

INSTRUCTION HANDBOOK

HEATABLE HOSE

TYPE NS, KS, HP

(Release 06-2014)

**IBÜHNNEN**  
KLEBESYSTEME

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## INSTRUCTION HANDBOOK HEATABLE HOSE

This document describes dealing with heatable hoses

- Type NS (for applicator heads)
- Type KS (for applicator heads) and
- Type HP (for manual applicator devices)

### **SPECIFIC SECURITY ADVICE**

#### **POSSIBLE DANGERS**



#### **Danger of burns!**

due to hot metal parts, hot melt material, and hot melt material vapors.

Therefore, always wear heat protection gloves.

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#### **INTENDED USE**

Heatable hoses are used as flexible connections between machines or machine parts. They are used to transport melted hot melt material, such as from a tank system to the manual application unit.



#### **Attention!**

Heatable hoses Types HP and KS are only approved for operation with BÜHNEN applicator heads and manual application devices.

Disconnection and connection to the applicator head/manual application device for Type HP may only be carried out by trained electricians. Switch the tank unit off beforehand!

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#### **NOTES ON SAFE OPERATION**



#### **Danger of burns!**

- The maximum permissible working temperature ( $T_{max}$ , see type plate) may not be exceeded. Too high temperatures will cause the pressure load capacity to sink. This could destroy the hose.
- 

- Release the system pressure before dismantling the heatable hose.
- 



#### **Danger!**

**Before every maintenance or repair work on the heatable hose, remove the mains plug from the tank system.**

Danger of burning caused by hot melt adhesive!

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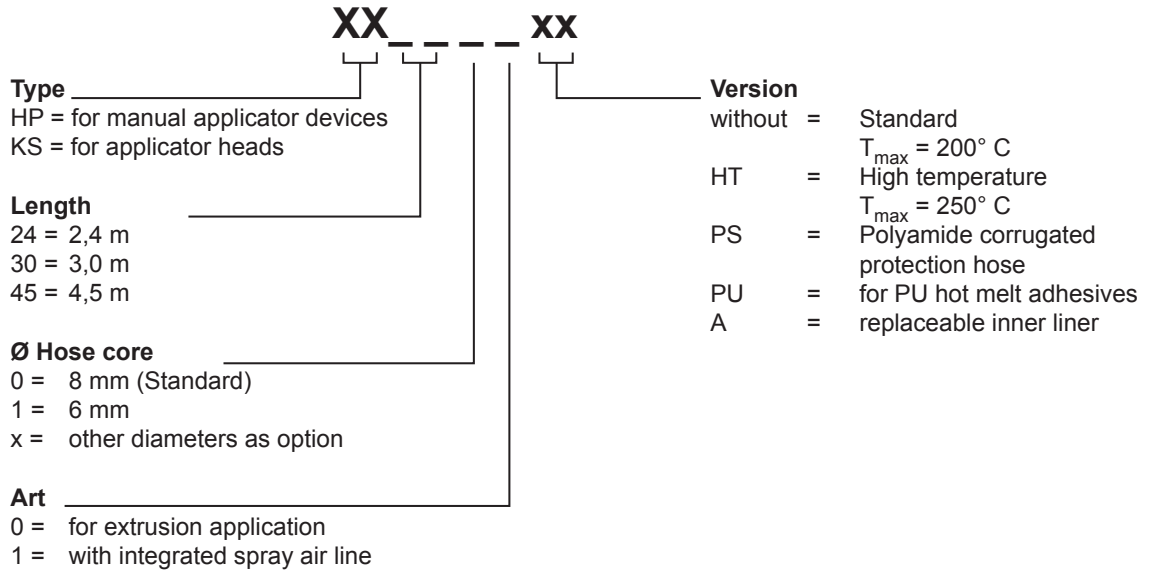
### **TYPE NS30**

<b>Item no.</b>	<b>Designation</b>
NKT0081	Hose NS30 0.6 m NW08
NKT0082	Hose NS30 1.2 m NW08
NKT0083	Hose NS30 1.8 m NW08
NKT0084	Hose NS30 2.4 m NW08
NKT0085	Hose NS30 3.0 m NW08
NKT0086	Hose NS30 3.6 m NW08
NKT0415	Hose NS30 4.0 m NW08
NKT0357	Hose NS30 4.2 m NW08
NKT0087	Hose NS30 4.8 m NW08
NKT0405	Hose NS30 6.0 m NW08
NKT0088	Hose NS30 7.2 m NW08
NKT0328	Hose NS30 8.0 m NW08
NKT0089	Hose NS30 10.0 m NW08
NKT0090	Hose NS30-SW 0.6 m NW08 surge water protected
NKT0091	Hose NS30-SW 1.2 m NW08 surge water protected
NKT0092	Hose NS30-SW 1.8 m NW08 surge water protected
NKT0093	Hose NS30-SW 2.4 m NW08 surge water protected
NKT0094	Hose NS30-SW 3.0 m NW08 surge water protected
NKT0095	Hose NS30-SW 3.6 m NW08 surge water protected
NKT0096	Hose NS30-SW 4.8 m NW08 surge water protected

**Optional:**

- A = replaceable inner liner  
(recommended for use with PUR or POR)
- VA-FLEX = VA casing  
(under extreme loading on external casing)
- S = external casing in signal colour (orange)

**TYP KS, HP**



## TECHNICAL DATA

### SERIES NS30

Version	High-Flex
Supply voltage	230V AC/50...60 Hz
Max. operating temperature (Tmax)	200° C
Temperature sensor	Ni120
Pressure resistance (at 200° C)	160 bar
Standard nominal diameter	NW08
Cap external diameter	40 mm

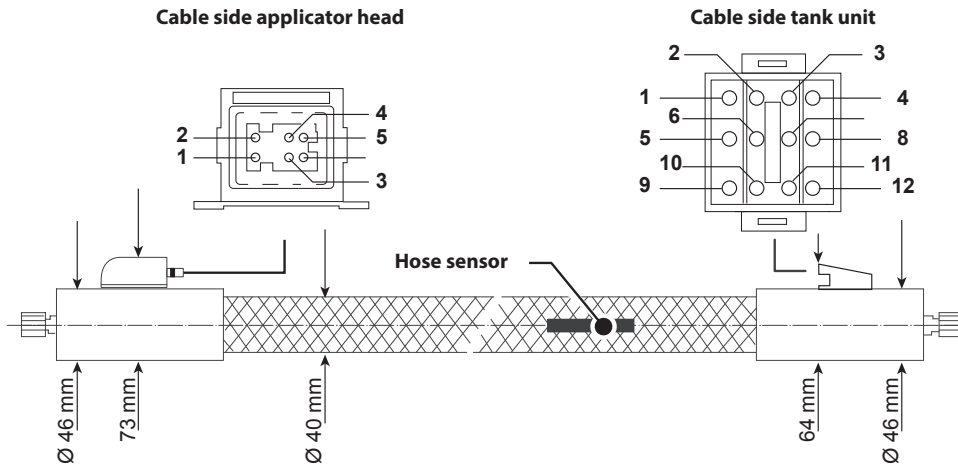
### TYPE KS, HP

Design	Standard	High temperature (HT)
Supply voltage	230V AC/50...60 Hz	
Heating capacity (P)	up to 3 m hose length: 130 W/m as of 3 m hose length: 100 W/m	
Max. operating temperature (Tmax)	200° C	250° C
Temperature sensor	PT100	
Pressure load capacity (Pmax) for 8 mm hose core	The stated values have been established by measurement in stretched condition without movement. The values will change for mechanical loads. Especially short, frequently very high pressure peaks have a negative impact.	
Bursting pressure at 24°C Max. hot melt material pressure: up to 24° C at 100° C at 200° C at 250° C	900 bar  200 bar 180 bar 160 bar -	900 bar  250 bar 225 bar 200 bar 188 bar
Max. spray air pressure (P <sub>max</sub> ) (Only with spray manual application device)	5 bar	
Fitting	galvanized steel, 9/16-18 UNF thread, size 19 for nominal diameters 08 and 10	

## PIN ASSIGNMENT

### TYPE NS30

Plug type: 12-pole rectangle, pins (to tank unit)  
6-pole rectangle, socket (to applicator head)



### To applicator head (6-pole rectangle)

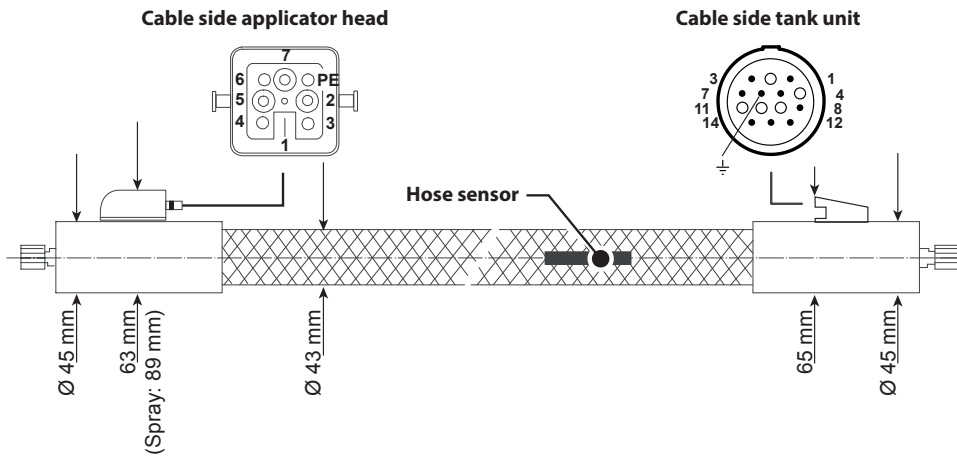
Pin	Colour	Function
1	white	Heater applicator head (L)
2	green	Heater applicator head (N)
3	orange	Applicator head sensor
4	free	
5	brown	Applicator head sensor
⊥	green/yellow	Protective earth

### To tank unit (12-pole rectangle)

Pin	Colour	Function
1	white	Heater applicator head (L)
2	green	Heater applicator head (N)
3	orange	Connecting line to sensor applicator head, jumper to Pin 12
4	blue	Heater hose
5	brown	Sensor hose (out) Brown & red are connected in the plug together with the jumper to Pin 9
6	blue	Heater hose
7	green/yellow	Protective earth
8	red	Sensor hose (return), jumper to Pin 11
9	brown	Jumper to Pin 5
11	red	Jumper to Pin 8
12	orange	Jumper to Pin 3

**TYPE KS**

Plug type: AMP, 14-pole, pins (to tank unit)  
Harting, 8-pole, lining, (to applicator head)



**To applicator head (8-pole)**

Pin	Colour	Function
1	free	
2	brown	Heater applicator head (L)
3	blue	Heater applicator head (N)
4	orange	Valve control
5	orange	Valve control
6	grey	Applicator head sensor
7	grey	Applicator head sensor
8	green/yellow	Protective earth

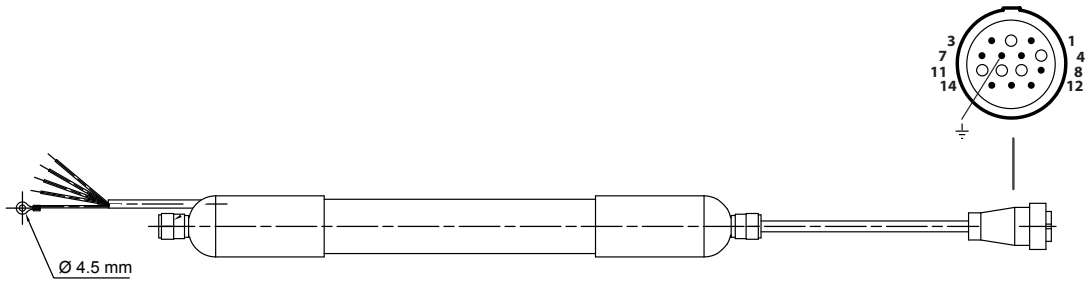
**To tank unit (14-pole AMP)**

Pin	Colour	Function
1	brown	Heater applicator head (L)
2	free	
3	blue	Heater applicator head (N)
4	grey	Applicator head sensor
5	green/yellow	Protective earth
6	grey	Applicator head sensor
7	orange	Valve control
8	free	
9	orange	Valve control
10	free	
11	white	Sensor hose
12	red	Sensor hose
13	yellow	Heater hose (L)
14	violet	Heater hose (N)



**TYPE HP**

Plug type: AMP, 14-pole, pins (to tank unit)

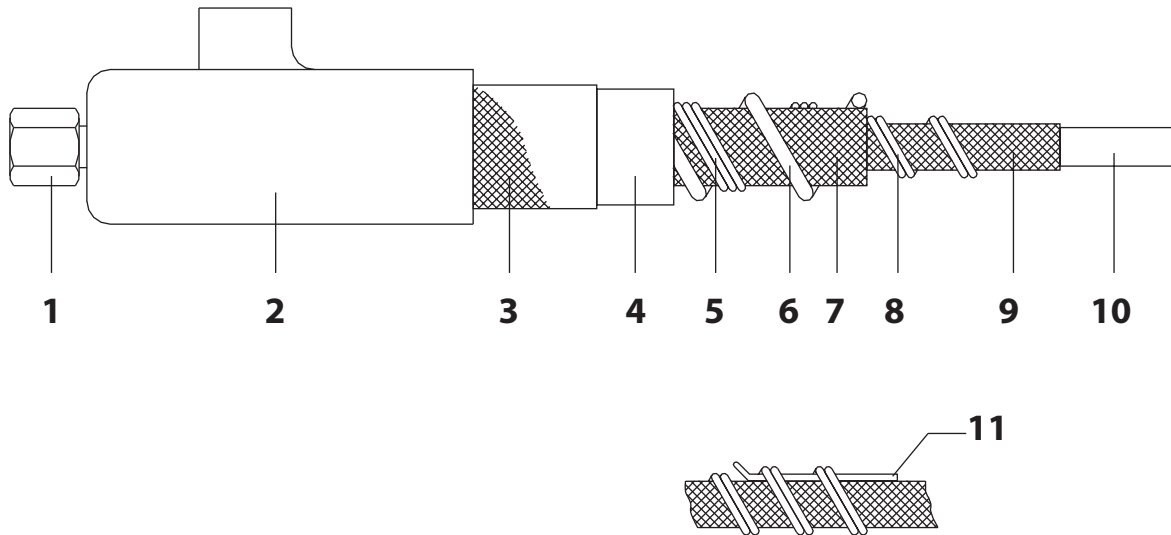


**To tank unit (14-pole AMP)**

Pin	Colour	Function
1	brown	Heater applicator head (L)
2	free	
3	blue	Heater applicator head (N)
4	grey	Applicator head sensor
5	green/yellow	Protective earth
6	grey	Applicator head sensor
7	orange	Valve control
8	free	
9	orange	Valve control
10	free	
11	white	Sensor hose
12	red	Sensor hose
13	yellow	Heater hose (L)
14	violet	Heater hose (N)

## CONSTRUCTION AND FUNCTION

### CONSTRUCTION



Cons. No.	Designation
1	Fitting
2	End cap
3	Braid or corrugated hose
4	Silicon foam
5	Control cores
6	PTFE hot air line (only in KS-S version)
7	Insulation
8	Heating
9	Stainless steel wire braid
10	PTFE inner liner
11	Pt 100/Ni120 temperature sensor

### FUNKTION

The basis of the heatable hose is formed by the inner liner (10) through which the melt flows. It is made in high-quality PTFE with a smooth surface.

Since the inner liner (10) does not have very much pressure resistance, it is enclosed in a stainless steel braid (9). The connecting fittings (1) in galvanised steel are pressed together with the overall setup plan.

The heating conductors (8) consist of high-quality heating conductor alloys that are covered by a protective conductor braid. Fiberglass braid (7) that covers the heating conductors is used as heat insulation.

The PTFE insulated brush shunts (5) are coiled around this construction in a spiral shape.

A heat stabilizing silicone foam (4) with fine-pored cell structure covers the entire construction that is protected by a polyamide protective braid (3). The connection sides of the hose are provided with stable temperature end caps made of silicone.

A temperature sensor (Pt100) is installed between the heater and stainless steel fiber that reports the current hose temperature to the control electronics.

Heatable hoses in the spray version also include a PTFE hose (6) for spray air.

#### TEMPERATURE STABILITY

The polyamide protective braiding is stable up to 160° C. Local overtemperatures can occur by bundling several heatable hoses or by touching hot machine parts.



#### Attention!

The maximum permissible temperature (given as  $T_{max}$  on the type plate) may not be exceeded.

The too high temperatures causes the pressure load capacity of the heated hose to sink, which can cause the hose to be damaged or destroyed.

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#### CHEMICAL RESISTANCE OF ADHESIVE HOSE

PTFE is resistant to almost all media.

Water will diffuse through the walls in minor amounts.



#### Attention!

When using hot melt materials containing fluorinated hydrocarbons, oils, alkali metals, or halogens, have the respective manufacturer advise you about PTFE compatibility.

Unsuitable hot melt materials can damage the adhesive hose.

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## INSTALLATION

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### Attention!

The heatable hose may only be installed by competent personnel.

See the operating instructions of the tank system for more details.

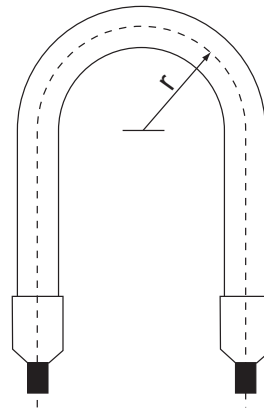
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### CONNECTION / REMOVAL

Assembling the heatable hoses to the tank system is described in detail in the operating instructions of the tank system.

### GUIDANCE NOTES

#### Bending radius



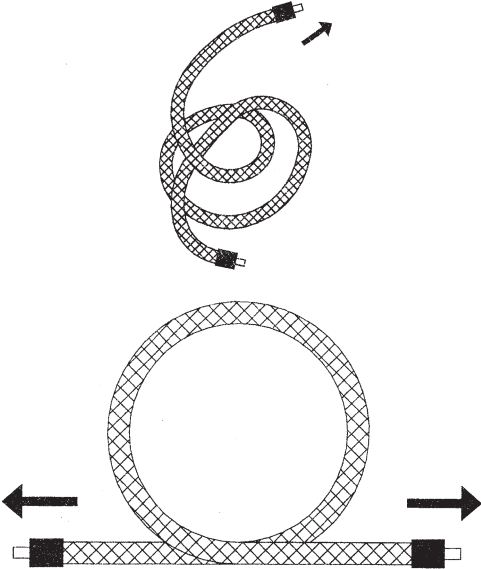
The minimum permissible bending radius for the heatable hose is  $r = 160$  mm, and 240 mm in the case of hoses with integrated spray air lines.

Please also observe the following notes

- Undercutting the minimum permissible bending radius, buckling, strong torsion loads (twisting) and S turns can cause the destruction of the hose.
- Movement and bending stresses may not occur directly at the connections.

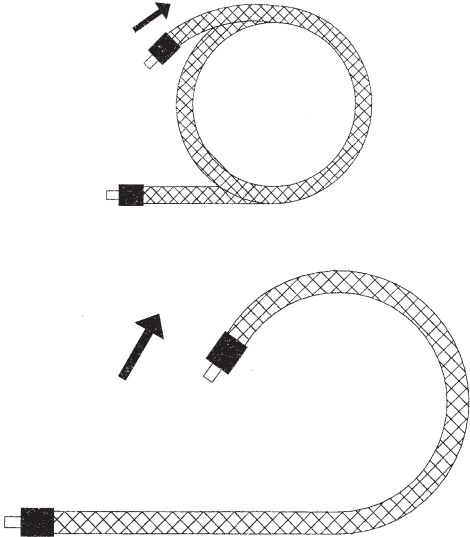
**FURTHER TIPS ON HOSE GUIDANCE**

**Wrong**

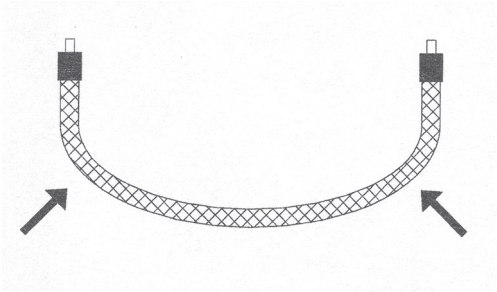


By pulling the ends of rolled up hoses, torsion stress occurs. The smallest permissible bending radius can be undercut!

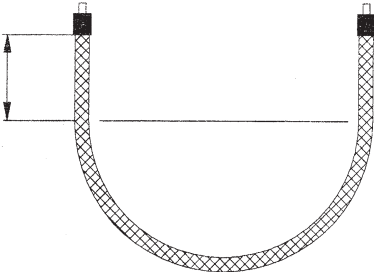
**Right**



Unwind the ring. (Do not pull off the hose)



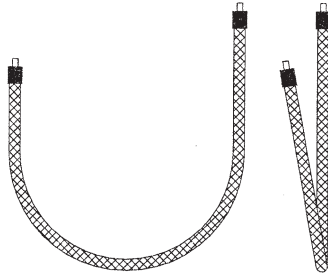
A too short hose will buckle at the connection ends



Plan to leave a straight piece (length approx. 5 x hose diameter) at the connection ends.

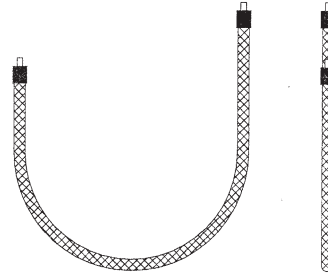
A greater bending radius will increase the service life of the hose.

**Wrong**

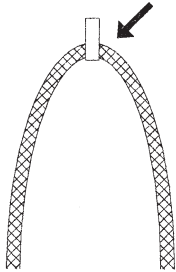


Torsion movement leads to destruction of the heatable hose. This occurs frequently due to incorrect installation, but above all due to twisting the hose during assembly.

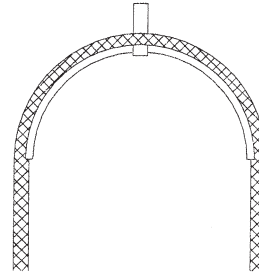
**Right**



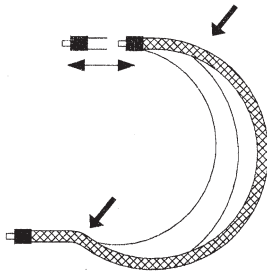
Let the hose axes run parallel during laying. Lay the hose in such a way that the direction of movement runs on a level with the hose axes.



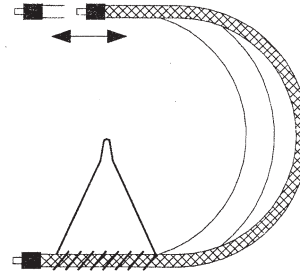
Guidance clips can cause buckling to the hose and bending stress.



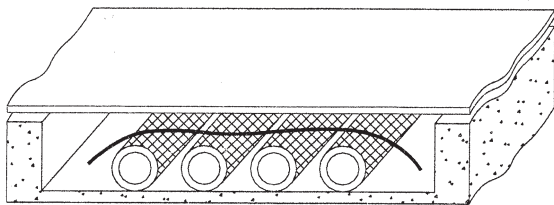
Remedy: Use a saddle or deflection pulley with corresponding diameter.



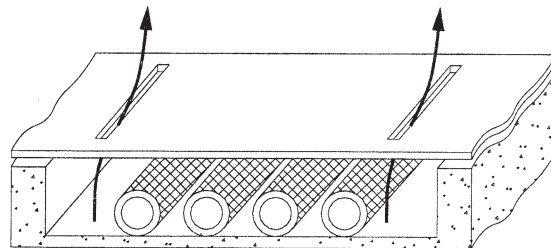
An unfavorable installation will let the hose sag.



Remedy: Spiral hose suspension

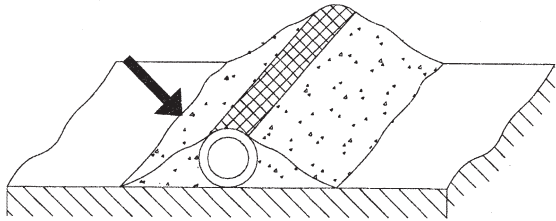


Heat accumulation can occur when laying the hoses in a closed canal or duct.



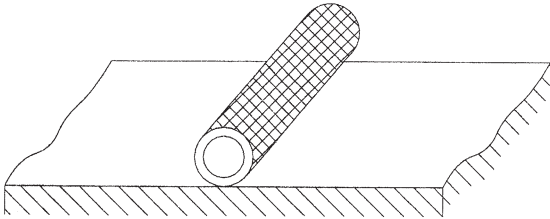
The hoses may not touch each other. Make sure you provide for adequate aeration.

**Wrong**

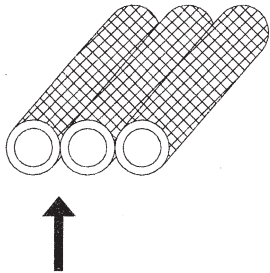


If the hoses are covered with powdery substances, local overheating will occur.

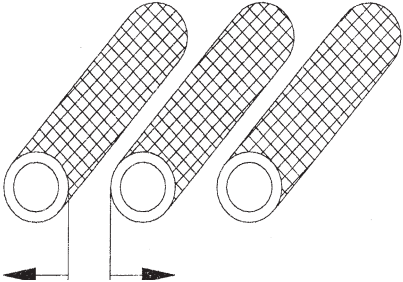
**Right**



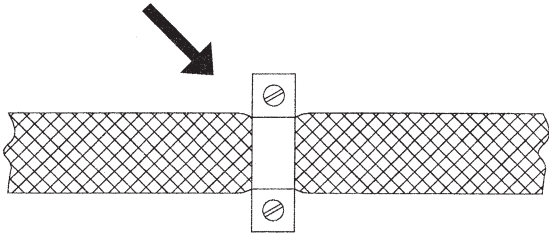
Clean the hoses at regular intervals.



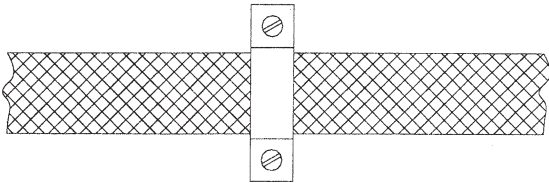
Bundling or laying the hoses with contact will lead to overheating at these contact sites.



Lay these hoses far enough apart.



Squeezing the hoses caused by brackets can damage the hoses.



Select the bracket with the matching diameter. Tighten the bracket enough so that the hose is secured but not squeezed.

## MAINTENANCE

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### Attention!

Maintenance works may only be implemented by competent personnel.

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### MAINTENANCE INTERVALS

Interval	Activity
Daily	Check the hoses for leak tightness.
	Check all mechanical and electrical connections for tight fit.
	Remove hot melt material residues and other in-crustations.

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### HEATABLE HOSE SYSTEM WITH REPLACEABLE INNER LINER

The type KS heating hose system consists of a carrier hose and a replaceable inner liner. Due to the structure, the hose length is limited to max. 12 m.

This system is particularly suitable for the processing of reactive adhesives. For impurities or clogging, only the inner liner needs to be replaced and the carrier hose (where the heater is situated) is retained. Replacement may only be carried out in a straight state.

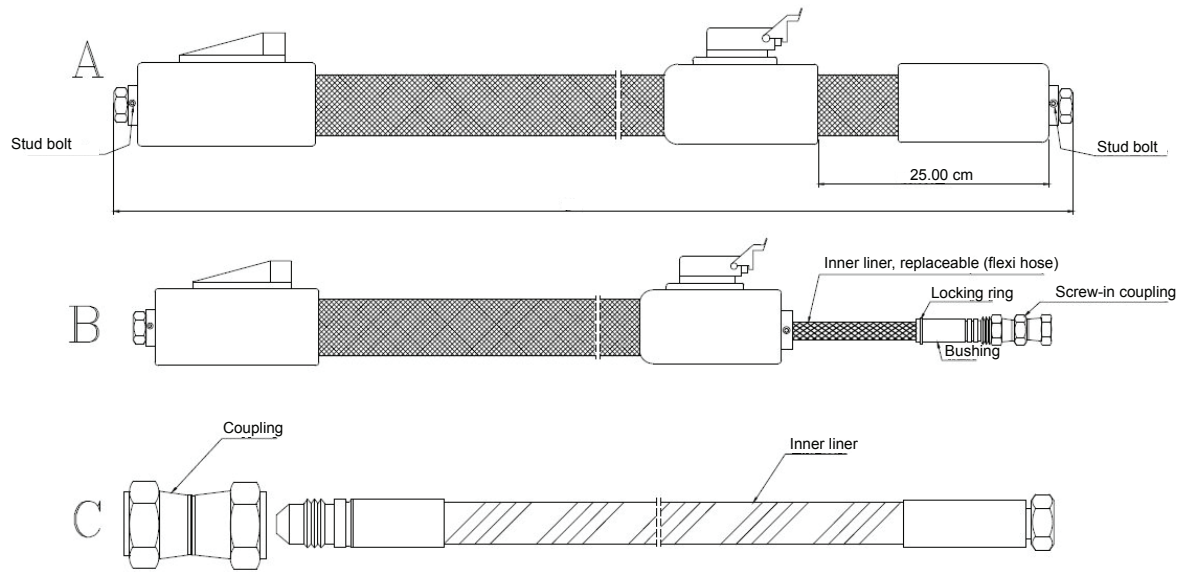
The heating capacity is adjusted to the corresponding nominal diameter of the carrier hose and to the operating temperature. This heated hose system is designed for an operating temperature of max. 200°C. The pressure load refers to the inner liner and can be seen in the „Technical Data” on *page 7-1*.

Observe the „Installation” chapter on *page 3-1*.

### INSTRUCTIONS FOR EXCHANGING THE REPLACEABLE INNER LINER

- Release the set screw with Allen wrench (Ø 2.5 mm) on both sides of the hose.
- Unscrew the double nipple.
- Remove the inner liner from the carrier hose. To do so, pull out the inner liner on the side of the firmly pressed fitting.
- The installation of the new inner liner occurs in reverse order.





## CLEANING



### Attention!

Do not use any aggressive solvent or combustible cleaning agents to clean the hoses. Such substances can cause damage to the hoses.

Using a suitable tool (e.g. cloth, soft brush, wood spatula), mechanically remove hot melt material residue and other pollution.

The heatable hose can also be cleaned by rinsing it with a suitable cleaning agent (see operating instructions of the basic unit).

### **REPAIRS**

Repairs other than those described in these operating instructions may only be implemented by competent persons commissioned by the manufacturer or otherwise competent persons under utilization of original BÜHNEN spare parts.

### **WARRANTY**

The unit was developed and manufactured according to the latest state of technology. The first purchaser receives warranty on function, material, and processing according to statutory regulations. Normal wear and tear is excepted.

The warranty is void if improper handling, use of violence, repairs by third parties and the installation of spare parts other than the original has been determined.

The warranty extends to servicing or replacing according to our choice. Warranty beyond our scope of delivery is excluded, as we do not have any influence on the competent and expert use of the unit.

Please observe our terms and conditions!

### **DISPOSAL**



Take the unit, packaging, and accessories to an environmentally friendly recycling center (in accordance with Directive 2002/96/EG of the European Parliament and the Council of January 27, 2003).

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**DECLARATION OF CONFORMITY**



# Declaration of Conformity

We, **Bühnen GmbH & Co KG.**  
**D-28277 Bremen**

declare in sole responsibility that the product

**Heatable Hose Type HP, KS, AT, NS and LS**

to which this declaration refers, conforms to the following standards or normative documents in its delivery state:

**Geräte- und Produktsicherheitsgesetz (GPSG)**  
**Elektro- und Elektronikgerätegesetz (ElektroG)**

**DIN EN ISO 12100-1, -2**

**DIN EN 55011**

**DIN EN 60204-1**

in accordance with the provisions of the directives

2001/95/EG

2004/108/EG

2006/95/EG

2011/65/EU

Bremen, June 2014

Hermann Kruse  
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