

Operating Instructions



Radiant heating elements 10.5/10.7X

90.60128.970-001-01-A

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1 About these operating instructions

1.1 Validity

These operating instructions are for the following material number range of radiant heating elements:

10.xxxxx.xxx

1.2 Handling of these operating instructions

These operating instructions are part of the product and describe the intended use of the product.

- ▶ Read these operating instructions, especially the safety instructions, carefully before use.
- ▶ Observe all other applicable documents.
- ► Keep these operating instructions during the product lifetime.
- Make sure that these operating instructions are available completely and legibly at all times.
- Pass these operating instructions to each subsequent owner or user of the product.

1.3 Revisions

Date	Version	What is new?
13 th February 2020	01	Initial version
2 nd September 2020	02	Orthography, Supplement in chapter 4.2.5 (p.19-21), Update of contact (p.26)
14 th December 2020	03	Supplement in chapter 2.11 (handling), Supplement in chapter 3.2 (handling repacked condition)

Tab. 1: Revisions

1.4 Other applicable documents

Type drawing



1.5 Symbols and markings

Symbols	Meaning
✓	Requirement of an action
>	One-step action
▷	Measure to avoid a hazard in a warning
1.	Step within a multi-step action list
	Keep order.
→	Final result of an action
i	Tip for easier work
A DANGER!	Hazardous situation that will lead to death or serious injuries, if the safety measures are not followed.
A WARNING!	Hazardous situation that can lead to death or serious injuries, if the safety measures are not followed.
A CAUTION!	Hazardous situation that can lead to minor injuries, if the safety measures are not followed.
NOTICE!	Hazardous situation that can lead to property damage if the safety measures are not followed.

Tab. 2: Symbols and markings



2 Safety

2.1 Intended use

EGO Radiant Heating Elements properly assembled into the final appliance are intended for heating food on cookers or hobs in domestic and commercial kitchen areas in fixed buildings. EGO Radiant Heating Elements have to be used under a glass ceramic surface with a thickness of 4 mm for domestic or 6 mm for commercial appliances. Any other use is not allowed by default and needs written consent of E.G.O.. EGO Radiant Heating Elements are intended for supervised operation only.

2.2 Staff qualification

These operating instructions are intended for following staff/staff groups:

Staff	Required qualification
Electrical and mechanical	Has detailed experience in design of electric kitchen appliances
skilled staff (research &	Has detailed knowledge in valid norms and safety standards
development, product engineering, quality) of the kitchen appliances manufacturer	Has detailed knowledge in using relevant tools and equipment for the production of electrical appliances
Qualified electrician	Knows the relevant standards and regulations for electrical installations.
	Has experience in using the relevant tools and equipment for electrical installations.
	Has knowledge of cooking appliances.
	Has received training from the kitchen appliance manufacturer.

Tab. 3: Staff qualification

2.3 Residual risks

2.3.1 Installation with applied voltage

If there is voltage applied on the radiant heating element by installation, electric shock hazard consists within the installation.

- ▶ Radiant heating element has to be installed or replaced by qualified staff only.
- ▶ Power supply of the cooking appliance has to be completely switched off before all installation or replacement work at a radiant heating element.

2.3.2 Insufficient grounding

People could suffer an electric shock by having insufficient grounding.

Radiant heating element housing has to be connected correctly and permanently with ground potential. Pay attention to the regional regulations.



2.3.3 Incorrect cable routing

The temperatures at radiant heating elements could outstrip 300 °C. Improper cable routings, which affecting the RHE retaining plate, could lead to a damage of the cable insulation. This could lead to a short-circuit risk or electric shock by having open wires.

Never affect the radiant heating element retaining plate with cable routings.

2.3.4 Accessible voltage-supplied parts

Radiant heating elements have accessible voltage-supplied parts (e.g. heating wire, connection terminals, contact parts, adjustment sleeve of rod limiter...). Furthermore, the contact parts of the electronic control unit for commercial RHE pot detection are accessible. These could lead to a hazard of electric shock.

- ▶ Radiant heating elements have to be covered with appropriate materials (glass ceramic), which are enough temperature stable.
- During operation neither the heating element nor the connecting parts must be accessible.
- During operation the contact parts of the electronic control unit for commercial RHE pot detection must be covered.

2.3.5 Hot surfaces

Radiant heating elements heat up heavily during operation. After switching off, the heat is retained for some time at glass surface. This leads to a risk of burning. A residual heat contact is an indication for hot surfaces with burning risk. Residual heat contacts could be defective within progressive operating time

▶ Do not touch the glass ceramic surface, which was used with the switched-on or recently used radiant heating element under it.

2.3.6 Humidity

Radiant heating elements as single components, which are not built-in a cooking appliance, have protection class IP00. In case of liquid entry, a hazard of electric shock consists.

▶ Radiant heating elements have to be protected from humidity and accessibility to the electric connections from outside of the cooking appliance.

2.3.7 Hygroscopy

The insulation material of radiant heating elements itself is hygroscopic and can take up to a maximum of 20 g of water, which will be steamed during the parboiling process of the radiant heating element. This could lead to dysfunction or damage of other hob components (e.g. electronic control units).

▶ Water-sensitive hob components have to be protected or designed for this humidity, which results of the hygroscopic radiant heating element insulation.

2.3.8 Skin irritation

The insulation material of radiant heating elements could lead to skin irritation according to dry out properties of the insulation.

▶ Wear suitable personal protective equipment.



2.3.9 Use of the radiant heating element outside its intended use

By using the radiant heating element outside the cooking area, there are hazards of burning and electric shocks. By doing a misuse (e.g. usage of the radiant heating element as room heating), a hazard of burning consists.

- Radiant heating element has to be used in the intended area
- ▶ Never store objects on the glass surface over the radiant heating element or on the radiant heating element itself.

▶

2.3.10 Non-intended objects on the cooking surface

Not intended objects on the cooking surface could lead to a burning hazard.

Never store objects on the glass surface.

2.3.11 Use of damaged radiant heating elements

If a radiant heating element is damaged (e.g. damaged heating wire through wrong transport and / or handling), it could lead to malfunction, electric shock or burning hazard. A direct touch of the heating wire to the glass surface could lead an electric shock, because the glass ceramic will be electric conductive by having high temperatures.

- ▶ Never use damaged radiant heating elements.
- Never carry radiant heating elements at rod limiter, connection block, plug connection or terminal wires.

2.3.12 Use of damaged glass ceramic surface

If there are cracks or breaks in the glass ceramic, the voltage-applied heating wire or contact parts can be touched directly. Liquids could enter the radiant heating element through the damaged glass ceramic surface. This could lead to electric shocks.

▶ Never use radiant heating elements, which are mounted under a damaged glass ceramic surface.

2.3.13 Use of damaged electronic control unit for commercial RHE pot detection

If an electronic control unit for commercial RHE pot detection is damaged (e.g. through wrong transport), it could lead to malfunction.

- ▶ Never use damaged electronic control unit for commercial RHE pot detection.
- Carry the electronic control unit for commercial RHE pot detection at the circuit board or transformer. Never carry at circuit board and transformer simultaneously.
- ▶ Take ESD protective measures.

2.3.14 Glass ceramic surface temperature adjustment

Radiant heating elements have a default glass ceramic surface temperature adjustment. When using a radiant heating element with a too high glass ceramic surface temperature adjustment, the glass ceramic surface could be damaged according to overheat. This could lead to electric shocks.

- The installation recommendations of the glass manufacturer must be observed.
- ► The default glass ceramic surface temperature adjustment has to be lower or equal than the maximum glass ceramic surface temperature recommendation of the glass ceramic manufacturer.
- Never open the limiter housing and never change the default glass ceramic surface temperature adjustment.



2.3.15 Sharp edges

Packaging materials and mechanical parts of radiant heating elements (e.g. RHE retaining plate, rod limiter, connection block, heating ribbon or coil, mounting parts...) could have sharp edges. Furthermore, the circuit board of the electronic control unit for commercial RHE pot detection could have sharp soldered points or board edges. People can cut themselves into hands or fingers.

Wear safety gloves during transport and installation.

2.3.16 Weight

Bundled and commercial radiant heating elements could have a high weight. Within the handling of bundled or commercial radiant heating elements, people can squeeze arms and hands. If these radiant heating elements fall, people may injure their feet.

▶ Be careful by carry bundled radiant heating elements.

2.4 Avoidance of property damage

2.4.1 Empty cooking and insufficient cookware

Using empty or insufficient cookware may overheat the cookware or glass ceramic surface. This creates the risk of damage to property.

- Only use a radiant heating element hob with suitable cookware.
- Do not cook the cookware empty or cook with empty cookware.



3 Transport and storage

3.1 Transport

- ▶ Use suitable packaging to prevent damage to the product.
- ► Stack a maximum of two radiant heating element pallets on top of each other with the maximum of own weight.
- ► Have a transport temperature between -20 °C +70 °C.

3.2 Storage

- ► Comply with the following storage conditions:
 - Have a storage temperature between 5-70 °C and use the original packaging.
 - Store dry in a closed room (hygroscopic insulation material).
 - Have a protection against corrosion and pollution.
 - By doing block storage: Stack a maximum of two radiant heating element pallets on top of each other with the maximum of own weight.
 - If the radiant heating elements need to be repacked, pile up as shown in picture 1.









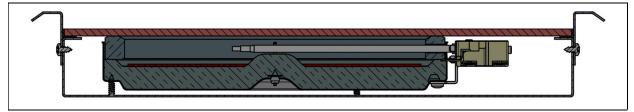
4 Installation and commissioning

4.1 Assembly

▶ The ambient temperature in the stove top must not exceed 250 °C.

4.1.1 Round radiant heating element

- 1. Insert the radiant heating element.
 - Radiant heating elements must be operated in horizontal position with the radiant surface facing up.
 - Position and insulation in the device are additional factors that contribute to the development of heat inside the hob.



- 2. Held down the radiant heating element at a minimum of three spring points.
 - The springs must be fixed only to the indent on the retaining plates.
 - The springs have to be positioned evenly.
 - The insulation ring of the radiant heating element has to be permanently attached to the glass ceramic bottom and the radiant heating element has to be secured against twisting.
 - The suspension of the radiant heating element in the device must allow the compensation of tolerances (thermal expansion), which are occurring during operation.
- 3. Additional installation recommendations of the glass ceramic manufacturer must be observed.

4.1.2 Square and rectangular commercial radiant heating element

- 1. Insert the radiant heating element.
 - Radiant heating elements must be operated in horizontal position with the radiant surface facing up.
 - Position and insulation in the device are additional factors that contribute to the development of heat inside the hob.
- 2. Held down the radiant heating element.
 - The springs must be fixed only at the edge of the radiant heating element.
 - The springs have to be positioned evenly.
 - The insulation ring of the radiant heating element has to be permanently attached to the glass ceramic bottom and the radiant heating element has to be secured against twisting.
 - The suspension of the radiant heating element in the device must allow the compensation of tolerances (thermal expansion), which are occurring during operation.
- 3. The installation recommendations of the glass ceramic manufacturer must be observed.
- 4. If a commercial RHE pot detection sensor is included, further assembly steps are necessary:



- Insert the electronic control unit that it is protected from the humidity, which results of the hygroscopic radiant heating element insulation.
- Ensure a maximum ambient temperature of 85 °C for the electronic control unit. A maximum allowed temperature deviation is 3 K/min. If the maximum ambient temperature can just be achieved with a fan, it is not allowed that the air flow is aligned directly to the electronic control board. Ensure that no humidity or dirty air will enter through the suction.
- 5. Insert the thermostat with auxiliary switch in the tube of the radiant heating element. Ensure that the allowed temperature limits are not exceeded.
- 6. Additional installation recommendations of the glass ceramic manufacturer must be observed.



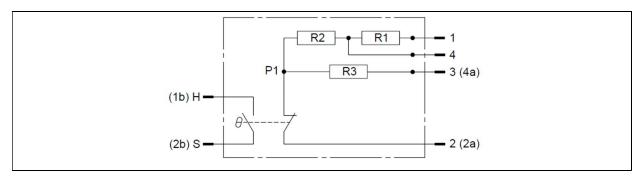
4.2 Electrical connection

- Observe the corresponding type drawing before connecting the radiant heating element.
- ▶ Never affect the radiant heating element retaining plate with cable routings.

4.2.1 Wiring of a 6-heat radiant heating element

A radiant heating element with six warming levels is designed for a use with 7-position switch (off/0 + 6 warming levels).

6-heat radiant heating elements are divided into three heating conductors:



Connection of the radiant heating element to 7-position switch

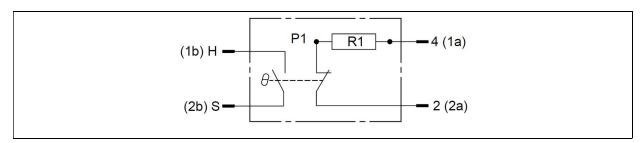
The different heat levels are each achieved with a parallel connection, series connection or switching off one or two of the three heating conductors. The power of the respective heat levels can be found on the type drawing.

▶ Interconnect the connections of the radiant heating elements to the corresponding connections of the switch.

4.2.2 Wiring of a single-circuit radiant heating element

A single-circuit radiant heating element is designed for a use with energy regulator or electronic control.

A single-circuit radiant heating element has one heating ribbon or coil. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered.



Connection of the radiant heating element to energy regulator or electronic control

The radiant heating element has to be connected according to the type drawing of suitable energy regulator or electronic control.

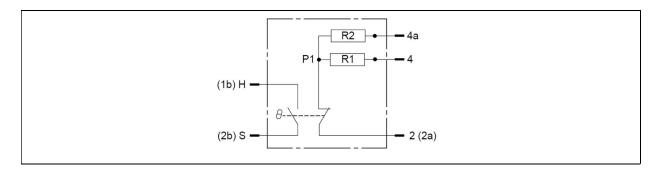


▶ Interconnect the connections of the radiant heating elements to the corresponding connections of the energy regulator or electronic control.

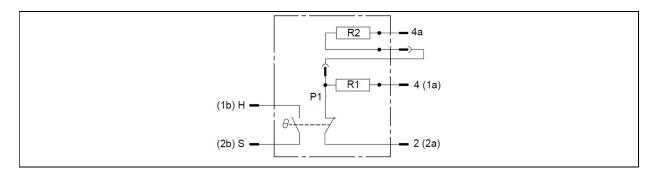
4.2.3 Wiring of a multi-circuit radiant heating element

A multi-circuit radiant heating element is designed for a use with energy regulator or electronic control.

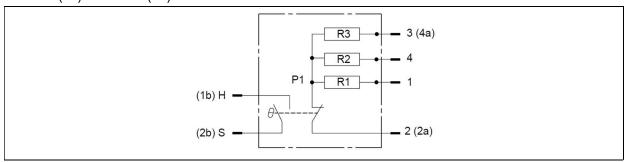
A dual-circuit radiant heating element has two heating ribbons or coils for having two cooking zones for different cookware sizes. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered.



A dual-circuit radiant heating element has two heating ribbons or coils for having two cooking zones for different cookware sizes. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered. If an additional connection block with terminal wire is integrated, the wiring diagram will change as followed.

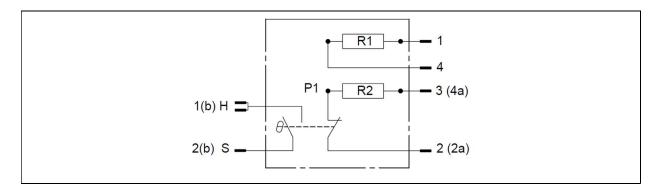


A triple-circuit radiant heating element has three heating ribbons or coils for having three cooking zones for different cookware sizes. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered.

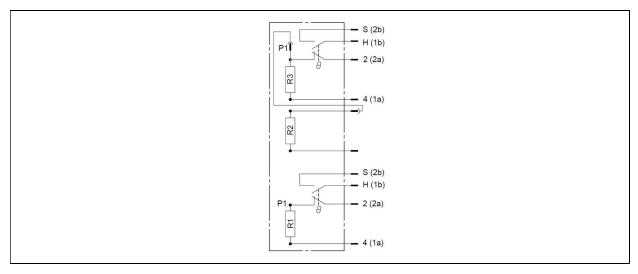




This radiant heating element has two heating ribbons for one cooking zone. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered.

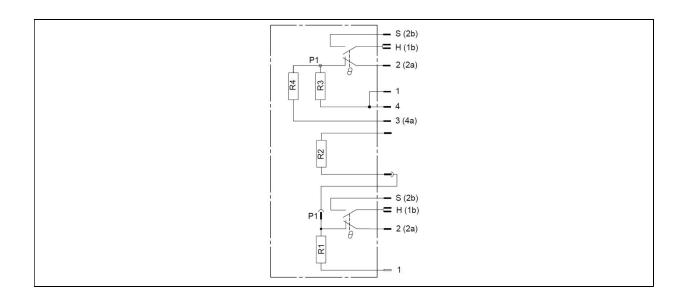


This triple-circuit radiant heating element has three heating ribbons or coils for having three cooking zones, which could be bridged for different cookware sizes. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered.



This radiant heating element has four heating ribbons or coils for having four cooking zones, which could be bridged for different cookware sizes. By having a radiant heating element without residual heat contact, the contacts (1b) H out and (2b) S are not considered.





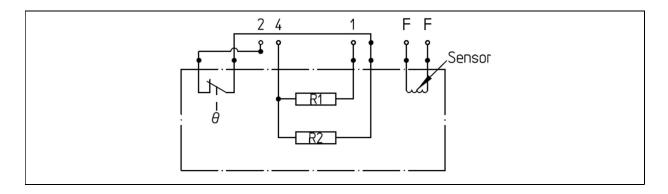
Connection of the radiant heating element to energy regulator or electronic control

The radiant heating element has to be connected according to the type drawing of suitable energy regulator or electronic control.

Interconnect the connections of the radiant heating elements to the corresponding connections of the energy regulator or electronic control.

4.2.4 Wiring of a square or rectangular radiant heating element for commercial kitchens

A square or rectangular radiant heating element for commercial kitchen is controlled by a capillary thermostat with auxiliary switch. By having a radiant heating element without pot detection, the sensor with F and F is not considered.



Connection of the radiant heating element to capillary tube thermostat

The radiant heating element has to be connected according to the type drawing of suitable capillary tube thermostat.

▶ Interconnect the connections of the radiant heating elements to the corresponding connections of the capillary tube thermostat.

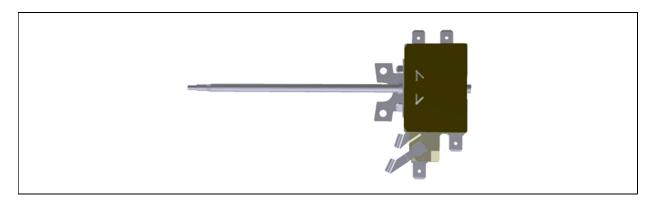


4.2.5 Connection types for domestic and commercial radiant heating elements

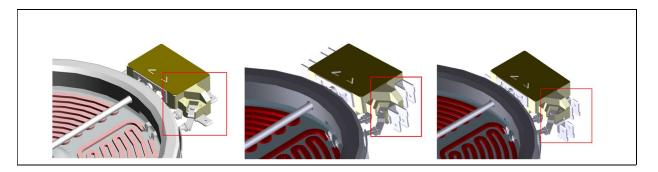
- Use only conductive and insulating material, which is designed for the high temperatures in the cooking appliance with radiant heating elements.
- ▶ Maintain sufficient air and creepage distance to conductive housing parts.
- ▶ Ensure that radiant heating element housing is properly and permanently connected to ground potential. Consider according to valid national guidelines.
- ► The heat detection contact must be operated with min. 24 V alternating voltage and max. 400 V, max. 100 mA.

Plug connection (type 1)

EGO Radiant Heating Elements have a rod limiter, which is used for limitation of the glass ceramic surface temperature and as electrical connection of the heating ribbon or coil. Furthermore, the rod limiter of series 60.25XXX.XXX has two contacts for residual heat indication by controlling with energy regulator or 7-position switch.



There are three different kind of plug-in directions of rod limiter connections. It is horizontal pointing to glass ceramic, vertically pointing to glass ceramic and vertically pointing to bottom:



- ▶ Use 6.3 x 0.8-receptacles for tabs of 1.4301 stainless steel.
- ▶ Use suitable receptacles for tabs, which are used for residual heat indication (contacts (1b) H out and (2b) S).
- ▶ Use suitable connection material with a minimum temperature resistance of 300 °C, because within the use of the radiant heating element temperatures > 300 °C at the retaining plate can occur.
- ► Ensure that the temperature will not exceed 250 °C at connection area housing to protect connection material and radiant heating element.



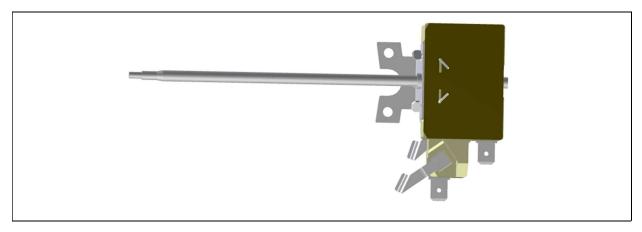
► For using stranded wires: only use with a minimum temperature resistance of 300 °C.

A use of group connectors has to be tested by the customer according to the appliance.

- When using group connectors:
 - Use only group connectors which have a material approved for temperatures in the specific application.
 - Use receptacles that require a low insertion force for easier work.

Plug connection (type 2)

Rod limiters of series 60.15XXX-XXX have in general the same design as 60.25XXX.XXX, but are without a residual heat indication.



There are three different kind of plug-in directions of rod limiter connections. It is horizontal pointing to glass ceramic, vertically pointing to glass ceramic and vertically pointing to bottom.

- ▶ Use 6.3 x 0.8-receptacles for tabs of 1.4301 stainless steel.
- ▶ Use suitable connection material with a minimum temperature resistance of 300 °C, because within the use of the radiant heating element temperatures > 300 °C at the retaining plate can occur.
- ► Ensure that the temperature will not exceed 250 °C at connection area housing to protect connection material and radiant heating element.
- For using stranded wires: only use with a minimum temperature resistance of 300 °C.

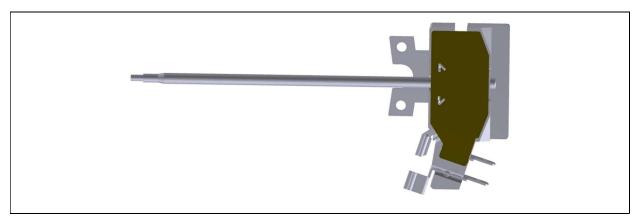
A use of group connectors has to be tested by the customer according to the appliance.

- When using group connectors:
 - Use only group connectors which have a material approved for temperatures in the specific application.
 - Use receptacles that require a low insertion force for easier work.



Plug connection (type 3)

Rod limiters of series 60.16XXX-XXX have another rod limiter housing design as 60.25XXX.XXX and 60.15XXX.XXX. 60.16XXX-XXX rod limiters have not a residual heat contact.



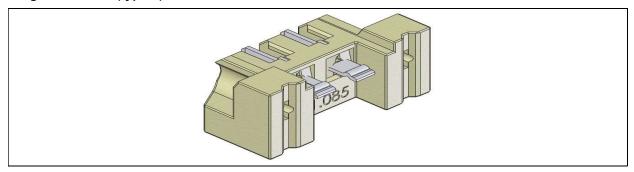
There are three different kind of plug-in directions of rod limiter connections. It is horizontal pointing to glass ceramic, vertically pointing to glass ceramic and vertically pointing to bottom.

- ▶ Use 6.3 x 0.8-receptacles for tabs of 1.4301 stainless steel.
- ▶ Use suitable connection material with a minimum temperature resistance of 300 °C, because within the use of the radiant heating element temperatures > 300 °C at the retaining plate can occur.
- ► Ensure that the temperature will not exceed 250 °C at connection area housing to protect connection material and radiant heating element.
- For using stranded wires: only use with a minimum temperature resistance of 300 °C.

A use of group connectors has to be tested by the customer according to the appliance.

- When using group connectors:
 - Use only group connectors which have a material approved for temperatures in the specific application.
 - Use receptacles that require a low insertion force for easier work.

Plug connection (type 4)



- ▶ Use 6.3 x 0.8-receptacles for tabs of 1.4301 stainless steel.
- ▶ Use suitable connection material with a minimum temperature resistance of 300 °C, because within the use of the radiant heating element temperatures > 300 °C at the retaining plate can occur.
- ► Ensure that the temperature will not exceed 250 °C at connection area housing to protect connection material and radiant heating element.
- For using stranded wires: only use with a minimum temperature resistance of 300 °C.



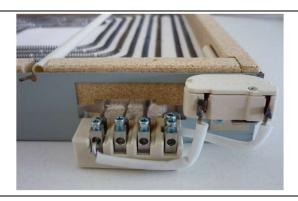
A use of group connectors has to be tested by the customer according to the appliance.

- When using group connectors:
 - Use only group connectors which have a material approved for temperatures in the specific application.
 - Use receptacles that require a low insertion force for easier work.

4.2.6 Type of connection especially for commercial kitchens

- ▶ Use only conductive and insulating material, which is designed for the high temperatures in the cooking appliance with radiant heating elements. Maintain sufficient air and creepage distance to conductive housing parts.
- ► Ensure that radiant heating element housing is properly and permanently connected to earth potential. Consider according to valid national guidelines.

Screw-terminal (type 1)

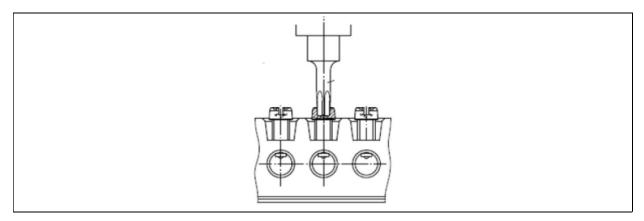


- ▶ Use temperature suitable connection material.
- ► Ensure that the temperature will not exceed temperature limits at connection area to protect connection material and radiant heating element.
- ▶ When using stranded wires: only use with a temperature resistance of 300 °C.

NOTICE! Wrong mounting position of the wire!

Damage of the electrical connection area due to additional heat development.

▷ Insert cables underneath the wire of the radiant heating element.



► Tighten the screw head of the M3.5 x 8 screws to a torque of 0.8 Nm.



Plug connection (type 5)



- Use temperature suitable connection material.
- ► Ensure that the temperature will not exceed temperature limits at connection area to protect connection material and radiant heating element.

Plug connection (type 6)

For the connection of the electronic control unit to the commercial radiant heating element with pot detection coil the following aspects have to be considered:

- ▶ Use 6.3 x 0.8-receptacles of stainless steel with nickel-plate surface.
- ▶ Use wires of the connection cables, which are nickel-plated.
- ► Ensure by welding the crimping point of the flat plug. Suitable methods are lasers and autogenous welding.
- ▶ The contact resistance of each contact point must be less than 500 mOhm.
- Twist the connection cables in pairs (ca. 25 turns/m).
- ► The controller has to be connected to grid permanently.



5 Cleaning and maintenance

5.1 Cleaning

An EGO Radiant Heating Element must not be cleaned, because it is mounted under a glass ceramic surface.

5.2 Maintenance

EGO Radiant Heating Elements cannot be repaired.

► A damaged radiant heating element has to be replaced by a completely new radiant heating element.

For the electronic control unit for commercial pot detection, which is an accessory of commercial radiant heating elements, the following maintenance has to be considered.

- Only repair measurements allowed by E.G.O. may be performed by the customer.
- ▶ Any work on unpacked PCBs must be carried out by trained personnel who know how to handle devices that are sensitive to electrostatic discharges (ESD).
- ▶ Re-soldering PCBs or the replacement of single electronic components is generally not allowed.



6 Disposal

▶ Dispose according to local regulations.



7 Technical data

For further details please refer to our type drawing.



8 Contact

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