

AUTOFRIDGE EUTECTIC

Portable Eutectic Refrigerator / Freezer



AUTOFRIDGE

Portable Eutectic Refrigerator/Freezer

MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION & OPERATION OF THE AUTOFRIDGE.

Model No. AF41 - 12/24	41 litre capacity
Input Voltage Range	9-17VDC & 21.3-32VDC

Model No. AF75 - 12/24	75 litre capacity
Input Voltage Range	9-17VDC & 21.3-32VDC

The AUTOFRIDGE Models No. AF41 - 12/24 and AF75 - 12/24 are fitted with the Danfoss BD35F compressor and electronic control system. These models can both be powered from either 12 Volt DC or 24 Volt DC battery or power supply.

Features of the Danfoss electronic control unit :-

- Automatically calibrates to the applied voltage of the electrical system;
- Incorporates overload protection and will shut down when either the compressor and electronic unit overheats;
- Normal operation of the control unit will restart when acceptable operating temperatures are sensed;
- Incorporates automatic shut-down when the battery supply voltage falls below an acceptable level;
- If the battery voltage is less than 17VDC, the electronic unit assumes that it is working from a 12 Volt system;
- If the battery voltage is greater than 17VDC, the electronic unit assumes that it is working from a 24 Volt system.

PLEASE read the following INSTALLATION and OPERATING information before attempting to use you AUTOFRIDGE. Follow these instructions for many years of trouble-free operation of your AUTOFRIDGE.

1. INSTALLATION

SELECT the POSITION where you intend to locate the AUTOFRIDGE and ensure that :-

- ◆ There is at least 30mm clearance around the cabinet exterior to ensure sufficient ventilation;
- ◆ The fridge top is not covered. The warm air generated during the refrigeration process must be allowed to easily move away from the cabinet;
- ◆ The AUTOFRIDGE is properly secured. A suggested method is to mount eye bolts through the floor of the vehicle and secure the AUTOFRIDGE with short straps connected to the handles;
- ◆ Whether the AUTOFRIDGE is installed in a campervan, motor home, boat, built-in with other furniture, or in a 4WD vehicle, it is necessary to provide FLOW-THROUGH VENTILATION. The warm air generated by the refrigerator must be able to escape easily, otherwise the compressor and electronic control unit can be exposed to overheating which can cause premature failure of these components.

2. ELECTRICAL CONNECTIONS.

To ensure that the electrical supply is acceptable for the operation of the fridge, the electrical supply line should be a dual wire system (i.e. positive and negative wires; cable size - 5mm-6mm) connected directly to the battery terminals (chassis earth connection should be avoided).

The electrical connections should be made directly to the battery terminals using eye-terminals soldered to the power leads. DO NOT use any type of switch in the fridge circuit because this may produce a voltage drop which can cause loss of efficiency at the fridge. The AUTOFRIDGE can be switched "ON" and "OFF" using the thermostat control on the top of the fridge. Note : "0" on the thermostat dial is OFF.

WHENEVER THE AUTOFRIDGE IS OPERATING, ADEQUATE VENTILATION MUST BE PROVIDED. IF SUFFICIENT VENTILATION IS NOT AVAILABLE, THE REFRIGERATOR WILL NOT PERFORM SATISFACTORILY AND THE COMPRESSOR AND CONTROLLER MAY BE PERMANENTLY DAMAGED.

Line protection in the positive (red) lead must be used. Use a circuit breaker or a fuse of 15 amps rating with a high-quality fuse holder. If a fuse rather than a circuit breaker is to be used, an automotive blade type fuse and holder is preferred.

The lead supplied with the AUTOFRIDGE is a 'link lead'. This lead is fitted with a socket for connection to the refrigerator plug. The other end of the lead is left bare. This bare end can be spliced directly to the supply line or, if an outlet socket is fitted to the vehicle, the compatible plug can be fitted to be link lead. The link lead should be kept as short as possible.

NOTE : The wiring runs should be as short as possible and heavy enough to carry the electrical load. If the wiring run is long, the cable must be a heavier gauge to carry the current (amperage) and to avoid voltage drops. Voltage drops reduce the efficiency of the electrical system.

3. AUXILIARY BATTERY.

If extended stops are likely, it is recommended to fit an auxiliary battery with a provision for battery isolation included.

When fitting an auxiliary battery, use a new high-quality HEAVY DUTY BATTERY. NEVER use a second-hand battery - it is well known that batteries are difficult to recharge after they have not been used for any length of time and this means that their capacity is greatly reduced.

4. EUTECTIC REFRIGERATION SYSTEMS.

The use of EUTECTICS (thermal storage compounds in the form of an "ice bank" housed within the internal walls of the fridge) allows the fridge to remain cold for long periods of time after it has been turned off. For example, when travelling during the day and stopping overnight, the vehicle engine battery can be used to run the AUTOFRIDGE in almost all conditions because the AUTOFRIDGE can be turned 'OFF' overnight which eliminates battery discharge. If the stop-overs are extended (more than one day), the battery will eventually be depleted by the fridge's operation and engine starting may become difficult.

DO NOT CONNECT THE AUTOFRIDGE using a cigarette lighter adaptor. Adaptors are not designed to carry the current required for the AUTOFRIDGE's operation.

5. OPERATING INSTRUCTIONS

5.1 EUTECTIC REFRIGERATOR - LOW POWER CONSUMPTION.

Instructions in full :-

- Turn the AUTOFRIDGE on to setting No. 3 and run for 4 hours prior to loading the product. This is to partly pre-chill the unit. The product to be refrigerated can now be loaded.
- The AUTOFRIDGE then needs to cycle for a further 8 hours to establish the eutectic ice bank and properly chill the contents. This 8 hour period may need to be extended if the product loaded into the fridge is warm. This 8 hour cycling period normally occurs during the driving time on the first day of a trip. At this point, the AUTOFRIDGE can be turned 'off' overnight. The contents will remain at refrigeration temperature during the overnight stop.
- The following day, the AUTOFRIDGE can be turned 'on' and allowed to cycle during the day's drive. Operating the AUTOFRIDGE each day in this way and then turning it 'off' overnight means that the power required by the AUTOFRIDGE is supplied by the vehicle alternator. Turning the AUTOFRIDGE 'off' overnight and allowing it to hold over on the eutectic ice bank means that there is no load on the battery at all. It is therefore possible to operate the AUTOFRIDGE from the standard engine battery installation on a day to day basis.
- When staying at a campsite for longer than one night, the fridge can be turned on and run for approximately 2 hours in the morning and then again for 2 hours in the evening. This will reduce the load on the battery to a minimum during the stopover. The number of days during which the AUTOFRIDGE can be used in this way is determined by the actual capacity (as expressed in Ah) of the battery. If a dual battery system is installed, it is possible to run the AUTOFRIDGE for many days without having to recharge the battery.

SUMMARY

- Turn the AUTOFRIDGE 'on' to setting No. 3;
- Run the fridge for 4 hours;
- Load the product to be refrigerated;
- Allow the AUTOFRIDGE to cycle for a further period of 8 hours;
- AUTOFRIDGE can now be turned 'off' for a period of approximately 12 hours.

5.2 CYCLIC REFRIGERATOR.

Instructions in full :-

- This method is recommended only when a dual battery system is fitted. Set the thermostat at setting No. '1' or '2' and allow the refrigerator to cycle. Using the AUTOFRIDGE in this way, the daily power consumption will increase slightly over the daily power consumption when operating the unit as outlined in No. 5.1 above - "Eutectic Refrigerator". In most systems, the dual battery provision should handle this increased level of power consumption.
- This is a convenient method of operation - set and forget - however during extended stopovers, it is advisable to operate the AUTOFRIDGE as a eutectic refrigerator as described in No. 5.1.

SUMMARY

- Set the thermostat at setting "1" or "2" and allow the refrigerator to cycle.

5.3 CYCLIC FREEZER.

Instructions in full :-

- When operating the AUTOFRIDGE as a freezer, a dual battery system is necessary. Set the thermostat to setting "5" and allow the unit to cycle. Do not turn the fridge off overnight as this will cause thawing and subsequent spoiling of the contents. The thermostat settings may be varied - the higher the thermostat setting, the colder the freezer will run. However, the colder the temperature at which the freezer runs, the higher the power consumption.
- Because the AUTOFRIDGE is a high efficiency eutectic refrigerator, the unit is set to operate in the medium freezer temperature range. Deep freezer temperatures are not practical in this type of portable refrigerator. The power required to operate a portable deep freezer from a battery would prove to be excessive.

SUMMARY

Sub-zero Settings on the AUTOFRIDGE are '5'-'6'-'7'.

- Set the thermostat to Setting No. 5 and allow the unit to cycle.

6. CARING FOR YOUR AUTOFRIDGE.

- Ventilation is very important to ensure efficiency and reliability. NEVER run the AUTOFRIDGE without sufficient air-flow around the cabinet. Poor ventilation will cause the compressor unit to overheat and substantially reduce its life.

- Never position the AUTOFRIDGE in a confined space or under cover without ensuring that adequate flow-through ventilation is provided.
- Keep the AUTOFRIDGE out of direct sunlight.
- Wash the AUTOFRIDGE out with soap and water as often as possible.

7. STORAGE.

When the AUTOFRIDGE is to be stored away and not used for some time, you should occasionally run the AUTOFRIDGE for 1 to 2 hours every 4 to 5 weeks to ensure the compressor is kept lubricated. It is also advisable to leave the lid propped open to ventilate the interior cabinet.

8. TROUBLE-SHOOTING and FAULT-FINDING.

- Thermostat failure can result in the AUTOFRIDGE either failing to start or not turning off at the correct temperature. A faulty thermostat should be replaced by qualified service staff.
- If the AUTOFRIDGE is accidentally turned on its side while the compressor is running, you should switch it "OFF" as soon as possible and leave it correctly positioned for approximately 20 minutes before attempting to restart it.

9. SPECIAL INSTRUCTIONS.

9.1 FAULT DIAGNOSIS LEDS :-

Please note that your AUTOFRIDGE has been fitted with a LIGHT EMITTING DIODE (LED). This LED is positioned adjacent to the thermostat and is an indicator that the electronic unit has recorded an operational error or fault in the system. When a fault occurs, the LED will flash a number of times - the actual number of flashes is to indicate a particular error. Each flash lasts ¼ second and, after the sequence of flashes finishes, there will be a pause with no flashes. The error recording sequence is repeated every 4 seconds. When a fault is recorded in the system, the electronic unit immediately shuts down the compressor. During this shutdown period, the LED will repeat the fault indication every 4 seconds. After one minute, the compressor will try to restart.

Number of Flashes :-

Error Type

1 Low-voltage cut-out: - The power in the electrical system is too low to run the fridge. This does not necessarily mean that the battery is flat. It could mean that a line fault has developed (such as a bad connection or a faulty fuse holder, etc). To confirm that the battery or wiring could be faulty, connect the fridge to another power source.

2 Fan fault - This is usually due to over-current or to a short circuit at the fan. Unplug the Autofridge, disconnect the fan, and then plug the fridge back into the power source and the compressor should restart. Replace the faulty fan (The fridge will still operate without that fan, but at a reduced efficiency).

3 Compressor fails to start - This may not always be a problem – the compressor tries start once a minute, and may require a number of attempts before starting. However, if the compressor continually fails to start, this could indicate a seized compressor.

4 Compressor has overloaded and stalled - This is usually caused by poor ventilation in high ambient temperatures. When the compressor cools down, it will restart. Make sure the Autofridge is well ventilated.

5 Electronic unit thermal cut-out - The refrigeration system has been overloaded (poor ventilation) in high ambient temperatures. When the compressor and electronic unit cools down, the system will automatically restart. Make sure the Autofridge is well ventilated.

During compressor shutdown due to a fault, the cooling fan fitted to the fridge may keep running. When the compressor attempts a restart, the fan will momentarily stall and then restart. This is a normal function.

9.2 FAN COOLED MODELS :-

AUTOFRIDGE models are supplied complete with a low-voltage axial fan. The addition of this fan facilitates the removal of heat from the compressor housing area and also improves the condensing characteristics of the refrigeration system.

The standard ventilation requirements as outlined earlier in these instructions remain unchanged. It is ESSENTIAL that there is NO RESTRICTION OF AIRFLOW either INTO THE VENTS AT THE BASE OF THE COMPRESSOR HOUSING AREA or OUT OF THE FAN VENT IN THE TOP OF THE COMPRESSOR HOUSING AREA.

If the fridge is used in dusty conditions, it may be necessary at times to clean the fan blades. This is best done by cleaning the blades with a soft, dry brush. Blowing the dust off with compressed air is also acceptable, but ensure that the blades are not allowed to spin at high speed whilst blowing off the dust, as this may damage the fan.

If the fan fails to operate at any time, the fridge can be run in moderate temperatures (<32 degrees Celsius) as per instructions without causing damage to the electrical-mechanical components. When the fan is inoperative, ensure that the AUTOFRIDGE is operated in 'EUTECTIC REFRIGERATION' mode - run only during the cooler parts of the day and turn off during the hot parts of the day. The eutectic system will continue to provide refrigeration during those periods when the AUTOFRIDGE is turned 'off'. The fan should be replaced as soon as possible.

Contact your AUTOFRIDGE Agent.

10. HANDY HINTS.

- Turn the AUTOFRIDGE on approximately 4 hours prior to use.
- When operating the unit in very hot climates, attempt to run the fridge in the cooler part of the day and allow the eutectic ice-bank to "hold" the refrigeration temperatures over during the hottest part of the day.
- During an extended stop-over, when operating the AUTOFRIDGE as a eutectic refrigerator, ensure that the fridge is allowed to run whenever the vehicle is being used.
- When restocking the AUTOFRIDGE during a trip, ensure that the new contents are properly chilled after being added to the cabinet by turning the thermostat to a slightly colder setting.
- Avoid running the AUTOFRIDGE in a closed vehicle - lack of ventilation can cause mechanical failures of the fridge components.
- Keep the AUTOFRIDGE out of direct sunlight.
- Wash the AUTOFRIDGE cabinet out with soap and water as often as necessary.

AUTOFRIDGE

LIMITED WARRANTY - THREE YEARS

THIS WARRANTY IS IN ADDITION TO ANY NON-EXCLUDABLE RIGHTS
CREATED UNDER THE TRADE PRACTICES ACT.

- Autofridge Australia Pty. Limited warrants the product to be free from defects in materials and workmanship under normal application, installation, use and service conditions for a period of three (3) years from date of purchase by the original purchaser from an authorised Autofridge reseller.
- As each Autofridge unit is hand-made, there may be differences noticeable between individual units. Such discernible differences do not constitute a claim under the terms of this limited warranty.
- This warranty does not apply to any Autofridge unit which, in Autofridge Australia Pty. Ltd.'s judgement, has been subject to misuse, neglect, or accident or which has been damaged through abuse, alteration, improper installation or application, or negligence in use, storage, transportation or handling (including but not limited to incorrect power current or insufficient ventilation) or repaired by anyone other than Autofridge Australia Pty. Ltd. or its appointed agent.
- This warranty will not apply to products, or any parts thereof, that have been maintained contrary to the specification or instructions supplied with the product, or if the product has been added to or modified otherwise than by Autofridge Australia Pty. Ltd. or by an authorised Autofridge agent.
- This warranty does not cover any cost associated with installation, removal or reinstallation of the unit.
- The benefits conferred by this guarantee are in addition to all other rights and remedies in respect of the product which the consumer has under the Trade Practices Act and similar State and Territory laws.
- Autofridge Australia Pty. Ltd. shall not be liable for any special, incidental or consequential damages or for loss, damage or expense directly or indirectly arising from customers' use or inability to use the equipment.
- Warranty claims made by the original purchaser must be substantiated by furnishing proof of purchase from an authorised Autofridge reseller.

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