

Wall Split A/C Site Inspection Checklist

Job #/Ref: _____

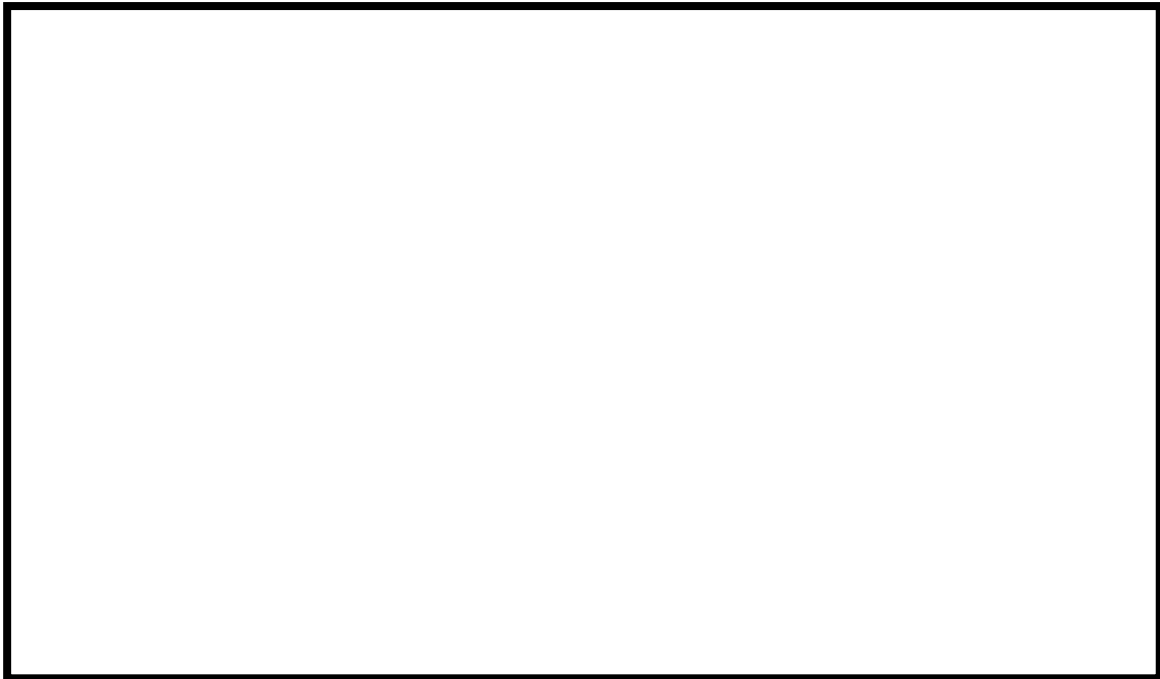
Customer/Client: _____ Mob/Ph: _____

Site Address: _____

Room/space to be air conditioned: _____

Heat Load: Floor area _____ m² (m²/6=kW or 120 – 200 W/m²) Unit Size: _____ kW

Indoor Location: _____



Draw a sketch of the location of the unit here – include openings and other info.

Rough In: Y / N Identify location of pipe work _____

Condensate Drain location: _____

Outdoor Unit Location: _____

Outdoor unit to be mounted: (a) on the wall or (b) on a slab (conc. / poly / other)

Roof/Wall Bracket: (a) gal bracket (b) powder coated (c) special/other.

Power:

Isolator location: _____

Circuit Rating: _____ Amps. Power board – adequate power in switchboard: Y / N

The details of the installation are correct and I agree to the terms and conditions.

Client Signature: _____ Date: / /

Wall Split Air Conditioning Installation checklist

Job #/Ref: _____

Customer/Client: _____ Mob/Ph: _____

Site Address: _____

Room/space to be air conditioned: _____

Unit Brand/model: _____ Size: _____ kW Refrigerant: R_____

1) Indoor unit correctly located	<input type="checkbox"/>
2) Outdoor unit correctly located	<input type="checkbox"/>
3) Wall/Roof Penetration sealed	<input type="checkbox"/>
4) Waffle pad under condensing unit feet	<input type="checkbox"/>
5) Install outdoor unit drain or tray (if required)	<input type="checkbox"/>
6) Purge nitrogen while brazing	<input type="checkbox"/>
7) Pipe work pressure tested (Refer COP)	<input type="checkbox"/>
8) Pipe work insulated, secured & covered	<input type="checkbox"/>
9) Evacuation to less than 500 microns (Refer COP)	<input type="checkbox"/>
10) Open both L/Line & Suction valves	<input type="checkbox"/>
11) Pour 2- 4 litres of water into the evaporator drain tray	<input type="checkbox"/>
12) Configure wall controller to manufacturer's manual	<input type="checkbox"/>
13) Open remote control: insert batteries & set the clock	<input type="checkbox"/>
14) Operate unit in all modes (cool, heat, dry, fan, auto)	<input type="checkbox"/>
15) . Check the operation of the 'Auto' function (if fitted)	<input type="checkbox"/>
16) Measure suction pressure _____ kPa	<input type="checkbox"/>
17) Measure head pressure _____ kPa (Use quick release valves on lines)	<input type="checkbox"/>
18) Compressor run current _____ amps	<input type="checkbox"/>
19) Measure Indoor ambient temp _____ deg C	<input type="checkbox"/>
20) Measure Indoor supply air temp _____ deg C Δk _____	<input type="checkbox"/>
21) Measure outdoor ambient temp _____ deg C	<input type="checkbox"/>
22) Measure condensing unit 'air off' coil temp _____ deg C Δk _____	<input type="checkbox"/>
23) Superheat: suction line temp _____ deg C - SST _____ deg C = Δk _____	<input type="checkbox"/>
24) Add or remove refrigerant according to pipe run (refer manuf. specs)	<input type="checkbox"/>
25) Explain to customer how to use the unit & clean the filter	<input type="checkbox"/>
26) Explain to customer the requirement for annual servicing	<input type="checkbox"/>
27) Carry out site clean (walls, replace furniture, pick up all off cuts).	<input type="checkbox"/>

The details of the installation are correct and I agree to the terms and conditions.

Client Signature: _____ Date: / / 20_____

Sample of disclaimers for contracts

The following typical items should be included in your contract for the customer. Always seek professional legal advice regarding contracts relevant to your business.

DESIGN CONDITIONS

- Cooling design temperature: indoor temperature of 24deg.C. DB, maximum outdoor temp 35 deg C. DB,
- Heating design Temperature: indoor temperature of 20 deg C DB, min. outdoor temperature of 7 deg C DB,
- When the outdoor temperature exceeds these conditions, (higher than 35 deg C, or lower than 7 deg C), the performance of the unit cannot be guaranteed.
- The house or building will be insulated with insulation that has been laid directly onto the ceiling and has a minimum R value of R2.5,
- The air conditioned space is to be maintained airtight,
- All windows exposed to direct sunlight should be covered with suitable coverings, and
- Our installer must be able to position the indoor unit within the truss layout of the roof, or suitable mounting location can be built during construction.

INSTALLATION COMPONENTS

- Only products that meet the relevant Australian Standards will be used - our suppliers are leaders in their fields for innovation, technology and quality
- External pipe work, where required, will be covered in PVC or COLORBOND® housing up to and as close as practical to the outdoor unit,
- Drains from indoor units will be insulated and trapped with a separate safety drain,
- Indoor and outdoor unit locations to be determined on site,
- System evacuation, lead test and unit commissioning to be performed at job completion.

EXCLUSIONS

- Building works required to facilitate provision of ductwork, e.g.; bulkheads, access panels, truss alteration etc.
- Condensate pumps, or provision of connections to storm water or drains unless specified in the scope of works that form part of the quote or tender documents,
- Mains power and weather proof isolators for the outdoor unit,
- Upgrading of switch board or mains if required,
- Filter changing during warranty period,
- Provision of clear space for the outdoor unit,
- Any approvals for councils or authorities,
- Any painting required,
- Supply and Installation of R2.5 batts on ceiling,
- Any penetrations that may be required,
- Should there be insufficient space under the doors for return air, the doors may have to be undercut or door grilles installed,
- Provision for fresh air, unless noted in litres/sec per person, based on the class of occupancy.

MAINTENANCE

It is recommended that the air conditioning system be serviced annually.

EQUIPMENT GUARANTEE

All products supplied will be covered by the standard manufacturer's warranties as outlined in each manufacturer's literature.

INSTALLATION GUARANTEE

We supply a twelve month guarantee on all installations performed.

If a fault is found that is caused by one of their installations, they will rectify the problem promptly.

If a fault is found that is not related to their installation but is a fault of the product, they can endeavour to solve the problem at the appropriate rate.

TITLE OF GOODS

Ownership of the goods supplied will not pass to the purchaser until such time as the goods, the subject of this proposal and all other goods supplied to the purchaser, have been paid in full.

TERMS AND CONDITIONS

- This quote has been prepared based on the drawings or information supplied.
- If the nominated system is unavailable at the time of installation a similar alternate system will be supplied and may incur an additional charge.
- Any contract variations that affect ductwork, refrigeration piping, System design or operating conditions, will incur additional charges
- This quote will only become valid once a company representative or Sub-contractor has inspected the job site.
- Prices are offered on the basis of the total range of product being ordered
- Product will not be accepted back for credit,

Installation/De-commissioning Procedures

Perform a risk assessment. Note any hazards. Provide appropriate controls.

Some points to consider for installation:

- **Tools**
 - Work safely with tools – use tested RCD's and leads.
 - Use appropriate tools and equipment rated to R410A.
 - Flaring tool
 - Gauges & Manifold 5/16" fittings for R410A,
 - Vacuum pump
 - Electronic Scales – weighing in refrigerant.
 - Digital Vacuum gauge,
 - Electronic leak detector

- **Copper Tubing**
 - Needs to be R410A rated (pink cap).
 - Both copper tubes need to be insulated. Soft dawn pair coil is most convenient.
 - Recommend removing flare joints and brazing pipe work.
 - **Caution!: Head unit may be pressurized with nitrogen,**

- **Sizing the unit.**
 - Use appropriate software or qualified persons to carry out heat load.
 - www.fairair.com.au website has a simple heat load calculator.
 - Rule of Thumb: floor area in $m^2/6=kW$, or 120 – 200 W/m^2 for residential applications.
 - Refer to Airah handbook for other applications.
 - Fresh air supply may be required for commercial installations – refer to AS1668.

- **Condensing unit.**
 - Use 50mm x 50mm waffle rubber under each of the condensing unit feet.
 - Allow suitable space for condenser air flow. Refer to manufacturers installation instructions.
 - The condensing unit is pre-charged with R410A.
 - Air flow away from the closest wall.
 - Beware of close perimeter fences and neighbours, (noise).
 - Add oil traps for large vertical pipe runs,
 - Do not exceed manufacturers' installation recommendations for maximum pipe run, and maximum vertical distance between indoor and outdoor.

- **Fan coil (indoor unit) mounting**
 - Ducted evaporator units – ensure adequate vibration controls (rubber mounts, springs, hang unit with light gauge gal strap). Ensure unit does not interfere with light or other electrical fittings or services.
 - Wall mount units - Mount fan coil base to wall. Ensure there are no objects behind the point where the hole for the pipe work is to be drilled, (electrical cables, studs, other services). Install the fan coil level. Drainage slope is allowed for in the drain tray in the unit.
 - Wall mounted units - Ensure minimum distance between ceiling and top of unit – refer manufacturer's recommendations. (min 50 mm),
 - **Caution!: Head unit may be pressurized with nitrogen,**
 - **Caution!: Take care not to kink or crease the copper tube when bending the pipe tails**

- **Mounting on Internal walls**
 - Run drain to nearest external wall or drain point (liaise with building supervisor or owner)
 - May require condensate pump fitted behind indoor unit,
 - Try and conceal pipe work in wall cavity or cupboard.

- **Wall penetration and cover**
 - The wall penetration should be cut with a hole saw on the condensing unit side towards the inside – use a long drill from the inside to make the centre hole before drilling.
 - Ensure that the outside hole is slightly lower than the inside hole to allow for the drain line to fall gently towards the outside.
 - Wall cover is to be fitted to outside penetration. Take care to pass copper tube, electrical cable and drain pipe through this before both ends of these are connected or fastened.
 - Seal the hole with waterproof sealant or similar to prevent vermin entering the wall.

- **Roof Mounting/Penetrations**
 - Use appropriate pipe flashing, (dektite or similar)
 - Seal the penetration with waterproof sealant to prevent leaks and vibration.
 - Purchase or have made galvanised or powder coated mounting brackets or sections – do **not** use timber,
 - Use gal strap to secure the condensing unit and prevent being blown over by wind/storms.
 - **Caution! Work safely at heights, use appropriate restraining harnesses or barriers and/or access scaffolding or cranes.**
 - **Caution! Work safely at heights, use ladders correctly, maintain correct angle, extend ladder 1 metre above gutter or work surface, and tie off or secure to roof or wall during use.**

- **Pipe/Electrical duct** – use the pipe cover as agreed by customer.
 - Cover the exposed pipe work as per the COP,
 - Inaba or similar plastic cover.
 - COLORBOND® 'hat' section with matching colour to customers' requirements.
 - Other types are available and may be manufactured to suit.

- **Connection and testing of tubing**
 - Perform flare connections appropriate for R410A refrigerant
 - Connect gauge manifold to system.
 - Take care to ensure refrigerant is not lost from the condensing unit.
 - Pressure test new tubing and fan coil with nitrogen to 59°C equivalent for R410A. 3670kPa (This is because unit is reverse cycle). Use nitrogen regulator.
 - Perform leak test - use bubble solution.
 - Repair leaks if necessary.

- **Electrical connection**
 - Electrical installation to be carried out by licensed electrician.
 - Some units require power to indoor unit or outdoor unit – refer to manufacturer's instructions.
 - Cover all cables in conduit or under pipe cover.

- **Condensate Drain**
 - Ensure drain pipes are insulated to prevent water damage
 - Use 25mm or larger electrical conduit or pressure pipe and fittings.
 - Run drain vertically down wall.
 - Use saddles where necessary.
 - Run drain to downpipe or other waste point.
 - Some units are able to switch exit ends – remove bung and swap outlet to other end if required.
 - Install a suitable trap into ducted units that facilitates servicing. (EZ trap)
 - Ducted systems – ensure the discharge from the safety drain is visible and instruct customer to arrange for immediate service if safety discharge is visible.

- **Rough In**

- Ensure drain, correct sized pipe work and electrical are installed,
- Check that the exposed tails are correctly positioned,
- Adequately cover and protect exposed pipe work from damage, moisture and debris,
- Confirm with site supervisor the location of pipe work – obtain signature to verify satisfactory location of works before leaving site.
- Pressure test all pipe work with joints – braze or use compression fittings on all concealed and inaccessible joints (do not use flare joints).

- **Relocation of a unit**

If required to move a system during construction or re-location:

- Attach the appropriate gauges to the suction line.
- Pump the system down – run the unit, wind in (front seat) the liquid line valve. (Small line).
- Watch the suction pressure until the system pressure approaches zero kPa – front seat the suction line valve. Immediately turn the unit off.
- Disconnect tubing and electrical cables. **Caution – ensure power is tested, confirmed de-energised and removed!**
- Remove fan coil from wall, re-package (if possible) and store away.
- Remove condensing unit and re-package (if possible) and store away).
- Ensure all pipe and fittings are sealed using caps and flare nuts, or tape. Ensure no contaminants enter the system.

- **Charging**

- Attach service gauges & open liquid line and suction service valves.
- Evacuate entire system to less than 500 microns. (Refer to COP). Use electronic vacuum gauge, suitably placed
- Close gauge manifold, remove electronic vacuum gauge.
- Weigh in liquid refrigerant equivalent to the quantity stated on the name plate (grams or kilograms of R32 or R410A or other),
- Add or remove refrigerant according the length of pipe run and manufacturers' recommendations.
- Energise unit and run in cooling mode.
- Fill out commissioning sheet with operational data (Pressures, temperatures, superheat at compressor suction inlet, sub cooling after condenser, evaporator split, running current etc).
- Remove gauges and replace all caps. Use electronic leak detector to check for leaks.

- **System evacuation – Deep evacuation method**

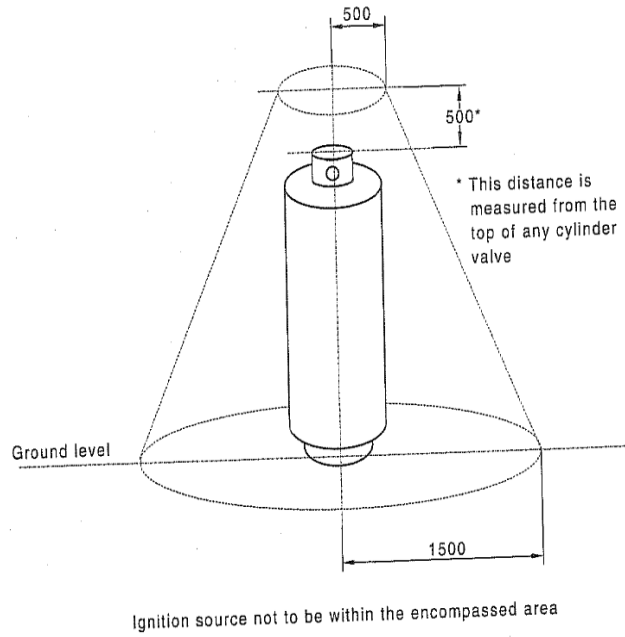
- Evacuate system between service valves and fan coil to minimum of 65 Pa or 500 microns of mercury. (Refer to COP part 2 Section 6).
- Use an electronic vacuum gauge, suitably placed.
- Allow a **minimum** of 30 – 60 minutes to evacuate. (Time to do paper work and clean the work area).
- Isolate the vacuum pump and allow the system to stand for 60 minutes – vacuum must be maintained below 78 Pa or 600 microns of mercury).

- **Commissioning**

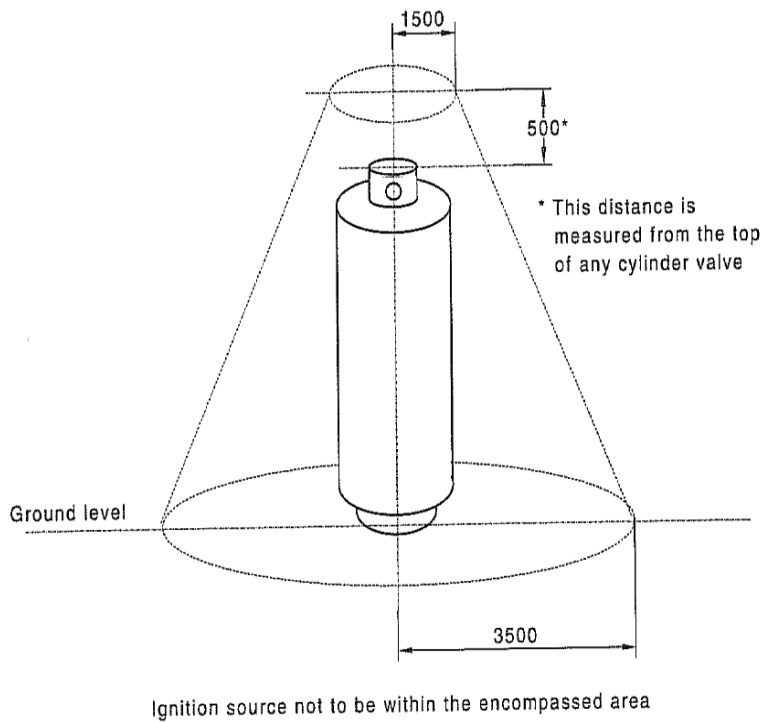
- Add or remove refrigerant according the length of pipe run and manufacturers' recommendations. (Usually grams per metre over the maximum length). Allow the equivalent of 1 metre of pipe run for a 90 deg bend.
- Run current – measure the run current of the unit. Refer to manufacturers name plate. Ensure inverter units are running at maximum. (Note! Electrical testing must be carried out by licensed persons). 2.16.6 a).
- Flush the drain with 2-3 litres of water to ensure free water flow and no leaks.
- Put batteries in remote and set clock or configure the wall controller to manufacturer's operation manual.
- Check unit operation in all modes: heating, cooling, fan (all speeds), dry, auto.
- Check blade swing function
- Measure air onto indoor coil (room ambient) and air off coil (supply air temp - SA) – expected difference of approx 10k. (E.g. Room +25 deg C; SA should be approx. 15 Deg C).
- Measure outdoor ambient temperature, air off the condensing coil should be approx 15 k higher than ambient. (E.G. outdoor ambient = 35 Deg C, air off the condenser should be approx 50 Deg C).
- Complete warranty card if required.
- Instruct customer in the use of the unit:
 - Cooling – set to 22 - 24 Deg C.
 - Heating – set to 17- 20 Deg C.
 - Drying Mode – lowers humidity without lowering temperature.
 - Auto – maintains set point with heating and cooling,
 - Zones – use of zones if fitted to ducted systems.
- Show customer how to remove and clean the air filter. Recommend regular service plan to customer.
- Ask customer to sign your checklist to ensure they accept the installation, and to facilitate payment.
- Ensure all tools and rubbish is removed.
- Clean all marks and dirt on walls etc. Replace any furniture or fittings.

- **Safety - other**

- Lifting – refrigeration tools and equipment can be heavy (over 20kg). Use correct manual handling techniques to lift heavy objects, use others to assist or use lifting equipment designed for the purpose (forklift, crane etc.)
- Use good housekeeping techniques to prevent injuries.
- Refer to the Job Safety analysis for your business or employer.
- Ensure MSDS are available for all hazardous materials.



Minimum distance to ignition sources - Exchange Cylinders



(a) Minimum clearance to ignition sources

Minimum distance to ignition sources – In Situ Fill Cylinders