast Guard (USCG) Approved 1 to 24 in. / 25 to 600 mm IIA (D) and IIB3 (C) Concentric and Eccentric design.

EN 12874 ATEX Certified 1 to 24 in. / 25 to 600 mm IIA and IIB3 Concentric and Eccentric design.

Models

Enardo DFA Series
EN 12874 ATEX Certified
U.S. Coast Guard (USCG) Approved

Sizes Available

4 to 48 in. / 100 to 1200 mm
1 to 24 in. / 25 to 600 mm

Construction Materials

Housing: Carbon steel, 304 Stainless steel, 316 Stainless steel and Hastelloy®(1)

Element: 304 Stainless steel, 316 Stainless steel and Hastelloy®

Gas Group

IIA (D), IIB3 (C) and IIC (B)

Additional Technical Data

For more technical information, contact your local Sales Office or log on to:

www.enardo.com

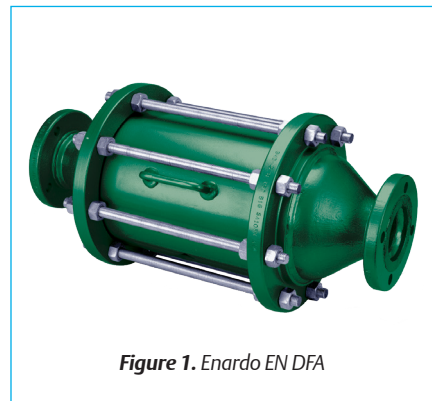


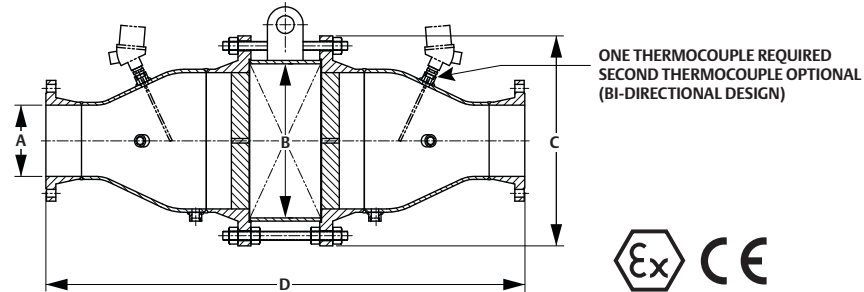
Figure 1. Enardo EN DFA

Features

- All Detonation Flame Arrestors are Designed for Unstable Detonations
- Removable Element Design Allows for Easy Inspection, Cleaning and Replacement
- Fluoropolymer Coated Hardware Provides Outstanding Corrosion and Chemical Resistance
- Standard Temperature Probe on EN Models
- Maximum Flow
- Less Pressure Drop
- Easy Cleaning
- Less Clogging
- Less Maintenance
- Bi-directional Design
- Available in ANSI, DIN and JIS Flanges

Hastelloy® is a mark owned by Haynes International, Inc.
1. Hastelloy® housings are not USCG approved.

ATEX Certified Model



See Following Page For Additional ATEX Certified Models

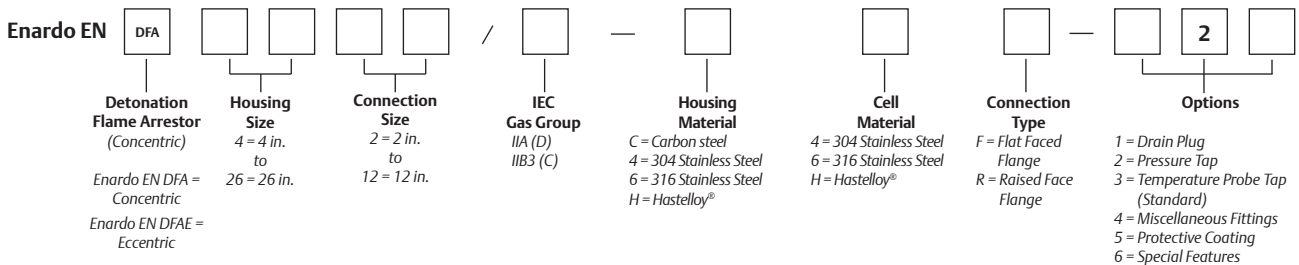
Figure 2. Enardo™ EN DFA Series Dimensions

Table 1. Enardo EN DFA Series Dimensions⁽¹⁾

MODEL	A (NOMINAL CONNECTION SIZE)		B (HOUSING SIZE)		C (OUTSIDE DIAMETER)		D (OVERALL LENGTH)				APPROXIMATE WEIGHT (GROUP IIA MODELS)	
	In.	mm	In.	mm	In.	mm	Gas Group IIA		Gas Group IIB3		Lbs	kg
							In.	mm	In.	mm		
Enardo EN DFA-0402	2	50	4	101	7.5	188	25.3	644	23.3	593	80	36
Enardo EN DFA-0602	2	50	6.6	168	10	250	29.8	758	27.8	707	118	54
Enardo EN DFA-0603	3	75	6.6	168	10	250	30.3	771	28.3	720	125	57
Enardo EN DFA-0803	3	75	10	254	13.5	338	33.3	847	31.3	796	206	94
Enardo EN DFA-0804	4	100	10	254	13.5	338	33.8	859	31.8	809	215	98
Enardo EN DFA-1204	4	100	14	356	19	475	38.8	986	36.8	936	452	205
Enardo EN DFA-1206	6	150	14	356	19	475	39.8	1012	37.8	961	468	212
Enardo EN DFA-1606	6	150	18	457	23.5	588	52.8	1342	50.8	1291	874	396
Enardo EN DFA-1608	8	200	18	457	23.5	588	53.8	1367	51.8	1317	910	413
Enardo EN DFA-2008	8	200	22	559	27.5	688	67.2	1707	65.2	1656	1294	587
Enardo EN DFA-2010	10	250	22	559	27.5	688	67.2	1707	65.2	1656	1320	599
Enardo EN DFA-2410	10	250	26	660	32	800	67.8	1723	65.8	1672	1740	789
Enardo EN DFA-2412	12	300	26	660	32	800	68.8	1748	66.8	1698	1800	817

1. Dimensions may vary somewhat from those given above. Allow for a tolerance of ± 1.00 in. / 25 mm. Specific dimensions available on request.

Key to Enardo EN DFA Model Number



Example:



Indicates a 6 in. Concentric Enardo DFA with a 12 in. Carbon steel housing, ANSI 150 lb raised faced flange connection and a 304 Stainless steel IEC Group "IIA" flame cell element. It also has an options of drain plugs, pressure taps and standard temperature probe.

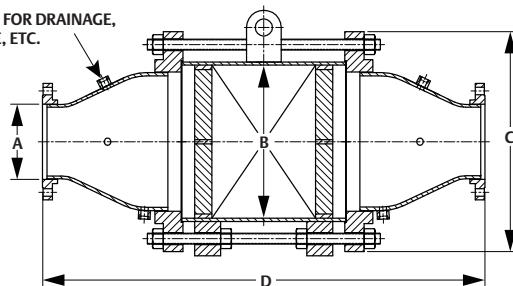
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Enardo DFA Series

Detonation Flame Arrestor

ATEX/US Coast Guard Certified Model*

OPTIONAL CONNECTIONS FOR DRAINAGE,
TEMPERATURE, PRESSURE, ETC.



*Not all models are available with USCG and ATEX certifications. Consult Flame Arrestor Certifications Chart for more information.

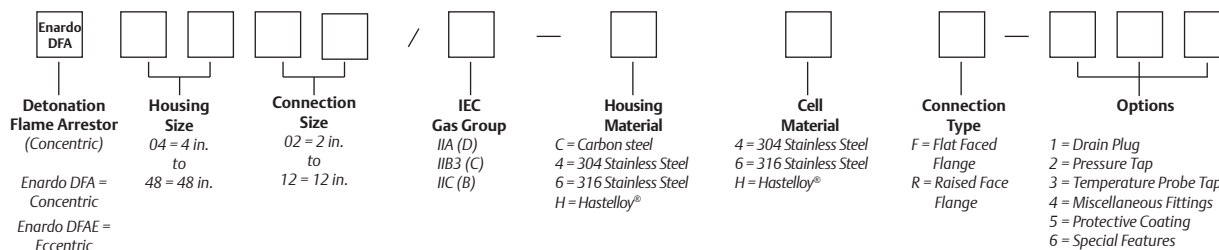
Figure 3. Standard Enardo™ DFA Series Dimensions

Table 2. Standard Enardo DFA Series Dimensions⁽¹⁾

MODEL	A (NOMINAL CONNECTION SIZE)		B (HOUSING SIZE)		C (OUTSIDE DIAMETER)		D (OVERALL LENGTH)				APPROXIMATE WEIGHT (GROUP D MODELS)	
	In.	mm	In.	mm	In.	mm	Gas Group B/C		Gas Group D		Lbs	kg
							In.	mm	In.	mm		
Enardo DFA-0401	1	25	4	100	9.00	229	25.00	635	21.00	533	90	40.8
Enardo DFA-0602	2	50	6	150	11.00	279	28.00	711	24.00	610	175	79.4
Enardo DFA-0803	3	75	8	200	13.50	343	30.00	762	26.00	660	220	99.8
Enardo DFA-1004	4	100	10	250	16.00	406	32.00	813	32.00	813	400	181.4
Enardo DFA-1206	6	150	12	300	19.00	483	36.00	914	36.00	914	500	226.8
Enardo DFA-1608	8	200	16	400	25.50	648	51.25	1302	51.25	1302	1360	616.9
Enardo DFA-2010	10	250	20	500	30.50	775	62.75	1594	62.75	1594	1945	882.2
Enardo DFA-2412	12	300	24	600	36.00	914	64.50	1638	64.50	1638	3000	1360.8
Enardo DFA-2814	14	350	28	700	40.75	1035	70.00	1778	70.00	1778	3400	1542.2
Enardo DFA-3016	16	400	30	750	43.00	1092	79.00	2007	79.00	2007	3800	1723.7
Enardo DFA-3418	18	450	34	850	47.50	1207	89.00	2261	89.00	2261	4800	2177.2
Enardo DFA-3620	20	500	36	900	50.00	1270	89.00	2261	89.00	2261	5600	2540.1
Enardo DFA-4824	24	600	48	1200	59.50	1511	101.00	2565	101.00	2565	8700	3946.3

1. Dimensions may vary somewhat from those given above. Allow for a tolerance of ± 1.00 in. / 25 mm. Specific dimensions available on request.

Key to Enardo DFA Series Model Number



Example:



Indicates a 6 in. Concentric Enardo DFA with a 12 in. Carbon steel housing, ANSI 150 lb raised faced flange connection and a 304 Stainless steel IEC Group "D" flame cell element. It also has an options of drain plugs, pressure taps and standard temperature probe connections.

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Standard Flame Arrestor Selection Criteria

Including US Coast Guard and ATEX/US Coast Guard Certified Detonation Arrestors

PARAMETERS	END-OF-LINE FVFA AND VSFA	IN-LINE (STANDARD) ENARDO™ 7 SERIES, HP AND IL	IN-LINE HP DEFLAGRATION ENARDO 8 SERIES	DETONATION ARRESTOR DFA
NEC Group "D" or IEC Group IIA Gases				
Maximum length of pipe between the arrestor and the ignition source without bends.	(Mounted on end of pipe)	20 ft / 6 m	60 ft / 18 m	Unlimited
Maximum length of pipe between the arrestor and ignition source with 1 to 90° bend.	(Mounted on end of pipe)	20 ft / 6 m	60 ft / 18 m	Unlimited
Maximum length of pipe between the arrestor and the ignition source with multiple bends.	(Mounted on end of pipe)	Not Recommended with Multiple Bends	Not Recommended with Multiple Bends	Unlimited
Flame Stabilization at stoichiometric mixture and ambient temperature not to exceed at 140°F / 60°C. ⁽¹⁾	5 minutes	5 minutes 30 minutes (Factory Mutual Approved units)	15 minutes	2 hours (concentric only)
Operating Pressure	Atmospheric	15.4 psia / 106 kPa	19.7 psia / 134 kPa	Concentric: 3 to 12 in. (22.7 psia) / 50 to 300 mm (157 kPa) Concentric: 2 and 14 to 20 in. (20.7 psia) / 350 to 500 mm (143 kPa)
NEC Group "C" or IEC Group IIB3 Gases				
Maximum length of pipe between the arrestor and the ignition source without bends.	(Mounted on end of pipe)	6 ft / 2 m (open ended pipe)	35 ft / 10.6 m	Unlimited
Maximum length of pipe between the arrestor and ignition source with 1 to 90° bend.	(Mounted on end of pipe)	6 ft / 2 m (open ended pipe)	35 ft / 10.6 m	Unlimited
Maximum length of pipe between the arrestor and the ignition source with multiple bends.	(Mounted on end of pipe)	Not Recommended with Multiple Bends	Not Recommended with Multiple Bends	Unlimited
Flame Stabilization at stoichiometric mixture and ambient temperature not to exceed at 140°F / 60°C. ⁽¹⁾	5 minutes (minimum)	5 minutes (minimum)	15 minutes	15 minutes
Operating Pressure	Atmospheric	15.4 psia / 106 kPa	16.7 psia / 115 kPa	Concentric: 2 to 20 in. (20.7 psia) / 50 to 500 mm (143 kPa) Eccentric: 3 to 20 in. (18.7 psia) / 75 to 500 mm (129 kPa)
NEC Group "B" or IEC Group IIC Gases (Except Acetylene)				
Maximum length of pipe between the arrestor and the ignition source without bends.	(Mounted on end of pipe)	4 ft / 1.2 m (open ended pipe)	15 ft / 4.5 m	Unlimited
Maximum length of pipe between the arrestor and ignition source with 1 to 90° bend.	(Mounted on end of pipe)	Not Recommended with a Bend	15 ft / 4.5 m	Unlimited
Maximum length of pipe between the arrestor and the ignition source with multiple bends.	(Mounted on end of pipe)	Not Recommended with Multiple Bends	Not Recommended with Multiple Bends	Unlimited
Flame Stabilization at stoichiometric mixture and ambient temperature not to exceed at 140°F / 60°C. ⁽¹⁾	2 minutes	2 minutes	15 minutes	15 minutes
Operating Pressure	Atmospheric	15.4 psia / 106 kPa	16.7 psia / 115 kPa	Concentric: 2 to 6 in. (17.7 psia) / 50 to 150 mm (122 kPa)
1. Unlimited burning should not be allowed in any flame arrestor regardless of its burn time rating. We recommend the use of flame sensors, along with an appropriate means of extinguishing the fire, in any situation where a stabilized burn may occur.				

ATEX Certified Flame Arrestor Selection Criteria

See Previous Page for Information on ATEX/US Coast Guard Detonation Arrestor Selection Criteria

PARAMETERS	END-OF-LINE FVFA	IN-LINE (STANDARD) ENARDO™ 7 SERIES, HP AND IL	DETONATION ARRESTOR DFA
IEC Group IIA Gases or NEC Group “D”			
Maximum length of pipe between the arrestor and the ignition source.	(Mounted on end of pipe)	2 in. to 6.5 ft / 50 mm to 2 m 3 in. to 7.5 ft / 75 mm to 2.3 m 4 in. to 10 ft / 100 mm to 3 m 6 in. to 13.1 ft / 150 mm to 4 m 8 in. to 13.3 ft / 200 mm to 4 m 10 in. to 16.6 ft / 250 mm to 5 m 12 in. to 19.7 ft / 300 mm to 6 m	2 to 12 in. / 50 to 300 mm Unrestricted (Designed for Unstable Detonations)
Flame Stabilization at stoichiometric mixture and ambient temperature not to exceed at 140°F / 60°C.	Short Time Burn Rating	Short Time Burn Rating	Short Time Burn Rating
Operating Pressure	Atmospheric	15.95 psia / 110 kPa	2 to 6 in. (17.7 psia) / 50 to 150 mm (122 kPa) 8 to 12 in. (16.9 psia) / 200 to 300 mm (116.5 kPa)
IEC Group IIB3 Gases or NEC Group “C”			
Maximum length of pipe between the arrestor and the ignition source.	(Mounted on end of pipe)	2 in. to 8.3 ft / 50 mm to 2.5 m 3 in. to 12.5 ft / 75 mm to 3.8 m 4 in. to 16.6 ft / 100 mm to 5 m 6 in. to 25 ft / 150 mm to 7.6 m 8 in. to 33.3 ft / 200 mm to 10.16 m 10 in. to 39.3 ft / 250 mm to 12 m 12 in. to 39.4 ft / 300 mm to 12 m	2 to 12 in. / 50 to 300 mm Unrestricted (Designed for Unstable Detonations)
Flame Stabilization at stoichiometric mixture and ambient temperature not to exceed at 140°F / 60°C.	Short Time Burn Rating	Short Time Burn Rating	Short Time Burn Rating
Operating Pressure	Atmospheric	15.95 psia / 110 kPa	17.2 psia / 118.3 kPa

Flame Arrestor Certifications

Flame and Detonation Arrestor

Table 1. Available Approvals for Enardo™ 7 Series Deflagration Flame Arrestors⁽¹⁾

MODEL	GROUP IIA (D)		GROUP IIB3 (C)
	ATEX ISO 16852	Factory Mutual	ATEX ISO 16852
Enardo 70402	X	X	X
Enardo 70602	X		X
Enardo 70603	X	X	X
Enardo 70803	X		X
Enardo 70804	X	X	X
Enardo 71204	X		X
Enardo 71206	X	X	X
Enardo 71606	X		X
Enardo 71608	X	X	X
Enardo 72008	X		X
Enardo 72010	X	X	X
Enardo 72410	X		X
Enardo 72412	X	X	X

Table 2. Available Approvals for Free Vent Flame Arrestors (FVFA)⁽¹⁾

MODEL	GROUP IIA (D)	GROUP IIB3 (C)
	ATEX ISO 16852	ATEX ISO 16852
Enardo 402	X	X
Enardo 602	X	X
Enardo 603	X	X
Enardo 803	X	X
Enardo 804	X	X
Enardo 1204	X	X
Enardo 1206	X	X
Enardo 1606	X	X
Enardo 1608	X	X
Enardo 2008	X	X
Enardo 2010	X	X
Enardo 2410	X	X
Enardo 2412	X	X

1. Applicable approvals must be specified prior to manufacture and will be indicated on the product nameplate.

Flame Arrestor Certifications

Flame and Detonation Arrestor

Table 3. Available Approvals for Detonation Flame Arrestors (DFA)⁽¹⁾ - Group IIA (D)

MODEL	TYPE OF DETONATION	ATEX WITH SHORT TIME BURN RATING	U.S. COAST GUARD AND ATEX/U.S. COAST GUARD WITH ENDURANCE BURN RATING ⁽²⁾
Enardo™ DFA-402	Unstable	X	
Enardo DFA-602	Unstable	X	X ⁽³⁾
Enardo DFA-603	Unstable	X	
Enardo DFA-803	Unstable	X	X
Enardo DFA-804	Unstable	X	
Enardo DFA-1004	Unstable		X
Enardo DFA-1204	Unstable	X	X
Enardo DFA-1206	Unstable	X	X
Enardo DFA-1608	Unstable	X	X
Enardo DFA-2010	Unstable	X	X
Enardo DFA-2412	Unstable	X	X
Enardo DFA-2814	Unstable		X
Enardo DFA-3016	Unstable		X
Enardo DFA-3418	Unstable		X
Enardo DFA-3620	Unstable		X

Table 4. Available Approvals for Detonation Flame Arrestors (DFA)⁽¹⁾ - Group IIB3 (C)

MODEL	TYPE OF DETONATION	ATEX WITH SHORT TIME BURN RATING	U.S. COAST GUARD AND ATEX/U.S. COAST GUARD WITH SHORT TIME BURN RATING
Enardo DFA-402	Unstable	X	
Enardo DFA-602	Unstable	X	X
Enardo DFA-603	Unstable	X	
Enardo DFA-803	Unstable	X	X
Enardo DFA-804	Unstable	X	
Enardo DFA-1004	Unstable		X
Enardo DFA-1204	Unstable	X	X
Enardo DFA-1206	Unstable	X	X
Enardo DFA-1608	Unstable	X	X
Enardo DFA-2010	Unstable	X	X
Enardo DFA-2412	Unstable	X	X
Enardo DFA-2814	Unstable		X
Enardo DFA-3016	Unstable		X
Enardo DFA-3418	Unstable		X
Enardo DFA-3620	Unstable		X

1. Applicable approvals must be specified prior to manufacture and will be indicated on the product nameplate.
2. Endurance burn rating applicable only to concentric configuration.
3. Short time burn rating only for both concentric and eccentric configurations of this model.

Flame Arrestor Design and Application Data Sheet

Flame and Detonation Arrestors

Customer _____
Contact _____
Address _____
Project Reference _____

Date _____
Telephone _____
Fax _____
Email _____

Application Data

Flow Rate (Normal/Max) _____ / _____
Temperature Rate (Normal/Max) _____ / _____ Pressure (Normal/Max) _____ / _____
Gas/Vapor Composition _____ (See next page for additional space)
NEC Gas Group _____ IEC Gas Group _____ MESH _____ mm
(If Gas Group is unknown please provide gas stream composition on next page)
Maximum Allowable Pressure Drop _____
Distance to be Installed from Potential Ignition Source _____ Any Bends? _____ How many? _____
Is Continuous Burning Possible on the FA Element? Yes No

Design Data

End of Line Flame Arrestor (Free Vent) High Pressure Deflagration Flame Arrestor
 Inline Deflagration Flame Arrestor Detonation Flame Arrestor⁽¹⁾

Installation: Horizontal _____ Vertical _____ Other _____
Pipe Size: _____ Flange Pressure Rating: ANSI 150# R.F. (standard)
 DIN
 JIS
 Other _____

Materials:
Housing and Element Housing _____ Flame Cell _____

Options:
 Drain Plug _____ (3/4 in. NPT **standard**)
 Temperature Probe Fitting _____ (3/4 in. NPT **standard**)
 Pressure Tap _____ (3/4 in. NPT **standard**)
 Coating/Special Paint _____
 Other Options _____

Additional Information: _____

1. All Detonation Arrestors are designed for unstable detonation and can be placed at any point in the system.



