



- Series 25000E - Sizes DN 50 (2"), DN 80 (3"), DN 100 (4"), DN 150 (6") and DN 200 (8")
- Series 35000E - Sizes DN 250 (10"), DN 300 (12"), DN 350 (14"), DN 400 (16") and DN 450 (18")
- Suitable for use with IEC Explosion Group IIA (NEC Group D) Vapors
- Conforms to the latest ATEX Directive, ISO 16852
- Improved flow and reduced pressure drop
- Optional connections for drains, pressure taps or temperature probes
- Tested by recognized independent laboratories
- Available in Carbon Steel, Stainless Steel & Alloy C276

SERIES  
25000E  
35000E

## OBJECTIVE

Protectoseal's Series 25000E / 35000E Detonation Flame Arresters are designed to withstand deflagrations, stable detonations and overdriven/unstable detonations. These arresters are bi-directional, capable of stopping a flame or detonation approaching from either direction in a piping system.

Suitable for use with International Electrotechnical Commission (IEC) Explosion Group IIA vapors, generally equivalent to National Electrical Code (NEC) Group D vapors. For arresters suitable for use with Explosion Groups IIA or IIB3 (NEC Groups D or C) vapors refer to Series 26000E / 36000E.

## STABLE VS. UNSTABLE DETONATION ARRESTERS

"Unstable" detonation arresters are required for safety in piping containing flammable vapors, as encountered in vapor recovery or manifolded tank systems.

A confined flame front will accelerate from the point of ignition, quickly reaching the speed of sound in a pipe run. During the unavoidable transition period from subsonic to supersonic speeds, flame front pressures and velocities are far greater than before or after the transition (an unstable detonation).

Devices approved under ISO 16852 as "stable detonation arresters" (Type 3 or Type 4) have not been tested against the severe mechanical and thermal effects of multiple unstable detonations. The use of "stable detonation arresters" is based on the premises that: 1) it is *unlikely* that the *unavoidable* high pressure and velocity transition will occur as the flame front reaches the detonation arrester, and 2) all of the independent safety systems required to be installed when stable detonation arresters are used will function properly.

The major approval agencies in the United States and Canada - United States Coast Guard (USCG), Underwriters Laboratories (UL), Underwriters Laboratories of Canada (ULC) and Factory Mutual (FM) - all require that detonation arresters be tested to withstand unstable (overdriven) detonations. For arresters meeting these specific test standards, refer to Protectoseal Series 25000 / 26000 and Series 35000 / 36000 Detonation Arresters

## LABORATORY TESTING

**Approvals.** Classified according to the latest ATEX Directive - ISO 16852 as Bi-Directional Detonation Arresters DET Type 2 tested for unstable (overdriven) detonations without restrictions. No limitations are imposed on the location within the piping.

## Maximum Operating Pressures:

DN 50 (2"), 1.22 bara (17.7 PSIA)	DN 250 (10"), 1.22 bara (17.7 PSIA)
DN 80 (3"), 1.22 bara (17.7 PSIA)	DN 300 (12"), 1.22 bara (17.7 PSIA)
DN 100 (4"), 1.22 bara (17.7 PSIA)	DN 350 (14"), 1.22 bara (17.7 PSIA)
DN 150 (6"), 1.22 bara (17.7 PSIA)	DN 400 (16"), 1.22 bara (17.7 PSIA)
DN 200 (8"), 1.08 bara (15.7 PSIA)	DN 450 (18"), 1.22 bara (17.7 PSIA)

Maximum Operating Temperature: 60° C (140° F).

Approved DET Type 2 detonation arresters that are suitable for short time burn (Class 'b' according to ISO 16852) are available. Refer to page 4 for more information.

Approved DET Type 2 detonation arresters not rated for short time burn or endurance burn (Class 'c' according to ISO 16852) are available.

## SPECIAL FEATURES

The Series 25000E / 35000E Detonation Flame Arrester designs utilize improved-flow, crimped metal flame arrester elements. High strength, welded housing, hydrostatically tested at 475 PSIG (32.7 BARG) for ten minutes. Pneumatically tested at 10 PSIG (0.7 BARG). All welding is performed in accordance with ASME Boiler and Pressure Vessel Code Sections VIII and IX.

**Configuration.** Concentric housing.

**Sizes Available.** DN 50 (2") through DN 450 (18") sizes.

Flanged to mate with standard flanged 150 lb. R.F. ANSI or DIN PN16 R.F. bolting specifications.

**Short Time Burn Rating.** Protectoseal's Series 25000E / 35000E Detonation Arresters are suitable for short time burn when additional external safety equipment is properly used in accordance with the requirements of EN ISO 16852. Refer to page 4 for more information.

**Optional Fittings.** Connections may be provided on the arrester housing for drains, pressure taps or temperature probes if required.

**Precision Manufacturing.** Manufactured under Protectoseal's ISO 9001 and ISO / IEC 80079-34 Quality System.

**PRO-FLOW® Sizing and Selection Software.** Use PRO-FLOW® to calculate flame arrester flow requirements in accordance with API 2000, ISO 28300, NFPA 30 and OSHA 1910.106.

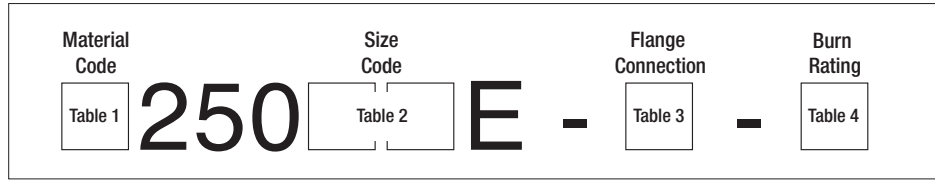
## CONSTRUCTION

A comprehensive range of materials is offered as shown in Table 1 of the Part Numbering System on pages 2 and 3.

# Series 25000E Bi-Directional Overdriven / Unstable Detonation Arrester

Suitable for use with IEC Explosion Group IIA (NEC Group D) Vapors

**SERIES 25000E PART NUMBERING SYSTEM** - DN 50 (2") through DN 200 (8") sizes, refer to Series 35000E on next page for larger sizes



**Table 1: Materials of Construction**

Option Code	Housing & Element Housing	Element Winding
C	Steel	304 S.S.
S	Steel	316 S.S.
L	304 S.S.	304 S.S.
F	316 S.S.	316 S.S.
M	C276	C276

**Table 2: Size**

Option Code	Size*
02	50 mm / 2"
03	80 mm / 3"
04	100 mm / 4"
06	150 mm / 6"
08	200 mm / 8"

See next page for larger sizes.

\*See Table 3 to designate flange connection..

**Table 3: Flange Connection**

Option Code	Description
1	ANSI 150 lb. R.F. Flange
2	DIN PN 16 R.F. Flange

**Table 4: Burn Rating**

Option Code	Arrester Description	Number of Taps
1	Not suitable for short time burn or for endurance burn (Class 'c')	0
2	Suitable for short time burn (Class 'b')**	2

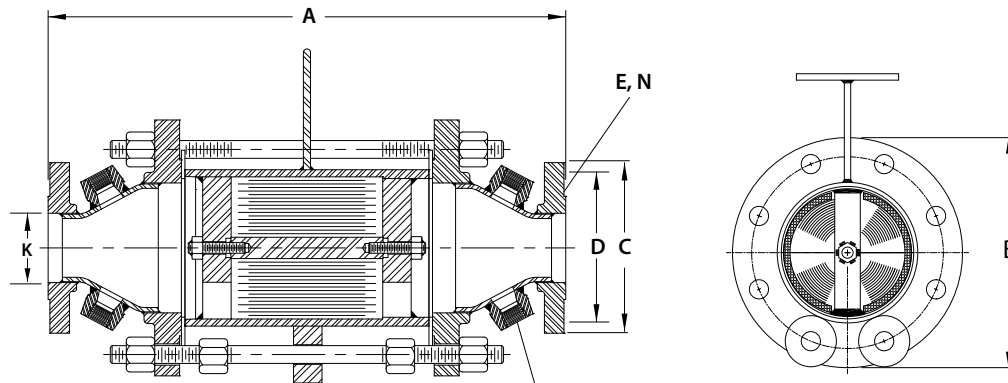
\*\* Short time burn rated arresters require the use of additional external safety equipment, see page 4.

## Part Number Example

**PART NUMBER: F25004E-1-1**

Material	Table 1 - Option Code - <b>F</b>	All 316 S.S.
Size	Table 2 - Option Code - <b>04</b>	4"
Mounting Connection	Table 3 - Option Code - <b>1</b>	ANSI 150 lb. R.F. Flange
Burn Test Rating	Table 4 - Option Code - <b>1</b>	Not suitable, no taps

## DIMENSIONS (Please refer to numbering system above to complete Part No. NOTE: Dimensions shown are for reference only, contact factory for certified drawings.)



Optional connections for drains, pressure taps or temperature probes

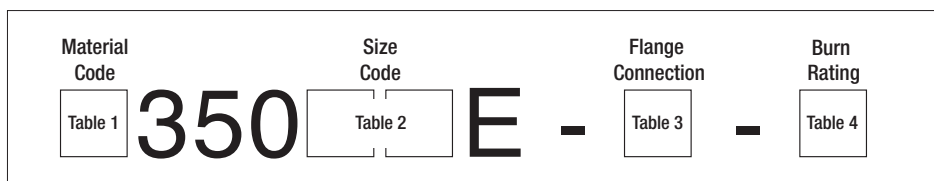
Part No.	K - Size / Connection		Face to Face A	Dia. B	Flange O.D. C	B.C. D	Dia. E	Holes N
	ANSI	DIN 16 PN						
1 25002E-1-4	2"	-	403mm (15.88")	229mm (9")	152mm (6")	121mm (4.75")	19.1mm (.75")	4
1 25002E-2-4	-	DN 50	403mm (15.88")	229mm (9")	165mm (6.5")	125mm (4.92")	18mm (.71")	4
1 25003E-1-4	3"	-	502mm (19.75")	279mm (11")	191mm (7.5")	152mm (6")	19.1mm (.75")	4
1 25003E-2-4	-	DN 80	502mm (19.75")	279mm (11")	200mm (7.88")	160mm (6.3")	18mm (.71")	8
1 25004E-1-4	4"	-	545mm (21.44")	343mm (13.5")	229mm (9")	191mm (7.5")	19.1mm (.75")	8
1 25004E-2-4	-	DN 100	545mm (21.44")	343mm (13.5")	220mm (8.66")	180mm (7.09")	18mm (.71")	8
1 25006E-1-4	6"	-	734mm (28.88")	483mm (19")	279mm (11")	241mm (9.5")	22.2mm (.88")	8
1 25006E-2-4	-	DN 150	734mm (28.88")	483mm (19")	285mm (11.22")	240mm (9.45")	22mm (.87")	8
1 25008E-1-4	8"	-	1117mm (44")	597mm (23.5")	343mm (13.5")	299mm (11.75")	22.2mm (.88")	8
1 25008E-2-4	-	DN 200	1117mm (44")	597mm (23.5")	340mm (13.4")	295mm (11.61")	22mm (.87")	12

Superscripted numbers refer to table numbers as indicated in the "Part Numbering System" charts.

# Series 35000E Bi-Directional Overdriven / Unstable Detonation Arrester

Suitable for use with IEC Explosion Group IIA (NEC Group D) Vapors

**SERIES 35000E PART NUMBERING SYSTEM** - DN 250 (10") through DN 450 (18") sizes, refer to Series 25000E on previous page for smaller sizes



**Table 1: Materials of Construction**

Option Code	Housing & Element Housing	Element Winding
C	Steel	304 S.S.
S	Steel	316 S.S.
L	304 S.S.	304 S.S.
F	316 S.S.	316 S.S.
M	C276	C276

**Table 2: Size**

Option Code	Size*
<i>See preceding page for smaller sizes.</i>	
10	250 mm / 10"
12	300 mm / 12"
14	350 mm / 14"
16	400 mm / 16"
18	450 mm / 18"

**Table 3: Flange Connection**

Option Code	Description
1	ANSI 150 lb. R.F. Flange
2	DIN PN 16 R.F. Flange

**Table 4: Burn Rating**

Option Code	Arrester Description	Number of Taps
1	Not suitable for short time burn or for endurance burn (Class 'c')	0
2	Suitable for short time burn (Class 'b')**	2

\*\* Short time burn rated arresters require the use of additional external safety equipment. see page 4.

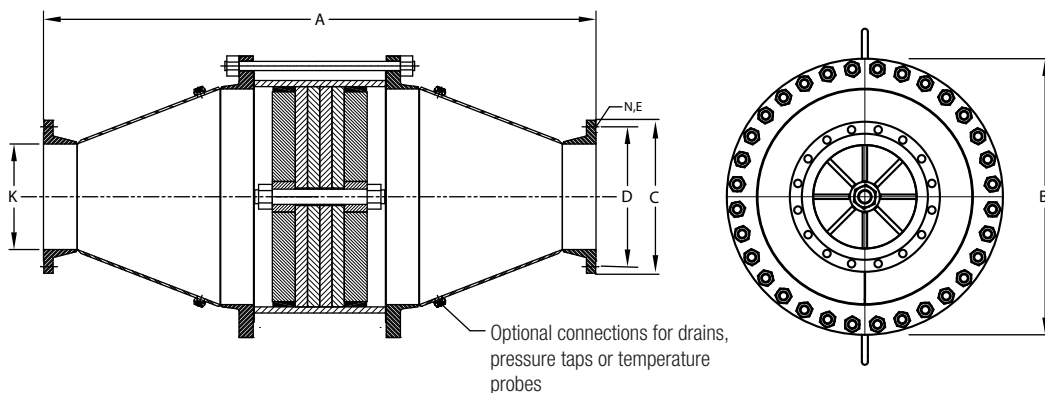
### Part Number Example

**PART NUMBER: F35018E-1-2**

Material	Table 1 - Option Code - <b>F</b>	All 316 S.S.
Size	Table 2 - Option Code - <b>18</b>	18"
Mounting Connection	Table 3 - Option Code - <b>1</b>	ANSI 150 lb. R.F. Flange
Burn Test Rating	Table 4 - Option Code - <b>2</b>	Suitable, see page 4

### DIMENSIONS

(Please refer to numbering system above to complete Part No. NOTE: Dimensions shown are for reference only, contact factory for certified drawings.)



Part No.	K - Size / Connection		Face to Face A	Dia. B	Flange O.D. C	B.C. D	Dia. E	Holes N
	ANSI	DIN 16 PN						
1 35010E-1-4	10"	-	1511mm (59.5")	699mm (27.5")	406mm (16")	362mm (14.25")	25.4mm (1")	12
1 35010E-2-4	-	DN 250	1511mm (59.5")	699mm (27.5")	405mm (15.95")	355mm (14")	26mm (1.02")	12
1 35012E-1-4	12"	-	1632mm (64.25")	813mm (32")	483mm (19")	432mm (17")	25.4mm (1")	12
1 35012E-2-4	-	DN 300	1632mm (64.25")	813mm (32")	460mm (18.1")	410mm (16.14")	26mm (1.02")	12
1 35014E-1-4	14"	-	2054mm (80.88")	985mm (38.75")	533mm (21")	476mm (18.75")	28.7mm (1.13")	12
1 35014E-2-4	-	DN 350	2054mm (80.88")	985mm (38.75")	520mm (20.5")	470mm (18.5")	26mm (1.02")	16
1 35016E-1-4	16"	-	2256mm (88.82")	985mm (38.75")	597mm (23.5")	540mm (21.25")	28.7mm (1.13")	16
1 35016E-2-4	-	DN 400	2256mm (88.82")	985mm (38.75")	580mm (22.8")	525mm (20.7")	30mm (1.18")	16
1 35018E-1-4	18"	-	2296mm (90.38")	1168mm (46")	635mm (25")	588mm (22.75")	31.8mm (1.25")	16
1 35018E-2-4	-	DN 450	2296mm (90.38")	1168mm (46")	640mm (25.2")	585mm (23.03")	30mm (1.18")	20

Superscripted numbers refer to table numbers as indicated in the "Part Numbering System" charts.

### SHORT TIME BURN RATED ARRESTERS

Protectoseal's Series 25000E / 35000E Detonation Flame Arresters are suitable for short time burn when additional external safety equipment is properly used in accordance with the requirements of EN ISO 16852.

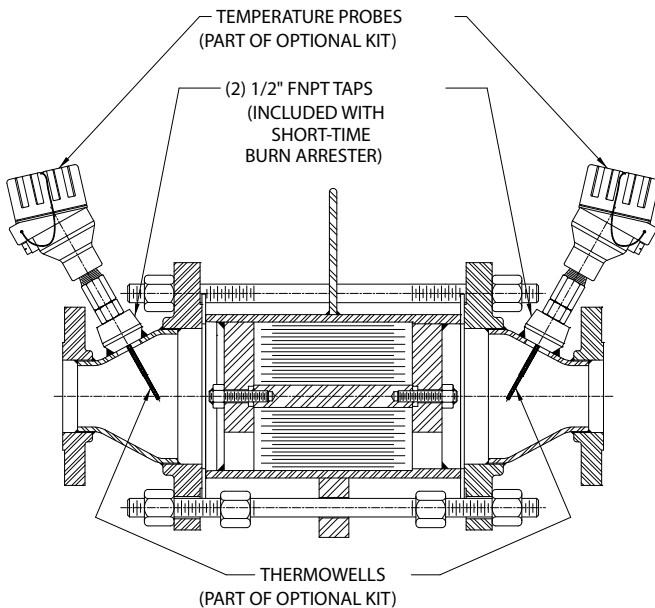
**Stabilized Burn Rating:** [BC:b t<sub>BT</sub> = ] - Consult factory for tested burn times.

Short time burn arresters are equipped with two ½" FNPT taps for the installation of ATEX Approved, intrinsically-safe temperature sensor assemblies. These temperature probes are used to detect a burn on the flame arrester element and send a signal that will trigger emergency functions within a burning time of 50% of the manufacturer's specified burning time, t<sub>BT</sub>.

All of Protectoseal's detonation arrester designs provide bi-directional protection. Use two ATEX Approved probes for bi-directional protection; use one ATEX Approved probe for single direction protection. Temperature probe(s) can be purchased from Protectoseal as part of a kit (see Table 5). The kit includes one temperature probe and one thermowell. The use of a thermowell both protects the temperature probe during operation and allows for its removal without discharging flammable vapors to atmosphere.

Temperature probes may also be supplied by the end user as long as they include the use of compatible thermowells, are manufactured in accordance with Directive 94/9/EC and meet the following requirements:

- Ex ia intrinsically-safe
- Equipment Group II
- Suitable for Gas Zones 0, 1, 2
- Gas vapor groups IIA or IIB3
- Temperature classification (TBD by customer). T6 offered standard with Protectoseal probes
- Type approval must be independent of thermowell or protection tube



**Table 5: Temperature Probe Kits**

Series Part Number	Size	Insertion Length	Kit Part No.
<b>Series 25000E</b>			
25002E- -2	DN 50 or 2" ANSI	200 mm	TP-050-KIT
25003E- -2	DN 80 or 3" ANSI	225 mm	TP-080-KIT
25004E- -2	DN 100 or 4" ANSI	255 mm	TP-100-KIT
25006E- -2	DN 150 or 6" ANSI	290 mm	TP-150-KIT
25008E- -2	DN 200 or 8" ANSI	355 mm	TP-200-KIT
<b>Series 35000E</b>			
35010E- -2	DN 250 or 10" ANSI	400 mm	TP-250-KIT
35012E- -2	DN 300 or 12" ANSI	455 mm	TP-300-KIT
35014E- -2	DN 350 or 14" ANSI	550 mm	TP-400-KIT
35016E- -2	DN 400 or 16" ANSI	550 mm	TP-400-KIT
35018E- -2	DN 450 or 18" ANSI	600 mm	TP-450-KIT

\* The kit includes (1) temperature probe and (1) thermowell