

Ceramic radiant tube SER-C

OPERATING INSTRUCTIONS

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1 SAFETY

1.1 Please read and keep in a safe place



Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

1.2 Explanation of symbols

1, 2, 3, a, b, c = Action

→ = Instruction

1.3 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

1.4 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

⚠ DANGER

Indicates potentially fatal situations.

⚠ WARNING

Indicates possible danger to life and limb.

⚠ CAUTION

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

1.5 Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

2 CHECKING THE USAGE

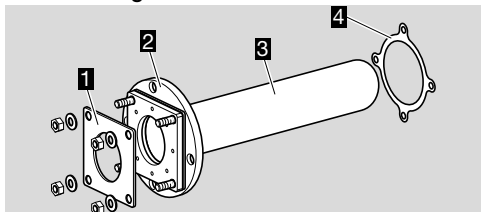
The ceramic radiant tube SER-C is used in conjunction with a self-recuperative burner for indirect heating in heat treatment processes where the combustion gases must be separated from the product. This function is only guaranteed when used within the specified limits – see also page 4 (7 Techni-

cal data). Any other use is considered as non-compliant.

2.1 Type code

SER-C	Ceramic radiant tube
100/088-202/188	External/internal diameter [mm]
W1000-3000	Length [mm]
Eco 0C-Eco 3C	Flange connection for ECO-MAX..C
-X	Connection dimensions deviate from standard
-Y	For hydrogen
-Z	Special version

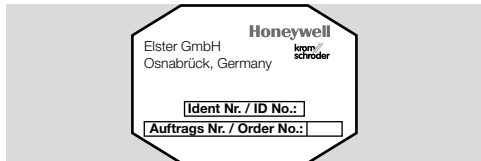
2.2 Part designations



- 1 Burner gasket
- 2 Flange connection
- 3 Radiant tube (SiSiC)
- 4 Mounting gasket

2.3 Type label

Identification and Order No.: see type label.



3 INSTALLATION

CAUTION

Please observe the following to ensure that the ceramic radiant tube SER-C is not damaged during installation and operation:

- Open packaging carefully and without using force.
- Install shock-free.

Packaging

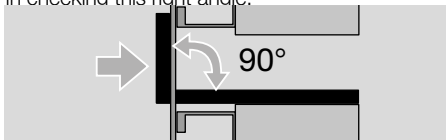
- 1 Check the shock indicator installed on the packaging on delivery of the ceramic radiant tube SER-C by the forwarding agent.
- A liquid in a glass tube turns irreversibly red upon heavy impact during transportation.

- 2 Inform the forwarding agent and the manufacturer immediately if this is the case.



3.1 Checking the furnace flange

- 1 Check that the furnace flange is at right angles to the opening in the furnace wall.
- If the furnace flange is not mounted at right angles, this can lead to subsequent damage to the radiant tube caused by mechanical effects.
- Use a try-square (A) and a ruler (B) to assist you in checking this right angle.



- 2 Check the diameter ($B2 - B1 > 16 \text{ mm}$) and length ($M1 - W2 > 1 \text{ cm}$) of the furnace extension.
- After assembly, the radiant tube clamping ring (C) will be positioned in the furnace extension but without touching it.

3.2 Preparation for installation

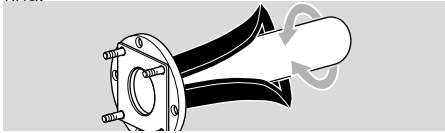
- Insulate the ceramic radiant tube SER-C with heat-resistant fibre blanket along the entire furnace wall opening and in the area of the furnace adapter.
- Select the thickness of the fibre blanket depending on the annular void between the radiant tube and the furnace wall lining.
- The fibre blanket should be compressed by approx. 25% of its thickness using adhesive tape to ensure a tight seal.
- Depending on the furnace lining and the type of expected movements in the furnace wall, the annular void must be at least 40 mm. Use a larger annular void if necessary.
- Force must not be applied to the radiant tube by the furnace lining.

CAUTION

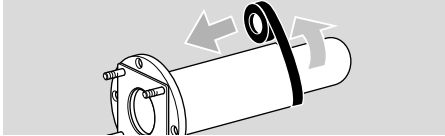
Personal protective equipment should be worn when handling the fibre blanket.

- 1 Cut the fibre blanket to the dimensions of the radiant tube circumference and the furnace wall thickness.
- 2 Wrap the fibre blanket which has been cut to size around the radiant tube.

→ It must not be wrapped around the clamping ring.



3 Starting from the top, wrap conventional adhesive tape tightly around the entire length of the radiant tube up to the clamping ring to secure the fibre blanket and to compress it by approx. 25%.

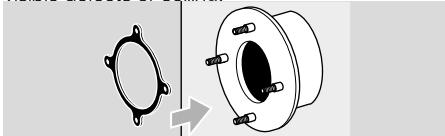


4 Remove any remaining fibre so that the blanket is flush with the clamping ring. When doing so, do not damage or cut into the ceramic surface.

→ After commissioning, the tape combusts and the fibre blanket expands until it is equally distributed in the annular void around the radiant tube.

5 Fit the mounting gasket over the threaded bolts.

→ Place the gasket so that it fits exactly with no visible defects or soiling.



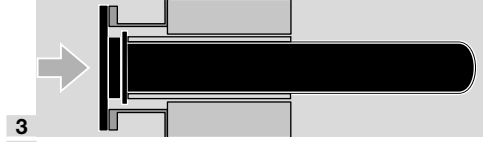
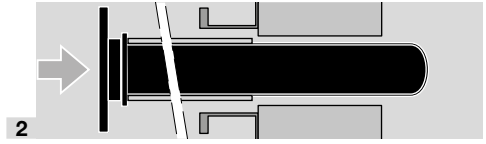
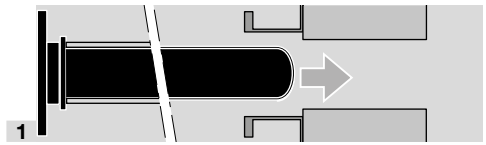
3.3 Installation in the furnace

⚠ CAUTION

Please observe the following to ensure that the ceramic radiant tube SER-C is not damaged during installation on the furnace:

- At least two people are required to install the tube in the furnace wall.
- Insert into the furnace chamber without any impacts or scratches to avoid damage and breakage. Depending on the furnace atmosphere during operation, damage to the protective oxide layer on the surface of the radiant tube can cause corrosion and thus reduce the service life.

→ We recommend that someone be inside the furnace chamber to receive the radiant tube.



4 Secure the radiant tube by placing 4 nuts on the respective threaded bolts and hand tightening them.

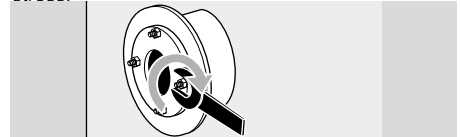
→ This prevents the tube from shifting unintentionally.

⚠ CAUTION

The maximum tightening torque for the nuts is 80 Nm and should be applied using a torque wrench.

→ Tighten the nuts in a crosswise fashion, each time with a maximum of ¼ of a turn per nut.

→ Avoid subjecting the radiant tube to mechanical stress.



5 Cut off any remaining fibre blanket so that the blanket is flush with the interior furnace wall.

→ Once the radiant tube SER-C has been installed, the segmented flame tubes SICAFLEX® and the burner ECOMAX® can be fitted.

4 COMMISSIONING

→ Once the tubes have been installed (and, where necessary, once the furnace has been tempered), we recommend annealing the radiant tubes for at least 72 hours in a moist air atmosphere at maximum furnace temperature.

→ The optimal humidity level for this is 50 to 70%.

→ The furnace should only be purged and operated with a protective atmosphere once annealing has been completed.

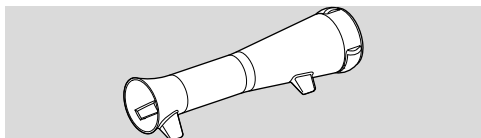
5 MAINTENANCE

→ Check the radiant tube SER-C for damage (visual inspection) when carrying out maintenance work on the burner or in the furnace.

→ In the event of damage, remove the radiant tube and replace it. The radiant tube should only be removed and replaced when the furnace has cooled down.

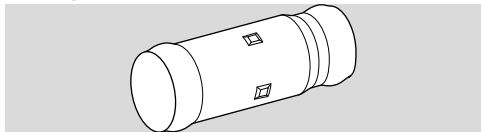
6 ACCESSORIES

6.1 FlameCone



The FlameCone is required in the radiant tube for Flameless mode. It is connected to the SICAFLEX by a bayonet joint.

6.2 Segmented flame tube SICAFLEX

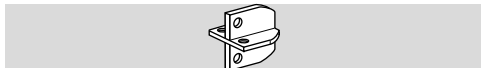


Segmented ceramic flame tubes to guide hot flue gases in radiant tubes.

Material: SiSiC.

The SICAFLEX® is not supplied with the SER-C and must be ordered separately.

6.3 Cruciform spacer

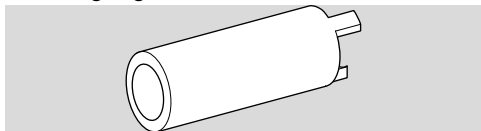


For installation of the SICAFLEX® segmented flame tube in radiant tubes.

The cruciform spacer ensures that a minimum deflector gap is maintained at the end of the radiant tube. Material: refractory clay or SiSiC.

Available on request in different sizes depending on the SICAFLEX® sizes and different heights.

6.4 Flue gas guide tube FGT for SER



Used to guide the flue gases if smaller burners are used than are standard for the radiant tube diameter. The flue gas guide tube ensures sufficient heat exchange via the burner recuperator.

Material: vacuum moulded pulp for ECOMAX..C or metal for ECOMAX..M.

Available on request in different sizes suitable for the SER radiant tube and ECOMAX burner sizes.

7 TECHNICAL DATA

Material:

Radiant tube: SiSiC, max. application temperature 1350°C (2462°F).

Flange connection: heat-resistant steel, 1.0425 (H11).
Storage and transport temperatures: -20 to +40°C (-4 to +104°F).

7.1 Designed lifetime

By avoiding chemical attacks on the radiant tube, a long service life will be ensured for the ceramic radiant tube.

Note the dew point temperature of the protective atmosphere.

Avoid the presence of impurities such as fluorine, chlorine or any alkaline compounds, e.g. sodium or sulphur compounds, in the furnace atmosphere.

8 LOGISTICS

Transport

Protect the unit from external forces (blows, shocks, vibration).

Transport temperature: see page 4 (7 Technical data).

Transport is subject to the ambient conditions described.

Report any transport damage on the unit or packaging without delay.

Check that the delivery is complete.

Storage

Storage temperature: see page 4 (7 Technical data).

Storage is subject to the ambient conditions described.

Storage time: 6 months in the original packaging before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.

9 DISPOSAL

Devices with electronic components:

WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive



At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse.

Do not burn the product.

On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschöder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

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