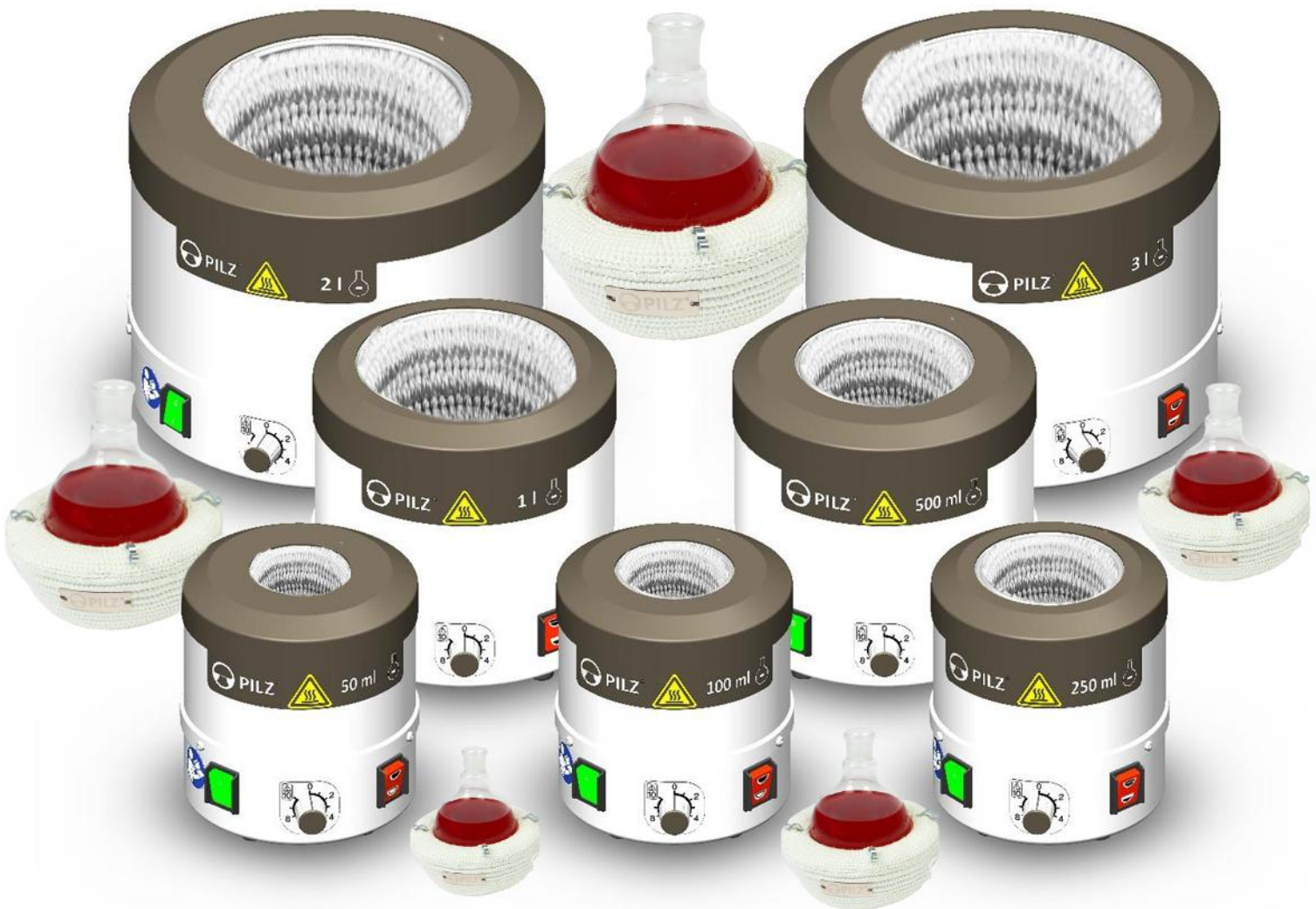




winkler

Operation Manual

 PILZ® Laboratory Heating Mantles



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Safety instructions



Please take a little time and read through these operating instructions carefully. We would like to provide you with important information on the safe use of PILZ® laboratory heating mantles. This applies above all to your own protection in the event of an unexpected reaction in the course of heating liquids, overflowing or a malfunction.

The type plate informs you about the technical data and connected loads of the device. Store these operating instructions within easy reach near the place of use. Please also observe the guidelines for ensuring occupational safety as well as those issued by the employers' liability insurance associations (i.e. TRGS526 Technical Regulations for Hazardous Substances Laboratories).

Include these notes as part of work instructions in your quality management manual.

Also treat them as operating instructions according to TRGS526 section 4.2.

Warning labels on the product must not be removed!

The PILZ® laboratory heating mantle is electrical equipment.

Maintenance is the responsibility of a qualified electrician, or a person trained in electrical engineering.

In addition, PILZ® laboratory heating mantles are supplied with a residual current circuit breaker (RCD) connection cable. If an electrician removes the residual current circuit breaker, the electrician must ensure that the mains supply line is protected by a residual current circuit breaker or use the supplied WHZA1000 connection cable with RCD.



If an electrical fault occurs, it safely disconnects the laboratory heating hood from the operating voltage and prevents personal injury.

Before commissioning and at regular intervals, the residual current circuit breaker must be checked for proper functioning (for a function test of the residual current circuit breaker connection plug WHZA1000, see page 16).



Moisture protection of the laboratory heating mantle

When using the PILZ® heating mantle, the use of a residual current circuit breaker in accordance with the standards and regulations is mandatory. If electrically conductive liquid penetrates the heating element and it becomes soaked, the residual current circuit breaker integrated in the power supply line or connection plug switches reliably and permanently voltage-free (switching threshold: residual current >30 mA [DIN EN 61008-1]). If this occurs, the laboratory heating mantle must be disconnected from the mains immediately by pulling the connection plug out of the protective contact socket.

**The PILZ® Protect Line laboratory heating mantle is additionally equipped with a heating element with metallic sheathing as a protective conductor. The design guarantees the operating mode of protection class I for the PILZ® laboratory heating mantle and triggers the residual current circuit breaker more quickly.

The PILZ® laboratory heating mantle must not be operated after the circuit breaker has been triggered! Carry out a function and safety check before operation.

The soaked/electrically faulty PILZ® laboratory heating mantle must be marked as "blocked" and placed into blocked storage. The PILZ® laboratory heating mantle must be stored in a dry cabinet, i.e. for drying. The laboratory heating mantle must be checked against moisture before being put back into operation. It must not be put into operation until it has been approved by the responsible electrician or electrically instructed person.

The PILZ® laboratory heating mantle must also be taken out of operation if,

- Protect Line Series; the protective conductor (braiding) of the heating element is damaged.
- wire connection lines show visible damage (i.e. cuts, abrasion, brittle and cracked sheathing).
- loose plugs and cable connections can be detected.
- visible heating cable wire in the interior (mechanical damage).
- brittle or damaged woven fabric (overheating of the woven fabric).

A qualified electrician or person trained in electrical engineering decides on possible repair or disposal.



Prevent overheating!

To always ensure safe operation of the PILZ® device heating mantle, overheating must be avoided. This can be achieved, for example, by using a temperature controller. Also, in the case of devices with heating zone switches, should operate in the heating mode for which a liquid level can be detected in the glass bulb. In the case of heating mantles with power selection, the heating reaction of the liquid and the filling level must be observed to avoid overheating!

For products with multiple heating zones, as the liquid level drops, the heating zones that are not necessary must be switched off.



PILZ® laboratory heating mantles must not be operated with empty, encrusted or completely without glass flasks.



Do not touch the PILZ® heating mantle when it is switched on or ready for operation.

Do not touch the heating surface with metal or electrically conductive objects.

Do not use metal flasks, vessels with metal parts or electrically conductive materials in the heating surface area. Do not insert needles or similar into the PILZ® heating mantle, as this may damage heating coils or other electrical conductors and/or their protective devices. Electrical shocks with serious injuries may result.

The PILZ® heating mantle contains a heating element in the interior. This heating element must not be touched when the PILZ® heated mantle is switched on or still hot. The upper edge of the PILZ® heated mantle and the fastening hooks can reach high temperatures. There is a risk of injury from burns.



PILZ® laboratory heating mantles are not approved for use in potentially explosive atmospheres!

These must not be used for heating processes where danger may arise from explosive media or explosive gas-air mixtures.

Note that fire can also occur with flammable liquids in the event of flask breakage, overfilling and spillage.

1 General / commissioning

These operating instructions for PILZ® laboratory heating mantles provide important information on handling, maintenance, and testing. Observance of these instructions will always ensure the operational safety of your PILZ® laboratory heating mantle and protect the user and company from hazards.

The development and manufacturing of WINKLER products is based on international guidelines (i.e. EN, ISO, VDE). Each device is subject to a documented individual test before delivery.

WINKLER AG follows its resolution of sustainable use of components and materials as well as the conservation of resources in the development and production. The modular product concept opens the possibility of repairing a device in the event of damage, thus conserving ecological resources and minimizing operating costs.

The heating mantle generates operating temperatures of up to 450°C. The heating element can reach much higher temperatures! The design and shaping of the woven heating mantle provides optimized heat transfer from the heating element to the medium.

The provided WHZA1000 residual current circuit breaker cable complies with the requirements of DIN VDE 0620-1:2019 and features a double protective contact (male/female).

2 Intended operation of PILZ® laboratory heating mantles

The design enables heating of liquid/solid substances in electrically insulating glass vessels (flasks). Due to the thermal dynamics of heating media, the heating element becomes warmer than the medium in the flask. PILZ® laboratory heating mantles should be set up with sufficient distance from other equipment on all sides so as not to obstruct the radiation of heat. This reliably prevents overheating.

When setting up your PILZ® laboratory heating mantle, make sure that it is placed on a level and solid surface that provides comprehensive support for the device.

The power supply for the PILZ® laboratory heating mantle must be able to be switched off at any time from a safe distance, i.e. by means of an emergency switch (disconnect all poles if danger becomes apparent).

Knowledge of the physical behavior of the medium to be heated, the reaction to the heat supply, possible chemical reactions and the maximum permissible operating temperature on safety data sheets is required for operation. The safety instructions given there must be observed.

The laboratory heating mantles are only suitable for use with glass round-bottomed flasks. If the flask containing the medium to be heated breaks, direct contact between the two may occur. The same can also happen if liquefied media foam over (boil over) or spillage occurs.

The volume and design must correspond to the shape of the receptacle in the PILZ® laboratory heating mantle (see overview table, page 7 and following).

Attention must be paid to the fit of glass flask in contact with the heating mantle. Gaps between the two reduce the effectiveness of heat transfer.

Accessory devices and holders must be checked for suitability before installation and/or commissioning. Above all, electrical connection values, power as well as nominal voltage and the temperature sensor characteristics in connection with the installed thermocouple.

Operation is only permitted with perfectly clean and filled round-bottom flasks. Inspection sticker (DGUV V3) for electrical equipment inspection must be up to date.

Decisive for the safety of the users, as well as the operation within the working environment, is the knowledge and observance of the guidelines for the operation of devices within the working area/laboratory. Furthermore, the rules and regulations of the DGUV as well as the knowledge of substances and reaction patterns that must be observed in connection with handling.

Depending on the area of application, regional or company-specific guidelines may be added to extend the range of requirements.

For more information: Ask our experts (see Contact).

Design details/operating elements of the PILZ® Protect Line laboratory heating mantle with housing
 The scope of controls varies depending on the type and equipment.



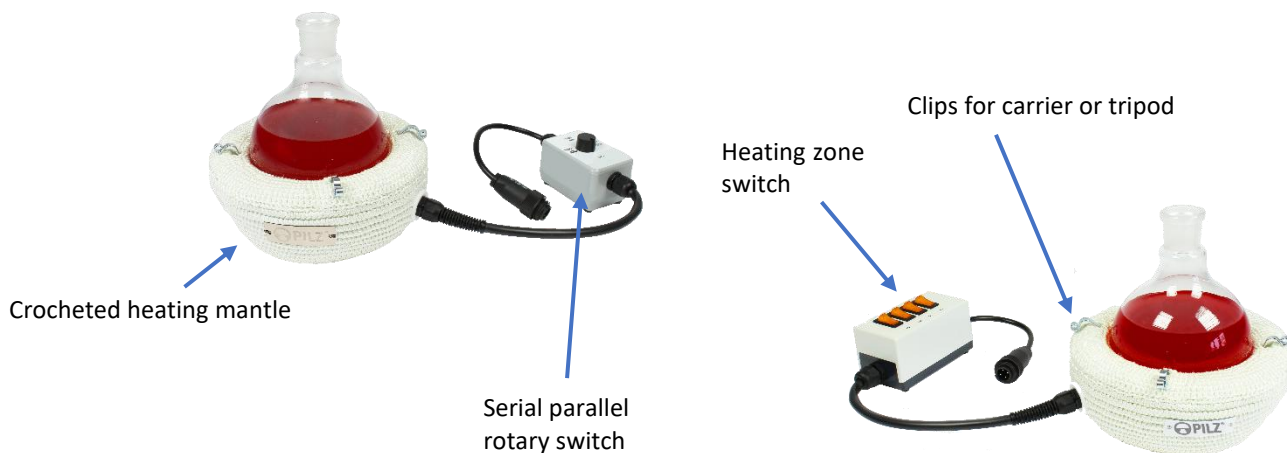
Label and warning sign examples:

PILZ® Protect Line WHLP... Laboratory heating mantles

PILZ® Classic Line Laboratory heating mantles



Construction details/operating elements of the PILZ® Classic Line WHG laboratory heating mantle
 The scope of controls varies depending on the type and equipment.



3 Commissioning of the PILZ® laboratory heating mantle

Before commissioning, check:

1. Do your order details match the nameplate?
2. Is the PILZ® laboratory heating mantle suitable for your application according to your technical specifications (type plate, description)?
3. Have measures been taken against excessively high temperatures?
4. Does your PILZ® laboratory heating mantle have a safe location?
5. Is it ensured that you can quickly disconnect the PILZ® laboratory heating mantle from the mains power supply in case of danger?
6. Is the flask or vessel cleaned and in technically perfect condition? Notes in section 2.

4 Types of PILZ® Laboratory Heating Mantles

PILZ® Protect Line heating mantle with housing

Features:

- protection class I
- illuminated power and heating zone selection switch
- heating element with a metallic braiding
- additional personal protection
- triggers the residual current circuit breaker more quickly when spillage or overflowing of liquid occurs
- for volumes up to 3,000 ml
- blind rivet nuts on the back for mounting rod clamping holder



Series	Included					Accessory power selector		
	Flask volume	Heating zone(s)	Zone switch	Power selector	Power stages	Power selector WRT00117	Power selector- WRT0016	Power stages
WHLP WHLPTC	50 and 100 ml	1			100%*) 50%*)		or	= 0-100%*) 0-50%*)
WHL P2ER		1			0-100%*) 0-50%*)			
WHLP WHL P2TC	250 to 3,000 ml	2			100%*) 50%*)		or	= 0-100%*) 0-50%*)
WHL P2ER		2			0-100%*) 0-50%*)			

*) related to nominal power

PILZ® Classic Line heating mantle with housing

Features:

- illuminated power and heating zone selection switch
- basic low cost version
- protection class II for robust operation
- for volumes up to 20,000 ml
- blind rivet nuts on the back for mounting rod clamping holder
- WHLSG2ER includes additional metal bowl on top of the crocheted heating mantle



Series	Flask volume	Included				Accessory power selector		
		Heating zone(s)	Zone switch	Power selector	Power stages	Power selector WRT00117	Power selector- WRT0016	Power stages
WHLG2	50 ml	1			100%*) 50%*)		or	= 0-100%*) 0-50%*)
WHLP2ER		1			0-100%*) 0-50%*)			
WHLG2	100 to 20,000 ml	2			100%*) 50%*)		or	= 0-100%*) 0-50%*)
WHLG2ER WHLSG2ER		2			0-100%*) 0-50%*)			

**) related to nominal power*

PILZ® heating mantles with housing and multi-place heaters

Features:

- illuminated power and heating zone selection switch
- basic low-cost version
- protection class II for robust operation
- for volumes up to 20,000 ml
- blind rivet nuts on the back for mounting rod clamping holder

Included						
Series	Flask volume	Heating zone(s)	Zone switch 1	Zone switch 2	Power selector	Power stages
WHLMG3ER	50 to 250 ml 250 to 1.000 ml 1,000 bis 3,000 ml	3				100%*) 50%*)
WHU2ER	4,000 bis 20,000 ml	2				0-100%*) 0-50%*)
WHRE4	100 ml 250 ml 500 ml	1				0-100%*)
WHRE6	1,000 ml					

*) related to nominal power



PILZ® Classic Line hand crocheted heating mantle

Features:

- heating zone selector
- basic low cost version
- hand crocheted outer jacket
- for volumes up to 20,000 ml



Included					Accessory power selector		
Series	Flask volume	Heating zone(s)	Zoner selector	Power stages	Power selector WRT00117	Power selector WRT0016	Power stages
WHG2	25 to 50 ml	1		50%*) 100%*)		or	= 0-100%*) 0-50%*)
WHG2	100 to 20,000 ml	2		25%*) 50%*) 100%*)		or	= 0-25%*) 0-50%*) 0-100%*)
WHG2H	250 to 6,000 ml	1					
WHG4R	4,000 to 20,000 ml	1 + 2 1 - 3 1 - 4		0-100%*) 0-50%*)		or	= 0-25%*) 0-50%*) 0-75%*) 0-100%*)

*) related to nominal power

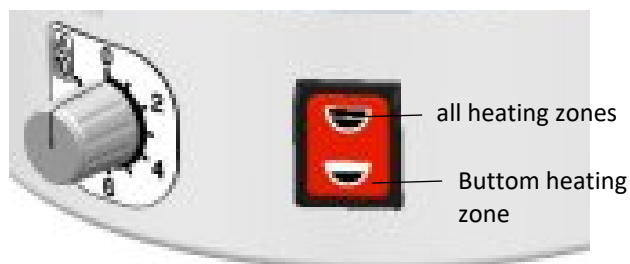
WHLG2; WHLG2ER	WHG2; WHG2H	WHLG2; WHLG2ER; WHLSG2; WHU2; WHU2ER	WHLMG3ER	WHG4R
Number of heating zones				
1 	2 	2 	3 	4
Circuit breaker and min-max switch	Series parallel rotary switch	Min-max-switch	Step switch	Heating zone switch
Power Stage				
0 50% 100%	0 25% 50% 100%	0 50% 100%	0 33% 66% 100%	0 25% 50% 75% 100%

5 Operating elements of the PILZ® laboratory heating mantles

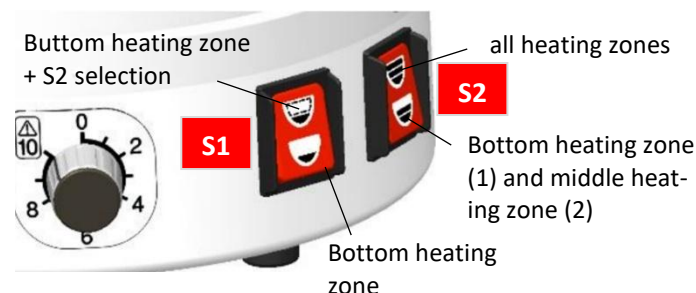
All PILZ® laboratory heating mantles of the WHLP series have an illuminated mains switch, illuminated heating zone switch and a robust, powder-coated housing.

Further device variants are laboratory heating mantles with integrated power controller or with thermocouple.

1 and 2 heating zone selection



WHLMG3ER heating zone selection



The range of PILZ® laboratory heating mantles WHLP offers three designs each 50 ml ... 3 l.

WHLP product series

Basic version of the PILZ® laboratory heating mantle. Illuminated heating zone switch.

For adjusting the supplied power, it can be combined with an electronic temperature controller (T500 or T700) or the power controller WRT00116 or WRT00117. Short, fast heating and/or in combination with an external power controller/temperature controller medium and long-term adjusting of the supplied heat in coordination with the behavior of the medium and desired reaction.

	Volume	Flask	Power	Heating	Dimensions	Description
	ml	Ø mm	W	zones	Ø x H mm	230 VAC (others available)
	50	51	60	1	160 x 180	WHLP2XXX-230XX450-000050DE
	100	64	90	1	160 x 180	WHLP2XXX-230XX450-000100DE
	250	85	150	2	160 x 180	WHLP2XXX-230XX450-000250DE
	500	105	200	2	205 x 195	WHLP2XXX-230XX450-000500DE
	1,000	131	300	2	205 x 195	WHLP2XXX-230XX450-001000DE
	2,000	166	500	2	280 x 215	WHLP2XXX-230XX450-002000DE
	3,000	185	600	2	280 x 215	WHLP2XXX-230XX450-003000DE


Note on the WHLPXX product series: For the 50 and 100 ml sizes, the red switch is used to halve the heating power over the entire surface of the glass bulb holder. For volumes >100 ml, two heating zones (half/full) can be switched.

All power specifications correspond to the respective nominal power +/- 10%.

WHLP2ER product series

PILZ® laboratory heating mantle with additional continuously adjustable power controller, which enables the heating power to heat the medium for rapid heating or continuous temperature maintenance. The heat supply can be influenced depending on the filling level in the glass flask by means of a heating zone switch (illuminated switch). When operating


with a laboratory temperature controller, the power controller must be set to the highest power (level 10).

	Volume ml	Flask Ø mm	Power W	Heating zones	Dimension Ø x H mm	Description 230 VAC (others available)
	50	51	60	1	160 x 180	WHLP2ERX-230XX450-000050DE
100	64	90	1	160 x 180	WHLP2ERX-230XX450-000100DE	
250	85	150	2	160 x 180	WHLP2ERX-230XX450-000250DE	
500	105	200	2	205 x 195	WHLP2ERX-230XX450-000500DE	
1,000	131	300	2	205 x 195	WHLP2ERX-230XX450-001000DE	
2,000	166	500	2	280 x 215	WHLP2ERX-230XX450-002000DE	
3,000	185	600	2	280 x 215	WHLP2ERX-230XX450-003000DE	

All power specifications correspond to the respective nominal power +/- 10%.

WHLP2TC product series

PILZ® laboratory heating mantle with integrated thermocouple type "K" in the lower heating zone and illuminated heating zone switch. The thermocouple has a ready-to-connect miniature plug (DIN) and can be connected to the laboratory electronic controller. In this way, the temperature of the medium can be controlled specifically.

	Volume ml	Flask Ø mm	Power W	Heating zones	Dimension Ø x H mm	Description 230 VAC (others available)
	50	51	60	1	160 x 180	WHLP2TCX-230XX450-000050DE
100	64	90	1	160 x 180	WHLP2TCX-230XX450-000100DE	
250	85	150	2	160 x 180	WHLP2TCX-230XX450-000250DE	
500	105	200	2	205 x 195	WHLP2TCX-230XX450-000500DE	
1,000	131	300	2	205 x 195	WHLP2TCX-230XX450-001000DE	
2,000	166	500	2	280 x 215	WHLP2TCX-230XX450-002000DE	
3,000	185	600	2	280 x 215	WHLP2TCX-230XX450-003000DE	


All power specifications correspond to the respective nominal power +/- 10%.


The program of PILZ® laboratory heating mantles WHL and WHU offers designs 50 ml to 20 l.

WHLG2 product series

Basic version of the PILZ® laboratory heating mantle. Power stage switching (illuminated switch).

For adjusting the supplied power, it can be combined with an electronic temperature controller (T500 or T700) or the power controller WRT00116 or WRT00117. Short, fast heating and/or in combination with an external power controller/temperature controller medium and long-term adjusting the supplied power of the supplied heat in coordination with the behavior of the medium and desired reaction.

 Winkler	Volume ml	Flask Ø mm	Power W	Heating zones	Dimension Ø x H mm	Description (Winkler/Mohr) 230 VAC (others available)
	50	51	50	1	160 x 185	WHLG2XXX-230XX450-000050DE WMO-LG1-50
100	64	100	2	160 x 185	WHLG2XXX-230XX450-000100DE WMO-LG2-100	
250	85	150	2	160 x 185	WHLG2XXX-230XX450-000250DE WMO-LG2-250	
500	105	200	2	205 x 205	WHLG2XXX-230XX450-000500DE WMO-LG2-500	
1,000	131	300	2	205 x 205	WHLG2XXX-230XX450-001000DE WMO-LG2-1000	
2,000	166	500	2	280 x 230	WHLG2XXX-230XX450-002000DE WMO-LG2-2000	
3,000	185	600	2	280 x 230	WHLG2XXX-230XX450-003000DE WMO-LG2-3000	



 Mohr	4,000	207	700	2	340 x 185	WHLG2XXX-230XX450-004000DE WMO-LG2-4000
	5,000	223	860	2	340 x 185	WHLG2XXX-230XX450-005000DE WMO-LG2-5000
	6,000	236	1.000	2	340 x 185	WHLG2XXX-230XX450-006000DE WMO-LG2-6000
	10,000	279	1.400	2	400 x 195	WHLG2XXX-230XX450-010000DE WMO-LG2-10000
	20,000	345	2.400	2	435 x 225	WHLG2XXX-230XX450-020000DE WMO-LG2-20000

Note on the WHLGXX product series: For 50 ml sizes, the red switch is used to halve the heating power over the entire surface of the glass bulb holder. For volumes from 100 ml, two heating zones (half/full) can be switched. All power specifications correspond to the respective nominal power +/- 10%.

WHLG2ER product series

PILZ® laboratory heating mantle with continuously adjustable power controller, which allows the heating power to heat the medium for rapid heating or continuous temperature maintenance.

The heat supply can be influenced depending on the filling level in the flask by means of a heating zone switch (illuminated switch). When operating with a laboratory table or temperature controller, the power controller must be set to the highest power (level 10).



	Volume ml	Flask Ø mm	Power W	Heating zones	Dimension Ø x H mm	Description (Winkler/Mohr) 230 VAC (others available)
 Winkler	50	51	50	1	160 x 180	WHLG2ERX-230XX450-000050DE WMO-LG1ER-50
	100	64	100	2	160 x 180	WHLG2ERX-230XX450-000100DE WMO-LG2ER-100
	250	85	150	2	160 x 180	WHLG2ERX-230XX450-000250DE WMO-LG2ER-250
	500	105	200	2	205 x 195	WHLG2ERX-230XX450-000500DE WMO-LG2ER-500
	1,000	131	300	2	205 x 195	WHLG2ERX-230XX450-001000DE WMO-LG2ER-1000
	2,000	166	500	2	280 x 215	WHLG2ERX-230XX450-002000DE WMO-LG2ER-2000
	3,000	185	600	2	280 x 215	WHLG2ERX-230XX450-003000DE WMO-LG2ER-3000
 Mohr	4,000	207	700	2	340 x 185	WHLG2ERX-230XX450-004000DE WMO-LG2ER-4000
	5,000	223	860	2	340 x 185	WHLG2ERX-230XX450-005000DE WMO-LG2ER-5000
	6,000	236	1,000	2	340 x 185	WHLG2ERX-230XX450-006000DE WMO-LG2ER-6000
	10,000	279	1,400	2	400 x 195	WHLG2ERX-230XX450-010000DE WMO-LG2ER-10000
	20,000	345	2,400	2	435 x 225	WHLG2ERX-230XX450-020000DE WMO-LG2ER-20000

All power specifications correspond to the respective nominal power +/- 10%.

WHLMG3ER product series

PILZ® laboratory heating mantle with continuously adjustable power controller, which enables the heating power to heat the medium for rapid heating or continuous temperature maintenance.

The heat supply can be influenced depending on the filling level in the glass flask by means of heating zone switching (illuminated switches). When operating with a laboratory table or temperature controller, the power controller must be set to the highest power (level 10).


 Winkler	Volume ml	Flask Ø mm	Power W	Heating Zones	Dimension Ø x H mm	Description (Winkler/Mohr) 230 VAC (others available)
	50-250	51-85	150	3	160 x 185	WHLMG3ER-230XX450-000250DE WMO-MG3ER-50-250
 Mohr	250-1,000	85-131	360	3	205 x 205	WHLMG3ER-230XX450-001000DE WMO-MG3ER-250-1000
	1,000-3,000	131-185	600	3	280 x 230	WHLMG3ER-230XX450-003000DE WMO-MG3ER-1-3

All power specifications correspond to the respective nominal power +/- 10%.

WHLSG2ER product series

PILZ® laboratory heating mantle with metal bowl and, continuously adjustable power controller, which enables the heating power to heat the medium for rapid heating or continuous temperature maintenance.

The heat supply can be influenced depending on the filling level in the glass flask by means of a heating zone switch (illuminated switch). When operating with a laboratory temperature controller, the power controller must be set to the highest power (level 10).


	Volume ml	Flask Ø mm	Power W	Heating Zones	Dimension Ø x H mm	Description 230 VAC (others available)
	250	85	120	2	160 x 185	WHLSG2ER-230XX450-000250DE
	500	105	200	2	205 x 205	WHLSG2ER-230XX450-000500DE
	1,000	131	300	2	205 x 205	WHLSG2ER-230XX450-001000DE
	2,000	166	500	2	280 x 230	WHLSG2ER-230XX450-002000DE

All power specifications correspond to the respective nominal power +/- 10%.

WHU2ER product series

PILZ® rectangular laboratory heating mantle for round-bottom flasks with continuously adjustable power controller, which allows the heating power to heat the medium for rapid heating or continuous temperature maintenance.

The heat supply can be influenced depending on the filling level in the glass flask by means of a heating zone switch (illuminated switch). When operating with a laboratory temperature controller, the power controller must be set to the highest power (level 10).

	Volume l	Flask Ø mm	Power W	Heating Zones	Dimension Ø x H mm	Description 230 VAC (others available)
	4	207	700	2	270 x 175	WHU2ERXX-230XX450-004000DE
	5	223	860	2	290 x 185	WHU2ERXX-230XX450-005000DE
	6	236	1.000	2	300 x 195	WHU2ERXX-230XX450-006000DE
	10	279	1.400	2	250 x 215	WHU2ERXX-230XX450-010000DE
	20	345	2.400	2	430 x 250	WHU2ERXX-230XX450-020000DE

All power specifications correspond to the respective nominal power +/- 10%.

WHRE4 product series

PILZ® rectangular laboratory heating mantle for up to 4 round-bottom flasks with continuously adjustable power controller per heating place, which enables the heating power to heat the medium for rapid heating or continuous temperature maintenance.

The heat supply can be influenced depending on the filling level in the glass flask by means of individual heating stations. When operating with a laboratory temperature controller, the power controller must be set to the highest power (level 10).

Volume ml/l	Flask Ø mm	Power W	Heating Zones	Dimension Ø x H mm	Description 230 VAC (others available)
100	64	4 x 110	1	620 x 220 x 130	WHRE4ERX-230XX450-000100DE
250	85	4 x 220	1	620 x 220 x 130	WHRE4ERX-230XX450-000250DE
500	105	4 x 330	1	765 x 260 x 130	WHRE4ERX-230XX450-000500DE
1,000	131	4 x 495	1	765 x 260 x 130	WHRE4ERX-230XX450-001000DE

All power specifications correspond to the respective nominal power +/- 10%.

WHRE6 product series

PILZ® rectangular laboratory heating mantle for up to 6 round-bottom flasks with continuously adjustable power controller per heating place, which enables the heating power to heat the medium for rapid heating or continuous temperature maintenance. The heat supply can be influenced depending on the filling level in the glass flask by means of individual heating stations. When operating with a laboratory temperature controller, the power controller must be set to the highest power (level 10).

Volume ml	Flask Ø mm	Power W	Heating Zones	Dimensions Ø x H mm	Description 230 VAC (others available)
100	64	6 x 110	1	870 x 220 x 130	WHRE6ERX-230XX450-000100DE
250	85	6 x 220	1	870 x 220 x 130	WHRE6ERX-230XX450-000250DE
500	105	6 x 330	1	1146 x 260 x 130	WHRE6ERX-230XX450-000500DE
1,000	131	6 x 495	1	1146 x 260 x 130	WHRE6ERX-230XX450-001000DE

All power specifications correspond to the respective nominal power +/- 10%.

WHG2 product series

Basic version of the PILZ® laboratory heating mantle with crocheted outer jacket.

For adjusting the supplied heat, it can be combined with an electronic temperature controller (T500 or T700) or series-parallel rotary switch WRT00116 or WRT00117. Short, fast heating and/or in combination with an external power controller/temperature controller medium- and long-term adjusting of the supplied heat in coordination with the behavior of the medium and desired reaction.

	Volume ml	Flask Ø mm	Power W	Heating Zones	Dimension Ø x H mm	Description 230 VAC (others available)
	25	41	40	1	-	WHG2XXXX-230XX450-000025DE
	50	51	70	1	-	WHG2XXXX-230XX450-000050DE
	100	64	110	2	-	WHG2XXXX-230XX450-000100DE
	250	85	200	2	-	WHG2XXXX-230XX450-000250DE
	500	105	300	2	62	WHG2XXXX-230XX450-000500DE
	1,000	131	450	2	62	WHG2XXXX-230XX450-001000DE
	2,000	166	700	2	62	WHG2XXXX-230XX450-002000DE
	3,000	185	800	2	62	WHG2XXXX-230XX450-0003000DE
	4,000	207	1,000	2	62	WHG2XXXX-230XX450-004000DE
	5,000	223	1,200			WHG2XXXX-230XX450-005000DE
	6,000	236	1,400	2	62	WHG2XXXX-230XX450-006000DE
	10,000	279	2,000	2	62	WHG2XXXX-230XX450-010000DE
20,000	345	2,800	2	62	WHG2XXXX-230XX450-010000DE	

Series parallel rotary switch ON/50%/100%.

All power specifications correspond to the respective nominal power +/- 10%.

WHG4R product series

Basic version of the PILZ® laboratory heating mantle with crocheted outer jacket, but with 4 heating zones.

For adjusting the supplied heat, it can be combined with an electronic temperature controller (T500 or T700) or heating zone switch WRT00116 or WRT00117. Short, fast heating and/or in combination with an external power controller/temperature controller, medium- and long-term adjusting of the supplied heat in coordination with the behavior of the medium and desired reaction.

	Volume l	Flask Ø mm	Power W	Heating Zones	Dimensions Ø x H mm	Description 230 VAC (others available)
	4	207	1,000	4	62	WHG4RXXX-230XX450-004000DE
	6	236	1,400	4	62	WHG4RXXX-230XX450-006000DE
	10	279	2,000	4	62	WHG4RXXX-230XX450-010000DE
	20	345	2,800	4	62	WHG4RXXX-230XX450-020000DE

* Heating zone switch: Heating zone 1, Heating zones 1+2, Heating zones 1-3, Heating zones 1-4

All power specifications correspond to the respective nominal power +/- 10%.

WHG2H product series (900 °C)

Basic version of the PILZ® laboratory heating mantle with crocheted outer jacket.

For adjusting the supplied heat, it can be combined with an electronic temperature controller (T500 or T700) or the series-parallel rotary switch (WRT00116 or WRT00117). Short, rapid heating and/or, in combination with an external power controller/temperature controller, medium and long-term adjusting of the supplied heat in coordination with the behavior of the medium and desired reaction.

	Volume ml	Flask Ø mm	Power W	Heating Zones	Dimensions Ø x H mm	Description 230 VAC (others available)
	250	85	300	2	-	WHG2HXXX-230XX900-000250DE
	500	105	500	2	62	WHG2HXXX-230XX900-000500DE
	1,000	131	750	2	62	WHG2HXXX-230XX900-001000DE
	2,000	166	1,200	2	62	WHG2HXXX-230XX900-002000DE
	4,000	207	1,800	2	62	WHG2HXXX-230XX900-004000DE
	6,000	236	2,500	2	62	WHG2HXXX-230XX900-006000DE

* Series parallel rotary switch ON/25%/50%/100%.

All power specifications correspond to the respective nominal power +/- 10%.

6 Technical Data

The type plate on the housing of the PILZ® laboratory heating mantle shows the technical data. See the example of the WHLP Series:

Part number	WHLG2ERX-230XX450-000050DE
Model	W4985-0654
SN	W012356058
MFD	09/2024
Input	230 V AC; 50 W
Operating temperature	450°C
Volume	50 ml

For dimension/further technical data, please refer to our PILZ® laboratory heating mantle catalogue.

7 Stand stability of the PILZ® laboratory heating mantles

To ensure a safe stand when using the PILZ® laboratory heating mantles, the stand surface is equipped with five stable, non-slip and captive feet.

Their design in combination with the material always guarantee a safe stand on smooth and dry surfaces.

When operating the laboratory heating mantle, make sure that the connecting cable is loose and free of tension between it and the unit.

8 Earthing contact plug as disconnecting device (residual current circuit breaker)

The basic equipment of a PILZ® laboratory heating mantle includes a mains cable with a residual current circuit breaker as a disconnecting device. A second mains cable with mains plug only is to be used for the application of the PILZ® laboratory heating mantles at workplaces with residual circuit breaker in the mains power supply. Both are connected to the laboratory heating mantle via plug-and-play couplings. Please check the respective situation before commissioning!



9 Temperatures

The type plate indicates the maximum permissible operating temperature of +450 °C or +900 °C of the PILZ® laboratory heating mantle. Dangerous operating situations can be avoided by observing the temperature in the medium, setting the heating zone regarding compliance with limit values and constantly monitoring the heating process.



When operating without temperature control, there is a risk of exceeding the maximum operating temperature. Reasons for this can be heat accumulation when the flasks are not filled or only partially filled or changing filling level!

For safe and proper operation of PILZ® laboratory heating mantles, we recommend connecting them, if not already built in, to a variable selector (WRT00117 or WRT00116) or electronic controller (T500 or T700 controller).

When using an external temperature controller and the temperature sensor used, make sure that the sensor type and controller connection (i.e. thermocouple) match.

Basically, the temperature sensor should be placed at the point of expected highest temperature.

It is always advisable to check the use of forced circulation (stirring) when using sensitive media or processes.

When using the laboratory heating mantle with integrated, variable power selector, the setting on the scale (0 ... 10) should be selected so that the heat supplied achieves the desired effect on the medium in the flask without overheating and destroying the medium.



The flask and the medium must be suitable for the respective max. operating temperature. Manufacturer's specifications for glass bulb and medium as well as product labels must be observed!

WHZA1000 power cable with residual current circuit breaker / function test

Commissioning: Insert the plug into the socket and press the orange "RESET" key. After the red function indicator lights up, the device is ready for operation.

A function test must be carried out regularly before commissioning. In case of repeated failure, the connected device must be checked. Please note that the residual current circuit breaker (RCD) cannot replace basic safety measures (i.e. mains fuse and knowledge of the media to be heated and their flammability/ explosion hazard).

Sequence of a functional test of the WHZA1000 power cable with residual current circuit breaker

Press red "TEST" button, the device switches off. Press the orange "RESET" button, after the red function indicator lights up, the device is operational again.

Operation

Place a round bottom flask (volume/design) in the PILZ® laboratory heating mantle and make sure that the glass vessel is properly seated and stable. Select one of the two mains lines (with/without RCD) after checking the safety precautions at the place of use. By inserting the coupling plug of the mains cable into the coupling of the laboratory heating mantle, it becomes ready for operation.

The operating modes can be found in the table "Types of laboratory heating mantles".



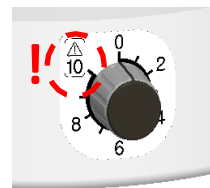
During operation, the PILZ® laboratory heating mantle must be supervised. Observe all notes and specifications in these operating instructions.

The power of the PILZ® laboratory heating mantle is controlled by means of an integrated power controller on the front of the housing, external power controller (WRT00117, WRT00116) or electronic temperature controller (T500 or T700).

Important: When set to scale value "10", the laboratory heating mantle operates with full power output. When operating continuously with the power controller in position 10, very high temperatures can be reached that are beyond the maximum operating temperature and the heater material gradually deteriorates. Insufficient heat dissipation (i.e. no/empty glass flask or heat-insulating medium) leads to overheating. Therefore, high power levels may only be used for accelerated heating with subsequent reduction of the power while observing the process.

Heat absorption and heat supply must correspond to each other!

Note: This procedure also applies to external power controllers.



10 Spillage of a medium into the PILZ® laboratory heating mantle and contamination

If electrically conductive liquid enters the heating element of the PILZ® laboratory heating mantle due to over foaming or rupture of the glass bulb, the design ensures comprehensive personal protection.

The heating element with electrical insulation of the heating conductor made of finely braided glass silk (Protect Line: additionally with a metallic earth braiding) initiates switch-off by the residual current circuit breaker in case of spillage or overflowing of electrically conductive liquid inside the heating mantles (see notes in section 8, 9).

The selective disconnection does not affect the operation of other equipment in the immediate vicinity, unless these are connected to the same RCD.

In the event of contamination (absorption of toxic, harmful, and aggressive substances) of the glass bulb with the integrated heating element, it must be checked whether cleaning and drying are possible. If the contaminating substances cannot be completely removed by cleaning, there is a risk of vaporization when exposed to heat during operation. This can lead to health hazards for the user.

The modular concept of the PILZ® laboratory heating mantle makes it easy to replace damaged or contaminated rod clamp at the back of the heating mantle or crocheted heating mantle. The rod clamp of the laboratory heating mantle can be easily separated by loosening the three screws. The manufacturer or a qualified electrician can replace the PILZ® crocheted heating mantle so that it can be safely used again.

At regular intervals, PILZ® laboratory heating mantles must be tested for operational safety in accordance with VDE guidelines BGV A3 and BetrSicherV (DGUV3).

Maintenance and servicing are carried out with reference to the standards mentioned under "Safety instructions" together with applicable regulations of the employers' liability insurance associations or application-specific guidelines. Damaged devices must be marked (i.e. "blocked" sticker) and placed into blocked storage. They must not be used again until they have been repaired, tested, and approved by a qualified electrician.

11 Transport

Packaging is recommended to be used for protection of the PILZ® laboratory heating mantles during transport. Never pull on the power cord during transport or installation.

Do not use any pointed tools when handling the unit heating mantle (i.e. for cleaning the mantle and hooks). This may cause damage and danger to the user! Do not pack the laboratory heating mantle until it has cooled down (fire hazard)!

12 Service and maintenance

Maintenance and servicing should be carried out at regular intervals in accordance with the standards specified under "Safety instructions", regulations and provisions applicable to the application. The function of the heating element, and, when available, the power controller and temperature controller must be checked and documented at least once a year.

The inspection must be performed after the heating mantle has cooled down to ambient temperature and has been disconnected from the power supply. The heating mantle should not have any cuts, cracks or stitches. The insulation of the connection cable must not have any visible damage. The heating mantle should have no accumulations of dirt, oil, grease or foreign matter. Warning notices and type plates should be undamaged and clearly legible.

13 Repair

The repair of the equipment should be ordered directly from the manufacturer or supplier, also considering warranty claims.

14 Safety plug-in system / device safety

For the connection of the PILZ® laboratory heating mantle, two different mains cables are included in the accessories, which are equipped with a "safety plug-in system". The uniqueness of the connections protects against incorrect operation.

The **WHZA1000** connecting cable with integrated residual current circuit breaker ensures personal protection in accordance with DIN VDE 0100-410/EN 61010-1 at all times and independently of the supply network (Fig. 5).

If protection by means of a residual current circuit breaker is already available at the operating site, this connecting cable can be exchanged for the **WHZA2000** protective contact plug version (Fig. 6).

Connection system PILZ® laboratory heating mantles



Figure 5 – Connection WHZA1000

Figure 6 – Connection WHZA2000

15 Power and temperature control

For the use of PILZ® laboratory heating mantles, the WINKLER AG delivery program offers additional devices and accessories to optimally equip the PILZ® laboratory heating mantles for the respective application.

Power Control: The WRT00116 and WRT00117 power controller (Fig. 7 and 8) allows heat transferred to the medium to be adjusted by dosing the heating power (0 ... 100%). A regulation does not take place!

Temperature Control: The T500 or T700 temperature controller (Fig. 9) allows precise monitoring of the set temperature of the medium. For this purpose, a temperature sensor records the temperature at any time in a closed control loop and adjusts the heating power as required.



Figure 7: WRT00016 power controller

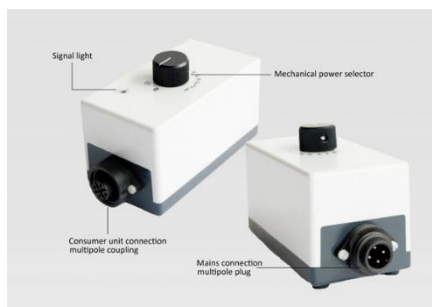


Figure 8: WRT00117 power controller



Figure 9: T500 and T700 micro-processor-based controller

16 Warranty

Winkler warrants the product to the original purchaser for a period of twelve (12) months from the date of delivery (handover of the goods).

In the event of justified complaints, Winkler shall, at its option, either remedy the defect or deliver a replacement. Winkler shall be entitled to have the defects remedied by third parties.

For details, please refer to our general conditions of purchasing and ordering at www.winkler.org.

17 Disposal

Environmental information for industrial customers within the EU:

The WEEE Directive 2012/19/EU aims to prevent waste from electrical and electronic equipment and to reduce such waste through reuse, recycling and other forms of recovery.




The symbol indicates that the product should be disposed of separately from regular commercial/household waste. It is your responsibility to dispose of this product only through the legally prescribed disposal channels or the appropriate collection points designated by the government or local authorities.

Proper disposal and recycling will help prevent potential negative consequences for the environment and human health. If you need more information on how to dispose of your waste equipment, please contact your local authorities, municipal waste disposal services or the dealer where you purchased the product.

18 Contact

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 PILZ® is a registered trademark of WINKLER AG, Heidelberg, Germany

19 EU Declaration of Conformity (CE Marking)

EU-DECLARATION OF CONFORMITY



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69126 Heidelberg

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Product group : PILZ® Heating Mantles

Product : WHLP..., WHG..., WHLG..., WHLMG..., WHLSG...,
WHU..., WHRE...

Directives : Low voltage directive 2014/35/EU
Electromagnetic compatibility directive 2014/30/EU
RoHS directive 2011/65/EU+2015/863/EU

We hereby declare that in planning and manufacturing of this product the basic safety and health requirements of the EU Directives mentioned above have been observed.

Other national standards and technical specifications applied:

EN IEC 60519-1:2020-12 (VDE 0721-1:2020-12)

EN 61010-1 VDE 0411-1 Berichtigung 2:2023-03

EN IEC 61010-2-010 VDE 0411-2-010:2022-12

Any modification to the product without our consent will make this declaration invalid.

Heidelberg, November 3rd 2023

Winkler AG

ppa D. Ernst
Daniel Ernst
Leiter Technik

DRUM, CONTAINER AND GAS CYLINDER HEATERS CATALOGUE

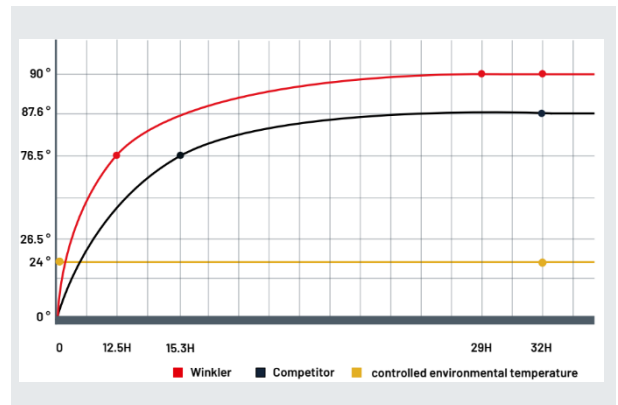


rapidLine DRUM HEATERS

Used for chemicals and products in various industries, such as food, cosmetic, science, detergent pharmaceutical, etc. For frost protection, temperature maintenance and heat-up of storage containers of up to 90 or 200°C.

rapidLine IBC Heaters

Used for chemicals and products in various industries, such as automobile, pharmaceutical, transportation, food & beverage, petrochemical and private households (for example, rainwater IBC). For frost protection, temperature maintenance and heat-up of storage containers of up to 90 °C.



In-House Manufactured L-400 Controllers

Our robust **L-400** in-line controller series are perfectly tailored for the use with drum, IBC, and canister heaters. Stand-alone, waterproof and an intuitive operation from the first moment defining these intuitive controllers. Fix temperature ranges, factory programmed setpoint, monitor function or integrated OEM-features will **make** these controllers a perfect for your application.

rapidLine Series: 20% improved heat-up time compared to common systems in the market

The above temperature curves and timetable are based upon: 200 liter 90 °C drum heater, 90 % filled with water, associated OEM controller and insulation cover under the same ambient conditions.