



AIR CONDITIONING

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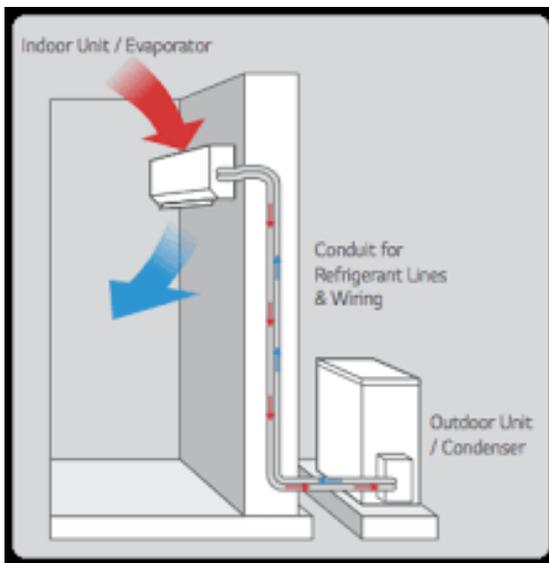
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HITACHI

AIR CONDITIONING SYSTEMS COMFORT GUIDE

WALL SPLIT SYSTEM



A **WALL Split System** is a popular way to cool a single room or open living area.

It consists of an indoor Cooling/Heating unit (or evaporator) mounted on an indoor wall and an outdoor unit (or a condenser) located at the outside of the building, which contains the compressor motor that generates cooling and heating as required (*see illustration above*).

Split systems are effective at cooling/heating the room or space that the indoor unit is mounted in; and they come with a remote control that allows you to select desired temperature and other functions such as airflow strength etc.

If the indoor unit is mounted in the Loungeroom, for example, you could expect quite effective cooling or heating of the Loungeroom area, however; cooling or heating to **other rooms** in the house would usually be limited or none.

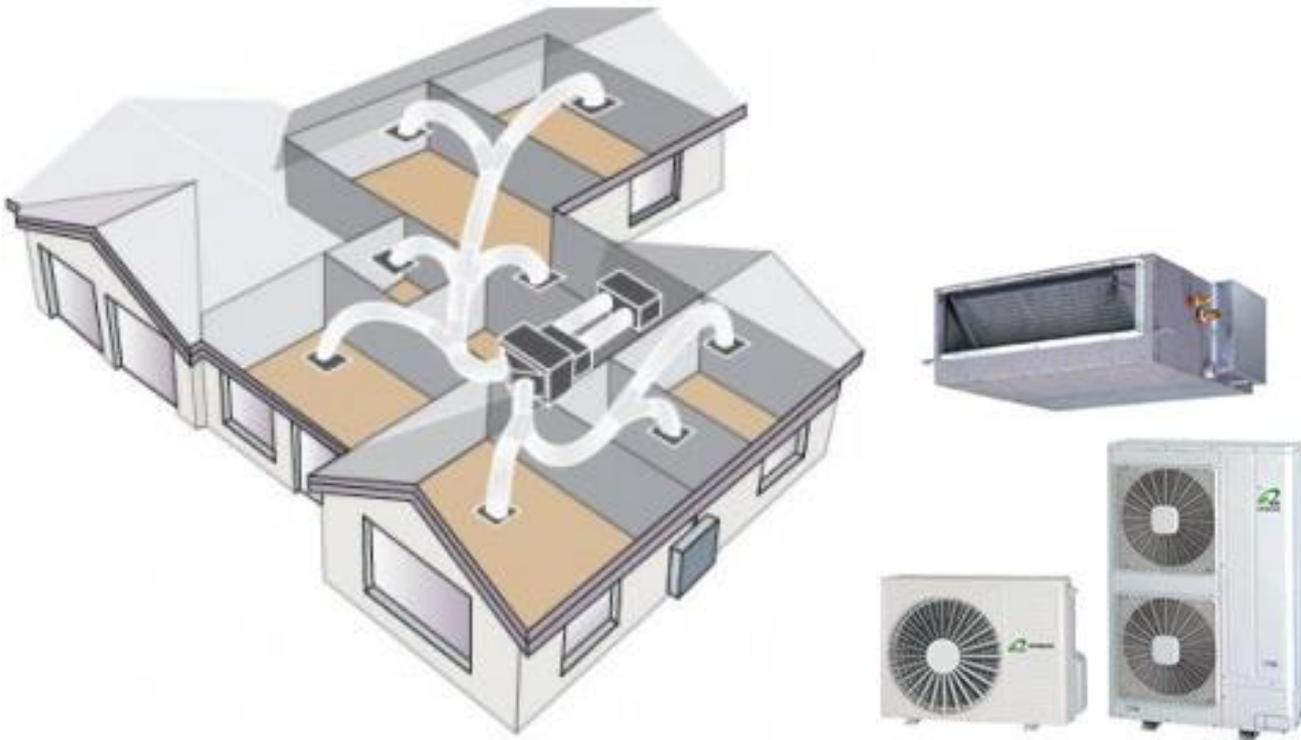
Split System features;

- Quiet
- Cost Effective
- Energy Efficient

Limitations;

- Requires a visible indoor unit on the wall
- Cannot condition other rooms, only the room the indoor unit is positioned in
- Cannot be extended to condition other rooms at a later date

SPLIT DUCTED SYSTEM



A split DUCTED system is the best way to Heat/Cool multiple rooms.

It consists of an indoor Cooling/Heating unit (or evaporator) mounted out of sight in the ceiling space, and an outdoor unit (or a Condenser) located outside of the building, which contains the compressor motor that generates cooling and heating as required. Insulated Flexible tubing (or ducting) also located within the ceiling space connects the indoor Cooling/Heating unit to the air conditioned rooms via unobtrusive vents located in the ceiling (see *illustration above*).

Ducted systems are effective at cooling/heating **multiple rooms**, and can be switched between groups of rooms (or zones) as required. Switching between groups of rooms (or zones) of the home that are used during the day and groups of rooms (or zones) of the home that are used during the night, for example.

A Ducted system comes with a central wall mounted control that allows you to select desired temperature and other functions such as airflow strength, areas/zones to be conditioned etc.

With unobtrusive ceiling vents in each air conditioned room; cooling or heating to all (selected) areas of the house is achieved.

Split DUCTED System features;

- Quiet
- Cost Effective
- Energy Efficient
- CAN condition Multiple rooms at once
- Can be switched between groups of rooms (or zones) eg. Day areas and night areas
- No visible indoor unit on the wall

Limitations;

- Initial investment or cost of the system is higher than a Wall Split System



RUNNING COSTS;

HITACHI are amongst the most **energy efficient** Air Conditioning units on the market today.

Utilising Inverter technology as well as Twin Rotary compressors and other power saving features, Hitachi have effectively minimised the electrical costs associated with running an Air Conditioner.

Having said that, there are obviously *some costs* associated with running even a Hitachi Air Conditioner.

Estimated Running Costs of a 7kW capacity Air Conditioning System.

Based on the standard rate of 23.4 cents (inc gst) per kW hour for electricity in N.S.W. a 7kW Air Conditioning system should cost approximately 50 cents per hour of continuous operation.

Therefore 50-60 hrs of continuous operation (8 - 8.5hrs per day) will cost around the same as a cup of coffee per day (around \$4) OR \$25-30 in energy costs per week (for continuous operation). ***Please note that the Air Conditioner usually cycles on and off automatically to maintain indoor set temperature, therefore will not run continuously at all times. In real terms, actual running cost is normally much less; and equates to only around 60% of the quoted figures, for the example given.***

SPLIT DUCTED SYSTEM.

A typical Zoned ducted system is designed to condition **EITHER** Day Zone (Example - Living, Dining, Kitchen, Study) **OR** Night Zone (Example - Bed 1, Bed 2, Bed 3).

The zoned system is the most common method of designing a ducted system, however, if you want to run the **whole house all of the time** then a larger system will be required; which means a higher initial investment price, larger unit, etc.

An Air Conditioning system will be able to provide comfort during normal ambient conditions provided that;

- External doors and windows are **shut** while Air Conditioning is operated and blinds/curtains are drawn to minimise heat from direct sunlight.
- The Air Conditioning unit is switched on early enough on a hot day say 8 - 9 am to prevent the internal living space **reaching excessive temperature**; and therefore much more difficult and costly to cool down.
- Doors to any non-air conditioned areas should remain closed when not in use to prevent warm/cold air effecting the Conditioned space.
- For a Zoned Ducted System; Once the peak heat of the day has passed (early evening) and the main day area is cool, then the bedrooms could also be run to pre-cool them prior to switching over to night area.

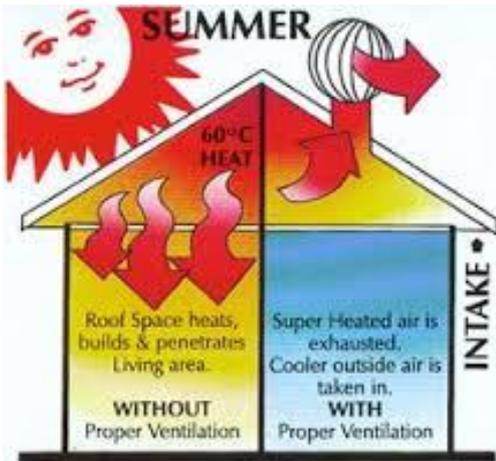
WALL SPLIT SYSTEM.

Although a Wall Split System can only condition the room or open area it is in, the same rules apply in relation to closing doors, windows, and drawing blinds etc. to minimise heat gain or loss within the conditioned space.

OPERATION OF AIR CONDITIONING. Suggested reasonable set point temperatures on your Air Conditioning system is 22-23 degrees Celsius in summer (for Cooling) and 21-22 Degrees Celsius in winter (for Heating).

Temperature improvement in the Air Conditioned space over outside conditions is normally around 10-12 degrees. For example; on a 34 degree summers day (outside temperature) you could expect to achieve a cool 22 degrees (inside temperature)

- on a cold winters day of say 10 degrees (outside temperature) you could expect to achieve a cosy 22 degrees inside.



INSULATION.

In the same way we keep drinks cool in summer by putting them in an (insulated) Esky or keep ourselves warm on a Winter's night with a Doona (which is also a form of insulation) providing additional insulation to your home may be beneficial to Air Conditioning effectiveness and lowering running costs.

The addition of roof batts to a non-insulated home, for example, would improve thermal efficiency of the building.

There a range of products including whirlybird and other types of fan driven roof ventilators which can be effective in reducing temperature inside the roof where the ducted Air Conditioning system and connective ductwork resides.

A reduction of the temperature in the roof space reduces the thermal stress on the ducted Air Conditioning unit, connective flex duct, and components.

For example, the temperature in the roof of even an insulated but non ventilated roof space can be 20-25 degrees hotter than outside ambient conditions. For example 35 degrees sunny day can equal 60+ degrees Celsius in the roof space!

The addition of roof ventilators and eaves vents by a qualified installer can reduce the temperature in the roof to within 5 degrees of outside temp.

For example 35 degree day can equal 40 degrees in roof space, a significant reduction from 60+ degrees.

