



winkler



PILZ® LABORATORY HEATERS

The tradition brand made in Germany



2011-03

Dear Business Partners,

Following the takeover of the PILZ® laboratory heating mantle range in 2007, we are delighted to present the second revised edition today.

Once again, in addition to the familiar PILZ® product quality, we wish to offer you long-term planning reliability with regard to prices and product selection with the new catalogue version which is valid as of the 01.04.2011.

Our warehouse holds stocks for you of all common heating mantles and tapes (intermediate sales rights are reserved).

You can, of course, find everything as usual in this catalogue that distinguishes the traditional PILZ® brand: reliability, durability, safety – in short: quality!

PILZ® laboratory heating systems and accessories are consistently manufactured in compliance with the latest safety regulations and standards, enabling you, as a dealer, to assume responsibility with a clear conscience with regard to your customers for the products you sell.

You can therefore place your trust in a reliable brand and a company with tradition and experience spanning over 30 years!

Please send all your inquiries and orders to our central sales office at sales@winkler.eu to ensure that they are speedily processed.

With best regards from Heidelberg

Andreas Zenner
Managing Director



Jan-Derek Schlué
Sales Manager



CONTENTS

SAFETY CONNECTION SYSTEM	3	ACCESSORIES	12
PLUG-IN SYSTEMS FOR ALL HEATING MANTLES	3	CONTROL AND MONITORING EQUIPMENT	13
HEATING MANTLES WITH CROCHETED OUTER JACKET	4	Mechanical devices	13
Heating mantles WHG2 and WHG2R	4	Microprocessor-controlled devices	14
Heating mantles WHG4R and WHG2H	5	Temperature sensors	15
METAL-CASED HEATING MANTLES AND MULTI-PLACE HEATING MANTLES	6	HEATING TAPES AND HEATING CORDS	16
Metal-cased heating mantles WHLG2 and WHLG2ER	6	Heating tapes silicone WBS00202	16
Metal-cased heating mantles WHLMG3ER and WHLSG2ER	7	Heating cords glass silk WKG00401	17
Metal-cased heating mantles WHU2ER	8	Heating tapes glass silk WBG00402	17
Multi-place heating mantles WHRE4 and WHRE6	9	Heating tapes silicate WBC00901	17
INDUSTRIAL HEATING MANTLES	10	SAFETY	18
Industrial heating mantles WHI and WHIS	10	GENERAL TERMS AND CONDITIONS	19
Control equipment for industrial heating mantles WHI and WHIS	11		

Important information

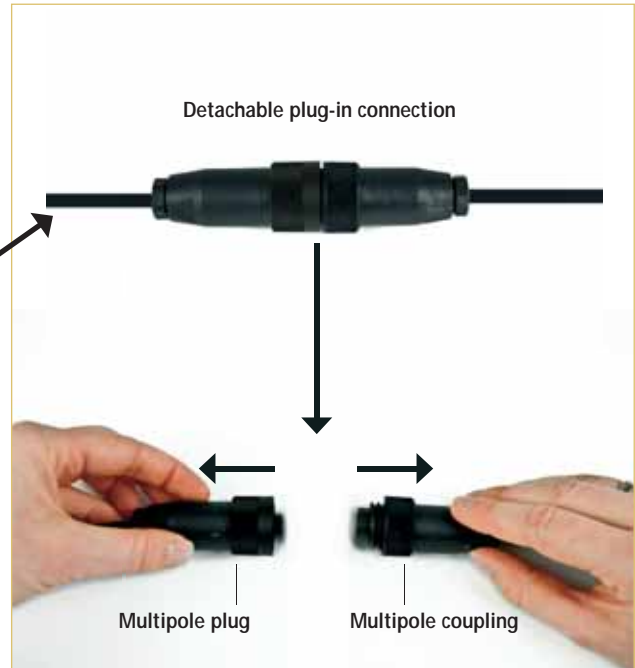
- Previous prices are no longer valid.
- Prices are quoted ex works, not including packing.
- Sale and delivery are governed exclusive by our General Terms and Conditions (page 19).
- Prices are quoted in Euros (€), not including statutory value-added tax (Germany).
- For small orders with a value below € 100,00 we invoice € 30,00 processing charge.
- We reserve the right to technical changes without notice.
- Unless expressly stated otherwise, the products from Winkler GmbH are to be connected to 230V/50Hz operating voltage.

SAFETY CONNECTION SYSTEM

All prices are valid to March 31, 2013

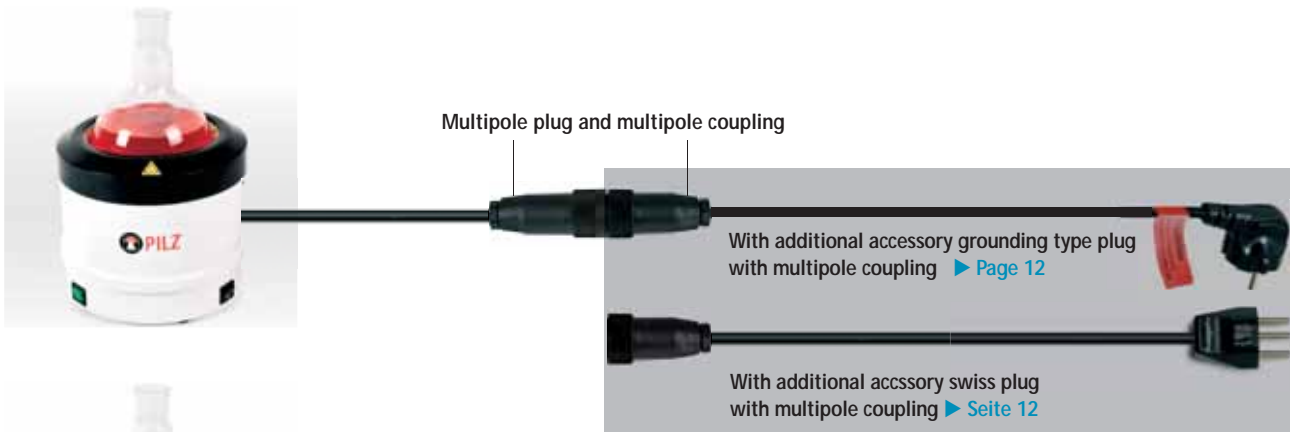


STANDARD | Equipment for all heating mantles (without glass flask)



STANDARD | Detachable plug-in connection

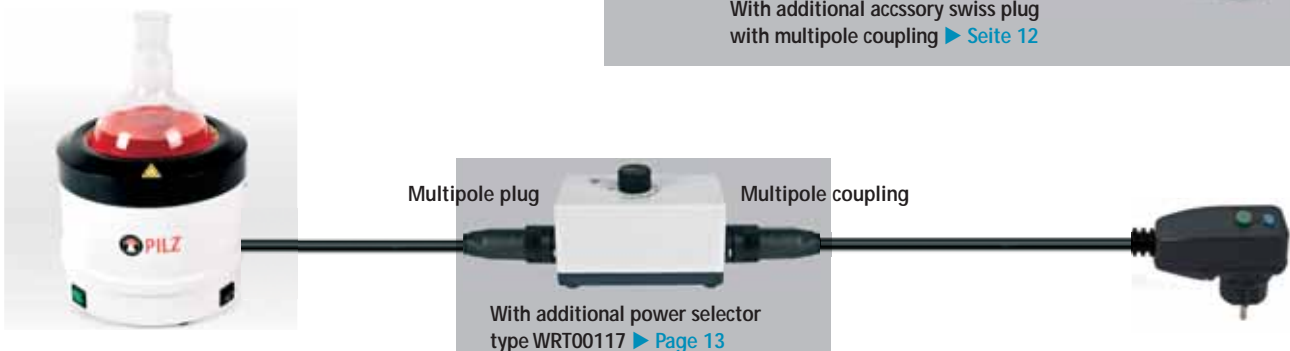
PLUG-IN SYSTEMS FOR ALL HEATING MANTLES



Multipole plug and multipole coupling

With additional accessory grounding type plug with multipole coupling ▶ Page 12

With additional accessory swiss plug with multipole coupling ▶ Seite 12



Multipole plug

Multipole coupling

With additional power selector type WRT00117 ▶ Page 13



Multipole plug

Multipole coupling

With additional temperature controller type WRT2010X ▶ Page 14

© Winkler GmbH · Engerstraße 24 · D-69126 Heidelberg · Tel.: +49-6221-3646-0 · Fax: +49-6221-3646-40 · sales@winkler.eu · www.winkler.eu

Our classic design – the “PILZ®” heating mantle

The forerunner of our standard series WHG2 was first developed for laboratory applications more than 60 years ago. It was also the basis for most of the other series. Continuous improvements in materials technology, and not least a high level of functionality and safety against accidents make this series an integral part of any laboratory facility. The product line is rounded off by a large range of accessories

and suitable control devices. As from size 500 ml through to 20 litres, the heating mantles have a base opening. Except for the smallest models with volumes of 25 ml and 50 ml (one heating zone) the heating mantles are always equipped with two heating zones.

SERIES WHG2 HEATING MANTLES WITH CROCHETED OUTER JACKET FOR ROUND-BOTTOM FLASKS T_{max} = 450°C

- hand crocheted heating mantles made of glass silk
- Device features**
- 25 and 50 ml heating mantles with slide switch
 - selectable power (0-50-100%)
 - one heating zone
 - 100 to 1.000 ml with series/parallel slide switch
 - selectable power (0-25-50-100%**)
 - heating zone 1 or heating zone 1+2;
 - as from 2.000 ml with series/parallel rotary switch
 - selectable power (0-25-50-100%*)
 - heating zone 1 or heating zone 1+2;
 - detachable plug-in connection (cable length 0.5 m)
 - RCD safety plug (cable length 1.0 m)
- Accessories** ▶ [Page 12](#)
- support rings and tripods
- 25 & 50 ml 1 heating zone
→ no heating zone switch

from 100 ml 2 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
25	41	40	1	-	WHG2XXXX-230XX450-000025RC	293,00	A
50	51	50	1	-	WHG2XXXX-230XX450-000050RC	303,00	A
100	64	100	2	-	WHG2XXXX-230XX450-000100RC	305,00	A
250	85	120	2	-	WHG2XXXX-230XX450-000250RC	278,00	A
500	105	250	2	62	WHG2XXXX-230XX450-000500RC	318,00	A
1.000	131	400	2	62	WHG2XXXX-230XX450-001000RC	381,00	A
2.000	165	600	2	62	WHG2XXXX-230XX450-002000RC	567,00	A
3.000	185	700	2	62	WHG2XXXX-230XX450-003000RC	630,00	A
4.000	207	800	2	62	WHG2XXXX-230XX450-004000RC	663,00	A
5.000	223	1.000	2	62	WHG2XXXX-230XX450-005000RC	779,00	A
6.000	236	1.200	2	62	WHG2XXXX-230XX450-006000RC	907,00	A
10.000	279	1.600	2	62	WHG2XXXX-230XX450-010000RC	1042,00	A
20.000	345	2.000	2	62	WHG2XXXX-230XX450-020000RC	1441,00	A

*115 V on request

SERIES WHG2R HEATING MANTLES WITH CROCHETED OUTER JACKET FOR ROUND-BOTTOM FLASKS T_{max} = 450°C

Extra-power heating mantle identical to series WHG2, but with greater power to shorten the heating-up phase.

Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
50	51	70	1	-	WHG2RXXX-230XX450-000050RC	343,00	B
100	64	110	2	-	WHG2RXXX-230XX450-000100RC	365,00	B
250	85	200	2	-	WHG2RXXX-230XX450-000250RC	372,00	B
500	105	300	2	62	WHG2RXXX-230XX450-000500RC	376,00	B
1.000	131	450	2	62	WHG2RXXX-230XX450-001000RC	455,00	B
2.000	165	700	2	62	WHG2RXXX-230XX450-002000RC	637,00	B

*115 V on request

SERIES WHG4R HEATING MANTLES WITH CROCHETED OUTER JACKET FOR ROUND-BOTTOM FLASKS

T_{max} = 450°C

- like series WHG2R, but with four heating zones
- hand crocheted heating mantle made of glass silk

Device features

- heating zone switch (cable length 0.5 m)
 - selectable power by activating additional heating zones
 - heating zone 1 or heating zones 1+2 or heating zones 1+2+3 or heating zones 1+2+3+4
- detachable plug-in connection (cable length 0.2 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- support rings and tripods



4 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
4.000	207	1000	4	62	WHG4RXXX-230XX450-004000RC	973,00	B
6.000	236	1400	4	62	WHG4RXXX-230XX450-006000RC	1070,00	B
10.000	279	2000	4	62	WHG4RXXX-230XX450-010000RC	1382,00	B
20.000	350	2800	4	62	WHG4RXXX-230XX450-020000RC	1712,00	B

*115 V on request

SERIES WHG2H HEATING MANTLES WITH CROCHETED OUTER JACKET FOR ROUND-BOTTOM FLASKS

T_{max} = 900°C

- corresponds to series WHG2, but with a maximum heat conductor temperature of 900°C
- hand crocheted heating mantle made of silicate yarn

Device features

- series/parallel rotary switch (cable length 0.5 m)
 - selectable power (0-25-50-100%)
 - heating zone 1 or heating zone 1+2
- detachable plug-in connection (cable length 0.2 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- support rings and tripods



2 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
250	85	300	2	-	WHG2HXXX-230XX900-000250RC	395,00	B
500	105	500	2	62	WHG2HXXX-230XX900-000500RC	447,00	B
1.000	131	750	2	62	WHG2HXXX-230XX900-001000RC	558,00	B
2.000	165	1.200	2	62	WHG2HXXX-230XX900-002000RC	782,00	B
4.000	207	1.800	2	62	WHG2HXXX-230XX900-004000RC	939,00	B
6.000	236	2.500	2	62	WHG2HXXX-230XX900-006000RC	1143,00	B

*115 V on request

SERIES WHLG2 METAL-CASED HEATING MANTLES FOR ROUND-BOTTOM FLASKS T_{max} = 450°C

- powder coated, robust metal housing with high chemical resistance
- hand crocheted heating unit made of glass silk

Device features

- master switch
- integrated heating zone switch
 - heating zone 1 or heating zone 1+2;
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- rod clamp STK 2
 - for mounting set-ups



50 & 100 ml 1 heating zone
→ no heating zone switch



from 250 ml 2 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø × H (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
50	51	50	1	158 × 175	WHLG2XXX-230XX450-000050RC	258,00	A
100	64	60	1	158 × 175	WHLG2XXX-230XX450-000100RC	258,00	A
250	85	120	2	158 × 175	WHLG2XXX-230XX450-000250RC	263,00	A
500	105	200	2	203 × 190	WHLG2XXX-230XX450-000500RC	296,00	A
1.000	131	300	2	203 × 190	WHLG2XXX-230XX450-001000RC	320,00	A
2.000	165	500	2	278 × 210	WHLG2XXX-230XX450-002000RC	401,00	A
3.000	185	600	2	278 × 210	WHLG2XXX-230XX450-003000RC	407,00	A

*115 V on request

SERIES WHLG2ER METAL-CASED HEATING MANTLES FOR ROUND-BOTTOM FLASKS T_{max} = 450°C

- powder coated, robust metal housing with high chemical resistance
- hand crocheted heating unit made of glass silk

Device features

- master switch
- integrated heating zone switch
 - heating zone 1 or heating zone 1+2;
- integrated power selector
 - infinitely variable power (0-100%)
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- rod clamp STK 2
 - for mounting set-ups



50 & 100 ml 1 heating zone
→ no heating zone switch



from 250 ml 2 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø × H (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
50	51	50	1	158 × 175	WHLG2ERX-230XX450-000050RC	316,00	A
100	64	60	1	158 × 175	WHLG2ERX-230XX450-000100RC	319,00	A
250	85	120	2	158 × 175	WHLG2ERX-230XX450-000250RC	326,00	A
500	105	200	2	203 × 190	WHLG2ERX-230XX450-000500RC	357,00	A
1.000	131	300	2	203 × 190	WHLG2ERX-230XX450-001000RC	378,00	A
2.000	165	500	2	278 × 210	WHLG2ERX-230XX450-002000RC	454,00	A
3.000	185	600	2	278 × 210	WHLG2ERX-230XX450-003000RC	471,00	A

*115 V on request

SERIES WHLMG3ER METAL-CASED HEATING MANTLES FOR ROUND-BOTTOM FLASKS

$T_{max} = 450^{\circ}C$

- powder coated, robust metal housing with high chemical resistance
- hand crocheted heating unit made of glass silk
- Variable-volume, metal-cased heating mantle for different flask sizes (see ordering data)

Device features

- master switch
- integrated heating zone switch
 - heating zone 1 or heating zone 1+2 or heating zone 1+2+3;
- integrated power selector
 - infinitely variable power (0-100%)
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- rod clamp STK 2
 - for mounting set-ups



3 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø × H (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
50-250	51-85	150	3	158 × 175	WHLMG3ER-230XX450-000250RC	356,00	A
250-1.000	85-131	360	3	203 × 190	WHLMG3ER-230XX450-001000RC	401,00	A
1.000-3.000	131-185	600	3	278 × 210	WHLMG3ER-230XX450-003000RC	479,00	A

*115 V on request

SERIES WHLSG2ER METAL-CASED HEATING MANTLES FOR ROUND-BOTTOM FLASKS

$T_{max} = 450^{\circ}C$

- powder coated, robust metal housing with high chemical resistance
- Corrosion-resistant heating shell with optimal thermal conductivity
- Ideally suited for baths or catching leaking fluid due to vessel breakage

Device features

- master switch
- integrated heating zone switch
 - heating zone 1 or heating zone 1+2;
- integrated power selector
 - infinitely variable power (0-100%)
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- rod clamp STK 2
 - for mounting set-ups



2 heating zones



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø × H (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
250	85	120	2	158 × 175	WHLSG2ER-230XX450-000250RC	437,00	A
500	105	200	2	203 × 190	WHLSG2ER-230XX450-000500RC	477,00	A
1.000	131	300	2	203 × 190	WHLSG2ER-230XX450-001000RC	481,00	A
2.000	165	500	2	278 × 210	WHLSG2ER-230XX450-002000RC	522,00	A

*115 V on request

SERIES WHU2ER METAL-CASED HEATING MANTLES FOR ROUND-BOTTOM FLASKS

$T_{max} = 450^{\circ}C$

- powder coated, robust metal housing with high chemical resistance
- hand crocheted heating unit made of glass silk

Device features

- integrated heating zone switch
 - heating zone 1 or heating zone 1+2;
- integrated power selector
 - ON and OFF function
 - infinitely variable power (0-100%)
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)

Accessories ▶ Page 12

- rod clamp STK 2
 - for mounting set-ups



2 heating zones

!NEW!



Volumen (ml)	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø × H (mm)	Artikel-Nr. 230 VAC*	Price (€)	Delivery code
4.000	207	700	2	288 × 166	WHU2ERXX-230XX450-004000RC	655,00	C
5.000	223	860	2	318 × 166	WHU2ERXX-230XX450-005000RC	755,00	C
6.000	236	1.000	2	318 × 166	WHU2ERXX-230XX450-006000RC	759,00	C
10.000	279	1.400	2	368 × 194	WHU2ERXX-230XX450-010000RC	855,00	C
20.000	345	2.000	2	438 × 234	WHU2ERXX-230XX450-020000RC	1158,00	C

*115 V on request



Laboratory set-up option (from left to right) with PILZ® heating mantle WHU2ER 6,000 ml with rod clamp STK 2 and PILZ® heating mantle WHG2 50 ml with support ring.

WHRE4 MULTI-PLACE HEATING MANTLE WITH 4 HEATING PLACES
T_{max} = 450°C

- powder coated, robust metal housing with high chemical resistance
- stainless steel front and cover plate
- hand crocheted heating unit made of glass silk
- 4 heating places

Device features

- master switch
- integrated power selector per heating place → infinitely variable power (0-100%)
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)
- rod clamp STK 1 per heating place (without rod)



1 heating zone per heating place



Back of multi-place heating mantle with rod clamp STK 1

Volume (ml)	Kolben Ø (mm)	Power (W ±10%)	Heizzonen je Heizplatz	Dimensions B × H × T (mm)	Article No. 230 VAC*	Price (€)	Delivery code
100	64	4 x 110	1	620 × 220 × 130	WHRE4ERX-230XX450-000100RC	1981,00	C
250	85	4 x 200	1	620 × 220 × 130	WHRE4ERX-230XX450-000250RC	1850,00	C
500	105	4 x 300	1	765 × 260 × 130	WHRE4ERX-230XX450-000500RC	1910,00	C
1.000	131	4 x 450	1	765 × 260 × 130	WHRE4ERX-230XX450-001000RC	2105,00	C

*115 V on request

WHRE6 MULTI-PLACE HEATING MANTLE WITH 6 HEATING PLACES
T_{max} = 450°C

- powder coated, robust metal housing with high chemical resistance
- stainless steel front and cover plate
- hand crocheted heating unit made of glass silk
- 6 heating places

Device features

- master switch
- integrated power selector per heating place → infinitely variable power (0-100%)
- detachable plug-in connection (cable length 0.5 m)
- RCD safety plug (cable length 1.0 m)
- rod clamp STK 1 per heating place (without rod)



1 heating zone per heating place



Back of multi-place heating mantle with rod clamp STK 1

Volume (ml)	Kolben Ø (mm)	Power (W ±10%)	Heizzonen je Heizplatz	Dimensions B × H × T (mm)	Article No. 230 VAC*	Price (€)	Delivery code
100	64	6 x 110	1	870 × 220 × 130	WHRE6ERX-230XX450-000100RC	2547,00	C
250	85	6 x 200	1	870 × 220 × 130	WHRE6ERX-230XX450-000250RC	2286,00	C
500	105	6 x 300	1	1146 × 260 × 130	WHRE6ERX-230XX450-000500RC	2555,00	C
1.000	131	6 x 450	1	1146 × 260 × 130	WHRE6ERX-230XX450-001000RC	3199,00	C

*115 V on request

SERIES WHI INDUSTRIAL HEATING MANTLES

$T_{max} = 450^{\circ}C$

With respect to its basic structure, this heating mantle series corresponds to the mantles for laboratory applications. However, because of the size the devices are mechanically reinforced by a sturdy carrier basket. Four eyebolts, which are movably connected to the support ring, are used as mounting fixtures.

- outer jacket made of PTFE or aluminium coated glass fabric (as desired)
- hand crocheted heating unit made of glass silk

Device features

- terminal box
- connecting cable with 10-pole industrial plug (2.0 m)

Accessories ▶ Page 11

- controller WRT171 for regulating the heating zones



Volume (l)**	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø (mm)	Article No. 230 VAC	Price (€)	Delivery Code
10	280	1600	3	60	WHI3X280-230XK450-0010XXXX	on request	C
20	350	2400	3	60	WHI3X350-230XK450-0020XXXX		C
20	365	2400	3	60	WHI3X650-230XK450-0020XXXX		C
50	490	4500	3	80	WHI3X490-230XK450-0050XXXX		C
50	510	4500	3	80	WHI3X510-230XK450-0050XXXX		C
100	610	6000	4	100	WHI4X610-230XK450-0100XXXX		C
200	750	9000	5	120	WHI5X750-230XK450-0200XXXX		C
200	760	9000	5	120	WHI5X760-230XK450-0200XXXX		C

*115 V on request
** other volumes on request

SERIES WHIS SAFETY HEATING MANTLES

$T_{max} = 300^{\circ}C$

This safety heating mantle, which offers up to 5 heating zones, is combined with a Winkler WRT172 controller for temperature control to a maximum of 300 °C. This protects the glass flasks against stress. In the event of excessive stress there is a danger of glass flask breakage.

- outer jacket made of PTFE or aluminium coated glass fabric (as desired)
- hand crocheted heating unit made of glass silk

Device features

- terminal box
- connecting cable with 10-pole industrial plug (2.0 m)
- cable with sensor plug (2.0 m)
- one temperature sensor per heating zone
 - **standard:** thermocouple Typ K (NiCr-Ni)
 - **option:** thermocouple Typ J (Fe-CuNi)
 - **option:** RTD Pt 100

Accessories ▶ Page 11

- controller WRT172 for regulating the heating zones



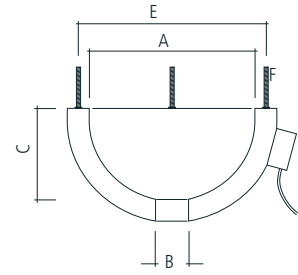
Volume (l)**	Flask Ø (mm)	Power (W ±10%)	Heating zones	Base opening Ø (mm)	Article No. 230 VAC	Price (€)	Delivery Code
10	280	1600	3	60	WHI3S280-230DK300-0010XXXX	on request	C
20	350	2400	3	60	WHI3S350-230DK300-0020XXXX		C
20	365	2400	3	60	WHI3S365-230DK300-0020XXXX		C
50	490	4500	3	80	WHI3S490-230DK300-0050XXXX		C
50	510	4500	4	80	WHI3S510-230VK300-0050XXXX		C
100	610	6000	4	100	WHI4S610-230VK300-0100XXXX		C
200	750	9000	5	120	WHI5S750-230FK300-0200XXXX		C
200	760	9000	5	120	WHI5S760-230FK300-0200XXXX		C

*115 V on request
** other volumes on request

Delivery code: **A**= from stock, subject to prior sale; **B**=3 weeks; **C**=6 weeks

A Flask Ø*	B Base opening	C Height*	E Screw to screw*	F Screw
280	to be specified if non-standard	150	315	4 x M12
350		190	398	4 x M12
365		200	405	4 x M12
490		265	555	4 x M12
510		275	575	4 x M12
610		325	670	4 x M12
750		395	825	4 x M12
760		400	830	4 x M12

All dimensions in mm



Schematic structure of an industrial heating mantle

CONTROLLER WRTI71 FOR INDUSTRIAL HEATING MANTLES

Controller series WRTI71 is employed for operating industrial heating mantles.

- table-top controller in a powder coated, robust metal housing with high chemical resistance
- aluminium front plate

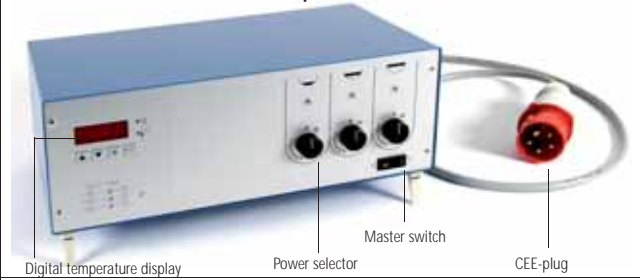
Device features

- master switch
- digital temperature display for lowest heating zone
- 3 to 5 power selectors with control status display for each heating zone
- with CEE-plug 16A for three-phase current connection 3×230V/50Hz (cable length 1.5 m)
- multipole, plug-in device outlet for industrial heating mantle connection

Dimensions (mm)

w 400 × h 180 × d 250

Controller WRTI7103 with three power selectors



Zones to be heated	Article No. 230 VAC	Price (€)	Delivery code
3	WRTI7103-230XK000	on request	C
4	WRTI7104-230XK000		C
5	WRTI7105-230XK000		C

CONTROLLER WRTI72 FOR SAFETY HEATING MANTLES

Controller series WRTI72 incorporates a safety system that limits the temperature of the different heating zones to 300 °C.

- table-top controller in a plastic coated, robust metal housing with high chemical resistance
- aluminium front plate

Device features

- master switch
- digital temperature display for media temperature
- 3 to 5 power selectors with control status display for each heating zone
- with CEE-plug 16A for three-phase current connection 3×230V/50Hz (cable length 1.5 m)
- Multipole, plug-in device outlet for industrial heating mantle connection

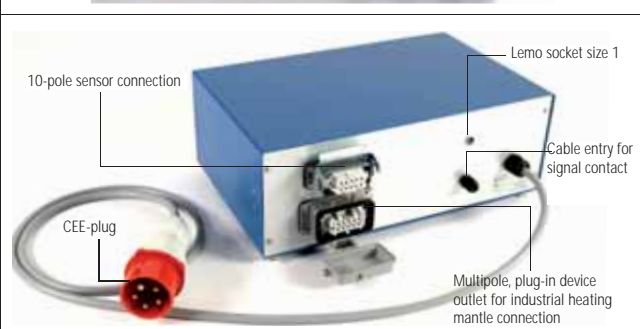
Additional features of WRTI72 device

- 10-pole sensor connection
- Cable entry for signal contact to permit temperature monitoring
- Lemo socket size 1; 4-pole; assignment in accordance with NAMUR (connection for external sensor to measure the media temperature)
- The overall control takes place via the freely selectable medium temperature $T_{max} = 300\text{ °C}$
- The temperature is limited by built-in temperature controllers
→ 300 °C for each zone being heated

Dimensions (mm)

w 400 × h 180 × d 250

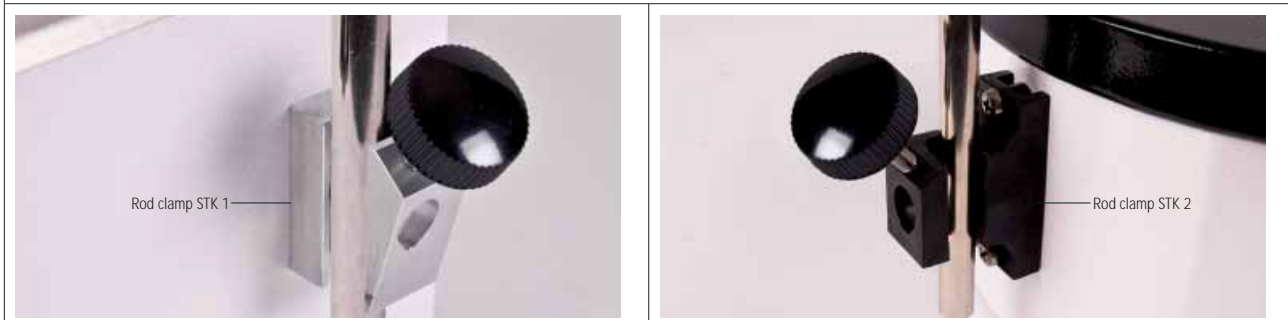
Controller WRTI7203 with three power selectors



Zones to be heated	Article No. 230 VAC	Price (€)	Delivery code
3	WRTI7203-230XK000	on request	C
4	WRTI7204-230XK000		C
5	WRTI7205-230XK000		C

ACCESSORIES

ROD CLAMPS FOR MULTI-PLACE HEATING MANTLES AND METAL-CASED HEATING MANTLES



Designation	Heating mantle type	Material	Article No.	Price (€)	Delivery code
STK 1	Multi-place heating mantles	Cast aluminium	WHZSTK01	23,00	A
STK 2	Metal-cased heating mantles	Plastic	WHZSTK02	19,00	A

SUPPORT RING FOR CROCHETED HEATING MANTLES



Flask volume (ml)	Article No. 230 VAC*	Price (€)	Delivery code
25	WHZT0025	35,00	A
50	WHZT0050	37,00	A
100	WHZT0100	37,00	A
250	WHZT0250	40,00	A
500	WHZT0500	40,00	A
1.000	WHZT1000	40,00	A
2.000	WHZT2000	40,00	A
3.000	WHZT3000	44,00	A
4.000	WHZT4000	44,00	A

TRIPOD FOR CROCHETED HEATING MANTLES



Flask volume (ml)	Article No. 230 VAC*	Price (€)	Delivery code
100	WHZD0100	122,20	A
250	WHZD0250	124,50	A
500	WHZD0500	124,50	A
1.000	WHZD1000	126,00	A
2.000	WHZD2000	126,00	A
3.000	WHZD3000	152,00	A
4.000	WHZD4000	153,00	A
5.000	WHZD5000	167,00	A
6.000	WHZD6000	188,00	A
10.000	WHZD0010	211,00	A
20.000	WHZD0020	260,00	A

CONNECTING CABLE FOR ALL HEATING MANTLE TYPES

STANDARD | RCD safety plug and multipole coupling WHZA1000



Cabel length	Current	Article No.	Price (€)	Delivery code
1,0 m	10 A	WHZA1000	48,00	A

To be used if the user's mains network is **not** protected by a residual current device.

Grounding type plug with multipole coupling WHZA2000
Also available with swiss plug



Cabel length	Current	Article No.	Price (€)	Delivery code
1,0 m	10 A	WHZA2000	15,00	A
1,0 m	10 A	WHZA20CH	29,00	B

May be employed when the user's mains network is protected by a residual current device.

CONTROL & MONITORING – MECHANICAL DEVICES

All prices are valid to March 31, 2013

POWER SELECTOR TYPE WRT00116

- plug-in power selector made of impact-resistant polystyrene
- sturdy switching mechanism

Device features

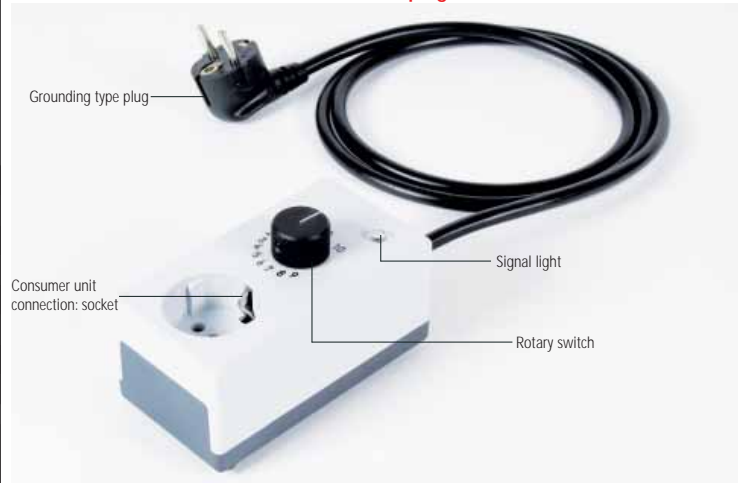
- rotary switch with bimetal element
 - infinitely variable power (0-100%)
- signal light for control status indication
- cable with grounding type plug → cable length 1.4 m

TECHNICAL DATA

Dimensions (mm) w × h × d	120 × 56 × 57
Nominal voltage	230 VAC
Nominal current	15 A ohmic load
Nominal frequency	50 Hz
Nominal switching capacity	3450 W
Mains connection	grounding type plug (1.4 m cable)
Consumer unit connection	socket

Article No.	Price (€)	Delivery code
WRT00116-230XX015	106,00	A
WRT00116-230XX0CH	131,00	B

Connecting cable also available with swiss plug; code 0CH



POWER SELECTOR TYPE WRT00117

- plug-in power selector made of impact-resistant polystyrene
- sturdy switching mechanism

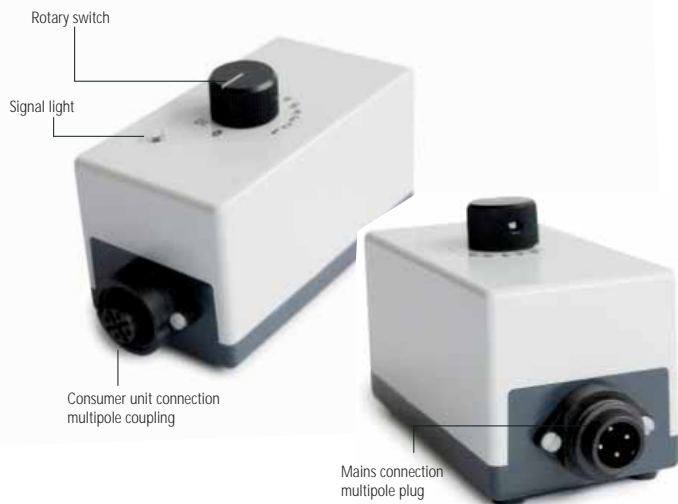
Device features

- rotary switch with bimetal element
 - infinitely variable power (0-100%)
- signal light for control status indication

TECHNICAL DATA

Dimensions (mm) w × h × d	120 × 56 × 57
Nominal voltage	230 VAC
Nominal current	10 A ohmic load
Nominal frequency	50 Hz
Nominal switching capacity	2300 W
Mains connection	Multipole plug
Consumer unit connection	Multipole coupling

Article No.	Price (€)	Delivery code
WRT00117-230XX010	134,00	A



POWER SELECTOR TYPE WRT00011

- plug-in power selector made of impact-resistant polystyrene
- sturdy switching mechanism

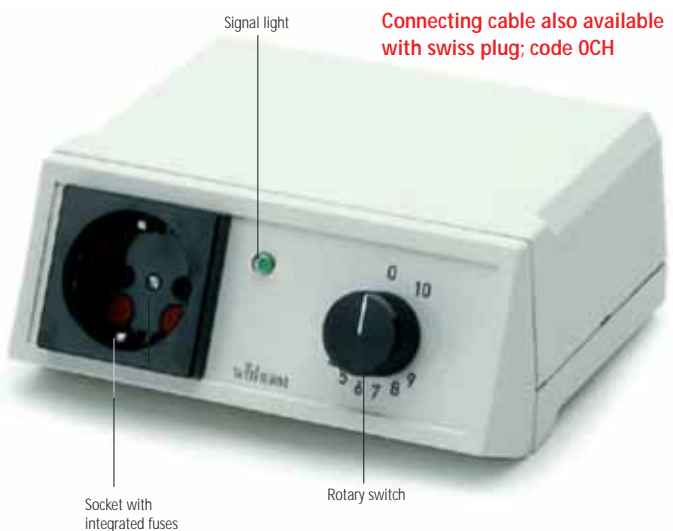
Device features

- rotary switch with bimetal element → infinitely variable power (0-100%)
- signal light for control status indication
- connection: cable with grounding type plug → cable length 1.4 m
- socket with integrated fuses
- mains connection on the back

TECHNICAL DATA

Dimensions (mm) w × h × d	155 × 65 × 135
Nominal voltage	230 VAC
Nominal current	10 A ohmic load
Nominal frequency	50 Hz
Nominal switching capacity	2300 W
Mains connection	grounding type plug (1.4 m cable)
Consumer unit connection	socket

Article No.	Price (€)	Delivery code
WRT00011-230XX010	161,00	A
WRT00011-230XX0CH	186,00	B



Connecting cable also available with swiss plug; code 0CH

© Winkler GmbH · Englerstraße 24 · D-69126 Heidelberg · Tel.: +49-6221-3646-0 · Fax: +49-6221-3646-40 · sales@winkler.eu · www.winkler.eu

TABLE-TOP CONTROLLERS WRT2000 / WRT2010

Function as

- Single-channel controller
- Two-position controller
- Continuous-action controller
- Three-position controller
- Step controller

Additional functions

- Timer function (process time)
- Ramp function
- Selector function
- Two logic inputs
- Configurable functions

Configurable input

- Pt 100
- Thermocouples

Additional configurable input

Limit value/cut-out function

- Pt 100
- Thermocouples
- Standard signal U or I

Analogue output

- Configurable output quantity and function

TABLE-TOP CONTROLLER TYPE WRT2000X

- table-top controller made of impact-resistant polystyrene according to DIN 53 453, fire-protection class UL 94 HB

Device features

- ON/OFF switch
- connecting cable (length 1.5 m) with grounding type plug
- analogue output
- digital temperature display of actual and setpoint temperatures
- integrated start and stop button
- terminal block for signal contacts
- terminal block for sensors and analogue output

Option

Serial interface RS232 / second analogue output



TECHNICAL DATA

Dimensions (mm) w x h x d	205 x 80 x 188
Nominal voltage	230 V
Nominal current	10 A ohmic load
Fuse protection	built-in thermal fuse
Power input	<4,5 VA
Ambient temperature	0...70 °C
Mains switch	all-pole disconnection
Protection standard	IP 30 IP20, pluggable screw terminal blocks
Connections	for wire or leads up to 2.5 mm ²
Safety class	I

Article No.	Price (€)	Delivery code
WRT2000X-230WW010	612,00	A
WRT2000X-230WW0CH	673,00	B

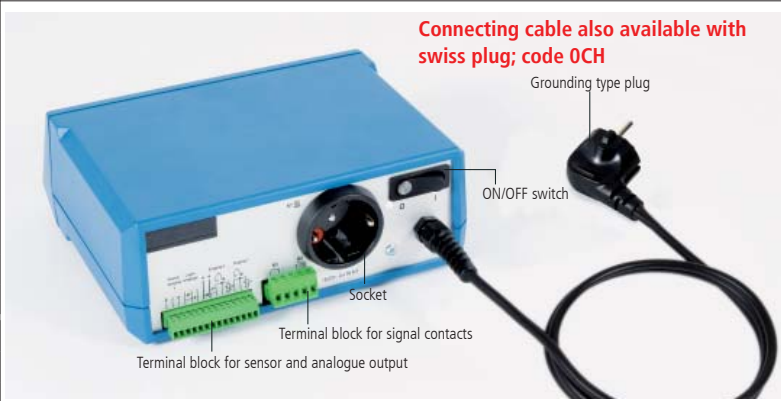


TABLE-TOP CONTROLLER TYPE WRT2010X

- table-top controller made of impact-resistant polystyrene according to DIN 53 453, fire-protection class UL 94 HB
- temperature controller for equipment with multipole coupling and plug

Device features

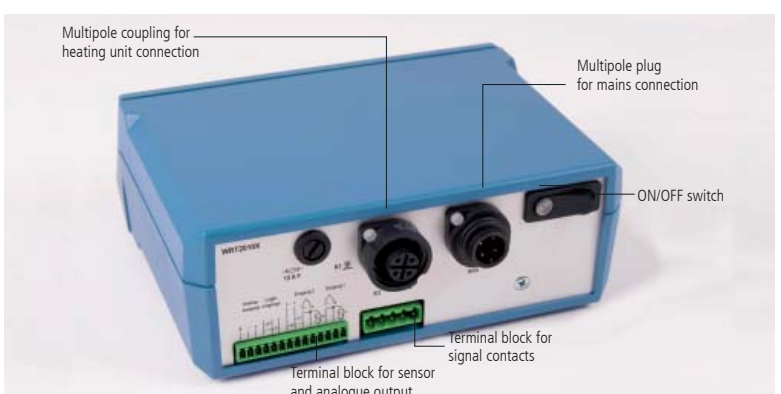
- ON/OFF switch
- connections for multipole coupling and plug
- digital temperature display of actual and setpoint temperature
- integrated start and stop button
- terminal block for signal contacts
- terminal block for sensors and analogue output



TECHNICAL DATA

Dimensions (mm) w x h x d	205 x 80 x 188
Nominal voltage	230 V
Nominal current	10 A ohmic load
Fuse protection	built-in thermal fuse
Power input	<4,5 VA
Ambient temperature	0...70 °C
Mains switch	all-pole disconnection
Protection standard	IP 30 IP20, pluggable screw terminal blocks
Connections	for wire or leads up to 2.5 mm ²
Safety class	I

Article No.	Price (€)	Delivery code
WRT2010X-230WW010	674,00	A



CONTROL & MONITORING – TEMPERATURE SENSORS

General information

Temperature sensors are designed to measure temperatures on the basis of an electronic evaluation system. In order to ensure correct functioning of the electronic system, the temperature sensors must be matched suitably to the specific application.

A number of basic factors need to be observed:

The temperature sensor always measures the temperature at the place where it is installed. Therefore the place of installation must be carefully chosen – with due consideration to the relevant technical requirements – to prevent overheating of the heating device, while maintaining the desired process temperature. As a rule, the temperature should be measured at the most critical point. The sensor must be correctly connected to the control system.


Where there is too great a difference between the operating temperature and the temperature at the hottest measuring point, a temperature controller and a thermal cut-out with separate sensors should be provided for safety reasons.


Pt 100


With a two-wire system, polarity reversal of Pt 100 sensors is not possible. Three-wire and four-wire systems have to be connected in compliance with instructions. In the case of two-wire systems, it should be realized that the line resistance has an impact on the temperature measurement. The line resistance can be measured and the control suitably adjusted.



Thermocouples

Special attention must be paid to avoid polarity reversal since this would create a risk of overheating. For thermocouple extension it is essential to use the correct type of compensating cable.

Pt100		T _{max} = 250°C		T _{max} = 500°C		
						
Sensor length	50 mm	Type	T _{max}	Article No.	Price (€)	Delivery code
Sensor diameter	4 mm	Pt 100 Zweileiter	250 °C	WFMP1250	27,00	A
Cable length	1,8 m	Pt 100 Vierleiter	500 °C	WFMP1500	35,00	A

THERMOCOUPLE ROD SENSOR		T _{max} = 500°C		T _{max} = 1000°C		
						
Sensor length	300 mm	Type	T _{max}	Article No.	Price (€)	Delivery code
Sensor diameter	1,6 mm	Type J (Fe-CuNi)	500 °C	WFSJ1500	72,00	A
Cable length	1,2 m	Type K (NiCr-Ni)	1000 °C	WFSK1999	94,00	A

THERMOCOUPLE TAPE SENSOR		T _{max} = 500°C		T _{max} = 1000°C		
<ul style="list-style-type: none"> with wire end ferrules, ready for connection 						
Sensor length	450 mm	Type	T _{max}	Article No.	Price (€)	Delivery code
Sensor width	16 mm	Type J (Fe-CuNi)	500 °C	WFBJ1500	59,00	A
Cable length	1,2 m	Type K (NiCr-Ni)	1000 °C	WFBK1999	56,00	A

COMPENSATING CABLES		T _{max} = 250°C					
<ul style="list-style-type: none"> PTFE insulated, twisted leads sold by the metre → minimum purchase quantity 10 m 		Type J			Type K		
		Type	T _{max}	Article No.	Price (€/m)	Delivery code	
twisted leads black / white	Type J	Type J (Fe-CuNi)	250 °C	WFBJ1500	5,00	A	
twisted leads green / white	Type K	Type K (NiCr-Ni)	250 °C	WFBK1999	5,00	A	

HEATING TAPES AND HEATING CORDS

Application


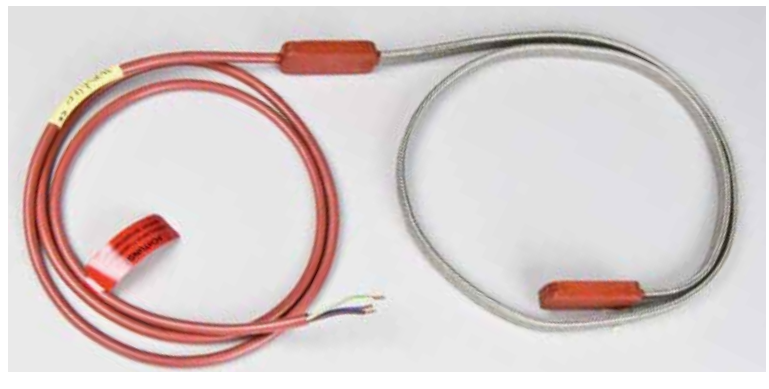
In laboratories and experimental facilities where an easily employed system is desired to heat shapes and parts to high temperatures or where it is important to ensure short heating-up periods.

Advantages

- very high and constant heating power per metre
- high operating temperature
- extremely flexible
- quick and easy installation

Please note:

- the high power (W/m) requires a good heat-transfer contact with the heated object.
- constant W/m heat output independent of pipe or surface temperature.
- to avoid overheating, heating tapes or cords must be laid in such a way that they are not in close contact with each other or overlapping.
- the surface temperature of the (switched on) heating system is always higher than the pipe temperature.
- install a temperature controller to ensure that the specified maximum temperature is not exceeded.

HEATING TAPE WBS00202		$T_{max} = 200^{\circ}C$																			
Structure <ul style="list-style-type: none"> · 4 heat conductors · Silicone-insulated · Outer braiding: tinned copper wire · Factory-terminated, vulcanized mains connection 		 <p>Outer braiding: tinned copper wire silicone insulation heat conductor</p>																			
TECHNICAL DATA <table border="1"> <tr> <td>Heat conductor temperature</td> <td>max. 200 °C</td> </tr> <tr> <td>Heating power</td> <td>50 / 75 / 100 W/m</td> </tr> <tr> <td>Nominal voltage</td> <td>230 VAC</td> </tr> <tr> <td>Power tolerance</td> <td>± 10%</td> </tr> <tr> <td>Heating tape length</td> <td>according to list</td> </tr> <tr> <td>Mains connection</td> <td>terminated ready for connection 1.00 m</td> </tr> <tr> <td>Insulation material</td> <td>silicone rubber with protective conductor braiding moisture resistant</td> </tr> <tr> <td>Construction type</td> <td></td> </tr> <tr> <td>Dimensions</td> <td>12,0 x 6,4 mm</td> </tr> <tr> <td>Min. bending radius</td> <td>> 9 mm</td> </tr> </table>			Heat conductor temperature	max. 200 °C	Heating power	50 / 75 / 100 W/m	Nominal voltage	230 VAC	Power tolerance	± 10%	Heating tape length	according to list	Mains connection	terminated ready for connection 1.00 m	Insulation material	silicone rubber with protective conductor braiding moisture resistant	Construction type		Dimensions	12,0 x 6,4 mm	Min. bending radius
Heat conductor temperature	max. 200 °C																				
Heating power	50 / 75 / 100 W/m																				
Nominal voltage	230 VAC																				
Power tolerance	± 10%																				
Heating tape length	according to list																				
Mains connection	terminated ready for connection 1.00 m																				
Insulation material	silicone rubber with protective conductor braiding moisture resistant																				
Construction type																					
Dimensions	12,0 x 6,4 mm																				
Min. bending radius	> 9 mm																				
																					

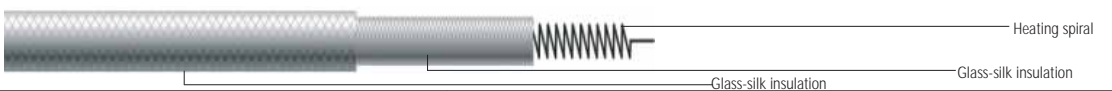
HEATING TAPE WBS00202 (50 W/m)				
Length (m)	Power (W ±10%)	Article No. 230 VAC*	Price (€)	Delivery code
0,9	50	WBS00202-230XX200-00900050	117,00	B
1,8	100	WBS00202-230XX200-01800100	139,00	B
2,7	130	WBS00202-230XX200-02700130	160,00	B
4,0	200	WBS00202-230XX200-04000200	190,00	B
6,3	320	WBS00202-230XX200-06300320	245,00	B
9,5	470	WBS00202-230XX200-09500470	322,00	B
13,5	670	WBS00202-230XX200-13500670	409,00	B
16,0	780	WBS00202-230XX200-16000780	477,00	B

HEATING TAPE WBS00202 (75 W/m)				
Length (m)	Power (W ±10%)	Article No. 230 VAC*	Price (€)	Delivery code
1,1	80	WBS00202-230XX200-01100080	123,00	B
2,2	160	WBS00202-230XX200-02200160	149,00	B
3,1	230	WBS00202-230XX200-03100230	170,00	B
4,6	350	WBS00202-230XX200-04600350	206,00	B
7,3	550	WBS00202-230XX200-07300550	270,00	B
11,0	820	WBS00202-230XX200-11000820	357,00	B
15,5	1160	WBS00202-230XX200-15501160	457,00	B
18,3	1370	WBS00202-230XX200-18301370	531,00	B

HEATING TAPE WBS00202 (100 W/m)				
Length (m)	Power (W ±10%)	Article No. 230 VAC*	Price (€)	Delivery code
0,9	100	WBS00202-230XX200-00900100	117,00	A
1,8	200	WBS00202-230XX200-01800200	139,00	A
2,7	270	WBS00202-230XX200-02700270	160,00	A
4,0	410	WBS00202-230XX200-04000410	190,00	B
6,3	640	WBS00202-230XX200-06300640	245,00	B
9,5	950	WBS00202-230XX200-09500950	322,00	B
13,5	1340	WBS00202-230XX200-13501340	409,00	B
16,0	1570	WBS00202-230XX200-16001570	477,00	B


*115 V on request

HEATING CORD WKG00401 T_{max} = 400°C



Structure

- one heating spiral
- protecting braiding: glass-silk insulation
- outer braiding: flexible glass silk




TECHNICAL DATA

Heat conductor temperature	max. 400 °C	Length (m)	Power (W ±10%)	Article No. 230 VAC*	Price (€)	Delivery code
Heating power	150 W/m					
Nominal voltage	230 VAC*	0,5	75	WKG00401-230XX400-00500075	44,00	B
Power tolerance	± 10%	1,0	150	WKG00401-230XX400-01000150	52,00	B
Heating cord length	according to list	1,5	225	WKG00401-230XX400-01500225	64,00	B
Mains connection	Ready for connection, both ends terminated; length 1.0 m	2,0	300	WKG00401-230XX400-02000300	74,00	B
Insulation material	glas silk	2,5	375	WKG00401-230XX400-02500375	80,00	B
		3,0	450	WKG00401-230XX400-03000450	87,00	B
Construction type	not moisture resistant	4,0	600	WKG00401-230XX400-04000600	100,00	B
Dimensions	Ø ca. 3,5 mm	5,0	750	WKG00401-230XX400-05000750	114,00	B
Min. bending radius	> 5 mm	6,0	900	WKG00401-230XX400-06000900	128,00	B


*115 V on request

HEATING TAPE WBG00402 T_{max} = 400°C



Structure

- two heat conductors arranged in parallel
- glass silk-insulated
- protective braiding: Nickel
- outer braiding: flexible glass silk

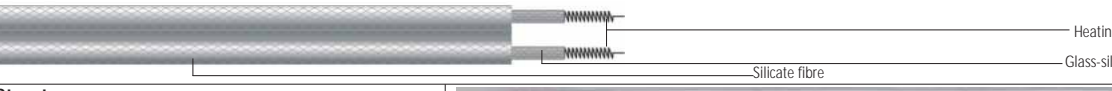


TECHNICAL DATA

Heat conductor temperature	max. 400 °C	Length (m)	Power (W ±10%)	Article No. 230 VAC*	Price (€)	Delivery code
Heating power	250 W/m					
Nominal voltage	230 VAC*	0,5	125	WBG00402-230XX400-00500125	89,00	A
Power tolerance	± 10%	1,0	250	WBG00402-230XX400-01000250	100,00	A
Heating cord length	according to list	1,5	375	WBG00402-230XX400-01500375	113,00	A
Mains connection	ready for connection, length 0.3 m	2,0	500	WBG00402-230XX400-02000500	130,00	A
Insulation material	glas-silk	2,5	625	WBG00402-230XX400-02500625	148,00	A
		3,0	750	WBG00402-230XX400-03000750	177,00	A
Construction type	not moisture resistant	4,0	1000	WBG00402-230XX400-04001000	200,00	A
Dimensions	30 × 5 mm	5,0	1250	WBG00402-230XX400-05001250	252,00	A
Min. bending radius	> 15 mm					A


*115 V on request

HEATING TAPE WBQ00901 T_{max} = 900°C



Structure

- two heating spirals arranged in parallel
- protecting braiding: silicate-fibre insulated
- outer braiding: flexible silicate fibre



TECHNICAL DATA

Heat conductor temperature	max. 900 °C	Length (m)	Power (W ±10%)	Article No. 230 VAC*	Price (€)	Delivery code
Heating power	350 W/m					
Nominal voltage	230 VAC*	0,5	175	WBQ00901-230XX900-00500175	218,00	B
Power tolerance	± 10%	1,0	350	WBQ00901-230XX900-01000350	262,00	B
Heating cord length	according to list	1,5	525	WBQ00901-230XX900-01500525	320,00	B
Mains connection	ready for connection, length 0.3 m	2,0	700	WBQ00901-230XX900-02000700	384,00	B
Insulation material	silicate fibre	2,5	875	WBQ00901-230XX900-02500875	450,00	B
		3,0	1050	WBQ00901-230XX900-03001050	522,00	B
Construction type	not moisture resistant					B
Dimensions	30 × 8 mm					B
Min. bending radius	> 15 mm					B

*115 V on request

SAFETY

By purchasing a PILZ® heating mantle you have chosen a good and safe product. The materials employed are designed to suit the type of application and undergo constant quality control inspections at our works. In order to ensure safe and trouble-free operation of the PILZ® heating mantle over a long period, you should observe the rules and conditions set out in the operating instructions supplied with the heating mantle.

The operating instructions are an important part of the device and must be made available to the user. They contain information for the safe, correct and economic operation of PILZ® heating mantles. Compliance with the operating instructions will help you to avoid dangers and increase the reliability and service life of the PILZ® heating mantle. The operating instructions must always be at hand; the user must have read and understood these instructions before putting a PILZ® heating mantle into operation. The proper and intended use of PILZ® heating mantles is explained and described in detail in the operating instructions. Warning and information symbols marked in colour complement the safety instructions for PILZ® heating mantles. Especially the important safety instructions on page 2 of the operating instructions must be understood and complied with for operating the device.

Even when all the safety rules and instructions are observed, the operation of PILZ® heating mantles still carries a residual risk. Anyone working with PILZ® heating mantles must know these residual risks. You need to follow the instructions and safety rules which prevent these residuals risk leading to injury or damage.



The operation of a PILZ® heating mantle must always be monitored or corresponding safety measures have to be put in place to ensure that the PILZ® heating mantle cannot pose a danger to persons or the environment.

In view of the fact that PILZ® heating mantles are designed for high operating temperatures and could suffer damage during uncontrolled operation, it will be necessary to employ suitable temperature controllers or power selectors. PILZ® heating mantles possess a certain flexibility and are available as crocheted versions made of high quality materials; these crocheted versions are not moisture resistant for constructional reasons.

In accordance with the relevant European Directives and national standards and regulations it must be ensured that no dangerous touch voltage, which could harm the user or endanger property, can arise on the electrical equipment during the proper and intended use of the electrical equipment and likewise during a first fault condition. Since the proper and intended use of a heating mantle cannot fully exclude breakage of a vessel or overflowing of liquids (foreseeable fault condition), technical measures must be in place to provide the user of the heating mantle with suitable protection against the risk of injury or other damage. Here, the danger of indirect contact plays a significant role.

Safety principle:

Merely displaying warnings on the heating mantle or including warnings in the operating instructions as a preventive measure against obvious risks is contrary to the general principles of safety engineering according to which safety must first and primarily be ensured by constructional and technical measures (state of the art). Only when all constructional and technical measures have been exhausted, will information-based safety measures be required and considered adequate (warning or indicating labels) to prevent any still existing residual risks. Transferring the residual risk to the user without first exhausting the technically possible safety measures is not allowed.



Heating mantles fitted only with a grounding type plug without a residual current device (RCD) do not meet the valid safety standards and, in the event of a fault, do not guarantee the necessary protection in accordance with Low Voltage Directive 2006/95/EC and the valid standards and regulations. Heating mantles can also be employed outside laboratories or similar facilities, where compliance with Directives and safety standards cannot be guaranteed. Here, there is a potential foreseeable risk of dangerous touch voltage arising on conductive parts in the event of a fault (overflowing, flask breakage, defective insulation, etc.).

For this reason all PILZ® heating mantles are supplied with a built-in residual current device (30 mA) in the power cable. In the event of a fault, this device will disconnect the PILZ® heating mantle from the mains supply before a dangerous electric current flow could set in (I_r – fault current). The device also enables the monitoring of other electrical faults (defects or breaks in the insulation), which will likewise lead to the PILZ® heating mantle being disconnected.



Tripping of the residual current device indicates a defect of or damage to the PILZ® heating mantle, which must then be given immediately to a qualified electrician for checking. The PILZ® heating mantle may only be put back into operation when the fault has been remedied.

The protective system also functions when PILZ® heating mantles are used in combination with corresponding accessories, such as controllers and power selectors. With this solution our customers can feel assured that PILZ® heating mantles do not pose a danger to persons or property provided the devices are operated in accordance with their proper and intended use (see operating instructions).

Inspections according to BGV A3 and VDE 0702 – periodic inspections

The inspection of operational equipment as well as of plant requiring supervision, or plant subject to obligatory supervision, is legally regulated by the new operational safety ordinance (BetrSichV) of 02.10.2002. This also lays down that persons carrying out inspections must have an appropriate training and further qualification. The BGV A3 accident prevention regulations (formerly VBG 4) of the employers' liability insurance association in the sectors of precision mechanics and electrical engineering provide instructions and detailed rules for the inspection of electrical plant and equipment.

Electrical plant and equipment must be inspected before being put into service and thereafter re-inspected at regular intervals. For portable equipment (heating mantles) an inspection period of 6 months is considered to be a guide and maximum value. If several inspections result in an error rate of < 2%, the inspection interval can be correspondingly extended (maximal 1 year).

DIN VDE 0701-0702:07-2008 (inspection after repair, modification of electrical appliances, periodic inspection of electrical appliances – general requirements for electrical safety) contains rules and information for carrying out the inspections and specifies limit values which need to be met for re-inspections.

Apart from a visual inspection, the scope comprises checking the effectiveness of the protective measure against electric shock and, after successful inspection, a corresponding functional test. The residual current device (RCD) must also be included in this inspection. For further information about the correct inspection of the residual current device see the accompanying operating instructions and the relevant regulations and standards.

GENERAL TERMS & CONDITIONS

1. Conditions and ancillary agreements

1.1 Unless agreed otherwise by separate contract, orders placed with Company Winkler shall be accepted and carried out according to the following conditions. This shall also apply to all follow-up orders where this is not expressly stated. At the time of order placement, the Customer shall accept these conditions as legally binding. Delivery by Company Winkler shall not constitute agreement with the Customer's different conditions.

1.2 Deviations, modifications or additions of the following conditions of contract shall require Company Winkler's written confirmation to become effective.

2. Formation and subject matter of contracts

2.1 Sales offers by Company Winkler are always subject to confirmation. A contract shall only be concluded upon Company Winkler's written acknowledgement of order. Company Winkler's scope of performance shall be based exclusively on the contents of the written acknowledgement of order.

2.2 Orders shall be executed on the basis of specifications, models, plans, drawings, pictures or other documents from Company Winkler. The latter reserves the right of ownership of all sales documents and the corresponding rights of exploitation protected by copyright. These items may not be reproduced nor made available to third parties without Company Winkler's consent. If an order is not placed, the items shall be returned to Company Winkler at its domicile (even if not specifically requested to do so).

2.3 If products are modified after contract conclusion, due to further product development, Company Winkler shall be allowed to supply a technically changed design provided the interests of both parties are taken into account and Customer can reasonably be expected to accept the change. This applies likewise to products forming part of a total order of high-volume goods.

2.4 Unless Company Winkler has agreed by separate contract to observe specific dimensions and special tolerances, deviations customary in the trade or permissible under DIN shall apply.

2.5 If the performance rendered is based on drawings or samples supplied by the Customer, the latter shall be responsible for ensuring that the protective rights of third parties are not infringed and that Company Winkler shall be exempted from claims by third parties in the event of infringement or damage.

2.6 Company Winkler shall be entitled to performance by successive instalments for which appropriate part payment may be requested.

3. Delivery time

3.1 The delivery date can only be observed if all the documents, permits and information to be provided by the Purchaser, and required for order processing, are received in time. In this context, the Purchaser shall fulfil all the remaining contractual obligations, in particular payment of amounts due, also with respect to previous deliveries.

3.2 The agreed delivery time shall begin when all the conditions mentioned in the previous paragraph have been met.

3.3 The delivery time shall be interrupted when the completion or delivery of the product is delayed due to circumstances for which the Purchaser is responsible or due to other unforeseen obstacles, in particular force majeure.

3.4 Delivery shall have been effected on time if the goods are dispatched before the delivery deadline or if the Purchaser has been notified that the goods are ready to be collected.

4. Delayed delivery and impossibility of performance

4.1 If performance of contract becomes impossible for Company Winkler or if Company Winkler's performance is delayed, the Customer may withdraw from the contract in accordance with the legal regulations or claim damages. The claim for damages shall be restricted to maximal 5 % of the net value of the relevant delivery.

5. Customer's duty to examine the goods, duty to give notice of defects, and duty to take delivery

5.1 At the time of acceptance of the freight, the Customer shall examine whether there is any noticeable damage or loss. Where such damage is found, the Customer shall request the carrier to take down the facts. Furthermore, the Customer shall notify Company Winkler immediately.

5.2 Other apparent causes for complaint shall be communicated to Company Winkler in writing within one week after receipt of the goods/subject of the contract. If notice of defects is not given in time, the delivery shall be considered to be free from defects.

5.3 The Customer shall also take delivery, without prejudice to his rights, if the goods show acceptable differences which do not prevent the use of the objects supplied or of individual parts thereof.

5.4 For business persons, the regulations of §§ 377 ff. HGB (German Commercial Code) shall primarily apply.

6. Liability for defects and rejection of other warranty claims and claims for damages

6.1 If defects become apparent within 6 months of delivery and if these defects were verifiably in existence at the time of the passage of risk, they shall be remedied free of charge or, at Company Winkler's option, removed by a substitute delivery (opportunity to cure). Replaced parts shall become the property of Company Winkler. Company Winkler shall not be liable for any defects and consequences due to natural wear and tear, incorrect handling, interference by the Customer or third parties, as well as chemical, electrical or other influences.

6.2 When a defect has been noticed, Company Winkler shall be notified in writing immediately. The Customer shall grant Company Winkler adequate time and opportunity to remedy the defect, otherwise Company Winkler shall be discharged of any further liability in connection with the defects. Company Winkler shall be entitled to arrange for remedy of defects by a third party. In so far as the expenditure for the remedy of defects is increased as a result of moving the subject of the contract after delivery/acceptance to a place other than the residence or the business location of the purchaser, the Customer shall bear these costs, unless the transport corresponds to the intended use of the subject of the contract.

6.3 Remedy of defects and replacement parts are covered by Company Winkler's warranty to the same extent as the original delivery item.

6.4 In the case of production according to the Customer's drawings, Company Winkler's liability for defects shall be restricted to construction in conformity with the design; in the case of design work commissioned by the Customer, it shall be restricted to the product corresponding to the state of the art. Company Winkler shall not be liable for defects resulting from any faulty design/drawing/etc. by the Customer.

7. Statutory limitation in time

7.1 Claims arising from the liability for defects shall be statute-barred as from 6 months after the date of delivery/acceptance. Claims for damages due to defects and consequences thereof shall be statute-barred after the same period. Other claims shall become statute-barred within 24 months as from the passage of risk.

7.2 Consumer contracts are governed by the relevant legal regulations.

8. Prices and terms of payment

8.1 Prices shall apply as from the place of dispatch, excluding freight, packaging, insurance and other incidental expenses which the Customer shall bear even if they are not specifically itemized.

8.2 Value-added tax to the legally required amount shall be shown separately on the invoice and shall be payable by the Customer.

8.3 Orders with an agreed delivery time of more than 4 months shall be calculated on the basis of the list prices valid on the delivery day, unless fixed prices have been expressly agreed.

8.4 Payment shall be in cash, by bank transfer or cheque free of Company Winkler's place of payment. Payment shall be effected as soon as the amount is finally at Company Winkler's disposal.

8.5 Payment shall be due within 30 days after date of invoice. For payments within 10 days after date of invoice a cash discount of 2 % of the invoiced value of the goods shall be granted. The cash discount shall not be applicable if the payment does not include the full settlement, without deductions, of all other amounts due from previous deliveries.

8.6 In the case of default in payment, Company Winkler may, without special demand for payment, charge interest on arrears amounting to 8 % above the relevant base interest rate; Company Winkler reserves the right to prove and claim greater damage.

9. Reservation of ownership

9.1 The Seller shall retain ownership of the goods delivered until the price has been fully paid and until further claims arising from the existing business relationship with the Purchaser have been met.

9.2 The Purchaser shall only be entitled to resell the goods or connect them with other movable goods within the scope of his regular business operations. It is his duty to ensure that the Seller's reservation of ownership is maintained where possible. Furthermore, the Purchaser shall already at the present time assign to the Seller the full amount of the purchase price of the possibly processed item due from his own buyers, up to a maximum of 120 % of the Seller's receivables. The Seller shall accept this assignment. The Purchaser shall inform the Seller of the identity of his own buyer.

9.3 The authority to collect shall remain with the Purchaser subject to cancellation. Any amounts collected shall be passed on by him immediately to the Seller. At the request of the Seller, the Purchaser shall be obliged to inform his own buyer about the assignment and to supply the Seller with all documents and information required by the latter to assert his rights.

9.4 If on the basis of the connection of the conditional commodity with other movable goods the Purchaser acquires sole ownership by act of law, he shall be obliged to grant co-ownership to the Seller amounting to a proportion corresponding to the value of the conditional commodity. With the production of the new object, agreement on the transfer of co-ownership shall be regarded as reached. Instead of a handover, the Purchaser shall hold the new object in joint possession within the framework of a custody agreement in favour of the Seller.

9.5 The assertion of reservation of ownership rights shall not be regarded as withdrawal from the contract.

10. Tools and special equipment

10.1 Any tools and special equipment made by us shall remain our property even if the total or partial costs are set out separately on the invoice.

10.2 In the case of tools made available to us by the Purchaser for the purpose of carrying out an order, we shall be liable according to the rules for gratuitous safekeeping. Provided no parts have been produced herewith for a period of 5 years, we shall have the right to scrap these tools.

11. Liability for customer's material

11.1 If material supplied by the Purchaser for the purpose of treatment and processing is damaged or rendered unusable during treatment or processing, we shall only be liable if the damage is due to gross negligence, but only to the amount of 10% of the manufacturing value.

11.2 Any material from customers stored on our premises shall be insured by us at our expense against burglary, robbery and fire; in the event of such damage we shall make over our insurance claims to the owner of the material with the effect of discharging the debt, if requested by him to do so. Beyond this we are liable for damage to and loss of such materials according to the rules for gratuitous safekeeping.

12. Place of jurisdiction and applicable law

12.1 If the Purchaser is a registered business person, a legal person under public law, or a special fund under public law, place of jurisdiction for all disputes shall be Heidelberg, Germany. Only the original German version of these Terms & Conditions shall be valid in law. The Seller additionally reserves the right to institute legal proceedings at the Purchaser's general place of jurisdiction.

12.2 Subsidiarity clause Should any of the provisions of the above General Terms & Conditions be or become invalid, the other provisions shall not be affected thereby. The parties to the contract have a mutual obligation to replace any invalid or impracticable provision by another provision that is as close as possible to the intended purpose and economic meaning of the provision to be discarded.

12.3 Applicable shall be the law of the Federal Republic of Germany excluding the Haager Einheitliche Kaufgesetze (Hague uniform purchase laws).

Credit cards accepted



Winkler GmbH is an independent, medium-sized company located in Heidelberg (Germany). For more than 30 years we have been developing and manufacturing a broad range of electric heating solutions for industry and laboratory applications.

We supply reliable and durable products made of high-quality materials.

We are the right partner for innovative and quick answers to your requirements. Customized solutions and flexible manufacturing are our particular strengths. Our experienced specialists will offer you sound advice and - together with you - develop the heating solution tailored to your application.

Winkler - Your heating solution!



Our headquarter



Our site in Walldorf

Winkler GmbH
Englerstrasse 24
D-69126 Heidelberg
Germany

Tel. +49-6221-3646-0
Fax +49-6221-3646-40
E-Mail: sales@winkler.eu
www.winkler.eu



Your contact:

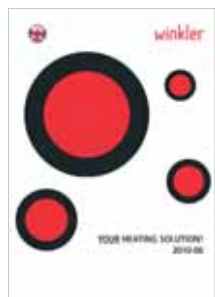
Franz-Josef Sauerborn
Product-Manager Laboratory Heating Mantles and Heatin Jackets

Tel: +49-6221-3646-23
Fax: +49-6221-3646-40

f.sauerborn@winkler.eu



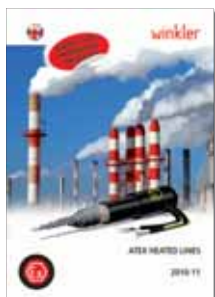
Our product range



Company presentation



Heated lines & heated hoses



Atex Heated lines



Heated wall bushings



Heated hoses



Heated hoses for Pharma and Food



Heating jackets



Silicone heaters & heating foils



Laboratory heaters



Drum and IBC heaters



Heating Solutions for Rail Applications

Agencies

AUSTRIA

Ing. Wolfgang Stipanitz, A-4060 Leonding
Tel. +43-732-770177
Fax +43-732-770177-7
E-Mail: sales@winkler-austria.com

FRANCE

André Weinzaepflen, F-75016 Paris
Tel. +33-1-46041590
Fax +33-1-46041590
E-Mail: commercial@winkler-france.com

BENELUX

KSR H&H Measurement BV, NL-5133 NE Riel
Tel. +31-13-5339688
Fax +31-13-5331962
E-Mail: sales@winkler-benelux.com