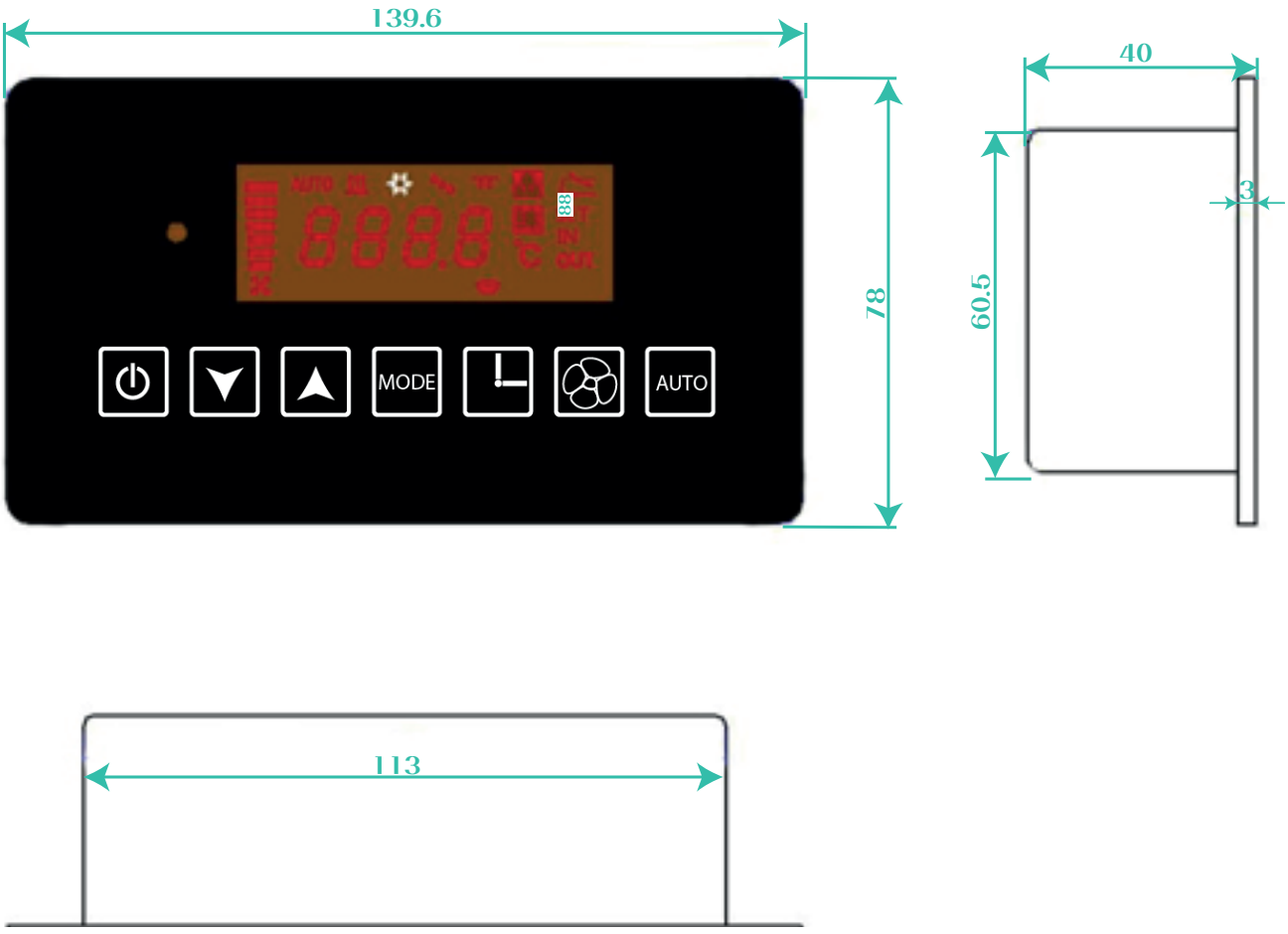
COOLABAH

SUPERIOR PROGRESSIVE TECHNOLOGY

INSTALLATION
&
USER MANUAL

CONTROLLER DIMENSIONS



TECHNICAL SPECIFICATION

Rated voltage: DC24V

Operation Temperature & Humidity: -30°C ~ 80°C, 5% ~ 95%. RH non-condensing.

Storage Temperature & Humidity: -10°C ~ 70°C, 5% ~ 95%. RH non-condensing.

Basic input:

1) Interior temperature sensor (25°C, Rb=5K, B=3274);
2) Defrosting sensor(25°C, Rb=5K, B=3274);
3) Pressure transducer (0~5V DC);
4) Supply voltage detection (20~40V DC);

Basic output:

1) Heating control; 1A*
2) Power supply changeover; 1A*
3) Compressor starting control 0V; 200mA*
4) Compressor speed control; 0-5V DC*
5) PWM Evaporator PWM speed regulation; 50mA*
6) PWM Condenser PWM speed regulation; 50mA*

***Maximum Current Allowed from controller**

Fault & Alarm:

1) Over high/low pressure supply fault alarm;
2) Defrosting temperature sensor fault alarm;
3) Interior temperature sensor fault alarm;
4) Pressure transducer fault alarm;

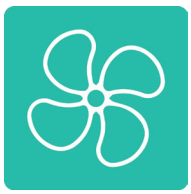
Display: LED

Display Accuracy:
Setting temperature display in 2 digits, accuracy,1°C; Interior temperature display in 2 digits, accuracy, 0.5°C

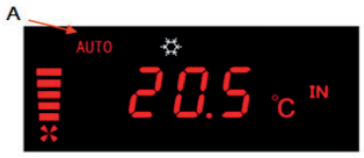
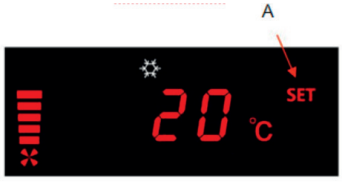
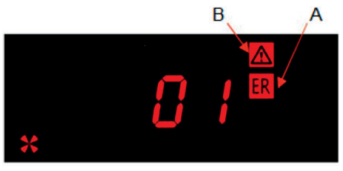
Temperature Detection Standard:
Temperature control with return air temperature as a reference;

Internal temperature is based on air inlet temperature detection.

CONTROLLER OPERATION

	**ON/OFF Switch** Press button to turn unit on/off. The buzzer tone indicates efficient operation.
	**Auto Mode Switch** In normal starting status, press this button and system will enter into auto mode. User needs only to set the desired temperature value, system will control compressor and fan motors to work automatically. Depending on ambient temperature the unit will activate cooling or heating to achieve desired temperature set. Meanwhile display screen shows each working icons accordingly. Buzzer tone indicates efficient operation.
	**Manual Cooling Switch** In normal starting up status, press this button for different working modes -> manual cooling -> ventilation -> manual heating -> Ventilation -> manual cooling in turn. Meanwhile display screen shows the corresponding icon and each working status accordingly. Buzzer tone indicates the efficient operation.
	**Temperature Setting** Users can adjust temperature between 18°C ~ 28°C. Press the button once, the setting temperature would change by 1°C in manual mode. In auto mode user can only adjust temperature from 22°C ~26°C. *To improve battery run time it is recommended that the unit is operated between 22°C and 25°C.
	**Fan Speed Regulation** Press this button to adjust fan speed value to required speed. Under automatic mode, system will set the fan speed automatically by comparing internal & external temperature. Buzzer tone indicates the efficient operation. In auto heating mode fan speed is automatically selected to Number 3 only.
	**Timer Function** To turn timed on, with unit switched off press timer button once, timer indicator will appear. Then hold timer button for 3 seconds and adjust time before unit auto switches on using the up and down buttons time is shown in 30 minute incriments. To set timer auto shut off, with the unit running in the mode required press the timer button once timer indicator will appear. Then hold timer button for 3 seconds and adjust auto shut off time using the up and down buttons time is shown in 30 minute incriments.

DISPLAY FUNCTIONS

	**Auto Mode Display** Once desired temperature is selected pressing the **AUTO** mode. System will regulate fan speed automatically, A lights on, display shows the system working status along with it.
	**Manual Cooling Mode** Press **MODE** switch, system enter into manual cooling mode. User need to set the temperature and fan speed manually. If A lights on in white, compressor is working. If A turns orange, compressor cycles off.
	**Manual Heating Mode** Press **MODE** switch, system enters into manual heating mode. User needs to set the temperature and fan speed manually. If A lights on, heater/ solenoid valve is working. If A flickers, heating is warms up or cycling.
	If A lights on, the display shows interior temperature value.
	**Defrosting Mode** Under cooling mode, if A lights up, and cooling indicator light is orange, it indicates that the system is under defrosting mode. When defrosting is complete, A light turns off, system resumes to previous working status
	**Setting Temperature** Press **UP** or **DOWN** to set the wanted temperature in range of 18°C and 28°C. A lights up, the display shows the setting value.
	**Error Code** In normal working status, A lights on, it indicates an error occurring, but parts of operation could run normally. Setting temperature display area shows the error code automatically. If A and B lights on at the same time, indicates the system has a serious fault, the system will stop working. Setting temperature display area shows the error code. Please refer to 'error code instruction' for details.

COOLING FUNCTIONS

When system is in cooling mode, controller will compare the interior sensor temperature and setting temperature automatically. °C

If interior sensor temperature ≥ setting temperature + 1°C, compressor ON, condenser fan ON.

Note. Cooling procedure requires a 1 minute reset period before restarting unit.
When defrosting temperature < 2°C, system enter into defrosting mode, cooling stops. When defrosting temperature > 7°C, system stops defrosting and restarts.

HEATING FUNCTIONS

When system is in auto heating mode, fan speed remains at 3 at all times. However in manual heating mode, fan speed can be adjusted from 3 up to 8.

Functional relation graph between condenser fan speed and pressure transducer		
V out	Condenser fan duty cycle	Compressor running
≤0.39V	0%	No
>0.44V	0%	YES
>1.2V	30%	YES
1.3V<Vout<1.9V	30%-100% vary between 30% and 100% as the voltage increases the fan speed increases	YES
>1.9V	100%	YES
>3V	100%	NO
To recover <2.7V back down to < 2.7V	100%	YES

Functional relation graph between V yellow and Temperature difference			
Temperature difference between interior temperature and setting temperature T (°C)	V red	V yellow	Compressor rotation speed
T≤-1	Suspended	0V	0
T≤1	0V	0V	2500
T≤1.5	0V	1.8V	3000
T≤2.5	0V	3V	3500
T≤3.0	0V	4V	4000
T>3.5	0V	5V	4500

Functional relation graph between evaporator fan speed and temperature difference under AUTO cooling mode	
Temperature difference between interior temperature and setting temperature (°C)	Evaporator fan duty cycle
T≤0	20%
T≤1	40%
T≤2	70%
T>3	100%

PRESSURE TRANSDUCER FAULT DETECTION INSTRUCTION

The controller uses the signal from the pressure transducer to control the compressor speed, the condenser fan speed also refrigerant pressure fault codes and controls the temperature in the cab according to the settings.

When the controller is powered up pressing and holding the auto button for 3 seconds will produce three beeps. This will show the current pressure in the system pressing the auto button again will move to the next menu and so on and so on. Scroll through this menu to get the following information.

Present value of Vout, <U> (unit:V)	<PrE> and <x.xx> flicker alternately
Low-voltage failure point, <UL1> (unit:V)	<Lo1> and <x.xx> flicker alternately
Recovery point from low-voltage failure ,<UL2> (unit:V)	<Lo2> and <x.xx> flicker alternately
High-voltage failure point, <UH1> (unit:V)	<Hi1> and <x.xx> flicker alternately
Recovery point from high-voltage failure ,<UH2> (unit:V)	<Hi2> and <x.xx> flicker alternately
Low voltage cut point Heating ON hysterise value <HoN> Heating OFF hysterise value <HoN>	(unit:V) <HoN> and <x.xx> flicker alternately <HoF> and <x.xx> flicker alternately

Without operation within 5s, controller returns to previous display status.
When U<UL1, low-voltage fault occurs; when U>UH1, high-voltage fault occurs; When U>UL2, low-voltage fault recovery; when U<UH2, high-voltage fault recovery.

When controller is OFF but powered on, user press AUTO switch for 3s, controller gives 3 warning tones and callout the setting surface for pressure security value and voltage detection value. Then short press AUTO switch to set each item in turn as following.

Present value of Vout, <U> (not available)	<PrE> and <x.xx> flicker alternately (unit:V)
Low-voltage failure point, <UL1> (unit:V)(setting range 0-2.5)	<Lo1> and <x.xx> flicker alternately
Recovery point from low-voltage failure ,<UL2> (setting range UL1-2.5)	<Lo2> and <x.xx> flicker alternately (unit:V)
High-voltage failure point, <UH1> (setting range 2.5-5)	<Hi1> and <x.xx> flicker alternately (unit:V)
Recovery point from high-voltage failure ,<UH2> (setting range 2.5-UH1)	<Hi2> and <x.xx> flicker alternately (unit:V)
Low voltage cut point	(unit:V) (setting range 20-23V)
Heating ON hysterise value <HoN> Heating OFF hysterise value <HoN>	<HoN> and <x.xx> flicker alternately <HoF> and <x.xx> flicker alternately

To select any item, press UP or DOWN switch to get adjust value.
If controller is not pressed within 10s, controller display turns off and keeps the previous setting value.

SHIFT FUNCTION

1) Override cooling

In cooling mode, press MODE switch 

for 3s, controller gives 3 warning tones, system enters into override cooling mode. Under this mode, the compressor speed control Vout is 1.8V. This ignores the inside temperature sensor and activates the compressor allowing for testing. Press any switch except ON/OFF or FRESH AIR switch to quit mandatory cooling mode.

2) Override heating

Under heating mode, press MODE 

switch for 3s, controller gives 3 warning tones, system enters into override heating mode. This ignores inside temperature sensor and turns heater on. Press any switch except ON/OFF or FRESH AIR button to quit override heating mode.

4) System working time checking

When controller is working, press FAN SPEED  switch for 3s, controller gives 3 warning tones and display system working time in unit of 100hrs.

5) Compressor working time checking

When controller is working, press the UP  switch for 3s, controller gives 3 warning tones and display system working time in unit of 100hrs.

6) System current voltage

When controller is working press DOWN  switch for 3s controller give 3 warning tones and displays the current system voltage.

ERROR DISPLAY & RESOLUTION

System takes the status of voltage, refrigerant pressure and sensors as the detection points.

1) Er-01: Under voltage error
When input voltage is below <low voltage cut point> for more than 3s, Er-01 occurs. With this error, all the outputs of compressor, evaporator fan, fresh air device, condenser and heating would stop, meanwhile the voltage changeover control outputs. All the switches are lock except ON/OFF switch, display show error code. Please check generator and power supply circuit. Such error is unrecoverable.

2) Er-02: Overvoltage error
When input voltage is above 31V for more than 3s, Er-02 occurs. With this error, AC system stops the entire outputs stop, display show error code. Please check generator and power supply circuit. Such error is unrecoverable.

3) H/L: Interior temperature sensor error
Short circuit is error "H", open circuit error is "L". Please detect sensor circuit, or whether sensor is in faulty. After remove the error, controller will recover normal working state automatically. With this error under cooling mode, compressor would wait for 5mins after every 60mins operation. With this error under heating mode, heating would wait for 5mins after every 30mins output.

4) ER-16: Defrosting temperature sensor error
When defrosting sensor is in short circuit or open circuit, ER-16 occurs. Please detect sensor circuit, or whether sensor is in faulty. After remove the error, controller will recover normal working state automatically.
With this error under cooling mode, compressor would wait for 5mins after every 60mins operation.
With this error under heating mode, heating output would not be influenced.

5) ER-03: Refrigerant low-pressure error
When controller detects the system refrigerant pressure is under the setting valve, Er-03 occurs. Cooling stops automatically and display show the error code. Please detect refrigerant pressure system and remove this error. Controller would not recover normal until pressure value recovers for more than 3seconds.

6) ER-04: Refrigerant high-pressure error
When controller detects the system refrigerant pressure is above than the setting valve, Er-04 occurs. Cooling stops automatically and display show the error code. Please detect refrigerant pressure system and remove this error. Controller would not recover normal until pressure value recovers for more than 3seconds.

Note: Every error occurs with error icon and warning tone, and error code would flicker.

3 PHASE COMPRESSOR CONTROLLER AND COMPRESSOR DIAGNOSTICS

1) Performance And Parameter

Rated Voltage	24V
Rated Current	25A
Max Current	38A
Rated Power	600W
Efficiency	>95%
Model Speed Range	2500RPM-4500RPM (Depend on motor and load)
Function Instruction	Upon detection of a fault, the motor will shut down. The controller will attempt to restart the motor after the fault condition is cleared. - Over voltage: The controller will delay for 60 seconds before attempting to restart. - Under Voltage fault protection: The controller will delay for 60 seconds before attempting to restart. **24VSystem: Lower limit voltage 20V±0.5V;Recover Voltage 22V±0.5V;Upper limit 30V±0.5V, Recover Voltage 28V±0.5V** - Start-delay: Power on AC switch, the light flash two times, first long flash second short flash then the controller start after 60s. - Over-current fault: When running current is over Max Current, the controller suspend for protection, delay for 60 seconds before attempting to restart. - Over-heat : o When controller connects with normally closed contact switch, the motor suspend, after 60s motor restart. o Inside controller there is a temperature protection, which stops the motor when the temperature is higher than 75°C immediately. When the temperature back to 70 °c, motor restart after 60s. - Locked motor fault: when detect lock, motor stop immediately after 60seconds it will restart - Startup Failed fault: If motor can't start in time, motor will auto stop, after 10s restart. Auto start must be less than 5 times, otherwise motor need to power on again - Fault signal output: Any problem above happen, the trouble light will flash; when controller works normally, the trouble light will be off. - Counter-attack function: If the power wire connect incorrectly, the controller will be no damage; until connect correctly, the controller will work normally.

3 PHASE COMPRESSOR CONTROLLER AND COMPRESSOR DIAGNOSTICS

Connector	Analog voltage connector
Trouble light	LED Option)
Grade of Protection	IPn4
Dimension	119mm*146mm*70mm
Weight	1.5Kg
Type of cooling	Fan cooling
Ambient temperature	-40°C~45°C

2) Fault Indicator Output

Item	**Fault type**	**Light flash character**	**Remark**
1	Over-heat	2 short 2 long	Short flash: flashing interval of 0.4 seconds; Long flash: flashing interval of 0.7 seconds.
2	Under Voltage	3 short 2 long	
3	Over Voltage	4 short 2 long	
4	Startup Failed	5 short 2 long	
5	Low speed	2 short 3 long	
6	Over-current	3 short 3 long	
7	Inner tempera-ture protection	4 short 3 long	
8	External tempera-ture protection	5 short 3 long	

Item	Fault Phenomenon	Measurement
1	Motor reversal	Stop the motor, change any 2 wires of the three motor wires, then restart motor.
2	Motor no work	Make sure the connecting of motor wires is correct, and the voltage also need to check
3	The speed is not normal	Make sure whether voltage is over-low or load too much
4	Motor stop suddenly	Make sure voltage over-high or over-low; over load or over heat
5	Motor can't startup or restart	Make sure the connecting of motor wires is correct, and the voltage also need to check
6	Trouble light flash	System over-load or short-circuit or other protection

Please note to extract codes on later model compressors use a volt meter or LED test light between power supply and blue wire terminal at the base of the six pin connector on the compressor condenser assembly.

Before installation

Determine that there is a sufficient and suitable position for all the components required to fit the Coolabah to the vehicle.

Make sure once location is decided that you check under flooring for wiring or other items that can be damaged when installing Coolabah. Also check wall where intending to fit for hidden wiring or for a single skin cab to prevent damage.

Installation of condenser/compressor unit

There must be adequate airflow around the condenser and no obstruction to the airflow from the condenser fan. Try to install unit away from exhaust or fit shield to radiate heat away from the condenser/compressor unit. It is highly recommended that the condenser fan faces outwards so that the hot air can rise past the sleeper cab and not create a hot loop effect.

Using the supplied mounting bracket make sure that the mounting points of the condenser/compressor unit are structurally sound and can handle the rough roads.
Install bracket using 6x M10 bolts with Nylock nuts. These are not supplied as floor thickness varies. At this stage assess whether battery will be fitted above the condenser unit as any fixing point for battery will need to be done before fitting outdoor unit. If this is the case fit battery at this point (please see below instructions).

Try and use points that are close to an edge or fit cross beams to suite. In some cases large washers will need to be used on the inside of cab for extra support if floor thickness is less then 3mm or if no structural support can be utilised.

You should also consider that there is enough room at the connection points to facilitate the a/c hose fittings with service port access and the wiring connections.

When running air conditioning hosing make sure that you **do not run the hoses across sharp objects** that could rub through with the vibrations of the cab. The general rule is that if it's too close to something that has the potential to rub through the wiring or hose then it must be clamped via a p-clamp to avoid any movement of the hose or wiring. **Please make sure to use the supplied blue clip retainers and rubber foam insulation with the hoses.** The blue clip retainers are there to make sure that the clip is clamping in the correct position on the fitting, the foam insulation is there to stop condensation from collecting around the hose and dripping inside the cab causing the trim to become wet. It also aids in the efficiency of the cooling. Mount condenser/compressor unit to bracket by using the bolts on bracket and nylock nuts supplied. Fit ac hoses and wiring loom.

Important: Keep ac hosing and wiring away from exhaust heat or shield them if necessary.
Wiring and hoses MUST NOT be exposed to any sharp edges, use grommets or glands and secure at appropriate intervals.

Ensure electrical connections are crimped properly and secured tightly on the studs.
When connecting the 6 pin Deutch plug make sure that the pins are lined up correctly and that none of the pins push out the back of the plugs after the clip is engaged.

Please note: No other accessories are to be attached to the lithium battery as it is calibrated for exclusive use of the Coolabah unit only.

Lithium Battery Fitment

Find a suitable location for the battery box on the rear of the cab, secure to the cab using a minimum of 8 x M8 Bolts with Nylock nuts. Make sure you pick up off the main structure of the rear of the cab as there is a fair bit of weight to it approximately 40kg for 5kwh battery. Use reinforcement brackets if necessary from the inside of the cab. Alternatively use reinforcement brackets to the main structure on the rear of the cab.

Important: Under NO circumstances are the batteries to be fitted on chassis without some sort of dampening mounts as the jarring will affect the life of the batteries .

Drill a 35mm hole through the floor to allow the cable connections from the battery to the condenser/compressor unit and to the output connections of the D/C to D/C charger. Running cable through grommets provided.

Secure the yellow 16mm sq cable to the midi fuse holder that is connected to the positive terminal of the battery.
Run cable (16mm sq) through the grommet at the bottom of the battery. Run cable and connect to condensor positive. From condensor positive run another yellow cable to 50A midi fuse and then to output of DCAC charger.

Run One earth Black (16mm sq) cable from the negative battery stud to the negative terminal stud on the condenser/compressor unit and one earth black (16mm sq) cable from the negative terminal stud on the condenser/compressor unit to the negative output connection on the D/C to D/C charger.

Make sure all your connections are crimped properly and use heat shrink on the ends.
Secure the cables at appropriate intervals and cables MUST be placed through grommets or glands when going through panels or sharp edges.
Please ensure all battery lugs are tighten correctly when connected to prevent high resistance joints and voltage drops.

Installation Of Charger
Mount the charger in a position inside the cabin where it can get cool air from the vehicle air-conditioning system as these units have a thermal overload protection and will stop charging if and when they get too hot.
The most suitable position is attached to the base of the passenger seat, near the return air intake for the vehicle air-conditioning system.

Vehicle Battery Input Pick Up Points
12v Vehicle setup
Drill a 35mm hole using grommet or gland under dc-dc charger and run two 35mm cables provided directly to the studs on the Alternator of a 12v vehicle. Run a Red (35mm sq) cable from the positive input connection of the D/C to D/C charger to the positive connection on the back of the truck alternator with a 100A Mega Fuse close to the Alternator and one black negative (35mm sq) cable from the negative input connection of the D/C to D/C charger to the negative connection on the back of the alternator.
(Do not connect to the battery as this overloads the OEM wiring and circuit breaker), fig1

24v vehicle setup
Note 24v vehicles with smart alternators make connection at body builder's battery connection point,
Run a Red (21mm sq) cable supplied from the positive input connection of the D/C to D/C charger to the positive connection on the back of the body builder connection with a 70A Mega Fuse close to the body builders connection point and one black negative (21mm sq) cable from the negative input connection of the D/C to D/C charger to the negative connection on the body builder connection point.fig2

Installation of Evaporator

Mount the Evaporator in the sleeper compartment in a position that allows the user to close the curtain between the driver's compartment and the sleeper compartment, as it is important that they close the curtain for the most efficient operation of this unit.
Select a position either on top of a cupboard, on top of a shelf, below a shelf or attached using strong brackets off a wall.
The Evaporator should be mounted in a slightly downward angle towards the rear of the evaporator. Drain tube MUST always be going downhill in the most direct route with NO kinks or twists in the hose, making sure the collected water can drain correctly, Failure to do so will cause water to leak into cabin.

Allow sufficient room at the rear of the evaporator to facilitate the connection of the hose fittings and adequate airflow from the intake. Ensure low-side fitting must be sealed with corking tape to prevent any water dripping inside the cab. Make sure to fit lint filter in place so that it can be easily removed for servicing.
Secure the evaporator's casings using a minimum of 4 x M6 bolts on each side using brackets provided or manufacture sufficient brackets to suit your application.
Place the Evaporator as high as possible in the sleeper compartment and on the same side as the compressor / condenser unit to achieve the best results.
Now make connections for ac hoses and wiring with any access wiring to be cable tide neatly behind trim.

Important: Make sure when mounting evaporator that you will not drill through the cabs external wall as some vehicles may be single skinned.
Important: Make sure that there is no swing or movement on the evaporator.
Important: Hoses and cables **MUST NOT** cut across sharp objects, are not twisted or kinked and are secured at appropriate intervals.

Heater Option

The heater is of PTC construction this allows heating in sub zero conditions. Conect the 6mm squared cable in the main wiring loom to the -1 conection on the Solid State Relay attached to the condensor/compressor assembly near tha main power conections. Connect the 6mm squared black cable to the negative conection on the main power input studs. Connect the 2mm blue/black trace wire to the +3 connection of the solid state relay. Cover the conections with some silicone to avoid terminals screws loosing and fit cover back on.

Installation of Controller

The Controller should be mounted in a position where the user can access it while lying down in his natural sleeping position (this is generally with his head directly behind the driver's seat as this is the way the road generally leans.)

The controller has many diagnostic functions explained in the user manual and will also switch off the display automatically after 2min of no use to make a more comfortable sleep.
Press any button to bring display back up. There are special fascias available for specific models if required.
The most efficient way to operate the system is to have the controller set on Auto.

134a Gassing

On completion of installation of all Coolabah components re-gassing is required.
Before re-gassing, the Coolabah system must be checked for leaks.
Using nitrogen, a pressure test of the system needs to be carried out with 300-psi pressure for 30 minutes make sure you do not lose any pressure.
If you are losing pressure this indicates a leak in the system.
Using soapy water in a spray bottle. Spray all ac connections of the coolabah to find the leak.
Repair Leak as required and retest system with nitrogen, If leak present please follow above step until no leaks found. If no leaks in system continue with next step.
Evacuate the system and hold min 28 Hg of vacuum for around 30 to 40 minutes. When this complete fill the system initially through the high side then start the unit up for the remainder through the low side.
Use 500grams of gas plus 55grams of gas per every metre of no. 6 high pressure hose used.
Run system and check for operation and efficiency.
Run the system on No 3 speed for 15 minutes and listen for any gurgling or hissing sounds through the TX valve.

Giving the system time to equalize at each adding of gas.
Do not go over 900gms of gas unless you consult with us first.
As the Coolabah is thermostated for cooling and heating features. The system has a override cooling and a override heating setting for testing purposes and for gassing the system when the ambient temperature is too cold or too hot.
While on cooling mode hold the menu button for three seconds this will automatically engage compressor so that you can gas the system correctly.
While on heating mode hold the menu button for three seconds this will automatically engage heater to test operation.

Very Important: At this stage you will need to test the charging of the lithium battery. Make sure that the Vehicle battery is not too flat when you do this test, as this will affect your results.
It is recommended that a battery charger remains connected to the vehicle whilst the installation process is underway. Start the vehicle and run engine at a high idle speed of around 1100 rpm then check the input voltage on the charger that it is above 13.5V. When it gets above 13.5v the charger will start to charge the lithium battery and it should remain charging until the voltage to the input terminal on charger falls below 12.5v at this stage the charger will stop charging to give power back to truck batteries.

Please note: If charger is continually cutting out and not charging lithium battery. You will need to check connection, truck batteries and alternator for faults.
When charging, the charger should be pumping around 30 to 45 Amps continuously if not check your connections and make sure they are not loose. As the Lithium battery voltage approaches 29V the current will start to tapper down as this means that the battery is almost full.
Thank you for taking the time to read this and please don't hesitate to call us if you have any further questions, and don't forget to instruct the customer on the correct use of the system. Making sure to let them know not to let the lithium battery sit for extended periods (more than 3 months) with the vehicle not in use and charging it as this will eventually flatten the lithium battery beyond recovery and void their warranty on it.

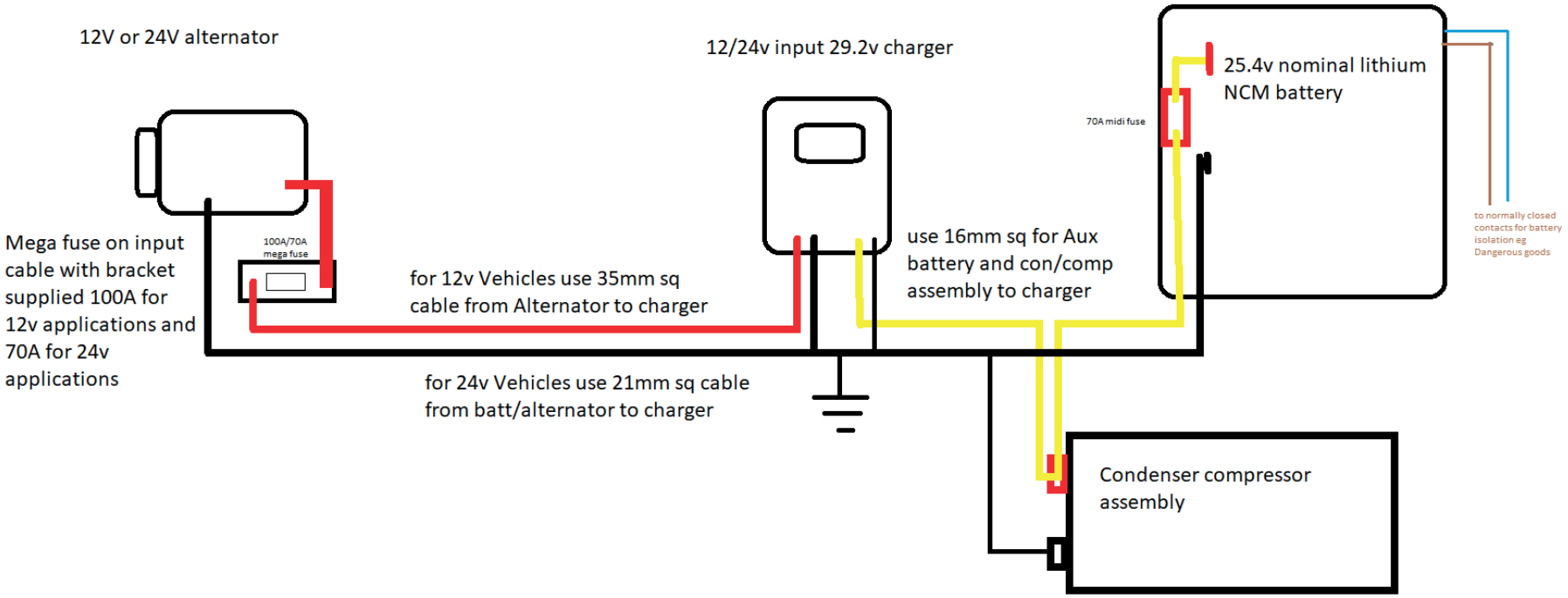
Disclaimer:

The Lithium battery and battery management system are designed and calibrated for exclusive use with the Coolabah DCAC truck sleeper Ac system. At no time is any other accessory to be connected to the lithium battery.

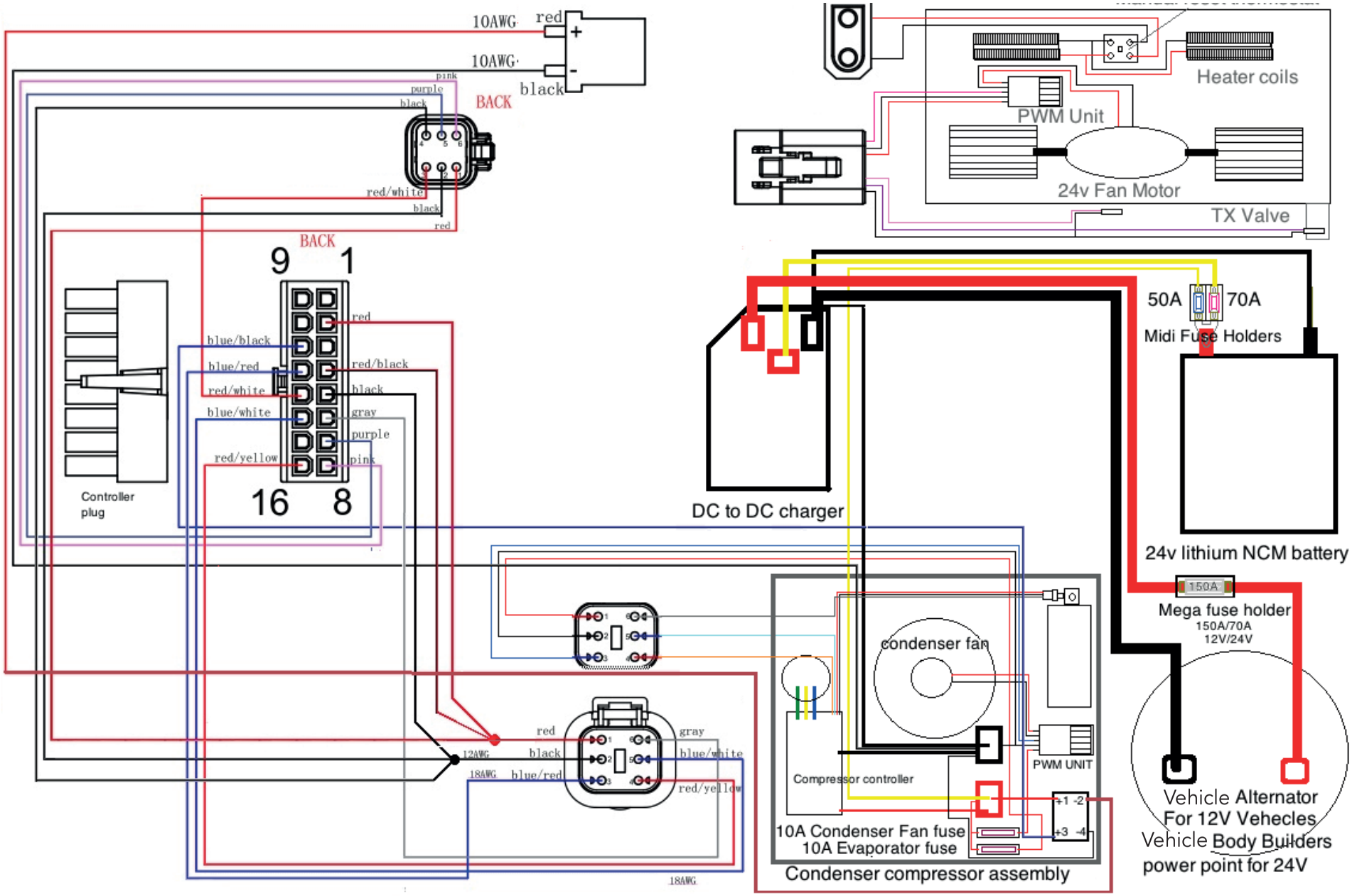
As this will:
Reduce run time of Coolabah,
May damage lithium battery and void warranty
Due to higher voltage out put of battery it may damage unauthorised accessory. (Manufacturer will not take any responsibility for damage caused to unauthorised accessories attached to its system.

Main Battery Connections For 12v & 24v

Auxillury Battery and charger wiring diagram to suit 12v/24V instalations.



Main Wiring Loom



Nationwide dealers available. Please enquire for your closest location.

MVM Auto Repairs PTY LTD

Smeaton Grange
Contact: David Saliba
11/28 Dunn Road, Smeaton Grange NSW 2567 Mobile: 0414 274 444
website: coolabahdcac.com

St Marys
Contact: Lino Debono
6/130 Forrester Road, St Marys NSW 2760 Ph: 02 9833 1900
Fax: 02 9833 1911
Email: info@mvmautos.com.au