

Coolabah DC/AC



User MANUAL

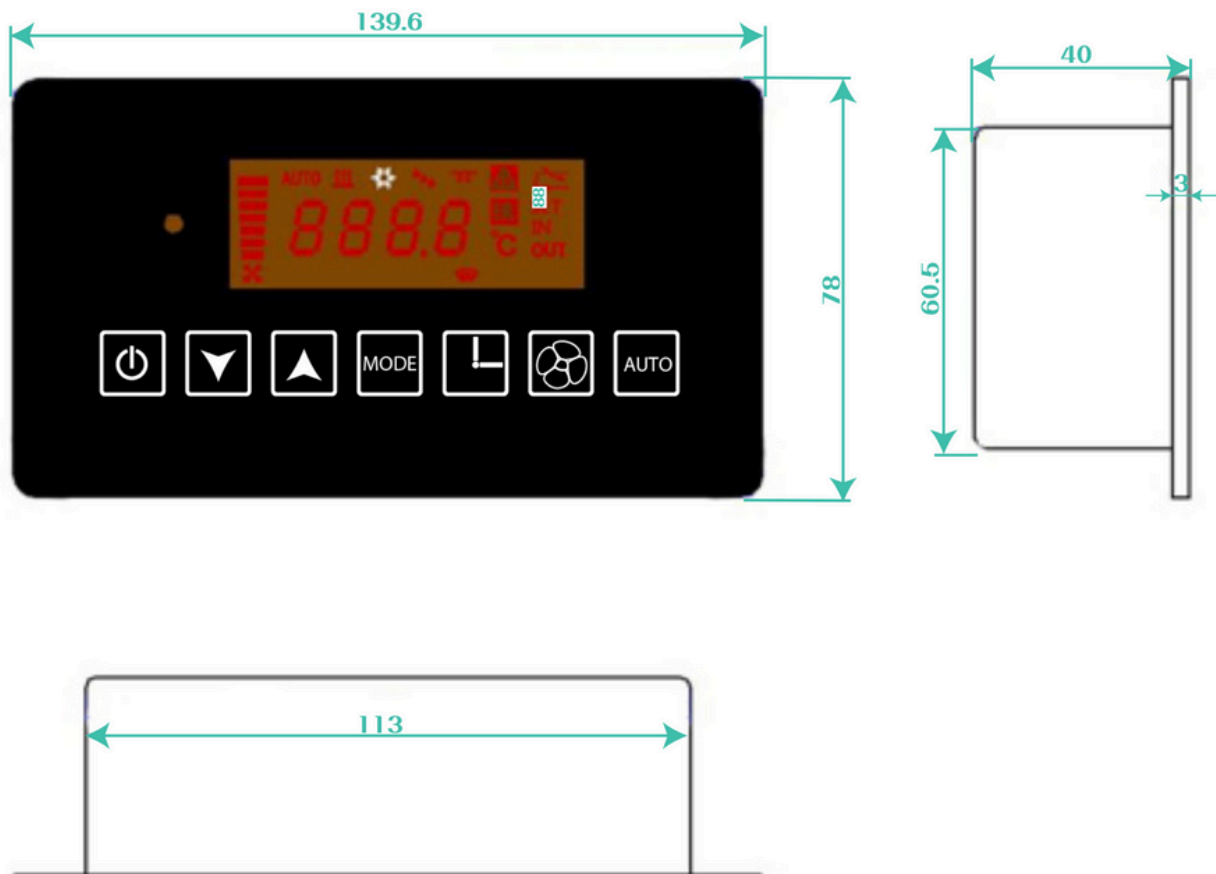
Built By Australians For Australian Conditions

Coolabah User Manual

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Controller Dimensions



Technical Specifications

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 OV: 200mA*
4. Compressor speed control: 0-5V DE*
5. PWM Evaporator PWM speed regulation: 50mA*
6. PWM Condenser PWM speed regulation: 50mA*

*Maximum Current Allowed from the 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
5. High/low voltage 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 Operations



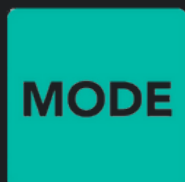
ON/OFF Switch

Press button to turn unit on/off. The buzzer tone indicates efficient operation.



Auto Mode Switch

In normal starting status, press this button, and the system will enter auto mode. The user needs only to set the desired temperature value; the system will control the compressor and fan motors to work automatically. Depending on the ambient temperature, the unit will activate cooling or heating to achieve the desired temperature. Meanwhile, the display screen shows each working icon accordingly. The Buzzer tone indicates efficient operation.



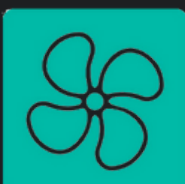
Manual Cooling Switch

In normal starting-up status, press this button for different working modes -> manual cooling -> fan only -> manual heating -> fan only -> manual cooling in turn. Meanwhile display screen shows the corresponding icon and each working status accordingly. The Buzzer tone indicates efficient operation.



Temperature Setting

Users can adjust temperature between 18°C ~ 28°C. Pressing the button once, will change the set temperature 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 the fan speed value to the required speed. Under automatic mode, the system will set the fan speed automatically by comparing internal & external temperatures. The Buzzer tone indicates efficient operation. While in heating mode the fan speed will automatically select Number 3 fan speed. This is done to eliminate heat soak.



Timer Function

To turn the timer on with the unit switched off, press the timer button once, and the timer indicator will appear. Then hold the timer button for 3 seconds and adjust the time before the unit auto switches on using the up and down buttons. Time is shown in 30-minute increments.

To set the timer auto shut off, with the unit running in the mode required, press the timer button once the timer indicator appears. Then hold the timer button for 3 seconds and adjust auto shut-off time using the up and down buttons, time is shown in 30 minute increments.

Display Functions

	Auto Mode Display Once the desired temperature is selected, press the AUTO mode. The system will regulate fan speed automatically. The A lights on, and the display shows the system's working status along with it.
	Manual Cooling Mode Press the MODE switch, and the system enters 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 When the MODE switch is pressed, the system enters manual heating mode. The user needs to set the temperature and fan speed manually. If A lights on, the heater/solenoid valve is working. If A is off, then heating coil has cycled.
	If A lights on, the display shows interior temperature value.
	Defrosting Mode Under cooling mode, if A lights up and the 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 the operation could run normally. Setting temperature display area shows the error code automatically. If A and B lights on at the same time, this indicates the system has a serious fault, the system will stop working. Setting the temperature display area shows the error code. Please refer to 'error code instruction' for details.

Cooling Functions

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

If the interior sensor temperature $\geq$ setting temperature + 1°C, the compressor is ON, and the condenser fan is ON.

Note:

The cooling procedure requires a minimum of 1-minute rest period before restarting the unit. When the defrosting temperature is less than 2°C, the system enters into defrosting mode, and cooling stops. When the defrosting temperature is greater than 7°C, the 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.

Installation & Trouble Shooting

Functional relation graph between condenser fan speed and pressure transducer

V out	Condenser fan duty cycle	Compressor running
$\leq 0.39V$	0%	No
$> 0.44V$	0%	Yes
$> 1.2V$	30%	Yes
$1.3V < V_{out} < 1.9V$	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
$T \leq -1$	Suspended	0V	0
$T \leq 1$	0V	0V	2500
$T \leq 1.5$	0V	1.8V	3000
$T \leq 2.5$	0V	3V	3500
$T \leq 3.0$	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
$T \leq 0$	20%
$T \leq 1$	40%
$T \leq 2$	70%
$T > 3$	100%

Pressure Transducer Fault Detection Instruction

The controller uses the signal from the pressure transducer to control the compressor speed and the condenser fan speed. It also reads 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. Scroll through this menu to get the following information.

Current pressure in system	<PrE> and <x.xx> flicker alternately
Low refrigerant pressure cut out value (0.39V)	<Lo1> and <xxx> flicker alternately
Recovery point from low refrigerant cut out value (0.44V)	<Lo2> and <xxx> flicker alternately
High refrigerant pressure cut out value (3.6V)	<Hi1> and <x.xx> flicker alternately
Recovery from high refrigerant pressure cut out value (3.0V)	<Hi2> and <x.xx> flicker alternately
Low system voltage cut out point (21V - 23V)	<UoL> and <x.xx> flicker alternately
Heating ON hysteresis value (2)	<HoN> and <x.xx> flicker alternately
Heating OFF hysteresis value (2)	<HoF> and <x.xx> flicker alternately
Highest adjustable temp setting on manual mode	<HuP> and <x.xx> flicker alternately
Lowest adjustable temp setting on manual mode	<Hdo> and <x.xx> flicker alternately
Highest adjustable temp setting on auto mode	<AUP> and <x.xx> flicker alternately
Lowest adjustable temp setting on auto mode	<Ado> and <x.xx> flicker alternately
Maximum compressor speed allowable	<Cop> and <x.xx> flicker alternately
Voltage calibration	<UoC> and <x.xx> flicker alternately
Fan style (0BLDC)/1Brushed	<FoP> and <x.xx> flicker alternately

Shift Functions

1) Override Cooling

In cooling mode, press and hold the MODE switch for 3s. The controller will give 3 warning tones, and the system will enter 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. Then press any switch except the ON/OFF switch to quit override cooling mode.

2) Override Heating

When in heating mode, press and hold the MODE switch for 3s. The controller will give 3 warning tones, and the system enters override heating mode. This ignores the inside temperature sensor and turns the heater on. Press any switch except the ON/OFF button to quit or override the heating mode.

4) Operation Hours

While the controller is working, press and hold the FAN SPEED button for 3s. The controller will give 3 warning tones and display the hours of operation time in a unit of 100 hours.

5) Compressor Working Hours

When the controller is in operation, press the UP button for 3 seconds. The controller will give 3 warning tones and display the compressor working hours in units of 100 hours.

6) Current Auxiliary Battery Voltage

When the controller is operating, press and hold the DOWN button for 3 seconds. The controller will give 3 warning tones and display POR, then current system voltage.

Error Displays

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

1) Er-01: Under voltage error

When the input voltage is below the low voltage cut point (21-23V) for more than 3s, then Er-01 will appear on the display. With this error, all the outputs of the compressor, evaporator fan, fresh air device, condenser and heating would stop automatically. All the switches are locked except the ON/OFF switch; the display shows an error code. Start the vehicle and check that the error disappears after a period of running the vehicle. Such an error is unrecoverable until the auxiliary battery voltage reaches a minimum of 24V.

2) Er-02: Overvoltage error

When the input voltage is above 31V for more than 3s, Er-02 occurs. With this error, the AC system stops, and the entire outputs stop, displaying an error code. Please check the DC-DC charger and power supply circuit. Such an error is unrecoverable until the voltage drops to below 30V.

3) H/L: Interior temperature sensor error

The short circuit error is "H," and the open circuit error is "L." Please detect whether the sensor circuit is faulty. After the error, the controller will automatically revert back to normal operating specifications. With this error under the cooling mode, the compressor would wait for 5 minutes after every 60 minutes of operations. With this error under the heating mode, heating would wait for 5 minutes after every 30 minutes of output.

4) ER-16: Defrosting temperature sensor error

When the defrosting sensor is in a short circuit or open circuit, ER-16 occurs. Please detect the sensor circuit or whether the sensor is faulty. After removing the error, the controller will recover to its normal working state automatically. With this error under cooling mode, the compressor would wait for minutes after every 60 minutes of operation. With this error under the heating mode, the heating output would not be affected.

5) ER-03: Refrigerant low-pressure error

When the controller detects that the system refrigerant pressure is under the set value, Er-03 occurs. Cooling stops automatically, and the error code is displayed on the display. Please detect the refrigerant pressure system and remove this error. The controller will not recover normal operation until the pressure value recovers for more than 3 seconds. Check for any refrigerant leaks in the system, repair and regas

6) ER-04: Refrigerant high-pressure error

When the controller detects that the system refrigerant pressure is above the set value, Er-04 occurs. Cooling stops automatically, and the error code is displayed on the display. Please detect the refrigerant pressure system and remove the error. The controller will not recover normal operation until the pressure value recovers for more than 3 seconds. Check to see if the condenser fan is operating correctly. Also, make sure that the condenser is not obstructed with debris.

Note: Every error occurs with an error icon, warning tone, and error code flickers.

3 Phase Compressor Controller and Compressor Diagnostics

1) Performance and Parameter

Rated Voltage	22-30V
Rated Current	10-50A
Max Current	50A
Rated Power	1200W
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. • Overvoltage: 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 $20V \pm 0.5V$; Recover Voltage $22V \pm 0.5V$; Upper limit $32V \pm 0.5V$, Recover Voltage $30V \pm 0.5V$ • Start-delay: Power on AC switch, the light flash flashes twice, first a long flash, second a short flash then the controller will start after 60s. • Over-current fault: When running, current is over Max Current, the controller suspends for protection, delay for 60 seconds before attempting to restart. • Over-heat : ◦ When controller connects with normally closed contact switch, the motor suspends, after 60s motor restart. ◦ Inside controller there is a temperature protection which stops the motor immediately when the temperature is higher than 75°C. When the temperature is back to 70 °c, the motor restarts after 60s. • Locked motor fault: when lock is detected, the motor stops immediately, after 60 seconds it will restart. • Startup Failed fault: If motor can't start in time, motor will stop automatically, after 10s it restarts. Auto start must be less than 5 times, otherwise motor needs to power on again. • Fault signal output: If any problem above happens, the trouble light will flash; when controller works normally, the trouble light will be off. • Counter-attack function: If the power wire is connected incorrectly, the controller has no damage; until connected correctly, the controller will work normally.

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	Light flash character
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 temperature protection	4 short 3 long	
8	External temperature 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 connection of motor wires is correct, and also check the voltage.
3	The speed is not normal	Check if voltage is over-low or load too much
4	Motor stop suddenly	Make sure voltage is over-high or over-low; over load or over heat
5	Motor can't startup or restart	Make sure the connection of motor wires is correct, and also check the voltage.
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 the power supply and green wire terminal at the base of the six-pin connector on the compressor condenser assembly.

Installation Guide

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 the location is decided that you check under flooring for wiring or other items that can be damaged when installing Coolabah. Also check the 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 the unit away from the exhaust or fit a shield to radiate heat away from the condenser/compressor unit. It is highly recommended that the condenser fan face 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 the bracket using 6x M10 bolts with Nylock nuts. These are not supplied as floor thickness varies. At this stage, assess whether the battery will be fitted above the condenser unit. If so, any fixing point for the battery will need to be done before fitting the outdoor unit. If this is the case, fit the battery at this point (please see the instructions below).

Try to use points close to an edge or fit cross beams to suit. In some cases, large washers will need to be used on the inside of the cab for extra support if the floor thickness is less than 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, service port access, and 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. You **MUST** make sure that the circle-type clip is crimped correctly. 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 D/C hoses and wiring loom.

Important: Keep A/C 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 them at appropriate intervals.

Ensure electrical connections are crimped properly and secured tightly on the studs. When connecting the 6-pin Deutsch 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: The lithium battery is calibrated for the exclusive use of the Coolabah unit only. No other accessories are to be attached to it.

Lithium Battery Fitment

Find a suitable location for the battery on the rear of the cab, and secure it to the cab using a minimum of 12 x M8 Bolts with nuts and washers. 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 a 5kwh battery. Use reinforcement brackets, if necessary, from the inside of the cab. Alternatively, reinforcement brackets can be used for the main structure on the rear of the cab. Please note that it is the responsibility of the installer to make sure that a suitable installation area and method is selected to mount the battery.

Important: Under NO circumstances are the batteries to be fitted on the chassis without some sort of dampening mounts, as the jarring will affect their life. Also do not fit the batteries anywhere near heat or exhaust.

Secure the yellow 16mm sq cable to the midi fuse holder connected to the positive terminal of the battery. Run a cable (16mm sq) through the grommet at the bottom of the battery. Connect the cable to the condenser positive. From the condenser positive, run another yellow cable to the 50A midi fuse and then to the DCAC charger's output.

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.

Ensure all your connections are correctly crimped, and use heat shrink on the ends.

Secure the cables at appropriate intervals. Cables MUST be placed through grommets or glands when going through panels or sharp edges.

Please make sure all battery lugs are tightened correctly when connected to prevent high-resistance joints and voltage drops.

Installation Of Chargers With Cooling Fans

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 thermal overload protection and will stop charging 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.

Installation Of Chargers Without Cooling Fans

Mount the charger in a well-ventilated position under the truck cab to allow cool air to flow past the charger fins when the truck is in motion.

Vehicle Battery Input Pick-Up Points

12v Vehicle Setup When Using A 40A Backcharger

Drill a 35mm hole using a grommet or gland under the DC-DC charger and run two 50mm cables provided directly to the studs on the Alternator of a 12v vehicle. Run a Red (50mm 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 (50mm 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. Caution: Make sure you run both the positive and the negative to the output terminals, not the engine earth. When installing a 30A Standard Charger, use a 35mm sq cable from the alternator to the charger's input.

(Do not connect to the battery as this overloads the OEM wiring and circuit breaker), fig 1

24v vehicle setup

Note: 24v vehicles, make the connection at the body builder's battery connection point.

Run a Red (35mm 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 (35mm 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. 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 at a slightly downward angle towards the rear of the evaporator. The 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 the cabin. After installing the evaporator, it is best practice to pour water into it and ensure all the water comes out of the drain hose.

Allow sufficient room at the rear of the evaporator to facilitate the connection of the hose fittings and adequate airflow from the intake. Ensure the low-side fitting is sealed with corking tape to prevent water from dripping inside the cab. Fit the lint filter in place so it can be easily removed for servicing.

Secure the evaporator's casings using a minimum of 4 x M6 bolts on each side, using the brackets provided or manufacturing sufficient brackets to suit your application.

To achieve the best results, place the Evaporator as high as possible in the sleeper compartment and on the same side as the compressor/condenser unit.

Make connections for A/C hoses and wiring with any access wiring to be cable tie neatly behind trim.

Important: When mounting the evaporator, do not drill through the cab's external wall, as some vehicles may be single-skinned.

Important: Make sure there is no swing or movement on the evaporator.

Important: Hoses and cables MUST NOT cut across sharp objects, be not twisted or kinked, and be secured at appropriate intervals.

Heater Option

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

Installation of Controller

The Controller should be mounted so that 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 leans).

The controller has many diagnostic functions explained in the user manual. It will also automatically switch off the display after 2 minutes of no use to facilitate a more comfortable sleep.

Press any button to bring the display back up. Unique fascias are available for specific models if required. The most efficient way to operate the system is to set the controller on Auto.

134a Gassing

Re-gassing is required upon completion of the installation of all Coolabah components. 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 to ensure no pressure is lost. If pressure is lost, this indicates a leak in the system.

Using soapy water in a spray bottle. Spray all A/C connections of the coolabah to find the leak. Repair Leaks as required and retest the system with nitrogen. If leaks are present, please follow the above step until no leaks are found. If no leaks are found, continue with the next step. Evacuate the system and hold a minimum of 28 Hg of vacuum for 60 - 90 minutes. When this is complete, fill the system initially through the high side and then start the unit up for the remainder through the low side.

550 grams of gas plus 55 grams of gas per metre of no. 6 high-pressure hose used.

Run the 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.

Give the system time to equalize after each gas addition. Do not add more than 900 grams of gas unless you consult with us first. The Coolabah is thermostated for cooling and heating features. The system has an override cooling and heating setting for testing purposes and for gassing the system when the ambient temperature is too cold or too hot.

While in cooling mode, hold the menu button for three seconds. This will automatically engage the compressor so that you can gas the system correctly.

While in heating mode, hold the menu button for three seconds. This will automatically engage the 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. A battery charger is recommended to remain connected to the vehicle while the installation is underway. Start the vehicle and run the 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 the charger falls below 12.5v. At this stage, the charger will stop charging to give power back to the truck batteries.

Please note: If the charger continually cuts out and the lithium battery is not being charged, you will need to check the 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 taper down, which means that the battery is almost full.

Thank you for taking the time to read this. Please don't hesitate to call us if you have any further questions. Remember to instruct the customer on the correct use of the system. Make sure to tell them not to let the lithium battery sit for extended periods (more than three months) without using the vehicle or charging it, as this will eventually flatten the 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. No other accessory will be connected to the lithium battery at any time unless discussed with a Coolabah Technician.

This will:

Reduce the run time of Coolabah, which may damage the lithium battery and void the warranty. Due to the battery's higher voltage output, it may damage unauthorised accessories. The manufacturer will not take any responsibility for damage caused by unauthorised accessories attached to its system.

12V/24V to 29.2V 30A 876W DC-DC Charger

- Wide input voltage from 12.5V to 16V and 26V-30V
- For 12V vehicle: start operating at 13.5V and switch off at 12.6 volts
- For 24V vehicle: start operating at 27V and switch off at 26 volts
- Stable output voltage is 29.2V
- 100% full rated power
- 100% full stable output current
- High efficiency up to 93%
- IP68 waterproof, Epoxy potting, Anti-vibration, Dustproof
- Cooling by free air convection
- Surface mountable
- 2 year warranty
- Over current protection, over voltage protection
- Over temperature shutdown, output short circuit protection
- According to: EN61000-6-3:2007/A1:2011/AC:2012 EN 55014-1:2006/A2:2011 EN60950-1:2006/ AC:2011

Model	Input voltage range (Vdc)	Output voltage (Vdc)	Output current typ (A)	Output power max (W)	Ripple & noise typ (mVp-p)	Efficiency typ (%)
30A Standard Charger	12.6-16/26-30V	29.2V	30	876	120	95
40A Back Charger	12.6-16	29.2V	40	1000	120	95

Note: All specifications measured at 25°C, nominal input voltage and full load unless otherwise noted.

Protections

Parameter	Test conditions or description	Min	Typ	Max	Units
Output over voltage protection	%Vo	115		140	%
Current limited	% nominal output current	110	120	130	%
Thermal shutdown case temp			80		°C
Cooling	Free air convection				
Fuse required 12V(100amp) 24V (70)					

Safety and Compliance

Parameter	Test conditions or description	Min	Typ	Max	Units
Safety approvals	EN 61000-6-3:2007/A1:2011/ AC:2012 EN 55014-1:2006/A2:2011 EN 60950-1:2006/AC:2011				
Enclosures	IP68				

Environmental

Parameter	Test conditions or description	Min	Typ	Max	Units
Case operating temperature		-40	25	85	°C
Ambient temperature		-20		60	°C
Storage temperature		-40		105	°C
Humidity	Non-condensing			95	°C

Mechanical

Parameter	Test conditions or description	Min	Typ	Max	Units
Dimensions	223 x 130 x 50				mm
Case material	Aluminium				
Weight				2500	Grams
Package	1pc/box, 9pcs/carton				
Carton measurement	48.5*32*32.8cm				



Diagram Wiring

Input + to Battery + , Input - to GND (24V vehicles)

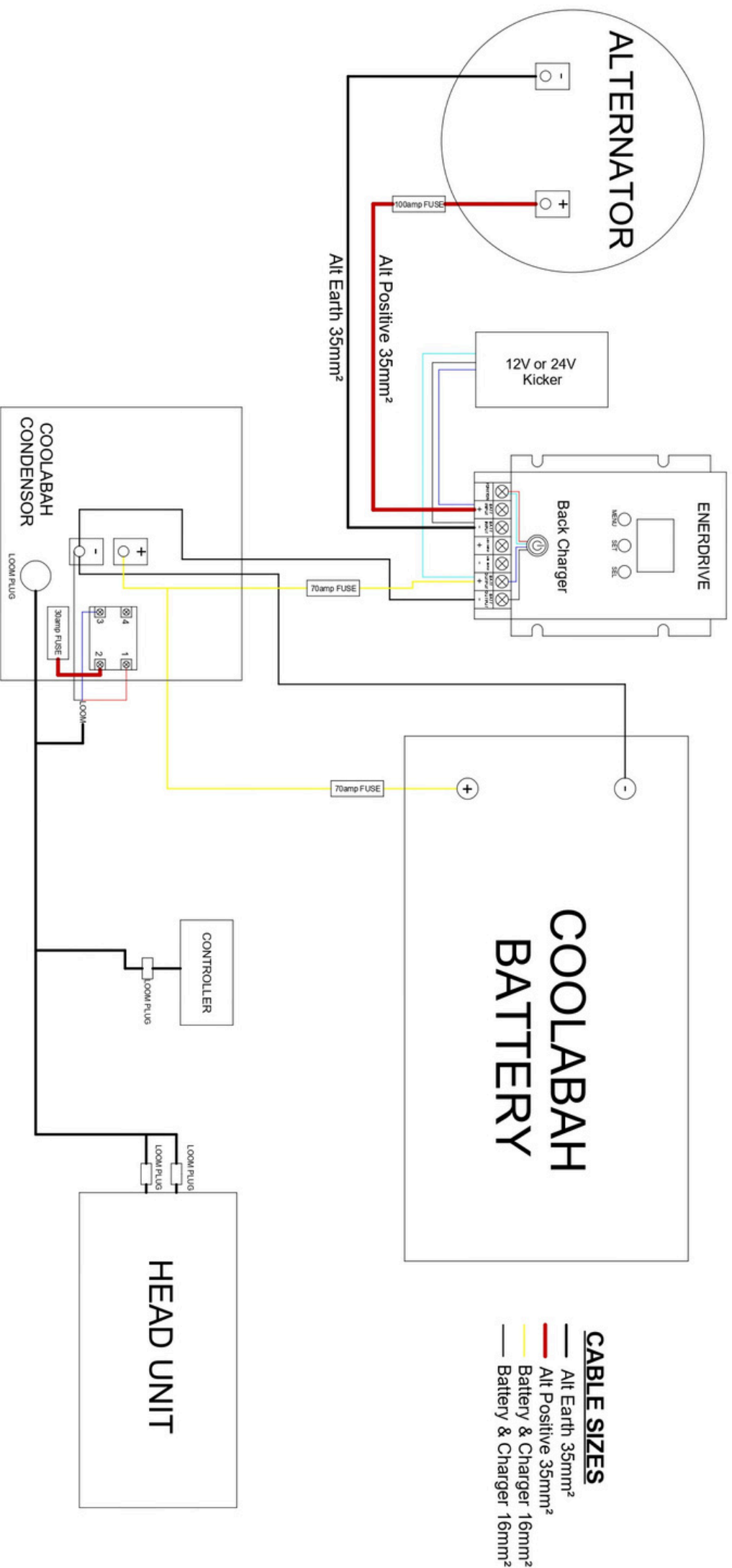
Input + to Alternator +, input - to Alternator negative terminal (12V vehicles) Output + to Load +, Output - to GND

Notes: Never reverse the input polarity, or it will destroy the charger

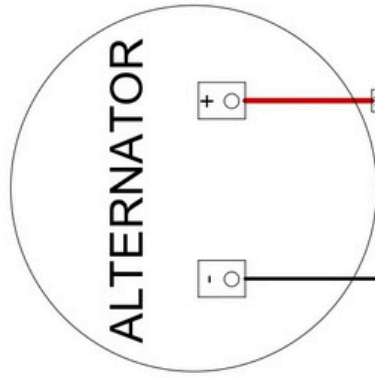
- Install the correct fuse/circuit breaker on the input cable as close to the source as possible.
- Use the correct-size cable to avoid a more than 3% voltage drop between the input source and the charger's input while in full load operation.
- Do not under any circumstances add any additional load to the input cable going to the charger (do not use the charger's power supply for any other accessories—this will void the warranty).

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Enerdrive Back Charger



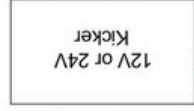
ALTERNATOR



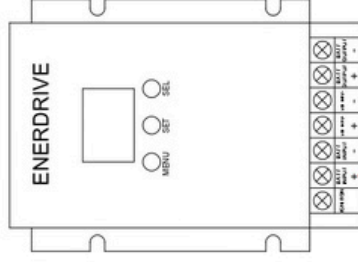
100amp FUSE

Alt Positive 35mm²

Alt Earth 35mm²



12V or 24V
Kicker



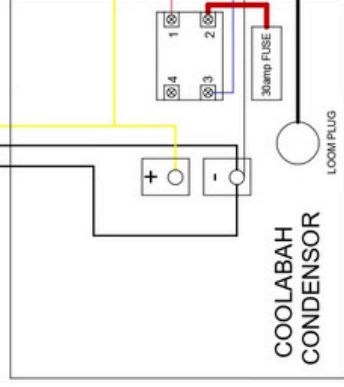
ENERDRIVE



COOLABAH
BATTERY

70amp FUSE

70amp FUSE



COOLABAH
CONDENSOR



30amp FUSE



CONTROLLER



HEAD UNIT

CABLE SIZES

- Alt Earth 35mm²
- Alt Positive 35mm²
- Battery & Charger 16mm²
- Battery & Charger 16mm²

Enerdrive Charger

Standard Charger Installation

VERY IMPORTANT, MUST READ, AS THIS COULD AFFECT YOUR WARRANTY

OPERATING INSTRUCTIONS:

TO OPERATE YOUR COOLABAH THERE ARE 2 MODES:

1. AUTOMATIC

- This mode will adjust the temperature and will allow the unit to heat or cool as required with one simple process
- Simply turn the unit on using the on/off button, set the required temperature you would like the cabin to be via the up and down buttons, and ensure the auto light is on; if not on, press the auto button once, and this should put the unit into automatic mode.

2. MANUAL

- Turn the unit on by pressing the on/off button. Select the mode you require via the mode switch. This is displayed as a snowflake for cooling only, a heater coil wire for heating only, or no indicator light for fan only. Once you have the designated mode, adjust the temperature you require using the up and down switch.

IMPORTANT INFORMATION:

- The Coolabah condenser/compressor assembly located under the truck's cab or on the rear of the cab must be regularly cleaned (every 3 months) of dirt or debris by hosing the condenser fins through the mesh on both sides of the unit until clear water runs from the unit. DO NOT USE A PRESSURE WASHER.
- On the Coolabah evaporator inside the truck cabin, there is normally a lint filter. This must also be removed and cleaned by blowing compressed air every three months or depending on the truck's conditions.
- Most importantly: DO NOT leave your lithium battery or AGM batteries sitting idle for a period of more than 3 months. As this will cause irreparable damage to your battery and will not be covered under warranty. This can be simply done by making sure that the vehicle is started and run for a minimum of 30 minutes every couple of weeks. If this cannot be done, simply switch your Coolabah battery off while not in use, by pressing the switch on your Coolabah battery.

For any further information or any technical help with this unit, please do not hesitate to call David at 0414274444

12V 40A Coolabah Back Charger Information

Charger Operation:

- The silver switch on the side of the charger controls the display on and off.
- The charger will not initiate charging unless the input voltage is over 12.5V.

Back-charger Operation:

1. To initiate the back charger, press the silver back charging button on the front side of the charger, next to the display screens.
2. Once the switch is pressed, you must leave it on for approximately 30 minutes before you can start the truck.
3. Before starting the truck, switch off the back charger switch.

THIS FEATURE IS NOT A JUMPSTART. DO NOT TRY TO START THE TRUCK WHILE THE BACK CHARGE BUTTON IS ENGAGED. THIS ACTION WILL DAMAGE THE BACK CHARGER.



Safety and Compliance

Frequency	Item to check	Maintenance
On truck service schedule	Check unit operation, unit turns on and gets cold	If unit does not turn on or does not get cold, contact Coolabah service agent
Once a month	Condenser/compressor unit	Clean condenser unit with garden hose (not pressure washer). If operating in dusty conditions carry out more regular cleaning and blow with air gun before washing.
6 to 12 months	Air intake/pollen filter	Clean and or replace the pollen filter.
2 years	Coolabah service	Contact Coolabah agent to organise Coolabah service and check.

Nationwide dealers available. Please enquire for your closest location.

Coolabha DC/AC

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Coolabah

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QUESTIONS?

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