

Operating Instruction  
for  
Heating hoses  
**electrically heating hose system** \*



As a rule, the heating hose consists of a high-quality PTFE inner hose through which the liquid or gaseous medium flows. The inner hoses are resistant to high temperatures up to 250°C, high operating pressures and aggressive substances to cover a wide range of applications. Selection of the type of pressure hose can be accomplished on the basis of the operating pressure required (see list on [page 5](#)).

The appropriate fitting can be press-fitted to the basic hose. Please observe that the inner diameter of the fitting is not identical with the nominal width of the hose and therefore restricts the hose passage.

The heating conductor is laid out according to VDE guidelines, is protected against moisture and the protective conductor is protected by a braided jacket. A temperature sensor is installed to control the operating temperature of the heated hose – as a standard feature, the sensor is located approximately 300 mm in back of the electrical outlet. If additional control lines or single-wire conductors are required, they can also be incorporate into the heating hose.

The thermal insulation can be selected according to the operating temperature and is protected against mechanical damage by an outside protective braid. On both ends, silicone caps or polyamide hard caps are mounted.

Usually, a standard plug as a standard feature for connection to our temperature control (see [page 10](#)), is mounted with the leads for heating, temperature sensor and control lines or the individual conductors are marked appropriately.

**Before using the heating hose, carefully read and observe the safety instructions and installation instructions.**

### **Safety Instructions :**

When planning, installing; testing and operating as well as for repair, always observe

- these operating instructions
- DIN EN 60519-1 "Safety in Electrical heating systems"  
Part 1 : General requirements (= IEC 519-1 = VDE 0721, Part 911)
- applicable part of VDE 100  
as well as other standards and regulations applicable for such applications
- all recognized rules of technology such as EN standards, VDE0100, Low-Voltage Guidelines EN 60204, Part 1, Machine Guidelines EN 292 and the Accident Prevention Regulations according to BGV A2.

Ensure that protection against dangerous body currents are provided as specified in VDE 0100, Part 410 and Part 540 (Grounding and System Grounding) as well as the specifications and the standards listed above.

**Ensure that the heating hose is installed only outside of explosion-hazard areas. It is not permissible to heat explosive mediums or mediums which release explosive gases when heated!**

Proper and safe operation of the heating hose assumes that the hose has been carefully transported, stored and properly installed.

Ensure that heating hoses are installed and put into operation only by qualified personnel.

Observe these operating instructions and operation of the device, particularly instructions and notes on routing, the applicable safety precautions for installation and operation of electrical equipment.

**Installation Instructions:**

Please read these installation instructions carefully and observe all points listed when installing the equipment. Failure to observe these installation instructions can result in malfunctions or, under certain conditions, the required EMC Guidelines may not be fulfilled.

Before connection and use of the heating hose, ensure that the operating voltage and the required operating voltage conditions for the heating hose conform with the local conditions (see type plate and technical data).

Ensure that the load voltage is switched off on site and secure against being switched back on while installing the heating hose. Complete electrical connections in conformance with the connection diagram and applicable, electric-technical regulations. Route the supply lines to the heating hose so that they are free of tension under all conditions and cannot be pinched or sheared off under any circumstances. If possible, use shielded cable for the sensor lines and signal lines and shielded compensation lines for the thermocouples. Fuse the heating hose load circuit against excessive current.

**These instructions do not contain all information on regulations, standards, etc. to be observed when working on heating hose in combination with systems. It is the responsibility of the operator of the equipment to compile and observe these regulations and standards, etc. as required for the specific application.**

### Operation Instructions :

Before putting the heating hose into operation, observe the following:

- Specifications on type plate must coincide with your order data
- Use only temperature controls compatible with the type of sensor in the heating hose.
- Ensure that the line voltage coincides with the voltage specified on the type plate.
- Ensure that the nominal power for the heating hose does not exceed the maximum power output of the connected temperature control or power output from the equipment (resistive load).
- **Never operate the heating hose without temperature sensor (connected to temperature control), because otherwise it heats up without control and exceeds the maximum operating temperature which can lead to damage to the heating hose and your equipment.**
- Provide for a protective system to protect the line against excessive temperature in the event of overload. Line protection according to VDE 0721, Part 1, Section 19, must ensure that the nominal value of the fuse is matched to the specific load and must be connected in series in front of the heating hose (including control). However, the max. fuse rating must not exceed 16A. We recommend using a conductor with a cross section of at least 1.5mm<sup>2</sup>
- If the heating hose is suspended or fastened with clamps, ensure that the outer diameter of the heating hose is not reduced by more than 10%.
- Ensure that connection fittings are not under tension, under any circumstances.
- **It is necessary for the heating hose to reach its operating temperature before it is subjected to your operating pressure, because the medium could still be rigid at the fittings.**  
The time required to heat up the heating hose to operating temperature is approx. 15-30 minutes, as a rule. When starting up the system for the first time or restarting; ensure that the medium in the heating hose has reached its processing temperature to avoid damage to the inner hose.
- **Observe minimum bending radiuses! (see list on [page 5](#)).**  
Kinks and high torsion loads lead to destruction of the heating hose.
- Observe placing instructions (see [pages 6 to 8](#))
- The resistance of the flexible heating hoses to pressure changes at various operating temperatures (see list on [page 5](#)). In the range up to 250°C, the pressure resistance can be specified, however, this decreases down to 0 bars at

temperatures above 250°C. The maximum operating pressure should be calculated with a corresponding correction factor, depending on the maximum operating temperature. Also observe pressure surges. These can be very high and are not indicated by normal pressure gauges. Never exceed the operating pressure!

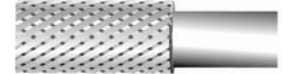
- Hoses and PTFE tubing up to NW 8 have been tested for their suitability for use with vacuum down to 8 mbar at temperatures up to 250°C.



### Pressure Hoses :

#### T1

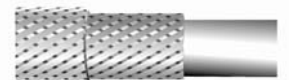
Smooth PTFE hose  
with one braided layer of steel wire (1.4301)  
nominal temperature 250°C



Nominal diameter DN (NW)	4	6	8	10	12	16	20	25		
Operating pressure in bar	275	240	200	175	150	135	100	80		
Burst pressure in bar	1100	920	800	700	600	540	400	320		
min. bending radius in mm	50	75	100	120	135	160	200	250		

#### T2

Smooth PTFE hose  
with two braided layers of steel wire (1.4301)  
nominal temperature 250°C



Nominal pressure DN (NW)		6	8	10	12	16	20	25	32	40
Operating pressure in bar		275	250	225	200	175	150	130	70	50
Burst pressure in bar		1100	1000	900	800	700	600	520	280	200
min. bending radius in mm		75	100	120	135	160	200	250	500	850

#### T3

Smooth PTFE hose  
with two winded and one braided layer of steel wire  
nominal temperature 250°C



Nominal pressure DN (NW)		6	8	10	12	16	20	25	32	
Operating pressure in bar		500	475	450	400	400	300	275	250	
Burst pressure in bar		2000	1900	1800	1600	1600	1200	1000	1000	
mind. Bending radius in mm		75	100	120	135	160	200	240	280	

### Correction factors

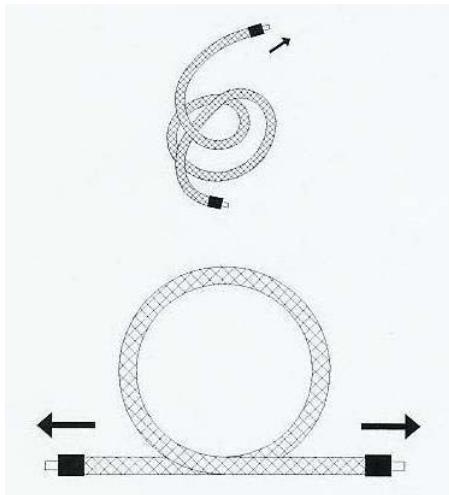
for differing operating temperatures

The specified pressures apply for operating temperatures from 20°C bis 50°C. Specifications or correction factors must be observed if using under different temperatures as follows :

Operating temperature up to	24°C	100°C	200 °C	250°C
Correction factor	1,0	0,9	0,8	0,6

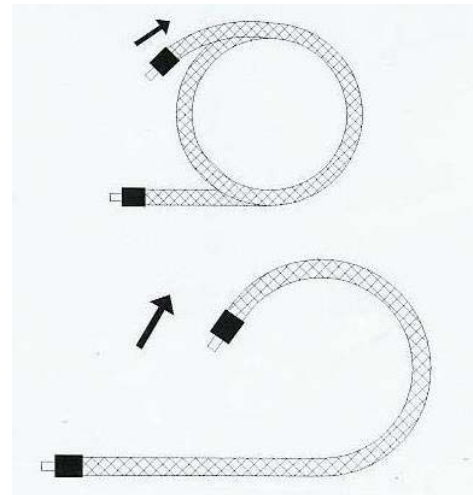
### Placing Instructions:

#### WRONG

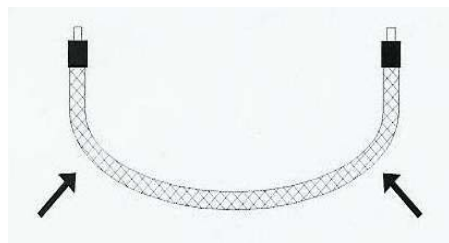


Dragging at the ends of the rolled-up heated hose causes torsional stress, as well as too narrow a minimum bending radius.

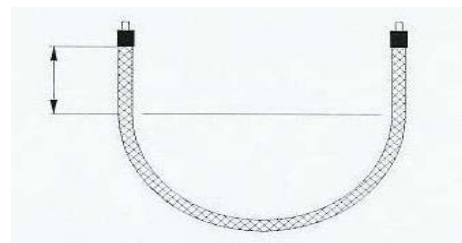
#### RIGHT



Unwind the roll instead of pulling the heated hoses hose.



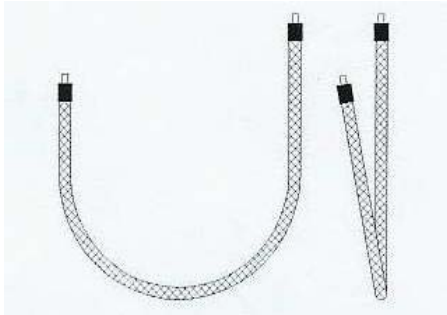
If heated hoses are too short, the heated hose will be kinked at the connections.



Plan in a straight piece of heated hose (about 5 x hose diameter) at the connections. A wide bending radius ensures a longer durability.

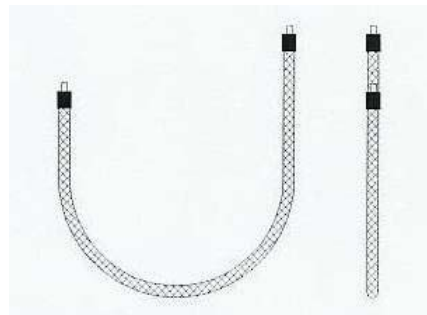
## Placing Instructions :

### WRONG

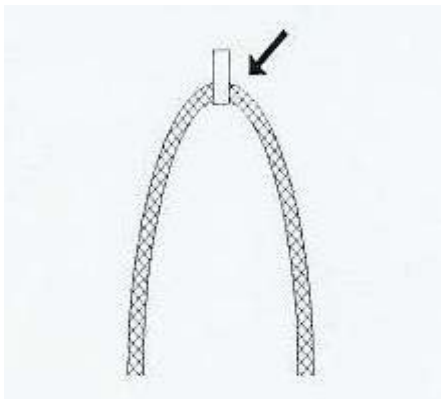


The heated hoses are often destroyed by torsional motions caused by improper installation.

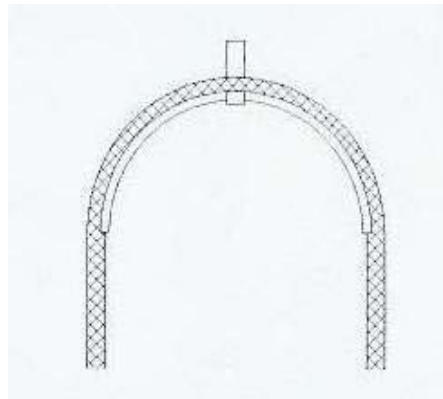
### RIGHT



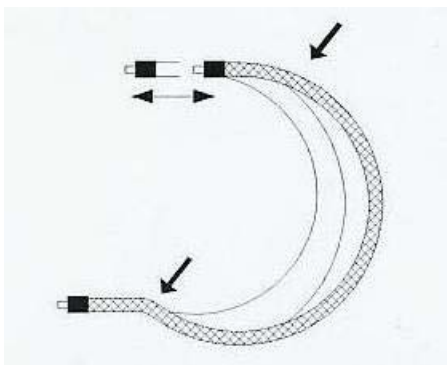
Make sure the axes of the heated hose run parallel and the motions are always on one and the same level.



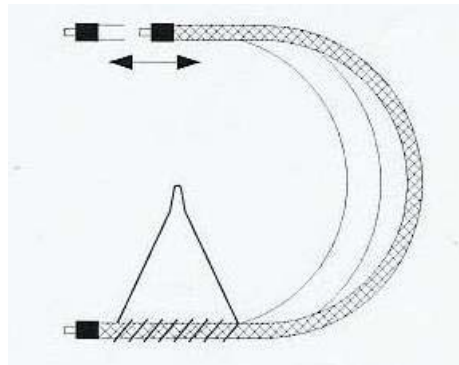
Avoid diversions, for they may cause kinking and bending stress.



Use a saddle-shaped device or a roll, each with the appropriate diameter.



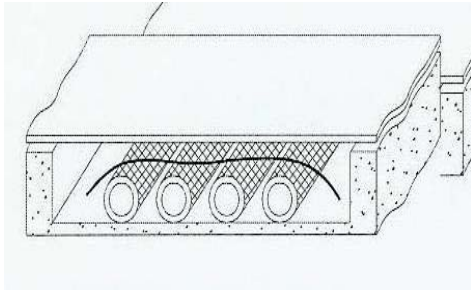
Any inappropriate installation makes the heated hose sag.



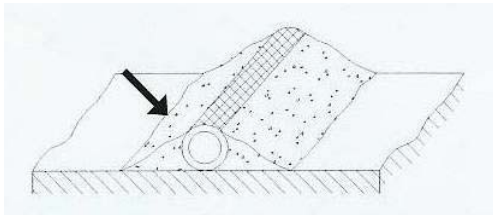
Use a spiral heated hose suspension.

## Placing Instructions :

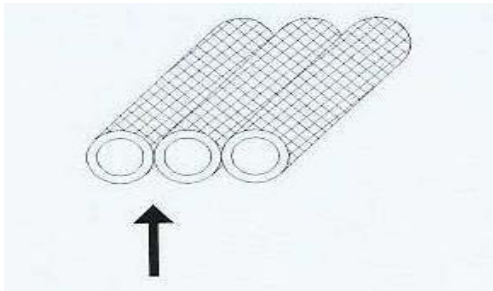
### WRONG



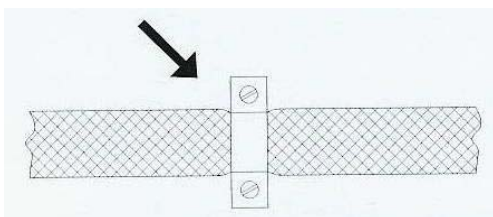
Heated hoses mounted within a closed channel or shaft will cause heat built-up.



If e.g. powdery substances, adhesives, or other thermo-insulating materials are spilled on heated hoses, those parts will overheat.

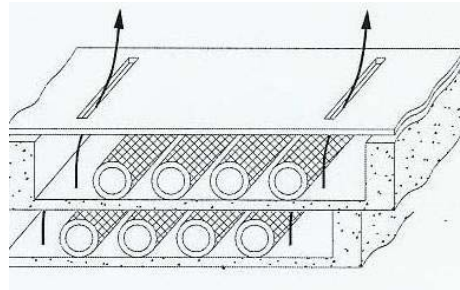


Heated hoses bundling or embedding with contact will cause overheating of contact areas.

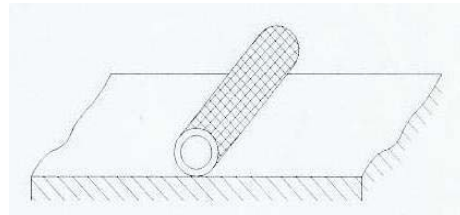


With the mounting brackets, do not squeeze the outer heat insulation onto the heating conductor during installation. This can cause damage of the protective layer, and may destroy the heated hose or damage the medium.

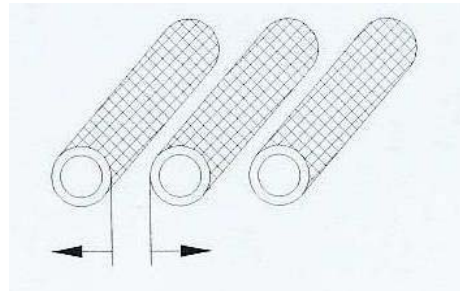
### RIGHT



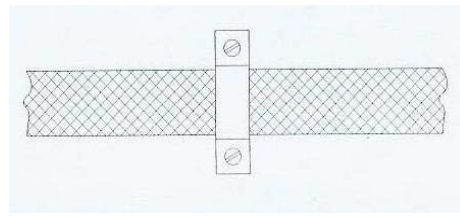
Heated hoses must not touch each other. Sufficient ventilation is to be provided.

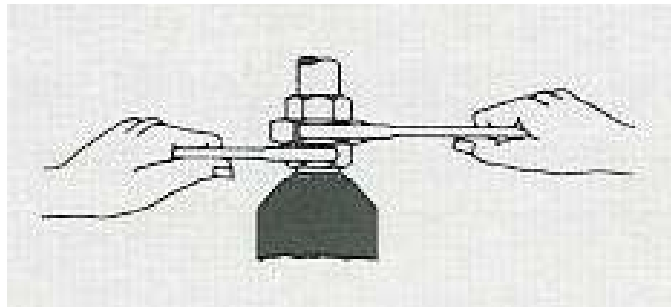


Constant cleaning and elimination of cause.



Install heated hoses with sufficient spacing.





**Use a counter-wrench when installing  
to avoid twisting the heated hose!**

### **Note on Fittings :**

The fittings size depends on the nominal width of the hose DN (NW). Please observe that the inner diameter of the fitting is not identical with the nominal width of the hose and therefore restricts the hose passage.

nominal diameter DN (NW) of the PTFE core	4	6	8	10	12	16	20	25	32	40
inner diameter armature in mm	3,0	4,5	6,0	7,5	10,0	12,5	16,0	20,1	27,5	31,5

### **Maintenance and Repair :**

Perform maintenance and repair according to the standards and conditions specified under the point "Safety precautions" observing all applicable regulations of the employer's liability insurance association and other conditions applicable for the type of application. The heating equipment and control should be checked for proper function at least once a year and testing intervals observed according to BGV A2.

### **Technical Data :**

please refer to type plate  
tolerance +5% / -10%

## Disassembly of the replaceable inner tube

Possible deposits of the hot-melt adhesive (e.g. PUR material) may lead to blockage or clogging within the hose or to contamination of the application material and hence to irregular application results. Usually, such contaminated or blocked hoses must be replaced.

Thanks to the integration of a replaceable inner tube for the hose, purchase of an expensive new hot-melt adhesive hose can be avoided. By screwing off the hose connection fitting, the entire inner tube can be drawn out of the hose and easily replaced by a new and clean inner tube.



1. The threaded pins with hexagon socket ( $\varnothing 2,5$  mm) must be unscrewed on both sides of the hose.
2. Subsequently, at the end with the shoulder nipple, the inner tube can be drawn out of the hose until the screwed in nipple with the ground surfaces (SW 12) becomes visible.
3. In order to unscrew the shoulder nipple, an open-end spanner SW12 is required; this spanner is applied at the screw-in nipple and with a second open-end spanner SW17 the fixed part of the shoulder nipple is rotated counter-clockwise until the screwed connection is loosened.
4. Now you can easily unscrew the shoulder nipple.
5. Subsequently the inner tube can be drawn out of the carrier hose at the side of the fixed fitting.
6. Assembly of the new inner tube is carried out in reverse order.