



SPECTRUM INFRARED

A division of ADS, Inc.

Coal Car Thaw Shed Heating Systems

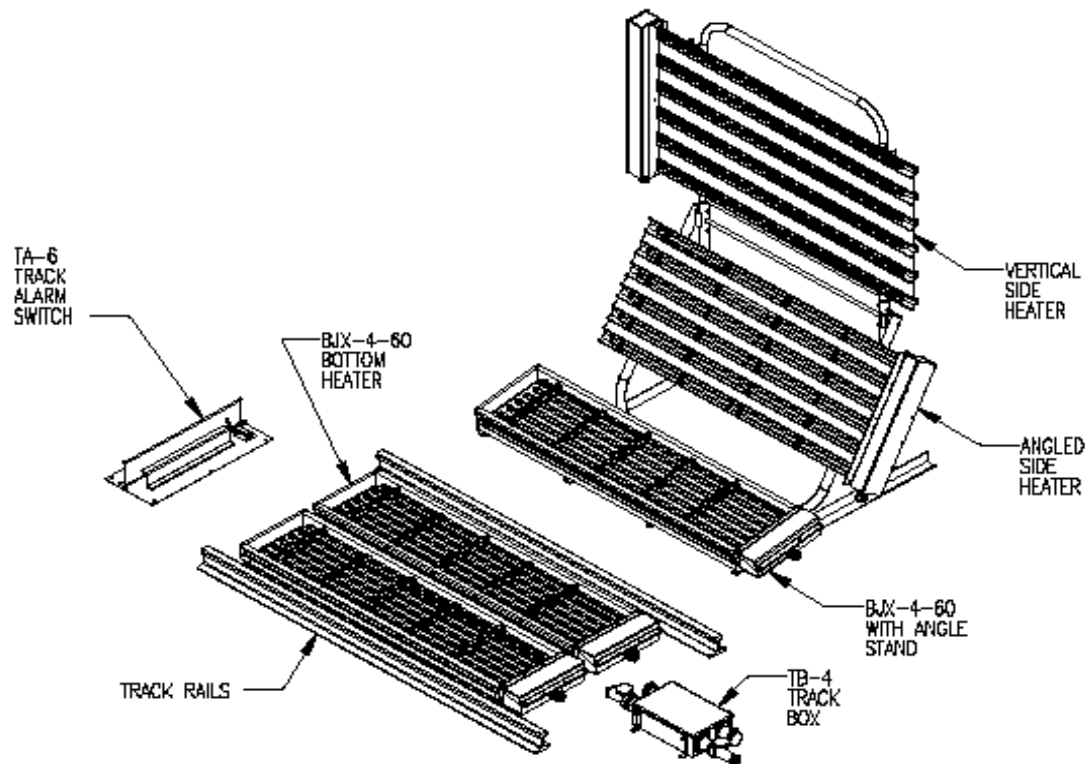


Designs Focus on...
Quality, Reliability and Life Cycle Cost Economics.

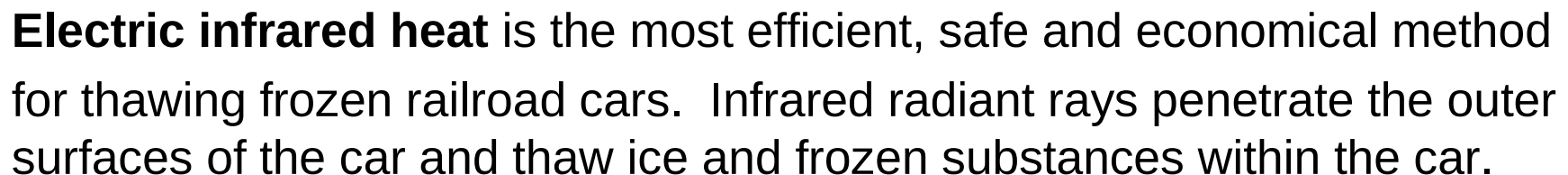


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Typical Thaw Shed Components



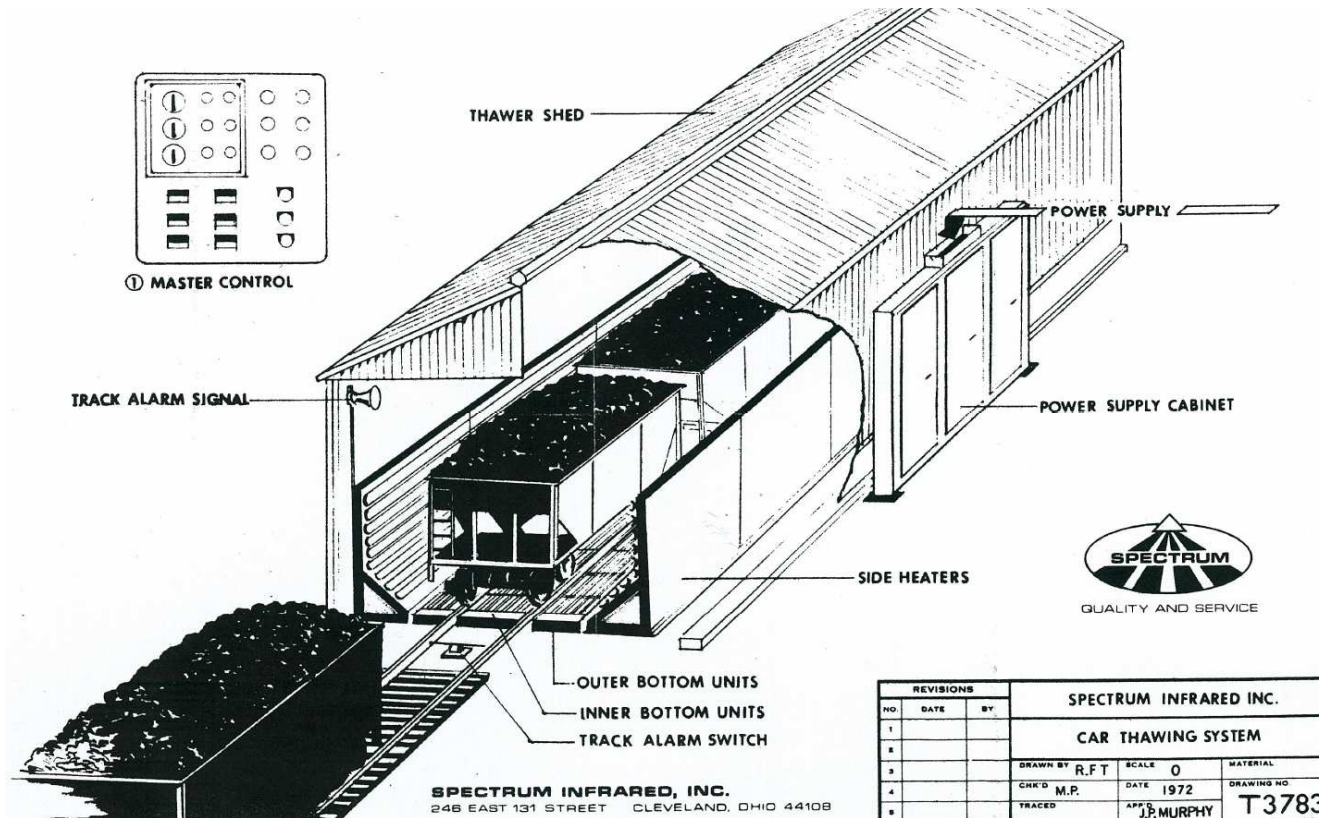
A typical heater system consist of undercar heaters mounted in parallel, inside and outside the tracks; and angled side and vertical side heaters mounted on stands, power distribution cabinets, track connection boxes, master control, track alarm and all associated engineering.





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Typical Car Thawing Shed*



Cars progress through sheds in a start-and-stop movement, exposed to infrared heat below and on sides at each stop. Thawing process commences at beginning of progression through shed. When car reaches dumping point, thaw has been completed and car is ready to dump.

*Spectrum is not responsible for the construction of thaw shed, but can assist in the design layout.



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Advantages of Electric Infrared

- Electric** all aluminum construction does not rust or corrode and has a life expectancy of 25-35 years.
- Electric** heat can be controlled from 0-100% - with the versatility of controlling the electric heat - you **only** use the electricity needed to get coal out of the car and this results in significant dollar savings.
- Electric** heaters have the fastest mean time to repair or replace – heaters can be replaced by two average men in less than 30 minutes or in less than 10 minutes with the quick disconnect option.
- Electric** infrared heaters also use reflective panels, which do not burn the surface or contaminate them with soot.
- Electric** is fast becoming an attractive alternative to natural gas.



SPECTRUM INFRARED Electric Infrared Heating Systems



Clean • Safe • Efficient

Photos courtesy of Nebraska Power & Light.



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Disadvantages of Fuel Fired Infrared

- **Gas** heaters are usually constructed of steel and last only 3-6 years.*
- **Gas** heat is not easily controllable, if too hot, it can dry out the coal and turn it into an insulator, this stops the heat migration into the car. Too much heat can also damage rail edges. (see slide #8, photo #1)
- **Gas** can burn holes through the tube, thus causing damage to coal car and or hopper doors. A hole in the burner can also cause coal on the ground to catch fire.
- **Gas** heaters have to be permanently mounted on cement pedestals with gas line connections, if there is a coal spill it becomes difficult to clean out. (see slide #8, photos 4,5,6)
- **Gas** requires makeup air for combustion, so you have to let the cold outside air into the shed to makeup for the air used. (see slide #8, photo #3)
- **Gas'** intense heat causes the heaters to move by expansion and contraction and can change their position to the cars. Reflector panels are sometimes used to re-direct the bouncing infrared rays back to the cars but the byproducts of combustion destroys the reflective surface so they don't work, or become burnt, soot covered and absorb heat. (see slide #8, photo #2)
- **Gas** prices continue to rise in today marketplace.

. * Based on the long "U" tube or the Shorter "hot dog style" gas heaters.



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Damage from Fuel Fired Systems

Photo #1



Photo #4

Photo #5

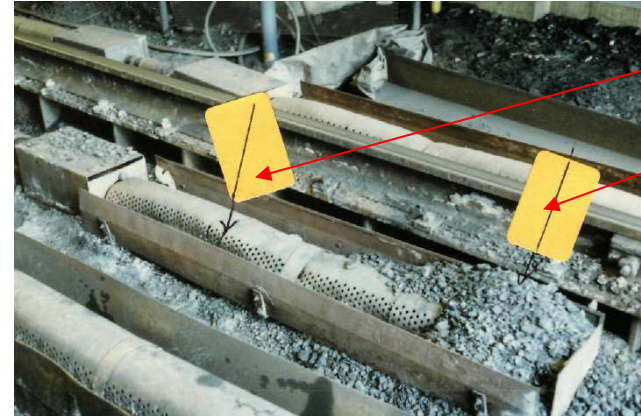


Photo #2



Photo #3



Photo #6

Damage to tracks and heater system caused by excessive heat. 8



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Damage from Fuel Fired Systems



Damaged coal cars caused by excessive heat.



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Coal Car Thaw Shed Heating Systems

Spectrum Infrared has full electric infrared rail car thawing installations at the following locations:

<u>Company</u>	<u>Location</u>	<u>Capacity</u>
Bessemer & Lake Erie Railroad	Conneaut, OH	10,000 KW
Bessemer & Lake Erie Railroad	Greensburg, PA	1,800 KW
Central Electric Power	Chamosis, MO	3,360 KW
Central Illinois Public Service	Coffeen, IL	3,600 KW
Consolidation Coal	Baltimore, MD	8,000 KW
Consumers Power, J. Campbell Plant	West Olive, MI	7,920 KW
Consumers Power, Karn Weadock Plt.	Jackson, MI	7,200 KW
Dairyland Power	Alma, WI	9,240 KW
Delmarva Power	Wilmington, DE	1,680 KW
FMC	Carney Point, NJ	1,660 KW
Illinois Power Company	Decatur, IL	3,960 KW
Inland Steel Company	E. Chicago, IN	5,720 KW
Inland Steel Company	E. Chicago, IN	2,520 KW
Iowa Public Service	Sergeant Bluff, IA	7,200 KW
Kansas City Power & Light	Kansas City, MO	1,080 KW
Northeast Public Utilities	Holyoke, MA	4,800 KW
Northern Indiana Public Service	Wheatfield, IN	4,080 KW
Old Dominion	Clover, VA	2,640 KW
Public Service of Indiana	Gibson County, IN	5,100 KW
Public Service of Indiana	Owensville, IN	5,100 KW
Rochester Gas & Electric	Rochester, NY	4,800 KW
Royal Coal Company	Mt. Hope, WV	3,200 KW
Southwest Public Service	Amarillo, TX	6,300 KW
Tennessee Valley Authority	Knoxville, TN	4,440 KW
Union Electric Co. (3 systems)	St. Louis, MO	2,700 KW
Wisconsin Power & Light	Madison, WI	1,140 KW
Wisconsin Public Service	Green Bay, WI	3,600 KW
Abbott Laboratories	N. Chicago, IL	1,320 KW
Sierra Pacific Power Company	Valmy, NV	7,800 KW
Omaha Public Power District (expansion)	Nebraska City, NE	1,656 KW



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Coal Car Thaw Shed Heating Systems

Spectrum has REPLACED equipment manufactured by others at the following locations:

Company

Bessemer & Lake Erie Railroad
Cleveland Illuminating Company
Consumers Power
Iowa Public Service
Metropolitan Edison Company
Norfolk & Western Railroad
Norfolk & Western Railroad
Norfolk & Southern
Conrail
Republic Steel Company
Union Electric Company
Lower LakeDock Company
Pennsylvania Power & Light
Potomac Electric
Virginia Electric Power
Wisconsin Power & Light
Intermountain Power Light

Location

Conneaut, OH
Cleveland, OH
Holland, MI
Sioux City, IA
Portland, PA
Norfolk, VA
Sandusky, OH
Ashtabula, OH
Philadelphia, PA
Cleveland, OH
St. Louis, MO
Ashtabula, OH
Allentown, PA (3)
Maryland
Mt. Storm, WV
Portage, WI
Delta, UT

Company

Dairyland Power
Edgewater Generating Plant
Erickson Station
First Energy
Holyoke Water & Power
Indianapolis Power & Light
JH Campbell Generating Plant
Lansing Board of Water & Light
Michigan City Generating
Mid American Energy
Mittal Steel
Mirant Mid-Atlantic
Alliant Energy
Ameren
American Commercial Term
Rochester Gas
Wisconsin Power & Light
Mount Storm Power Station

Location

Alma, WI
Sheboygan, WI
Lansing, MI
Ohio
Hartford, CT
IN
West Olive, MI
Lansing, MI
Michigan City, MI
Salix, IA
Cleveland, OH
MD
WI, IA
MO
Saint Louis, MO
Rochester, NY
Sheboygan, WI
Mt. Storm, WV



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