OPERATING INSTRUCTIONS (ETC-974)

RV 9,11,16 Road Only Operation

RV 9,11,16E Road & Standby Operation

DIRECT DRIVE REEFER OPERATION:

RV-RVE & RT Series Reefers

This manual explains the recommended operation of the reefer product. Please read before operating the reefer.

General Operation – Road Only & 110v Electric Reefers

- Reefervan reefers have the ability to operate in fresh and frozen applications and can be adjusted to suit
- Program the cab command setting to the actual set point you require.
- Regardless if the reefer is set to chill or frozen, the reefer **will not** cool any faster by adjusting the set point lower.
- Always pre cool the cargo load space area to the temperature you require **before** loading product into the cargo area. The reefer is only designed to maintain the product temperature within the cargo area, the reefer is not designed to cool the product down from a higher temperature.
- In very hot climates, it can take the reefer up to several hours to cool a very warm or hot cargo area – Make sure that this is taken into account BEFORE loading product into the van
- Make sure that the cooling coil in the cargo load area is visibly clear of ice build up – Although the reefer has an automatic defrost system the operator must **MANUALLY DEFROST THE REEFER REGULARY!** Failure to do so will reduce cooling capacity dramatically. A good indication that the air flow is correct, with the reefer operating you should be able to feel the air flow at the rear door of the vehicle, if there is an ice restriction the air flow will be less.
- If the cooling coil is blocked, **initiate a Defrost Cycle** – On the cab command buttons, **push the UP ARROW for 5 Seconds to initiate defrost.**
- Make sure door openings on deliveries are kept to a minimum. High frequency door openings will add an extra buildup of ice on cooling coil that will affect cooling performance.
- If you have a lot of deliveries, take into account the amount of time the reefer is not operating while the van is stopped for deliveries, this can greatly reduce cooling capacity. Additional Cargo Polar Walls can be added to assist cooling performance for high frequency deliveries by reducing the cargo area space if this becomes a problem.
- Do not obstruct the cooling coil air circulation in the load area. A min of 18” of a gap must be maintained for proper air flow in the cargo area.
- **For ALL deep frozen applications with small cargo load, the use of an insulated bulkhead wall may be required to maintain deep frozen temperatures – Pre cooling of the cargo area is required. We also recommend electric 110v standby to precool the cargo area.**
- Do not operate the reefer in enclosed spaces, operation must only be in well ventilated areas, failure to do so could lead to a fire hazard.

- The reefer must only be serviced or repaired under warranty by an approved Reefervan installer. Please contact Reefervan for locations.
- **Warning** The reefer is filled with high pressure refrigerant – **Do not** interfere with the reefer piping or personal injury or severe burning may occur, only a certified technician should carry out installation and repairs to the reefer.
- **Warning** Do not touch the fan motor blades or personal or severe injury may occur
- **Warning** The reefer may automatically start up without warning, avoid drive belts and pulleys, keep hands clear of moving parts.
- **Warning** A Vehicle or engine failure can occur due to the operator driving the vehicle while with a RED engine stop and or warning light present on the dashboard. Should a RED engine warning light appear the van must be **"Shut down and stopped immediately" with no exceptions,** then contact Reefervan. The van should not be driven any further and should be towed to a dealer for inspection and or repair. **The operator / driver is ultimately responsible for preventing any vehicle or engine damage if a RED warning light appears.**

RVE Electric Standby Reefer Operation

115v Single (1) Phase

- To operate the reefer on electric standby, you MUST have a 30 Amp 115v 60HZ power supply, a correct power cable and high voltage appliance inlet and outlets receptacles for the reefer to function correctly. Failure to so may cause damage to the electrical wiring and or damage the reefer internal components.
- Power supply **MUST** have a **dedicated ground fault protected circuit (GFCI)** rated at 30 AMP 115 VOLT.
- The reefer normal operating current on standby is approximately 14 to 18.5 amps on 115v. The supply current should be a 30 Amp supply. Reefervan are not liable if the reefer is operated outside of the approved specification noted above or if a lower current power supply is used for operation.
- **UNDER NO CIRCUMSTANCES** Join the reefer power cord of the reefer to an external / additional extension cable cord. The maximum length of cable that can be safely used is 25ft plugged directly into the correct power source, due to the high current draw. If the reefer is operated with an extension cord A **FIRE HAZARD** may occur **ALWAYS USE THE CORRECT PLUG CONNECTIONS**.
- It is the end user - owner's responsibility to have a qualified certified electrician to verify that the power outlet supply, sockets and cables are correct for the safe operation of the reefer. Faulty power cables, plugs and sockets are not covered under warranty.
- The correct cable size for 115v operation is **12-3 SJOW WITH A MAXIMUM SAFE OPERATION LENGTH OF 25 FEET** from the reefer to mains plug in socket. If you are in doubt about your power supply, it is the owner's responsibility to contact a qualified electrician to verify the power supply. **DO NOT ASSUME IT WILL BE OK, THERE MAY BE A FIRE HAZARD!**
- After operating the reefer on road operation, never stop and plug immediately into the mains electric standby shore power – **The reefer can overload and trip out and will take a service call to reset the reefer.** Allow a minimum of 15 minutes off time between start up.
- On standby 110v, do not plug the reefer inside enclosed spaces like a garage etc, the reefer must only operate in well ventilated areas and it is best to park the vehicle in a shaded area for best performance.
- If you have any questions consult Reefervan before operating the reefer

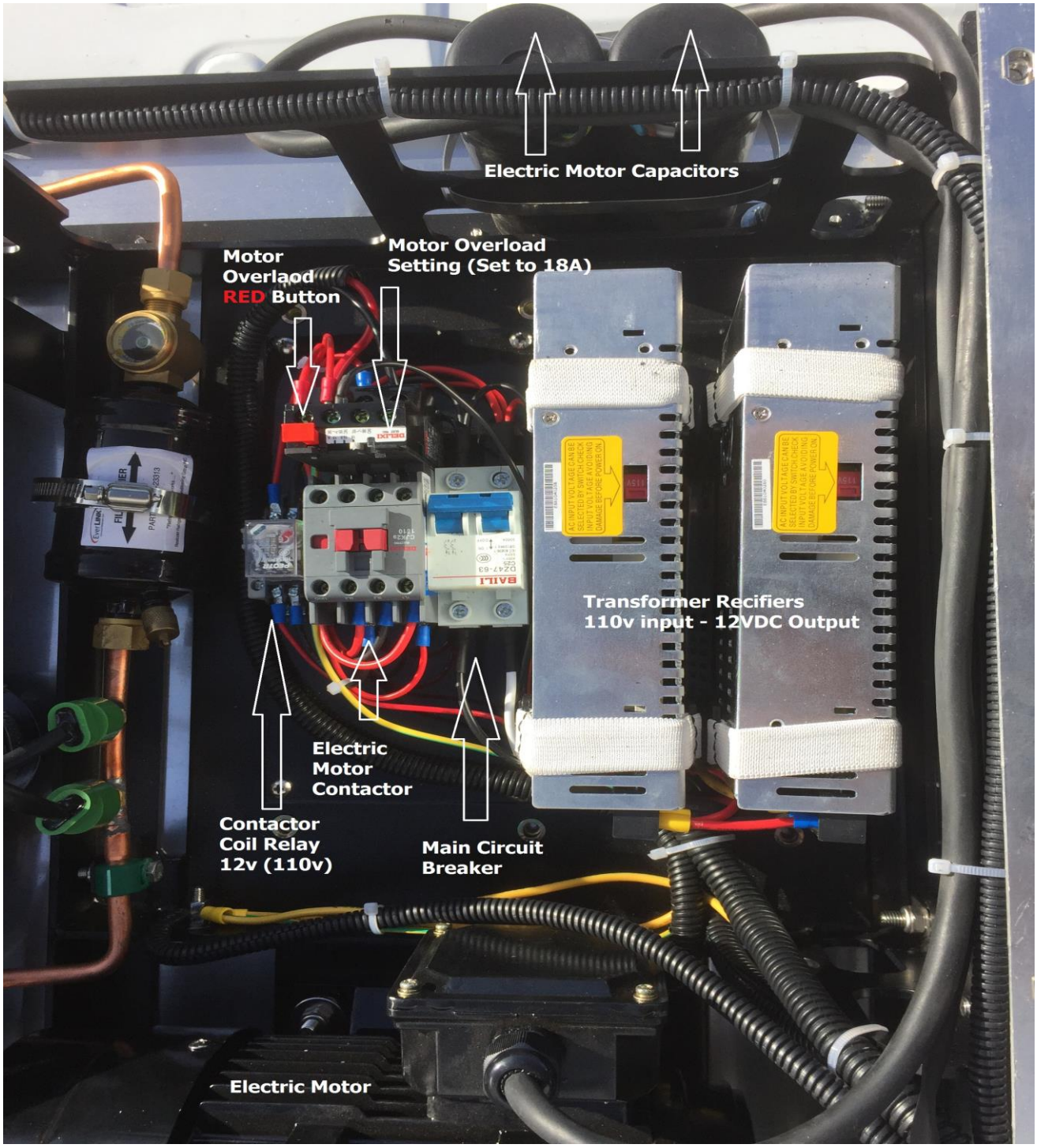
STANDBY OPERATIONAL & SAFETY CHECKS:

1. Do not use damaged or exposed wiring power cables, worn plug pins, sockets or plugs when operating on shore power plugin electric operation.
2. Always defrost the reefer regularly and defrost just after plugging in to road or standby

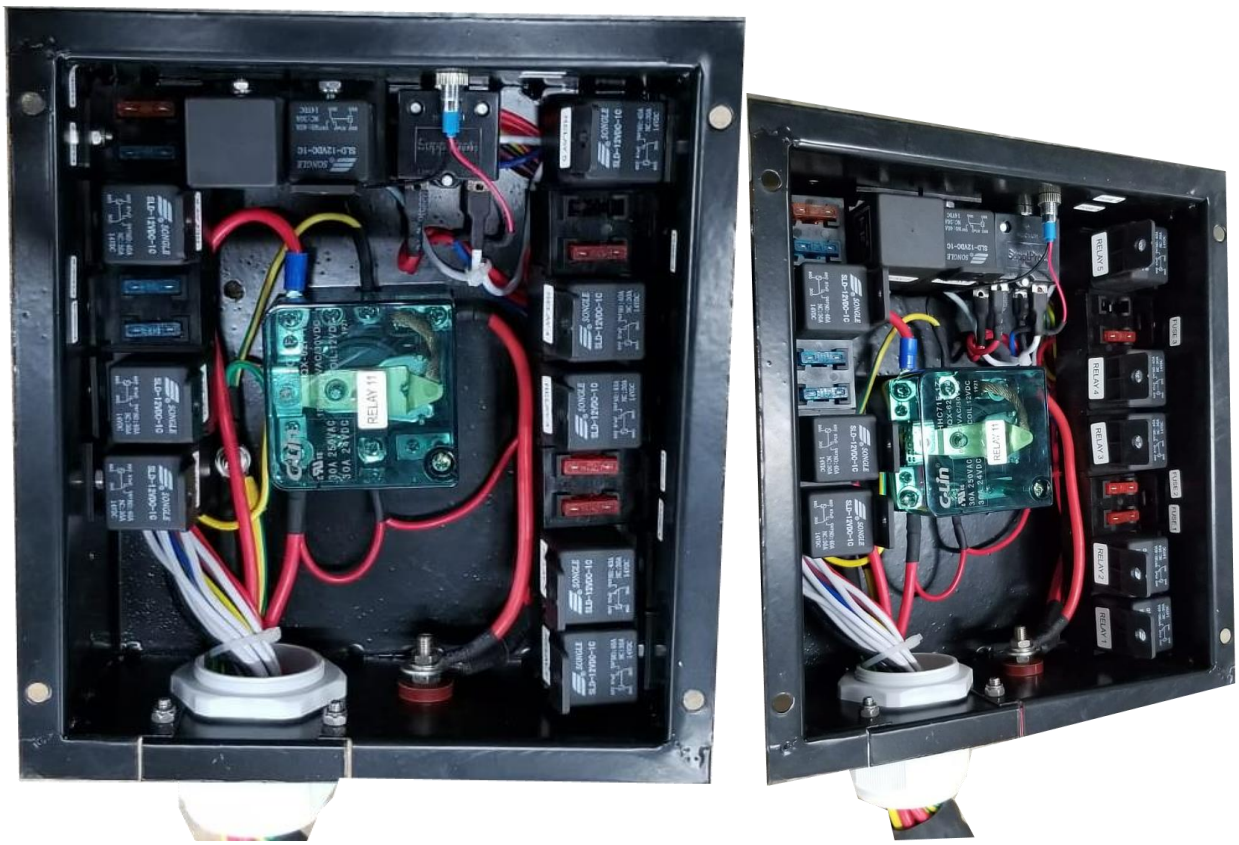
Technical Specifications:

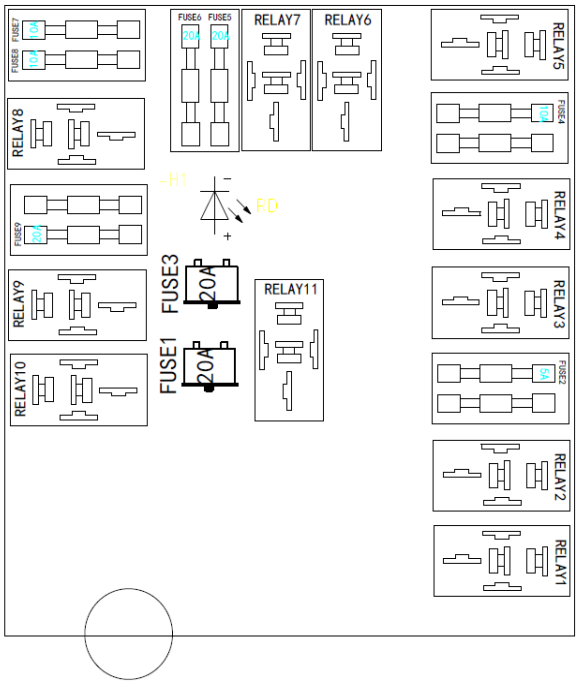
Reefer Model	RV9 and RV9E	RV11 and RV11E	RV16 and RV16E
BTU Cooling Capacity	9000 BTU (Road Op)	11,000 BTU (Road Op)	16,000 BTU (Road Op)
Refrigerant Type	R134a	R134a	R134a
Refrigerant Charge	Approx. 2.8LB (1.3KG)	Approx. 3.2LB (1.5KG)	Approx. 3.5LB (1.6KG)
Compressor Road	Valeo TM15	Valeo TM16	Valeo TM16
Compressor Standby	Sanden - SD5S14	Sanden - SD5S14	Sanden - SD5S14
Refrigerant Oil	RL68 (7 OZ road compressor)	RL68 (8 OZ)	RL68 (8 OZ)
	Total amount of oil to be added to system inc. Oil Separator(s) 13 OZ	Total amount of oil to be added to system inc. Oil Separator(s) 13 OZ	Total amount of oil to be added to system inc. Oil Separator(s) 13 OZ
Electric Motor 110v	1.5KW (rated at 17.5A)	1.5KW (rated at 17.5A)	1.5KW (rated at 17.5A)
HP Switch	320 PSI Cut Out	320 PSI Cut Out	320 PSI Cut Out
Low Pressure Switch	5 PSI Cut Out	5 PSI Cut Out	5 PSI

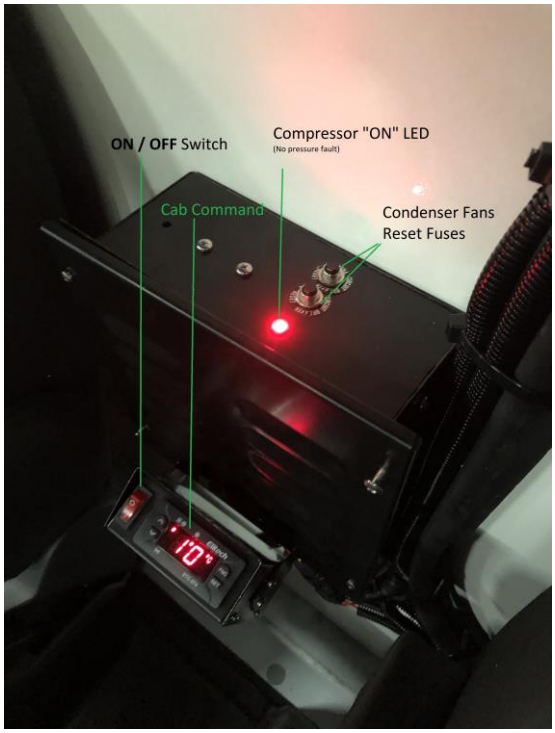
High Voltage 110v - Control Box: RV9,11,16E Road and Standby Models Only
(Located in the condenser section – cover removal required)



Low Voltage Relay & Fuse Box – 2019 - 2020 Model

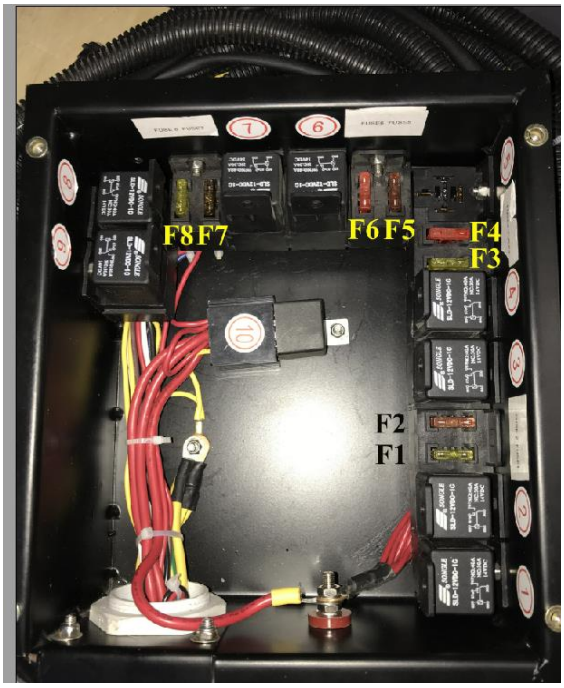




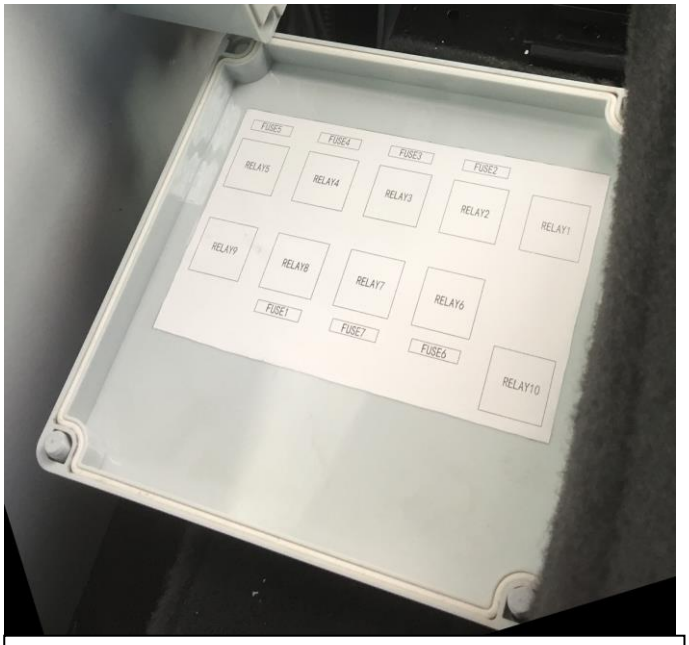


Relay & Fuse Identification:

Low Voltage Relay & Fuse Box - 2018 Model



Low Voltage Relay & Fuse Box - 2016 Model



Relay and Fuse Identification label:

REEFRERVAN ETC-974 Cab Command **Operation Instructions**

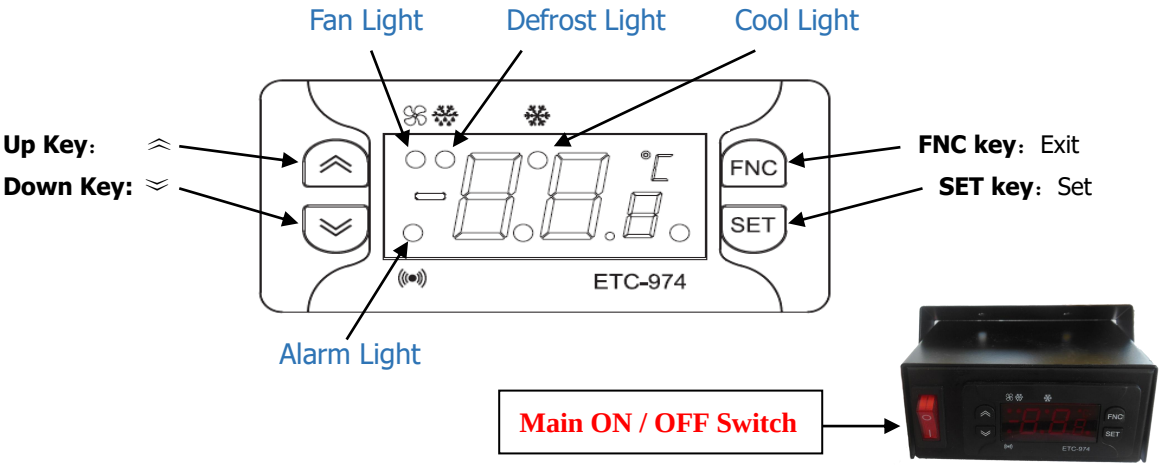
1. Specifications:

1. Power supply：12VDC
2. Rated current of internal relays (refrigeration, defrost and fan)：8A
3. Product Size：Length 77× Width 34.5 × Depth 58（mm）
4. Mounting Hole Size：Length 71 × Width 29 (mm)

2. Technical parameters:

1. Temperature controlling range:
   NTC probe: –50…110 °C (-58...230°F)
   PTC probe: –55…140 °C (-67...284°F)
2. Display resolution：1℃/0.1℃
3. Probe type：NTC（-50℃～120℃） PTC（-50℃～150℃）

2. Operation and display panel



ICON	Related Function	Status
❄	Compressor	ON when the compressor is started; blinking in case of delay, protection or blocked enabling
❄	Defrost	ON when defrosting; blinking in case of manual enabling (Push UP Arrow for 5 Sec to initiate)
(•)	Alarm	ON when the alarm is enabled; blinking when the alarm is silenced
✣	Fans	ON when the fan is working

4. Controller Basic Operation:

Setting the "Set point" temperature that you require:

1. To adjust set point of the controller, press the SET key once, now the display will show "Set".
2. Now press the SET key again for a second time, now you can view the current temperature set point of the controller.
3. Press ⩔ key or ⩒ key to modify or adjust the set point up or down.
4. Press FNC key to confirm the set point temperature and exit from the temperature setting.
5. The display will now return to the cargo area temperature reading

Manually Defrosting the Reefer:

1. Once the cargo area is cool enough to allow a defrost cycle – Initiate defrost by pressing the "UP" button for 5 seconds
2. If a defrost cycle is initiated the defrost light will appear on the display
3. If the display "Blinks" three times the conditions are not right for a Defrost cycle to initiate. (for example, the evaporator sensor temperature is higher than defrost stop temperature)
4. The reefer has an automatic timed defrost for every 2 or 3 hours, however it is recommended that the driver monitors the ice on the cooling coil in the cargo area and manually defrost when required.
5. Defrost will terminate automatically and resume cooling
6. The defrost timer always resets to 0 mins when the reefer controller is turned off.

Other display readings:

Pb1: Air Return probe value

Pb2: Defrost Suction probe value (Expansion valve)

SEt: Set point.

5. Parameter settings

The controller has seven parameter function folders**: CP, Def, Fan, AL, diS, CnF, FPr** The folders contain settings to fully optimize the operation of the reefer.

CAUTION ! Changing the controller from **Degree °C** to **Degree °F** – FIRSTLY CHANGE PARAMETER, **"dro" in the "dis" folder to degree C or F** and then **ALL THE PARAMETERS MUST BE CHANGED.**
The controller does not change all the parameters automatically, **ONLY THE MEASUREMNET VALUE (degree C or F).**

Parameters marked with warning symbol are crucial for correct operation of reefer

Entering parameter folders, CP, Def, Fan, AL, diS, CnF, FPr:

- The controller normally shows the cargo temperature on the display panel, to enter parameters settings press **SET key for at least five seconds**, then the display will enter into the first parameter folder code **CP.**
- Press ⩔ **key or** ⩖ **key**, to display all the parameters folders in rotation (…Def,Fan,AL.diS,CnF,FPr.)
- If you need to view or modify a parameter setting in a folder, press SET key to view the parameter value, then press ⩔ **key or** ⩖ key to modify the value.

To exit the parameters, press **FNC key** this will exit from the parameter folder you are currently in.
To fully exit, **Press FNC again**, this will restore to the normal display temperature value and exit from parameter settings.

Alarm codes:

- **PB1:** Return Air Probe Failure (sensor wire connection failure or sensor failure)
- **PB2:** Defrost Suction Line Probe Failure (or sensor wire connection failure)
  (Note: If PB1 and PB2 alarms are active, they will be displayed simultaneous alternately, every 2 seconds)
- **HAL:** High Temperature Alarm (Out of Range)
- **LAL:** Low Temperature Alarm (Out of Range)

Note: To silence alarms press any key.

6. Parameter Table

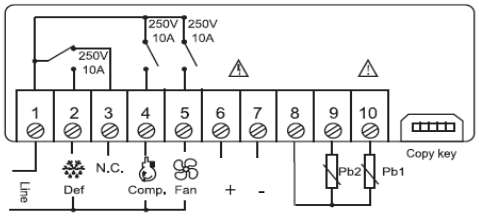
COMPRESSOR REGULATOR (folder with "CP" label)					
	Parameter code	Description	Set range	Default value	Unit
1	**diF**	The temperature difference between set point and when the compressor restarts	(0.1 ... 30.0)	**2 °C** **3 °F**	°C/F
2	**HSE**	Higher Set. Maximum possible set point value.	(LSE ... 302)	**99.0**	°C/F
3	**LSE**	Lower Set. Minimum possible set point value. **R134a Only**	(-55.0 ... HSE)	**0°C /32 °F**	°C/F
4	**Ont**	Compressor On time activation time in the event of faulty probe. If set to "1" with **Oft at "0"** the compressor is always on, while at **Oft >0** compressor cycle mode.	(0 ... 250)	**0**	min
5	**OFt**	OFF time (compressor). Compressor in disabled state time in the event of a faulty probe. If set to "1" with **Ont** at "0" the compressor is always off, while at **Ont >0** it functions always in duty cycle mode.	(0 ... 250)	**1**	min
6	**dOn**	Delay compressor on. Delay time in activating the compressor relay after switching on cab command.	(0 ... 250)	**0 - For road op.** **10 - For 110v** **Standby**	Seconds

7	**dOF**	Delay (after power) OFF. Delay after switching off; the indicated time must elapse between switch-off of the compressor relay and the successive switch-on.	(0 ... 250)	**0**	min
8	**dbi**	Delay between power-on. Delay between compressor starts; The indicated time must elapse between two successive switch-ons of the compressor.	(0 ... 250)	**0 Road Only** **4 - For 110v Standby**	min
9	**OdO**	Delay Output (from power) On. Delay time in activating the outputs after switch-on of the instrument or after a power failure.	(0 ... 250)	**0**	min
DEFROSTING REGULATOR (folder with "dEF" label)					
10	**dtY**	defrost type. Type of defrosting. 0 = Electric defrost; 1 = Reverse cycle defrost (hot gas); 2 = Natural defrost (No compressor).	(0 ... 2)	**1**	number
11	**dit**	Defrost interval time. Interval between the start of two successive defrosting operations.	(0 ... 250)	**2**	hours
12	**dCt**	Defrost Counting type. Selection of count mode for the defrosting interval. 0 = compressor operating hours; 1 = Real Time – appliance operating time; 2 = compressor stop.	(0 ... 2)	**1**	number
13	**dOH**	Delay Defrost on start up. Start-of-defrosting delay time from start up of instrument.	(0 ... 59)	**0**	min
14	**dEt**	Length of defrost time. Defrosting time-out; determines duration of defrost cycle.	(1 ... 250)	**15**	min
15	**dSt**	Defrost Stop temperature. Defrost stop temperature (Defined by the suction evaporator sensor, at the Expansion valve).	(-50.0 ... 150.0)	**8.0 °C** **46°F**	°C/F
16	**dPO**	Defrost at Power On. Determines if at the start-up the reefer should enter defrost mode (Only if suction evaporator sensor is cold enough to allow this operation). **y = yes; n = no.**	(0=n ... 1=Y)	**n**	flag
FANS REGULATOR (folder with "FAn" label)					
17	**FSt**	Fan Stop temperature. If the value, read by the evaporator sensor, is higher than the set value, the fans will stop.	(-50.0 ... 150.0)	**60 °C** **140 °F**	°C/F
18	**FAd**	Fan differential. Fan starting differential (see par. **"FSt"**).	(1.0 ... 50.0)	**2.0 °C** **35 °F**	°C/F
19	**Fdt**	Fan delay time. Delay time in activating fans after defrost.	(0 ... 250)	**0**	min
20	**dt**	Water Drainage time. Defrost.	(0 ... 250)	**0**	min
21	**dFd**	Defrost Fan disable. Allows to select y = yes; n = no.	(0=n ... 1=Y)	**Y**	flag

22	**FCO**	Evaporator Fans OFF when compressor stops at set point y = fans activated (based on the value of the evaporator sensor, see parameter "FSt"); **n = fans turn off at set point;**  dc = not used	(0=n ...1=Y ... 2=dc)	**n**	flag
ALARMS (folder with "AL" label)					
23	**AFd**	Alarm Fan differential.	(1.0 ... 50.0)	**2.0**	°C/F
24	**HAL**	Higher Alarm. Maximum temperature alarm. Temperature value (Set point), if exceeded in an upward direction will trigger the alarm signal.	(LAL ... 150.0)	**60 °C** **140°F** 	°C/F
25	**LAL**	Lower Alarm. Minimum temperature alarm. Temperature value (Set point), Which if exceeded in a downward direction will trigger the alarm signal.	(-50.0 ... HAL)	**-50.0**	°C/F
26	**PAO**	Power-on Alarm Override. Alarm exclusion time after instrument switch on, after a power failure.	(0 ... 10)	**0**	hours
27	**dAO**	Defrost Alarm Override. Alarm exclusion time after defrost.	(0 ... 999)	**0**	min
28	**tAO**	Temperature Alarm Override. Temperature alarm signal delay time.	(0 ... 250)	**0**	min
DISPLAY (folder with "diS" label)					
29	**LOC**	Keyboard locking (LOC). **y = yes; n = no**	(0=n ... 1=Y)	**n**	flag
30	**PA1**	Password 1. When enabled (value other than 0) it constitutes the access key for level 1 parameters.	(0 ... 250)	**0**	number
31	**ndt**	Temperature / Number display. View with decimal point. **y = yes; n = no**	(0=n ... 1=Y)	**n**	flag
32	**CA1**	Calibration 1. Calibration 1. Positive or negative temperature value added to the value read by probe 1.	(-12 ... 12)	**0**	°C/F
33	**CA2**	Calibration 2. Calibration 2. Positive or negative temperature value added to the value read by probe 2.	(-12 ... 12)	**0**	°C/F
34	**ddL**	Defrost display. Viewing mode during defrosting. 0 = shows the temperature read by the controller probe; 1 = locks the reading on the temperature display read by controller probe when defrosting starts, and until the next time the set point value is reached; 2 = displays the label **"deF"** during defrosting, and until the next time the Set point value is reached.	(0 ... 2)	**1**	number
35	**dro** 	Selecting degree **°C or °F** for temperature display and parameters read by the controller probe. **0 = °C, 1 = °F.** **IMPORTANT! This setting MUST be set FIRST BEFORE changing any other parameters**		**1**	number

CONFIGURATION (folder with "CnF" label)					
36	**H00**	Probe type selection, PTC or NTC. 0 = PTC; 1 = NTC.	(0...1)	**1**	number
37	**H42**	Evaporator suction probe present.	(0=n ... 1=Y)	**y**	flag
38	**rEL**	Release firmware. Device version: read only parameter.	/	**/**	
39	**tAb**	Table of parameters. Reserved: read only parameter.	/	**/**	
COPY CARD (folder with "Fpr" label)					
40	**UL**	Up load. Programming parameter transfer from instrument to Copy Card.		/	
41	**dL**	Down load. Programming parameter transfer from Copy Card to instrument		/	
42	**Fr**	Format. Erasing all data in the copy card.		/	

Cab Command Wiring Diagram



Direct Drive Reefer – Service Maintenance Schedule:

Reefervan regular servicing is required in order to optimize the service life and reliability of your reefer product and to maintain your warranty coverage. Required servicing schedule for Reefervan reefer products

KM's Miles	5,000 3,000	30,000 18,000	60,000 36,000	90,000 54,000	120,000 72,000	150,000 90,000	180,000 108,000	210,000 126,000
A Service	Y	Y	Y	Y	Y	Y	Y	Y
B Service		Y	Y	Y	Y	Y	Y	Y
C Service			Y		Y		Y	
D Service					Y			

A Service
Check compressor belt tension & alignment – Check compressor mount kit – Refrigerant level – Fan Operation – General operation

B Service
Clean condenser – replace road and standby belts, replace filter drier (if required)- Refrigerant & compressor oil level check – Check cab command operation – Check defrost, fan motors and safety cut out – Check electric operation (if installed)

C Service
Check drive bearings, belt tension & pulleys compressor – Change compressor oil R404a – Filter drier (Compressor oil must be inspected for contamination and changed every 18 months due to natural wear by R404a refrigerant)

D Service
Change removable relays and fuses of control panel – Change start relay on electric standby reefer.

Please note: *Road service reefer warranty repairs are not covered under standard warranty terms coverage. All warranty repairs are limited to workshop repairs only at your nearest local Reefervan dealer regardless of distance. Road service or any on-site warranty repairs, require a service plan agreement to be in place.*

BEFORE CALLING REEFERVAN, IF THE REEFER IS NOT FUNCTIONING PROPERLY, CHECK OUT THE FOLLOWING

Road Only:

1. Is the reefer cab command switched on with and set to the correct set point?
2. Check fans are operating in the cargo load area and on the roof operating reefer may shut down on safety due to low pressure.
3. Is the evaporator coil iced up? Defrost and clear coil fully before operating reefer may shut down on safety due to low pressure.
4. Check fuses at the wiring relay box (normally behind driver's seat)
5. Check battery fuse
6. Check and listen to see if the road compressor has engaged (located in engine bay)
7. Check to see if there is refrigerant flowing through the sight glass in the evaporator section

Standby & Road Operation:

1. Is the electric mains power supply present (110v), Has the mains circuit breaker tripped?
2. Check that there is a 30A power supply to operate the reefer
3. Contact a Reefervan dealer for further assistance