



4x4 Recreational
Vehicle
Equipment
Specialists

Portable Refrigeration

**PORTABLE COMBINATION
REFRIGERATOR/FREEZERS**

**12 / 24 VOLT - BATTERY
220 VOLT - MAINS**



**LOWEST AVERAGE
POWER CONSUMPTION
IN SOUTH AFRICA**

INSTRUCTION MANUAL

IN ORDER TO OBTAIN THE GREATEST SATISFACTION FROM YOUR REFRIGERATOR/FREEZER, IT IS RECOMMENDED YOU STUDY THE INSTRUCTIONS CAREFULLY.

CONTENTS

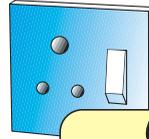
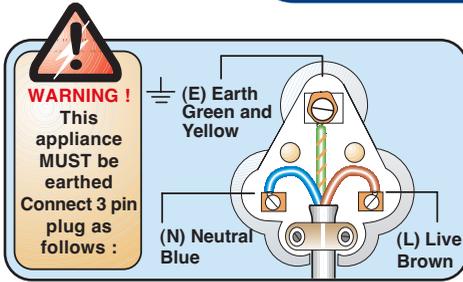
● COMPANY PROFILE	1
● SAFETY INSTRUCTION / SAFETY HINTS/ DEFROSTING	2
● FREEZER CALENDAR / INSTALLATION AND POSITIONING	3
● RECOMMENDED TEMPERATURE SETTINGS	3
● HOT AND HIGH HUMIDITY CLIMATES / FREEZER STORAGE GUIDE	4
● FEATURES AND PARTS LOCATION	5
● FLOOR MOUNTING PLATE	6
● TURBO FREEZE AND BATTERY MANAGER - OPTIONAL FITMENT	6
● ELECTRONIC THERMOSTAT	7
● SETTING THE ELECTRONIC THERMOSTAT	7
● TRAILER/CARAVAN POWER CONNECTIONS	8
● CONNECTIONS AND WIRING	8
● POWER PACK	9
● BATTERY INFORMATION AND GLOSSARY OF TERMS	10/11/12
● SPLIT CHARGING SYSTEMS	13
● CARE AND CLEANING	14
● TROUBLE SHOOTING	14
● INFORMATION ON STAINLESS STEEL	15
● DIMENSIONS	16
● MAINTENANCE	17
● GUARANTEE	18
● RUST FREE GUARANTEE / SERVICE NUMBER	19

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. Development of such a refrigerator took place and was launched in 1993.

A number of these refrigerators were sold to customers who used them in their remote lodges on game farms as well as being placed at the back of 4x4 vehicles. As time passed, a greater demand for our high quality 4x4 refrigerator unit evolved. During 1998 it was decided to develop a full range of specialized 4x4 refrigerator/freezer units to meet this increasing demand. This new product has evolved from field experiences derived not only from our own, but that of many 4x4 enthusiasts and 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.

SAFETY INSTRUCTIONS



CAUTION! IF THE POWER SUPPLY CORD IS DAMAGED IT MUST BE REPLACED BY THE MANUFACTURER OR IT'S SERVICE AGENT OR A SIMILARLY QUALIFIED PERSON IN ORDER TO AVOID A HAZARD.

SAFETY HINTS

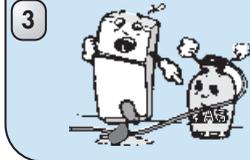
Do not store bottled food or drinks when in the freezer mode



Never splash water/liquids onto the appliance



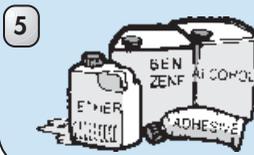
The unit must not be operated next to explosive gases



Do not use flammable sprays near the unit when it is in operation



Do not put volatile chemicals such as benzine in the refrigerator



This refrigerator is not suitable for the storage of corrosive chemicals or liquids*



DEFROSTING

- Disconnect the power supply. **Failure to disconnect the power supply may result in electrical shock or personal injury.**
- Remove all food and baskets from the freezer and store in a cool place.
- Leave the freezer door open. To speed up the process, place a plastic bowl of hot water in the freezer.
- Once the ice has melted and the water has been removed, clean and dry the freezer section.
- Replace food and baskets.
- Do not forget to reconnect the power supply.

NB. Never hack/chip at the ice with a plastic or metal tool in an attempt to hasten the process.

FREEZER CALENDAR

MAXIMUM RECOMMENDED FREEZING PERIODS AT -18°C

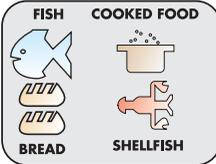
THIS STAR ICON MEANS THE APPLIANCE HAS A FREEZER COMPARTMENT



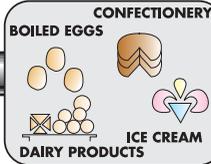
3 STAR FREEZER RATING GUIDE

THESE THREE STAR ICONS EACH REPRESENT A -6 DEGREE C. ABILITY IN COOLING TEMPERATURE MAINTAINING -18 DEGREES C.

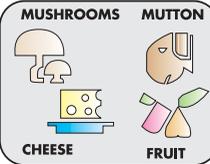
3 MONTHS



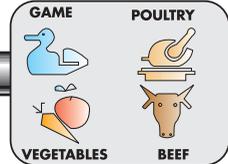
6 MONTHS



9 MONTHS



12 MONTHS



RECOMMENDED REFRIGERATOR/FREEZER TEMPERATURE

FOR FOODSTUFFS
6°C

FOR BEVERAGES
A COLDER SETTING
0°C to 2°C

WHEN USING AS A
FREEZER, TO
MAINTAIN GOODS IN
A FROZEN STATE
-6°C to -18°C

INSTALLATION AND POSITIONING

1

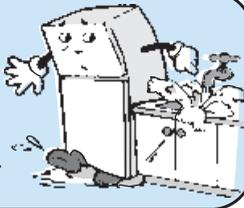
- Connect the unit to a 220-250V AC power supply. All units are supplied with a 3-pin moulded plug. Should this plug be detached from the power cord for any reason, reconnect as per the diagram on page 2.

2

- Connect the 12 volt Hella male plug and female socket assembly to a **fully charged car battery**, ensuring good connections. (See page 8)

3

- Avoid areas which may be affected by dampness as this will adversely affect the electrical insulation of the cabinet, when connected to 220 volt.



4

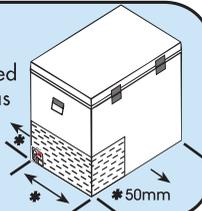
- Place the appliance in a dry, well ventilated area, away from heat sources and direct sunlight, where possible.



5

NB

- Ensure that your appliance is positioned with adequate clearance on all sides. Suggested minimum clearance areas are as follows:
Clear above the appliance
50mm on the rear
50mm on the compressor side



6

- All units are fitted with an electronic thermostat, located on the front right hand side of the cabinet. The recommended temperature is at +6° for the refrigerator and at -6° for the freezer.

HOT & HIGH HUMIDITY CLIMATES

If you are operating your refrigerator in a hot or humid climate it is important to follow these tips.

- Never store uncovered liquids or food in the compartment. This causes excessive moisture to enter the evaporator area and may hamper operation.
- Make sure the refrigerator door is properly closed and sealed. Remove any objects that might prevent the door from closing completely.
- Warm temperatures and high humidity affect the way your refrigerator operates. See the Temperature Controls section on how to set the controls. (Page 7).
- Keep the refrigerator door gasket dry. Stagnant water can cause mildew to grow.
- Ensure that the refrigerator is positioned so that **no obstruction of the ventilation grill** occurs.
- Leave the door open when not in use.

FREEZER STORAGE GUIDE

Listed below are some tips to assist you when freezing food or packing your freezer.

Allow 1 hour of operating time before loading the freezer. When bulk freezing, load the freezer in stages approximately 25% of the total freezer space and allow to freeze before further loading.

Divide food into reasonable portions, sized according to your requirements.

When freezing meat cutlets, chops etc., insert plastic or foil between the portions before wrapping.

This will ensure easy separation.

1

- Always allow food to cool before placing in the freezer.



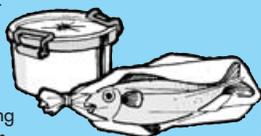
2

- When freezing liquids or soft foods never fill the containers to the maximum. During freezing some liquids increase their volume by approximately 10%.



3

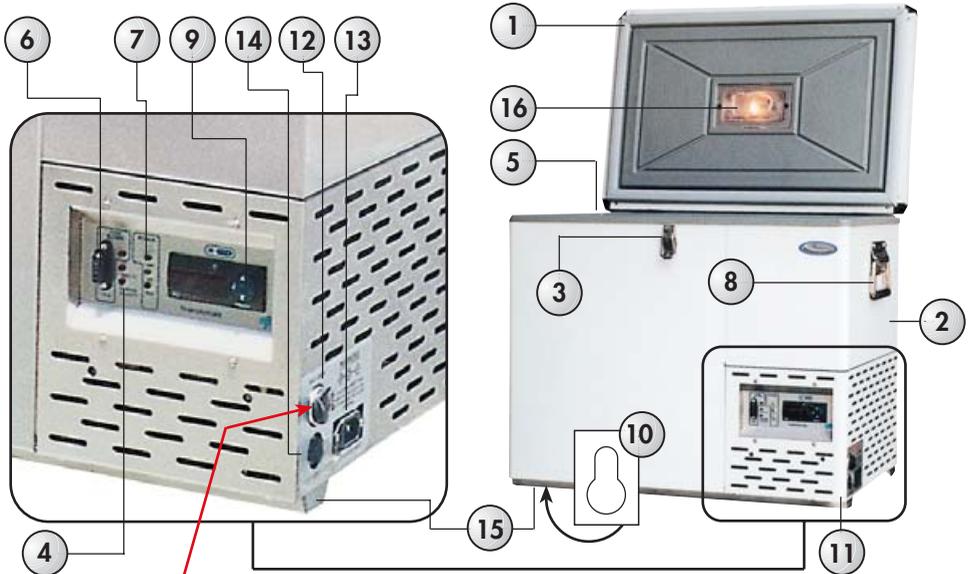
- All food should be sealed or in airtight containers. This will ensure prolonged nutritional value and avoid the mixing of tastes and odours.



4

- Never exceed the expiry date on the frozen foods. There is a freezer calendar guide on page 3 of this instruction guide.

FEATURES AND PARTS LOCATION

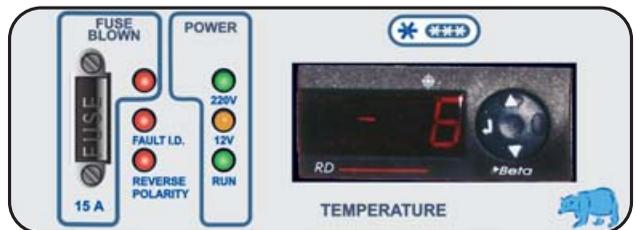


The **NATIONAL LUNA** refrigerator/freezer is fitted with a 12 volt DC auxiliary socket which allows the power pack to run a 12 volt fluorescent light directly off the refrigerator.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Solid Lid 55mm Insulation 2. Hi Density Polyurethane Foam Cabinet 3. Stainless Steel Locking Catch 4. Fault Indicators 5. Stacking Basket 6. External Fuse and Blown Fuse Warning Indicator 7. Refrigerator Power Indicators
- 220V - 12V - Refrigerator Running 8. Comfort Carry Handles | <ol style="list-style-type: none"> 9. Electronic Thermostat 10. Base Plate Mounting Holes (underneath) 11. Built in Power Pack with Automatic change over 12. 12 Volt DC Output Plug (Maximum 2 Amps) 13. 220V Input Plug 14. 12 Volt DC Input Plug Cable with Hella Male Plug 15. 3CR12 Stainless Steel Base 16. Interior Light |
|---|--|

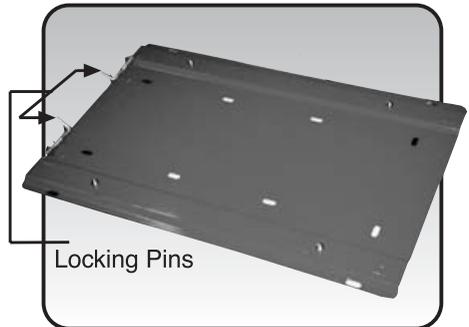
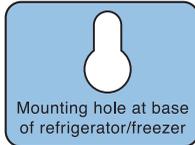
FREEZER SECTION

Take note that by setting at maximum freeze, the unit will consume more power from the battery. Best energy saving setting should be in the order of -6°C .



FLOOR MOUNTING PLATE

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

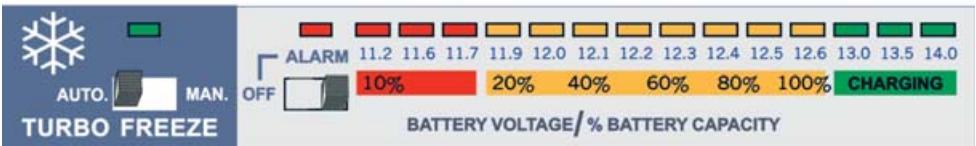


TURBO FREEZE / BATTERY MANAGER - OPTIONAL FITMENT

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). The **NATIONAL LUNA** range of refrigerators/freezers are factory set to run at 2,000 rpm (Low Speed) in order to conserve battery power. .



An optional fitment to your refrigerator/freezer, is the revolutionary **NEW TURBO FREEZE and BATTERY MANAGER CONTROL**



1. The compressor will automatically run at "High-Speed" when your battery voltage increases above 13.3 volts (vehicle engine running), or when connected to 220 volt AC. This increases freezing capacity. The compressor will automatically default to low speed (i.e. energy saving mode) when the vehicle is switched off. (i.e. voltage will drop below 12.6 volts).
When setting this **TURBO** option to manual position, the compressor will remain in High-Speed mode continuously.
NB - It is recommended to leave this switch in the AUTO position for average use.
2. The battery manager gives an accurate reading of battery capacity. It is fitted with a low voltage alarm which may be switched off. (See page 11 for details of battery discharge curves)

ELECTRONIC THERMOSTAT

PROGRAMME SET

Depress to enter programme mode (see step 1)

LED 1 - Flashing indicates 'Programme Active'

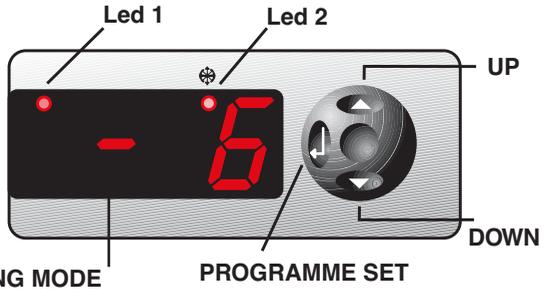
LED 2 - Compressor/thermostat - 'On'

UP - Increases temperature setting

DOWN - Decreases temperature setting



REFLECTS FREEZING MODE



SETTING OF THE ELECTRONIC THERMOSTAT

RECOMMENDED REFRIGERATOR/FREEZER TEMPERATURE

FOR FOODSTUFFS
6°C

FOR BEVERAGES
A COLDER SETTING
0°C to 2°C

WHEN USING AS A
FREEZER, TO
MAINTAIN GOODS IN
A FROZEN STATE
-6°C to -18°C

STEP BY STEP INSTRUCTIONS FOR SETTING ELECTRONIC THERMOSTAT

STEP 1 Depress "Programme Set" button (for approximately 2.5 seconds) until the display changes - release immediately. Display will now read....diagram ①



STEP 2 Immediately after releasing the "Programme Set" button - depress again for approximately 0.2 seconds
- The Indicator will now reflect the current (previous) temperature settings (in this example freezer set at -18°C)
- The programme LED 1 will now be flashing.
Display will now read....diagram ②



STEP 3 Depress "Up" set button to increase temperature to the desired refrigerator setting (per our example of +6°C). Release "Up" button when the display indicates you have reached the desired setting.
Display will now read....diagram ③

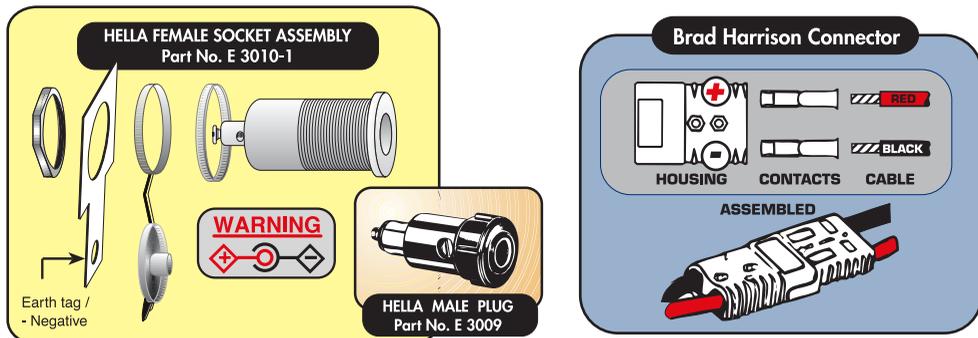


STEP 4 The flashing LED will stop automatically after approximately 10 seconds, and the display will reflect the current temperature inside the bin. Should the bin temperature be above your desired setting of +6°C the LED 2 will light up to indicate the compressor is switched on to lower the bin temperature.
Display will now read....diagram ④



TRAILER / CARAVAN POWER CONNECTIONS

It is very important to use a plug / connector that has *no voltage drop*. Most 4x4 vehicles use a Hella male plug and female socket for connecting the refrigerator. For connecting to a trailer / caravan, a 175 Amp Brad Harrison connector should be used. For large compressors with a high start-up current, a 50 Amp Brad Harrison connector should be used. One of the biggest causes of start-stop (hunting) of a refrigerator can be attributed to bad connections. It is important that earth connections are sound. Preferably connect all (-) negative wiring direct to the battery (-) negative pole.



CONNECTIONS AND WIRING

Please follow all instructions under the separate headings of installation, operation, care, cleaning and storage guidelines.



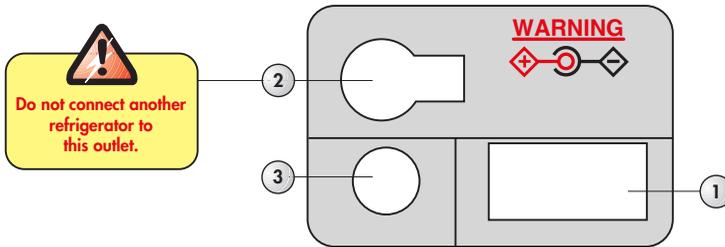
Special Note: The 12 volt units are cooled by means of a fan assisted air blown system. Please ensure that the air vents, located around the compressor area, are not obstructed in any way as this will adversely affect the performance of the appliance.

N.B. DO NOT RELY ON THE CAR BODY FOR EARTH

Please follow all instructions under the separate headings of installation, operation, care, cleaning and storage guidelines.

- 1) The 12 volt unit has been supplied with a male Hella plug fitted to the 12 volt power input.
- 2) A female Hella socket is supplied with every refrigerator and should be connected to your auxiliary battery. It is very important to mount this female socket firmly with a 6mm² black earth cable (-) negative soldered onto the earth tag provided, and connected directly onto the (-) negative terminal of the battery.
- 3) Similarly connect the 6mm² red cable to battery (+) positive.
An in-line fuse (15 amp) should be fitted next to the battery (+) positive terminal.
- 4) Should this connection distance be less than 3 metres a 4mm² cable may be used.
DO NOT USE THINNER CABLE - (See Page 9)

POWER PACK



1. The 220 volt supply in recreational camps sometimes is overloaded and a voltage drop to below 200 volts AC can occur. Similarly a 220 volt generator (if not set correctly) could either give too low (i.e. below 220 volt) or up to 260 volts if the revs are too high. The built in Power Pack is designed to accommodate this varying 220 AC volt input.
2. There is a 12 volt Hella female socket "take-off" on the unit. Please ensure that a maximum demand of 2 amp is not exceeded (i.e. 2 x fluorescent lights).
3. The refrigerator is supplied with 1.5 metres of 4mm² cable and male Hella plug.
It is not recommended to exceed this length.

WIRING LOSS

This refers to the voltage drop in an electrical conductor, for example from the battery to the refrigerator when a thin wire is connected. The voltage drop is of such a magnitude as to create an artificially low voltage to the compressor. Some compressors are designed to cut-out when the battery reaches 10.4 volts. On start-up, the compressor draws an instantaneous peak current, which can reduce the voltage, and cause the refrigerator to switch off. Normally a 4mm² dual wire is the **minimum** thickness that should be used.

(Below is a table of wiring over distance).

Ensure that a suitable sized cable is used for the power supply line (see table): If possible, with no junction on the wire which might otherwise cause further voltage drops.

N.B. The use of wires with inadequate dimensions may inhibit the compressor even if the battery is fully charged.

TYPICAL WIRING LOSSES AND THE RECOMMENDED CABLE IS LISTED BELOW

CABLE SECTION mm ²	MAXIMUM CABLE LENGTH IN METRES	
	12 Volt DC	24 Volt DC
2.5	N/A	5
4	4	8
6	6	12
10	10	20

- Any circuit breakers must have a breaking load of not less than 20A (10A for the 24V models)
- Ensure the polarity is correct

BATTERY INFORMATION AND GLOSSARY OF TERMS

Many users of 12 volt refrigeration/freezers do not understand the buzz words of refrigeration.



TERMINOLOGY FOR THE LAYMAN



A short explanation of the terms used :

EVAPORATOR

This is the part of the refrigeration system that absorbs heat from the box/foodstuffs. Very cold liquid refrigerant gas (R134a) is pumped via the compressor through pipes to this area where heat energy transfer takes place by evaporation of the refrigerant. The gas is then returned to the compressor.

CONDENSOR

The gas from the evaporator passes through the compressor and is then cooled down using a "radiator" (similar to a motor car's radiator) before being pumped back to the evaporator. This cooling process takes place through heat exchange. Many refrigerators have a fan to cool the "radiator" down faster.

COMPRESSOR

This is a refrigeration "pump" which pumps the refrigerant gas throughout the refrigeration system in a continuous cycle. It is of interest to purchase a refrigerator with a reliable and energy efficient compressor designed for off-road conditions. The compressor is linked to a thermostat which controls the temperature at which it will be switched on and off.

THERMOSTAT

This device measures the inside temperature of the refrigerator bin and will switch off the power supply to the compressor when the desired temperature is reached. When the bin temperature rises, the thermostat will switch the power on again, and the compressor will run.

The colder the refrigerator is set, the longer the compressor will run. Note that more power (amp hours) is consumed over time to do this.

VOLTS (V)

Typically ESKOM supplies households with 230 volt AC (alternating current). In the off-road market the available power source is normally a 12 volt DC (direct current) car battery (main) and an additional deep cycle battery (auxiliary).

AMPS (A)

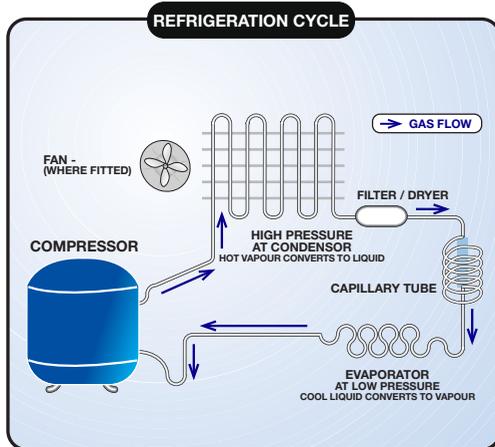
Current flow is measured in amps that is being consumed by the electrical device to make it work.

WATTS (W)

This is total power by multiplying volts x amps = watts. Mathematically a drop in volts (V) will increase the current draw amps (A) in order to provide the necessary power in watts (W) to drive the electrical device.

AMBIENT TEMPERATURE

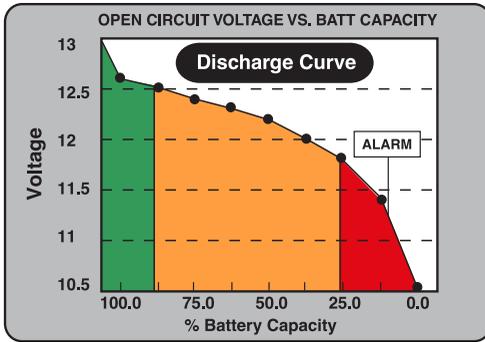
This is the prevailing temperature of the air surrounding the refrigerator. Ambient temperature is normally higher during the day. The higher the ambient temperature, the more difficult it is for the refrigerator to cool down.



BATTERY VOLTAGE

Since ambient temperature affects voltage, readings are done at +25°C

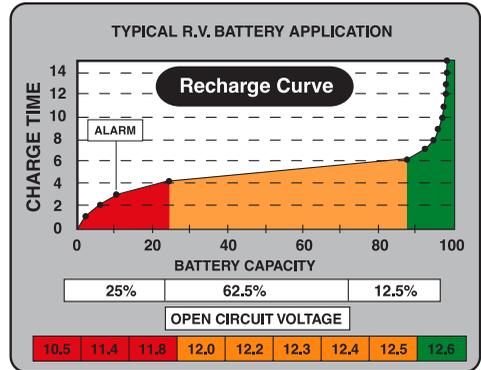
The state of charge of a battery is typically measured by voltage at its terminals. This is not an accurate method, but is used throughout the industry to control battery charging and low voltage cut-outs where necessary. The battery does not have a linear discharge rate and collapses after approximately 11.8 volts.



% Battery capacity	Open circuit voltage
100.0	12.6
87.5	12.5
75.0	12.4
62.5	12.3
50.0	12.2
37.5	12.0
25.0	11.8
12.5	11.4
0.0	10.5

BATTERY CHARGING

Different batteries have different recharging requirements and would need to be matched to the alternator of the car (typically 13.7 volts or 14.2 volts). Deep cycle batteries normally require 14.2 volts DC to achieve a proper charge. Poor wiring in the split charging system could cause a voltage drop and the battery will take a very long time to charge and possibly never achieve a fully charged state.



A deep cycle battery should never be stored in a flat / discharged condition.

CHARGE ACCEPTANCE RATE (EXCESSIVELY DISCHARGED BATTERY)

EXCESSIVE DISCHARGE OF BATTERIES

Most people are unaware of the charge characteristics of a battery, which has been discharged too deeply. Provided the battery has not been damaged beyond repair, and that the recharge process takes place immediately after the battery went flat, a conditioning process takes place chemically whereby the battery will accept a slow charge only for 4 hours. Thereafter it will accept a charge for approximately 5 hours and then a trickle charge of 20 - 48 hours would be required to recover the battery to its full capacity.

BATTERY CAPACITY

Deep cycle batteries used in the 4x4 market have a rated storage capacity of typically 45 amp hour up to 115 amp hour. In an off-road refrigerator situation, a refrigerator that draws a current of 2.5 amps from a 100 amp hour battery could in theory run continuously for 40 hours before having to recharge the battery.

Different batteries have different capacities and recharge rates.

START UP CURRENT

THIS IS THE MOST COMMON PROBLEM RELATING TO UNRELIABILITY OF THE PERFORMANCE OF ANY 12 VOLT OFF-ROAD REFRIGERATOR /FREEZER. (SEE WIRING LOSS PAGE 9)

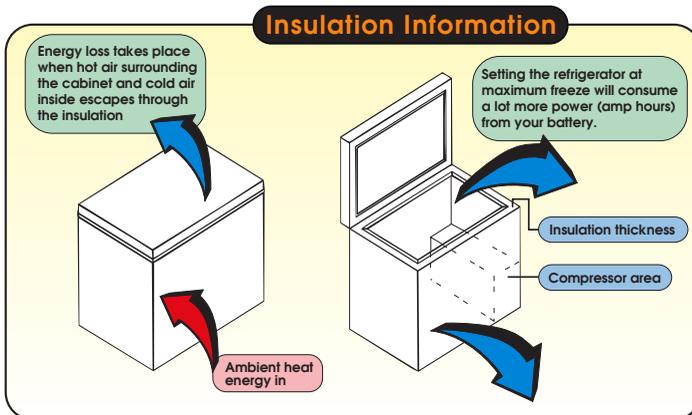
When a compressor starts up initially, it will draw many times more than it's rated current (amps). Depending on the type of compressor fitted to a 12 volt refrigerator, this "instantaneous" start-up current could range from 4.7 amps to 33 amps. This creates major problems where bad connections and thin wiring have been installed on the 12 volt system.

BATTERY PROTECTION LOW VOLTAGE CUT-OUT

FACTORY SET "BATTERY LOW" CUT-OUT VOLTAGES		
COMPRESSOR	CUT - OUT	RESTART
12 Volt DC	10.4	11.7
24 Volt DC	22.8	24.2

INSULATION

Most refrigerator/freezers are insulated using a high-density polyurethane foam. Heat energy transfer takes place through the foam. The higher the ambient temperature outside, and the colder the refrigerator/freezer bin temperature inside, the more energy will be lost through heat exchange. It stands to reason that an increase in insulation thickness will reduce this 'loss' considerably.



STANDARD VERSUS TROPICAL CONDITIONS

An international standard of refrigerator/freezer testing is based on 32°C and 43°C ambient temperature.

In South Africa, it is not uncommon for the ambient temperature to be above 32°C. In summer, a poorly insulated freezer left in a closed motor vehicle may fail to operate effectively causing defrosting.

ENERGY LOSS

For the purposes of simplicity, energy loss can be regarded as the extra power needed to drive the compressor longer to compensate for 'lost energy' permeating through the wall of the refrigerator into the bin. (Heat exchange).

Poorly designed refrigerator insulation combined with small compressors may reach a stage whereby the total refrigerator system is incapable of functioning effectively under high ambient temperature conditions.

SPLIT CHARGING SYSTEMS

There are a number of split charging systems being offered to the 4x4 industry.

1. **Manual battery change over switch** - this requires the driver of the vehicle to switch from the main battery to the auxiliary or vice versa. However, the **NEGATIVE** of this system is that you disconnect a battery from the alternator and it may never get a full charge. (Causing permanent damage to the battery).
2. **Solenoid / relay type systems** - these typically use a small relay or solenoid which is not capable of handling the current required to charge the auxiliary battery. These systems also tend to work off the ignition or alternator, which connects both batteries when the car is started. Wiring done by normal auto electricians is too often too thin to handle the power required in a good split charging system.
3. **Time delay systems** - these are now recognized by most 4x4 specialists as a better methodology whereby the main battery gets a full charge for approximately 4-6 minutes before a large solenoid connects both batteries. Cable thickness 16mm² - 35 mm² (Welding Cable).

NATIONAL LUNA has in its experience of field problems and discussions with leading 4x4 specialists developed a fully comprehensive split charging system called the **INTELLIGENT BATTERY MANAGER SYSTEM** which caters for all conditions of battery charging. It also has a battery monitor, which indicates to the driver the state of both batteries, with an alarm to indicate when the battery gets excessively discharged.



Battery Manager Kit



R.V. Equipment

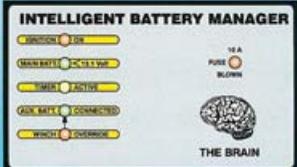
INTELLIGENT BATTERY MANAGEMENT SYSTEMS



BATTERY MONITOR



INTELLIGENT BATTERY MANAGER



FOR

DUAL

BATTERY SYSTEMS




CARE AND CLEANING

Your refrigerator should be cleaned in the following manner, both on installation and when defrosting. It is important that you keep the inside and outside of your refrigerator/freezer clean to prevent bacteria and odours from forming. Remove all food and disconnect the power source before cleaning.



Failure to disconnect the power may result in electrical shock or personal injury.

DO NOT use metallic scouring pads, brushes, any abrasive cleaners or alkaline solutions. Use a soft sponge or a soft cloth.

Interior:

Wash the interior of the refrigerator with a mild household cleaner or 2 tablespoons of bicarbonate of soda diluted in 250ml of warm water. Rinse with warm water and dry.

Exterior: N.B. DO NOT use a garden hose to wash the refrigerator exterior as this could jet water into the electronics

Wash the exterior with the same solution as for the interior.

DO S - ✓

- Routine simple and gentle cleaning
- Use cleaners showing "Suitable For Stainless Steel"
- Employ repeated Routine Cleaning rather than an aggressive single cleaning

DON TS - ✗

- Use coarse abrasive powders
- Use metallic scourers (or brushes with metal bristles)
- Use the "Silver Cleaners"

TROUBLE SHOOTING

Please check the following points: - Should the refrigerator not get cold -

- the temperature setting may be incorrect on the electronic thermostat.
- an electrical fault may have tripped the main circuit board in the house.
- the power source may have been switched off or disconnected at the plug.
- the air circulation may be blocked around the compressor area by paper or plastic.

Operational errors will cause the fault ID LED (Point 4 on pg 5) to flash a number of times. The number of flashes depends on what kind of operational error was recorded. Each flash will last $\frac{1}{4}$ second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds.

Number of Flashes	ERROR TYPE
1	Battery protection cut-out (The battery voltage was below the battery cut-out setting. See page 12).
2	Fan over-current cut-out (The fan loads the electronic unit with more than 0.5 Amps or 1 Amp peak)
3	Motor start error (The rotor is blocked or the differential pressure in the refrigerator system is too high(>5 bar))
4	Minimum motor speed error (If the refrigerator system is too heavily loaded, the motor cannot maintain minimum speed 1,900 rpm)
5	Thermal cut-out of electronic unit (If the refrigeration system has been too heavily loaded, and the ambient temperature is high, the electronic unit will run too hot)

INFORMATION ON STAINLESS STEEL

CARE, MAINTENANCE AND CLEANING OF STAINLESS STEEL

The corrosion resistance of stainless steel stems from an extremely thin but tenacious and self-repairing film which forms on its surface. This imparts the properties of stain resistance, non-tainting of food, hygiene, cleanability and aesthetic appearance which make it the ideal choice for many domestic articles. Further, it does not chip, flake, crack or break. Stainless steel will be unaffected by the normal conditions of household use. Routine simple gentle cleaning will reward the owner with a product which retains its properties and appearance throughout years of constant daily usage. Because of its reputation for durability stainless steel is sometimes assumed to be indestructible, and therefore subjected to misuse or even abuse. Care should be taken to avoid such "abnormal" use.

ROUTINE CLEANING: Stainless steel's best friends are quite simply soap, or mild diluted detergent, or diluted ammonia in warm water, applied with a soft cloth or synthetic sponge. Rinse well, dry with a soft cloth. Occasionally the use of a mild household cleaner (e.g. Handy Andy™), a fine synthetic scourer (green "Scotch-Brite™") or a brush with nylon bristles may be used. Routine cleaning applied repeatedly over several days will often remove heavy soiling, and staining which has occurred will become less noticeable (may even completely disappear).

NOTES: Avoid contact with aggressive chemicals.

Dilute Nitric Acid (up to 20%) is a "Friendly" acid to stainless steel- the **ONLY** acid which may be used with no risk to stainless steel.

Avoid prolonged contact with heavily spiced or salty food, raw bloody meat, some salad dressings, citrus juice (especially lemon juice), etc.

Slight residue of grease, fat, oil is often the cause of dull bluish film.

Rub in direction of finish.

Do not leave ordinary steel in contact with stainless steel under damp conditions.

RUST STAINS: If heavy, swab with diluted 10%-15% Nitric Acid on a sponge, followed by routine cleaning. Light stains will be removed by repeated routine cleaning.

WATER MARKS/LIME SCALE: Prolonged soaking in a 25% vinegar solution or 5% Nitric Acid solution will loosen the deposit. Periodically rub with a nylon bristle brush or synthetic scourer. Follow by routine cleaning.

NITRIC ACID: It is not an overly dangerous acid, but due protection to skin and eyes must be taken, and it must be kept out of reach of children. Neutralise with soda bicarbonate or ammonia, or dilute extensively before disposal.

If the above solutions do not prove to be adequate, please seek further advice from SASSDA - (Southern Africa Stainless Steel Development Association) before employing other treatments.

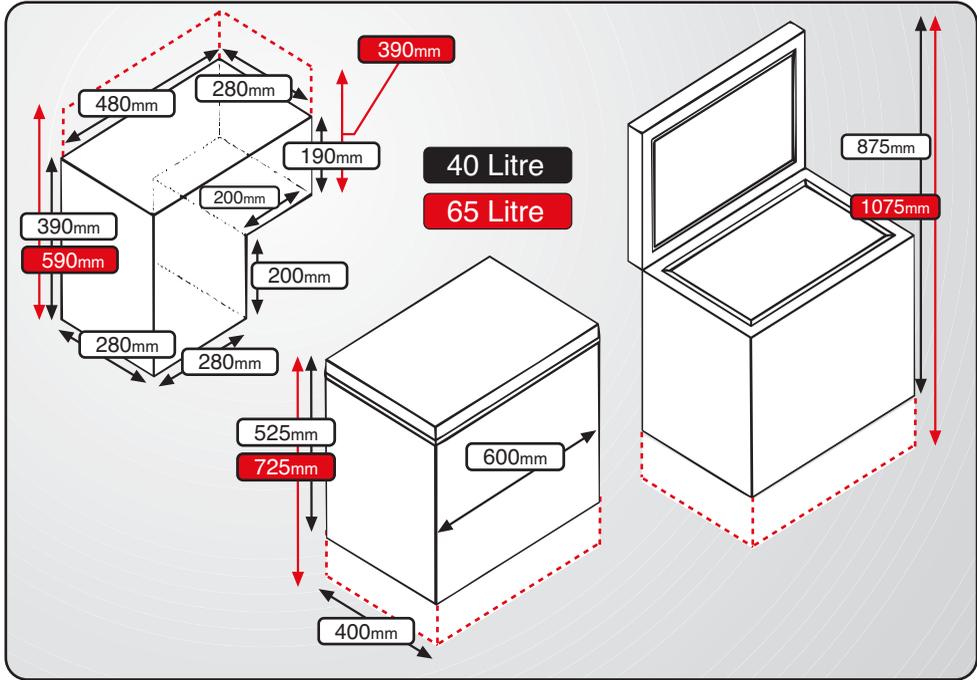
Please take care when using abrasive pastes and scourers as alteration of the appearance may occur.

SAADA: Tel No : +27 11 803 5610/20
Fax No.: +27 11 803 2011

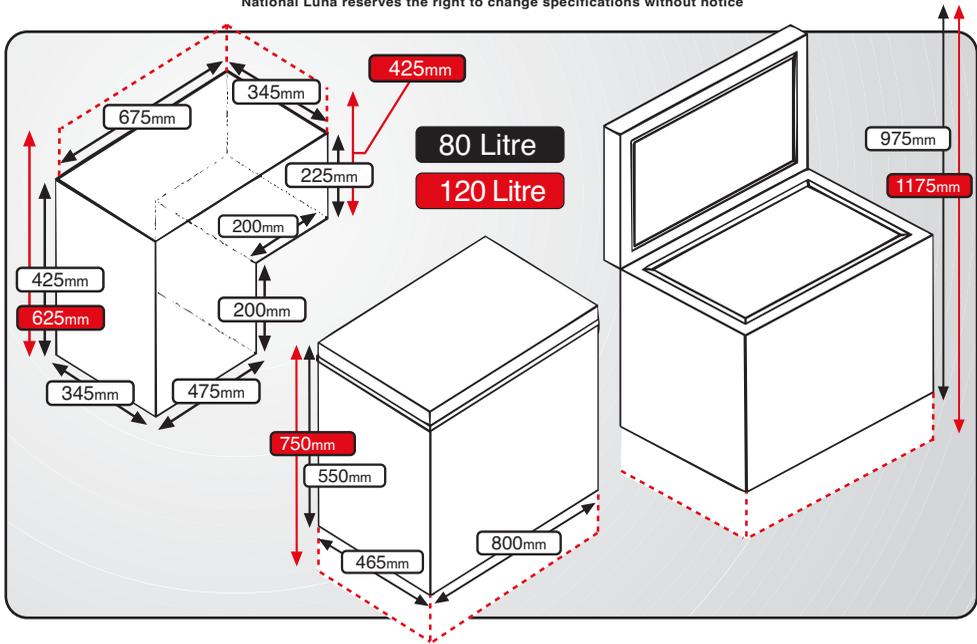
Internet : www.sassda.co.za
e-mail : sassda@onwe.co.za

These solutions are based on experience and given in good faith, but no responsibility will be accepted, nor any claim entered, for any damage or problems resulting from the employment of the "suggested solutions" given above.

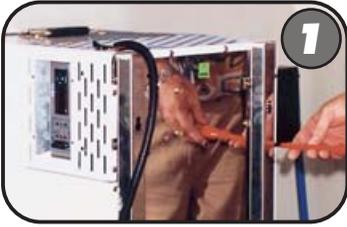
DIMENSIONS



National Luna reserves the right to change specifications without notice



MAINTENANCE



1

- Disconnect the power supply. **Failure to disconnect the power supply may result in electrical shock or personal injury.**

REMOVAL OF SIDE COVER

- Tip refrigerator so as grill area is at the top (Pic 1)
- Remove screws from base plate (6xM5 screws) and from the sides of the power pack (4xM3 screws - Pic 2)
- The grill will now slide away easily



2

REMOVAL OF POWER PACK

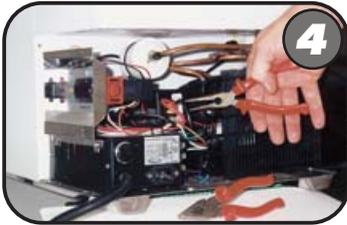
- Remove side cover (Pic 1 and 2) and 4xM4 screws (Pic 3)
- Remove colour coded cables/terminals using long nosed pliers (Pic 4)
- Power Pack can now be easily removed



3

REPLACING THE INTERIOR LIGHT FUSE

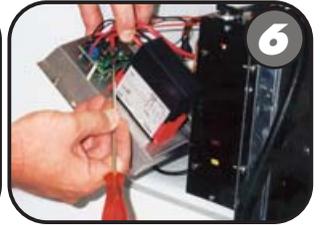
- Without removing the Power Pack, release the face plate. (Pic 5)
- Replace the 5x20 1.6 amp "Slo-Blo" fuse as shown in (Pic 6)



4



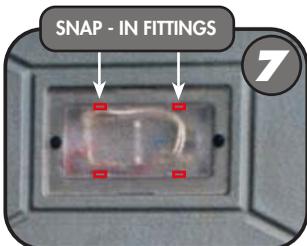
5



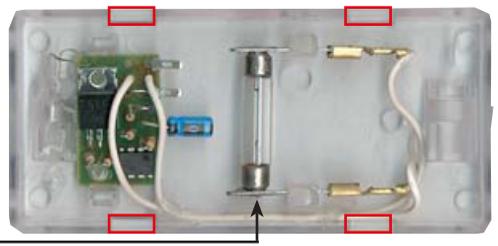
6

CHANGING INTERIOR LIGHT BULB

- Using a very narrow screw driver/thin flat plate, or nail file, remove the front lens of the light fitting. (Pic 7). The lens/cover has a "snap-in" click fitting in the 4 obvious slots on the lens/cover. Replace the 'festoon' bulb with a 24 volt 5 watt replacement.



The exposed bulb in the lid housing after lens/cover has been removed



GUARANTEE

The **MANUFACTURER** herewith warrants to the original purchaser that the appliance identified on this certificate is free from defects in material and workmanship under normal use and service, subject to the following:-

1. At any time within **THREE YEARS** from the date of purchase by the original purchaser, the **MANUFACTURER** will at its discretion replace or repair without cost to the owner, and if necessary through an authorised service dealer, any part found by the **MANUFACTURER** to be defective in this appliance.
2. This warranty does not apply to light bulbs, pilot lights, fuses, compressor or item where the length of life depends on the amount of use and care given.
3. Removal of the serial number will render this warranty null and void.
4. The **MANUFACTURER** shall not be responsible for damage of any kind resulting from incorrect voltages or faults in the house wiring, improper use of controls, failure to use the appliance in accordance with the operating instructions, commercial use of the appliance, general misuse or abuse, and for any damage caused by fire, flood, civil disturbance or Act of God.
5. It is a condition of the warranty that the **MANUFACTURER** shall not be responsible for the transportation or any other costs involved other than those covered by point 1 above.
6. Specifically, the **MANUFACTURER** will not accept any responsibility for loss or damage of any kind caused by, or due to, failure of operation or malfunction of the appliance.
7. This document also serves as proof of purchase for warranty purposes. Please ensure that the information required below is correctly noted. Service under warranty will only be done if this certificate is produced. Failure to produce this certificate will result in a charge levied for work done, even if the repair / service to the appliance is to be done during the warranty period, as will any service calls where no fault is found with the appliance.
8. Repair work to be done in terms of this warranty must be referred to the **MANUFACTURER** for authorisation.
9. This warranty will not be valid unless the purchase had been registered by way of completion and return of the attached postcard within 14 days after date of purchase.

SERIAL No.: _____ DATE PURCHASED: _____

MODEL: _____ INVOICE NO.: _____

BRANCH: _____ TEL: _____

DEALER'S NAME /STAMP: _____



CUSTOM COVERS

Optional, Durable Protective cover with zips

All units are fitted with grade 3CR12 stainless steel base and grade 430 stainless steel interior. (Grade 430 exterior optional).



2 YEAR (24 MONTH) RUST FREE GUARANTEE

NATIONAL LUNA guarantees to the original purchaser that the unit sold is free from corrosion for a period of 2 years, from the original purchase date, subject to the following conditions:

- This guarantee does not extend to units that have been found to be subject to misuse, abuse, neglect or accidental damage.
Please read page 14 and 15 relating to stainless steel Information.
- Repair and maintenance of the unit by a workshop other than an appointed **NATIONAL LUNA** service agent or **NATIONAL LUNA** branch will render the guarantee null and void.
- Claims are to be reported immediately.
- This guarantee applies to the cabinet and door of the unit only.
- At **NATIONAL LUNA'S** discretion, the repair or the replacement of defective door/s will be carried out in accordance to accepted commercial standards.

PLEASE RETAIN YOUR ORIGINAL PURCHASE INVOICE

**Technical
Enquiries**