SAN/Omni Control Technologies

Switch Heating

San Electro Heat and Omni Control Technologies manufacture and produce robust flat switch heating elements that are then tailored to the needs of the rail customer. This customization involves the packaging, termination and connectorization of the heaters being produced. This partnership optimizes and focuses the experience and technology from Europe and places it in the hands of a seasoned US rail manufacturer.

Ultra Corrosion Free Outer Jacket afforded by Monel 400 Sheathing

- MONEL 400 is impervious to salt and most chemicals
  - Used in undersea applications
  - Perfect for Rail environment
  - Raises Mean Time Before Failure (MTBF) of heaters better than 30 years
    - Empirically based on over 20,000 deployments over 20 plus years
  - 10 Year Warranty – best in the industry
  - Extend life of heater - lowers overall cost of ownership
- AISI 316 or 321 Steel Sheath also available[1]

Flat Heater Thermal Conductivity & Energy Savings

- Flat Heater Profile allows for maximum thermal transfer to the rail
  - 40% of flat heater makes contact with rail vs 15% of tubular heater makes contact with rail
  - Energy savings of 38% is realized with providing the same adjusted heat to the rail – for example a 250w/ft. SAN heater is equivalent, in thermal conductivity, to a 400 w/ft. tubular heater
  - Single element from 100 w/ft. to 300 w/ft. – Dual Element from 200 w/ft. to 600 w/ft.
  - Length 4 feet to 24 Feet[2]

Pan Heaters

- Heat Switch Rods
- Use flat heater elements – total wattage from 150 w/ft. to 600 w/ft.
- Ease of installation – easily slide under rods for protected operation
- 2 foot to 12 foot Stainless Steel Pans

Installation

- SAN's kick-on stainless steel clips last much longer than alloy clips and are easy to install and remove
- Single and Dual Element installation configurations are available
- Pan Heaters easily slide under switch rods for protected operation

Wind Cover Option Keeps Heat Focused[3]

- Switch point heating stainless steel and aluminum covers protect switch point's loss of heat due to wind
  - Wind can erode or eliminate heating efficiency
  - Covers reduce heat loss due to wind & minimize corrosion
  - Covers protect the element from mechanical perils such as tamping

[1] 3-year warranty
[2] Longer lengths under development
[3] Covers are offered and priced separately – under development

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OMNI Control Technology, Inc.

Switch Heating

Rail Proven Design – Ruggedized & Waterproof

- Shock and Vibration Proof design adds to the ultra-high Mean Time Before Failure(MTBF)
  - The heating wire is a solid wire wound in a spiral. The spiral is encapsulated in highly compressed magnesium oxide. The heating element is then subjected to a thermodynamic cycle to further ruggedize[4]
- Hermetically sealed power and end terminations prevent water and moisture penetration
- Helix design of wire supports thermal expansion/contraction

Warranty

- 10-year warranty available for heaters with Monel Sheath[5]
- 3-year warranty available for Stainless Steel heaters[6]

Element Physical Characteristics

- Single Element Power: 100 w/ft. to 300w/ft.
- Double Element Power: 200 w/ft. to 600w/ft.[7]
- Voltages: 40 to 750 V
- Lead Cable Connection: Permanently Molded
- Lead Cable Type: H07BQ-F, 8 AWG Exane, or as required by specification
- Lead Cable Length: 15-foot standard, or as required by specification
- Protection Class: IP67
- Electrical Isolation: >10 MΩ
- Heating Element Length: From 4ft Up to 24 feet
- Heating Element dimensions: 0.52” X 0.20”
- Power Termination OD: 1.0”
- Power Termination Length: 3.0”
- Power Termination Cold Zone: 6.0”
- End Seal Cold Zone: 0.8”
- Outer Jacket: MONEL 400 or Stainless

[4] transfer of heat into and out of the heating element, while varying pressure, temperature, and other state variables

[5] Warranty is applicable to failure due to production errors - mechanical damage to heater after delivery is not included

[6] Warranty is applicable to failure due to production errors - mechanical damage to heater after delivery is not included

[7] Continuous power above 400 watts per foot can be dangerous to the rail that the heaters are attached to. It is recommended to have a safety circuit such as the San-Omni rail over temperature circuit to monitor and alarm when long periods of high heat are applied or left active