

Portable Refrigeration



IDEAL FOR:

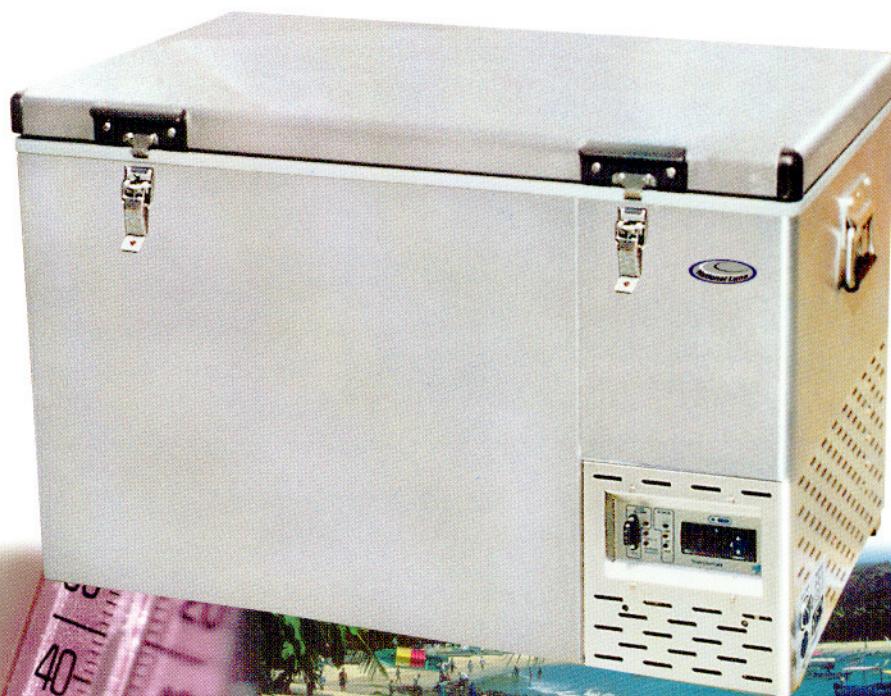
- Off Road Vehicles
- 4x4's
- Caravans
- Solar Powered Lodges
- Long Haul Trucks
- Boating
- Camping
- Outdoor Recreation
- Medical Vaccine
- Off Road Trailers
- Motorhomes

AVAILABLE IN:

STAINLESS STEEL OR CHROMADEK

12 / 24 VOLT
220 VOLT

BATTERY / MAINS



Company Profile



In the early 1990's, **NATIONAL LUNA** was very active in the solar electrical market and rapid expansion was being made in the areas of low cost housing and remote medical stations where no Eskom electricity was available. One of the greatest demands at the time, was that of medical vaccine refrigeration which had to meet the very stringent World Health Organization's specifications.

indel B, the leading Italian manufacturer of specialised 12 volt refrigerators, had not only done extensive research in the industrial vehicle field, but had supplied **indel B** refrigerators to NASA for the space shuttle program.

NATIONAL LUNA, benefiting from this large company's wealth of experience and expertise were able to launch a locally assembled unit in 1993. A number of these refrigerators were sold to customers who used them in their remote lodges, game farms as well as being placed in the back of 4x4 vehicles. As time passed, a greater demand for our high quality 4x4 refrigerator unit evolved.

During 1997, Danfoss, the largest European manufacturer of compressors, launched what is known as the BD35 F 12/24 volt compressor. This revolutionary concept allows a variable speed option on the compressor (thereby using very little current draw from the battery).

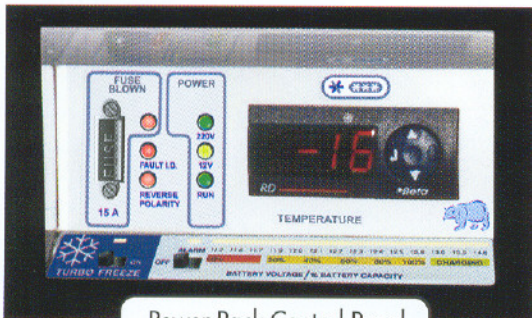
During 1998 it was decided to develop a full range of specialised 4x4 refrigerator/freezer units. Incorporating the World Health Organisation's specifications (relating to superior refrigeration performance), and the new Danfoss compressor, **NATIONAL LUNA** has developed a revolutionary new product range. This new product has evolved not only from our own field experiences, but also from those of many 4x4 enthusiasts.

This has resulted in a refrigerator/freezer range that is very robust in design, utilizes very little power from the battery, and is fitted with management information indicators which allows the user to understand exactly how the refrigerator is operating.



The new Danfoss compressor

Unique South African Technology



Power Pack Control Panel

One of the biggest problems in the field has been that of comprehending battery charging and understanding the operation of your off - road refrigerator / freezer.

An '**Intelligent Control Panel**', built as an option into the power pack, addresses this problem. A major feature of the **NATIONAL LUNA** power pack is that it incorporates an automatic speed control technology which increases the freezing capability when 220 volt is applied, or when the vehicle's engine is running (i.e. surplus power is available). It will automatically default to energy saving mode when the battery is not being charged. The power pack is fitted with a battery monitor and low voltage audible alarm.



Stick Lite



The **National Luna** refrigerator/freezer is fitted with a 12 volt auxiliary socket which allows the power pack to run a 12 volt fluorescent light directly off the refrigerator.

Design Registrations:

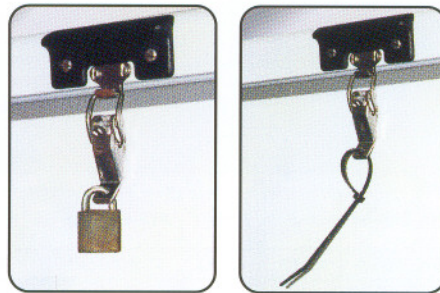
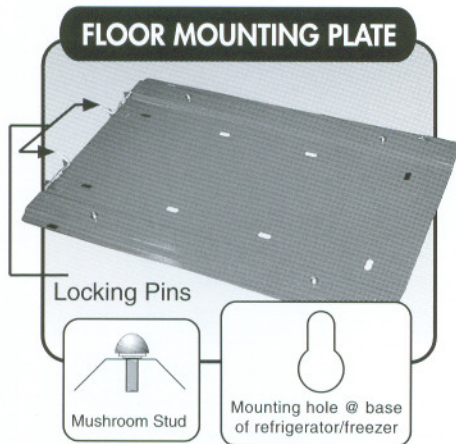
- South Africa: 2001 /0525/0526/0527/0528/0529/0530/0531/0538
- Australia: 1733/0021 1734/0021

Specifications

Standard features on all models

CHROMADEK EXTERIOR STAINLESS STEEL INTERIOR BIN GALVANISED METAL BASE			STAINLESS STEEL			
MODEL	NLR 40	NLR 80	NLR 40S	NLR 65S	NLR 80S	NLR 125S
ACTUAL VOLUME (LITRES)	39.8	79.7	39.8	66.8	79.7	127.8
INTERIOR LIGHT	✓	✓	✓	✓	✓	✓
BASKETS	3	4	3	5	4	7
CURRENT DRAW @ -18°C Amps/HOUR (AVE) @ 12.5 V dc	2.5	2.5	2.5	2.5	2.5	2.5
WEIGHT (KG)	27	40	31	38	42	51
MIN. TEMP @ 32°C @ 2000 RPM- LOW SPEED	-19	-18	-19	-18	-18	-17
MIN. TEMP @ 43°C @ 2000 RPM- LOW SPEED	-13	-12	-13	-12	-12	-10

- LOCKABLE LID
- 12/24 DC/220 VOLT AC POWER
- ELECTRONIC THERMOSTAT
- LOW VOLTAGE CUT-OUT
- 60 mm INSULATION
- WIRE & SKIN CONDENSOR
- FAN ASSISTED CONDENSOR
- STAINLESS STEEL BASE
- POWER/RUN INDICATORS
- TEMPERATURE GAUGE
- SPRING LOADED CARRY HANDLES
- STAINLESS STEEL INTERIOR BIN

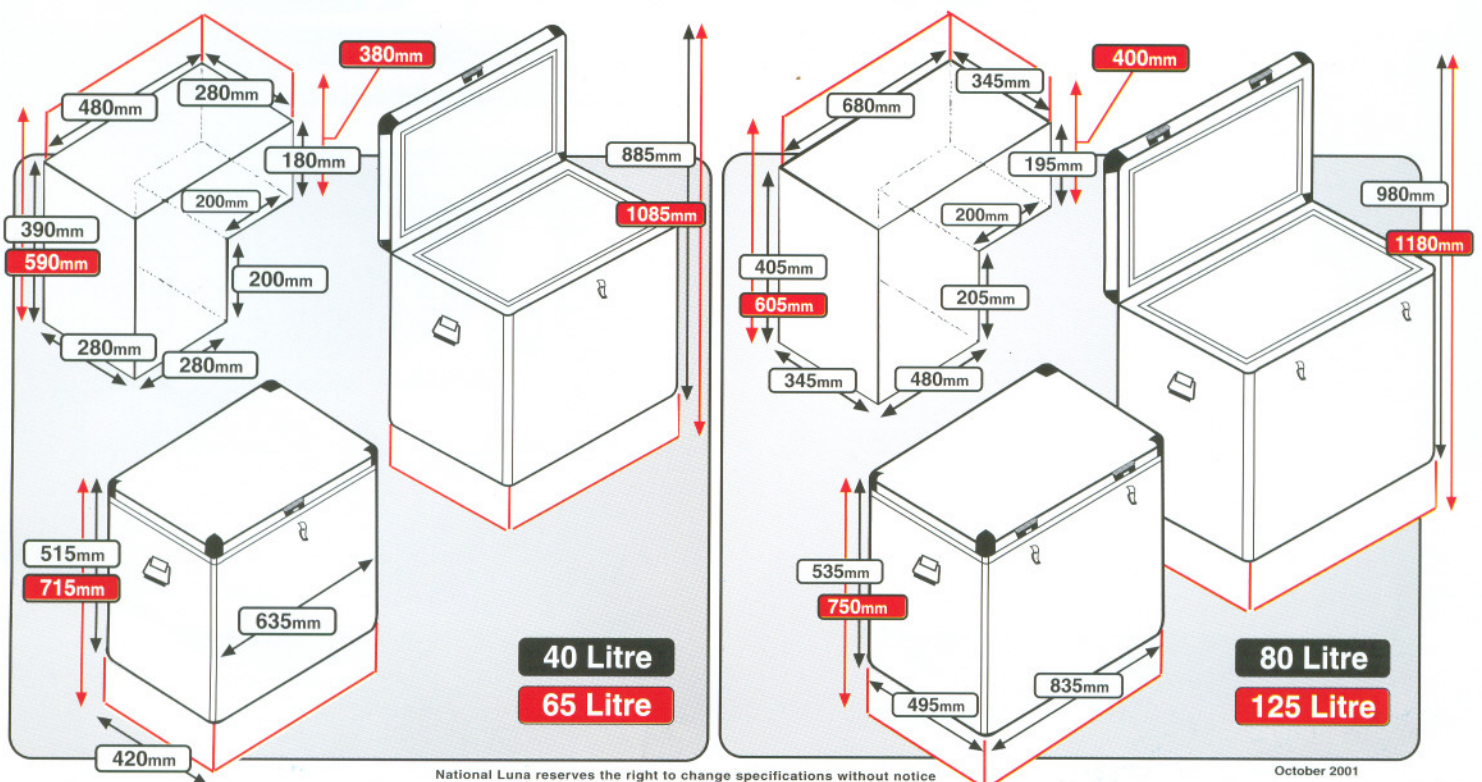


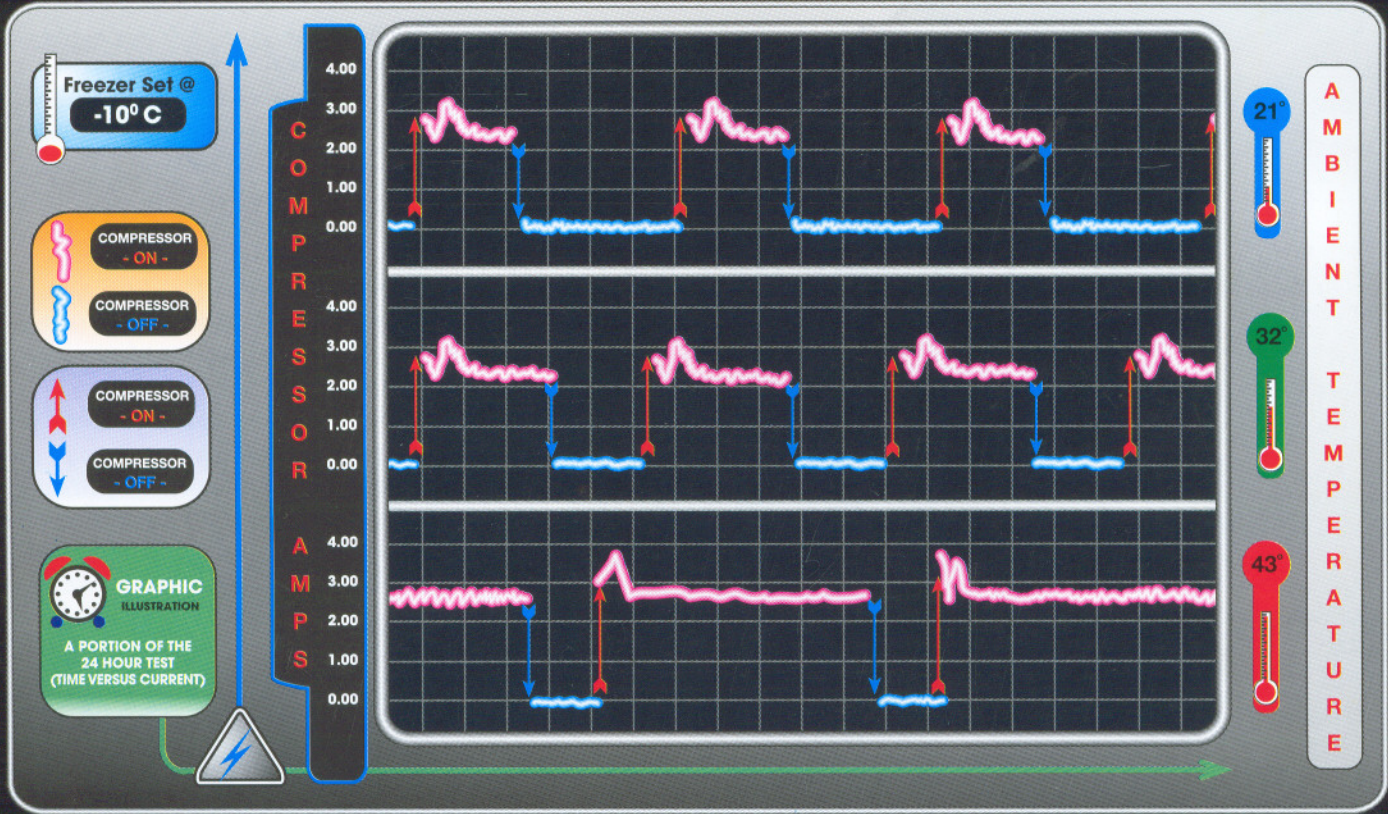
Lockable latches are fitted to allow use of a normal padlock or cable tie.



A unique base mounting plate is available for floor mounting to your vehicle, complete with locking pins. Simple to unlock & remove your portable refrigerator/freezer.

Dimensions include hinges & handles





SPEED SET @ 2000 RPM		NLR-40	NLR-65	NLR-80	NLR-125	NLR-40	NLR-65	NLR-80	NLR-120	NLR-40	NLR-65	NLR-80	NLR-125	Total Sample Time - 24 HOURS
Percentage Running Time		41.10	42.35	46.90	49.17	59.22	62.90	63.18	67.55	83.21	83.36	84.17	93.85	
Average current (Amps) drawn by compressor		2.63	2.65	2.56	2.67	2.59	2.67	2.75	2.70	2.72	2.79	2.84	2.85	
Average Amp / per Hour / 24		1.08	1.12	1.20	1.31	1.53	1.68	1.74	1.82	2.26	2.33	2.39	2.67	
Total Amp Hours consumed (Sample Time) OVER 24 HOURS		25.94	26.93	28.82	31.51	36.81	40.31	41.70	43.77	54.32	55.82	57.37	64.19	
Min. Temp. Continuous running (Thermostat by-passed - Low Speed)		-25	-25	-26	-23	-19	-18	-18	-17	-12	-12	-12	-10	
Ambient Temperature (Thermostat set at -10°C)		21°C				32°C				43°C				

CALCULATION OF ENERGY - BATTERY AMP HOURS REQUIRED

- The power consumption test results can now be used to calculate the battery sizing. Also, provided good condition deep cycle batteries are used, a driving/charge time can be estimated on a daily basis to ensure enough battery power is available to drive the refrigerator/freezer. (This would depend on the size of the battery)
- As the ambient temperature varies during a 24 hour day, an estimate of temperature conditions will be required.
- For the purposes of this example, an assumption of daily temperature is as follows :

1. Night - time	18h00 pm - 06h00 am @ 21°C x	12 Hours
2. Morning	06h00 am - 10h00 am @ 32°C x	4 Hours
3. Mid - day	10h00 am - 15h00 pm @ 43°C x	5 Hours
4. Late afternoon	15h00 pm - 18h00 pm @ 32°C x	3 Hours
		24 Hours

CALCULATION

	N. Luna 40L	N. Luna 65L	N. Luna 80L	N. Luna 125L
1. (21°C) Ave x 12 Hours	1.08 x 12 = 12.96	1.12 x 12 = 13.44	1.20 x 12 = 14.40	1.31 x 12 = 15.72
2. (32°C) Ave x 4 Hours	1.53 x 4 = 6.12	1.68 x 4 = 6.72	1.74 x 4 = 6.96	1.82 x 4 = 7.28
3. (43°C) Ave x 5 Hours	2.26 x 5 = 11.30	2.33 x 5 = 11.65	2.39 x 5 = 11.95	2.67 x 5 = 13.35
4. (32°C) Ave x 3 Hours	1.53 x 3 = 4.59	1.68 x 3 = 5.04	1.74 x 3 = 5.22	1.82 x 3 = 5.46
TOTAL amp hour x 24 Hours	34.97	36.85	38.53	41.81

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