VULCANIC S.A. - 48, rue Louis Ampère
Zone Industrielle des Chanoux - F 93330 NEUILLY / MARNE (France)
Tél. (33) 01.49.44.49.20 - Fax (33) 01.49.44.49.41

# OWNER'S MANUAL

# HIGH TEMPERATURE HEATING TAPES

# TYPES 26158 AND 26159

## 1 - APPLICATION :

Tracing for heating or temperature maintenance (essentially on pipes, tanks, vats) for industrial or laboratory applications requiring high operating temperatures :

- Type 26158 : maximum operating temperature : 450°C (insulated tape under glass silk sheath),
- Type 26159 : maximum operating temperature : 900°C (insulated tape under quartz fiber sheath).

The temperature reached depends upon the conditions of use, the process, the thermal conductability of the part materials (and their shapes) or the heated products, the ambient temperature, the nature and thickness of the heat insulation.

## 2 - DESCRIPTION :

Consult our manual "High temperature heating tapes types 26158 and 26159" and the corresponding drawing in the case of special manufacturing.

## 3 - PRECAUTIONS FOR USE :

### 3 - 1 - CHECKING BEFORE INSTALLATION :

- Make sure that the equipment received is compliant with the order and has not been damaged by transport.
- Ensure that the maximum utilization temperature is lower than that recommended, according to the type indicated in § 1, and that the temperature of the sheath skin is not incompatible with the traced surface material.
- Make sure that the service voltage available on site is that of the tape : generally 230 V single-phase standard.
- Because these tapes are unsuitable for explosive atmospheres, they must never be used in an environment liable to be or become explosive because of the emanations resulting from a heated fluid, for instance.
- In the case of the product being heated in a recipient :
  - take all necessary precautions to avoid the overflowing of the liquid,
  - the boiling point can be reached easily. Take all necessary steps (venting) to prevent the pressurizing of the recipient.
- Trace the route of the heating tape over the pipe or tank and locate any points where accessories and components are located on this route.
- Make sure that the pipe is free of burrs, rough surfaces or sharp edges liable to damage the tape. Deburr if necessary.
- Make sure that coatings and paint on the pipe or tank are dry before installing the tape.

### 3 - 2 - HANDLING THE HEATING ELEMENT:

- When handling the tape (paying, application), avoid sharp edges, excessive voltage, twisting or crushing.
- Pay out the entirety of the tape near the pipe or tank to be equipped, working it around the supports and equipment, before attaching it.
- Provide additional lengths of tape to trace any losses due to the supports, valves, taps and flanges, or to spiral wind it when necessary.

- If the final application of the tape and insulation cannot be carried out quickly, protect it temporarily from damp, contamination, mechanical accidents or other risks.

3 - 3 - ATTACHMENT OF HEATING TAPE :

- Use attaching collars capable of supporting the temperatures set out every 300 mm at the most, and less if necessary (in pipe bends for instance).

## 4 - **ASSEMBLY AND ELECTRICAL CONNECTION :**

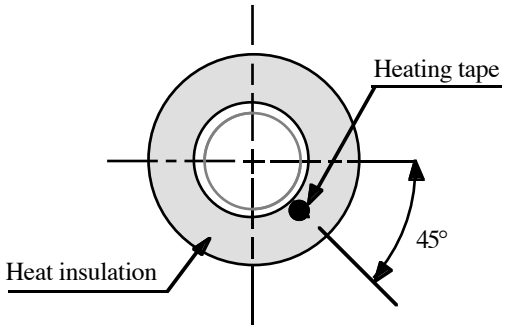
4 - 1 - INSTALLATION OF THE HEATING TAPE :

The tape can be applied in lines (one or several tapes depending on the power to be installed) or can be spiral wound, depending upon the specifications of the technical survey.

NOTES : In no case may a tape be shortened.
: The tape must never be overlaid on itself (no overlapping).
: The entire length of the tape must be applied at all points of the surface to be traced.

4 - 1 - 1 - LINEAR TRACING :

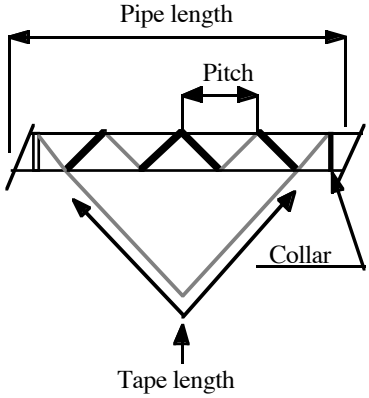
- Trace the pipe linearly (unless a technical investigation suggests spiral winding).
- For horizontal pipes, apply the tape as indicated in the figure below and not on the lower generating line :



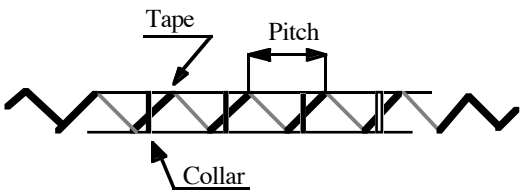

- A heating element of length L can be used for tracing a pipe with length L/2. In this case, place each arm of the heating element diametrically opposite on the pipe.

4 - 1 - 2 -SPIRAL TRACING :

There are two possible methods of spiral winding, in accordance with the following schematic diagram :




**METHOD No.1**




**METHODE No. 2**

To determine the pitch, valid for the 2 spiral winding methods, see the following paragraph.

- Method No. 1 :

- Method No. 1 :
  - Prepare the loop and attach the tape at either end.
  - Wind the loop around the pipe.
  - Space the turns regularly and attach the tape with collars.

- Method No. 2 :
  - Mark the pipe with the spiral pitch value.
  - Form the turns and attach the tape gradually as it is positioned, using collars.

DETERMINATION OF SPIRAL WINDING PITCH :

The table below indicates the spiral winding pitch as a function of the diameter of the pipe and the spiral winding ratio obtained, by devoting the length of the tape by the length of the pipe:

| PIPE DIAMETER | | | SPIRAL TRACING : APPROXIMATE HELIX PITCH IN CM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| external | nominal | | RATIO = (Length of tape) / (Lenght of pipe) | | | | | | | | | |
| (mm) | ND | (Inches) | 1,1 | 1,2 | 1,3 | 1,4 | 1,5 | 1,6 | 1,7 | 1,8 | 1,9 | 2 |
| 14 | 10 | 1/4" | 13 | 9 | | | | | | | | |
| 21 | 15 | 1/2" | 19 | 13 | 10 | | | | | | | |
| 27 | 20 | 3/4" | 23 | 16 | 12 | 11 | | | | | | |
| 42 | 32 | 1 1/4" | 33 | 23 | 18 | 15 | 13 | 12 | | | | |
| 48 | 40 | 1 1/2" | 38 | 25 | 21 | 18 | 15 | 14 | 13 | | | |
| 60 | 50 | 2" | 45 | 31 | 25 | 21 | 19 | 17 | 15 | 13 | | |
| 73 | 65 | 2 1/2" | 52 | 36 | 29 | 24 | 21 | 19 | 17 | 16 | 15 | |
| 89 | 80 | 3" | 65 | 45 | 36 | 30 | 27 | 24 | 22 | 19 | 18 | 17 |
| 114 | 100 | 4" | 82 | 57 | 45 | 38 | 34 | 30 | 27 | 25 | 23 | 21 |
| 168 | 150 | 6" | 119 | 82 | 66 | 56 | 49 | 43 | 40 | 36 | 33 | 31 |
| 219 | 200 | 8" | 154 | 107 | 85 | 72 | 63 | 57 | 51 | 47 | 43 | 40 |
| 273 | 250 | 10" | 191 | 132 | 106 | 89 | 78 | 70 | 64 | 58 | 53 | 50 |
| 324 | 300 | 12" | 226 | 156 | 125 | 106 | 93 | 83 | 75 | 68 | 64 | 60 |

E.g. : For a pipe measuring ND 80 (3”), requiring 1.3 meters of tape per meter of pipe, the spiral winding pitch is 36 cm.

4 - 2 -RECOMMENDATION FOR APPLICATION TO PIPE ACCESSORIES :

4 - 2 - 1 - VALVE:

Refer to the specification for the length to be applied to the valve; remember that the element must never be overlaid on itself (no crossing).
Attach with collars (see § 3-3).

4 - 2 - 2 - BEND :

Locate the heating element on the external generating line of the bend.
Attach with collars (see § 3-3).

4 - 2 - 3 - FLANGE :

The length of the supplementary element needed equals twice the diameter of the pipe.
Attach with collars (see § 3-3).

4 - 3 - HEAT INSULATION AND MARKING :

4 - 3 - 1 - CHECKING BEFORE HEAT INSULATION :

- Visually ensure that the tape is properly installed and is free of damage.
- Make sure the tape is firmly attached at every point of the pipe to avoid any risks of including the insulation between it and the pipe (sufficiently closely located attaching collars - special precautions to be taken on the valves and flanges).
- It is recommended to check the insulation resistance (megger) before carrying out insulation.

4 - 3 - 2 - RECOMMENDATION FOR APPLICATION OF HEAT INSULATION :

- A correct tracing installation calls for dry insulation that is properly installed and sealed (the tape is not protected against damp).
- It is essential to use the correct type and thickness of heat insulation and a protective plate that is suitable, allowing for the utilization temperature.
- To reduce the risk of the possible damage to the tape, apply the heat insulation immediately after application and checking (§ 4-3-1).
- Check that all the piping, flanges, partitions feed-throughs and other surfaces have been carefully insulated.
- Make sure that all the cut-outs in the heat insulation are sealed (on the valves, supports, thermostat probes, etc.).

4 - 3 - 3 - MARKING :

- Affix “Electrical tracing” labels either side and along the heat insulated piping, every meter, for correct signaling (we can supply you with regular aluminum 50 x 100 mm labels : Reference 26180-05).
- On the protective plate, indicate the positions of components such as tape ends.

4 - 4 - ELECTRICAL CONNECTION :

30 mA differential protection is recommended in the case of :
- risks of mechanical damage,
- a damp environment.

The tape is protected by a stainless steel woven sheath and must be connected to the installation ground (electrical protection class I) as well as all the metal parts in contact with the tape.

Electrical connection shall be made to a suitably protected network (differential, circuit breaker, fuses, etc.).

To obtain a constant operating temperature, it is indispensable to use a temperature regulation device and a thermal safety device that irreversibly turns off the tape supply in the event of overheating, while there is an alarm present.

**NOTE** : It is highly advisable to check the insulation resistance again on the initial commissioning.

## 5 - **MAINTENANCE :**

5 - 1 - After 50 hours of operation : Check that all the connections are tightened properly.

5 - 2 - Every 6 months :
- same operation as in § 5-1.
- Visually inspect the visible parts of the tape and its insulation to make sure that there are no signs of mechanical damage.
- Check the insulation resistance of the tape.
- Check the operation of the electrical protection devices as well as the regulation and safety devices.

5 - 3 - Repairs :

Never attempt to repair a defective tape. Replace it immediately.

Whenever repairs are made to the pipes, disconnect the heating tape and remove it before going any further.

Never install tape that has been heated. Replace it systematically : sheaths brought to high temperatures will lose their mechanical properties.

To install a new tape, refer back to the operations of § 3 and 4.

## 5 - **GUARANTEE :**

Our guarantee complies with the inter-union agreements of the electrical construction industry and our general conditions of sale.

Any deterioration caused by :

- use at more than 10% of the set rated voltage,
- faulty maintenance, impact, clumsy or inexperienced use,
- failure to comply with the present manual, the state-of-the-art rules and the legislation,

are not binding upon our responsibility.