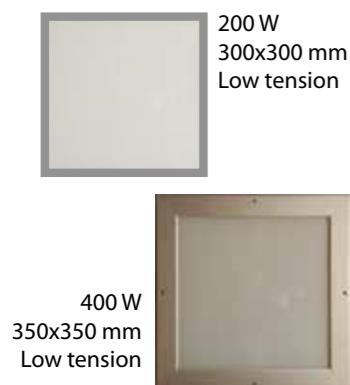


# THE RADIATOR RANGE - 12V, 24V, 230V



## CUSTOMER REFERENCES



**BERNARD DE RAVIGNAN**

-InfrasOLS – IS: Mr de Ravignan, you are well known in the sailing world but could you present yourself briefly to a broader public?;

Bernard de RAVIGNAN – JdeR: 'Let's say a dedicatee of the high seas, sailing adventures and real encounters).

-IS: You were already equipped with heating. Why did you seek out a new system? JdeR: 'La Cardinale is a 16m steel schooner ideally suited to our type of sailing. Over five years we have sailed through the channels of Patagonia, circumnavigated Cape Horn a number of times and undertaken two two-month expeditions in Antarctica.

We needed a second heating system and we were attracted by the technical simplicity of Infrasols' radiators as presented made by Roger Amirault at the Crouesty Boat Show. On board, we now have a Reflex fuel heating system plus the 9 highly efficient Infrasols radiating panels. Installation was easy.'

IS: You have been using this Infrasol heating for five years, how has it worked out? Has it provided anything in addition to your other types of heating?

JdeR: 'Basically, very ease to use and highly efficient: oilskins are dried out despite hostile external conditions. Inside, it is comfortable! 'A ray of sunshine on board!'. Technically, it is a simple piece of equipment. No mechanical parts and hence no decay. Heat regulation is very easy to control. Maintenance is limited and this is reassuring.

IS: Would you recommend this set-up to other sailors?

JdeR: 'Yes, of course! It is clean and safe, with no risk of overheating or loss of energy on line. The system can be adapted to any type of vessel, subject to good control of the batteries and their suitability to the given power.

IS: Do you have any anecdotes in this respect?

JdeR: 'Well, yes, if you like. Stop-over guests immediately expressed their pleasure. When they joined us on board they noticed the difference with their own yachts: this prompted skippers to ask about the Infrasols system. La Cardinale was often chosen as the 'port local' for its pleasant heat and comfort'.

### OLIVIER CREIGNON – 56552 BELZ

Our yacht is a Cornish Crabber 22. The IR radiator and thermostat were installed at the shipyard of origin in England.

The heating has worked well for six years. It is installed in the saloon of a 6.7m yacht based in La Trénité. The heating is connected to the 220V network and functions when we are berthed at the pontoon of a port. At the start and end of the season, it easily heats the whole boat, and without occupying any floor space. It also dries the air in the interior, which is agreeable and practical. The radiator is attached to the saloon wall and the frosted glass finish is discreet and suits the cosy atmosphere of our mahogany interior.



**Infrared radiators**  
Comfortable, healthy  
and economic heat

*The best marine heating !*

INFRASOLS - 6 rue des Rivières - 37140 Chouzé sur Loire  
09 88 05 33 34 / 06 08 68 07 85

Contact : roger.amirault@infrasols.fr - www.infra-sols.fr

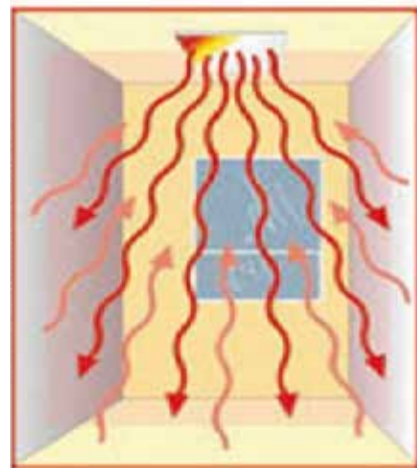
RCS Tours - SIRET : 797 955 382 00016 - APE 4752B - N° TVA intracommunautaire : FR 24 803 117 712

## THE PRINCIPLES OF THE NEW LONG INFRARED HEATING – – NCIR WHAT IS NEW ABOUT NCIR COMPARED WITH 'OLD STYLE' INFRARED ?

The radiator releases infrared rays that warm materials and persons like the sun. In turn, these become emitters and thus gradually release heat. Black Sun radiators transmit 80% of their energy in the form of 'far or long' radiation and 20% in the form of convection. Older generations of infrared heaters comprised resistances issuing infrared rays with a very low output. Essentially they were convectors with a radiating portion. Moreover, they are near infrareds (see below).

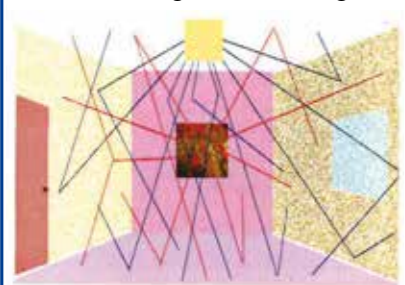


## CHARACTERISTICS OF INFRARED RADIATION



INFRARED HEATING

Schematic of heaters radiation can be hang to wall or ceiling.



The radiation length fluctuates between 3,00 to 8,00 meters. According to wall's reflection, articles and furnitures in the room.

For your heaters, choose a regulation :  
Deport thermostats for better economy, programmable radio or connect thermostats on power plug.

Infrared radiation (IR) is a non-ionising electromagnetic radiation similar to visible light, with a longer wavelength, just above the colour red in visible light, and hence invisible: IR radiation covers a wavelength range between 700 and 1000 nanometres (nm, millionth of millimetre). Infrared radiation types are distinguished by their wavelength and intensity. Infrared rays are divided into three types: 'near' IRA (700-1400nm), 'mid' IRB (1400-3000nm) and 'far' IRC (3000-10000nm), beyond which we have submillimeter microwaves. The main property of infrared is the thermal radiation which produces warmth for heating, drying... when it is absorbed by a body or materials, notably in 'far' IR rays which offer an air reach over several meters. IR heating radiation principles. Can be located on the wall or ceiling as desired. Radiation length varies between 3m and 8m according to the reflection from walls, objects and furniture in the room. For your radiators, use a control: remote/radio programmable/plug-in thermostats for greater savings.)

## ANOTHER WAY TO THINK ABOUT HEATING

At home, only heat what needs heating! Would you raise the temperature of your kitchen to 100°C degrees to boil a pan of water? Whereas traditional convection heating is designed to heat the air of a given volume, e.g. a room and its contents, the new infrared heating directly warms materials and persons. Hence the heat is transmitted directly between the radiator and the person. Moreover, some places are difficult or impossible to insulate (cave/underground dwellings, large exhibition halls, work stations in garages/workshops, etc). In all cases, infrared heating is also an appropriate response.



Black Sun Heating's technology is also of interest on land. By avoiding the use of forced hot air, the system does not raise dust and heats materials directly. Hence naval shipyards employ it for the painting of ships. We equipped a hall for the Belgian navy to this end. With 360 'Varmigo' panels, we have accelerated the drying process and gained 13 degrees within this huge hull, providing stability and robustness. The workers have also gained productivity as they can work in winter.

Indications for an enclosed room	
Heating power	Heated surface area
200 Watts	3 to 6 m <sup>2</sup>
300 Watts	4 to 8 m <sup>2</sup>
400 Watts	6 to 12 m <sup>2</sup>
500 Watts	8 to 14 m <sup>2</sup>
600 Watts	12 to 18 m <sup>2</sup>
800 Watts	14 to 22 m <sup>2</sup>
1000 Watts	16 to 28 m <sup>2</sup>

## ENVIRONMENT / CLIMATE

**0 carbon emissions**

### No CO2, no fine particles, no nitrates

-  INFRARED
-  100% recyclable
-  We meet IP67 standards.
-  Our equipment is guaranteed for 10 years.
-  No maintenance, compact, readily installed and integrated in your electric network.
-  An end to pointless fuel consumption in our ports: with InfraSols you can charge at berth in 220 V by also avoiding the overload on your electricity network.
-  Odourless, silent. No forced air = no dust/pollen/mite circulation.
-  Electric regulation modules.
-  No fuel to heat your office. 0 CO2 emissions from our equipment.
-  Remote control of your long black sun infrared heating.
-  Our equipment is assembled in Belgium at Black Sun Heating.
-  No dampness with our system. The interior of your vessel will remain dry. A soaked oilskin dries out in six minutes.
-  Parts suppliers are located in Marne la Vallée and Alsace to ensure responsiveness and reduced supply times.
-  We can offer tailored manufacturing to provide an efficient means to heat your vessel.