Flame arrester maintenance and cleaning

For qualified personnel servicing a removable crimped-metal element. Identify the arrester model and serial number on the nameplate and use the installation and maintenance manual for that unit.

> **Suspected deflagration, detonation or stabilized burn**
>
> Keep the unit out of service pending inspection. Contact Paradox IP LLC with the model, serial number and event details before returning it to service.

01 Set the inspection interval

Inspect during the first few months of operation. Set the next interval from the type and amount of deposits found. Inspect sooner if the pressure drop rises at comparable flow.

Deposits can restrict flow and impair heat absorption in the flame channels. Record the pressure drop and operating flow so later readings can be compared.



Deposits on the face of a removed element.

02 Isolate, mark and remove the assembly

Follow the site shutdown and lockout procedure. Isolate the unit from all pressure and vapor sources, relieve stored pressure safely, and verify isolation and zero pressure. Allow the unit to cool. Purge and test the atmosphere as required before opening it.

Before loosening any studs, use a site-approved permanent marker compatible with the material and service. On the solid exterior of the removable element shell, write E1 at the protected end and E2 at the ignition end. Put the same labels on the adjacent fixed end sections. Keep ink off the crimped ribbon, channels and gasket sealing faces.

At 12 o’clock, mark matching lines on the shell and fixed housing. Record the landmark and sketch the marks or take a site-permitted photo before cleaning. Use suitable lifting equipment. Follow the model manual for removal, retain the alignment lugs and inspect both faces with the element in its shell.

03 Clean without deforming the channels

Use a model-approved cleaning medium (water, detergent, solvent or steam) compatible with the deposits, process residues and element. Collect wash residue under the site procedure.

If spray washing is permitted, follow the model’s pressure, nozzle and stand-off instructions. Spray perpendicular to the face and alternate sides. Never rod the channels with wire or other hard objects.

Dry the element by the approved method. If compressed air is permitted, follow the applicable pressure, guarding and personal protective equipment requirements.

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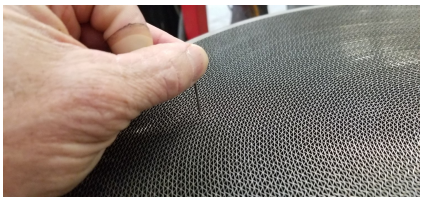
Inspection and return to service

04 Inspect the clean element

Check both faces and visible channels for deposits, corrosion, erosion, dents or crushed ribbon. Replace the assembly if damaged or if deposits cannot be removed.

Use calibrated pins without forcing them. Check the model-specified locations and several random openings on each face. Record each pin trial on page 3.

NEC group (IEC)	Min. (in.)	Max. (in.)
D (IIA)	0.056	0.061
C (IIB3)	0.033	0.038
B (IIC)	0.015	0.0215



Pin-gauge inspection of the crimped-metal channels.

For other ratings, obtain the element limits from Paradox IP LLC. Never use a gas or vapor's maximum experimental safe gap (MESG) as the pin diameter.

Replace an element assembly with an oversized opening

If any crimp opening measures larger than the maximum for its gas group, take the element assembly out of service and replace it before returning the arrester to service.

05 Fit new gaskets and tighten the assembly

Clean sealing faces without scratching them. Fit specified new gaskets each time the assembly is loosened or removed. Use adhesive only as directed. Keep it off the element face and channels.

Match E1 to E1 and E2 to E2, then align the two 12 o'clock lines. Verify against the recorded landmark before tightening. Center the assembly on its lugs and seat it evenly on the gaskets. Refit the studs, start the outer nuts by hand and back any jacking nuts clear of the flange faces.

After the nuts are hand tight, follow the model manual's tightening sequence and stages. Apply the final torque specified for the installed fasteners and gaskets.

06 Release the unit and record the work

Complete required leak and installation checks before restoring service. For leaks, failed inspections or unconfirmed limits, keep the unit isolated and contact Paradox IP LLC.

If prior orientation is uncertain, record it as unknown. Check every current reading against its applicable limit. Compare individual readings over time only when the same face and location can be identified. Start a new baseline for a clean, accepted element if the original orientation cannot be recovered.

This bulletin provides general maintenance guidance and makes no express or implied warranty. Paradox IP LLC may revise product designs and specifications.

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Element inspection record

Keep the first inspection of a clean, accepted element as its baseline. Use a fresh copy for each inspection and enter the baseline record ID for comparison.

Site / equipment tag | **Arrester model** | **Element ID / serial number**

Inspection date | **Record ID** | **Type (baseline / follow-up)** | **Baseline record ID, if follow-up**

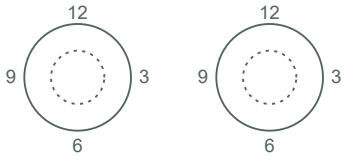
Gas group / element rating | **Min. opening (in.)** | **Max. opening (in.)** | **Gauge set ID** | **Calibration due date**

Before removal, mark E1 on the protected end (e.g., process gas supply) and E2 on the ignition end (e.g., flare). Match both ends to the fixed housing and mark 12 o'clock as described on page 1. Keep the end numbers even if flow reverses.

End 1 · Protected side | **End 2 · Ignition side** | **Physical landmark at 12 o'clock (e.g., lifting lug)**

Sample both faces

Look directly at each face with the same physical landmark at 12 o'clock. On each face, randomly select multiple openings across different clock sectors and at different distances from the center. Include any locations required by the model manual.



END 1
Protected side

END 2
Ignition side

For each pin trial, enter the clock position and radial location (e.g., 2:30 / outer), the pin diameter in inches and whether the pin entered (Y/N). Use another copy with the same record ID for extra trials.

END 1 / PROTECTED SIDE			END 2 / IGNITION SIDE		
Clock / radial location	Pin (in.)	Entered? Y/N	Clock / radial location	Pin (in.)	Entered? Y/N

If any opening exceeds the applicable maximum, remove the element assembly from service and replace it.

Findings / action / sketch or photo reference | **Orientation vs. baseline** | **E1, E2 and 12 aligned at refit?**

Inspector name / initials | **Disposition (accept / hold / replace)** | **Next inspection date**

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