

# Calvane™ Heaters - FV

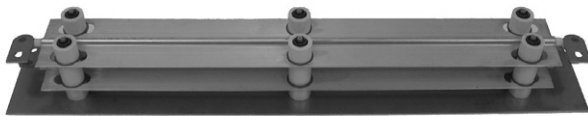
## Compact and Lightweight for Space, Economy and Comfort

Calvane™ heaters combine compact size with lightweight Calrod® construction for an efficient and easily installed electrical heating source. They are designed for installations requiring size and weight control, where heater sheath temperatures below 600°F (316°C) can be maintained. The heaters are used primarily in natural and forced convection heating applications such as aircraft and transit car comfort heating.



## Construction

The Calvane™ heating element, U.S. Patent No. 6,963,053, features an aluminum sheath with integrally extruded fins for an extended heat transfer surface. Nickel chromium resistance wire or ribbon and high grade magnesium oxide insulation combine to provide maximum life expectancy. With lengths up to 120" (3048 mm) and widths of 2.25" (58 mm) and 3.25" (83 mm), Calvane™ heaters are exceptionally well suited for air heating for comfort and dehumidification purposes in aircraft or transit cars. Quick connect or screw type projection welded connectors are available, and elements can be supported on studs.



## Standard Product Features

- Two standard widths: 2.25" (57 mm) & 3.25" (83 mm)
- Lightweight:
  - 2.25" (57 mm) wide = 0.2 lbs/ft
  - 3.25" (83 mm) wide = 0.3 lbs/ft
- Extended heat transfer area:
  - 2.25" (57 mm) wide = 5 sq. in/in
  - 3.25" (83 mm) wide = 7 sq. in/in
- Low watt density
- Calrod® construction for long life
- Fast start-up and cool down periods
- No magnetic noise
- Low pressure drop
- Resistance to damage from shock and vibration
- Easily isolated for high voltage applications

## Heater Selection

### Thermal Duty

See Section D (technical data) for guidance on how to determine the appropriate total kW rating for a specific application.

### Watt Density

The surface temperature of the heater must not exceed 600°F (316°C). Where there is a free flow of air through the element array, a watt density of 250 W/ft is acceptable for natural convection and low velocity, forced convection, comfort air heating. For other applications, consult CCI Thermal Technologies Inc.

### Mounting Arrangements

CCI Thermal Technologies supplies Calvane™ heaters in three configurations:

- With plain fins for field modification to accommodate user installed hardware.
- With holes/slots in fins.
- Mounted on back plates.

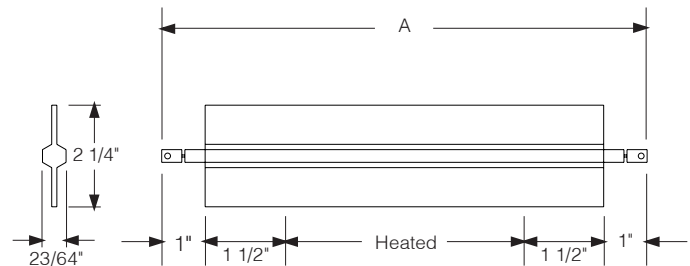


Figure 68

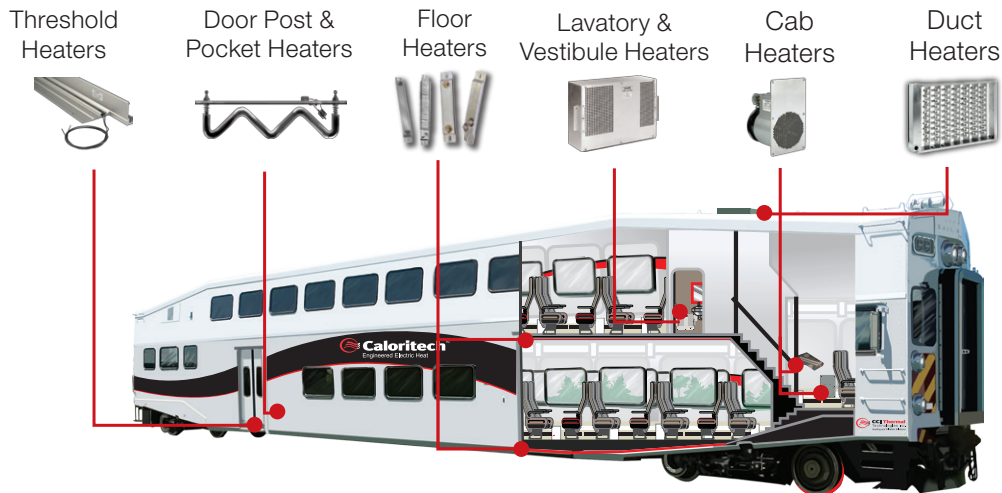
Table 27 – Standard Product Listing

'A' Dimensions		Watts	Catalog Number
in	mm		
29	737	500	FV1241
41	1041	750	FV1361
53	1346	1000	FV1481
65	1651	1250	FV1601
77	1956	1500	FV1721
89	2261	1750	FV1841

### Note

- Standard heaters 120V and rated at 250 W/ft
- Custom designs available

# Transit Car Floor Heaters



## Transit Car Specifications

Transit car applications typically require floor heaters and even heat distribution. Heaters are normally installed in enclosures that take in air at the bottom and discharge air at the top or at the base of the window. Enclosure surfaces which can be contacted should not exceed temperatures of 125°F (52°C).

## Calvane™ Heaters

Calvane™ heating elements in lengths up to 120" (3048 mm) can be purchased factory-mounted to stainless steel sub panels, ready for easy installation. These lengths reduce the number of field interconnections and allow series-connected elements to be powered at car ends or mid-car, thus minimizing assembly and wiring costs during car building. Calvane™ heaters also offer more even heat output and resultant lower casing temperatures than steel case strip heaters in similar applications. Calvane™ element weight is approximately 25% of steel case strip heater weight.

For transit car applications with supply voltages in the 600V nominal range, ceramic stand-off insulator systems are available. These insulators provide the required creepage and clearance distance for operation at over 240V. They also allow for expansion and contraction of the elements with minimal noise.

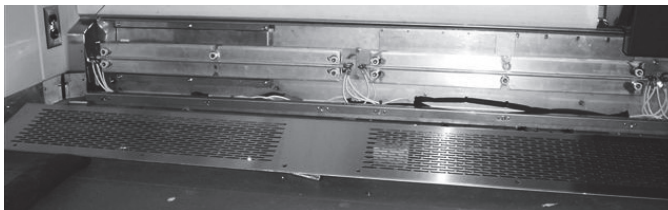


Figure 69 – Calvane™ Installation



Figure 70 – Strip Heater

## Calvane™ Standard Product Features

- Two standard widths:
  - 2.25" (57 mm)
  - 3.25" (83 mm)
- Light weight:
  - 2.25" (57 mm) wide = 0.2 lbs/ft
  - 3.25" (83 mm) wide = 0.3 lbs/ft
- Low watt density
- Calrod® construction for long life
- Fast start-up and cool down periods
- No magnetic noise
- Low pressure drop
- Resistance to damage from shock and vibration
- Easily isolated for high voltage applications

## Strip Heaters

CCI Thermal offers steel case strip heaters in chrome, aluminized, and rust resistant steel. For more information, refer to Strip & Finned Strip Heaters - SS, SD & FS on page A23 to A29.

Typically, strip heaters designed for transit application are straight with terminal studs at each end. A high temperature nickle chromium resistance wire is uniformly spaced evenly over the width of the heater embedded in a special refractory material that possesses excellent heat transfer characteristics for demanding railcar environments.

## Strip Heater Standard Product Features

- Uniform heat distribution
- Vibration resistant
- Rust resistant sheath material