DAYLIFF

SUNFRIDGE

Energy Efficient Solar Refrigerator

SUNFRIDGE 55

SUNFRIDGE 128/ 233

Installation & Operating Manual

INDEX

Congratulations on selecting Dayliff Solar Fridge. They are manufactured to the highest standards and if installed and operated correctly will give many years of efficient and trouble free service. Careful reading of this Installation Manual is therefore important, though should there be any queries they should be referred to the equipment supplier.

1. SPECIFICATIONS

SUNFRIDGE 55

SUNFRIDGE 128/ 233

DAYLIFF SUNFRIDGE Solar Refrigerators/Freezers are highly efficient DC energy saving refrigerators specifically designed for off-grid solar PV powered applications including residential homes, camps and medical centres. They can be used either as refrigerators or freezers due to the fully programmable temperature control and feature an air forced fin-coil condenser that assures top cooling performance.

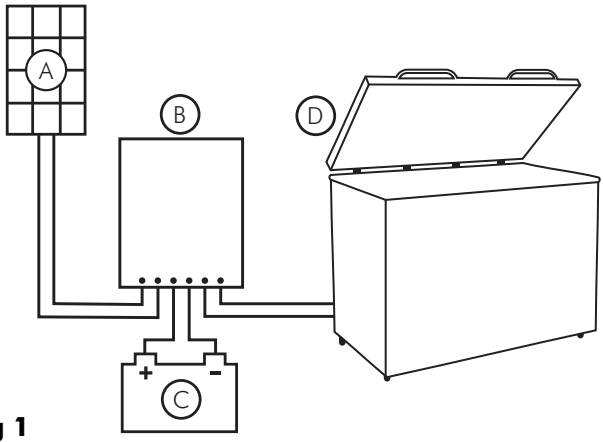
The Dayliff SUNFRIDGE offers the following features:

- Opening top chest design, 55/128 single lid and 233 double lid
- Selective temperature setting that provides either fridge or freezer application
- Multifunction LED display of operating parameters including battery power and temperature
- 12 or 24VDC power input with automatic selection
- Inbuilt protection against reverse polarity, battery deep discharge
- Bottom drain plug for easy cleaning, lockable lid with interior light
- Internal basket to separate fridge contents
- 110mm insulation wall and CFC free
- 100% Copper Tube, Cooling System Enhanced
- Extremely strong lid, hinge and freezer body
- Low maintenance and easy to clean

Featuring the latest cooling technology in combination with optimized electronic regulation and compressor speed control, Dayliff SUNFRIDGE provide optimal use of energy which results in lower input power requirements and the highest standards of quality, reliability and long service life.

TECHNICAL SPECIFICATIONS

MODEL	SUNFRIDGE 55	SUNFRIDGE 128	SUNFRIDGE 233
Storage Volume (Litres)	55	130	240
Operating Temperature Range	-20°C to +10°C		
Ambient Temperature	>0°C, <32°C		
Nominal Solar Power Requirement	80W	125W	150W
Energy Consumption per 24hrs	0.302kWhr	0.46kWhr	0.6kWhr
Battery Size Requirement	100Ah		150Ah
Charge Controller Requirement	10A		15A
Power Supply	12/24VDC		
DC Input Voltage	10VDC-17VDC/17VDC - 31.5VDC		
DC Reconnection Voltage (LVR)	11.5/23.9V		
DC Deep Discharge Protection (LVD)	10.2/22.5V		
Operating Ambient Temperature	10°C to 43°C		
Internal Dimensions (LxWxH)	430x230x315	513x530x585	993x516x594
External Dimensions (LxWxH)	650x450x535	733x750x805	1213x736x814
Weight (kgs)	28	47	66



A-Solar Panel
B-Charge controller
C-Battery
D-Solar Freezer

Fig 1

2. SYMBOLS & WARNINGS

WARNING

Keep fridge upright when it is turned on and when in use.

WARNING

Never switch the fridge on with wet hands or when feet are in contact with water.

WARNING

If installed in a vehicle, do not turn fridge on when vehicle engine is not running.

Always ensure that the correct voltage and current is applied to the fridge. The voltage and current ratings are indicated on the nameplate underneath the fridge.

Ensure power supply is rated correctly.

Do not carry corrosives or solvent material in the fridge.

Do not obstruct vents as they supply necessary airflow to compressor and fan.

Do not fill fridge with liquid or ice.

To avoid personal and material damage, the device should be unpacked and installed by atleast two people.

If a fault occurs, immediately disconnect from power and follow instructions on trouble shooting.

Do not bring open flames or other ignition sources into the internal spaces of the fridge. Ensure that the cooling circuit is not damaged when transporting and cleaning the device. In case of damage, keep ignition sources away and ventilate the room well.

Avoid long-term skin contact with cold surfaces or cooled / frozen products. This can lead to pain, numbness and freezing. Wear protective clothing, e.g. gloves, when longer skin contact is unavoidable.

Do not consume ice cream, frozen drinks or ice cubes, immediately after removal from the freezer as the low temperatures can present a "burn danger".

The device is intended for cooling and freezing food and for preparation of ice products for small scale. The applicable commercial regulations must be observed when the device is used in a commercial environment.

Do not store explosive substances or spray cans with inflammable materials, such as propane, butane, pentane etc., in the fridge. Escaping gases can be ignited by electrical components.

The fridge can be operated between 10.3V and 17.5V DC or 22V and 31V DC. If the voltage is out of range, the fridge will not work. Over voltage can cause damage to the electronic components of the fridge.

When using the fridge off mains, use the AC/DC adapter supplied with the unit and do not substitute.

Place the fridge on a dry surface protected from water and direct sunlight.

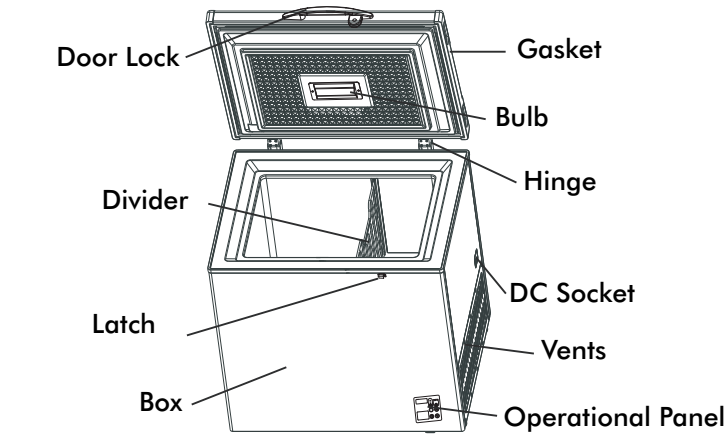
Do not locate fridge where the room temperature is below 0°C or above 32°C.

Do not connect the device together with other devices using an extension cable due to danger of overheating.

Make sure that fridge has stood for 2 hours at least before running. Before connecting the unit to the power source, let it stand upright for approximately 2 hours. This will reduce the possibility of a malfunction in the cooling system from handling during transportation.

It is recommended to store the contents until the inside temperature is at 0 degrees.

3. EQUIPMENT CONTENTS



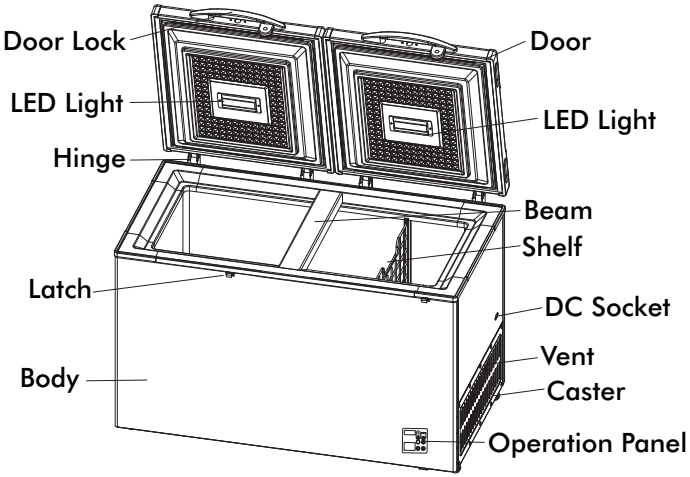


Fig 2: Parts of the Fridge

4. INSTALLATION

Before installation;

- Ensure that no parts are missing after unpacking the fridge.
- The floor at the installation location should be level and flat. Install the device a sufficient distance from the wall so that the lid can open and close unhindered.
- Do not cover the gap between the lower edge of the cabinet and the floor, because the fridge must be provided with cooling air.

- The minimum clearance between the ventilation grill and the wall should be 20 cm. This clearance must always be maintained and the ventilation grill must not be covered.
- Do not alter the outer cladding of the device. A minimum all-round clearance of 20 mm must be maintained to ensure adequate heat dissipation.
- According to the EN 378 refrigeration standard, the installation room for the device must have an air volume of 1 m^3 per 8 g of R 600A coolant, so that if a leak develops in the cooling circuit no inflammable gas-air mixture can result in the installation room. Information on the coolant volume can be found on the name plate.
- Take note of the cable cross-section information in the table below when extending the power cable.

Cable Sizes		12V Cable Length		24V Cable Length	
Cross Section	AWG				
mm2	Gauge	m	ft.	m	ft.
2.5	12	2.5	8	5	8
4	12	4	13	8	13
6	10	6	19.5	12	19.5

4.1 Connection

The power type and voltage at the installation location must match the specifications on the name plate which is located on the upper right side wall of the cabinet.

- The cable provided must be connected to a 12 V or 24 V DC connection at the battery or the charge controller.
- Pay attention to the correct polarity: blue (-) and red (+).

Avoid long and unnecessary opening of the lid.

Allow warm food to first cool to room temperature before storing it in the fridge.

Defrost the device when ice layer has formed. This improves the cooling transfer and reduces the energy consumption.

4.2 Direct Connection to the Battery

The compressor is switched off by the integrated deep discharge protection, but the control unit remains in operation. The alarm sounds when the temperature increases.
This type of connection is necessary and preferable to give high priority to solar energy systems.

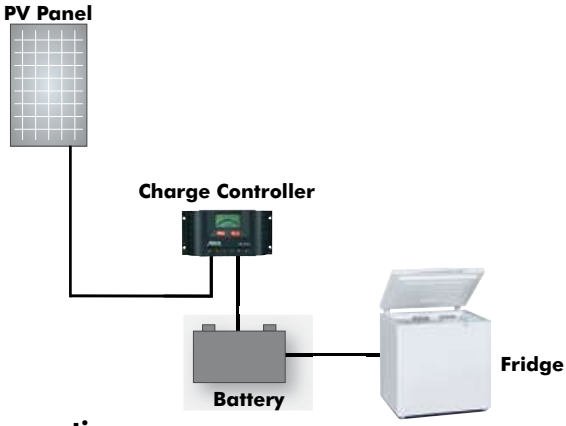


Fig 3: Battery Connection

4.3 Connection to a charge Controller with Deep Discharge Protection

If the deep discharge protection of the charge controller completely switches off the cabinet power, then the control unit also receives no power. When the device is switched on again automatically, the integrated power outage indicator will display you of the internal temperature reached.

NOTE

This type of connection is preferable, the device is given the same priority as other loads in the solar energy system.

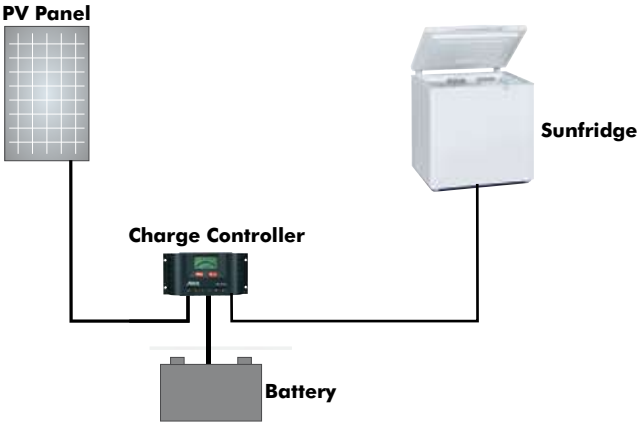


Fig 4: Sunfridge Priority Connection Diagram

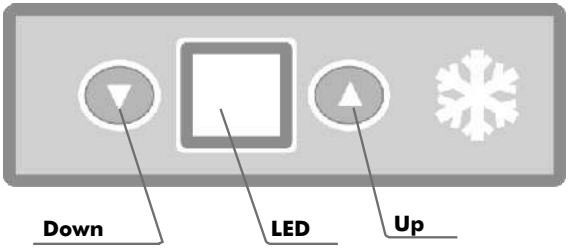
5. OPERATING INSTRUCTIONS

5.1 First Start Up

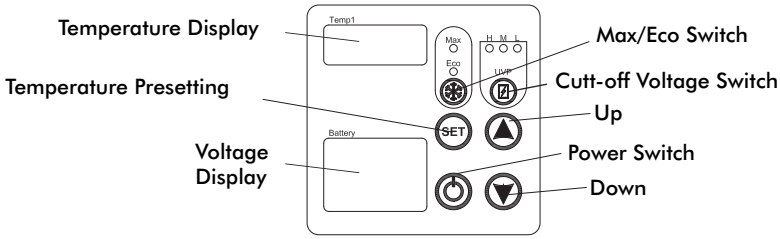
- Ensure the unit has stood upright for at least 2 hours before running
- Carry out the electrical connections as detailed in Section 4.
- Press the power switch to switch cooler on or off
- For Sunfridge 128/233 , press "SET" button once to enter temperature settings mode of first cabinet and once again to enter temperature settings mode of second cabinet
- For all models Press the "up" or "down" button to adjust the temperature
  - Press once to adjust the temperature by ±1°C
  - Maximum cool setting is -19°C
- For Sunfridge 128/233, use MAX/ECO mode switch to select quick freezing and power savings mode

5.2 Operation Panel Layout and Instruction

SUNFRIDGE 55



SUNFRIDGE 128



SUNFRIDGE 223

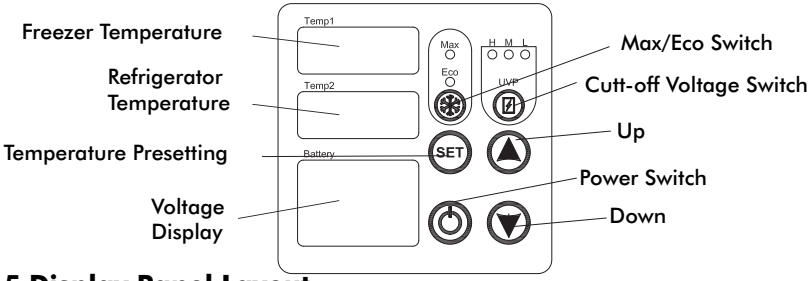
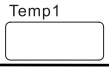
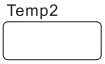


Fig 5 Display Panel Layout

No	Operation Method	Meaning
1	 Press the button for 3 seconds to switch on or switch off product	Power on/off switch
2	 Readout	Frozen Cabinet temp readout
3	 Readout	Cold Cabinet temp readout
4	 Readout	Voltage Readout
5	 Setting for cabinet temp setting	Press once to control temperature of first cabinet, and press once more to control the temperature of second cabinet.
6	 Temperature change	Temperature up / down
8	 Power Mode	Max: Quick freezing mode Eco: Power saving mode
9	 Power Mode change	Switch operation models between Max and Eco.
10	 Power cut-off	Cut-off power
11	 Press UVP button to switch H\M\L	Refer to cut-off voltage presets in table below

The fridge can be operated on 12V/24V DC. Prior to connection check whether the voltage indicated on the manufacturers label is in accordance with the battery voltage.
For car installation, connect the equipment to cigarette lighter socket of the vehicle with the 12V/24V DC

Degree	12V Cut-off Voltage	12V Cut-in Voltage	24V Cut-off Voltage	24V Cut-in Voltage
L	10V	11V	21.6V	23V
M	10.7V	11.7V	22.6V	24V
H	11.5V	12.5V	24.6V	26V

5.3 Notes on Freezing and Storage

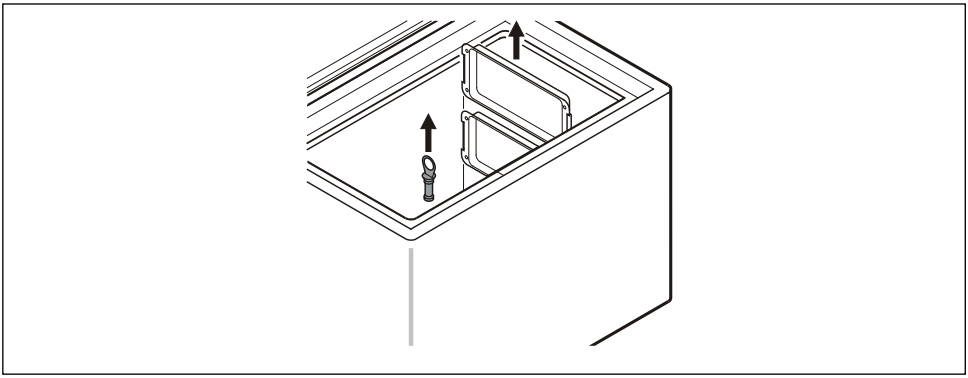
- Store the same types of cooled / frozen products together.
- The following products are suitable for freezing: meat, game, poultry, fresh fish, vegetables, fruit, dairy products, bread, cakes and pastries, convenience food.
- The following products are not suitable for freezing: Cabbage or lettuce, radishes, grapes, whole apples and pears, fatty meat.
- It is recommended to pack food in household-sized portions. To ensure that the products quickly freeze to the core, the following quantities per package should not be exceeded: Fruit and vegetables up to 1 kg, meat up to 2.5 kg.
- Blanch vegetables after washing and portioning (place in boiling water for 2-3 minutes, then remove and rapidly cool in cold water).
- Do not salt or season fresh food and blanched vegetables before freezing. Other food should only be lightly salt and seasoned. Seasoning changes the taste intensity.
- Commonly available freezer bags and reusable plastic, metal, and aluminium containers can be used for packaging.
- Do not allow unfrozen food to come into contact with already frozen food. Always store dry packages to ensure that they do not freeze together.
- Always label the packaging with date and contents and never exceed the recommended maximum storage time of the frozen products.
- Do not freeze bottles and cans containing carbonated liquids. They may burst.
- Only thaw the quantity that you currently actually require.
- Always label the packaging with date and contents and never exceed the recommended maximum storage time of the frozen products.
- Do not freeze bottles and cans containing carbonated liquids. They may burst.
- Only thaw the quantity that is currently required.

5.4 Defrosting

Over longer operating periods, a layer of frost and / or ice forms on the inner walls. This increases the energy consumption. Regular defrosting is necessary particularly when the frost reaches 5-7mm.

- Switch off the device for defrosting. Remove the fuse and disconnect the battery or pull off the power plug.
- Wrap the cooled / frozen goods in paper or blankets and store them in the baskets in a cool place.
- Pull the condensation water plugs from the outflow opening. Remove the partition wall or freezer tray and place it underneath the device so that the condensation water flows through the outflow opening and into the partition wall or freezer tray.
- Leave the cabinet lid open during the defrosting process. Mop up any remaining condensation water with a cloth and clean the device.
- Freeze the contents before taking them out to prevent from melting during the power off time.
- Dry the cabinet with a clean towel, power on the freezer and put back the contents.

Never use a mechanical device or any other artificial aid for defrosting, other than those recommended by the manufacturer.



5.5 Cleaning

Always switch off the device before cleaning. Remove the fuse and disconnect the battery or pull the power plug.
Clean the inner compartment, accessories, and outer walls with warm water and a small amount of detergent.

Never use cleaning agents containing sand or acidic chemical solvents.

Do not use steam cleaning devices.

- Ensure that no cleaning water penetrates into the electrical components or the ventilation grill.
- Thoroughly dry everything with a cloth.
- The inlet and exhaust grills must be regularly cleaned. Dust deposits increase the energy consumption. Ensure that no cables or other components are torn off or damaged.

6. MAINTENANCE

Tips For Energy Saving

- Place the cooler in a cool and dry place away from direct sunlight.
- Always cool the food or drink before storing them into the cooler.
- Do not set the temperature colder than is required.
- Do not open the cooler more than necessary.
- Do not leave the lid open longer than necessary.

Storage

- When storing theSunfridge it is recommended that the lid is left slightly open. This will prevent mould from forming and will keep stale odors out of the fridge. It is recommended to clean the equipment before storage.

Cleaner

Sunfridge does not need to be cleaned before initial use though if desired, the below steps can be followed;

1. Clean the cooler with a soft cloth moistened with luke warm water.
2. Pay attention that no water drops into the vents as this my lead to damage to the electronic components.
3. Use a soft dry cloth to completely dry the cooler after cleaning.
4. Clean the cooler after use and before storage.

The following issues are normal and should not cause alarm;

1. Sometimes there is frost on the surface of fridge caused by high ambient temperature or infrequent door opening. Simply wipe the frost off.
2. There is sound of water flow or water boiling which is sound of refrigerant flowing normally.
3. When the freezer is working, compressor and condenser will heat.
4. The compressor will be working for a long time when storing too much food over heat.
5. The compressor will be working for a long time to keep the inner cabinet temperature when the ambient temperature is very high.

7. TROUBLE SHOOTING

SUNFRIDGE 55

PROBLEM	POSSIBLE CAUSE	SOLUTION
Cooling function does not work	Loose contact between plug and unit socket	Plug fridge firmly into socket or cigarette lighter.
	Power voltage is out of range	Check whether unit is plugged into power supply of 12V or 24V, ensure that battery charge is not too low or too high.
	The temperature sensor is malfunctioning	Replace temperature sensor
Poor cooling efficiency	The fan motor does not work	Replace fan motor
	Unit is exposed to direct sunlight	Place the unit in a shady, cool place with good airflow.
	Ventilator or propeller is blocked	Clean the ventilator and the propeller, make sure the unit has good ventilation
There is a strange noise or vibration during operation	Unit is malfuntioning	To prevent breakdown, turn the unit off immediately and unplug it from power supply. Contact a local repair center.
There is a burning smell or the case is deformed		
LED display "E1" unit not running	Not enough power supplied to the unit	Check unit whether it's plugged into power supply of 12V or 24V, ensure that battery charge is not too low.
LED display "E2" unit not running	High voltage supplied to the unit	Check unit whether it's plugged into power supply of 12V or 24V, ensure that battery charge is not too high.
LED display "E3" unit not running	Temperature sensor is disconnected or faulty	Check the temperature sensor's plug and replace

PROBLEM	POSSIBLE CAUSE	SOLUTION
SUNFRIDGE 128/223		
LED display "Err 0" unit not running	Malfunction of temperature sensor	Check that power supply conforms to product nameplate
LED display "Err 1" unit not running	Over voltage or under voltage	Check battery voltage and correct as necessary
LED display "Err 2" unit not running	Fan overcurrent	Replace fan
LED display "Err 3,5,7" unit not running LED display "Err 4" unit not running, fridge overload	Malfunction of compressor starting (unbalance of system pressure)	Check if there are hot foods in the freezer an eliminate Check if compressor vents are covered and correct Check fan is running correctly Switch off the power for 30mins and restart Contact a local repair center
LED display "Err 6" unit not running	Compressor controller malfunction	Replace compressor
LED display "Err 8" unit not running	Rotor is blocked	Remove the cable of the T terminal of compressor controller, short circuit of terminals C and T of compressor controller, once the compressor work well, plug in the cable of T terminals Power off the freezer, 30 min later, power on the freezer again
	Malfunction of the compressor	Replace of it

8. TERMS OF WARRANTY

I) General Liability

- In lieu of any warranty, condition or liability implied by law, the liability of Dayliff (hereafter called the Distributor) in respect of any defect or failure of equipment supplied **is limited to making good by replacement or repair** (at the Distributor discretion) defects which under proper use appear therein and arise solely from faulty design, materials or workmanship within a specified period. This period commences **immediately after the equipment has been delivered to the customer** and at its termination all liability ceases. Also the warranty period will be assessed **on the basis of the date that the Distributor is informed of the failure.**
- This warranty applies solely to equipment supplied and **no claim for consequential damages,** however arising, will be entertained. Also the warranty specifically excludes defects caused by fair wear and tear, the effects of careless handling, lack of maintenance, faulty installation, incompetence on the part of the equipment user, Acts of God or any other cause beyond the Distributor reasonable control. Also, any repair or attempt at repair carried out by any other party **invalidates all warranties.**

ii) Standard Warranty

General Terms

If equipment failure occurs in the normal course of service having been competently installed and when operating within its specified duty limits warranty will be provided as follows:-

- **Up to 1 year - The item will be replaced or repaired at no charge.**
- **Over 1year, less than 2 years - The item will be replaced or repaired at a cost to the customer of 50% of the Davis & Shirtliff market price.**

The warranty on equipment supplied or installed by others is conditional upon the defective unit **being promptly returned free to a Davis & Shirtliff office** and collected thereafter when repaired. No element of site repair is included in the warranty and any site attendance costs will be payable in full at standard chargeout rates. Also proof of purchase including the purchase invoice must be provided for a warranty claim to be considered.

DAYLIFF is a brand of **Davis & Shirtliff**

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for details of the nearest branch or stockist

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