



THE INTELLIGENCE OF SOLAR COOLING

Direct solar cooling for remote areas

FREECOLD[®] manufactures in France independent solar cooling and freezing solutions, for places which are not connected to power grid.

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

Table of contents

Refrigeration

- Solar portable fridge / freezer GLS 75 page 3
- Solar portable fridge for vaccines RFO 65 page 3

Refrigeration and freezing solutions

- RSI 180 fridge - solar direct powered page 4
- RCSI 180 refrigerator and freezer page 4
- RCSI 300 refrigerator and freezer page 5
- RCVI 360 upright refrigerator and freezer page 5
- CRC 195 Combined refrigerator / freezer page 6
- CRC 295 Combined refrigerator / freezer page 6
- CSV 185 & 260 fridge and freezer with glass slid tops page 7

Public lighting

- All in one solar Led street light page 7

Air conditioning

- DC/AC Hybrid air-conditioners CMS12.H and CMS18.H page 8
- Off-Grid DC 48V solar air conditioners CMS09, 12 and 18 page 8

Dairy sector

- Independent milk tanks 125, 225 & 300L / 2 milkings page 9
- 60L & 100L pasteurizers page 9
- FrigoMobile 180L direct solar powered page 9

Farming and trade sectors

- Independent solar cold room (from 10 to over 30m³) page 10
- Independent solar freezer-room for 200kg of ice page 10
- Scale ice makers page 11
- Autonomous solar incubator IAS 1000 eggs page 11

Solar kits

- Solar energy kit (lighting) page 12
- Independent solar charger for 10 mobile phones page 12
- Solar kits from 50W to 800W in 230V page 12

Refrigeration

Solar portable fridge / freezer GLS 75



The FREECOLD GLS75 solar cooler meets the need for cold for food, fishing, livestock ... in rural or peri-urban offgrid areas.

Coupled with a 150W - 12V solar panel and a 100Ah 12V maintenance-free solar battery, it maintains the quality of the cold in autonomy for 2 to 3 days depending on the outside temperature.

It is easily movable to be installed in a vehicle, and easily configurable with its digital control panel with a display screen.

The result of an important research program, robust and reliable, the GLS75 solar cooler is suitable for harsh environments and operating conditions in Africa and the Middle East.

Solar portable fridge for vaccines RFO 65



The FREECOLD RFO65 solar refrigerator is suitable, in remote areas, for all applications, medical (vaccine storage), domestic and leisure (motorhomes, pleasure boats ...).

It can be optionally equipped with an electronic switcher of power sources allowing it to switch automatically from a photovoltaic solar power supply to a supply from 220Vac grid in the absence of sun, then on a 12V battery in the event of absence of grid, always prioritizing photovoltaic power.

The autonomy of the RFO65 can be increased by the FREECOLD Ecotainer placed at the heart of the evaporator: the cold produced during the day allows the composite eutectic mass located in the Ecotainer to be frozen, for being released in the evening.

Refrigeration and freezing solutions

RSI 180 Refrigerator - Direct solar-powered



A++

Technical Data FREECOLD®	RSI 180 Refrigerator
Power supply	Direct photovoltaic module (Voc maximum voltage: 42V)
Direct current voltage acceptable	10.5 - 42 Vdc
Energy class	A++
Refrigerant fluid	R134a (without CFC)
Wall insulation	90mm polyurethane (80mm on cover)
Working inner volume	155 liters
Electrical power consumed (CECOMAF)	72 W
Refrigerating power (EN 12900 CECOMAF)	75 W
Cold accumulator	FREECOLD Ecotainer
Hanging baskets	1
Standardized energy consumption	40 kWh / year
Ambient temperature range	10°C / 43°C
Outer dimensions HxWxD (with/without packaging)	87 x 89 x 68.5 cm / 90 x 95 x 73 cm
Net / gross weight	57 kg / 59 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	42 (Ctn 20') - 72 (Ctn 40') - 112 (Ctn 40' High Cube)

FREECOLD 180L refrigerator is directly connected to the photovoltaic module located outdoor, on a roof or a terrace. The excess energy of the day is converted and stored not in batteries but in a cold container inserted into the heart of the evaporator, the FREECOLD Ecotainer, to be released slowly during the night and no-sunny days, and to maintain the quality of the cold in autonomy for 2-3 days according to the outside temperature. Robust and reliable, the solar direct drive refrigerator is adapted to hard environments and operating conditions in Africa and the Middle East.

RCSI 180 refrigerator and freezer



A++

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 loadibility	42 (20' Ctn) - 72 (40' Ctn) - 112 (40' High Cube Ctn)	

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



A++

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)

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).

RCVI 360 upright refrigerator and freezer



A++

Technical Data FREECOLD®	360 L Refrigerator / Freezer Cupboard
Power supply	Photovoltaic solar and 24 or 36 V batteries
Recommended photovoltaic power	2 x 240 Wc (240 Wc mini for refrigerator use)
Direct current voltage acceptable	24 - 42 Vdc
Energy class	A++
Refrigerant fluid	R134a (without CFC)
Wall insulation	90mm polyurethane (80mm in the door)
Electrical power consumed (CECOMAF)	125 W à 180 W (workshop configuration)
Refrigerating power (EN 12900 CECOMAF)	105 W to 185 W
Working inner volume	360 liters
Number of shelves and baskets	7 / 8
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
Indoor temperature range	-24°C / +8°C
Outdoor temperature range	10°C / 43°C
Outer dimensions HxWxD (with/without packaging)	70 x 75 x 175 cm / 72 x 82 x 182 cm
Net / gross weight	97 kg / 91 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	24 (Ctn 20') - 48 (Ctn 40')

FREECOLD® 360L upright refrigerators and freezers are designed for comfort : the extra-high and removable drawers are closed all round. This means that the cold cannot dissipate so quickly when the appliance is opened ; the transparent front of the compartments guarantees an optimum overview of the items. The drawers and intermediate glass shelves underneath them can be conveniently removed so that space can be created quickly even for larger frozen food items ; Thanks to the evaporator drowned in insulating foam on all 4 sides of the appliance, the RCVI 360 freezes food faster and reduces ice build-up, making defrosting simpler and quicker.

CRC195 Combined refrigerator / freezer



A++

Technical Data FREECOLD®	Combined Refrigerator / Freezer 195 L
Power supply	Photovoltaic solar and 12 or 24 V batteries
Direct current voltage acceptable	12 - 42 Vdc
Energy class	A++
Refrigerant fluid	R134a (without CFC)
Wall insulation	90mm polyurethane (80mm in the door)
Electrical power consumed (CECOMAF)	72 W (workshop configuration)
Refrigerating power (EN 12900 CECOMAF)	75 W
Working inner volume - refrigerator	151 liters
Working inner volume – freezer	44 liters
Protection against deep discharges (LVD)	10.5V as standard
Automatic reset threshold (LVR)	11.8V as standard
Standardized energy consumption	176 kWh/year
Ambient temperature range	10°C - 43°C
Outer dimensions HxWxD (with/without packaging)	124 x 55 x 63 cm / 130 x 56,5 x 71 cm
Net / gross weight	52 kg / 49 kg
Connection cable - MC4 connectors as standard	4 meters of 4mm ² solar power cable as standard - Other length on request
Number of devices per 20' and 40' container	24 (Ctn 20') - 48 (Ctn 40')

Powered by solar batteries, these 2 combined fridges/freezers are multi-purpose home appliances. Solid and reliable, they have a good thermal insulation and convenient facilities such as adjustable glass shelves and transparent drawers.

CRC295 Combined refrigerator / freezer



A+

Technical Data FREECOLD®	Combined Refrigerator / Freezer 295 L
Power supply	Photovoltaic solar and 24 V batteries
Direct current voltage acceptable	24 - 42 Vdc
Energy class	A+
Refrigerant fluid	R134a (without CFC)
Wall insulation	90mm polyurethane (80mm in the door)
Electrical power consumed (CECOMAF)	125 W to 180 W (workshop configuration)
Refrigerating power (EN 12900 CECOMAF)	180 W
Working inner volume - refrigerator	210 liters
Working inner volume – freezer	84 liters
Protection against deep discharges (LVD)	22.5V as standard
Automatic reset threshold (LVR)	23.8V as standard
Standardized energy consumption	210 kWh/year
Ambient temperature range	10°C - 38°C
Outer dimensions HxWxD (with/without packaging)	182 x 55 x 63 cm / 187 x 57 x 71 cm
Net / gross weight	72 kg / 67.5 kg
Connection cable - MC4 connectors as standard	4 meters of 4mm ² solar power cable as standard - Other length on request
Number of devices per 20' and 40' container	30 (Ctn 20') - 60 (Ctn 40')

CSV185 and CSV260 Refrigerator / Freezer with double glass slid tops



Like super-insulated chest refrigerators and freezers, CSV 185 and 260 appliances are suitable for all commercial applications in remote areas: catering, hotels and resorts, tourism sector, distribution and sales of food products including in the outdoor markets,...).

Their main advantage: the 2 glass slid tops that allow customers to see the goods inside.

Placed on a FrigoMobile, the CSV 185 is particularly suitable for transporting, storing and selling meat, fish or ice through cold produced at a lower temperature than by the RSI 180.

Public lighting



All in One solar LED street lights

Our 10W and 15W LED street lights are equipped with

- waterproof and replaceable LED module powered by high brightness and low light decay MLS or Nichia LED
- high efficiency solar panels (15 - 30Wp)
- long lifespan lithium battery (48 - 192Wh LiFePO4)
- wireless remote-control with dimming function
- light and motion controls: motion sensor automatically regulates the light source from full bright (100%) to the energy saving level (30%) to increase battery autonomy
- Mounting parts on Ø60mm pole (mast or wall console)

These LED lightings are mounted very quickly and require no electric wiring. They are ideal to light a village square or the courtyard of a concession.

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 and CMS18.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 and 300 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. Solar batteries of the installation allow to smooth the peaks and hollows of the photovoltaic source as well as the intermittences.

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.



180 L FrigoMobile - Solar Direct



The 100% solar FREECOLD® FrigoMobile is the ideal solution to develop micro-enterprises in rural or suburban areas without electrification, to answer to:

- the need of cold for fishing, food and beverage, livestock farming...
- the need of communication: 1 hour of mobile phone charging is sold € 0.15 or FCFA 100
- the need of lighting to extend the sale in the evening, or at home.

To generate a real income and to develop a responsible, autonomous and sustainable economic activity.



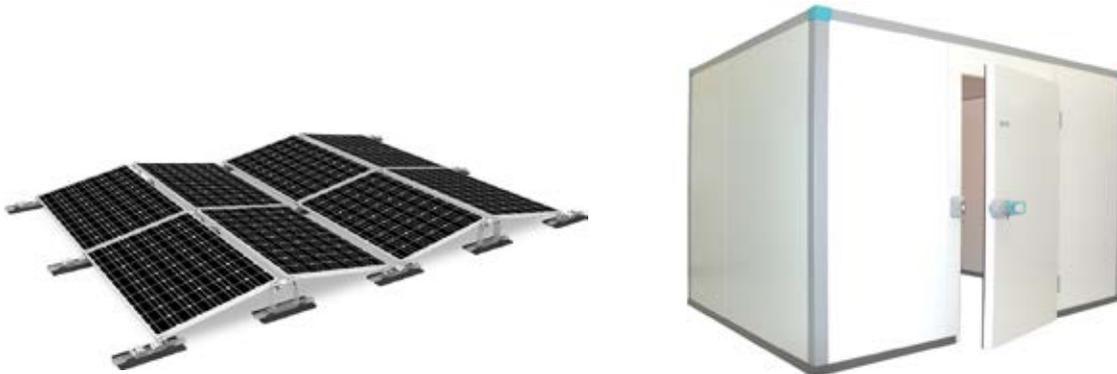
Equipped with CSV185, the FrigoMobile is particularly suitable for the transport and sale of meat, fish and ice.



Farming sectors

Independent solar cold rooms from 10m³ to 30m³, 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 1000 kg of harvest produce 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

Independent solar freezer-room to make 200 kg of ice 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.



Scale ice makers

To preserve fish, meat and poultry

Ideal for fishermen, hospitals and laboratories, fish counters and buffets (in restaurants, shops and outdoor markets), transport and storage of food, in the form of scales with a thickness of between 1.5 and 3mm, flake ice is very dry ice with a very cold temperature between -6 and -8 ° C, which pours perfectly even after prolonged storage in the ice container.



Efficient, innovative and hygienic, with a production capacity of 120 to 6,000 kg / day, FREECOLD ice machines are specially made in Germany.

Autonomous solar incubator IAS 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.

Solar kits

Solar energy kit : 3 LED lamps and charging of mobile phones



Components :

- 1 solar panel with 5 m long cable
- 1 black control box including a lithium battery
- 3 waterproof LED lights with 3 m long cable
- 10 phone charging connectors

Independent solar charger for the charge of 10 mobile phones

Mobile technologies contribute massively to the growth of remote areas. The M-economy is developing in Africa, the flow of money and the deployment of agricultural and health services. But it is still necessary to be able to recharge the batteries of the phones. Easy to move and install, the FREECOLD solar charger provides electric power sources to safely recharge the batteries of the phones.



- Strong design (anodized aluminum cover, unbreakable plastic case) for professional use
- Complete kit with its European-Origin 150w solar panel, 10 USB outputs, 5 Micro-USB and '5-in-1' charging cables (Nokia 6101, Samsung G600, Micro-USB, Mini-USB, iPhone 4/4S)
- 5V-1A regulated outputs for a total safety of des batteries
- Easy and convenient holding of the phones during the charge

115 or 230V solar kits : from 50W à 800W to power household equipments, lighting, fans, TV, notebook ...



This range of 12, 24 and 48V kits includes a wide variety of power and the easiest setup so far to hook up

Components :

- solar panels with photovoltaic cable
- VRLA AGM sealed solar batteries
- Solar controller (from 10 to 50A)
- 12, 24 or 48V PureSinus inverter to 115 or 230V (from 300W to 3kW)



34 chemin de l'Echut - 31770 Colomiers - France

RCS Toulouse (31) 799 569 108

e-mail : info@freecold.com

www.freecold.com

