FR-B Series Brochure and Design Guide

DC Chest Refrigerator/Freezer for off-grid homes, small businesses and mobie applications

Maximum Efficiency

- Direct DC operation eliminates wasted inverter energy
- Chest-style design and extra-thick insulation keeps the cold in and reduces compressor run time
- New Feature: Boost switch for faster cooling

Flexible

- Can be powered with a 12 or 24 V battery (auto detection)
- Wide temperature thermostat allows every unit to run as a refrigerator or freezer (temperature setting is defined by user)

Low-Maintenance

- Maintenance free, brushless DC compressor
- Low-frost system reduces formation of condensation and ice
- Sturdy integrated handle

Simple Design

- Direct DC operation from battery, no costly inverter required
- Lock on lid standard
- Environmentally-friendly R600a refrigerant

Technical Data

Type	FR100-B	FR230-B	FR350-B
System Voltage (Nominal)	12 / 24 V auto recognition		
Internal Operating Temperature Range	-18 to +8 °C / -0.4 to +46.4 °F		
Energy Consumption at 21°C / 70°F Ambient Temperature (in Default ECO Mode)	82 Wh / day (Fridge: 4 °C / 38 °F) 433 Wh / day (Freezer: -18 °C / 0 °F)	178 Wh / day (Fridge: 4 °C / 38 °F) 609 Wh / day (Freezer: -18 °C / 0 °F)	202 Wh / day (Fridge: 4 °C / 38 °F) 679 Wh / day (Freezer: -18 °C / 0 °F)
Energy Consumption at 32°C / 90°F Ambient Temperature (in Default ECO Mode)	174 Wh / day (Fridge: 4 °C / 38 °F) 561 Wh / day (Freezer: -18 °C / 0 °F)	193 Wh / day (Fridge: 4 °C / 38 °F) 899 Wh / day (Freezer: -18 °C / 0 °F)	228 Wh / day (Fridge: 4 °C / 38 °F) 981 Wh / day (Freezer: -18 °C / 0 °F)
Power consumption at 12 Vdc*	36 W ECO / 44 W BOOST	69 W ECO / 78 W BOOST	68 W ECO / 81 W BOOST
Content (Net Capacity)	104 L / 3.6 cu. ft	238 L / 8.4 cu. ft	358 L / 12.6 cu. ft
Refrigerant	Environmentally-Friendly R600a		
Ambient Temperature	+10 to +43 °C / +50 to +104 °F		
Door Type	Top-Opening with integrated handle and lock		
Storage Baskets	1 Basket	2 Baskets	3 Baskets
Boost Switch	Standard on all models - accelerates cooling when activated		
Cabinet Dimensions (WxHxD)	685 x 850 x 590 mm / 27 x 33.5 x 23.2 in	1035 x 850 x 750 mm / 40.8 x 33.5 x 29.5 in	1475 x 875 x 750 mm / 58.1 x 34.5 x 29.5 in
Inner Dimensions (WxHxD)	505 x 640 x 375 mm / 19.9 x 25.2 x 14.8 in Excludes compressor recess of 190 x 210 x 375 mm / 7.5 x 8.3 x 14.8 in	856 x 628 x 498 mm / 33.7 x 24.7 x 19.6 in Excludes compressor recess of 230 x 250 x 496 mm / 9.1 x 9.8 x 19.5 in	1290 x 619 x 498 mm / 50.8 x 24.4 x 19.6 in Excludes compressor recess of 300 x 240 x 498 mm / 11.8 x 9.4 x 19.6 in
Weight	29 kg / 64 lbs	80 kg / 160 lbs	110 kg / 242 lbs
Container Loading (20'/ 40' GP /40' HC)	54 pcs. / 108 pcs. / 170 pcs.	30 pcs. / 60 pcs. / 98 pcs.	20 pcs. / 42 pcs. / 66 pcs.
Certificates	CE compliant, RoHS compliant		
Warranty	2 years		

* Max. surge for compressor start-up 15 A / 8 A for 12 / 24 V, respectively. All surge durations below 0.2 s.

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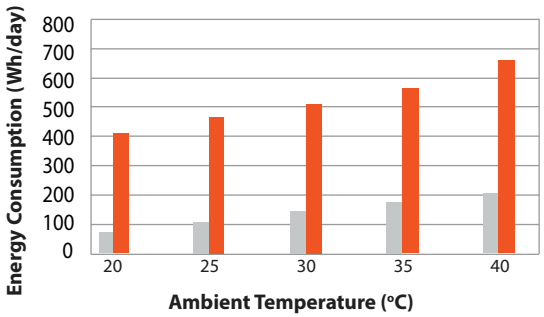
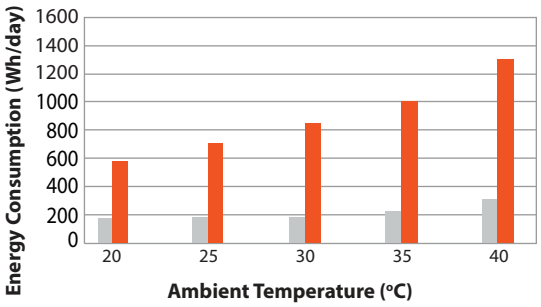
Design your off-grid system in 2 easy steps

1 Use the ambient temperature (°C/°F) to determine the estimated power draw of your refrigerator/freezer system*

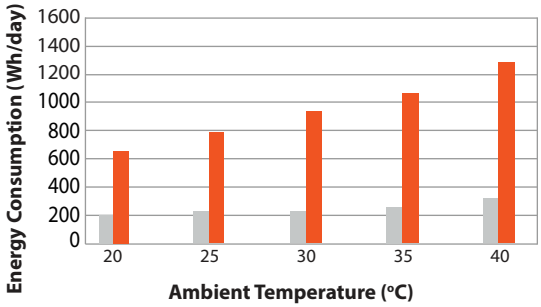
FR100-B Energy Consumption/Power Draw



FR230-B Energy Consumption/Power Draw



FR350-B Energy Consumption/Power Draw



Legend
Freezer Mode (-18 °C / 0 °F)
Fridge Mode (+4 °C / +38 °F)

°C to °F Conversion	
20 °C	68 °F
25 °C	77 °F
30 °C	86 °F
35 °C	95 °F
40 °C	104 °F

2 Using your estimated power draw value, find the recommended solar array and Battery Capacity from the chart below*

Power Draw (Wh/Day)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
Solar Array (Wp)**	50	100	150	200	250	300	350	400	450	500	550	600	650	700
Battery Capacity (Wh)***	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000

*** Recommended solar array assuming a solar irradiation of >3 kWh/m²/day and de-rating for system losses and load variation.*
**** Recommended battery capacity (Wh) assuming lead-based batteries with 3-days of autonomy at a maximum depth of discharge (Dod) of 50%. For example, if the recommended capacity from the chart above is 2000 Wh, then a 12V/167Ah or 24V/83Ah total capacity battery would be required. If using other battery chemistries, please conslut your battery manufacturer for sizing assistance.*

Disclaimer: This guide should be used as an estimation tool. Location parameters, array tilt, & azimuth should be factors when finalizing a solar system design.

**Data per standard ASHRAE test conditions: Constant ambient temperature with no product inside and no door openings. Energy usage will increase when adding warm product or repeated door openings. Increasing the solar array size and battery storage may be required for each consumer's specific applications.*