

INSTALLATION INSTRUCTIONS FOR HERON 2.2

The Heron 2.2 is suitable for installation in most caravans & motorhomes. Installation in Commercial and Industrial vehicles and equipment should be referred to AIRCOMMAND AUST for assessment of suitability. The Heron System must be installed in accordance with national wiring regulations.

The capacity of the airconditioner to adequately cool or heat a van, is dependent on:

- The size of the van or vehicle.
- The thickness and quality of thermal insulation installed in the van.
- The expected outside or ambient conditions.

The Heron 2.2 is recommended for vans up to 5.2 m overall, but assumes that wall and ceilings are insulated with a minimum of 25 mm of insulation, wool or foam. The Heron 2.2 may be used in vans up to 7 metre provided the insulation is a minimum 38mm thick and all windows are double insulated. Windows should all have shades or curtains as a minimum.

If the van is to be used mainly in extreme conditions (40°C plus), then be conservative, i.e. ensure the best insulation is installed, consider double glazed windows, and size the airconditioner down to 4.8 m maximum.

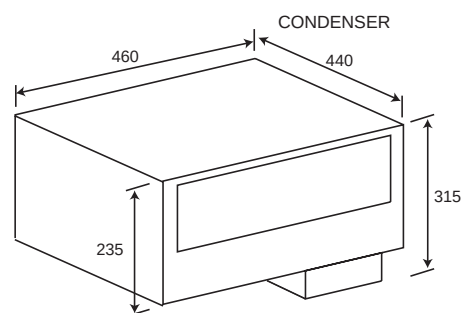


Figure 1

DESCRIPTION OF THE HERON 2.2 SYSTEM

The HERON 2.2 is a split system, utilizing a condenser set (referred to throughout this text as a CON/SET) and an airhandler (referred to as an A/H).

The Con/set is designed for installation beneath a bunk, settee, or in the bottom of a floor cupboard. Refer fig. 1 for dimensions.

The A/H is designed for fitment into an overhead cupboard or similar, and comes complete with facia and controls. See fig. 2.

The A/H and CON/SET are coupled by means of a pair of refrigerant lines, and a control cable. The pipework is not supplied with the unit, but a standard 5 m control cable is.

Before proceeding with the installation, consider a number of important details that **must be complied with** in the following description.

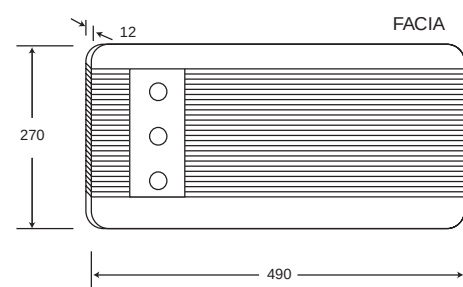


Figure 2

CHOOSING A POSITION FOR THE CON/SET

Generally, avoid installation on the left hand side (awning side), as the condenser set will **discharge hot air into this space**.

Australia & UK (LHS of road) it is usual to install the con/set on the right hand side, either under a bunk, settee or at the bottom of a floor cupboard. Conversely, continental Europe (RHS of road) the con/set should be on the left hand side.

NOTE: Ensure that wherever the con/set is installed, reasonable access to the top of the unit is always available, for service, and any shelving etc. above, must be easily removed. Also, the two line valves on the back of the unit must be easily accessed.

The maximum length of pipework between the Con/set and the A/H is 5 metres. Installations exceeding this may require extra refrigerant to be added to the system.

MANUAL COMPANION PAGE

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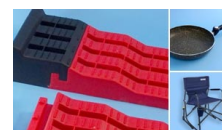
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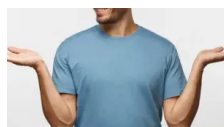
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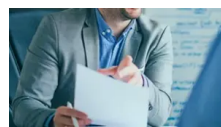
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INSTALLING THE CONDENSER SET

■ Marking out the floor

Use the floor template as provided (or refer to fig. 3). Both, or either end of the con/set may be hard against a wall or panel, but the back of the unit **must** have sufficient clearance to allow easy access to the line valves (see fig. 4). Once a convenient position has been decided upon, place the template, side marked “Inside Wall”, hard against the inside skin of the van, and mark out the six 114 mm diameter (4 1/2”) condenser air inlet holes, and the square compressor well hole (see fig. 3).

Note: Check to see if any structural floor members will interfere with any of these holes. It is essential that the compressor well is unimpeded.

The air inlet holes will tolerate some obstruction. However the total area must not be less than 75% of the inlet holes in the chassis.

We recommend that a hole saw be used to cut out the six round holes. If a structural member is beneath, then the **complete** cut out can be removed. The gap between the top of the structural member and the underside of the unit (i.e. the floor thickness) will help in overcoming the restriction of the member.

■ Marking out the wall

Now mark out the hole in the wall for the condenser discharge grille (see fig. 5).

Mark out the position and size of the air outlet hole, from inside the van, using the floor as reference.

Pilot holes can be drilled at the four corners, and the hole cut out from the outside. It is **essential** to frame up this hole to give a firm seal to the air outlet from the con/set and to stop any discharge air from entering the wall space.

■ Positioning of the Con/set

Lay down a generous bead of silicone on the floor to match the perimeter of the Con/set. Now, lift the Con/set into position, and check that the compressor well does not interfere and prevent the con/set from sitting firmly on the floor.

Push the Con/set **hard** up against the wall.

It is vital that the Con/set seals hard against the inside wall to ensure no hot air leakage during operation.

To secure the Con/set in position, use the two **hold down** clips provided (see fig. 4). These clip over the edge of the chassis. At least one clip should be installed on the back edge to ensure the good airseal is maintained against the inside wall.

Screw the clips firmly to the floor.

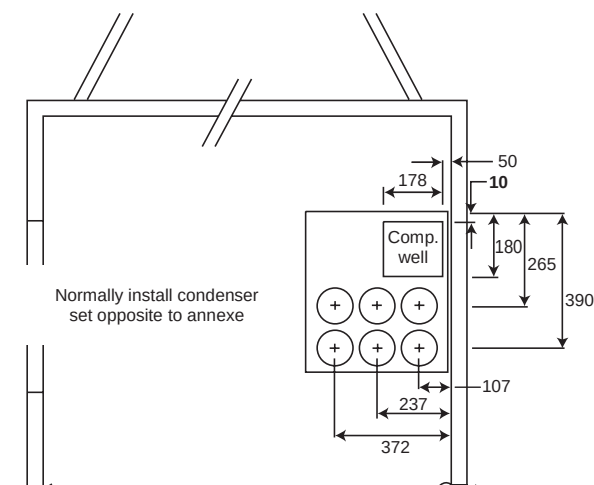


Figure 3

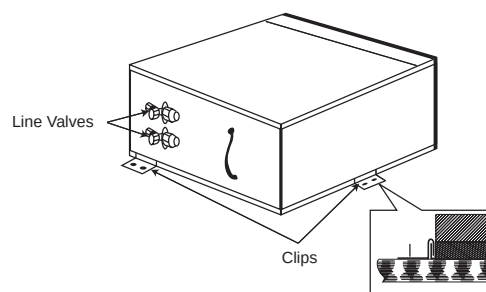


Figure 4

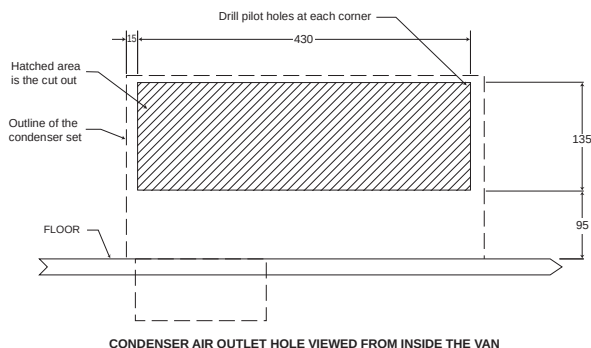


Figure 5

PIPE INSTALLATION & CONTROL WIRING

The pipe work consists of a 1/4" tube (liquid line), and a 3/8" tube (return gas) running between the Con/set and the A/H. The 3/8" line must be insulated with 10 x 10 mm foam rubber insulation.

Connection is made at the back of the Con/set. Pipe work may be run internally to the A/H, or may be run through holes in the floor and run externally to a convenient re-entry point, or the pipes may be built into the wallspace during van construction. **NB.** Pipework installed in walls **must be well insulated** to avoid "sweating" and possible long term moisture damage.

The control wiring will normally follow the pipework and be taped to it. **NB.** If the control cable is to be run externally, then it must be run in a suitable conduit.

Now refer to the A/H installation, after which we return to the Con/set to open up the refrigeration circuit and fit the louvre panel.

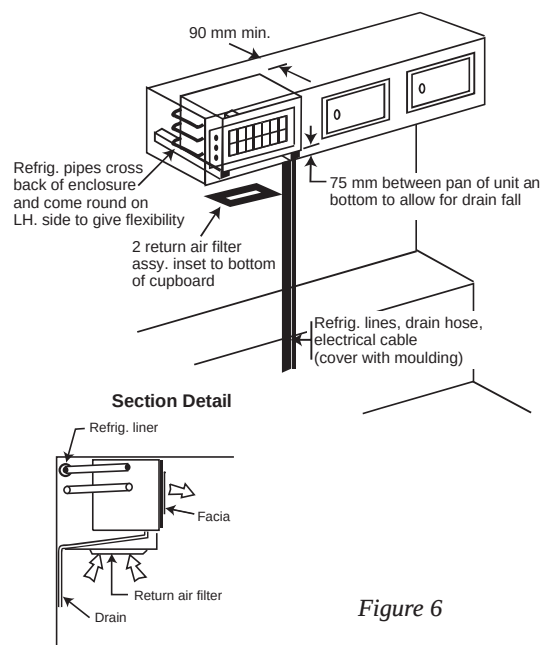


Figure 6

AIR HANDLER INSTALLATION

If possible, the A/H should be installed at either end of the van, such that unimpeded air flow is obtained down the length of the van.

If this is not possible, install the A/H in as central a position as possible.

5 MOST IMPORTANT POINTS THAT MUST BE SATISFIED

1. The distance from the back of the cupboard to the back of the A/H **must not be less than 90 mm** to allow proper air entry to the fan. Insufficient gap will also increase the noise level.
2. **Two** separate return air grilles/filters are supplied, and **must** be installed. If only one is used, this will reduce the air volume back to the fan and hence the capacity of the airconditioner.
3. The airhandler must be fitted allowing a minimum space of 25 mm between the right hand of the A/H and the wall, and likewise 25 mm between the top of the A/H and the inside top of cupboard.
4. The return air grilles/filters, should be fitted as far **back** as is possible to provide a more direct path for air to flow back to the fan.
5. The A/H has a condensate drain underneath. This drain must continuously "fall" from the outlet. It is recommended that the bottom of the A/H be 70 mm above the bottom of the cupboard, to allow adequate fall.

A lesser amount is ok, provided **much** care is exercised to avoid "humps" that will result in airlocks and backup & overflow of condensate.

**It is recommended that the minimum cupboard dimensions be
525 wide x 320 high x 300 deep.**

The airhandler has been designed to operate in a cupboard or enclosure as described on this page. Under no circumstances is the resistance to airflow to be increased by ducting the supply or return air.

Mark out the A/H cut out as per fig. 7. Ensure the choice of location satisfies the following:

- A. The Facia panel will be centrally located.
- B. The right hand edge of the cutout will ensure that when the A/H is installed, a minimum space of 25 mm exists down the side of the A/H, as requested on page 3.
- C. The left hand side of the A/H must be a minimum of 110mm from the LHS of the cupboard to allow pipes to be connected. (Refer fig. 9)
- D. The bottom of the cutout should be at least 70 mm above the bottom of cupboard to allow the condensate drain to “fall” away sufficiently.

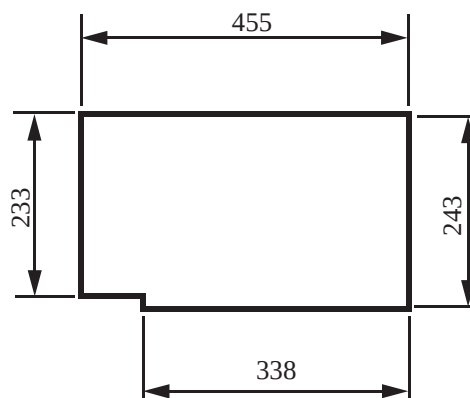


Figure 7

■ Fitting of the 2 return air grilles/filters

Provided the cupboard is 525 mm wide or more, the two grilles can be installed side by side in the underside of the cupboard. (Refer fig. 10)

In the case of pop top vans, it may be convenient to install one of the two through the top. **Make sure however, that all two are installed.**

Place the grilles as far back as is possible to allow the most direct route of the air to the fan inlet.

Cut out size for each grille is 158 x 232.

The following describes the procedure for both a cupboard with a removable front, and a cupboard with a front that is not easily disassembled. Typically the latter type will have 4 to 5 mm ply which will need reinforcing around the perimeter of the cutout and tying to the main structural members of the cupboard assy.



Figure 9

It is important to cut the hole out accurately.

If the front panel is a solid 19 mm panel, the A/H will not need additional support. If however the front panel is light ply, then this must be strengthened after cutting out as per the template. This framing should be 20 mm thick to provide the necessary support, and should tie in with the main cupboard members, to support the weight of the Airhandler.

■ Installation of the refrigeration pipe work and condensate drain

The 9.5 mm Ø and the 6.4 Ø pipes can enter either side of the cupboard, and be carefully manipulated to make the connection to the Airhandler. The 9.5 Ø pipe must be insulated entirely.

The condensate drain is normally run vertically. 12 mm hose or poly pipe is preferred. An elbow is provided in the installation kit to change direction from the vertical run to the horizontal to connect the airhandler. Failure to use this elbow usually results in a hump in the drain which may impede drainage, or a kink.

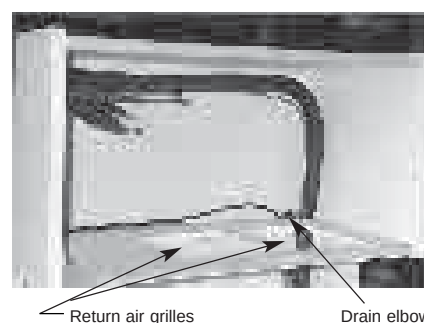


Figure 10

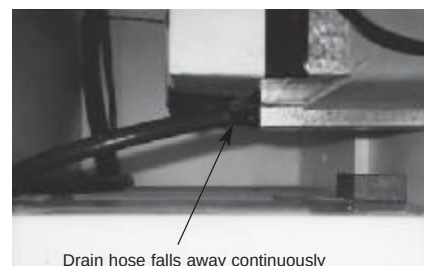


Figure 11

■ Now Install the Air Handler (refer fig. 10, 11 & 12)

Insert the A/H into the front panel, and shift to the right as far as possible such that the right hand flange is fully over the front panel. Now insert a screw to hold the A/H in place while the copper tubes are manipulated to line up with the respective nipples.

Mark any excess tube to be cut off, and remove the A/H to allow the flare nuts to be put on and the flares made. Unscrew both flare nuts from the nipples of the A/H, ensuring the sealing caps are removed.

See page 5 for tips on making flares.

Having completed the flaring, reinstall the A/H, remembering to shift it fully to the right after insertion. Screw the flanges back to the front panel through the 4 holes provided. Couple the flare nut connections and do up firmly.

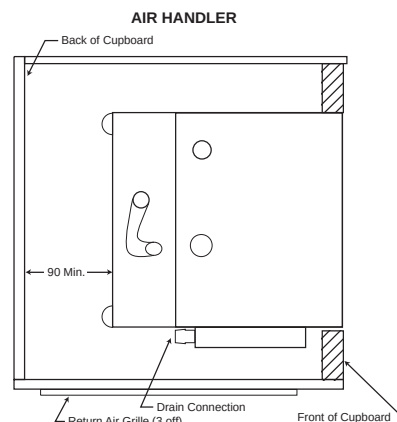


Figure 12

POWER SUPPLY

The unit is designed to plug into a normal mains electricity supply.

This plug must be accessible after installation. If a new plug is installed, then it must be positioned near to the airhandler and be easily accessible.

Note: The supply cord is designated Type F. If replacement is necessary it should be replaced by an Aircommand approved technician.

■ Tips on Making Flare Joints

1. Always use a proper Tube Cutter to cut tube to length (Never Ever a Hacksaw).
2. Remember to put the flare nut on the tube prior to making flare.
3. Always deburr the inside of the tube. Buy a proper deburring tool to do this. It is a good idea to wipe around the inside of the tube to wipe away any copper particles that may have come off during deburring.

NB. If an inside burr is left on, the flaring head will inevitably drive this burr onto the surface of the flare, resulting in a pitted flare face, which will almost certainly leak.

4. Clamp the tube in the flaring block **firmly**. For 1/4" tube (6.4Ø), the unflared tube should protrude 1.0 mm. For 3/8" tube (9.5Ø) the unflared tube should protrude 1.5 mm. See Fig. I, J & K
5. The flaring head should be lubricated with a smear of oil. (Preferably vacuum pump oil).

Tighten down flaring head by:

- a) Contact tube with flare head
- b) Advance 3/4 turn
- c) Back off 1/4 turn
- d) Advance 3/4 turn etc, until flare has bottomed in the anvil (don't tighten on the bottom).

This oscillating manner will ensure an accurate contour and guard against splitting.

6. Check that the resulting flare shows a **bright** continuous ring around the face, and no imperfections exist.

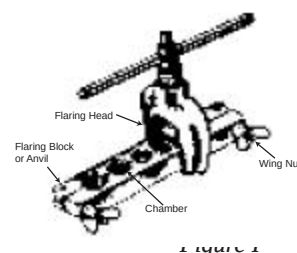


Figure I

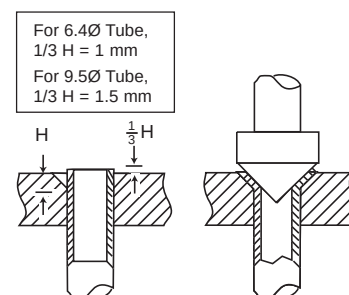


Figure J

FLARED FITTINGS

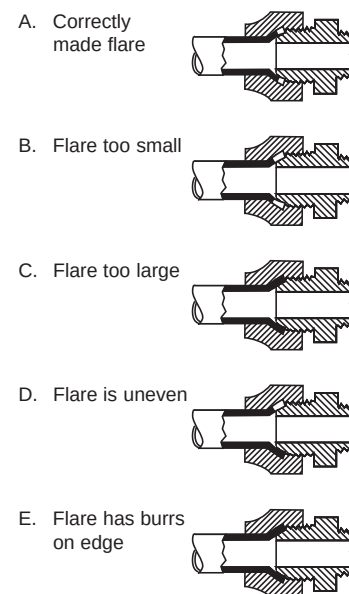


Figure K

CHARGING THE SYSTEM

The system is charged with R22 in Australia / New Zealand or R407C in Europe, which is a prescribed refrigerant gas. Most states / countries will require the installer to have an appropriate license.

The condenser set is factory precharged, but the Air handler and connecting pipework needs to be purged or evacuated of noncondensibles.

Please note: In Australia, state/country laws re the handling of prescribed refrigerants may prohibit the purging method. Such laws take precedence.

Method 1: (purging)

- Make sure both connections are tight at the A/H.
- Tighten firmly both flare nuts at the Con/set.
- Then ease off the 3/8 nut **one turn** at the Con/set.
- Remove both valve stem caps. (See fig.13)
- With a 5mm allen key, insert into the stem of the 1/4 valve and undo an 1/8 of a turn.
- Gas will be heard to be purging through the eased off 3/8 flare nut.
- Allow to purge for 6 seconds, and tighten up the 3/8 flare nut.
- Now wind out **both** the 1/4 & 3/8 valve stems with the allen key until **fully backseated**.
- Put on the valve stem caps and tighten them up.
- **Now check for leaks:** See paragraph following on leak testing.

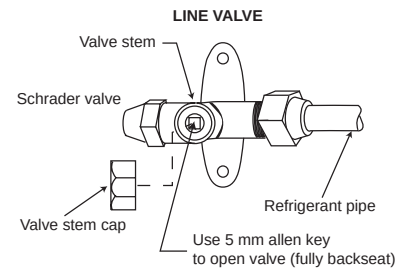


Figure 13

Method 2:

- Use a vacuum pump to remove noncondensibles from A/H & pipework.
- Tighten all flare nut connections on both the Con/set and the A/H.
- Remove schrader valve caps and connect vac. pump hoses, preferably to both valves (make sure valve depressors are set ok).
- If both hoses are fitted, then evacuate for 10 minutes.
- If only one, then evacuate for 15 mins.
- Check that the pump maintains a high vacuum.
- Remove both stem caps, then isolate the vac. pump, before turning on **both** valve stems. Fully backseat both, and refit caps.
- **Now check for leaks.**

LEAK TESTING

It is of the utmost importance that a leak check is made on the 4 flare nut connections. A leak, however small, will result in the aircon system losing capacity and endanger the compressor.

1. Use either soapy water, or a proprietary leak test solution.

Paint on each flare nut (particularly the neck) and inspect carefully for any telltale bubbles. Use a torch to improve visibility, particularly in the A/H area.

Any leak will generally be remedied by further tightening of the flare nut. In the event of a faulty flare, the line valves must be turned off, the A/H pumped out, and the flare remade.

2. Use an **ELECTRONIC** leak detector.

Test initially on low sensitivity, examining in particular the neck of each flare nut. Increase the sensitivity until you are confident that no leak exists.

INSTALL BITUMINOUS TAPE AROUND 9.5 FLARE NUT AT THE A/H.

From the Installation kit provided, take the length of bituminous tape and wrap it around the 3/8 flare nut and joining the foam rubber insulation already on the pipe. The purpose of this is to avoid formation of condensate, which may drip into the cupboard.

FITTING OF THE AIRHANDLER FACIA

With Leak testing of the A/H flare nuts completed and bitumen tape installed, the Facia may now be fitted.

1. Feed the service lead into the cupboard, and plug into the GPO, but leave turned off.
2. Plug in the Con/Set control cable to the back of the switch box (6 pin plug) & clamp it with cable clamp provided. Also plug in the A/H cable (9 pin). See fig.14.
3. Now push the Facia fully into the cupboard front panel. Check alignment, and using the c/s chipboard screws supplied, screw the Facia at each corner. Use the white plastic buttons provided to cover the screw heads.
4. Check that the air direction vanes are free to rotate.
5. Turn on the power to unit.
6. Fit the 2 return air filters **by pushing** them into their frames.

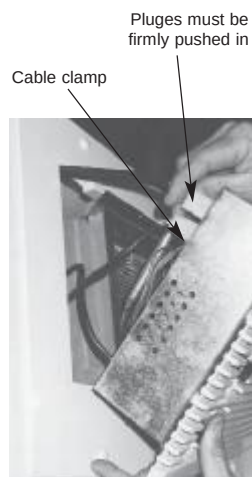


Figure 14

Final condensate connection can be made reaching up through return grilles. Also, wiring cables may be tidied up and tied.

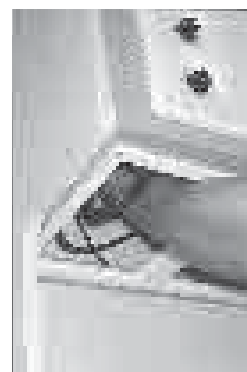


Figure 15

TEST TO BE CARRIED OUT BY INSTALLER PRIOR TO DELIVERY

COOLING: (ref fig.16)

NB. The unit will not run on cooling if the inside temp. is much below 18°C.

1. Turn fan speed selector to  (Hi Speed Cooling)
2. Turn mode selector to  (Cooling)
3. Adjust the thermostat counter clockwise until the condenser set is heard to start.

Ensure that cold air is being discharged, and there are no pipe rattles etc. After about 15 minutes of running, and providing the inside temp. is above 20°C, then the discharge air should be 12°C or cooler than the return air.

HEATING: (ref fig.16)

NB. The unit will not heat if inside temp. is much above 28°C.

1. Turn fan speed selector to  (Heating Speed)
2. Turn mode selector to  (Heating)
3. Adjust the thermostat to max. clockwise position.

There will be approximately 30 seconds delay before heating is apparent.

4. After about 15 mins. the discharge air will be approx. 25°C more than the return air.

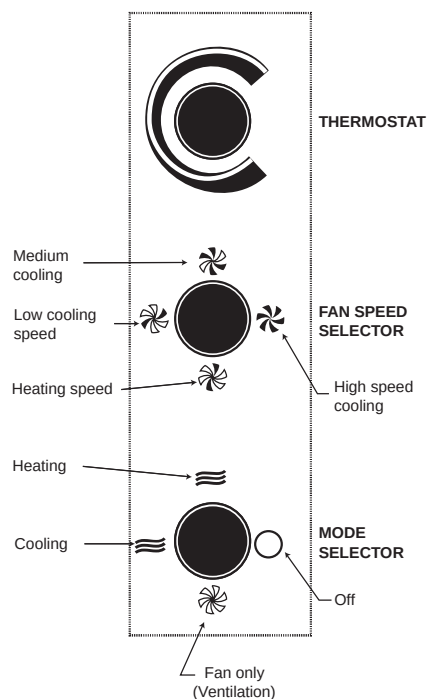


Figure 16

OPERATING INSTRUCTIONS

This appliance is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with this appliance.

This airconditioner may be used in cooling mode with outside temperatures from 18°C to 48°C, and inside temperatures from 18°C to 30°C. In heating mode, the airconditioner may be used with outside and inside temperatures up to 30°C.

COOLING: (ref fig.16)

NB. The unit will not run on cooling if the inside temp. is much below 18°C.

1. Turn fan speed selector to  (Hi Speed Cooling)
2. Turn mode selector to  (Cooling)
3. Adjust the thermostat counter clockwise until the condenser set is heard to start.
4. Gradually over time, adjust the thermostat until comfortable conditions are maintained.

AVOID RESTARTING THE COMPRESSOR WITHIN 3 MINUTES OF TURNING OFF

HEATING: (ref fig.16)

NB. The unit will not heat if inside temp. is much above 28°C.

1. Turn fan speed selector to  (Heating Speed)
2. Turn mode selector to  (Heating)
3. Adjust the thermostat to max. clockwise position.
There will be approximately 30 seconds delay before heating is apparent.
4. Gradually over time, adjust the thermostat until comfortable conditions are maintained.

UNIT SPECIFICATIONS

Condenser set:

Height	-	235 mm Above floor
Width	-	460 mm
Depth	-	440 mm
Weight	-	30 kg

Air Handler:

Height	-	220 mm
Width	-	385 mm
Depth	-	230 mm
Weight	-	4 kg

Minimum cupboard dimensions:
320 high x 525 wide x 300 deep

Cooling output:	2.2 KW
Heating output:	1.5 KW
Maximum current (cooling):	4.0 amps
Maximum current (heating):	6.5 amps
Maximum locked rotor current:	19 amps

Refrigerant:	<i>Australia only</i>	R22
	<i>Euro production</i>	R407C
Charge:		650 grms.
Air volume (max) Air Handler:		110 l/s
Compressor:		Sanyo KR6102
Resistance run wdg.:		2.8Ω
Resistance start wdg.:		4.3Ω
Capacitor:		20 mfd. 440 vac
Fan (Air handler):		
Resistance run wdg.:		165Ω
Resistance aux wdg.:		265Ω
Capacitor:		1.5 mfd. 440 vac
Fan (Condenser set):		
Resistance run wdg.:		168Ω
Resistance aux wdg.:		150Ω
Capacitor:		2.5 mfd. 440 vac
Heating element:		1500W
		(Pt. No. 4002024)

Refer fitting instructions included

All Dimensions in mm unless otherwise noted

TROUBLE SHOOTING

Symptom	Probable Cause	Remedy
Condenser set is noisy and vibrates	Check that general pipework is not touching cabinet, lid, or chassis	Gently bend or pull away from panel etc
“Tipping” noise from Con/set	Fan rotor touching inlet ring	Ease motor retaining screws, and adjust
“Tipping” noise from A/H	Fan rotor touching inlet ring	A/H must be partially removed from cupb’d. Remove top and adj. fan ht. via 4 support bolts (5/16”)
Unit does not energize	Circuit breaker open	Reset circuit breaker
A/H fan will not run on any speed	Plug not in correctly at back of S/W box	Remove facia & push in 9 pin plug
A/H fan will run only on max. speed	Faulty capacitor in switch box	Replace
Compressor & cond. fan will not run	Plug not in correctly at back of S/W box	Remove facia & push in 6 pin plug
Insufficient cooling	1. Thermostat set too high 2. Fan speed too low 3. Condenser fan not running 4. Unit is low on refrigerant charge. Generally the temp. diff. between return air and discharge air is 11 to 12°C	Adjust more into blue Switch fan to high Check free to turn Check resistor ok Refrigeration Mech. to adjust charge
Insufficient heating	1. Thermostat set too low 2. If no heating apparent check 9 pin plug at back of S/W box 3. Element faulty	Adjust further into red Remove facia and push in plug Replace element
Water drips from A/H	1. Faulty drain installation, elbow into A/H must not protrude above grommet 2. Drain hose does not have continuous downward gradient 3. Drain hose kinked or blocked 4. Condensate dripping off 3/8 flare nut on A/H	Check correct elbow has been used at A/H see pp. 4 Adjust accordingly see pp. 4 & fig. 11 Ensure elbow is used at top of vertical drop. Wrap bituminous tape around f/nut to insulate