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Heat Recovery Ventilation

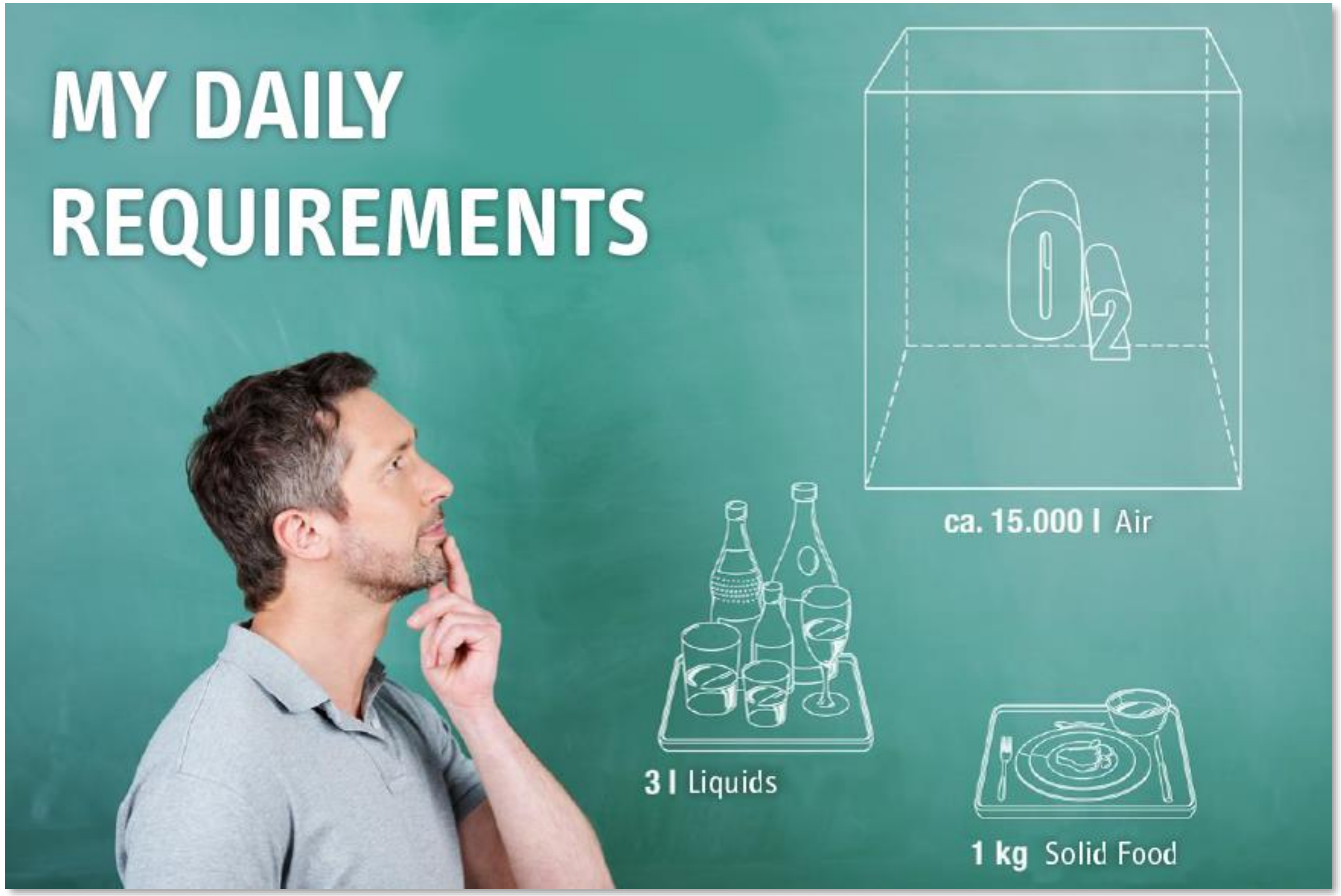
2024

Why do we need to ventilate?

Time spent indoors

With 90% of our time spent indoors and two thirds of that at home, the air quality within in our homes is paramount to our health and wellbeing.

What Humans Need



There is something in the air…

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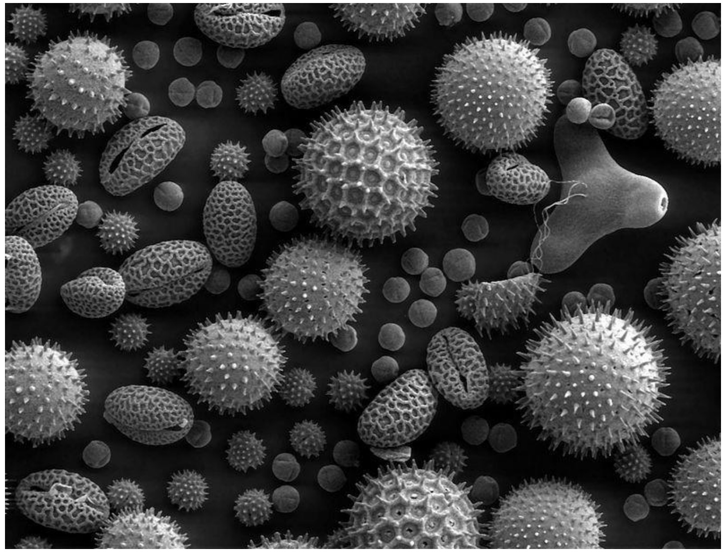
- CO_2
- Radon
- Particles
- Dust
- Solvents
- Bacteria
- Insects
- Humidity

Causes discomfort, allergies and asthma

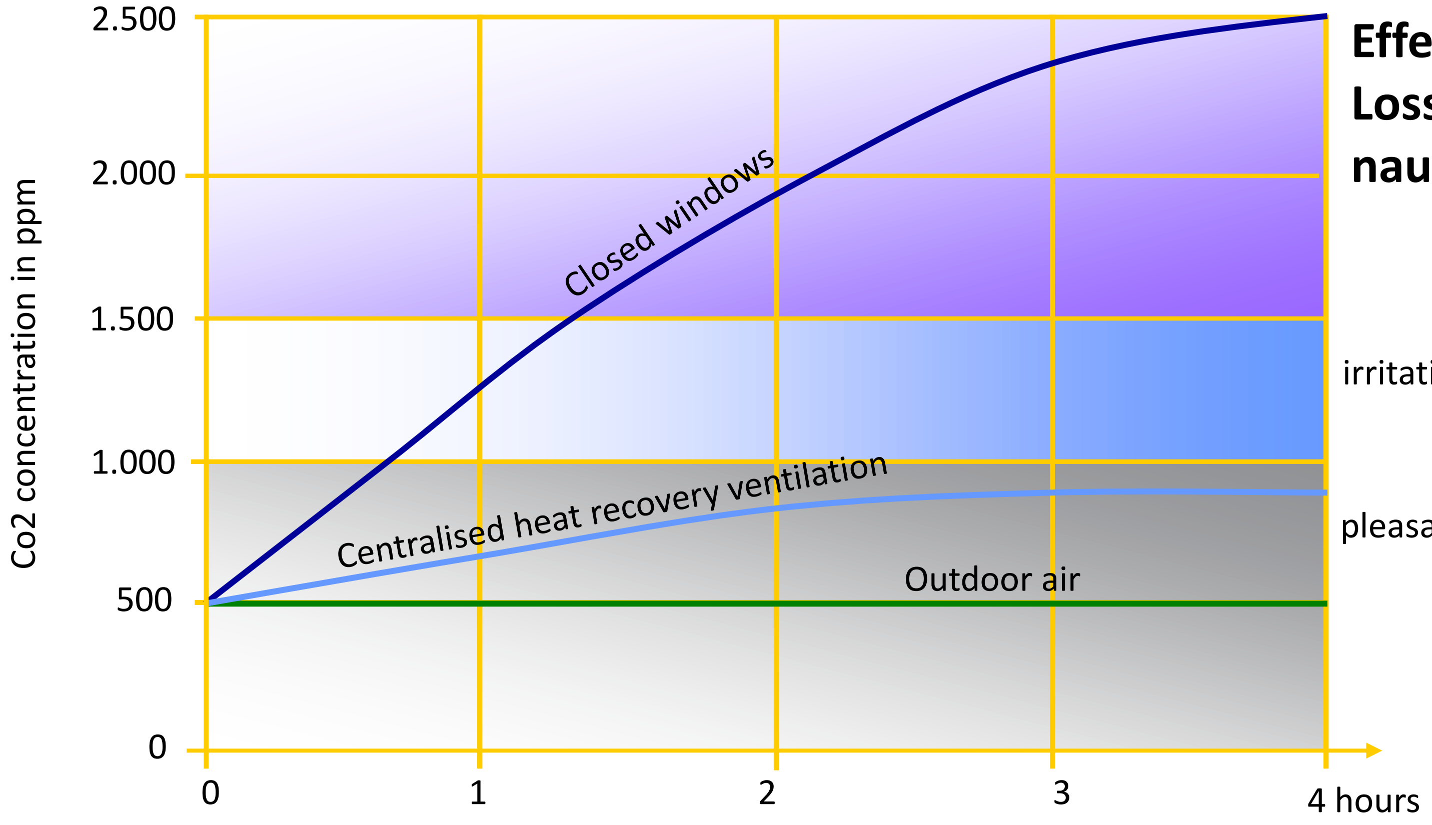


- 1 in 5 Australians have Allergic Rhinitis (hay fever).
- 1 in 9 Australian have Asthma

What affects air quality?

- Vehicle emissions.
- Burning of fossil fuels.
- Exhaust from industrial manufacturing facilities.
- Construction and farming.
- Natural hazards such as bushfires, volcanoes and dust storms.

Ventilation and CO_2 – Concentration



Effect on dweller:
Loss of ability to concentrate, head aches, nausea Et cetera

Health effects of mould

- Mould associated with damp buildings can trigger nasal congestion, sneezing, cough, wheeze, respiratory infections and worsen asthma and allergic conditions. People who are more sensitive to these symptoms and other serious health effects include those with:

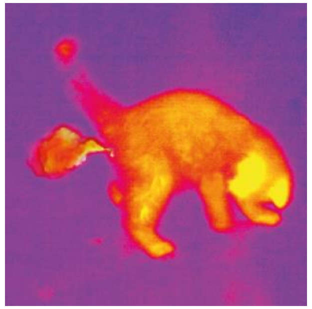
- Impaired immune systems
- Allergies
- Severe asthma
- Chronic, obstructive or allergic lung diseases.

Why use Heat Recovery Ventilation?

- Filtered fresh outdoor air
- Improved indoor air quality
- Ideal for Asthma and air-born allergy sufferers
- Prevents mould growth and damage to the building
- Removal of harmful emissions
- Heating energy otherwise lost through open windows is retained
- Energy efficient ventilation through heat recovery

What can Heat Recovery Ventilation not do?

- It cannot remedy poor building construction
- It is not a heating or cooling system
- It cannot actively dehumidify a home
- It does not replace rangehoods or standard bathroom and laundry exhaust
- It is not free of maintenance
- It is not a fresh air solution for smoking areas
- It does not eliminate odours entirely, but it can help to manage them



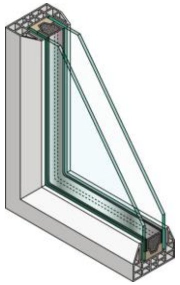
Building quality & standards

Updates to the National Construction Code

- NCC 2022 Energy Efficiency – 7- star rating – improved thermal performance and airtightness
- Certified Passivhaus homes

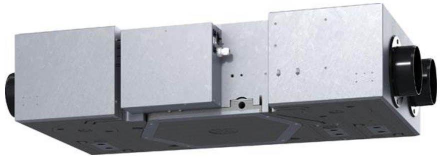
The result = well sealed, airtight homes with excellent thermal performance that will require ventilation

Building wraps and seals



Improved Glazing

Improved insulation



Mechanical Ventilation

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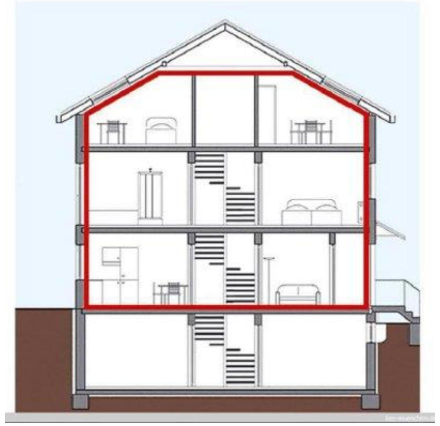
When is ventilation required?

Air change ratio n50: Tested air change ratio @ 50Pa pressure difference



Note: Most new Class 1 Homes in Australia will sit around here

0 0.6 3 5 10+

< 5ACH - Moisture becomes an issue

< 3ACH - Mechanical Ventilation is Mandatory

< 0.6ACH - PassivHaus Certified

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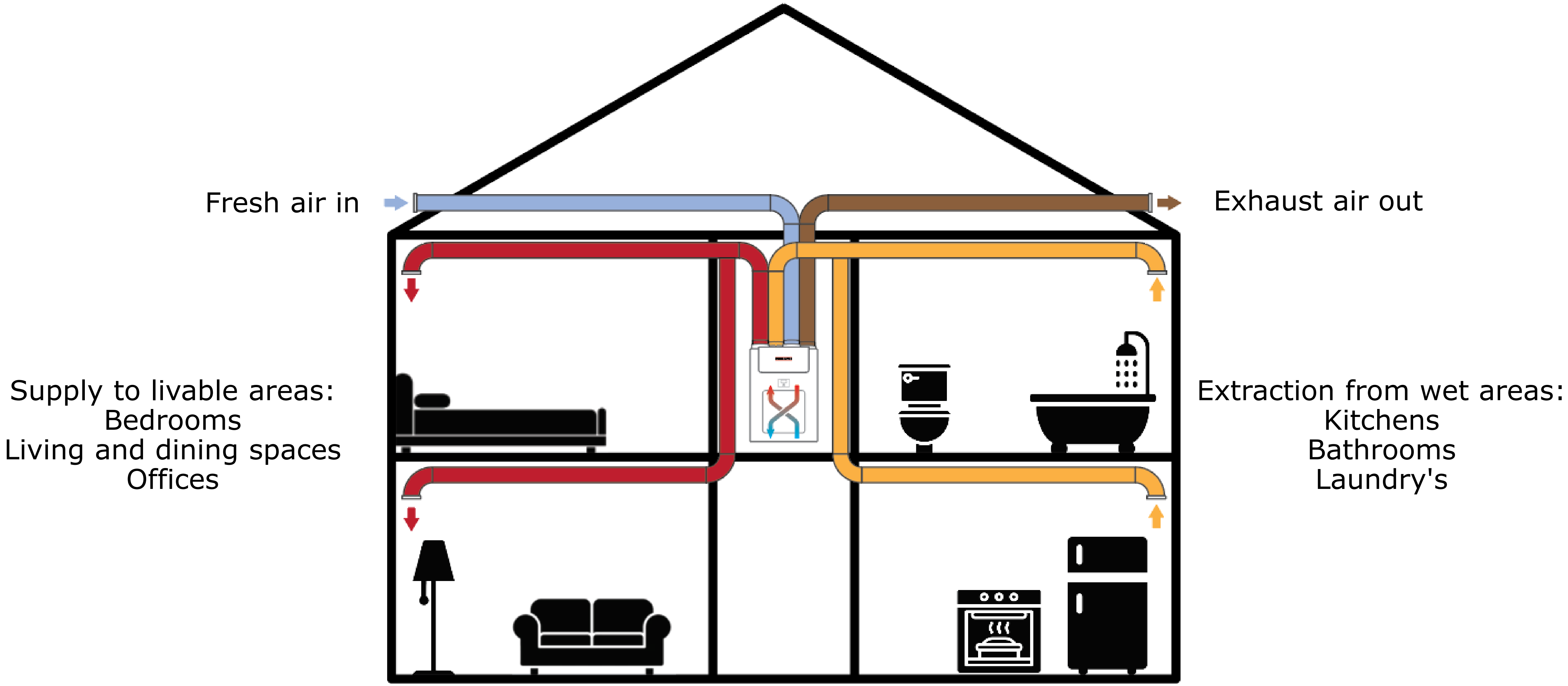
HRV How Does it work



HRV Design

- Air volume calculations, 4 stages, air change rates for building.
- Spatial planning per room, volumes per room.
- Supply to living/bedrooms
- Extract from wet areas
- Material composition
- Design service for building professionals.

HRV design & installation

Total air flow and fan speeds

Nominal volume flow rate determination

By living space	190 m³/h
According to the sum of the extract air rooms	165 m³/h
By number of persons	120 m³/h
Maximum value of area, extract air rooms and persons	190 m³/h
Less infiltration	0 m³/h
Fresh air flow rate (manually selected)	190 m³/h (nach Norm 160 m³/h)
Building air exchange	0.37 times per hour
Complete air exchange in the building	every 2.7 hours

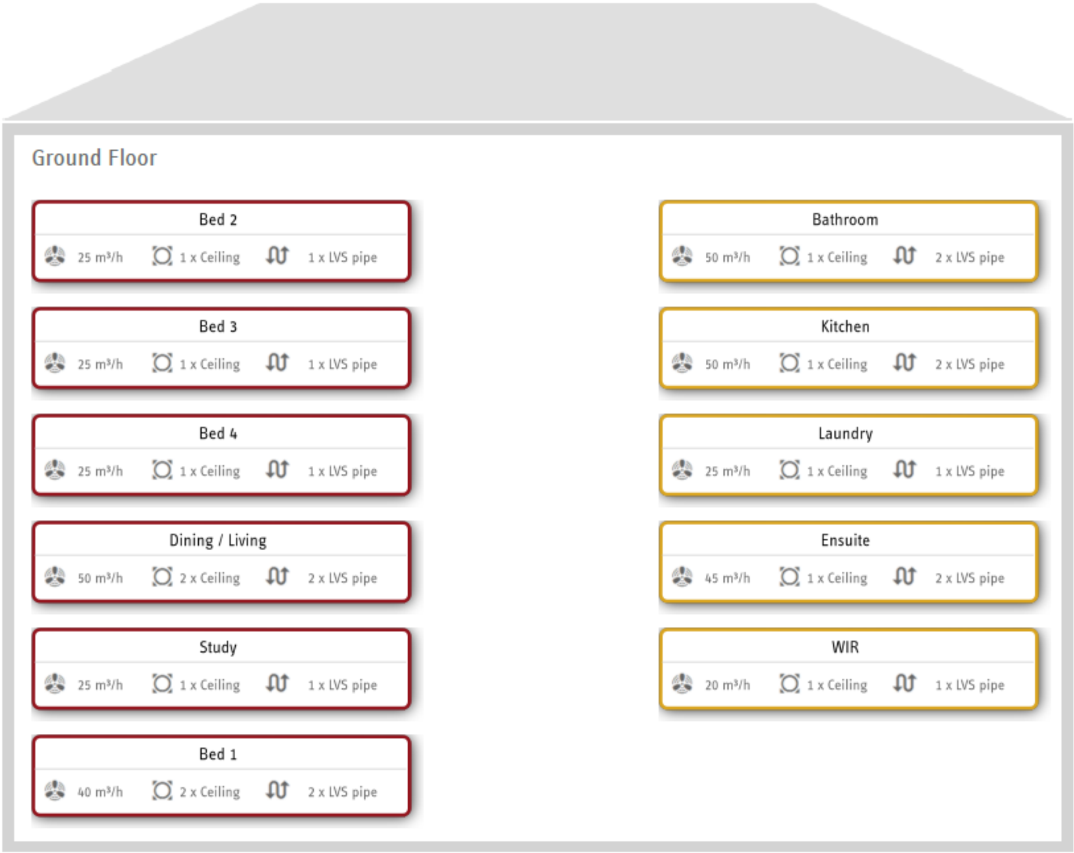
Recommendation of fan stages on the ventilation unit

Ventilation for moisture protection	40 m³/h
Reduced ventilation	135 m³/h
Nominal ventilation	190 m³/h
Intensive ventilation	245 m³/h

How we calculated

Type of building and thermal insulation	Standard (High thermal insulation)
Living space | Average room height	190 m² | 2.7 m
Occupancy of residential unit	Low occupancy (> 40 m² per person)
Number of persons	4 persons

Spatial representation



Planning support: system design & layout

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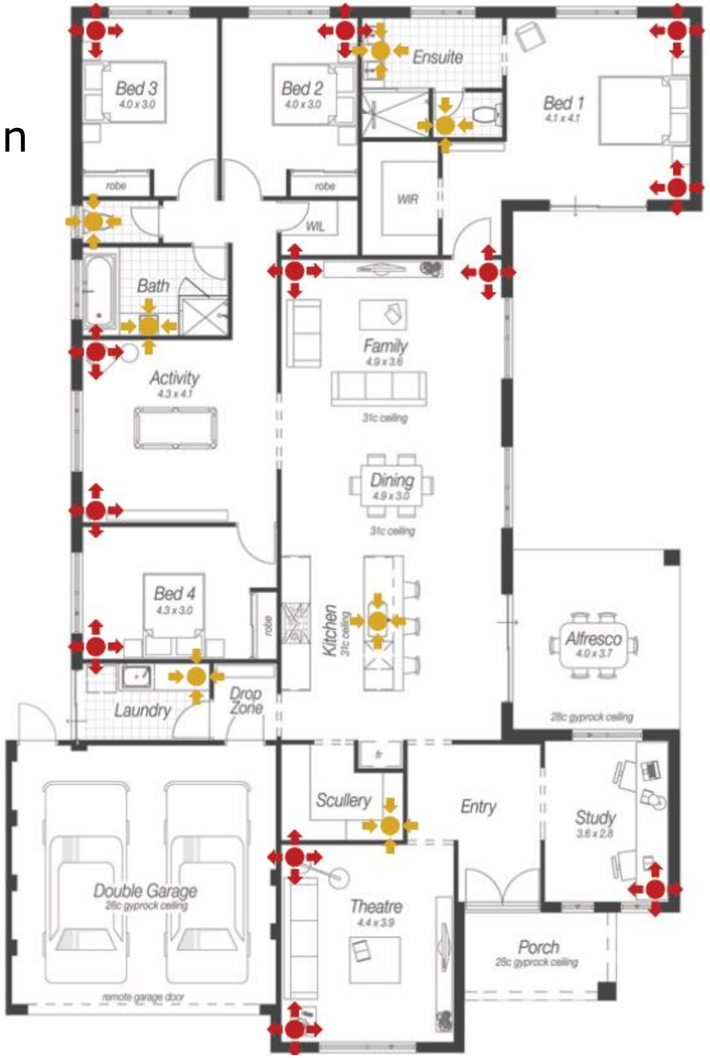
Full design



Partial design

Design & Installation considerations

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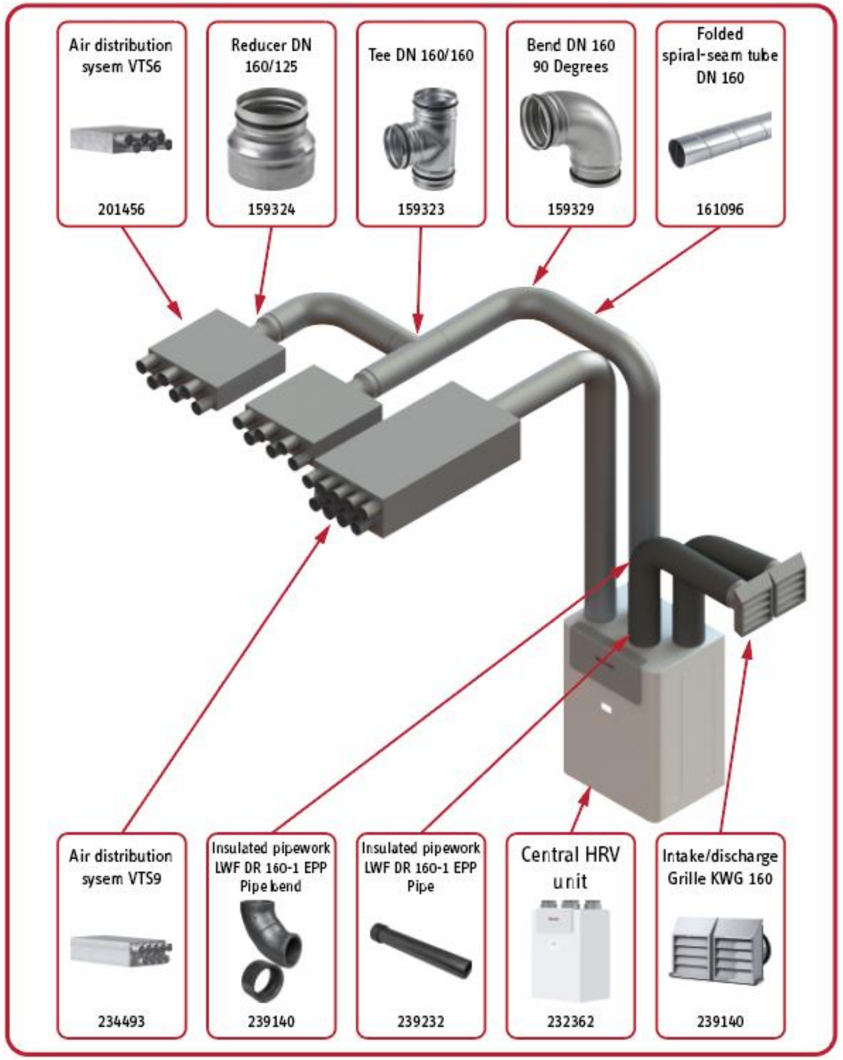
Installation guidelines

- Ensure installation wall is suitable to support weight of the HRV unit
- Fresh air intake/discharge to an external wall
- All components must be installed within the building thermal envelope
- 10amp GPO required for HRV unit
- Condensate will be drained off with natural fall or condensate pump to an existing drain



System installations

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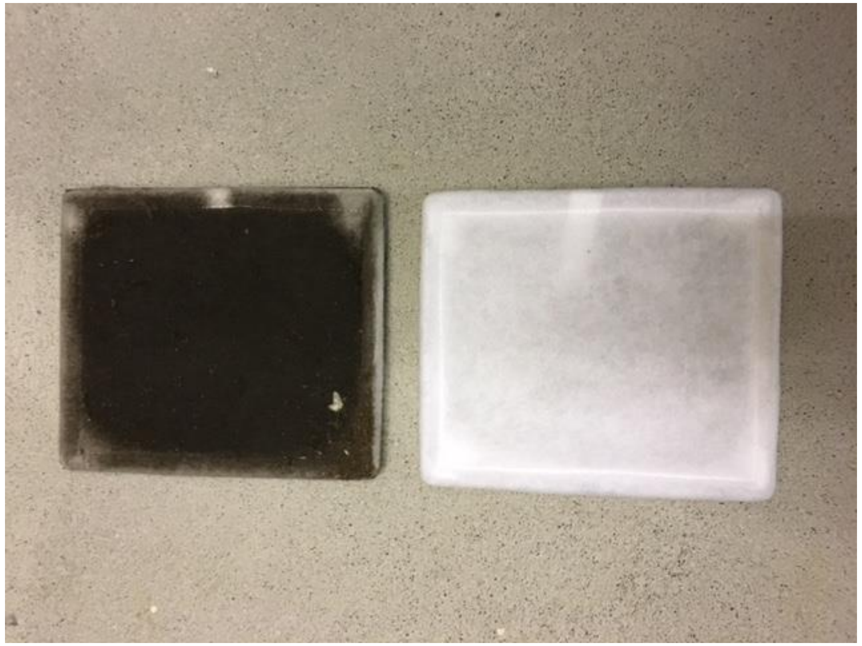
Don’t forget to change the filters!



G4 filter after 3000 hrs (left)

Replacement of filters can be done by the consumer