



Figure 1: Elstein BSH construction panel 375 x 750 mm with HSR

The BSH construction panel system was developed for optimum use of Elstein's HTS and HSR ceramic panel radiators.

Elstein BSH construction panels are infrared radiation areas being factory assembled. The ceramic infrared panel radiators are fixed to the MBO mounting sheets and surrounded with a frame section made from extruded aluminium alloy and stainless steel capping sections.

The user only has to do the wiring, insert the BSH panel in a steel section frame to be made on site and connect the panel with the electricity mains.

The BSH system is ideal for heating all types of goods with a large area and can be installed in any position.

Elstein BSH construction panels are available in dimensions from 125 x 250 mm up to 1000 x 1500 mm and can be fitted with radiators with wattages up to 600 W.

Length in mm

	Inner dim. (Outer dim.) [No. of rad.]	250 (267) [2]	375 (392) [3]	500 (517) [4]	625 (642) [5]	750 (767) [6]	875 (892) [7]	1000 (1017) [8]	1125 (1142) [9]	1250 (1267) [10]	1375 (1392) [11]	1500 (1517) [12]		Radiator wattage
Width in mm	125 (142) [1]	0.50 0.80 1.20	0.75 1.20 1.80	1.00 1.60 2.40	1.25 2.00 3.00	1.50 2.40 3.60	1.75 2.80 4.20	2.00 3.20 4.80	2.25 3.60 5.40	2.50 4.00 6.00	2.75 4.40 6.60	3.00 4.80 7.20	kW	250 W 400 W 600 W
	250 (267) [2]	1.00 1.60 2.40	1.50 2.40 3.60	2.00 3.20 4.80	2.50 4.00 6.00	3.00 4.80 7.20	3.50 5.60 8.40	4.00 6.40 9.60	4.50 7.20 10.80	5.00 8.00 12.00	5.50 8.80 13.20	6.00 9.60 14.40	kW	250 W 400 W 600 W
	375 (392) [3]	1.50 2.40 3.60	2.25 3.60 5.40	3.00 4.80 7.20	3.75 6.00 9.00	4.50 7.20 10.80	5.25 8.40 12.60	6.00 9.60 14.40	6.75 10.80 16.20	7.50 12.00 18.00	8.25 13.20 19.80	9.00 14.40 21.60	kW	250 W 400 W 600 W
	500 (517) [4]	2.00 3.20 4.80	3.00 4.80 7.20	4.00 6.40 9.60	5.00 8.00 12.00	6.00 9.60 14.40	7.00 11.20 16.80	8.00 12.80 19.20	9.00 14.40 21.60	10.00 16.00 24.00	11.00 17.60 26.40	12.00 19.20 28.80	kW	250 W 400 W 600 W
	625 (642) [5]	2.50 4.00 6.00	3.75 6.00 9.00	5.00 8.00 12.00	6.25 10.00 15.00	7.50 12.00 18.00	8.75 14.00 21.00	10.00 16.00 24.00	11.25 18.00 27.00	12.50 20.00 30.00	13.75 22.00 33.00	15.00 24.00 36.00	kW	250 W 400 W 600 W
	750 (767) [6]	3.00 4.80 7.20	4.50 7.20 10.80	6.00 9.60 14.40	7.50 12.00 18.00	9.00 14.40 21.60	10.50 16.80 25.20	12.00 19.20 28.80	13.50 21.60 32.40	15.00 24.00 36.00	16.50 26.40 39.60	18.00 28.80 43.20	kW	250 W 400 W 600 W
	875 (892) [7]	3.50 5.60 8.40	5.25 8.40 12.60	7.00 11.20 16.80	8.75 14.00 21.00	10.50 16.80 25.20	12.25 19.60 29.40	14.00 22.40 33.60	15.75 25.20 37.80	17.50 28.00 42.00	19.25 30.80 46.20	21.00 33.60 50.40	kW	250 W 400 W 600 W
	1000 (1017) [8]	4.00 6.40 9.60	6.00 9.60 14.40	8.00 12.80 19.20	10.00 16.00 24.00	12.00 19.20 28.80	14.00 22.40 33.60	16.00 25.60 38.40	18.00 28.80 43.20	20.00 32.00 48.00	22.00 35.20 52.80	24.00 38.40 57.60	kW	250 W 400 W 600 W

Maximum surface rating 38.4 kW/m²

Weight approx. 48 kg/m²

Other dimensions and surface ratings available on request

The outer dimensions indicated in the table do not include the AL-square sections.

Figure 2: Overview of the standard dimensions, outer dimensions (), number of radiators [] and the connected loads in kW

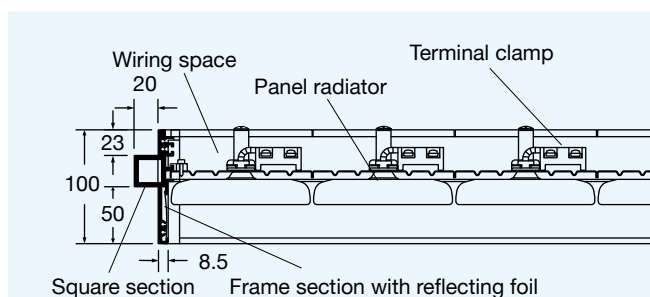


Fig. 3: Structural design of the BSH construction panel
Dimensions in mm



Fig. 4: Wiring space of a BSH construction panel

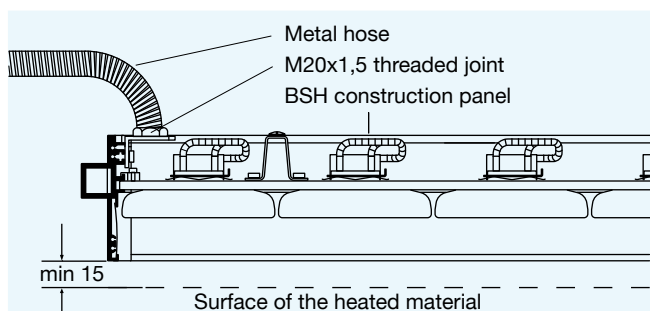


Fig. 5: Arrangement of the connection unit for establishing the mains connection. Dimensions in mm



Fig. 6: BSH construction panel, inserted in a steel section frame

Standard scope of delivery (variants available on request)

Ceramic infrared radiators HTS and T-HTS or HSR and T-HSR, fitted

Radiators can be chosen from the radiator power ratings 250 W, 400 W and 600 W. Mixed radiator wattages can also be fitted. One radiator with integrated thermocouple (T-HTS or T-HSR respectively) is provided for each construction panel.

Extruded AL-frame sections with AL-square section and capping sections made from stainless steel, fitted

These components are used to surround the ceramic infrared radiators fixed to the MBO mounting sheets. The square section with a side upstand enables the BSH construction panels to be hung into a steel section frame to be built on site.

AK bipolar terminal clamps, fitted and connected with radiator power leads

For the electrical wiring of the individual radiators in connection with heat resistant insulated nickel wires and connection of the thermocouple radiator with the heat resistant insulated thermo line.

Mounting units, enclosed, individual parts are not fitted

A mounting unit contains an angle section, up to 3 heat resistant flexible metal hoses 1m long as well as M20- and other screw fitting accessories. The hoses are used to hold the nickel wire and thermo line and to protect them from mechanical stress. The mounting units can be fixed to anywhere on the BSH frame section.

Wiring material (nickel wire, thermo line), enclosed

Nickel wire (2.5 mm², max. 500 °C, max. 11 A) is supplied for the electrical wiring of the ceramic infrared radiators. The thermo line (1 mm², max. 400 °C) is used to connect the thermocouple to the controller. The Elstein product range includes a compensating line (1 mm², max. 100 °C) for extending this connection outside the IR radiation area.

Our instructions for mounting, operation and safety must be observed.

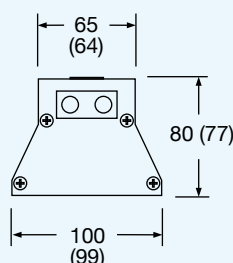
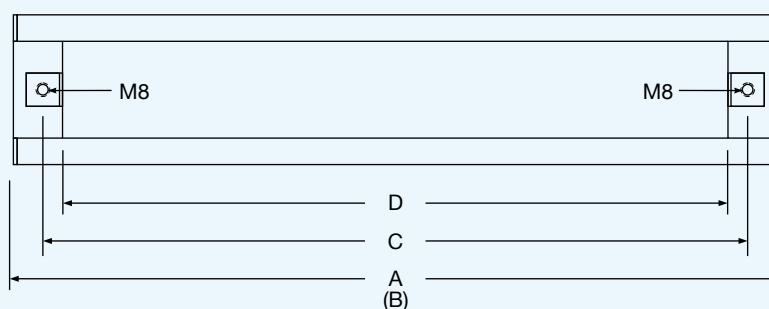


Elstein EBF-R construction elements are supplied in assembled condition and are equipped with universal power rails. The construction elements can be equipped with Elstein ceramic panel radiators FSM, FSR, HSR/1, HTS/1, SHTS/1 and FSM/2, FSR/2, HSR/2, HTS/2, SHTS/2, whereby it is also possible to combine different radiator designs and wattages of the same types of radiators.

For positioning the universal power rails in the wiring space of EBF-R ceramic terminals are used. With the help of clamping brackets, spring washers and screws the connection of the heaters is done to the terminal points of the universal power rail. The one-sided fixing of the universal power rail to one of the terminals enables their thermal expansion without tension.

Thus the EBF-R needs to be fixed in a steel section frame to be made on site and connected up with the electricity mains.

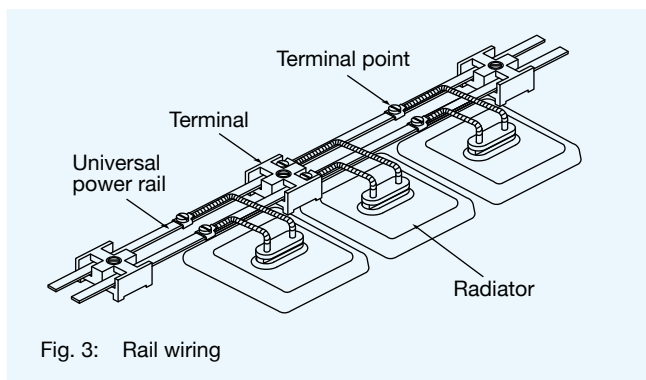
Elstein EBF-R construction elements are available in five lengths and can also be fitted together to form flat or curved radiation panels in any installed position.



	A	B	C	D
EBF-R/25***	260	255	217	190
EBF-R/50	510	505	467	440
EBF-R/75	760	755	717	690
EBF-R/100	1010	1005	967	940
EBF-R/125	1260	1255	1217	1190

***The standard scope of delivery for EBF-R/25 does not include a rail if a radiator with the dimensions 245 x 60 mm is mounted.

Figure 2: Mounting dimensions and EBF-R dimensions () in mm



Standard scope of delivery (variants and other lengths are available on request)

Ceramic infrared radiators, fitted, selectable heater types:

FSM, FSR, HSR/1, HTS/1, SHTS/1, FSM/2, FSR/2, HSR/2, HTS/2, SHTS/2

The maximum radiator power level available is 1200 W. Mixed radiator wattages and dimensions can be fitted.

Thermocouple radiators for temperature control are installed in the EBF-R construction element at the request of the customer. Accessories for controlling the temperature, such as the TRD 1 temperature controller and TSE thyristor switching units are included in the Elstein range of products.

REO reflectors for the radiator dimensions 245 x 60 mm and 122 x 60 mm, fitted

The REO reflectors are made from polished stainless steel. They are used for holding and fixing the radiators and reflecting the IR radiation in the direction of the material to be heated. On request, the reflectors fitted with ceramic infrared radiators are also available separately under the type designations REF/250 and REF/125.

Extruded frame and capping sections and end pieces made from aluminium, fitted

For surrounding the ceramic infrared radiators fixed to the REO reflectors. Each EBF-R construction element includes a capping section and two end pieces. The end pieces have an M8 thread for screwing the EBF-R construction element with a steel section frame. The end pieces also include a ceramic bushing for the electricity cables and a labelled safety earth terminal.

Universal power rails (8 x 2 mm) and terminals, both fitted, rails connected with radiator power leads

Fitted universal power rails being connected electrically with the ceramic infrared radiators. The rails have enough holes for connecting 245 x 60 mm radiators. Using radiators with smaller dimensions (122 x 60 mm) can require additional holes on the rails.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein FIS focus infrared radiator

Elstein focus infrared radiators FIS are ceramic IR-dark radiators with reflector made of aluminium and E27 screw caps.

The aluminium reflector focuses the infrared radiation being generated by a ceramic rod radiator so that the FIS radiator transmits a high radiation power to a small area.

This concentration of radiation power is especially suited for solving tasks dealing with the heating of selective or small areas.

The standardised E27 thread allows easy and safe installation, as the radiators can be screwed in like bulbs into porcelain or metal sockets with porcelain insert.

The standard power of Elstein focus infrared radiators FIS is 250 W.

FIS

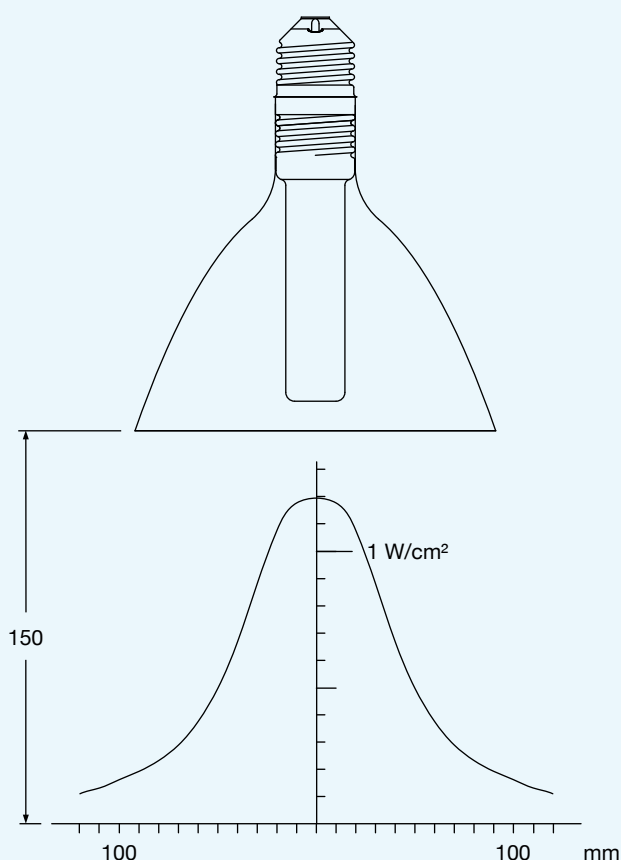
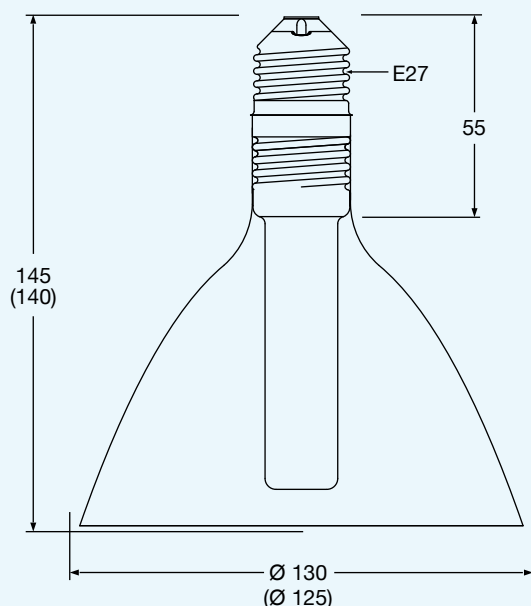
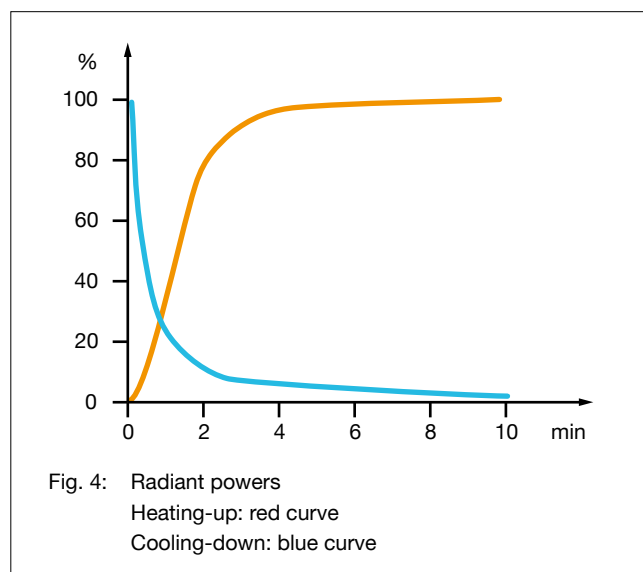
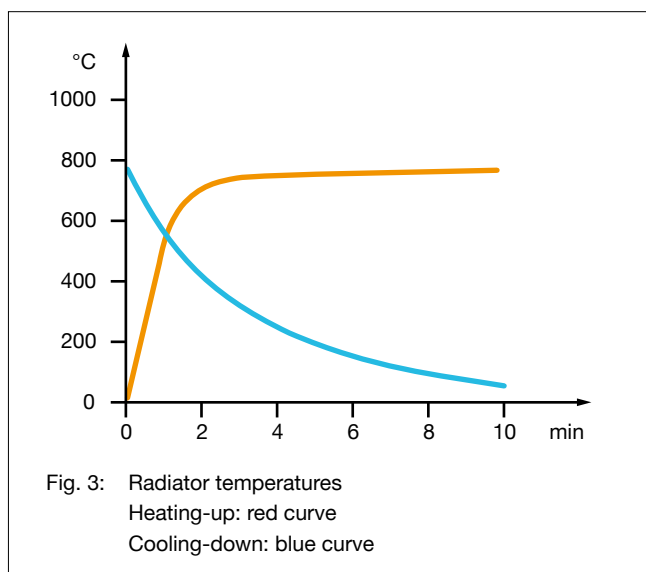


Figure 2: Mounting dimensions and radiator dimensions () in mm and power distribution



Type, weight, wattage	FIS	90 g	250	W
Surface rating			12.3	kW/m ²
Typical operating temperature			750	°C
Maximum permissible temperature			850	°C
Wavelength range			2 - 10	μm

Standard design Operating voltage 230 V Aluminium reflector E27 Edison screw cap	Thermocouple radiators Not available. For means of controlling output see below.	Variants Special wattages Special voltages
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The power can be adjusted using proprietary power controllers or dimmers.

Porcelain or metal sockets with porcelain inserts are to be used both for electrical and mechanical connection of Elstein FIS radiators. The sockets must not contain any plastic components.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein FSF series

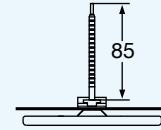
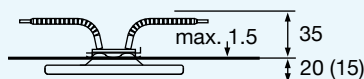
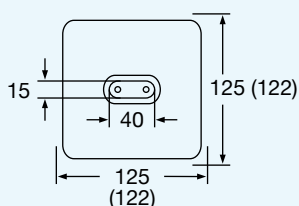
Elstein FSF panel radiators are ceramic infrared radiators with a low overall height. They are produced using a full-pour casting ceramic process and are designed for operating temperatures up to 720 °C and surface ratings up to 64 kW/m².

Compared to other Elstein panel radiators, which have the standard socket, the overall height of the FSF radiators, measured from the radiation surface up to the mounting plate, has been reduced by approximately 45 %.

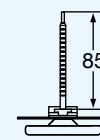
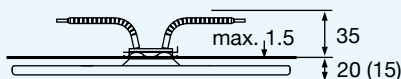
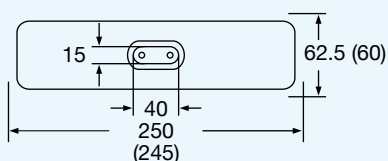
FSF series radiators can be used universally. The low overall height of the radiators enables space-saving installation, for example, which may be required to retrofit machines.

Elstein FSF radiators are available in four designs and cover the power range from 60 W to 1000 W. They have the customary market dimensions and can therefore be replaced with radiators with corresponding properties if the requirements change.

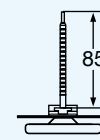
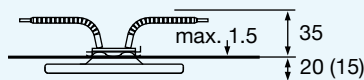
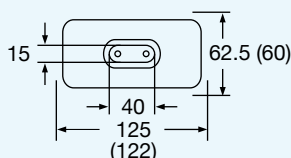
FSF



FSF/1



FSF/2



FSF/4

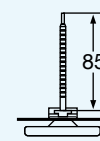
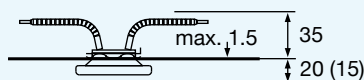
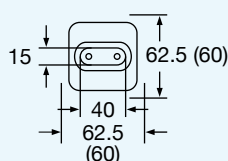
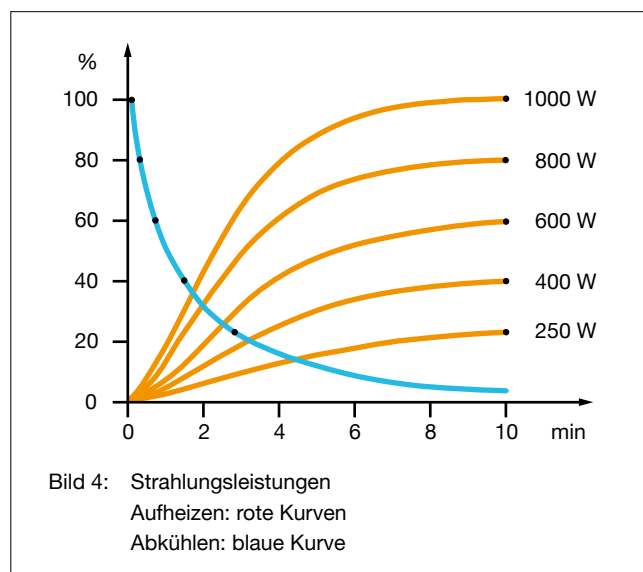
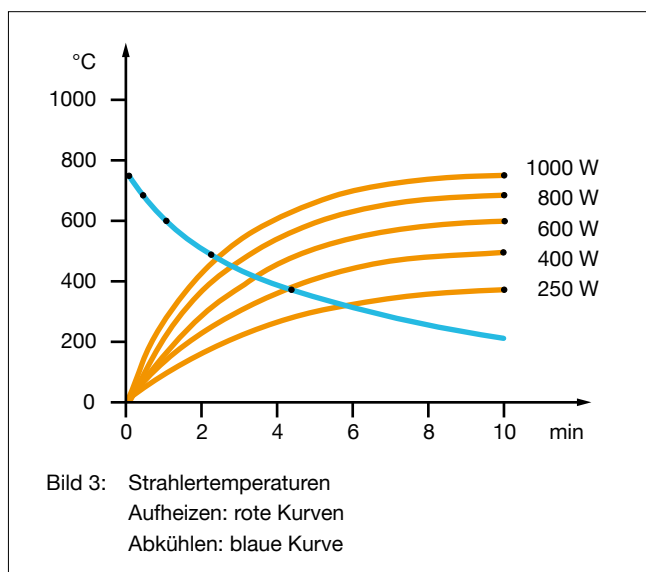
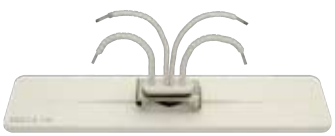


Figure 2: Mounting dimensions and radiator dimensions () in mm



Typ, Gewicht, Leistung	FSF/1, FSF	220 g	250	400	600	800	1000	W
	FSF/2	125 g	125	200	300	400	500	W
	FSF/4	75 g	60	100	150	200	250	W
Flächenleistung			16,0	25,6	38,4	51,2	64,0	kW/m ²
Typische Betriebstemperatur			400	500	590	670	720	°C
Maximal zulässige Temperatur			750	750	750	750	750	°C
Wellenlängenbereich			2 - 10					µm

Standardausführung	Thermoelementstrahler	Varianten
Betriebsspannung 230 V Keramik-Vollguss Anschlüssen 85 mm Elstein Normsockel Befestigungsgarnitur	Bezeichnung T-FSF, T-FSF/1, T-FSF/2, T-FSF/4 Integriertes Thermoelement Typ K (NiCr-Ni) TE-Anschlüssen 100 mm	Sonderleistungen Sonderspannungen Verlängerte Anschlüssen Anschlüssen mit Ringkabel- schuhen
		

Die Leistung ist regelbar mittels Thermoelementstrahlern in Verbindung mit Temperaturreglern TRD 1, Thyristorschalteinheiten TSE und weiterem Zubehör.

IR-Strahlungsflächen können mit Montageblechen MBO aufgebaut werden.

Für den jeweiligen Anwendungsfall sind die nationalen Sicherheitsvorschriften zu beachten, wie zum Beispiel die IEC- oder EN-Norm 60519-1, Sicherheit in Elektrowärmeanlagen.

Unsere Montageanleitungen, Betriebs- und Sicherheitshinweise sind zu beachten.



Figure 1: Elstein FSL series

Elstein FSL long panel radiators are ceramic infrared radiators with a low overall height, designed for operating temperatures up to 550 °C and surface ratings up to 45 kW/m².

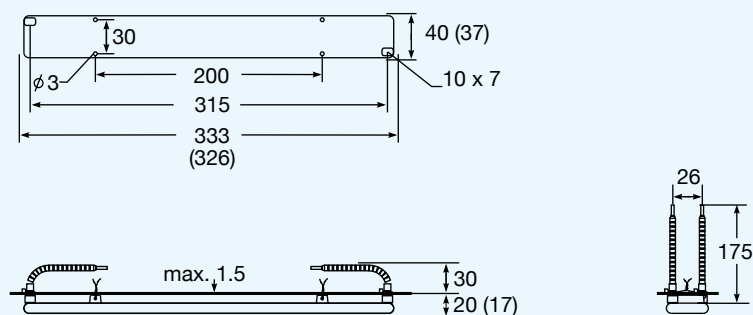
They have two sockets with integrated litz fixing wires, which are put through corresponding holes in the mounting sheet and twisted behind it. In this way FSL radiators are easy to install and are space-saving. No special pre-punched holders or reflector plates are required for the assembly.

FSL series radiators are particularly suitable for lamellar heating tasks due to their long narrow design.

An example for lamellar heating tasks can be found in the lamp industry where FSL radiators are used for curing the coating of fluorescent tubes.

Elstein FSL long panel radiators are available in two designs with 300 W and 600 W.

FSL



FSL/2

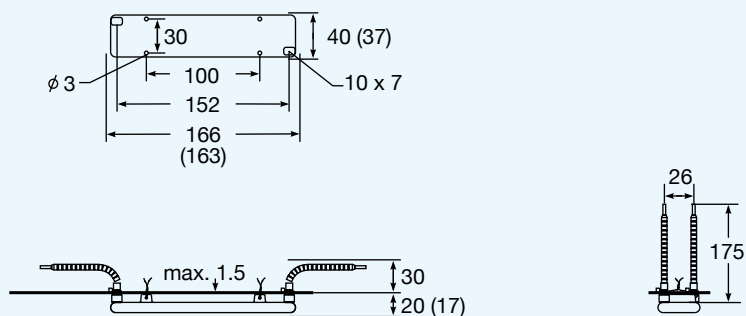
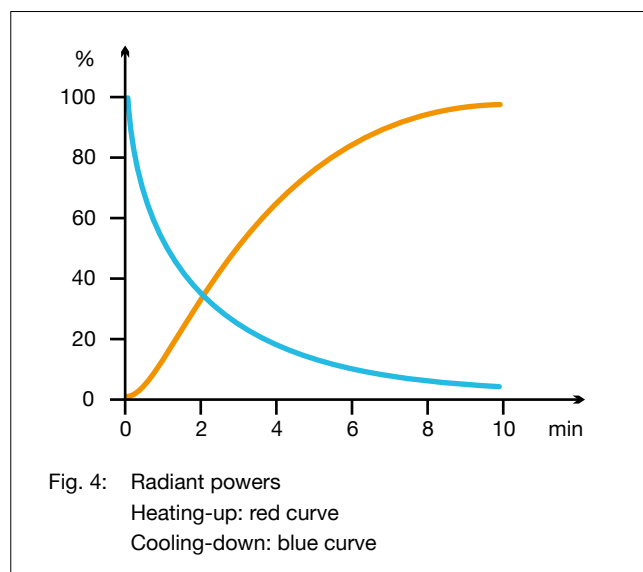
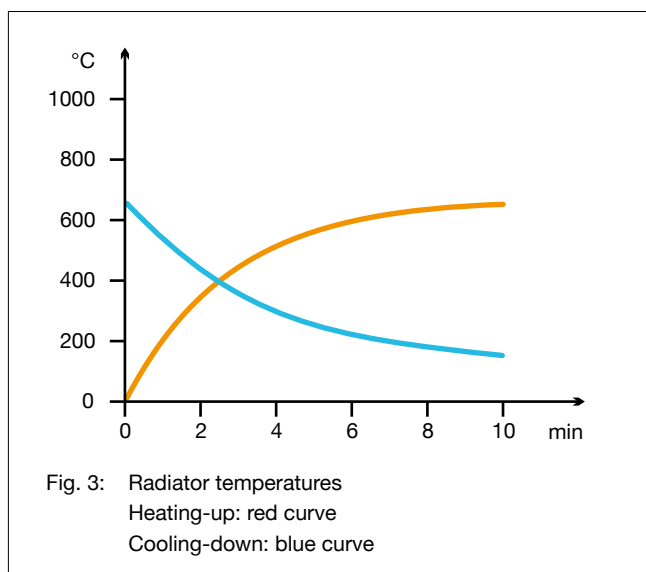


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	FSL	220 g	600	W
	FSL/2	130 g	300	W
Surface rating			45.0	kW/m ²
Typical operating temperature			550	°C
Maximum permissible temperature			700	°C
Wavelength range			2 - 10	μm

Standard design Operating voltage 230 V Ceramic full-pour casting Leads 175 mm Two litz mountings	Thermocouple radiators Designation T-FSL, T-FSL/2 Integrated thermocouple Type K (NiCr-Ni) TC leads 110 mm 	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein HFS series

Elstein HFS panel radiators are ceramic infrared radiators, which are designed for medium surface ratings up to 38.4 kW/m^2 and operating temperatures up to 700°C .

HFS series radiators are made using a hollow casting ceramic process. Compared to ceramic IR radiators produced using the full-pour casting process, HFS radiators have a considerably shorter heating-up time.

This technique was successfully used first for HFS radiators and then further developed for subsequent models.

HFS panel radiators are available in four designs and cover the power range from 60 W to 600 W.

Elstein HFS panel radiators have customary market dimensions and can therefore be replaced with radiators with the relevant properties if the requirements change.

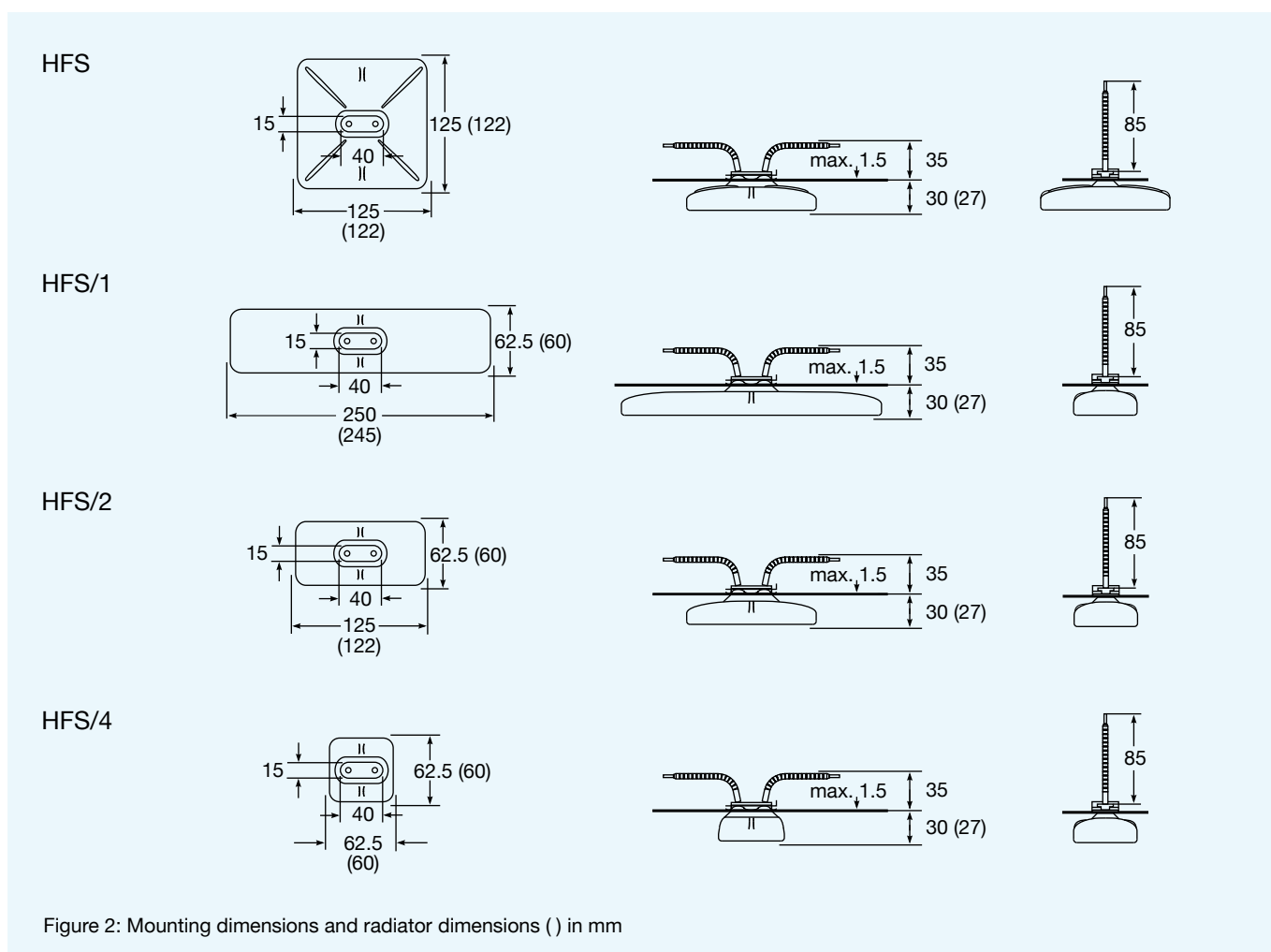
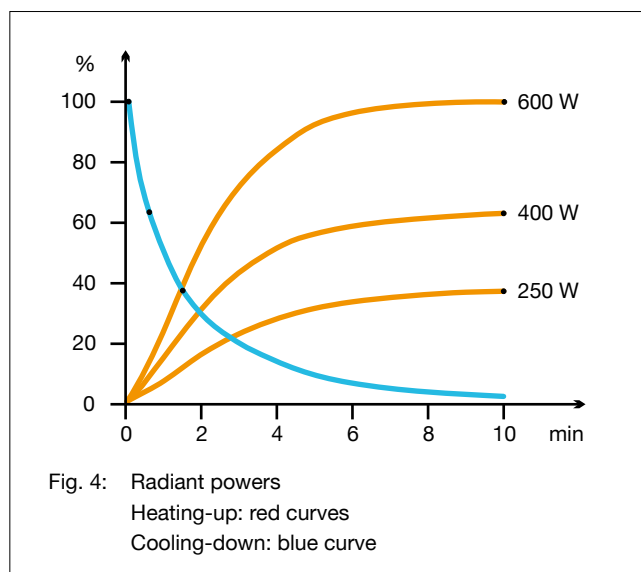
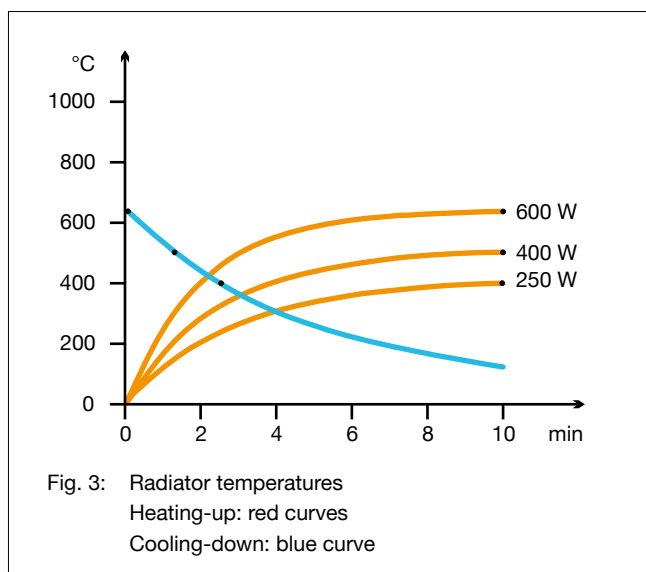


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	HFS/1, HFS	220 g	250	400	600	W
	HFS/2	125 g	125	200	300	W
	HFS/4	75 g	60	100	150	W
Surface rating			16.0	25.6	38.4	kW/m ²
Typical operating temperature			420	510	630	°C
Maximum permissible temperature			700	700	700	°C
Wavelength range			2 - 10			µm

Standard design Operating voltage 230 V Ceramic hollow casting White glaze Leads 85 mm Elstein standard socket Mounting set	Thermocouple radiators Designation T-HFS, T-HFS/1, T-HFS/2, T-HFS/4 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

IR radiation areas can be assembled using REO reflectors, REF construction sets and MBO mounting sheets.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein HLF panel radiator

Elstein HLF panel radiators are ceramic infrared radiators, which can be used for operating temperatures up to 700°C and surface ratings up to 42 kW/m².

The elongated socket of the HLF radiators allows inserting of a heat insulation layer between the radiation surface and the mounting sheet.

Due to this design in connection with heat insulation the radiation efficiency of a ceramic radiator was increased significantly for the first time. On the other hand a relatively thick heating panel was the consequence.

In the course of the further development the heat insulation was integrated into the radiator. This led to our HTS high temperature radiator with short standard socket. Today the radiators of the HTS series are the industrial state-of-the-art for heating and drying machines.

Elstein HLF panel radiators cover the power range from 250 W to 650 W.

HLF

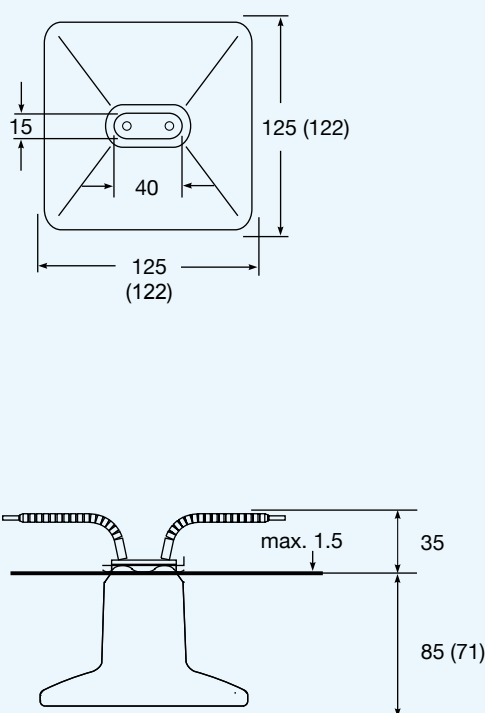
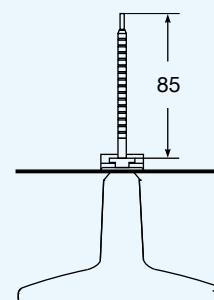
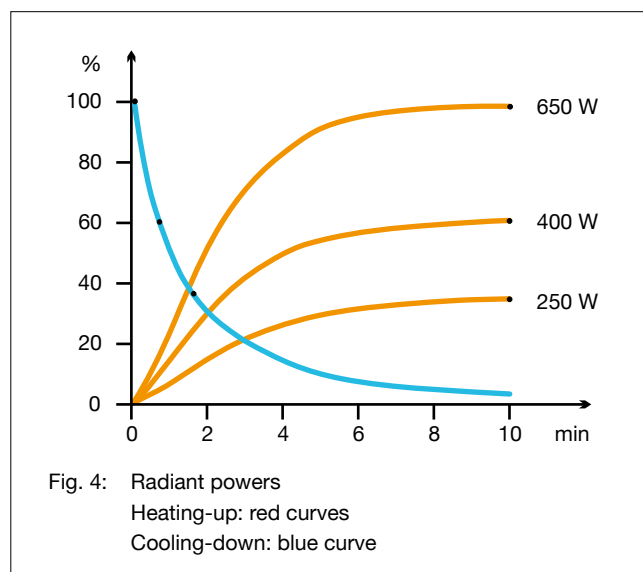
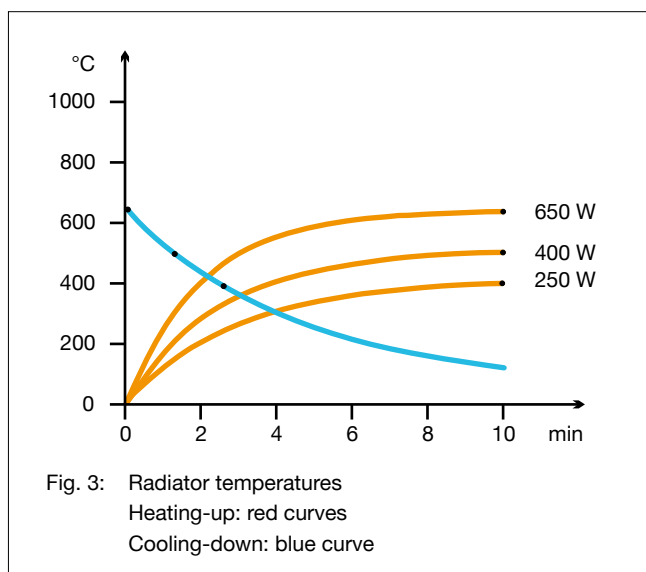


Figure 2: Mounting dimensions and radiator dimensions () in mm





Type, weight, wattage	HLF	270 g	250	400	650	W
Surface rating			16.0	25.6	41.6	kW/m ²
Typical operating temperature			420	510	630	°C
Maximum permissible temperature			700	700	700	°C
Wavelength range			2 - 10			μm

Standard design	Thermocouple radiators	Variants
Operating voltage 230 V Ceramic hollow casting White glaze Leads 85 mm Elstein standard socket Mounting set	Designation T-HLF Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Special wattages Special voltages Extended leads Leads with ring terminals

The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein HLF/S panel radiator

Elstein HLF/S panel radiators are ceramic infrared radiators, which can be used for operating temperatures up to 750 °C and surface ratings up to 64 kW/m².

Compared to other Elstein panel radiators the design of HLF/S-radiators is characterised by a heightened back with an extended socket.

HLF/S panel radiators are used in heating panels or machines, which are designed for the model of HLF/S radiators.

Since the Elstein HTS series with integrated thermal insulation was developed the HTS radiators represent the industrial state-of-the-art and are preferred for implementing projects of new machines and plants.

Elstein HLF/S panel radiators cover the power range from 250 W to 1000 W.

HLF/S

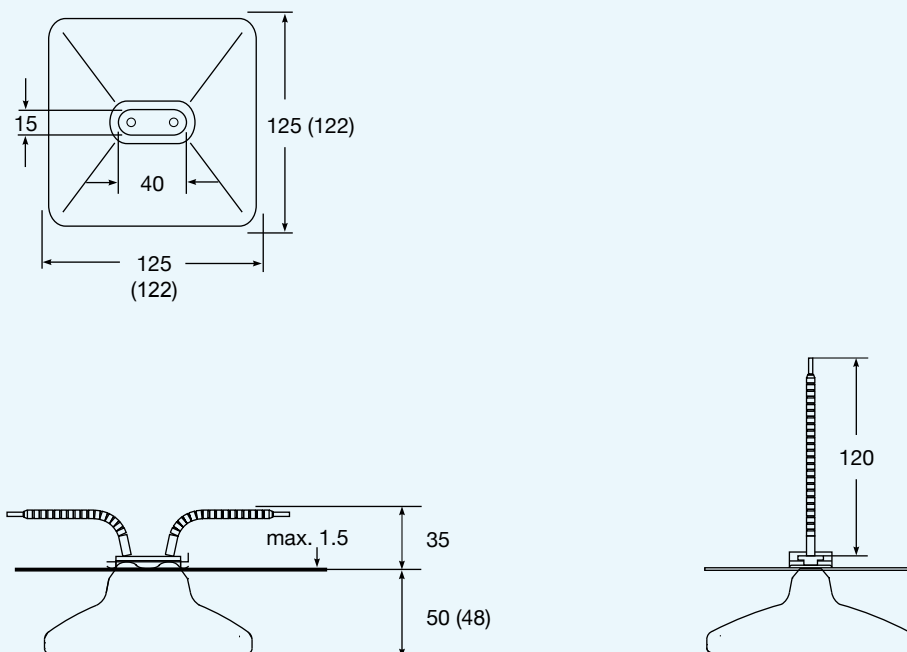


Figure 2: Mounting dimensions and radiator dimensions () in mm

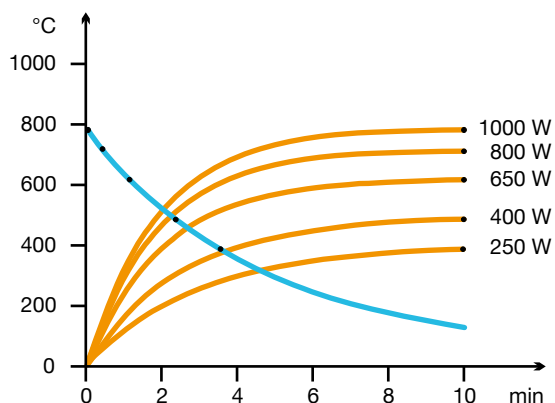


Fig. 3: Radiator temperatures
Heating-up: red curves
Cooling-down: blue curve

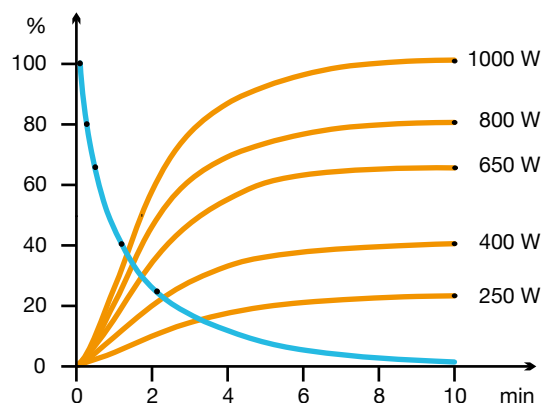


Fig. 4: Radiant powers
Heating-up: red curves
Cooling-down: blue curve

Type, weight, wattage	HLF/S	220 g	250	400	650	800	1000	W
Surface rating			16.0	25.6	41.6	51.2	64.0	kW/m ²
Typical operating temperature			420	530	660	700	720	°C
Maximum permissible temperature			750	750	750	750	750	°C
Wavelength range			2 - 10					µm

Standard design	Thermocouple radiators	Variants
Operating voltage 230 V Ceramic hollow casting White glaze Leads 120 mm Elstein standard socket Mounting set	Designation T-HLF/S Integrated thermocouple Type K (NiCr-Ni) TC leads 120 mm	Special wattages Special voltages Extended leads Leads with ring terminals

The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein IPO screw radiator

Elstein radiators IPO are ceramic infrared dark radiators with E27 screw cap.

The standardised E27 thread allows easy and safe installation, as the radiators can be screwed in like bulbs into porcelain or metal sockets with porcelain insert.

Due to their simple connection, IPO infrared radiators are suitable both for individual operation and for configuring groups of radiators.

An example for an application is shown in our product catalog. A three dimensional heating panel for laminating door trims was built by using IPO radiators (page 6, figure 8).

The power can be adjusted using a proprietary dimmer.

Elstein screw radiators IPO have a power of 150 W.

IPO

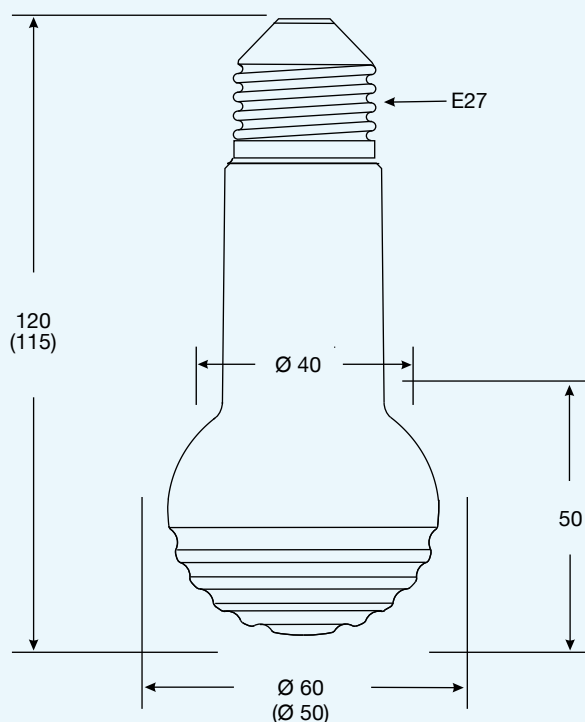
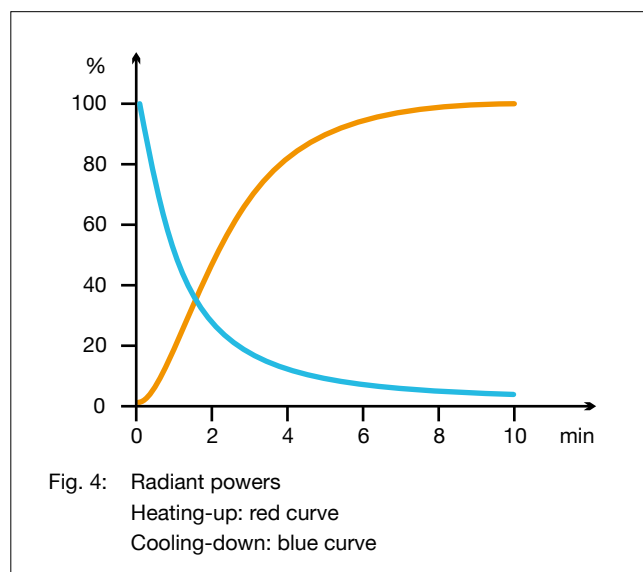
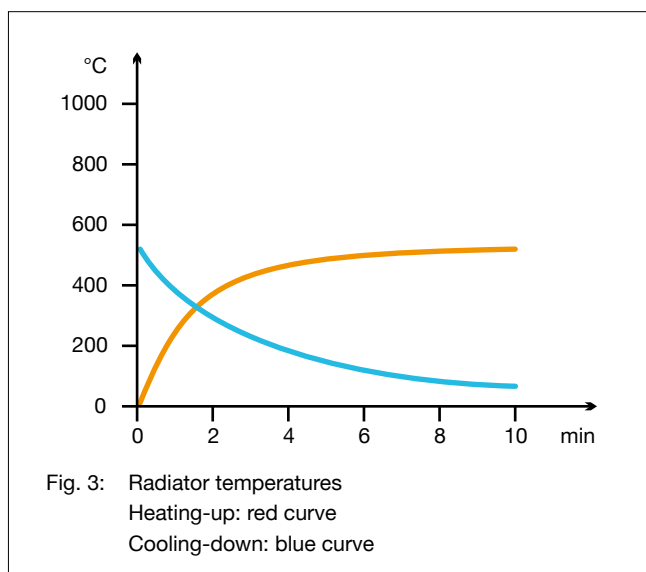


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	IPO	75 g	150	W
Surface rating			38.4	kW/m ²
Typical operating temperature			510	°C
Maximum permissible temperature			550	°C
Wavelength range			2 - 10	μm

Standard design Operating voltage 230 V Ceramic hollow casting White glaze E27 Edison screw cap	Thermocouple radiators Not available. For means of controlling output see below.	Variants Special wattages Special voltages
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The power can be adjusted using proprietary power controllers or dimmers.

Porcelain or metal sockets with porcelain inserts are to be used both for electrical and mechanical connection of Elstein IPO radiators. The sockets must not contain any plastic components.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure. 1: Elstein IPT series

Elstein IPT radiators are ceramic infrared dark radiators with E27 screw caps.

The standardised E27 thread allows easy and safe installation. The radiators can be screwed in like bulbs into porcelain or metal sockets with porcelain insert.

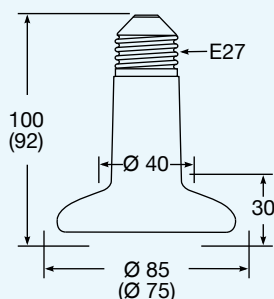
Due to their simple connection, IPT infrared radiators are suitable both for individual operation and for configuring groups of radiators.

Heaters of the IPT series are mainly used for two applications. In sulphur evaporators IPT/75 makes the sulphur liquid and evaporating, so that fighting against vermin is done in an environment-friendly way.

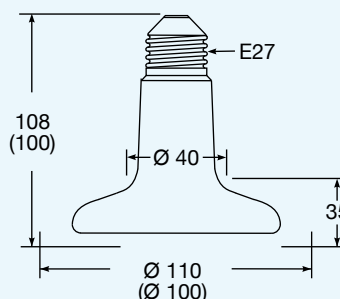
A further application is using the heaters of the IPT series in terrariums to generate comfortable and close-to-nature heat radiation for reptiles and insects.

Elstein IPT screw radiators are available in three designs and power ranges from 60 W to 500 W.

IPT/75



IPT/100



IPT/125

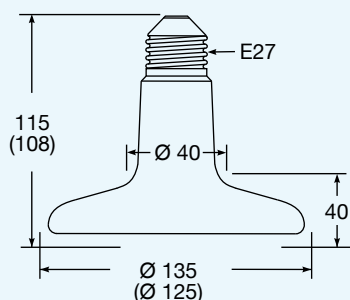
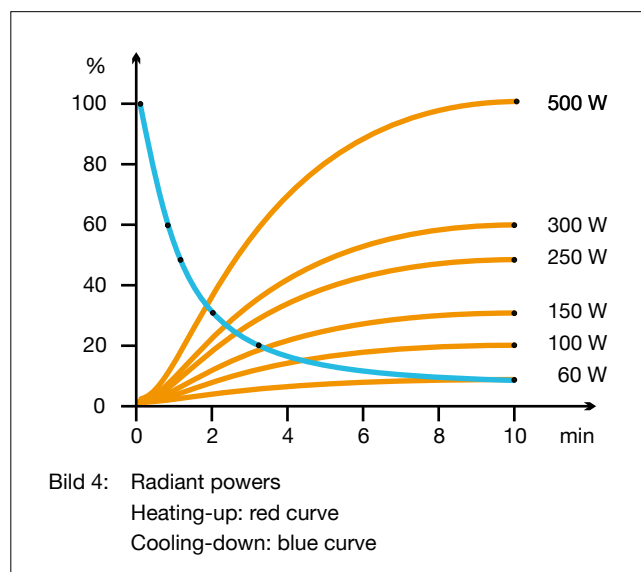
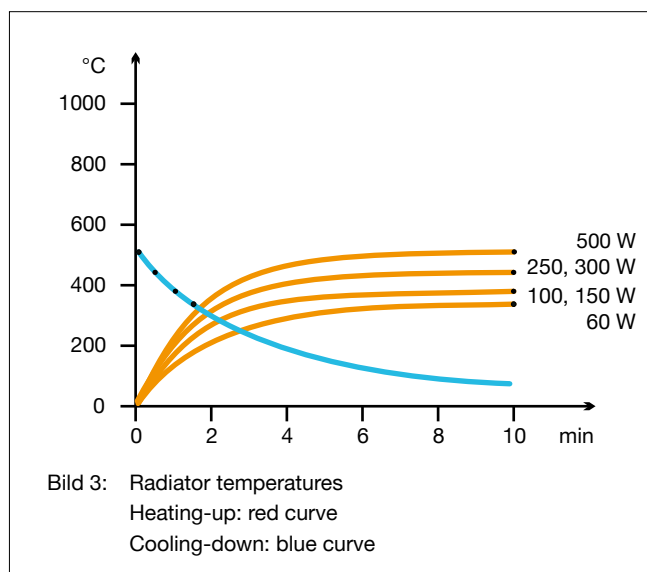


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	IPT/75	85 g	60	100	-	-	-	-	W
	IPT/100	150 g	-	-	150	250	-	-	W
	IPT/125	210 g	-	-	-	-	300	500	W
Surface rating			8,6	14,4	13,2	22,0	18,1	30,3	kW/m ²
Typical operating temperature			290	380	370	460	430	510	°C
Maximum permissible temperature			530	530	530	530	530	530	°C
Wavelength range			2 - 10						µm

Standard design Operating voltage 230 V Ceramic hollow casting White glaze E27 Edison screw cap	Thermocouple radiators Not available. For means of controlling output see below.	Variants Special wattages Special voltages
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The power can be adjusted using proprietary power controllers or dimmers.

Porcelain or metal sockets with porcelain inserts are to be used both for electrical and mechanical connection of Elstein IPT radiators. The sockets must not contain any plastic components.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Fig. 1: Elstein IRH infrared radiator. Picture on top and in the middle: front. Lower picture: back

Elstein IRH infrared radiators are ceramic radiators in convex design.

The radiating surface consists of ten small longish radiation surfaces, which are also designed in a convex shape.

Compared to IRH/S the radiating surface was enlarged by almost 60 %, which is more advantageous for the radiation distribution in the room.

Additionally also aesthetical requirements in the well-ness sector are fulfilled in a particular way.

The thermally insulating inner space of IRH has a share in improving the radiator's efficiency.

When connected to 230 V the Elstein IRH infrared radiators are available in wattages of 200 W and 250 W.

Special wattages and voltages are available on request.

IRH

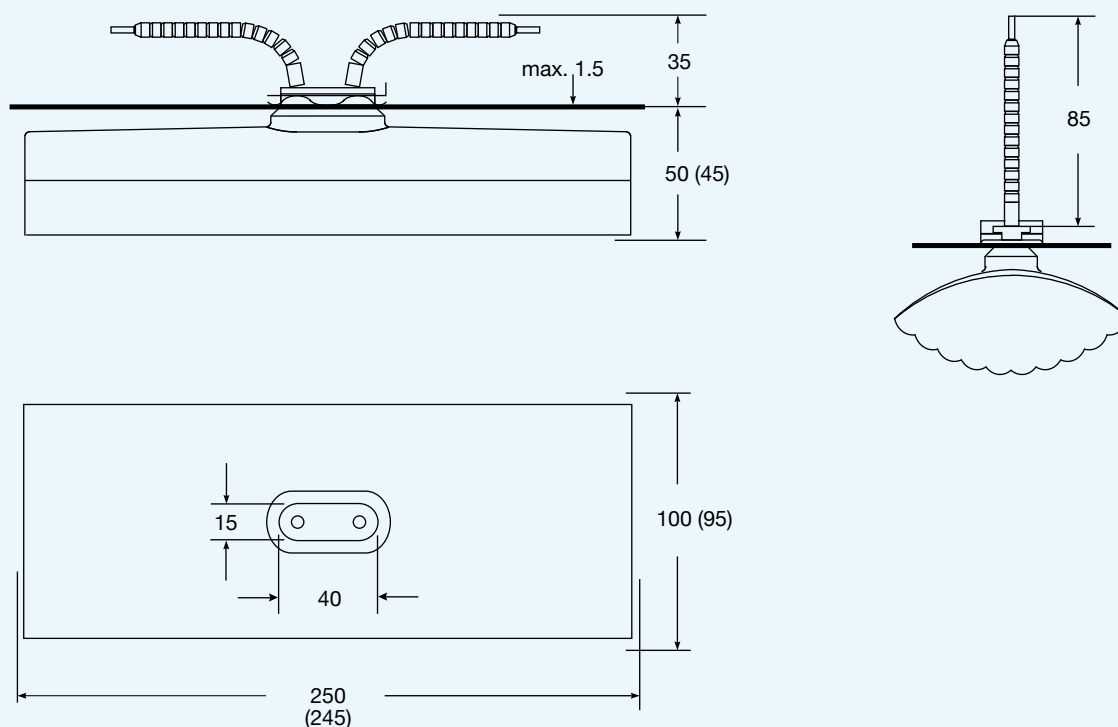
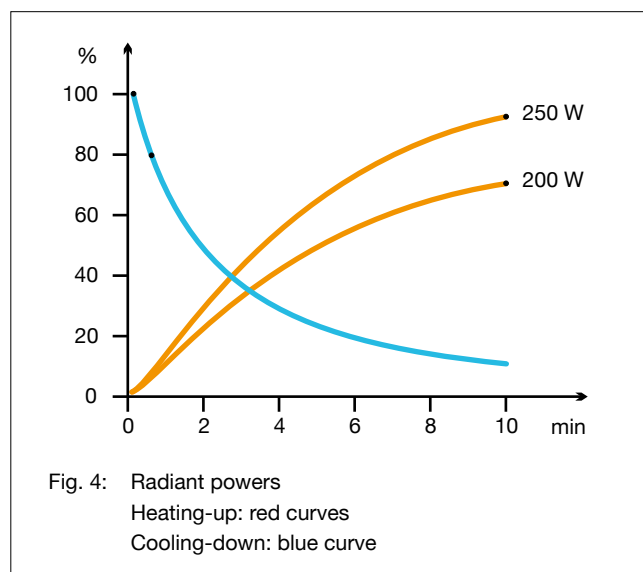
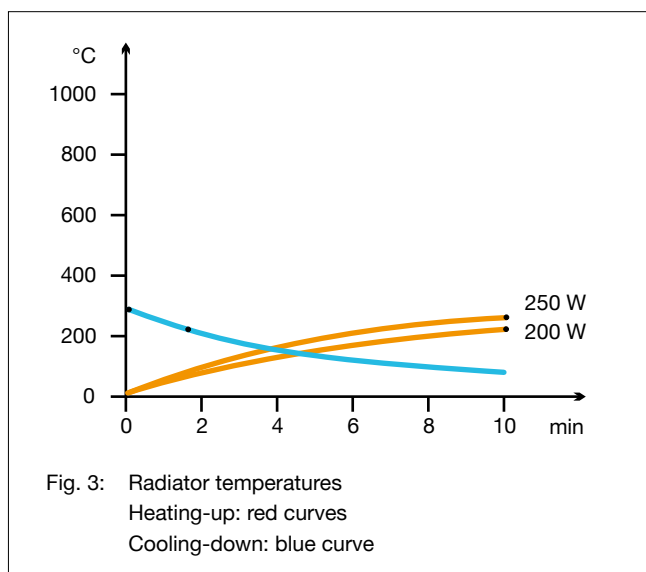


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	IRH	330 g	200	250	W
Surface rating			8.0	9.6	kW/m ²
Typical operating temperature			260	290	°C
Maximum permissible temperature			400	400	°C
Wavelength range			3 - 10		μm

Standard design Operating voltage 230 V Ceramic hollow casting White glaze Leads 85 mm Elstein standard socket Mounting set	Thermocouple radiators Designation T-IRH Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using proprietary power controllers or dimmers.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1 „Safety in electrical heating installations“, or the EN 60335 Part 2-53 „Special requirements for sauna heating devices and infrared cabins“.

Our instructions for mounting, operation and safety must be observed.



Fig. 1: Elstein IRH/S infrared radiator. Picture on top and in the middle: front. Lower picture: back

Elstein IRH/S infrared radiators are ceramic radiators. Their radiating surface is arranged in six small longish and convexly designed radiation surfaces. The whole radiation surface of IRH/S is also convexly designed with a white glaze.

Such model is more advantageous for the radiation distribution in the room. Additionally also aesthetical requirements in the wellness sector are fulfilled.

The IRH/S radiator is fixed to the reflector by using the Elstein standard socket. Due to this kind of fixing and also due to the outer dimensions of the radiator a relatively simple retro- or backfitting of existing systems is possible.

The thermally insulating inner space of IRH/S has a share in improving the radiator's efficiency.

When connected to 230 V the Elstein IRH/S infrared radiators are available in wattages of 150, 200 and 250 W.

Special wattages and voltages are available on request.

IRH/S

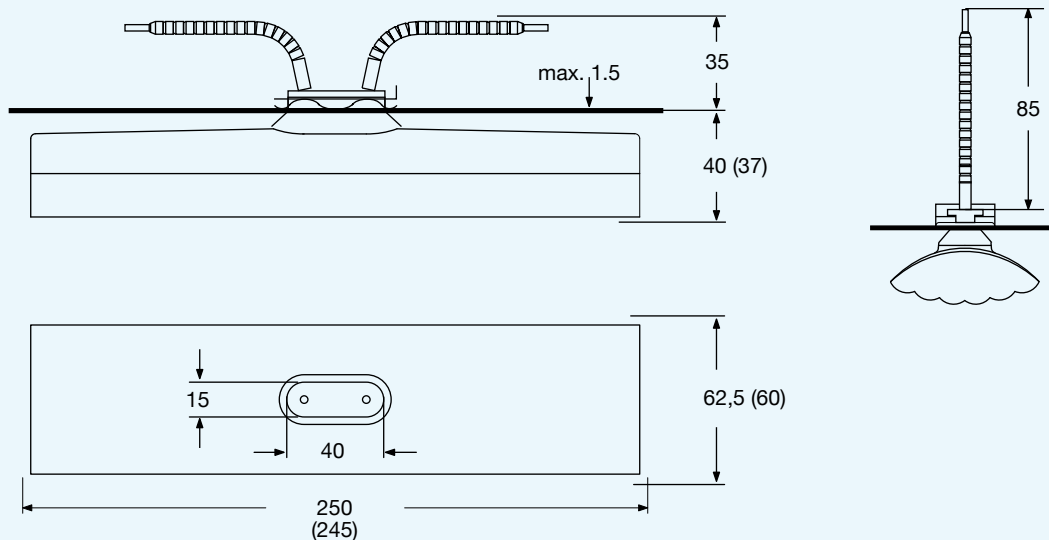
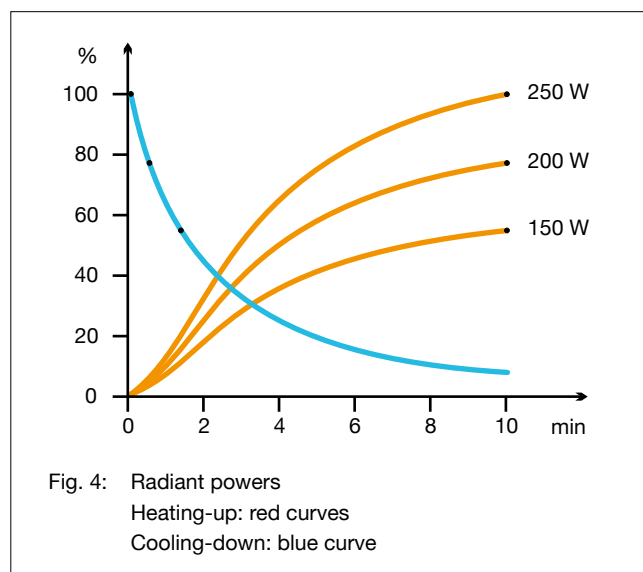
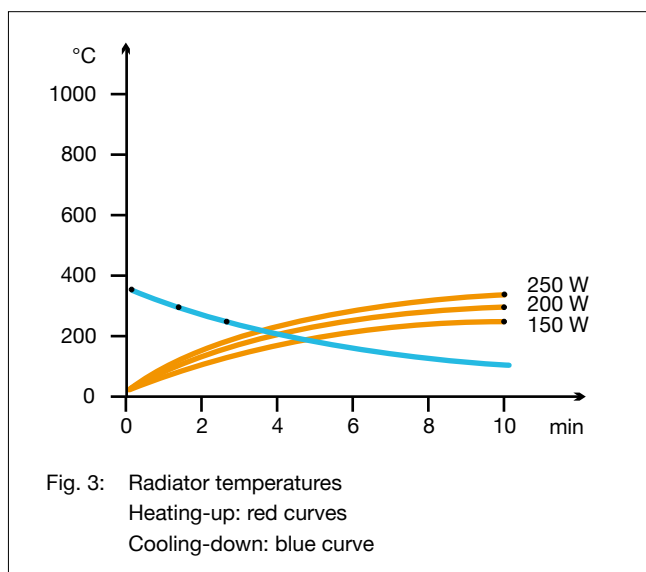


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	IRH/S	220 g	150	200	250	W
Surface rating			9.6	12.8	16.0	kW/m ²
Typical operating temperature			260	300	350	°C
Maximum permissible temperature			400	400	400	°C
Wavelength range			3 - 10			µm

Standard design Operating voltage 230 V Ceramic hollow casting White glaze Leads 85 mm Elstein standard socket Mounting set	Thermocouple radiators Designation T-IRH/S Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using proprietary power controllers or dimmers.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1 „Safety in electrical heating installations“, or the EN 60335 Part 2-53 „Special requirements for sauna heating devices and infrared cabins“.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein IRS/330 rod radiator

Elstein IRS/330 rod radiators are ceramic infrared radiators with operating temperatures up to 750 °C and surface ratings up to 36 kW/m². They have one mounting socket on each side, with which they can be fixed to a mounting sheet with fixing springs.

The IRS/330 rod radiators replace the ISS radiators. They have larger mounting sockets and the heating rod has a bigger diameter. Both lead to an improved mechanical strength and high service life.

IRS/330 can be used in already existing ISS-systems or reflectors. Only the holes need to be enlarged so that the bigger sockets of IRS/330 can be inserted.

Next to linear heating tasks IRS/330 rod radiators are used as room, comfort or patio heater as well as heating element on terraces.

Elstein IRS/330 rod radiators are available with a power of 250 W and 400 W.

IRS/330

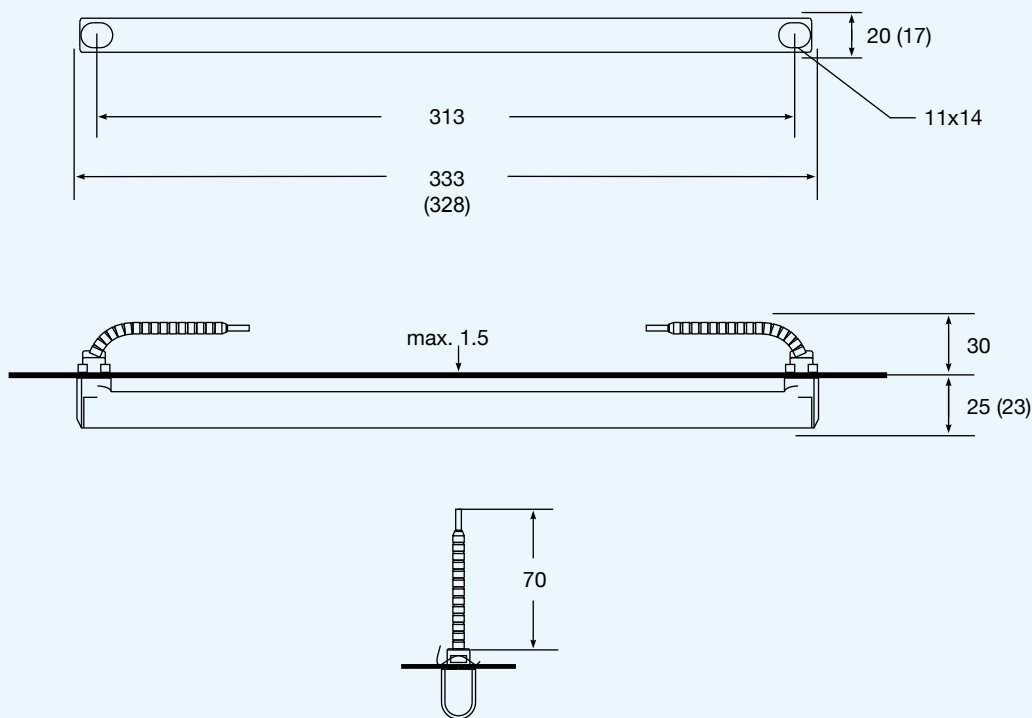
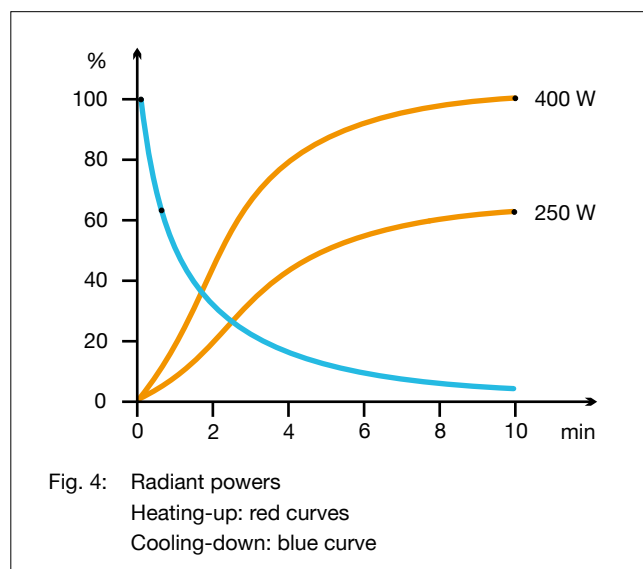
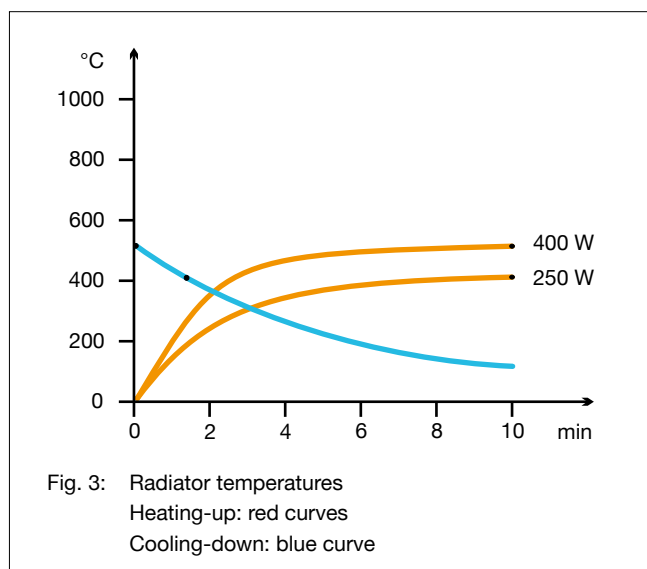


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	IRS/330	130 g	250	400	W
Surface rating			22.8	36.4	kW/m ²
Typical operating temperature			400	530	°C
Maximum permissible temperature			750	750	°C
Wavelength range			2 - 10		μm

Standard design Operating voltage 230 V White glaze Leads 70 mm Two mounting sockets Two fixing springs	Thermocouple radiators Designation T-IRS/330 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein IRS/K series

Elstein IRS/K rod radiators are ceramic infrared radiators, which are available in different lengths of up to 300 mm and surface ratings of up to 75 kW/m²

Unlike the IRS series radiators, which have the leads running through the mounting sockets on each side, the leads of IRS/K series lie only on one side (see figure 1).

Thus IRS/K radiators make the heating of the interior of hollow bodies like tubes or bottles possible.

Linear heating tasks that need one-sided leads can be solved, too.

If required IRS/K rod radiators are available with double sided leads.

Elstein IRS/K rod radiators cover the power range from 125 W to 750 W.

IRS/K

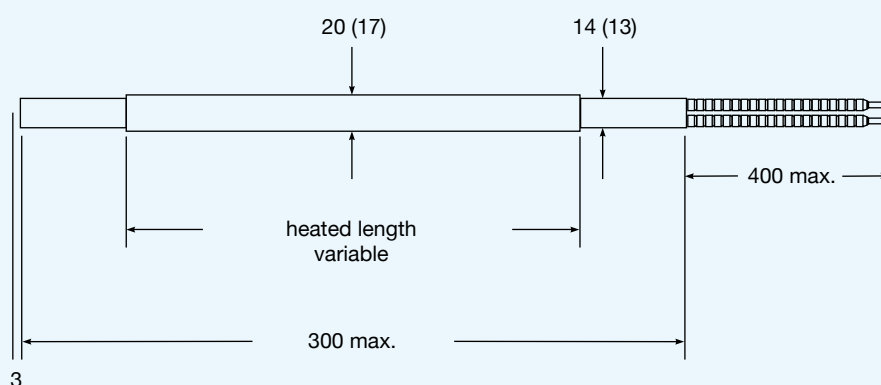
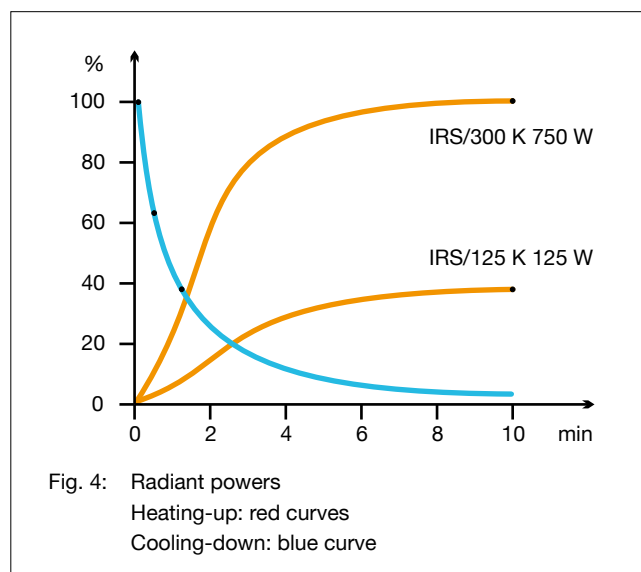
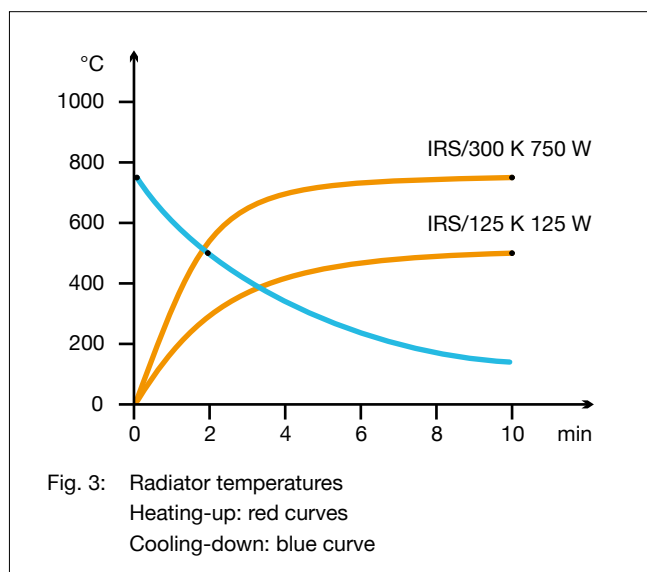


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	IRS/300 K, 300 mm	100 g	300	to	750	W
	to					
	IRS/125 K, 125 mm	40 g	125	to	300	W
Surface rating			30.0	to	75.0	kW/m ²
Typical operating temperature			400	to	700	°C
Maximum permissible temperature			750		750	°C
Wavelength range			2 - 10			µm

Standard design	Thermocouple radiators	Variants
Operating voltage 230 V White glaze Single sided leads Leads up to 400 mm Rod heated completely or partly	Designation T-IRS/**K Integrated thermocouple Type K (NiCr-Ni) TC leads up to 400 mm *** Length specification (e. g. T-IRS/125 K 300 W 230 V)	Special lengths Special wattages Special voltages Extended leads Double sided leads Leads with ring terminals

The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein ISN series

Elstein ISN rod radiators are ceramic infrared radiators, designed for surface ratings up to 72 kW/m² and operating temperatures of up to 750 °C.

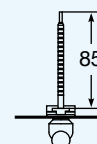
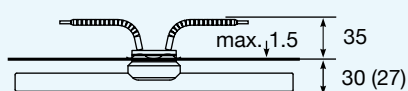
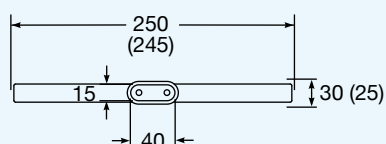
Within the product group of the ceramic infrared rod radiators only the radiators of the ISN series have the Elstein standard socket.

The Elstein standard socket makes a simple fixing to the mounting sheet possible. If required an exchange against other Elstein radiator types with standard socket is possible.

The rod shaped design makes ISN series radiators preferably suitable for linear heating tasks.

Elstein ISN rod radiators are available in two designs and cover the power range from 400 W to 600 W.

ISN



ISN/2

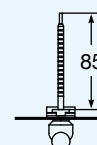
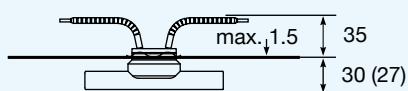
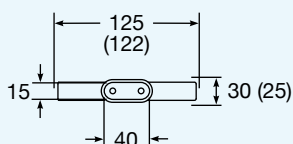
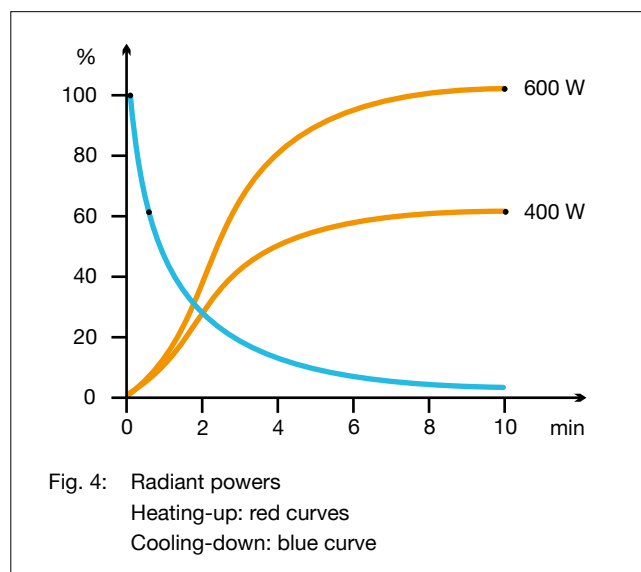
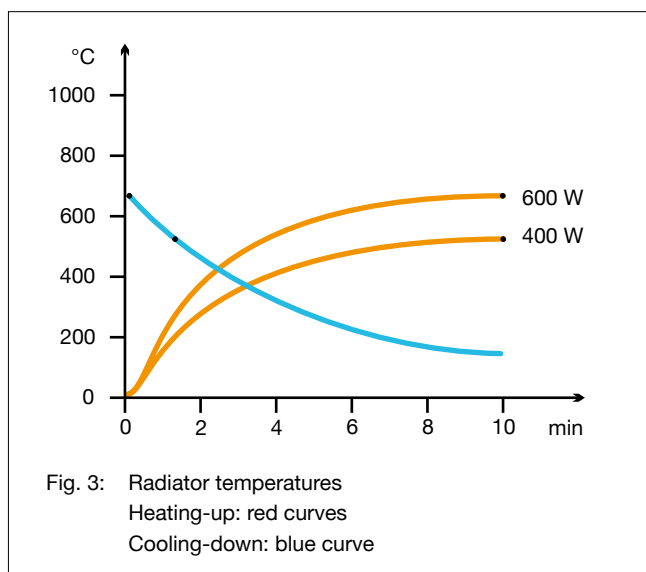


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	ISN	120 g	400	600	W
	ISN/2	75 g	200	300	W
Surface rating			48.0	72.0	kW/m ²
Typical operating temperature			550	650	°C
Maximum permissible temperature			750	750	°C
Wavelength range			2 - 10		μm

Standard design Operating voltage 230 V White glaze Leads 85 mm Elstein standard socket Mounting set	Thermocouple radiators Designation T-ISN, T-ISN/2 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

For building IR radiation areas with ISN series radiators the Elstein REO reflectors, REF construction sets, and EBF construction elements are suitable.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein ISS rod radiator

Elstein ISS rod radiators are ceramic infrared radiators with operating temperatures of up to 650 °C and surface ratings of up to 48 kW/m².

The ISS radiators have one mounting socket on each side, with which they can be fixed to a mounting profile using fixing springs.

Within the group of ceramic infrared rod radiators they are the rod radiators with the smallest diameter and enable therefore a space-saving installation.

Next to linear heating tasks ISS radiators are used as room, comfort or patio heater as well as heating element on terraces.

Elstein ISS rod radiators are available with a power of 250 W and 400 W.

ISS

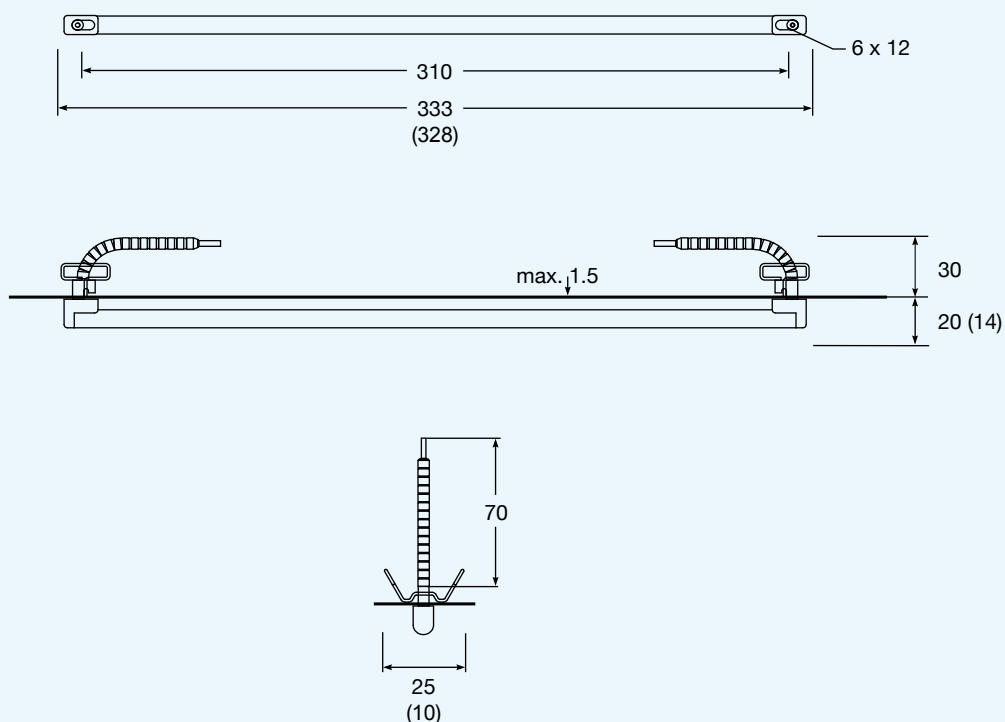
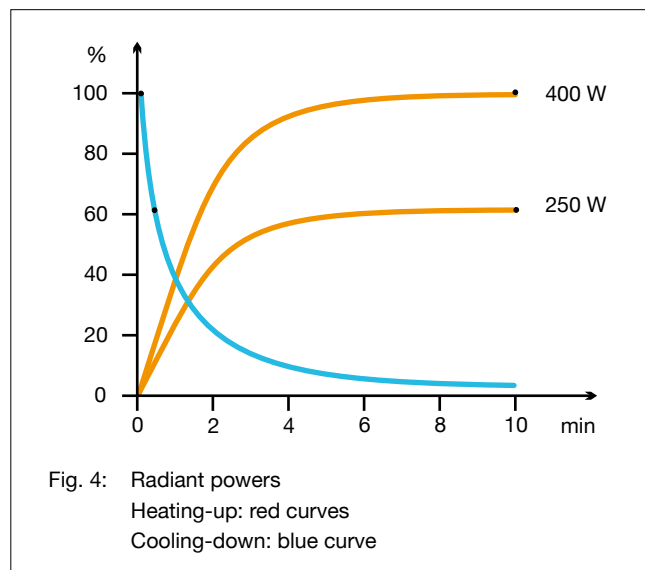
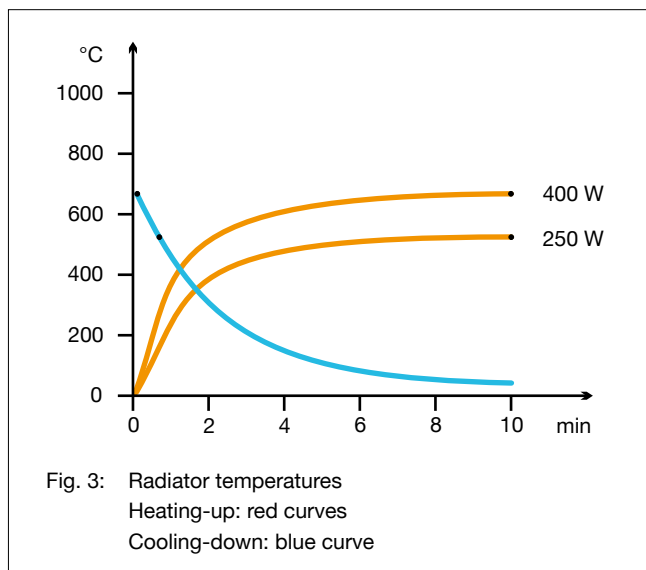


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	ISS	45 g	250	400	W
Surface rating			30.0	48.0	kW/m ²
Typical operating temperature			500	630	°C
Maximum permissible temperature			650	650	°C
Wavelength range			2 - 10		μm

Standard design Operating voltage 230 V White glaze Leads 70 mm Two mounting sockets Two fixing springs	Thermocouple radiators Not available. For means of controlling output see below.	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using proprietary power controllers or dimmers.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein KSS/60 sphere radiators

Elstein KSS/60 sphere radiators are ceramic infrared radiators, which are designed for operating temperatures up to 750 °C and surface ratings of up to 38 kW/m²

Three dimensional heating panels can be built with KSS/60 sphere radiators by arranging the radiators in higher or lower position.

This enables the adaptation of the heating panel to the design of three dimensional components. Such components are for example door trims for vehicles.

In this way KSS/60 sphere radiators enable an optimum heating of the three dimensional part.

Elstein KSS/60 sphere radiators are available with a power of 250 W.

KSS/60

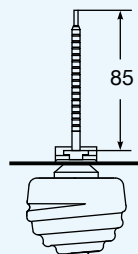
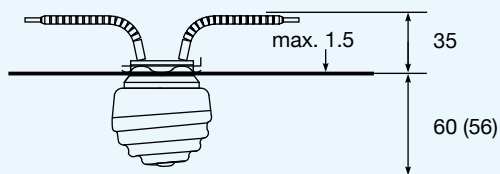
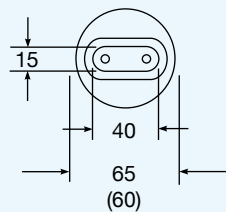


Figure 2: Mounting dimensions and radiator dimensions () in mm

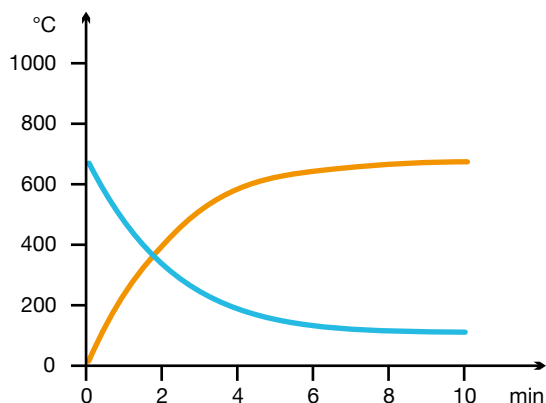


Fig. 3: Radiator temperatures
Heating-up: red curve
Cooling-down: blue curve

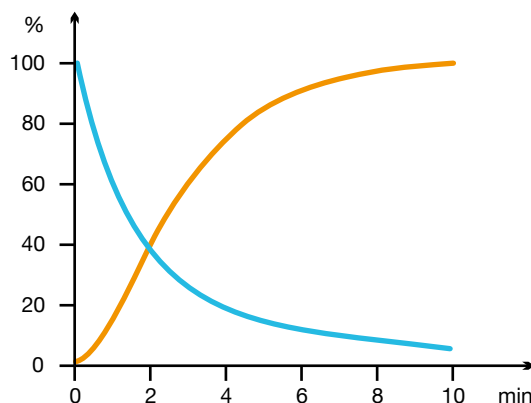


Fig. 4: Radiant powers
Heating-up: red curve
Cooling-down: blue curve

Type, weight, wattage	KSS/60	90 g	250	W
Surface rating			38.0	kW/m ²
Typical operating temperature			670	°C
Maximum permissible temperature			750	°C
Wavelength range			2 - 10	μm

Standard design	Thermocouple radiators	Variants
Operating voltage 230 V Ceramic hollow casting White glaze Leads 85 mm Elstein standard socket Mounting set	Designation T-KSS/60 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Special wattages Special voltages Extended leads Leads with ring terminals

The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein LCR large curved radiator

Elstein LCR large curved radiators are ceramic infrared panel radiators, which are designed for operating temperatures up to 750 °C. Surface ratings of up to 60 kW/m² can be installed.

LCR radiators are made using a full-pour casting ceramic process and are characterised by their large size and concave design. Due to the latter, there is a space between the radiator and mounting plate, which reduces the heat absorbed by the wiring space.

For some special applications the large size can reduce the mounting and installation work compared to the regular sizes of ceramic infrared radiators.

Elstein LCR large curved radiators are for universal use and are suitable for assembling radiation areas with any geometry required.

The covered power range is 400 W up to 1500 W.

LCR

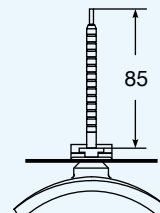
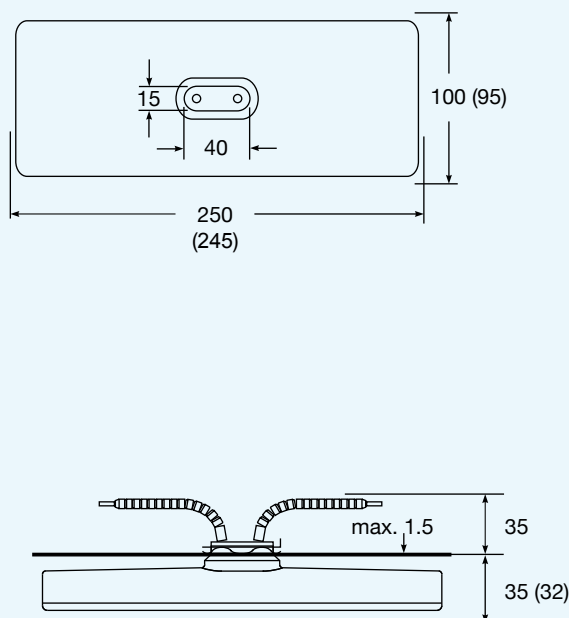
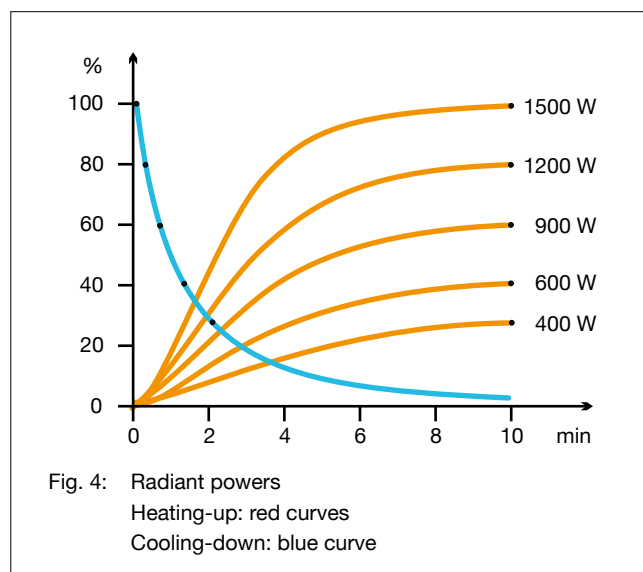
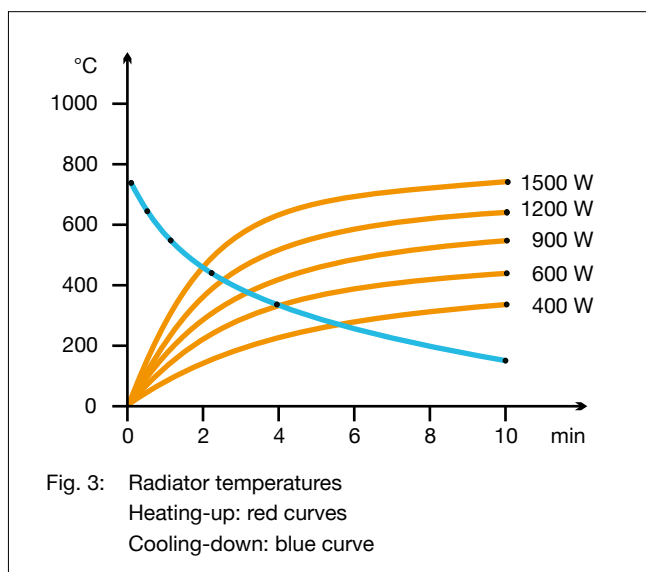


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	LCR	350 g	400	600	900	1200	1500	W
Surface rating			16.0	24.0	36.0	48.0	60.0	kW/m ²
Typical operating temperature			400	490	580	660	710	°C
Maximum permissible temperature			750	750	750	750	750	°C
Wavelength range			2 - 10					µm

Standard design Operating voltage 230 V Ceramic full-pour casting White glaze Leads 85 mm Elstein standard socket Mounting set	Thermocouple radiators Designation T-LCR Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein RFS series

Elstein RFS round panel radiators are ceramic infrared radiators with round design and can be used for operating temperatures up to 700 °C and surface ratings up to 46 kW/m².

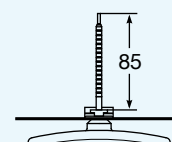
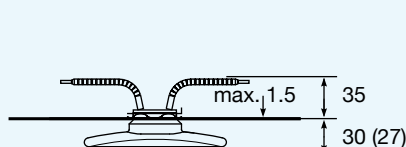
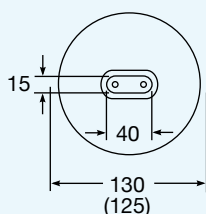
Radiators of the RFS series are used in small thermoform devices of dental technique for example. Such devices are used for manufacturing dental prostheses.

The round design enables additionally an optimal heating of corresponding materials to be heated like the bottom of bottles.

Radiators of the RFS series are available in two sizes: RFS/100 with a diameter of 100 mm and RFS/125 with 125 mm.

Elstein RFS series radiators cover the power range of 150 W to 500 W with these two designs.

RFS/125



RFS/100

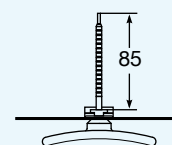
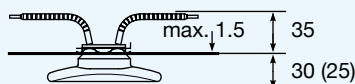
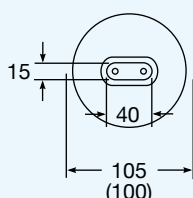
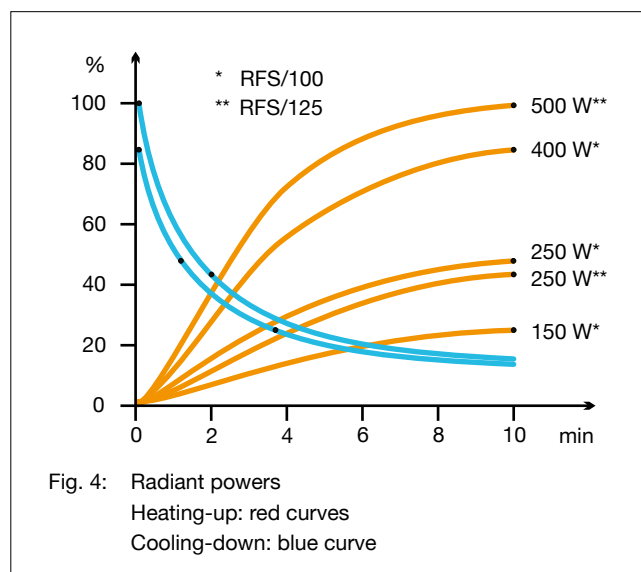
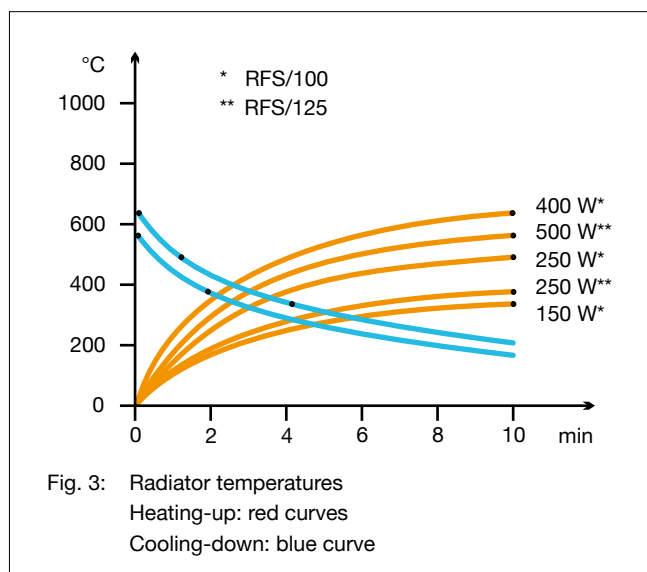


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	RFS/100	145 g	150	250	400	-	-	W
	RFS/125	175 g	-	-	-	250	500	W
Surface rating			17.3	28.9	46.2	18.8	37.6	kW/m ²
Typical operating temperature			300	430	610	330	550	°C
Maximum permissible temperature			750	750	750	750	750	°C
Wavelength range			2 - 10					μm

Standard design Operating voltage 230 V Ceramic full-pour casting White glaze Leads 85 mm Elstein standard socket Mounting set	Thermocouple radiators Designation T-RFS/100, T-RFS/125 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein SBM series

Elstein SBM rod radiators are ceramic infrared dark radiators with surface ratings of up to 36.0 kW/m².

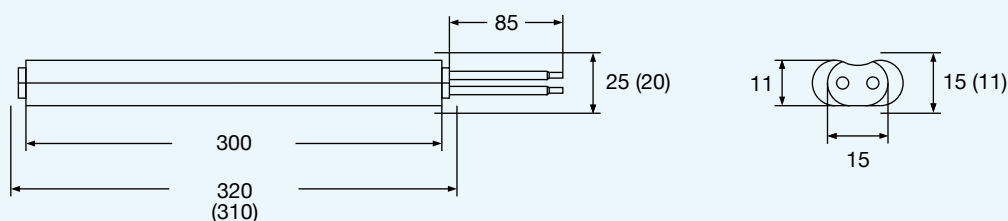
SBM radiators have been developed for use in infrared heated cabins and due to their long-wave infrared radiation gently and pleasantly heat the human body.

Furthermore, SBM rod radiators can also be used for other heating tasks. Due to their long oval design, they are particularly suitable for linear heating or for space-saving installations, if low installed heights have to be achieved.

SBM series radiators can be installed in any position. The power can be adjusted using a proprietary dimmer.

Elstein SBM rod radiators are available in two designs and cover the power range from 200 W to 400 W.

SBM/300



SBM/450

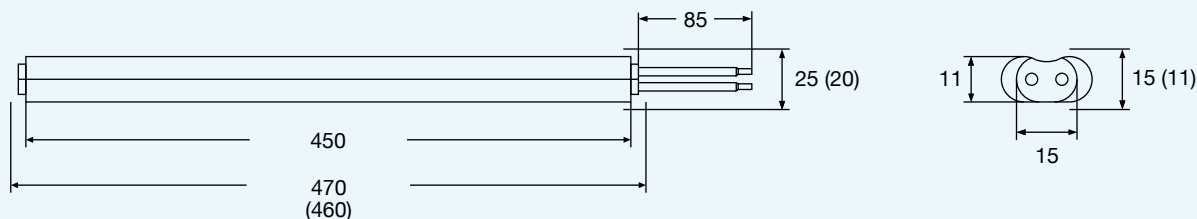
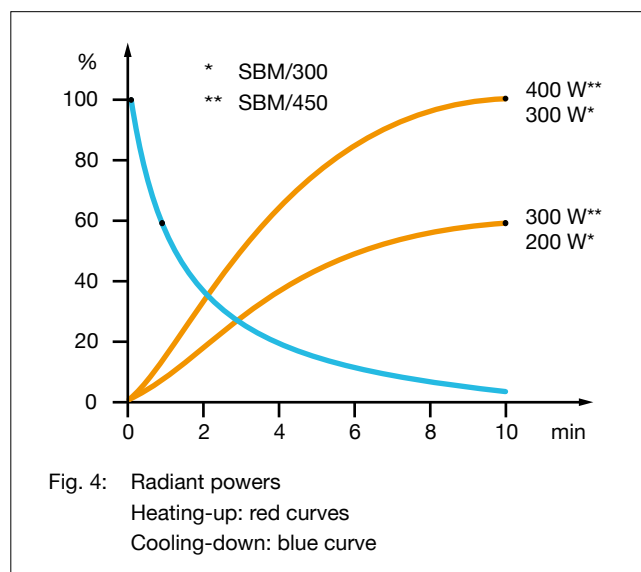
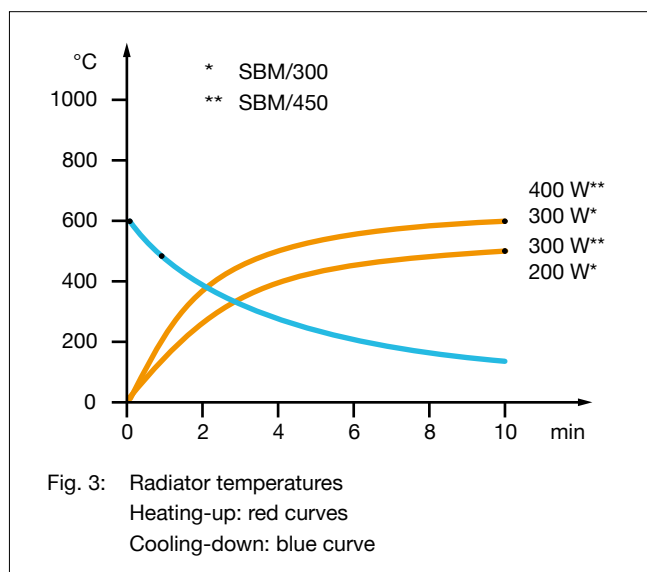


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	SBM/300	110 g	200	300	-	-	W
	SBM/450	165 g	-	-	300	400	W
Surface rating			24.0	36.0	24.0	32.0	kW/m ²
Typical operating temperature			420	550	350	500	°C
Maximum permissible temperature			600	600	600	600	°C
Wavelength range			3 - 10				μm

Standard design Operating voltage 230 V Ceramic full-pour casting Leads 85 mm Leads with insulating sleeve	Thermocouple radiators Designation T-SBM/300, T-SBM/450 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm 	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be adjusted using proprietary power controllers or dimmers.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Ceramic Infrared Panel Radiator SHTS/100



Figure 1: Elstein SHTS/100

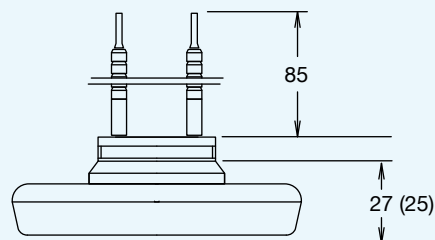
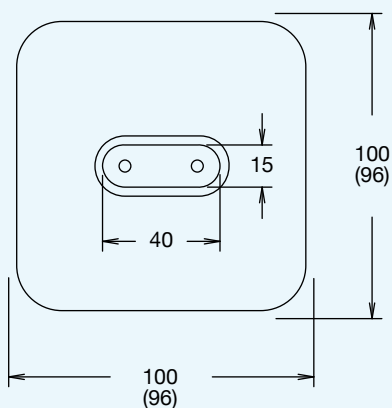
Elstein SHTS/100 super high temperature radiator is a ceramic infrared radiator, which has been designed for maximising the surface rating (W/m^2).

The surface rating of SHTS/100 is $80 \text{ kW}/\text{m}^2$. It has a nominal output of 800 W and reaches an operating temperature of up to 860°C .

The Elstein SHTS/100 radiator has the dimensions $96 \times 96 \text{ mm}$ and is a special design of SHTS with the dimensions $122 \times 122 \text{ mm}$. Information about SHTS is available in our product catalog as well as download on the internet.

For building up infrared heating panels with SHTS/100 the MTO stainless steel mounting plates are available.

SHTS/100



SHTS/100 with MTO

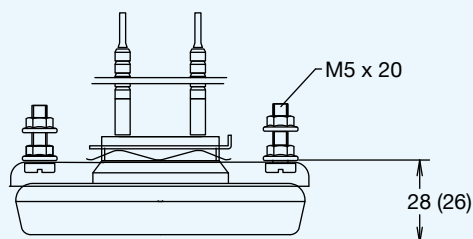
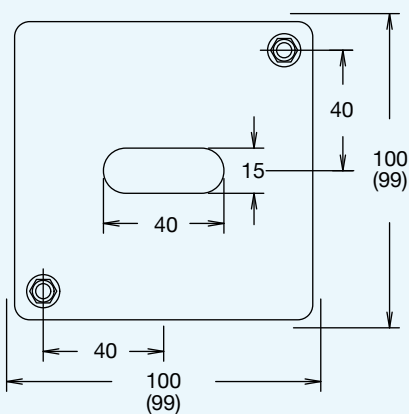
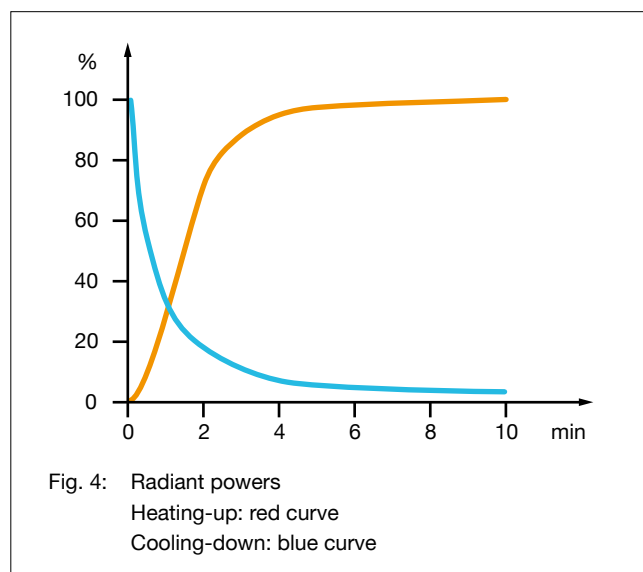
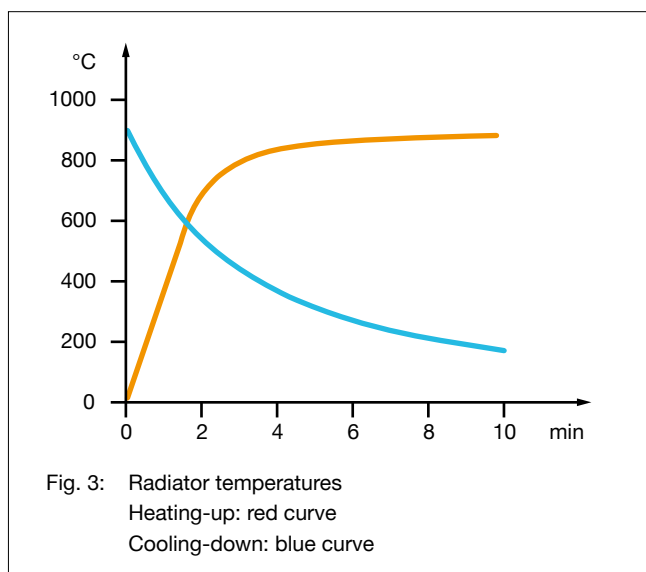


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	SHTS/100	170 g	800	W
Surface rating			80,0	kW/m ²
Typical operating temperature			860	°C
Maximum permissible temperature			900	°C
Wavelength range			2 - 10	μm

Standard design Operating voltage 230 V Ceramic hollow casting Integrated thermal insulation Leads 85 mm Elstein standard socket Mounting set Special black glaze Gold-plated back	Thermocouple radiators Designation T-SHTS/100 Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

IR radiation areas can be assembled using MTO mounting bases.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Figure 1: Elstein SSH switchboard heater

Elstein SSH switchboard heaters are ceramic infrared radiators in round design with surface ratings of up to 18 kW/m². The typical operating temperature is 200 °C up to 280 °C.

The SSH infrared radiators are used for switchboards in order to avoid the formation of condensation water.

SSH switchboard heaters are delivered with a fixing clip, which allows an easy mounting of the SSH radiator onto 35-mm standard rails. Such standard rails have been mounted already in many switchboards.

The low overall height enables space-saving installation so that the radiator can be mounted in small switchboards and in switchboards being densely equipped.

Elstein SSH switchboard heaters are available with a power of 60 W and 100 W.

SSH

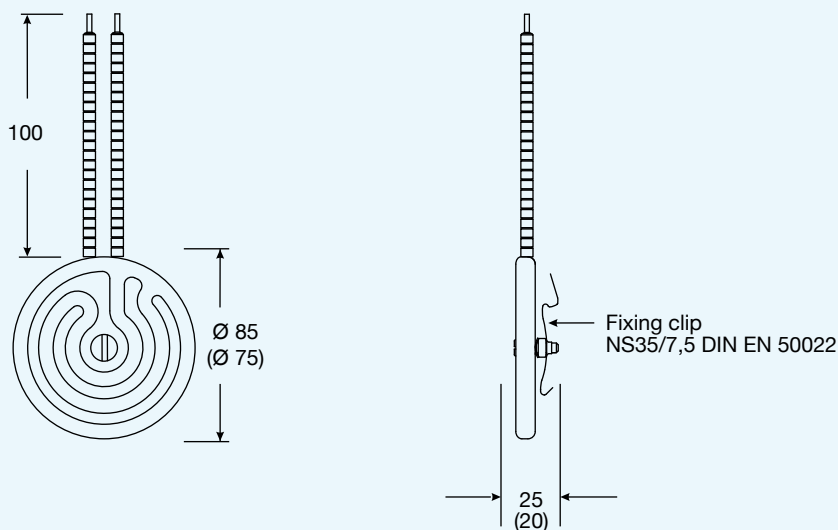
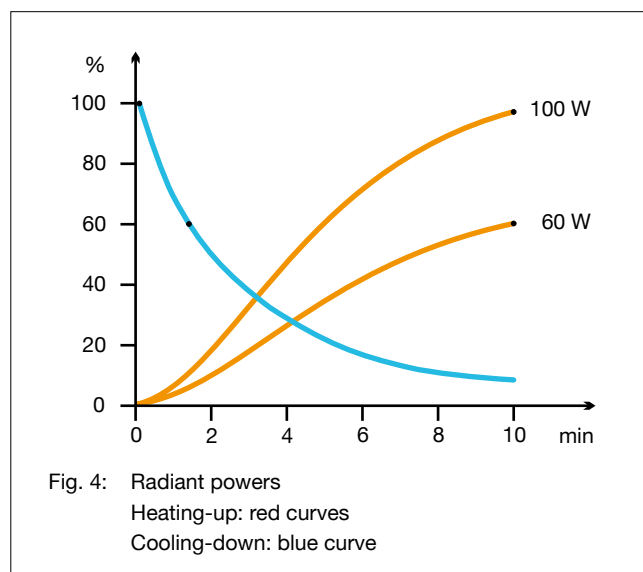
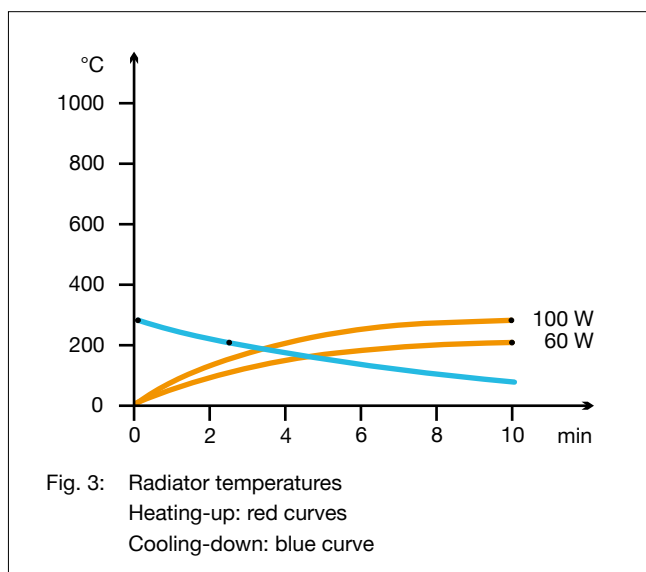


Figure 2: Mounting dimensions and radiator dimensions () in mm



Type, weight, wattage	SSH	75 g	60	100	W
Surface rating			10.6	17.6	kW/m ²
Typical operating temperature			260	350	°C
Maximum permissible temperature			700	700	°C
Wavelength range			2 - 10		μm

Standard design Operating voltage 230 V Ceramic full-pour casting White glaze Leads 100 mm Fixing clip Screw M4 x 16 2x toothed disc A 4,3 Nut M4	Thermocouple radiators Designation T-SSH Integrated thermocouple Type K (NiCr-Ni) TC leads 100 mm	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using thermocouple radiators together with TRD 1 temperature controllers, TSE thyristor switching units and other accessories.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1, Safety in electrical heating installations.

Our instructions for mounting, operation and safety must be observed.



Fig. 1: Elstein WKS infrared cabin radiator
Top: Front of the heater. Bottom: Rear.

Elstein WKS infrared cabin radiators are ceramic IR radiators, which have been developed for the requirements in IR cabins regarding material, geometry, function, design and mounting.

WKS radiators have a considerably extended radiation surface, which is designed convexly. Thus there is a five-times bigger primary radiation surface compared to heating systems with reflector.

Since WKS radiators are held by a flat metal frame, the assembly of radiation fields is possible in any size on the cabin's wall. An insulation layer in the inner part of the heater increases the radiator's efficiency and limits the temperature on its back mounting surface.

Compared to cabins, which are equipped with heating foils, there is a much improved ratio between radiation surface and radiator's temperature, so that the heating of the user is done mainly by infrared radiation instead of convection.

Elstein WKS infrared cabin radiators are available with a power of 200 W and 250 W.

WKS

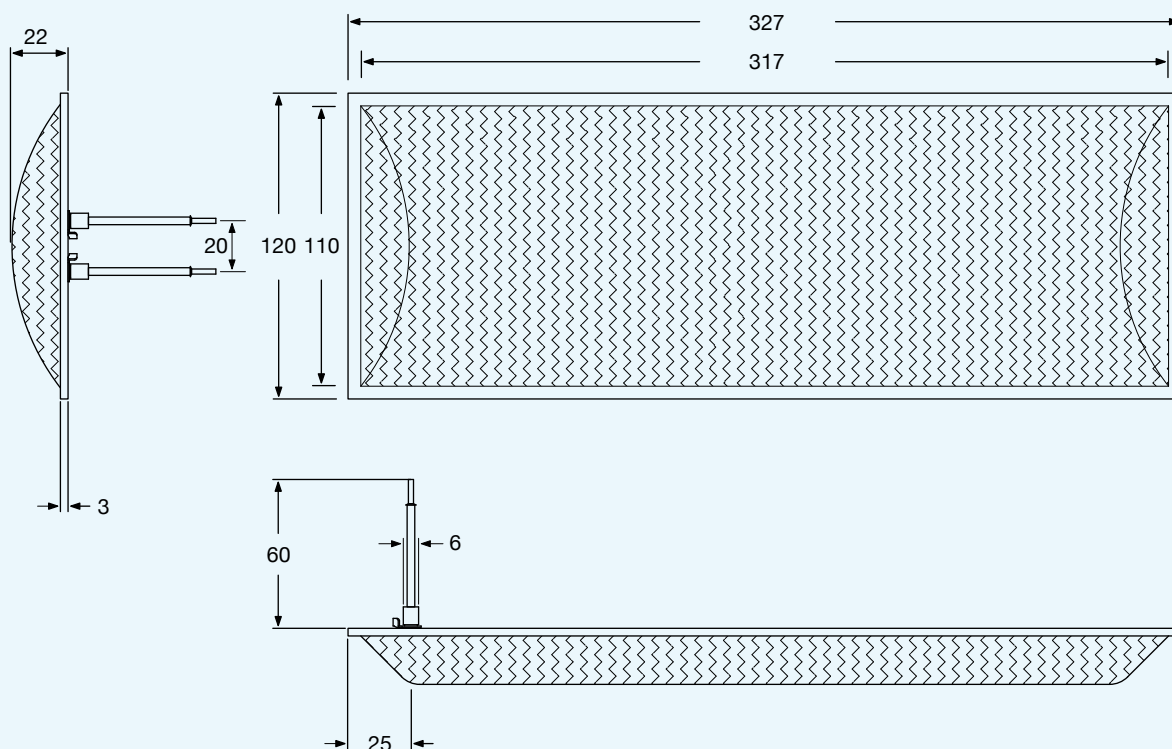
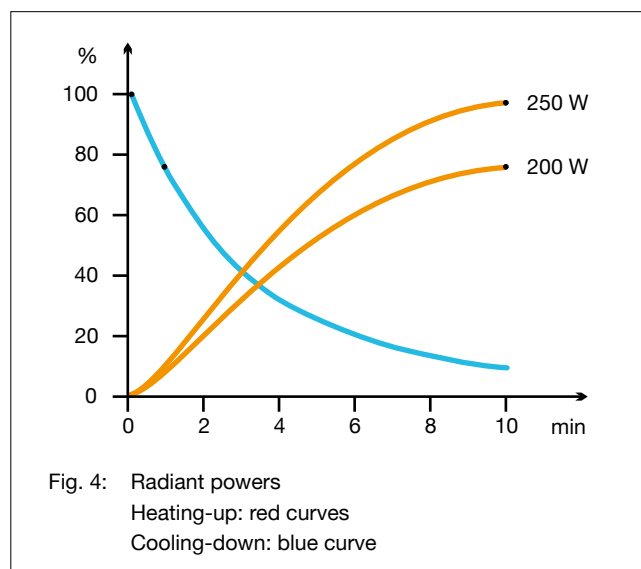
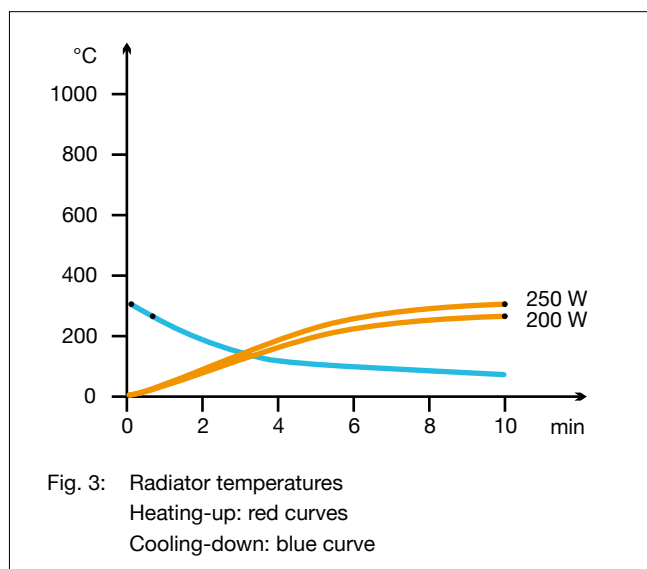


Figure 2: Radiator dimensions in mm



Type, weight, wattage	WKS	260 g	200	250	W
Surface rating			5.6	7.0	kW/m ²
Typical operating temperature			260	300	°C
Maximum permissible temperature			400	400	°C
Wavelength range			3 - 10		μm

Standard design Operating voltage 230 V Ceramic full-pour casting Integrated thermal insulation Heater's back open Leads 60 mm Leads with insulating sleeve	Thermocouple radiators Not available. For means of controlling output see below.	Variants Special wattages Special voltages Extended leads Leads with ring terminals
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The power can be controlled using proprietary power controllers or dimmers.

The national safety regulations must be complied with for the respective application, for example, the IEC or EN standard 60519-1 „Safety in electrical heating installations“, or the EN 60335 Part 2-53 „Special requirements for sauna heating devices and infrared cabins“.

Our instructions for mounting, operation and safety must be observed.