

Quartz Cassette Heaters

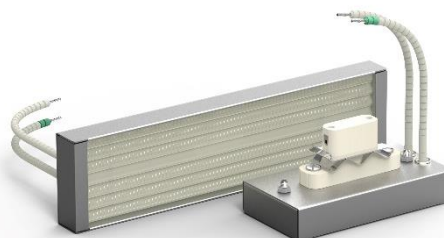
Medium-Wave Emitters

Dear Customer,

we would like to use this opportunity to thank you for buying this product from Friedr. Freek GmbH.

Please read this document carefully before installing the heater in order to learn important facts regarding the product's safety and use.

More information about our products you can find on our website: freek-heaters.com.



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Download our contact details on your smart phone. Just scan the code with your QR Reader App.



Kontakt

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Introduction

With infrared radiation from our infrared emitters, a wide variety of materials can be heated without contact. The energy transfer from the emitter to the product takes place almost immediately after switching on. This is because heat radiation, as electromagnetic radiation, is as fast as light and does not depend on "slow" transport media. Infrared emitters can therefore be used both in a vacuum and in an ambient atmosphere. The different designs and infrared wavelengths allow them to be used in a wide variety of applications.

In the case of medium-wave quartz emitters, a heating conductor heats quartz glass tubes and thus causes the glass to vibrate. Depending on the temperature, a dark red to bright orange glow can be seen.

Quartz infrared radiators have an emission spectrum comparable to ceramic radiators in the medium-wave and long-wave infrared spectrum. The difference is made by the short-wave spectral band below 3 μm , which only quartz infrared emitters have. Despite many overlaps, the application areas of both emitter types therefore differ. Due to their lower mass, quartz IR emitters have shorter response times and are thus recommended for cyclical or frequently interrupted work processes. However, quartz emitters are mechanically more fragile and for example not suitable for dusty atmospheres. Quartz infrared emitters are available as individual tubes or as cassettes. The dimensions of the cassettes follow those of the ceramic elements, so that ceramic and quartz infrared heaters can also be used in mixed arrangements in IR heating platens. For uniform installation, quartz cassettes are therefore also available with a ceramic connection socket, just like the ceramic elements.

Safety

As a manufacturer of heating elements, Freek is not responsible for the conditions in which its heating elements are installed, connected and used in the various customer-specific applications, nor is Freek responsible for how the heating elements are controlled. Rather, it is the customer's responsibility to be aware of and observe good engineering practice as it is recognised in the application and business markets in question. For example, many machines and their equipment are subject to the standard EN 60204 "Safety of machinery – Electrical equipment of machines".

Additionally, the customer is responsible for ensuring that electrical heating elements are only ever connected under the responsibility of a qualified electrician. This is because only a qualified electrician will know the risks associated with electrical heating elements, such as fire, explosion, combustion or electric shock, and – even more importantly – will know the safety measures that need to be put in place in order to prevent such events from occurring, even if the heating elements malfunction. Examples of these safety measures include protection against contact, thermal insulation, electrical insulation, temperature control, overtemperature prevention, earthing, residual current operated circuit breakers, overcurrent circuit breakers and miniature circuit breakers.

General Remarks & Handling

Risk of Overheating

- The aluminised projector/reflector or housing sheet metal used for our emitters begins to corrode at temperatures above 500 °C. This causes the sheet metal to lose its reflective properties, which can result in critical overheating and thus destruction of the emitters.
- Under normal circumstances 500 °C is rarely reached, even in high-power applications, due to the excellent reflective properties of the sheet metal (reflection factor ~ 0.96). However, contamination, condensation, dripping water and "face-to-face" operation of radiators, reflectors, projectors, infrared platens can reduce the reflective effect and thus increase the risk of overheating.
- If these risks cannot be ruled out, we recommend using reflector plates and housings made of polished stainless steel (on request!), providing air cooling or using external temperature sensors to prevent overheating by temperature controllers.

Overcurrent

- Our infrared heaters are designed for operation at specified voltages. Any higher operating voltages differing from this can considerably reduce the lifetime or lead to immediate failure (15 % more voltage = 32 % more power!!!).

Installation Position

- Our quartz heaters should only be used in a horizontal mounting position. In moving applications/fields, it must be ensured that quartz heaters (tubes and cassettes) are always mounted crosswise to the direction of movement.

Safety Distances

- Please ensure that you always leave sufficient space between the beaded leads of our quartz infrared heaters and the mounting or cover plates above/below them. In certain contaminated atmospheres, conductive deposits can form on surfaces which increase the risk of earth faults or short circuits.
- We recommend using a glass fibre sleeve over the beaded leads as additional touch protection measure.
- Ensure that infrared heaters cannot be touched during operation and that a safe distance to the heater is maintained so that no fires or burns can be caused by the radiation.
- The temperature of the infrared heaters can reach much higher than 600 °C at the glass surface. As with all hot heat sources, it must be ensured that the atmosphere in which the heaters are operated does not contain explosive gases that could be ignited on contact with the heater surface. In all cases, the operator is responsible for ensuring that the heaters are suitable for the application.
- Due to thermal expansion, a minimum distance of 5 mm must be maintained between two heaters.
- The recommended distance between the radiant surface and the material to be heated is 100 to 200 mm.

Ventilation

Substances that evaporate due to heat radiation can reduce the radiation power and lead to problematic deposits on leads and reflectors. Depending on the application, sufficient ventilation of the working area therefore must be provided.

Tests

In every application, there are, in practice, working and environmental parameters which cannot be calculated exactly in theory. That is why we recommend generally testing quartz heaters in the application under real working conditions in advance.

Wiring Diagram



without thermocouple

with thermocouple

L + N	outer, shorter leads
TE + (NiCr)	inner, longer leads with green marking
TE - (Ni)	inner, longer leads without marking

No warranty claims can be derived from these user instructions.

