SKIN-TRACE

A safe and reliable system for heating very long pipelines from single point power supplies.

Suitable for transfer lines, pipebridges, above ground and buried pipelines, sub-sea pipelines, etc.

HEATING SYSTEM FOR VERY LONG PIPELINES

- Up to 24 km lines heated from one supply point
- The most effective method for heating long distance pipelines
- Robust and reliable system with outputs up to 160W/m
- Suitable for up to 200°C operating temperature
- Suitable for use in hazardous areas
- Suitable for specialist rail and mono-rail applications

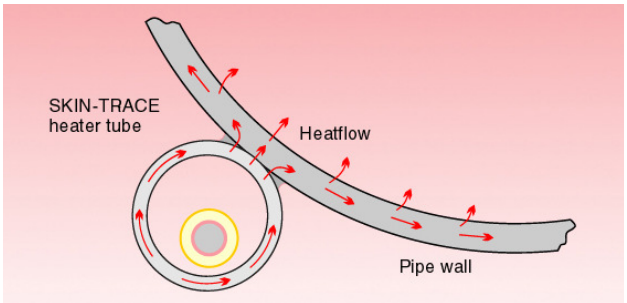
PURPOSE

SKIN-TRACE is intended for temperature maintenance, freeze protection and heat raising of long-distance pipelines. This is the only system that can heat a pipeline of up to 24 km long with a power supply at one end only. It is also the most efficient and cost-effective method of heating pipelines of unlimited length from a single supply point.

PRINCIPLE OF OPERATION

Special heating elements are used with SKIN-TRACE that operate based on “skin-effect” and “proximity effect” in ferromagnetic conductive materials in combination with an alternating current of commercial frequency.

The heating element consists of a carbon steel tube, 0.75”-1” in diameter, with a wall thickness of not less than 2 mm, with a non-magnetic Nickel or Tin coated copper (Cu) conductor placed inside the tube. This conductor is connected to the steel tube at one end. At the other end, an AC voltage is applied between the conductor and the tube. The value of the voltage is calculated based on the power output required and the length of the heated pipe.



The alternating current flows through the whole cross-section of the inner conductor, due to the fact that there is no noticeable “skin-effect” in a non-magnetic material conductor with low electrical resistance. In contrast, in the ferromagnetic outer conductor/steel tube, the skin-effect is pronounced and the whole current flows on the inner surface layer of the tube less than 1 mm in thickness. The electrical potential of the outer surface of the tube remains at zero. Because of the low thickness of skin depth, the majority of the power output (up to 80%) is generated at the steel heater tube.

BENEFITS

1. Very long pipe runs. Due to the large cross-section of the current-carrying cable, the inner conductor generally does not serve as a heater, but as an integral parallel supply network.

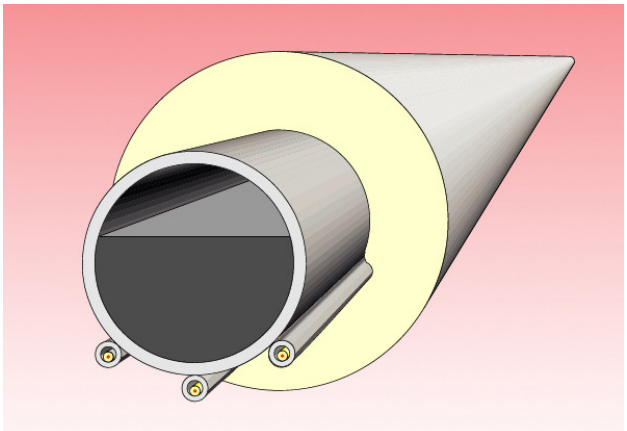
2. Power supply at one end only. SKIN-TRACE design is generally intended for use where the power supply is only available at one end of the pipe run.

3. Electrically safe. The outer surface of the heating tube is at zero potential. It is earthed and fully shields the inner current-carrying conductor.

4. Efficient heat transfer. The heater tube is directly welded to the pipeline, or is fastened to it by means of special equipment.

5. Easy installation. The heating components have no electrical insulation that might be damaged during installation.

6. System Reliability. Durable heating components (steel pipes) ensure high mechanical properties and failure protection of current-carrying conductors. This can be important for buried or underwater pipelines.



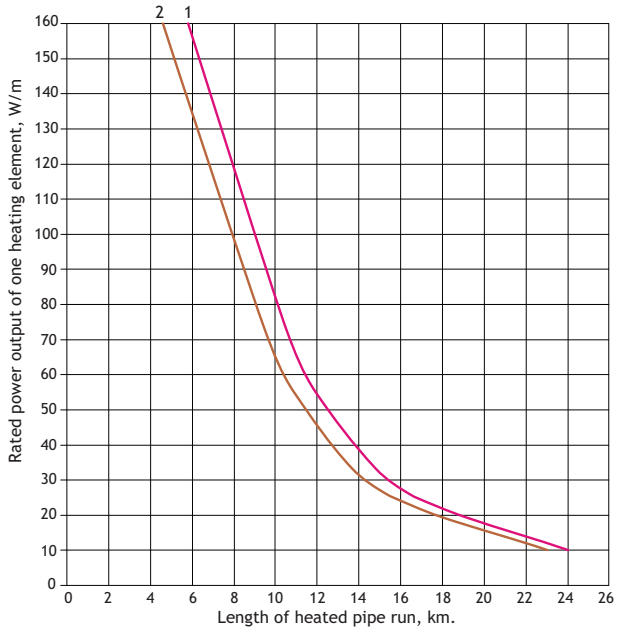
Depending on the heating power required and the pipeline length, SKIN-TRACE may consist of either one, two, or three, heater tubes (see image above).

SPECIFICATION

OPERATING TEMPERATURE
-40 to +200°C

POWER SUPPLY
up to 5kV AC 50 or 60 Hz

POWER OUTPUT

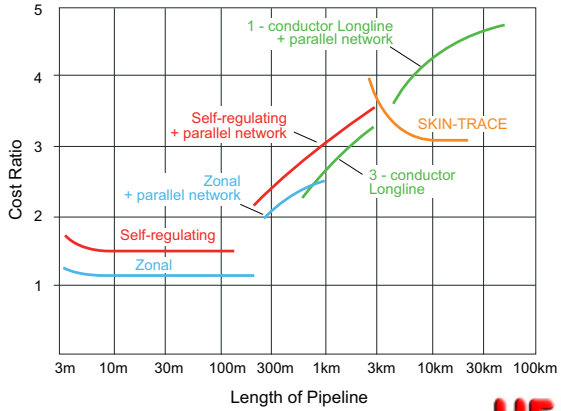


	Heater Tube Dimension
1	1.0”
2	0.75”

CONSTRUCTION

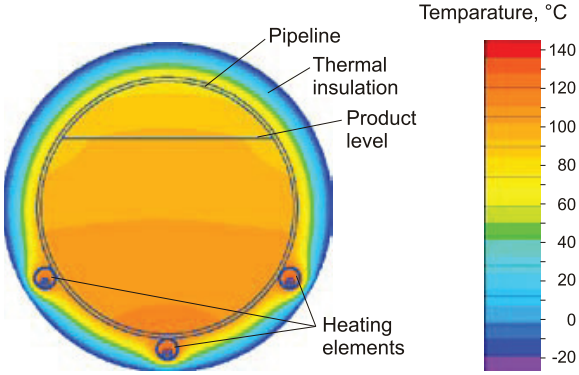
Heater Tube	Carbon steel tube 20 - 60mm in diameter with wall thickness 2 - 4mm
Anti-corrosive insulation of heater tube	Epoxy coating (at customer’s request)

SKIN-TRACE SYSTEM EFFICIENCY
(when compared with other styles of heater)



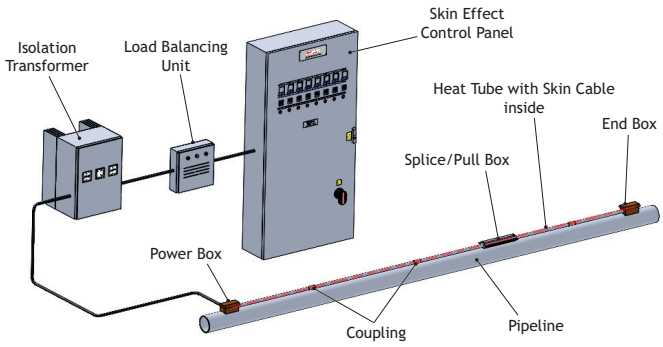
CONTROL SYSTEM
In the interest of optimising efficiency SKIN-TRACE may be equipped with a control system that reduces power output in response to changes in the ambient temperature.

CALCULATED TEMPERATURE DISTRIBUTION



Example: Heating of insulated pipeline using three SKIN-TRACE heater tubes, total power output 160W/m. Pipeline diameter 530mm, minimum ambient air temperature -40°C.

POWER SUPPLY DRAWING OF PIPELINE SYSTEM HEATED BY SKIN-TRACE



ACCESSORIES
A complete range of accessories is available - including distribution, connection, terminal & pull boxes; couplings, fastenings and control systems.

HEAT TRACE™
SETTING THE STANDARDS LEADING THE WAY

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