

# Vacuum-Canister Sipping for PWR and BWR Failed Fuel Detection

## Field-proven Performance and Reliability

AREVA's vacuum-canister sipping delivers proven performance and reliability for detecting failed fuel in PWRs or BWRs. This dependable process detects failure during routine fuel assembly off-loading operations, or when preparing for dry cask storage.

## Innovative Sipping Canister

Vacuum sipping identifies failed assemblies by isolating each one in a sipping canister. The process starts by flushing the canister with primary grade water. Next the system forms a void in the top of the canister. A vacuum pump is then used to evacuate the canister and draw fission gases from leaking fuel rods. These gases are recirculated through the system and past the detectors. An analysis system assesses the integrity of each fuel assembly and identifies failures to the operator.

## User-friendly Design Helps Minimize Dose

Operators control the sampling process from freestanding electrical control consoles. A single multi-conductor cable connects these consoles to the valve stations. Plus, they are designed and set up to operate from a non-contaminated area. Each console is shipped fully assembled in individual shipping containers.

## Additional Sipping Services

AREVA also offers optional mast sipping to further minimize impact to your outage schedule. Our mast (water/gas) sipping removes any gaseous fission products by using the reduction in pressure which occurs when lifting the fuel assembly. Plus, our in-core sipping can test up to eight BWR fuel assemblies simultaneously – without lifting.

## Special Features Ensure Safe and Reliable Operations

- Visible and audible alarms indicate loss of service water or compressed air, high canister temperature, insufficient vacuum or loss of the canister lid seal.
- Loss of services will cause the canister lid to open, and the system will return to the flush mode to prevent fuel assembly damage.
- The electronic console includes a built-in diagnostic program to improve troubleshooting capabilities and in-field servicing.

## Features and Benefits

- Can sip both BWR and PWR fuel
- Experience? We have inspected over 15,440 fuel assemblies
- Uses two canisters with cycle times of only ten minutes per canister
- Proven on failed fuel up to 30 years old
- Detects hard-to-find leaks
- Yields near 100% efficiency
- Requires no plant modifications
- Short set-up time: Only one 12-hour shift
- Test up to eight fuel assemblies per hour, depending on fuel movement time
- We can set up control consoles 75 feet from the in-pool components to lower personnel dose

## Minimal Service Requirements:

- Electric Power: 120VAC/60 Hz/20 AMP
- Water: 50psig @ 25-35 gpm,  
Primary Grade or Condensate
- Compressed Air: 100 psig @ 6 cfm

## Equipment dimensions fit most any site:

### Electrical Console

- Height: 43"
- Depth: 28"
- Width: 25"
- Weight: 350 #

### Detector Cave – Quantity 2

- Height: 19"
- Diameter: 16"
- Weight: 400 #

### Canister – Quantity 2

- Length: 15'
- Width: 24"
- Weight: 500 # for BWR  
1050 # for PWR

### Canister Support Stand – Quantity 1

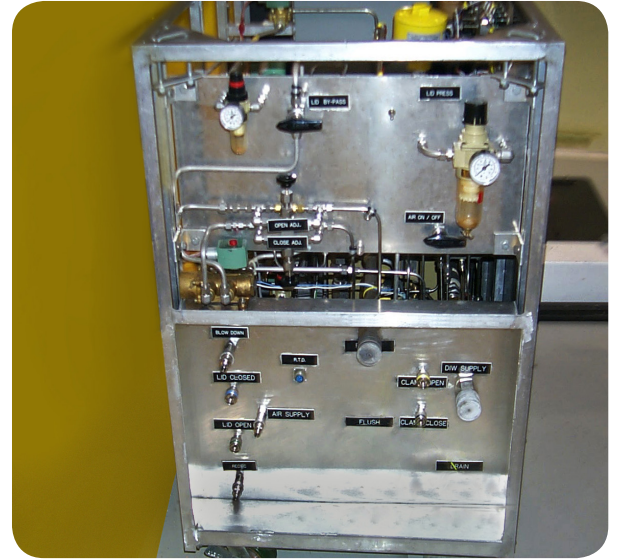
- Height: 65"
- Length: 60"
- Width: 60"
- Weight: 580 #

### Mechanical Console

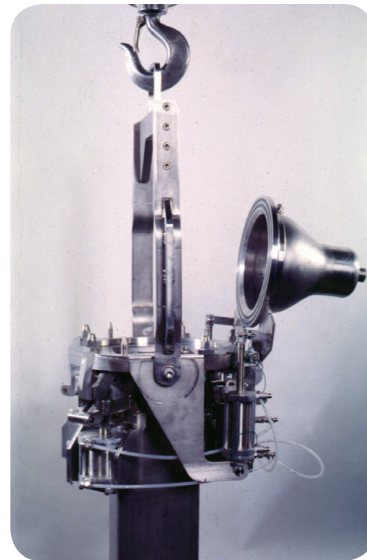
- Height: 43"
- Depth: 28"
- Width: 25"
- Weight: 350 #



Electrical Console



Mechanical Console



AREVA can install vacuum sipping canisters in guide tube storage cells or in our customized support stands.

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