

# HITACHI

HEAT PUMPS

## Technical Guide

Multizone: Multi-Split Type Heat Pump Systems



# Another Hitachi Day

*Imagine choosing your perfect day then instantly creating it in the comfort of your own home. With Hitachi heat pumps you create your favourite season anytime, at the touch of a button. The choice is yours. Welcome to Another Hitachi Day.*

## What is a Hitachi Multizone system?

A Hitachi Multizone system is a heat pump that combines one outdoor unit with multiple indoor units. Different types of indoor units of varying heating and cooling capacity can be connected – dependent on the number of rooms and their size and shape.

It is an effective and economical way of air conditioning several rooms. For instance, Multizone is ideal if you would like to heat your lounge and some of the bedrooms or if you have a commercial area with several small offices you need to cool.

## Why Multizone?

A Multizone system allows one outdoor unit to combine with various indoor units which creates more flexibility in installation and saves outside space. It is very suitable for small offices and shops as well as houses.

## Key Features

- Wide selection of indoor types and capacities
- High efficiency and low noise
- Cooling available down to -10°C ambient temperature
- Heating available down to -15°C ambient temperature
- Auto restart by previous mode
- Washable carbon and antibacterial air purifying filter



## Key Benefits of a Hitachi Multizone System

### Flexibility

Hitachi Multizone allows a combination of wall mounted, cassette and bulkhead (ducted) type components all run from a single outdoor unit and a central controller. You are able to choose an indoor unit type to suit each individual room.

Instead of using a large centralised indoor unit with a lot of ductwork, Multizone places the indoor unit(s) in the space that is being air conditioned. The piping that runs from the outdoor unit to the indoor unit(s) is easier to conceal in an existing house than ductwork.

### Spacer Saver

You only need to accommodate a single outdoor unit in your garden or terrace, i.e. enhances exterior aesthetics.

1 Wall Mounted (RAK)



3



4

4 Outdoor Unit (RAM)



2 CASSETTE (RAI)



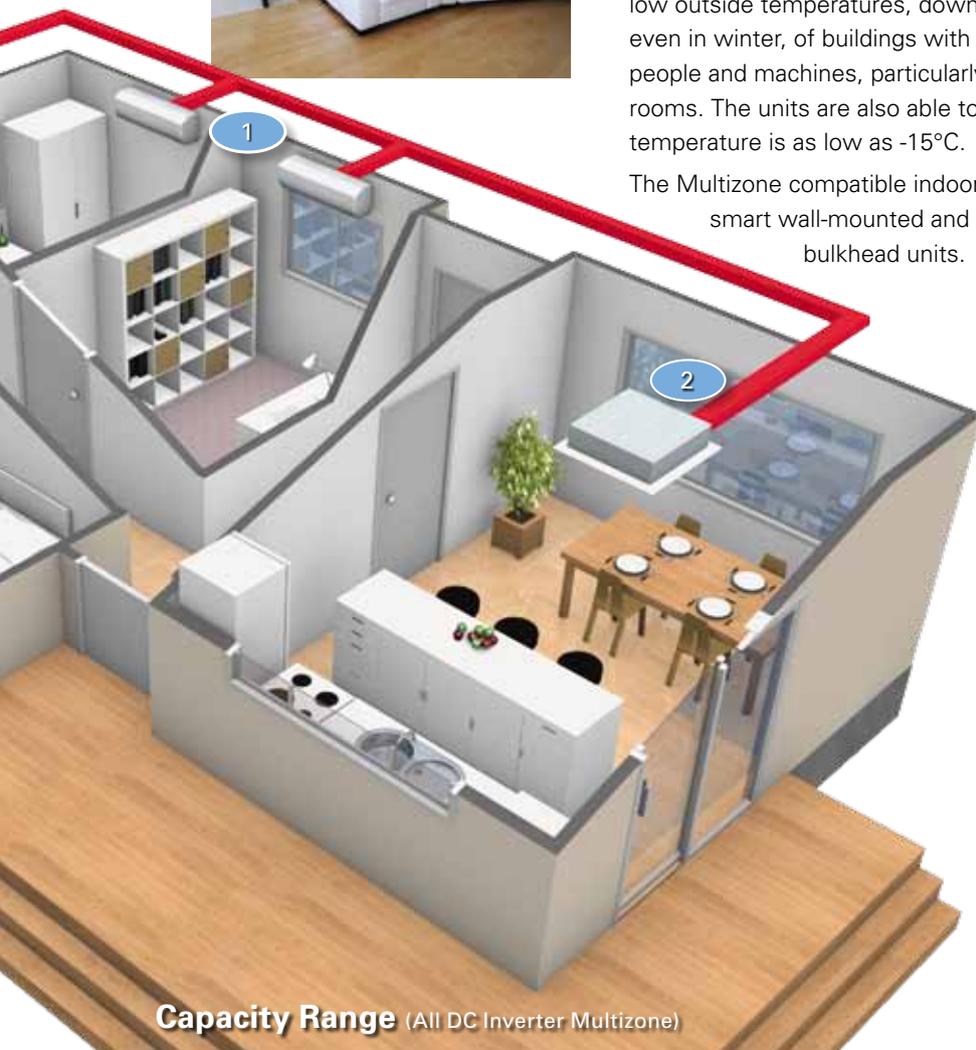
## Extensive Range and Full Indoor/Outdoor Compatibility

The Hitachi Multizone range was the world's first all DC Inverter Multi-split system with zone by zone cooling or heating for up to 6 rooms.

The Hitachi DC twin-rotary compressor, together with award-winning DC inverter PAM technology achieves a system power factor of almost 100% to give unparalleled performance and efficiency. The all DC Inverter system ensures extremely sensitive and accurate temperature control through fuzzy logic and offers remarkably low sound levels.

The wide range of units has been designed for cooling operation even with low outside temperatures, down to -10°C. This feature enables cooling, even in winter, of buildings with high internal heat gains due to lighting, people and machines, particularly in areas such as shops and lecture rooms. The units are also able to supply heating even when the outside temperature is as low as -15°C.

The Multizone compatible indoor unit range caters for all requirements with smart wall-mounted and cassette units and concealed in-the-ceiling bulkhead units.



3 Bulkhead Type (RAD)



### Capacity Range (All DC Inverter Multizone)

Outdoor Unit Model	2 Rooms 55QHA1	3 Rooms 65QHA1	4 Rooms 72QHA1	5 Rooms 90QHA1	6 Rooms 130QHA1
Nominal Capacity Cool / Heat (kW)	5.4 / 7.2	6.3 / 7.2	7.1 / 8.6	9.0 / 11.0	12.6 / 14.4
Min. / Max. Nominal Combination	3.6 / 7.5	3.6 / 8.8	3.6 / 11.0	3.6 / 15.5	7.2 / 17.6
Capacity Max. Pipe Length (m)	35	45	60	75	90
Connectability (units)	2	2~3	2~4	2~5	4~6

Indoor Unit Model	Wall (RAK)	4-Way Cassette (RAI)	Bulkhead (RAD)
<b>Cooling / Heating Capacity Range (kW)</b>			
1.8 / 2.5		✓	
2.5 / 3.9		✓	✓
3.5 / 4.8		✓	✓
5.0 / 6.5		✓	✓
6.0 / 7.3		✓	✓
7.0 / 8.5		✓	

### Comprehensive range/ long pipe length and easy installation

You can choose from different types of indoor and outdoor units depending on the number of rooms, width and shape of the room.

Multizone outdoor units can have a maximum piping length up to 70m when one outdoor unit is used with 6 indoor units in various locations. Combinations of indoor units can provide a wide selection from 6.5kW to 17.6kW.

# Indoor Units

1

## Wall Mounted (RAK)

### More Powerful

A compact flap delivers a sweeping airflow quickly to every corner of the room, eliminating dead zones and improving the cooling and heating effect.

### High Efficiency

The Lambda-shaped heat exchanger's advanced design has a wide suction area and graduated design grille which increases both the efficiency and performance of the heat exchanger.

### Easy Clean

A washable carbon and antibacterial air purifying filter ensures that micro dust, pollen particles and odours that collect on the filter can be easily removed. Filters can be washed and reused up to 20 times.

### Silent Operation

Trapezoidal blades cut the air diagonally to minimise air resistance, causing less friction which reduces noise and improves efficiency.



Conventional fan



New conical blade fan

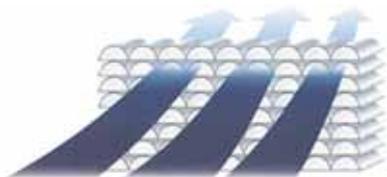


Wide and big air flap

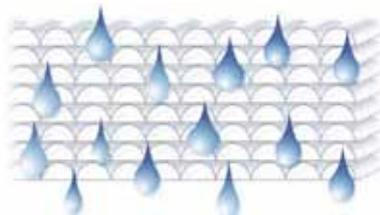


### Superior Air Quality

Either the SPX-CFH5 or SPX-CFH11, washable carbon and antibacterial air purifying filters are included in all of the Hitachi room air conditioning products.



Reusable after washing



Breathable structure. Micro level dust is absorbed by static electricity



SPX-CFH5, SPX-CFH11



## Wall Mounted (RAK)

Model	RAK-18NHA1	RAK-25NHA1	RAK-35NHA1	RAK-50NHA1	RAK-60NHA1	RAK-70NHA1
<b>Capacity</b>						
Nominal Cooling Capacity (kW)	1.8	2.5	3.5	5.0	6.0	7.1
Nominal Heating Capacity (kW)	2.5	3.9	4.8	6.5	7.3	8.5
<b>Sound Pressure Level (Range)</b>						
Cooling (dBA)	35 ~ 20	38 ~ 20	41 ~ 25	47 ~ 27	47 ~ 28	48 ~ 30
Heating (dBA)	36 ~ 23	39 ~ 23	41 ~ 26	47 ~ 27	47 ~ 33	49 ~ 33
<b>Dimension (Net)</b>						
Height / Width / Depth (mm)	254 / 780 / 210	254 / 780 / 210	254 / 780 / 210	254 / 780 / 210	271 / 1030 / 191	271 / 1030 / 191
Weight (kg)	9	9.5	9.5	9.5	11	11
<b>Indoor Fan</b>						
Air Flow Rate Cooling (l/sec)	121 / 111 / 96	141 / 116 / 100	168 / 133 / 108	225 / 166 / 113	225 / 208 / 188	233 / 208 / 188
Air Flow Rate Heating (l/sec)	133 / 116 / 96	158 / 133 / 116	180 / 141 / 125	225 / 166 / 113	225 / 208 / 188	233 / 208 / 188
<b>Refrigerant Piping</b>						
Liquid / Gas Line (mm)	6.35 / 9.52	6.35 / 9.52	6.35 / 9.52	6.35 / 12.7	6.35 / 12.7	6.35 / 15.88
Air Purifying Filter Type	SPX-CFH11	SPX-CFH11	SPX-CFH11	SPX-CFH11	SPX-CFH5	SPX-CFH5



**Cooling Operation Conditions:** Indoor Air Inlet Temperature: 27°C DB / 19°C WB, Outdoor Air Inlet Temperature: 35°C DB. **Piping Length:** 7.5m **Piping Lift:** 0m. **Heating Capacity Conditions:** Indoor Air Inlet Temperature: 20°C DB, Outdoor Air Inlet Temperature: 7°C DB / 6°C WB. **Sound Pressure Level Measurement Distance:** 1m from discharge grille, 0.8m beneath the unit's height centre.



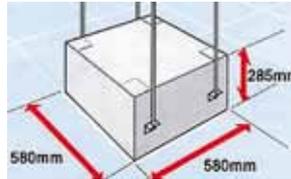
Wall mounted (RAK)

## 2

## CASSETTE (RAI)

### Fits into 60cm x 60cm Ceiling Tile

With its compact design, the 60cm x 60cm ceiling unit fits neatly inside a standard ceiling module which minimises the installation work.



Easy to install

### Silent

The sound level is just 25dB (sleep mode) thanks to the 3D-twisted wing design of the compact turbo-fan.

### Flexible Airflow System

The user can select between 2-way, 3-way or 4-way operation of auto swing louvers.

### One-Touch Panel

The panel can be swung open up to 90° with just one push so that the filter can be removed for cleaning.



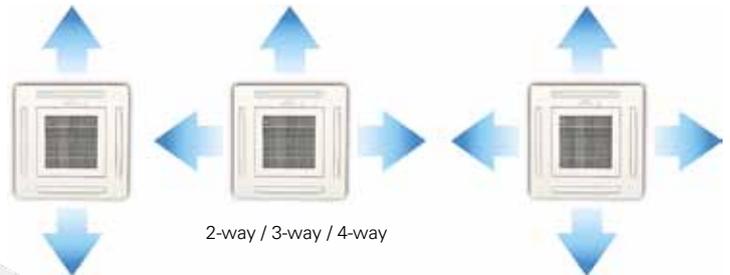
### Solidly Silent Operation and Captivating Design for All Interiors

### 24% less ventilating resistance with compact unit for silent operation

Super-high-stream turbo fan (three-dimensional twisted wing with large bore and high efficiency) enables greater wind flow efficiency – 20% over conventional machines. The underdamping slit mounted near the centre of the revolving shaft helps reduce the electromagnetic noise of DC motors caused by the number of magnetic poles and revolution speed of the motor.

### DC motor reduces fan motor input

A magnetic surface-mounted rotor, centralised winding system and split core system enables reduction of motor input and thus, improves the motor efficiency.



2-way / 3-way / 4-way

### Built-in Drain Pump

The unit is equipped with an internal drain pump (500 mm lift) to remove accumulated condensation water from the drain pan even while it is operating. A float switch monitors the water level and automatically activates the pump as necessary.





## Cassette (RAI)

MODEL	RAI-25NHA1	RAI-35NHA1	RAI-50NHA1	RAI-ECPM Panel
<b>Capacity</b>				
Nominal Cooling Capacity (kW)	2.5	3.5	5.0	
Nominal Heating Capacity (kW)	3.9	4.8	6.5	
<b>Sound Pressure Level (Range)</b>				
Cooling (dBA)	35 ~ 25	39 ~ 26	43 ~ 29	-
Heating (dBA)	36 ~ 27	40 ~ 29	44 ~ 31	-
<b>Outer Dimension (Net)</b>				
Height / Width / Depth (mm)	285 / 580 / 580	285 / 580 / 580	285 / 580 / 580	32 / 650 / 650
Weight (kg)	20	20	20	4
<b>Indoor Fan</b>				
Air Flow Rate (l/sec)	141 / 116 / 96	180 / 133 / 96	200 / 133 / 96	-
<b>Refrigerant Piping</b>				
Liquid / Gas Line (mm)	6.35 / 9.52	6.35 / 9.52	6.35 / 12.7	-
Air Purifying Filter Type	-	-	-	(SPX-CFH5)



**Cooling Operation Conditions:** Indoor Air Inlet Temperature: 27°C DB / 19°C WB, Outdoor Air Inlet Temperature: 35°C DB. **Piping Length:** 7.5m. **Piping Lift:** 0m. **Heating Capacity Conditions:** Indoor Air Inlet Temperature: 20°C DB, Outdoor Air Inlet Temperature: 7°C DB / 6°C WB. **Sound Pressure Level Measurement Distance:** 1.4m from beneath the unit.

Cassette (RAI)



# 3

## Bulkhead Type (RAD)



### Easy to Install

The in-the-ceiling unit enables the air inlet and outlet system to be freely chosen depending on the building structure and room width, in keeping with your decor.



### Built-in Drain Pump

The unit is equipped with an internal drain pump (500 mm lift) to remove accumulated condensation water from the drain pan while it is operating. A float switch monitors the water level and automatically activates the pump as necessary.

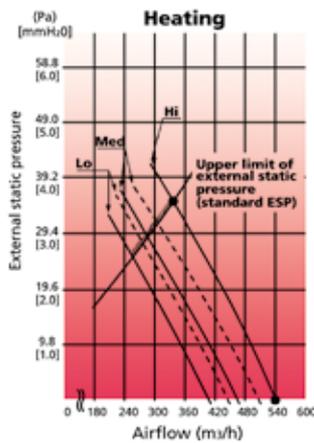
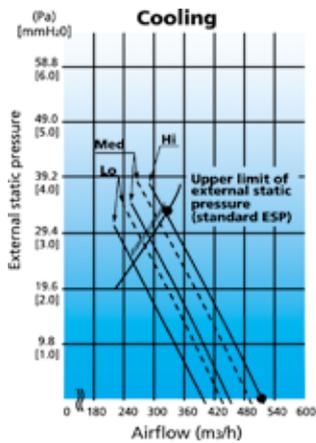


### Static Pressure & Airflow

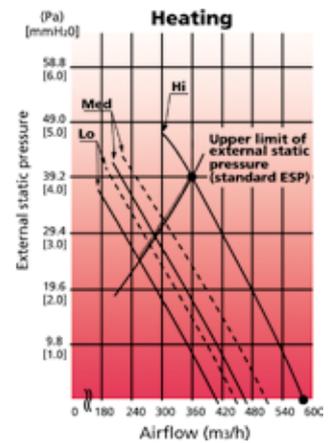
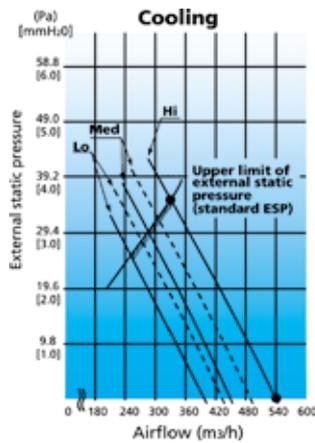
The ceiling unit is equipped with a highly efficient, multi-blade centrifugal fan that generates a powerful yet gentle airflow throughout the room and minimises operational sound even at high fan speeds.



**RAD-25NHA1**



**RAD-35/50 NHA1**



Mo – with one indoor unit



## Bulkhead Type (RAD)

Model	RAD-25NHA1	RAD-35NHA1	RAD-50NHA1
<b>Capacity</b>			
Nominal Cooling Capacity (kW)	2.5	3.5	5
Nominal Heating Capacity (kW)	3.9	4.8	6.5
<b>Sound Pressure Level (Range)</b>			
Cooling (dBA)	40 ~ 29	40 ~ 29	44 ~ 29
Heating (dBA)	40 ~ 30	40 ~ 30	44 ~ 30
<b>Outer Dimension (Net)</b>			
Height / Width / Depth (mm)	235 / 750 / 400	235 / 750 / 400	235 / 750 / 400
Weight (kg)	19	19	19
<b>Indoor Fan</b>			
Air Flow Rate Cooling (l/sec)	136 / 121 / 103	141 / 126 / 103	141 / 126 / 103
Air Flow Rate Heating (l/sec)	153 / 125 / 103	155 / 126 / 103	155 / 126 / 103
<b>Refrigerant Piping</b>			
Liquid / Gas Line (mm)	6.35 / 9.52	6.35 / 9.52	6.35 / 12.7



**Cooling Operation Conditions:** Indoor Air Inlet Temperature: 27°C DB / 19°C WB, Outdoor Air Inlet Temperature: 35°C DB. **Piping Length:** 7.5m. **Piping Lift:** 0m. **Heating Capacity Conditions:** Indoor Air Inlet Temperature: 20°C DB, Outdoor Air Inlet Temperature: 7°C DB / 6°C WB. **Sound Pressure Level Measurement Distance:** 1.4m from beneath the unit.



Bulkhead Type (RAD)

# Outdoor Units

## 4

## Multizone (RAM)

Model	2 rooms RAM-55QHA1	3 rooms RAM-65QHA1	4 rooms RAM-72QHA1	5 rooms RAM-90QHA1	6 rooms RAM-130QHA1
<b>Power Supply</b> AC 1Ph 220 ~ 240V 50Hz					
Nominal (min.-max.) Cooling Capacity (kW)	5.4 (1.5 ~ 5.9)	6.3 (1.5 ~ 6.6)	7.1 (2.4 ~ 8.8)	9.0 (1.5 ~ 9.5)	12.6 (1.5 ~ 13.2)
Nominal (min.-max.) Heating Capacity (kW)	7.2 (1.5 ~ 7.2)	7.2 (1.5 ~ 7.2)	8.6 (2.8 ~ 9.5)	11.0 (1.5 ~ 11.5)	14.4 (1.5 ~ 14.4)
<b>Sound Pressure Level (Overall Scale)</b>					
Cooling (dBA) (max./sleep)	52 / 45	52 / 45	53 / 46	55 / 46	55 / 48
Heating (dBA) (max./sleep)	53 / 45	53 / 45	56 / 48	58 / 52	56 / 48
<b>Outer Unit Dimensions</b>					
Height / Width / Depth (mm)	650 / 850 / 298	650 / 850 / 298	800 / 850 / 298	800 / 950 / 370	1450 / 855 / 308
Weight (kg)	50	50	55	71	113
Cabinet Colour (Munsell Code)	Beige	Beige	Beige	Beige	Beige
<b>Refrigerant</b>					
	R410A	R410A	R410A	R410A	R410A
<b>Flow Control</b>					
	Expansion Valve				
<b>Compressor</b>					
Type	1 x DC Twin Rotary	2 x DC Twin Rotary			
<b>Condenser Fan</b>					
Type	DC350V	DC350V	DC350V	DC350V	DC350V (x 2)
Air Flow Rate (l/sec)	600	600	750	1083	1200
<b>Usable Outdoor Temperature</b>					
Cooling (°C)	-10 ~ 43	-10 ~ 43	-10 ~ 43	-10 ~ 43	-10 ~ 43
Heating (°C)	-15 ~ 21	-15 ~ 21	-15 ~ 21	-15 ~ 21	-15 ~ 21
<b>Refrigerant Piping</b>					
Liquid Line (mm)	6.35 (x 2)	6.35 (x 3)	6.35 (x 4)	6.35 (x 5)	6.35 (x 6)
Gas Line (mm)	9.52 (x 2)	9.52 (x 3)	9.52 (x 3)	9.52 (x 3)	9.52 (x 6)
			12.7 (x 1)	12.7 (x 2)	
<b>Pipe Run</b>					
					Indoor 1, 2, 3    Indoor 4, 5, 6
Max. Pipe Length (m)	35	45	60	75	45    45
Max. Pre-charged Length (m)	35	35	30	30	35    35
Additional Charges (g/m)	-	20	20	15	20    20
Individual Pipe Length (m)	25	25	25	25	25    25
Max. Pipe Lift (m)	20	20	20	20	20    20
Starting Current (A)	10	10	16	16	20
Recommended Fuse Size	16	16	30	30	30
Interconnection Wires (cores)	3	3	3	3	3



**Cooling Operation Conditions:** Indoor Air Inlet Temperature: 27°C DB / 19°C WB, Outdoor Air Inlet Temperature: 35°C DB. **Heating Capacity Conditions:** Indoor Air Inlet Temperature: 20°C DB, Outdoor Air Inlet Temperature: 7°C DB / 6°C WB.



RAM-55QHA1  
RAM-65QHA1



RAM-72QHA1



RAM-90QHA1



RAM-130QHA1

# Icon Index

## Filter



**Carbon Filter;** provides both anti-bacterial and deodorising action, keeping air clean and fresh.

## Comfort



**Fuzzy Logic Control;** determines temperature and setting using a fuzzy calculation and adjusts the heat pump output.



**Auto Operation;** the heat pump automatically selects from heating, cooling or dry operation.

## Airflow



**Up/Down Flap Swing;** easily adjusted to preferred angle anywhere between horizontal and perpendicular.

## Convenience



**On Timer;** enables the operation to start a little earlier so room temperature is close to the set temperature at ON time.



**Dry Operation;** the unit dehumidifies the room by intermittent cooling operation.



**24 Hour On/Off Programmable Timer;** once timers are set, the unit will start/stop at the specified times of the day repeatedly.



**Off Timer;** enables the unit to stop at the specified time.



**Sleep Mode;** provides automatic control during the set sleep mode to maintain a continuous room temperature.

## Economy



**DC Inverter;** rather than a continuous stop/start operation, the speed of the compressor is adjusted to an energy saving mode to maintain the desired temperature and save power.



**High Energy Efficiency;** a permanent magnet motor maintains current without the need for a constant electrical source, delivering 10% greater efficiency than equivalent DC inverters.



**DC Twin Rotary Compressor;** the independent operation of the cylinders leads to greater efficiency and lower vibration.



**PAM Performance;** Hitachi's PAM (Power Active Module) ensures efficient use of input power, and minimises loss to less than 1%, providing an industry leading COP.



**DC Fan Motor;** enables smoothly balanced operation even against strong headwinds on the outer face of the outdoor unit.

## Maintenance and Prevention



**Self Diagnostic function;** if a malfunction occurs, the internal microcomputer runs a self diagnosis. Inspection and repair should be performed by authorised dealers.



**Green Fin;** this special anti-corrosion coating on the outdoor unit improves durability.

## Other



**Auto Restart function;** following a power cut, settings will automatically reset to the original operating mode once power is restored.



**R410A Refrigerant;** non-toxic and non-flammable with zero ozone depletion.

# Indoor Units



Wall Mounted (RAK)



Cassette (RAI)



Bulkhead Type (RAD)



## Peace of Mind

Temperzone Ltd distributes Hitachi heat pumps throughout New Zealand.

Hitachi heat pumps from temperzone have a 6 year warranty on parts and labour.

It's a comfort to know that this warranty is backed by Temperzone Ltd, the largest air conditioning manufacturer and exporter in Australasia: founded, owned and operated by New Zealanders since 1956.

## Easy Installation

Your temperature problems can be solved in a matter of hours.

Call us today for your no obligation on site inspection and quote.

*Six year warranty*



*Energy Efficient*



*Quiet and Discreet*



*Convenient comfort control*



*'Hitachi ticks all the boxes'*

Your local Hitachi dealer:

