

Operating Characteristics . . .

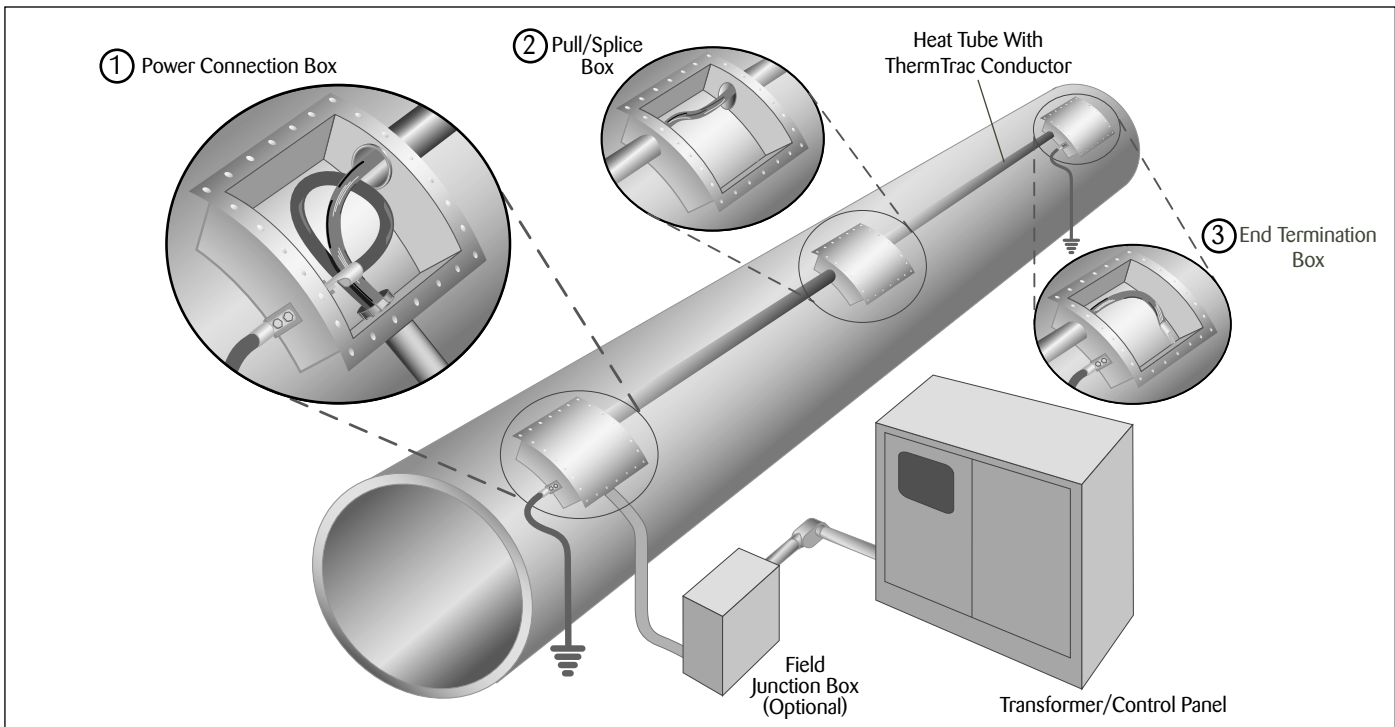
The operating principle of a ThermTrac skin effect heating system is based on two phenomena: proximity effect and skin effect. The heating device is a carbon steel pipe called a "heat tube" with a specially designed skin effect conductor inside. The heat tube and insulated conductor are joined together at one end, while at the opposite end the heat tube and the conductor are connected across an AC voltage source.

When the system is energized, current flows through the conductor to the end point, then is concentrated toward the inner surface of the heat tube by the skin effect phenomenon and the attendant proximity effect. This electromagnetic interaction ensures that the return current travels on the inner surface of the heat tube with virtually no measurable voltage on the outer surface. The current flow through the impedance of the inner skin of the heat tube generates heat.



Typical ThermTrac System . . .

ThermTrac Power Connection, Pull/Splice, and End Termination Boxes are integral to the skin effect heating system and carry current in the same manner as the heat tube. These boxes are constructed of heavy wall ferromagnetic materials and must be welded to the heat tube to ensure the continuity of the skin effect electrical path. The boxes are constructed to conform to the carrier pipe and provide water-resistant protection with gasketed, bolted covers.



- 1. Power Connection Box:** Located at the power feed end of the ThermTrac circuit, the power connection box permits the connections that supply electrical energy to enter and exit the heat tube. An external tab on the box permits grounding of the system.
- 2. Pull/Splice Box:** Located periodically along the heat-traced pipe, this box permits access for installing the ThermTrac conductor. The box is sized to provide for expansion/contraction of the conductor, and can allow the heat tube to cross over the carrier pipe if necessary at elevation or directional change points.
- 3. End Termination Box:** The end termination box allows the ThermTrac conductor and heat tube to be joined together thereby allowing electrical current to return to the power connection box via the inside surface of the heat tube. An external tab on the box permits grounding of the system.

