

INSTALLATION INSTRUCTIONS FOR HERON Q

The HERON Q is suitable for installation in most caravans & motorhomes. Installation in commercial and industrial vehicles and equipment should be referred to AIRCOMMAND AUSTRALIA or agent for assessment of suitability. The Heron System must be installed in accordance with National wiring regulations.

The capacity of the air-conditioner to adequately cool or heat a van is dependent on:

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

The HERON Q is recommended for vans up to 7.0 meters overall, but assumes that all walls and ceilings are insulated with a **minimum of 25mm** of insulation wool or foam. The Heron Q may be used in vans up to 9 metres 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 unit down to 6m.

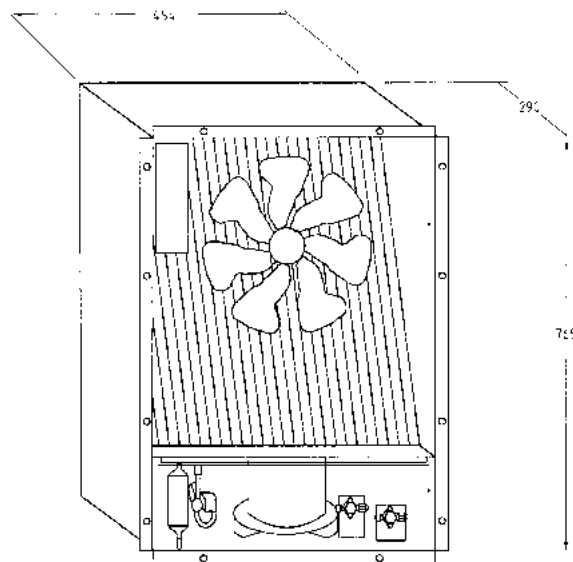


Figure 1

DESCRIPTION OF THE HERON SYSTEM

The HERON Q 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 into a side wall of a van, and will fit beneath the bench top or into the back of a wardrobe etc. Ref. to 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)

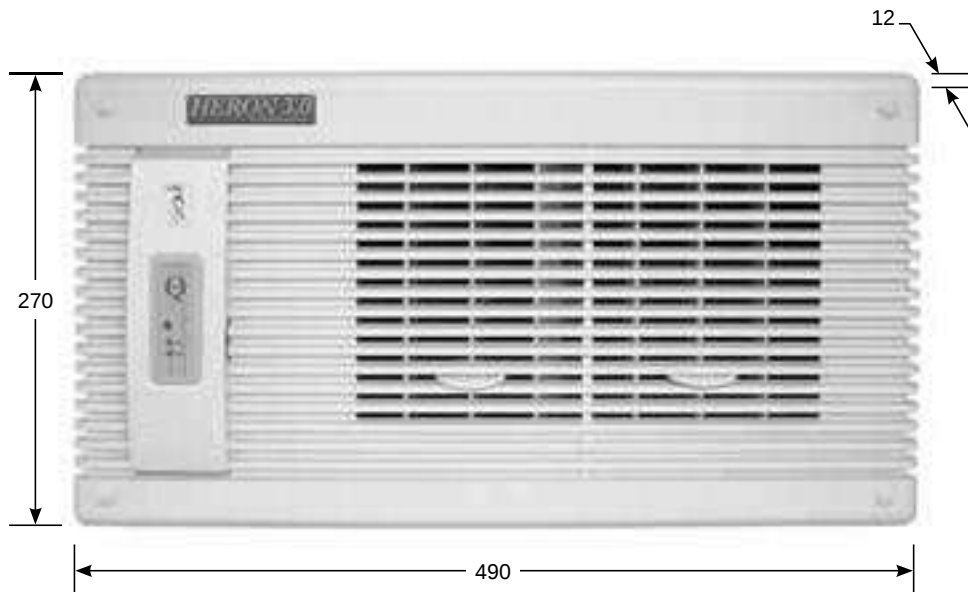


Figure 2

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

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

INSTALLATION OF THE CONDENSER SET

The Con/set may be sited through any side wall of a van. The hole size for installation is 454 wide x 765 high, and may be located under a bench top, or in a wardrobe etc.

This unit should be sited as near as possible to the A/H to minimize the length of refrigeration pipework. **NB.** A maximum of 5m of pipework is allowable. Runs of up to 10m are possible, but would require additional refrigerant added to the system.

Generally, the Con/set is not installed on the near side, as if an awning is installed, the area would have **hot condenser air discharged into it.**

Note: The Con/set normally sits on the floor, but may also be sat atop the wheelarch, providing the **entire** base of the unit is supported.

Cut the opening for the Con/set, measuring 765mm high off floor level, and 454mm wide.

Caution: This opening may interfere with wiring concealed in the wall cavity (both 12v and 240v). If the wiring layout is not known, then proceed with caution. **Do not have the van plugged into a 240v supply during this stage of the installation.**

The opening must now be framed with timber at least 25mm thick.

The Con/set can now be lifted into the opening. Before pushing in fully, run a generous bead of silicone around the back of the flanges (sides and top).

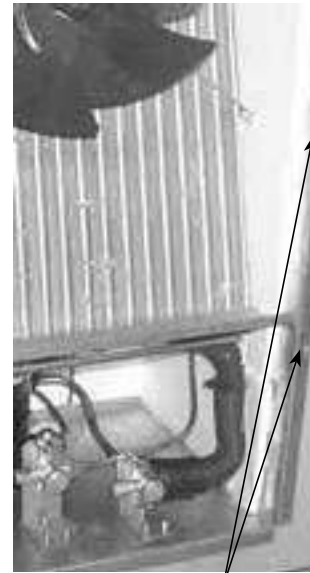
Push in firmly and fix in position by screwing back into the framing timbers. (See fig. 3) 4 screws x no 8 required.

Now seal along the bottom edge.

■ Power Supply

The unit is designed to plug into a normal mains supply. This plug must be accessible after insulation. If a new outlet is installed, then it must be positioned near the con/set and easily accessible.

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



Retaining screw holes

Figure 3

PIPE INSTALLATION & CONTROL WIRING

(See also Tips on Flaring, page 11)

All pipe work must be clean and dry refrigeration grade annealed copper tube. The pipe work consists of a 6.4mm dia. tube (liquid line), and a 9.5mm dia. tube (return gas) running between the Con/set and the A/H.

These tube sizes are equivalent to 1/4" and 3/8" respectively.

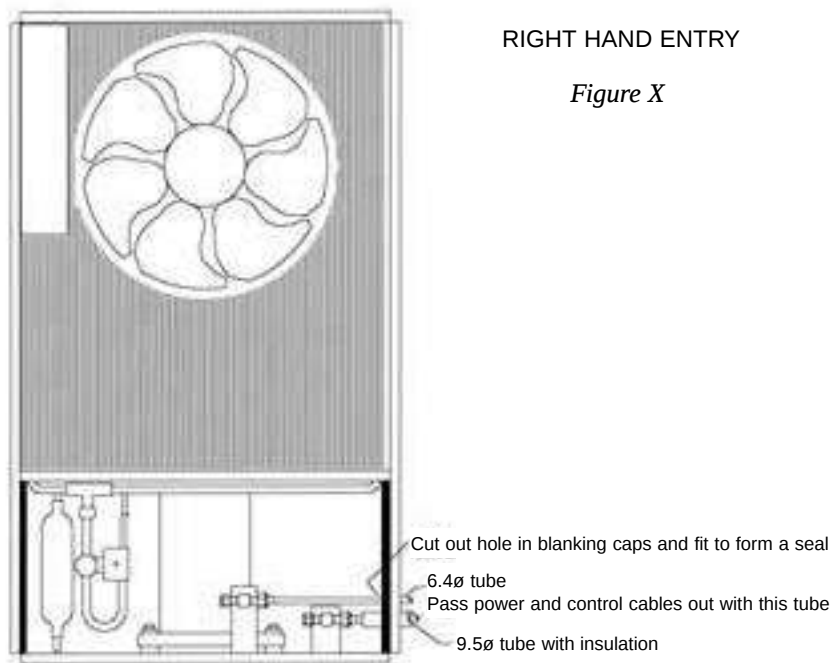
The 9.5 dia. **must** be insulated with 10 x 10 foam rubber insulation.

Entry to the Con/set (Refer figures x, y & z). Retain the red plastic blanking caps on the pipes before flaring. These can be reinserted after the pipework is tightened up. It is essential that a good airseal is made here. Failure to do so will result in hot air being possibly leaked into the conditioned space.

The control cable and A/H power cable are passed out with the 6.4 dia. pipe, and usually runs to the A/H taped to the pipe.

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

DETAILS FOR RH, LH & REAR PIPE ENTRY



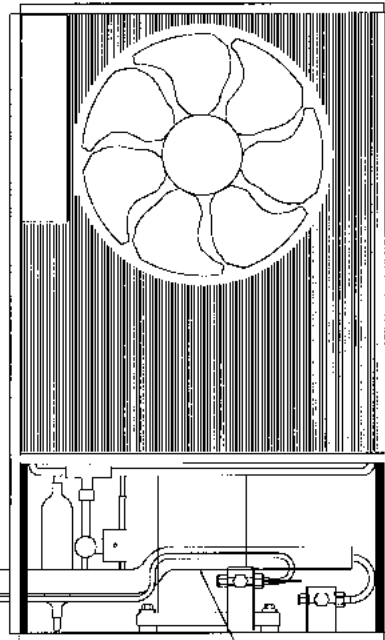
LEFT HAND ENTRY

Figure Y

Power & control cables can follow the 6.4ø pipe

9.5ø tube insulated

6.4ø tube



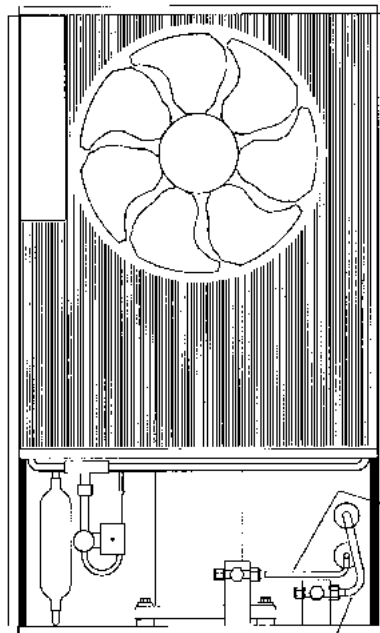
Ensure tubes do not touch compressor

REAR ENTRY

Figure Z

6.4ø tube
pass out the power
& control cables
thru this entry

9.5ø tube insulated



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 90mm** to allow proper air entry to the fan. Insufficient gap will also increase the noise level.
2. **Three** separate return air grilles/filters are supplied, and **must** be installed. If only two are 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 25mm between the right hand side of the A/H and the wall. And likewise 25mm 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 70mm 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.

The airhandler has been designed to operate in a cupboard or enclosure as described on page 5.

Under no circumstances is the resistance to airflow to be increased by ducting of the supply or return air.

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



Figure 6

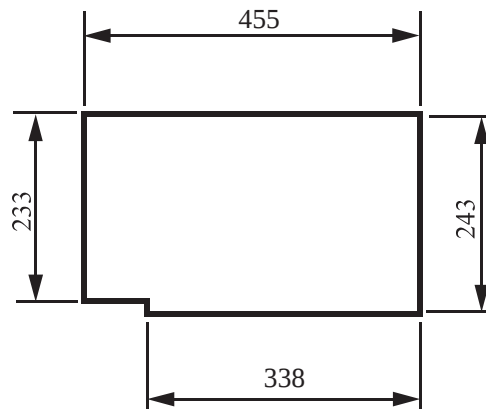


Figure 6a

Mark out the A/H cut out as per fig. 6a. 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 25mm exists down the side of the A/H.
- 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. 6)
- D. The bottom of the cutout should be at least 70mm above the bottom of cupboard to allow the condensate drain to “fall” away sufficiently.

■ Fitting of the 3 return air grilles/filters

Provided the cupboard is 540mm wide or more, the three grilles can be installed side by side in the underside of the cupboard. (Refer fig. 7)

In the case of pop top vans, it may be convenient to install one of the three through the top. **Make sure however, that all three 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 5mm ply which will need reinforcing around the perimeter of the cutout and tying to the main structural members of the cupboard assy.

Make out the cut out as per fig 6a.

Drill holes at the corners of the cutout to allow a jig saw to cut out the entire cutaway.

It is important to cut the hole out accurately.

If the front panel is a solid 19mm 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 20mm thick to provide the necessary support, and should tie in with the main cupboard members, to support the weight of the Airhandler.

The front panel can now be fitted and screwed into place.

■ Installation of the refrigeration pipe work and condensate drain

The 9.4mm 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 9.4 Ø pipe must be insulated entirely.

The condensate drain is normally run vertically. 12mm 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.

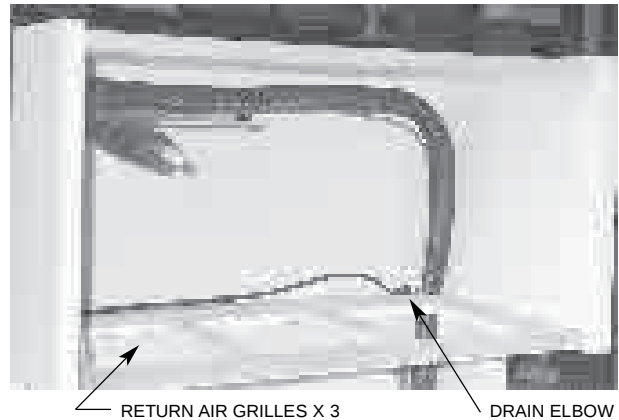


Figure 7

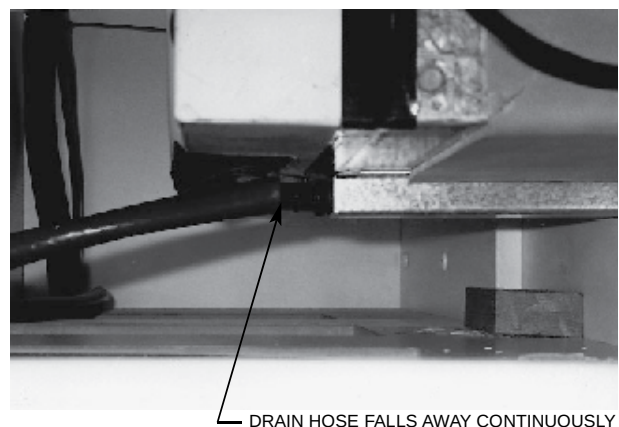


Figure 8

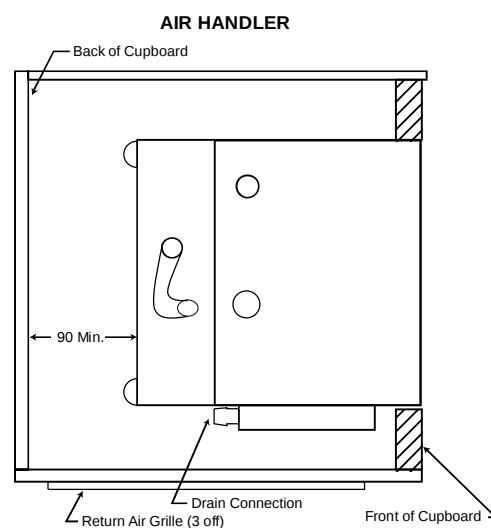


Figure 9

■ **Now Install the Air Handler** (refer fig. 7 - 13)

Insert the A/H into the front panel, and shift to the right as far as possible.

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 6 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.

■ 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 1.0mm. For 3/8" tube (9.5Ø) the unflared tube should protrude 1.5mm.

See Fig. 10, 11 & 12

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.

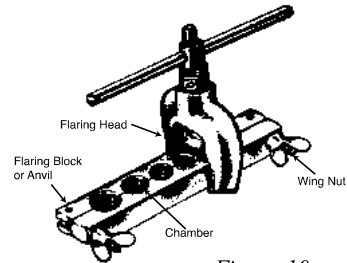


Figure 10

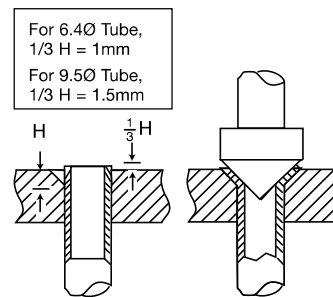
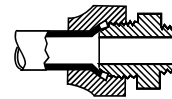


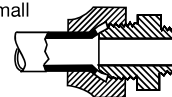
Figure 11

FLARED FITTINGS

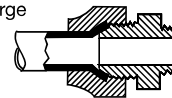
- A. Correctly made flare



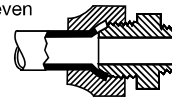
- B. Flare too small



- C. Flare too large



- D. Flare is uneven



- E. Flare has burrs on edge

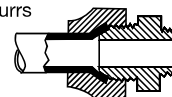


Figure 12

■ Charging the system

The system is charged with R22 in Australia / New Zealand or R407C in Europe, which is a prescribed refrigerant gas.

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

Please note: 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.

Method 2 (preferred)

- 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.**

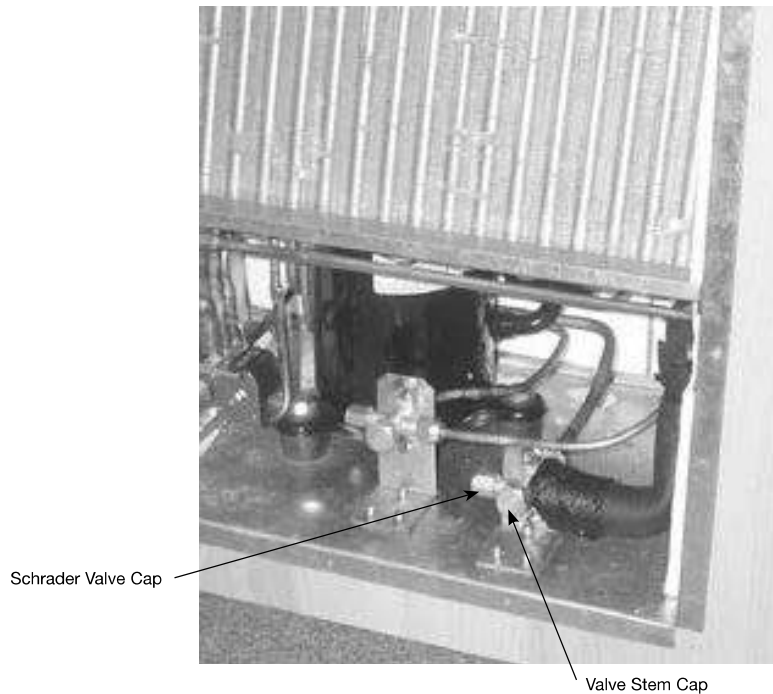


Figure 13

■ 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. (preferred)

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 $\frac{3}{8}$ 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 Outside Louvre Panel (See fig. 14)

The outside panel will fit snugly over the flanges of the condenser set. Using the c/s screws provided, fit one in each corner. Now check that the fan has at least 3mm running clearance all around. Now screw in the 2 metal thread screws as provided across the centre. (see fig 14) . Fit the rest of the c/s screws around the outside and fit caps provided.

■ Fitting the Facia to the Airhandler

1. Make the signal cable connection by mating the short cable from the facia to the matching plug on the cable assy inside the cupboard.
NB. This connection can also be made afterwards by reaching up through the return air inlet with frame removed.
2. Push facia onto the front of the Airhandler, square it up and fit the 4 screws supplied.
3. Check that the air directional vanes are free to rotate.
4. Fit the 3 return air filters to their frames.

■ Initial Run & Test

1. Plug the condenser set into a 3 pin GPO.
2. Using the remote control handset, press the ON/OFF button once
The red "POWER ON" LED will light on the facia.
3. Choose "COOL" by pressing MODE button.
4. Adjust the Thermostat setting a few degrees cooler than the ambient temperature.
NB. The thermostat has a minimum setting of 15°C. If the surrounding temperature is less than 17°C then it will not be possible to test on COOL
5. The Airhandler fan will start immediately.
6. The green LED on the facia signalling the compressor has started will not light for 3 minutes. As a timer controls the compressor turn on.

■ **To Test on Heat**

1. Choose HEAT by pressing the MODE button.
2. Adjust the thermostat to a few degrees above the surrounding air temp.
3. Wait 3 minutes for the timer to turn on the compressor and the green LED on facia to light.
4. As the compressor starts, the Airhandler fan will stop and will not restart until the airhandler coil has warmed up.

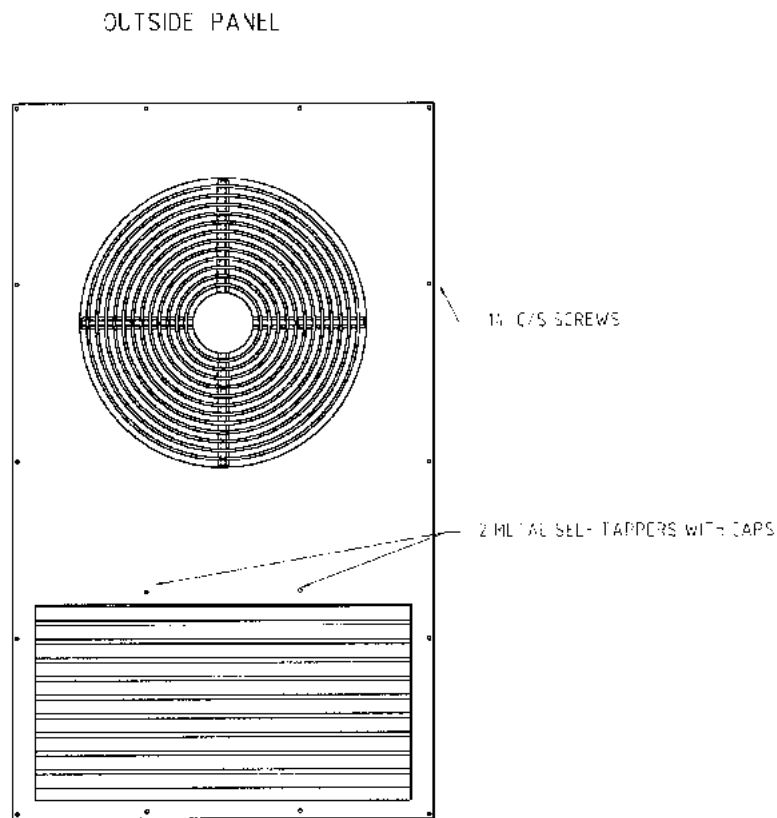


Figure 14

UNIT SPECIFICATIONS

Condenser set:

Height - 765 mm
 Width - 454 mm
 Depth - 290 mm
 Weight - 35 kg

Air Handler:

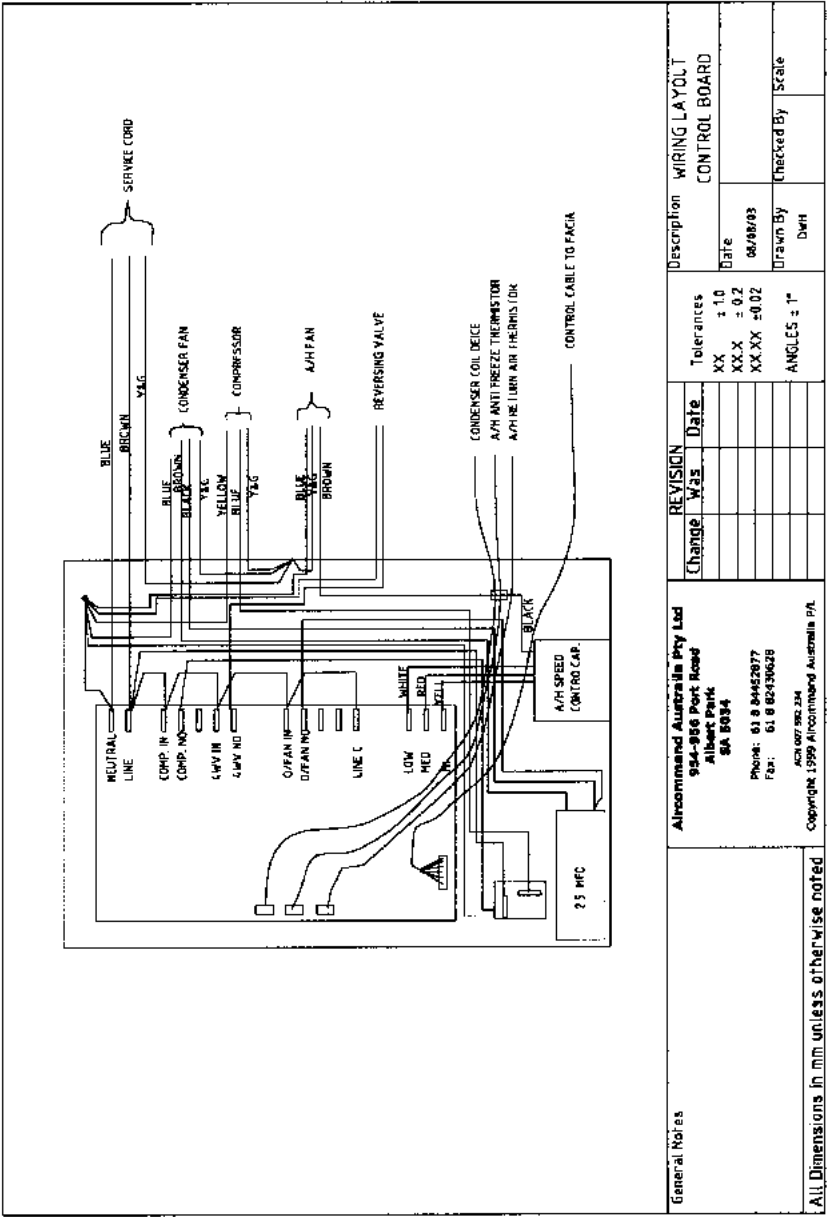
Height - 220 mm
 Width - 390 mm
 Depth - 230 mm
 Weight - 5 kg

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

Cooling output:	2.5 KW	
Heating output:	2.5 KW	
Maximum current:	5.5 amps	
Locked rotor current:	20 amps	
Refrigerant:	R22	Aust / NZ
	R407C	Euro
Charge:	730 grms.	
Air volume (max) Air Handler:	138 l/s	
Compressor: SGI	RH189V	Aust / NZ
	RE189VHSMT	Euro
Resistance run wdg:	3 ohms @25°C	
Start wdg:	4 ohms	
Capacitor:	30 mfd. 440 vac	
Axial fan:	Zeil A2E200-AH38-01	

A/H

Resistance run wdg.:	154 Ω
Aux wdg.:	235 Ω
Capacitor:	1.5 μ fd. 370 vac
Axia Fan Con/Set:	Zeil A4E300
Resistance run wdg.:	155 Ω
Aux wdg.:	238 Ω
Capacitor:	2.0 μ fd. 370 vac



General Notes	Aircorrespond Australia Pty Ltd 934-936 Port Road Albert Park SA 5034 Phone: 61 8 84452077 Fax: 61 8 82436028 ACN 007 982 234 Copyright 1999 Aircorrespond Australia P/L	REVISION		Description
		Change	Date	
		W25		
All Dimensions in mm unless otherwise noted	Tolerances		Date	
	XX ± 1.0			
	XX X ± 0.2			
	XX XX ± 0.02			
	ANGLES ± 1°		06/08/03	
	Drawn By		Checked By	Scale
	DWH			

Trouble Shooting

Symptom	Probable Cause	Remedy
Condenser set is noisy and vibrates	Check that pipe work is not touching the cabinet	Gently bend or pull away.
	The compressor stabilizing tab is touching its socket	Remove lower back panel and adjust socket.
“Tipping” noise from Con/set	Fan blade touching inlet ring	Check alignment of outside panel.
“Tipping” noise from A/H	Fan blade touching inlet ring	Remove A/H from cupboard, split unit and adjust fan.
A/H noisy	Excessive airflow resistance	1. Check fan inlet distance. 2. Check pipes not running across fan inlet 3. Check that 3 inlet filters are installed 4. Check inlet filters are clean.
Unit does not energize	Not plugged in	Check service lead at Condenser set.
	Circuit breaker open	Reset at van’s power board.
	Handheld remote control has flat batteries	Replace batteries or press ON/OFF button on facia.
	Control plugs not pushed together	Remove facia and inspect 3 plugs.
Compressor and Cond. Fan will not run	Check that thermostat is set correctly	Reset.
	3 minute time delay	Wait 3 minutes.

TROUBLE SHOOTING

Symptom	Probable Cause	Remedy
Insufficient cooling	1. Thermostat set too high 2. A/H fan speed too low 3. Unit is low in refrigerant 4. Area to be cooled too great for one unit	Adjust thermostat. Press "FAN" button to HI speed 3. Refer to refrigeration specialist. Reduce heat load by insulation etc.
Insufficient heating	1. Thermostat set too low 2. In very cold outside conditions, unit may be defrosting 3. Unit low in refrigerant	Adjust up. Wait for unit to resume operation. Refer to refrigeration specialist.
Water drips from A/H	1. Faulty drain installation: (a) Hose does not have continuous downward gradient (b) Hose kinked (c) Hose blocked 2. Condensate dripping off 3/8" flare nut on pipe	Inspect and rectify. Insulate with bituminous tape.