

## Heated lines type WAKW

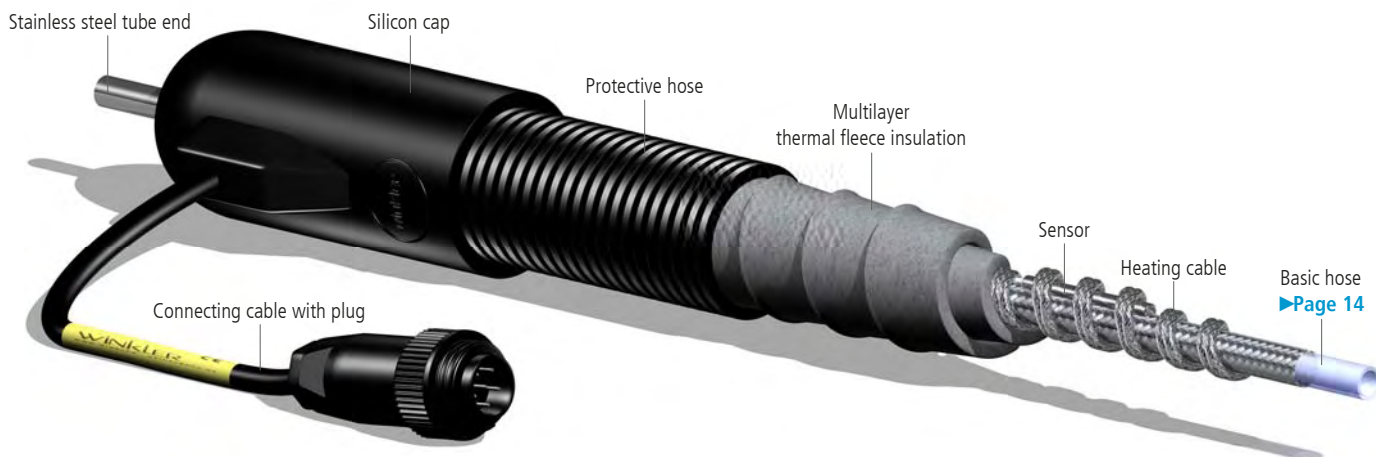
$T_{Max} = 100^{\circ}C \mid 200^{\circ}C$

### Applications

Heated lines for the transport of gas samples in the temperature range up to **200°C**.  
Very well suited for fix installation - even outdoors - and the mobile use with higher mechanical strain.

### Structure

- PTFE basic hose with stainless steel braiding and tube ends made of stainless steel 1.4305.  
Options for basic hoses and fittings as well as their available nominal diameters ▶Page 14.
- Heating with PTFE insulated heating cable with protective braiding.
- Flexible insulating structure with multilayer thermal fleece.
- Standard insulation structure approx. 40 mm (up to ND 13) and approx. 50 mm (ND 16). Options underneath.
- Outer cover with sturdy protective hoses in different versions and silicon caps.
- Built-in temperature sensor ▶Page 16 for the operation with a controller.
- Ready to connect with plug.



## Options of protective hoses for the outer cover of type WAKW

**STANDARD**

<b>Code W2</b>	Black polyamide (PA) corrugated hose Use for standard applications. Available up to <b>ND 16</b>
<b>Code W3</b>	Black TPE corrugated hose. Mobile use. Not for permanent outdoor use. Available up to <b>ND 13</b>

Only indoor use !

<b>Code W8</b>	Galvanised steel spiral hose. Trittfest. Use for höhere Belastungen Available up to <b>ND 13</b>
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<b>Code W7</b>	Spiralschlauch PUR black Use for Sonderanwendungen upon request Available up to <b>ND 25</b>
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Nur for Innen !

<b>Code W9</b>	Spiralschlauch stainless steel. Trittfest. Ideal for eine dauerhaft perfekte Optik Available up to <b>ND 13</b>
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## Options of insulation structures for type WAKW

**STANDARD**

<b>IW40</b>	Insulation structure approx. 40 mm. Use for standard applications. Available up to <b>ND 16</b>
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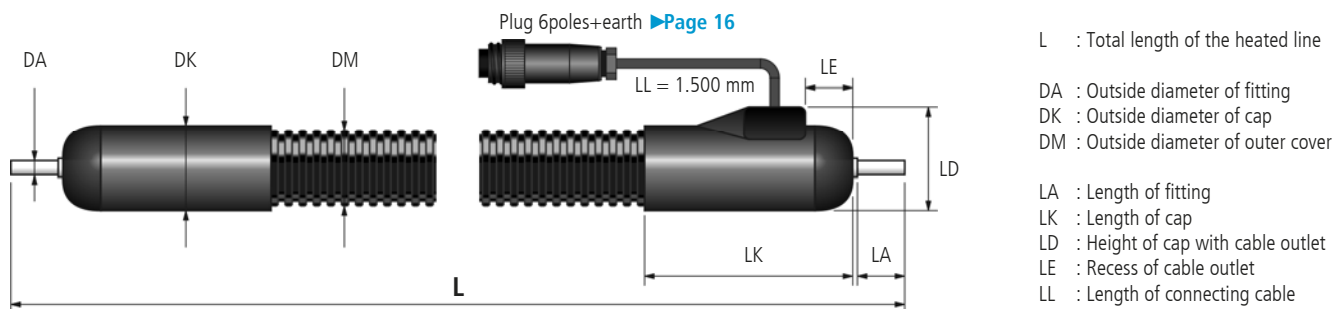
**-25°C** ❄️

<b>Option IW50 (W2)</b>	Insulation structure approx. 50 mm. Use for instance in climate chambers. Available up to <b>ND 16</b>
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**$T_{Max} = 180^{\circ}$**

<b>Option IW30 (W3)</b>	Insulation structure approx. 30 mm. Ideal for mobile use. Available for <b>ND 4</b>
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## Technical data type WAKW



### Dimensions and bend radiuses (Tolerances of length $\pm 2\%$ , tolerances of diameter $\pm 5\%$ )

ND	2	4	6	8	10	13	16
DA	4 mm	6 mm	8 mm	10 mm	12 mm	15 mm	18 mm
DK	48 mm						
DM	42,5 mm						
LA	25 mm				26 mm	28 mm	32 mm
LK	105 mm						
LD	62 mm						
LE	25 mm						
Min. bend radius	200 mm				300 mm		

### Maximum operating temperatures and power (Tolerances of power $\pm 10\%$ , ambient temperatures $-20^{\circ}\text{C}$ up to $+40^{\circ}\text{C}$ )

$T_{\text{Max}}$	ND	2	4	6	8	10	13	16
100°C	fix	–	100 W/m			125 W/m		150 W/m
	exchangeable	100 W/m		125 W/m		150 W/m	–	
200°C	fix	–	100 W/m			125 W/m		150 W/m
	exchangeable	100 W/m		125 W/m		150 W/m	–	

### Maximum lengths for operating voltages of 230 VAC and 115 VAC with one heating circuit (Tolerance of lengths $\pm 2\%$ )

$T_{\text{Max}}$	ND	2	4	6	8	10	13	16
100°C	230 V	52 m				41 m		34 m
	115 V	25 m				20 m		17 m
200°C	230 V	52 m				41 m		34 m
	115 V	25 m				20 m		17 m

## Standard basic hoses and fittings

Example: type 3 → WAKG0203-230XP006-1500STND

Available basic hoses and fittings for heated lines of the types listed. Depending on design, basic hoses with PTFE hose can be employed for fluid temperatures up to 250°C. Heated lines with stainless steel pipes and corrugated stainless steel hoses are designed for fluid temperatures up to 400°C, depending on the type of insulation.

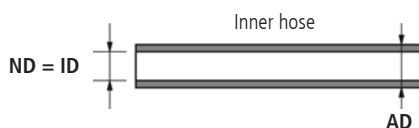
Higher temperatures and special solutions upon enquiry.

		Types of heated lines					
		WAL/H WAP	WEX	WAKG	WAKS	WAKW	WAF WAM
		▶ Page 4	▶ Page 6	▶ Page 8	▶ Page 8	▶ Page 10	Page 12,13
	<b>Type 0</b> PTFE hose (overlapping 500 mm on both ends)			Auf Anfrage	Auf Anfrage	Auf Anfrage	
		<b>T<sub>Max</sub> = 250°</b>					
	<b>Type 1</b> Exchangeable PTFE hose in hose (overlapping 500 mm on both ends)			Auf Anfrage	Auf Anfrage	Auf Anfrage	
		<b>T<sub>Max</sub> = 250°</b>					
	<b>Type 3</b> PTFE basic hose + stainless steel tube ends	ND 4 ND 6 ND 8 ND 10	ND 4 ND 6 ND 8 ND 10 ND 13	ND 4 ND 6 ND 8 ND 10 ND 13 ND 16,20 ND 25,32	ND 4 ND 6 ND 8 ND 10	ND 4 ND 6 ND 8 ND 10 ND 13 ND 16	<b>WAF</b> ND 4 ND 6
		<b>T<sub>Max</sub> = 250°</b>					
	<b>Type 4</b> PTFE carrier hose with exchangeable PTFE hose (overlapping 500 mm on both ends) + stainless steel tube ends	ND 4 ND 6		ND 4 ND 6 ND 8	ND 4 ND 6 ND 8	ND 4 ND 6 ND 8	
		<b>T<sub>Max</sub> = 250°</b>					
	<b>Type 5</b> Stainless steel tube (overlapping 50 mm on both ends)	ND 4 ND 6		ND 4 ND 6 Larger ND upon request	ND 4 ND 6 Larger ND upon request	ND 4 ND 6 Larger ND upon request	
		<b>T<sub>Max</sub> = 800°</b>					
	<b>Type 6</b> PTFE carrier hose with exchangeable PTFE hose (overlapping 500 mm on both ends)	ND 2 ND 4 ND 6		ND 2 ND 4 ND 6 ND 8	ND 2 ND 4 ND 6 ND 8	ND 2 ND 4 ND 6 ND 8	
		<b>T<sub>Max</sub> = 250°</b>					
	<b>Type 7</b> Corrugated stainless steel hose + stainless steel studs			ND 6 ND 8 ND 10 ND 12 ND 15	ND 6 ND 8 ND 10	ND 6 ND 8 ND 10 ND 12 ND 15	<b>WAM</b> ND 40 ND 50 ND 65 ND 80 ND 100 ND 125 ND 150
		<b>T<sub>Max</sub> = 600°</b>					
	<b>Type 8</b> PTFE carrier hose with exchangeable PTFE hose + exchangeable stainless steel tube ends			ND 2 ND 4 ND 6 ND 8	ND 2 ND 4 ND 6 ND 8	ND 2 ND 4 ND 6 ND 8	
		<b>T<sub>Max</sub> = 250°</b>					
	<b>Type 9</b> PTFE carrier hose with exchangeable PTFE hose + stainless steel ferrule fittings			ND 4 ND 6 ND 8	ND 4 ND 6 ND 8	ND 4 ND 6 ND 8	
		<b>T<sub>Max</sub> = 250°</b>					

## Nominal diameters ND

Example : ND = 6 mm → WAKG0203-230XP006-1500STND

**Important !** The nominal diameter (ND) of a heated line always refers to the inner diameter (ID) in mm of the inner hose or the inner tube.



**Important !** The nominal diameter is not to be confused with the dimensions of the fitting.



Nominal diameter (mm)		Inner diameter ID	Outer diameter AD
ND	Code	Inner hose	Inner hose
4	004	4 mm	6 mm
6	006	6 mm	8 mm
8	008	8 mm	10 mm
10	010	10 mm	12 mm
13	013	13 mm	15 mm
16	016	16 mm	18 mm

## Innenschläuche + Innenrohre



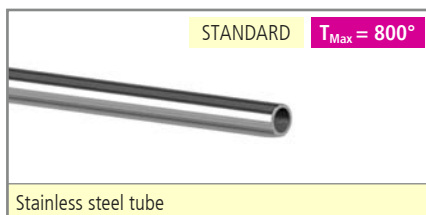
### PTFE-hose

Standard in all basic hoses of types 0, 1, 3, 4, 6, 8 and 9.

Resistant to all chemical agents, acids and bases of any concentration. Exception: alkaline metals and fluorine compounds.

For replacement :

ND 4 : Art.-Nr. WAZ02742-004TX006  
 ND 6 : Art.-Nr. WAZ02743-006TX008  
 ND 8 : Art.-Nr. WAZ02744-008TX010  
 ND 10 : Art.-Nr. WAZ02745-010TX012

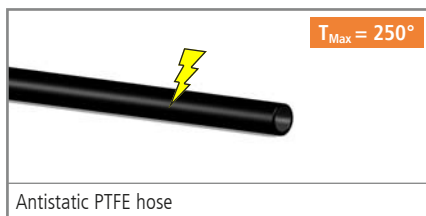


### Stainless steel tube 1.4404

Standard in heated lines of type 5  
 Available in ND 4 and 6 mm  
 Other nominal diameters upon request

For replacement :

ND 4 : Art.-Nr. WAZ02753-004VV006  
 ND 6 : Art.-Nr. WAZ02754-006VV008



### Option antistatic PTFE hose

For all basic hose with exchangeable hoses of types 0, 1, 4, 6, 8 and 9.  
 Available in ND 4 - ND 13



### Option PFA-hose

For all basic hose with exchangeable hoses of types 0, 1, 4, 6, 8 and 9.  
 Available in ND 4

## Lengths of heated lines L

Example : L = 15 m → WAKG0203-230XP006-1500STND

### Lengths of heated lines

We supply heated lines to the exact length required, ranging from 0,30 m to 78 m.  
 As from certain lengths, several heating circuits or three-phase arrangements will be necessary, depending on voltage, temperature and power.

**Tolerances** : ± 2 %

Pressure or thermal load variations during operation can result in changes in length of up to ± 2 %.

## Operating voltages

**Standard: 230 VAC-50 Hz**

Options: 12 VAC, 24 VAC, 48 VAC, 115 VAC, 200VAC, 400 VAC, 480 VAC  
12 VDC, 24 VDC, 48 VDC  
Others upon request

## Temperature sensors

### Standard types of sensors:

Temperature sensor Pt 100 (2 wire)	Code <b>XP</b>
Thermocouple type K (NiCr-Ni)	Code <b>XK</b>
Thermocouple type J (Fe-CuNi)	Code <b>XJ</b>

### Options for types of sensors:

Temperature sensor Pt 100 (3 wire)	Code <b>XT</b>
Temperature sensor Pt 100 (4 wire)	Code <b>XQ</b>
Bi-metal temperature controller	Code <b>XB</b>
Temperature fuse	Code <b>XS</b>

### Options for multiple sensors and sensor combinations:

Multiple sensors

2 x Pt 100 (2 wire)	Code <b>ZP</b>
3 x Pt 100 (2 wire)	Code <b>DP</b>
2 x thermocouple type K	Code <b>ZK</b>
... etc.	

Sensor combination e.g. Pt100 + thermocouple type K

...	Code <b>PK</b>
...	

**Example: 230 V → WAKG0203-230XP006-1500STND**

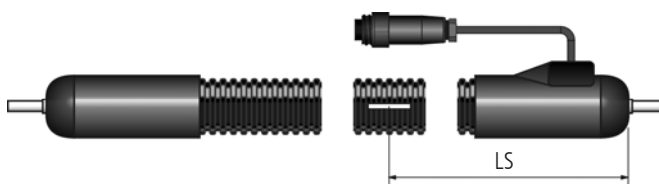
**Standard: One heating circuit = one heating zone**

Options: Several heating circuits → several heating zones.  
3-phase layout possible.

**Example: Pt 100 → WAKG0203-230XP006-1500STND**

### Standard sensor position:

The sensor position is always measured from the electrical connection side.  
**LS = 300 mm** for heated lines with heating cable.  
**LS = 1.000 mm** for heated lines with parallel heating tape.



### Optional sensor positions:

Please indicate your desired sensor position **LS** in your order.  
The correct position of the sensor is particularly important in cases of (partial) installation in switch cabinets, through walls or outdoors.  
Please ask our specialists for advice.



### Important!

Exposure to wind, as in the case of outdoor installations, can cool down the heated line quite considerably. Under these conditions, the heated line should be laid with appropriate protection, provided with stronger insulation (see options) and/or more power (W/m), while the temperature sensors have to be strategically placed. If the analytical measurement line runs through areas with different ambient temperatures, the internal hose temperature will vary accordingly. This can be prevented by incorporating different heating zones with separate control.

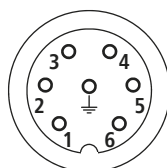
## Connecting cables and plugs

### Standard:

- Power- and sensor cable together.
- Cable exit sideways according to type 1.
- Length of connecting cable: 1,5 m
- 7-pin round plug (< 10 A), 5-pin round plug (< 20 A)
- Cable ends with ferrules (types WAL, WAH, WAP, WEX)

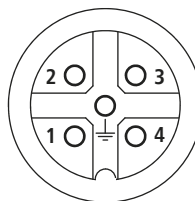
### Options:

- Power and sensor cable routed separately.
- Cable exits according to types 2, 3, 4 or 5
- Other lengths of connecting cable possible from 0,1 m.
- Without plug (cable ends with ferrules)
- Other plugs : You may specify other kinds of plugs required apart from the standard. If the correct type is not known, please send us a sample and the desired pin assignment.



### Pin assignment (7-pin round plug)

1 : Power (L)	5 : Sensor (+)
2 : Power (N)	6 : Sensor (-)
3 : free	PE : Earth
4 : free	



### Pin assignment (5-pin round plug)

1 : Power (L)	3 : Sensor (+)
2 : Power (N)	4 : Sensor (-)
	PE : Earth

