



THE INTELLIGENCE OF SOLAR COOLING

Independent and hybrid direct solar cooling

FREECOLD[®] manufactures in France independent and hybrid solar cooling, freezing and airconditioning solutions, suited to sunny countries.

Designed for harsh environments and operating conditions, the FREECOLD[®] range meets essential needs of cold for green transition and sustainable development.

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Refrigeration and freezing solutions

RCSI 180 refrigerator and freezer



FREECOLD® technical data	RCSI 180 refrigerator / freezer	RCSI 180+ refrigerator / freezer
Power supply	12, 24 or 36 Volt battery	24 or 36 Volt battery
Acceptable input voltage	10.5 - 42 Vdc	24 - 42 Vdc
Energy class	A++	
Refrigerant	R134a (without CFC)	
Wall insulation thickness	90mm Polyurethan foam (80mm in the lid)	
Net capacity	175 liters	175 liters
Power consumption (CECOMAF)	61 W	130W to 180 W
Cooling capacity (EN 12900 CECOMAF)	55 W	125W to 185 W (to define on order)
Inside Ecotainers	-18°C, 0°C or 5°C blocks or Ecotainer on demand	
Baskets	2	
Standard energy consumption	refrigerator 40kWh/year / freezer 145 kWh/year	
Ambiant temperature range	10°C / 43°C (50°F / 110°F)	
Outside dimensions HxLxD (without/with packing)	87 x 89 x 68.5 cm / 90 x 95 x 73 cm	
Net weight / gross weight	39 / 41 kg	40 / 42 kg
20' & 40' container loadability	42 (20' Ctn) - 72 (40' Ctn) - 112 (40' High Cube Ctn)	

A++

Powered by solar batteries, RCSI 180 can be used either as a refrigerator or a chest freezer, with an internal temperature adjustable by the user. The capacity of each appliance is configured in workshop and adapts to the operating and using conditions.

RCSI 300 Refrigerator and freezer



Technical Data FREECOLD®	Refrigerator / Freezer RCSI 300
Power supply	24 or 36 Volt Batteries
Direct current voltage acceptable	24 - 42 Vdc
Energy class	A++
Refrigerant fluid	R134a (without CFC)
Wall insulation	90mm polyurethane (80mm on cover)
Working inner volume	300 liters
Electrical power consumed (CECOMAF)	130W to 180 W
Refrigerating power (EN 12900 CECOMAF)	125W to 185 W (to define at order)
Cold accumulator	Ecotainer or Tablets 5°C, 0°C or -18°C on request
Hanging baskets	2
Protection against deep discharges (LVD)	22.0V as standard – different values on request
Automatic reset threshold (LVR)	23.8V as standard - different values on request
Standardized energy consumption	refrigerator 55kWh/year / freezer 190 kWh/year
Ambient temperature range	10°C / 43°C
Outer dimensions HxWxD (with/without packaging)	87 x 133 x 68.5 cm / 90 x 139 x 73 cm
Net / gross weight	54 / 56 kg
Connection cable - MC4 connectors as standard	4 meters of 4mm² solar power cable as standard - Other length on request
Number of devices per 20' and 40' container	28 (Ctn 20') - 50 (Ctn 40') - 75 (Ctn 40' High Cube)

A++

Like RCSI 180, RCSI 300 is suitable for all DC applications in remote areas: Home, Business (catering, hotel and resort, tourism industry, alimentary retailing and selling including street markets...) and Medical (refrigeration and preservation of vaccines and medicines).

Air conditioning

With a robust and proven design, FREECOLD air conditioners can cool the indoor air of home or business premises even in the absence of a reliable power grid.

With global warming and the increase in average incomes of families, air conditioning is growing very fast all over the world. The resulting sharp increase in electricity consumption will, according to the International Energy Agency, will lead to a doubling of CO2 emissions induced by air conditioning between 2020 and 2050.

Similarly, in areas with little to no electricity grid, air conditioning is most often provided by generators, that are polluting and noisy.

The FREECOLD solar air conditioning partly overcomes these problems. Our modular and easy-to-install solution offers access to cool air while avoiding the use of a non-existent or polluting electrical installation. Both domestic and professional premises can, thanks to FREECOLD, now be air-conditioned using the free energy of the Sun!

DC/AC Hybrid solar air-conditioners CMS12.H, CMS18.H and CMS24.H



FREECOLD hybrid air-conditioners operate from two sources of electricity: photovoltaic as a priority and the electricity grid as a backup and when there is no more sun, with an automatic switching of sources without cutting off power supply. They can be used in air conditioning mode as well as in heating or dehumidification modes.

When the sun shines, hybrid air conditioners operate 100% on the photovoltaic source.

FREECOLD hybrid air conditioners are of energy class A +++ and offer 3,500 W (12,000 BTU) or 5,000 W (18,000 BTU) of air conditioning as well as heating.

Energy savings are there, both in summer and winter: in Dakar, where the sun shines 3000h/year, the annual electricity savings amount to 600,000 FCFA (900€) and the investment is paid back in 2.5 years, not counting the comfort of air conditioning during power cuts or the cost of operating a backup diesel generator; in Marseille, where the sun shines for 1000 hours during the heating months and 1000 hours during summer, the annual savings amount to 480€ and the payback time is 4 years.

Off-Grid DC 48V solar air conditioners CMS09, CMS12 and CMS18



FREECOLD autonomous air conditioners operate directly using DC 48V voltage from photovoltaics and batteries, without converting energy into AC 230V power and therefore without loss of efficiency.

When the sun is shining, our air conditioners are powered by the photovoltaic source which simultaneously recharges batteries.

Autonomy is ensured by maintenance-free AGM solar batteries. Their capacity is defined according to the chosen air-conditioner and the desired autonomy; as standard, the 5-hour autonomy is dedicated to shops and offices that need to be refreshed during the day; the 12-hour autonomy is intended for domestic use, allowing refreshment day and night.

Thus, FREECOLD 100% solar air conditioners offer those who work and live where there is no grid power supply or where electricity is unsteady and expensive, to enjoy air-conditioning economically and freely.

Dairy sectors

Independent solar milk tanks : 125, 225, 300, 500 and 800 liters / 2 milkings

Including photovoltaic plant, battery storage and smart management of energy



The FREECOLD milk tanks, available in 125, 225 and 300 liters capacity cools a milking in 2 hours down to a temperature of 4 °C with an ambient temperature of 35 °C.

All in stainless steel, the tank has a smooth inner wall, rounded corners and polished welds for optimum conditions of hygiene and food safety. Its walls are insulated with injected polyurethane foam to limit heat losses.

The solar power plant with its photovoltaic modules of European origin, is delivered with their support in kit and preinstalled wiring for a quick and easy commissioning. The solar plant powers directly the milk tank and simultaneously recharges the battery to ensure the autonomy of the dairy installation.

The FREECOLD® smart management of energy ensures a high-quality power supply and enables a second potential source, grid or generator.

The solar plant can be pooled to power at the same time a «all in stainless steel» 60 or 100 Liters pasteurizer for heat treatment of milk.



Autonomous 100% solar mini-tank batteryless, including patented FREECOLD Ecotainer



Specially designed for small producers of milk, juices or drinks, Freecold mini tank is a 50-liter '2 milkings' model which cools the volume of one milking down to 4°C in 3 hours.

Easy to transport, to install and to commission, with its impact-resistant and unbreakable rotomolded outer body, it is poered batteryless, thanks to the Freecold Ecotainer which ensures cooling of the evening milking and quality of the cold during the night.

Its automatic germicidal device with UV-C ultraviolet radiation disinfects in few minutes the aluminium inner tank to more than 99% of bacteria and viruses such as E. Coli or salmonella.

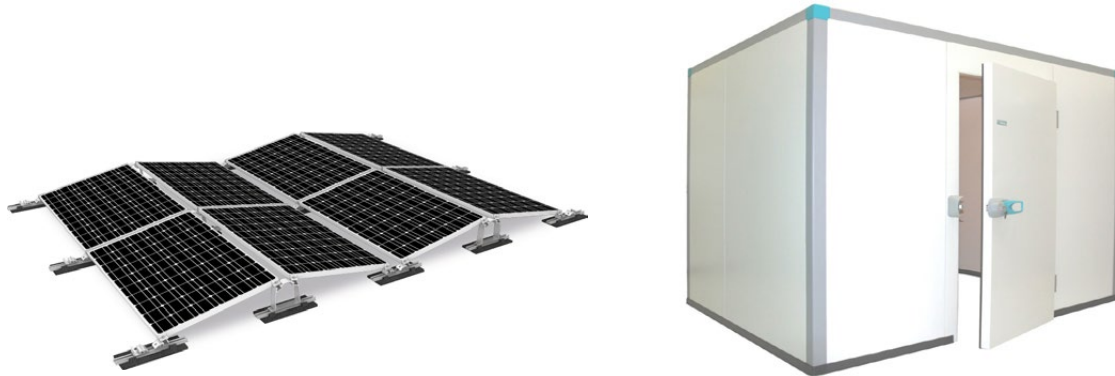
The mini-tank is delivered complete with three pre-wired photovoltaic modules, which can be used as sunshade or shelter for sale.



Farming sectors

Independent solar cold rooms from 10m³ to 100m³, from -18°C to +12°C

Including photovoltaic plant, battery storage and smart management of energy



Featuring a modular design which fulfils the requirements of the various food industry sectors, the room's volume of 10 to over 30 m³ offers an ideal and adaptable solution for storing crops, foodstuffs or frozen products in optimum conditions.

100 or 150 mm reinforced insulation and an efficient opening system significantly reduce heat loss. From 200 kg to over 1000 kg can be cooled daily, using storage batteries that provide between 30 and over 60 hours of autonomy. As an option, a tough, non-slip, easy-to-clean floor, a strip curtain and shelving for butchery, fishery and dairy applications.

Mounted in few hours, FREECOLD solar cold rooms are complying with the strictest hygiene & safety rules.

Every cold room's project needs a quick sizing to define its main characteristics: power of solar plant, capacity of battery storage, management of energy, power of refrigeration unit...

To fulfill the client's actual needs, we thus have to know :

- the type of food: meat, eggs, medicine, fruits & vegetables
- the daily flow of food to cool down and the entry temperature of the food
- the temperature inside the cold room

The cold rooms can also be integrated into a 20" or 40" container to become mobile refrigeration units, with their rooftop solar power plant serving as a sunshade. The container is then shipped with its cold room installed and connected to the energy management and electrical safety cabinet.

All tools are supplied, no drilling, no welding is required for easy and reliable installation in few hours.



Independent solar freezer-room to make 100 or 200 kg of ice in pouches per day

The need for ice is daily in Africa, storekeepers or people buy them every day, for business use or for their families;

In market towns and villages that are not connected to the electricity grid, ice is a very valuable product; It is used to refresh drinking water and beverages, but it is also essential to preserve food such as meat and fish;

The FREECOLD solar freezer-room responds to this need for accessible cold and creates a new trade activity with high profitability and a return on investment less than 2 years.



Autonomous solar incubator IAS for 320 or 1000 eggs



The FREECOLD IAS1000 autonomous solar incubator is designed for all professionals who are developing an incubation project without wanting to invest significant capital.

This incubator combines good egg capacity and innovative functions that allow the user to work in complete safety, while fully meeting the requirements of farms located in hot and sunny climates..

Made on a galvanized steel structure, it is delivered with universal metal baskets and extractable and stackable hatching baskets.



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