

# air2air

With Heat Recovery

**Biddle**







# PROVEN TECHNOLOGY

In recent years, commercial buildings of all types have become increasingly well insulated to maximise energy efficiency. This makes them more cost effective to heat and run. However, it can have a negative effect on the indoor air quality. Good ventilation is essential to prevent this, but if it is not carefully controlled, it can lead to heat loss and increased energy consumption. Biddle's proven ventilation system with heat recovery pre-heats clean, fresh air as it enters the building using the energy/warmth from the air that is vented out. As a result, it is not only highly energy efficient, but also very cost effective.

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# BUILT TO THE HIGHEST STANDARDS



Fully compliant with the latest UK and European legislation, the Biddle system can reduce CO2 emissions associated with heating and ventilation by more than 90%. When used in conjunction with a renewable heat source, such as a heat pump, our products also cut energy generated from fossil fuels to zero, even during periods of peak demand.

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# FULL SCALE DESIGN SERVICE

Our business is all about collaboration. We work in partnership with leading specialists to optimise the efficiency of our systems. We work closely with your design team to create a best practice solution, that will meet the exact requirements of your project. And, we work side-by-side with your installers, providing professional training and customised products, plus expert support at every stage of the installation process, where it is needed. Our full-scale design service includes everything from calculations, master planning and templates, to project management and ongoing continuous improvement.

# EFFICIENT HEAT RECOVERY



## APPLICATIONS

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Suitable for all types of commercial buildings, Biddle's heat recovery technology has been proven at hundreds of sites throughout Europe. From supermarkets, hypermarkets, department stores and DIY outlets, to hotels, schools, restaurants, sports halls, logistic centres and warehouses.

## HOW IT WORKS

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The Biddle unit improves air quality and reduces energy consumption using counterflow heat recovery technology. Waste heat is extracted from warm, polluted air as it leaves the building and transferred to cool fresh air as it flows in. The unit can work in isolation or in combination with the Building Management System Controller, or BMS system on site to automatically adjust the fan speed to maintain optimum air quality, based on data from CO<sub>2</sub> sensors located within the building. With an air-to-air heat exchanger recovery efficiency rates of up to 90% can be achieved.



## COMPLETE CLIMATE CONCEPT

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Four models are available, the air2airHR12 (1200m<sup>3</sup>/h), HR25 (2500m<sup>3</sup>/h), HR35 (3500m<sup>3</sup>/h) and the HR45 (4500m<sup>3</sup>/h). All these units can be used as a standalone solution in conjunction with a duct system in the building, or as part of a complete Biddle climate system together with:

- ◉ The NOZ Range of energy-efficient air heater & coolers, which provide comfort in large rooms with high ceilings
- ◉ Comfort Circle Cassettes, which combine heating, cooling & ventilation in one ceiling unit are ideal where a false ceiling is in place
- ◉ The Biddle range of air curtains and fan coils

NOZ<sub>2</sub>

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Comfort Circle Cassettes

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SR Comfort

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## COMPACT, MODULAR DESIGN

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The modular design of Biddle's air2air units make them a fitting solution for all types of application. No matter how limited the space, you are assured of maximum performance.

### FEATURES AND BENEFITS

- Fits into very compact spaces
- Can be recessed or fitted below the ceiling
- High-performance stepless EC fans
- Low installation height (minimum 2.7m to underside of unit)
- Easy to clean and replace components
- Plug & play site wiring
- Easy to install

# OPERATING MODES AVAILABLE\*

The air2air HR12, 25, 35 and 45 units have a number of operating modes available:



## FULL HEAT RECOVERY

Warm, polluted air is drawn through the system to be exhausted to the outside and cold, fresh air is distributed throughout the building.

Heat from the outgoing air is transferred to the incoming air, saving energy and CO2.

A constant temperature is maintained with the HC6 heating and cooling module.



## SMOKE EXTRACTION

In the event of a fire, the unit will extract smoke for a limited period\*\*\*



## FREE COOLING

Cool fresh air from the outside is drawn into the building, bypassing the heat exchanger to cool the building.



## RECIRCULATION

When CO2 levels are low and fresh air is not required, air is recirculated rather than extracted.



## HEATING & COOLING

Heating and cooling available, based on room temperature or supply temperature control.



## NIGHT COOLING

During periods of hot weather, cool fresh air from outside is drawn into the building at night reducing the temperature for the next day.



## AUTOMATIC MODE\*\*

The units use the temperature and CO2 inputs to determine the operating mode. Additionally, the units can be programmed remotely, allowing users to regulate the available modes such as heating/cooling, recirculation, free cooling, heat recovery, etc.



## CO2 CONTROL\*\*

Heat recovery is controlled by the CO2 level measured in the extract air. When the level is high, the unit will run at high speed. The speed will then be automatically adjusted as the CO2 level falls.

\*Operating modes depend on the model \*\*Accessories \*\*\* This is not its designed use and prolonged use with smoke may cause irreparable damage to the unit.

## MAINTENANCE AND CLEANING

Biddle units are easy to maintain with access from the side, or the bottom of the unit.

# CONTROL FEATURES

## B-TOUCH

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The user-friendly b-touch control panel can be used to switch the unit on and off, adjust the room temperature and change situation specific settings. air2air units feature built-in intelligence, which means they can also function without the b-touch control. When this is the case, the control panel is only required for servicing purposes.

### KEY FEATURES:

- Manual and auto mode
- Programmable timer
- Touchscreen control
- Status display
- Multi-language navigation menu (11 languages)
- Screen security with personal PIN code
- Personalised branding

### ○ ANALYSIS TOOL

The b-touch's built-in USB port allows users to import and export settings, carry out software updates and export unit specific data for performance monitoring.

### ○ MODBUS

The automatically regulated Heat Recovery can communicate using the Modbus protocol for remote control with a BMS system. The Modbus and the b-touch can also be used in parallel, allowing local control and remote control to take place at the same time.

### ○ SYSTEM CONTROL

A single b-touch can be used to manage your air2air system, allowing you to control the Heat Recovery alongside the heating and cooling of the space.



# air2air

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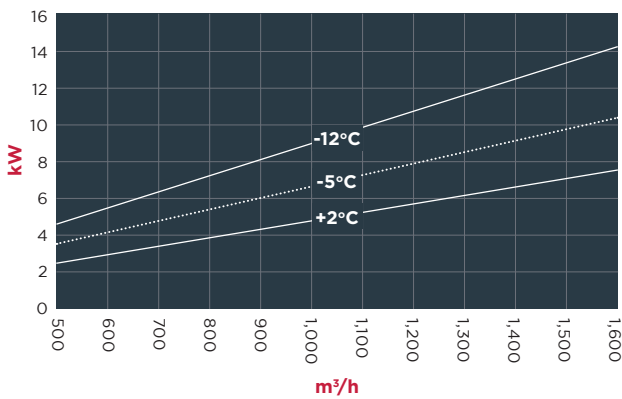
Technical Details



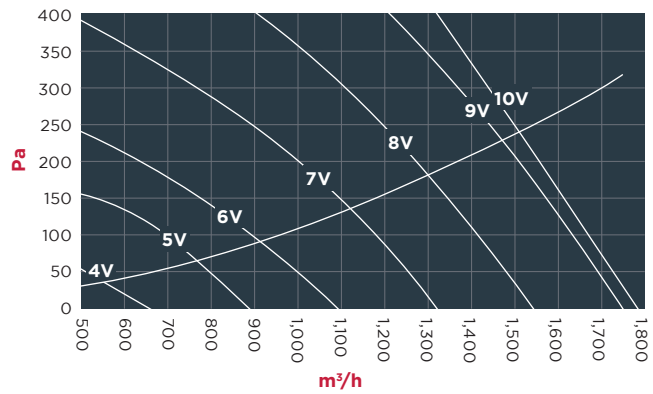
# SAVINGS AND EFFICIENCY

The air2airHR12 contains two energy saving EC fans – a Supply fan and an Extract fan. You can see the airflow performance of the fans below. The airflow performance is a combination of air volume (m<sup>3</sup>/h) and external pressure (Pa). Using these graphs you can select the control voltages of the fans for the units.

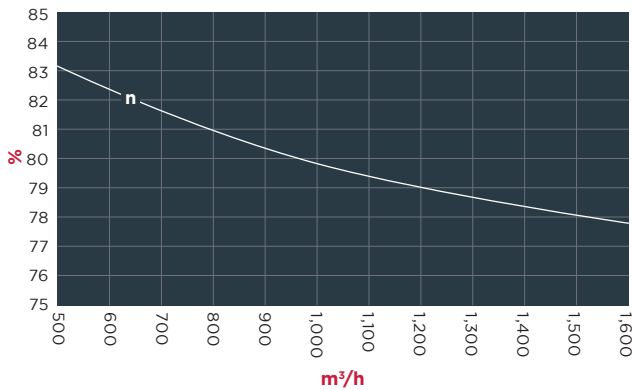
## HEAT RECOVERY OUTPUT



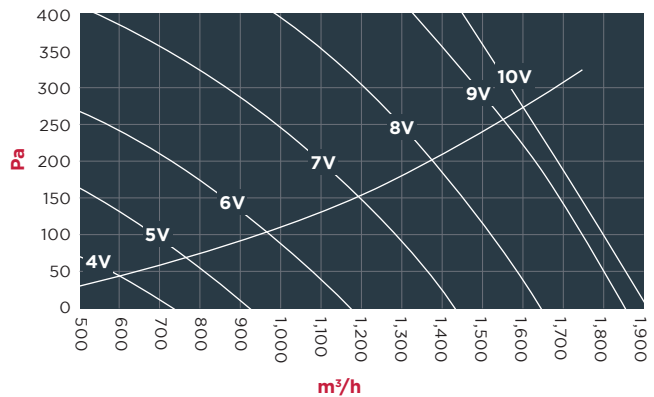
## SUPPLY FAN



## HEAT RECOVERY EFFICIENCY - DIN EN13053 EUROVENT CERTIFIED



## EXTRACT FAN



m<sup>3</sup>/h: Air volume kW: Heat energy saving %: Efficiency Pa: External pressure.

## CALCULATION BASIS

**Air volume:**  
1200 m<sup>3</sup>/h  
**External static pressure:**  
150 Pa  
**Outside temperature:**  
-12 °C

## RESULTS

**Fan speed:**  
7V (supply)  
7.5V (extract fan)  
**Heat recovery savings:**  
10.5 kW  
**Heat recovery efficiency:**  
79%



Electrical supply (V)	230		
Maximum input current (A)	4.55		
Maximum fan power (kW)	1.05		
<b>Weight &amp; size</b>			
Extract fan section (kg)	-		
Supply fan section (kg)	-		
Heat exchanger section (kg)	-		
Total (kg)	215		
Size (mm)	2371 x 968		
Height (mm)	480		
<b>Filter</b>			
Fresh air filter	F7		
Extract air filter	M5		
<b>Speed</b>	<b>1</b>	<b>2</b>	<b>3</b>
Supply air volume (m <sup>3</sup> /h)	780	970	1200
Extract air volume (m <sup>3</sup> /h)	780	970	1200
Sound pressure level at 1m (dB(A))	41	47	49
Efficiency (%)	81	80	79
External air pressure loss (supply) (Pa)	65	100	150
<b>Operating modes</b>			
Heat recovery	*	*	*
Recirculation			
Night cooling		*	
Free cooling		*	*
Heating/cooling with room temperature control			
Heating/cooling with supply air temperature control			
Automatic mode	*	*	*
Smoke extraction			*

## MAXIMUM IN-DUCT SOUND POWER LEVELS

Heating/cooling	Per octave band in the medium frequency, in dB (Hz)								L <sub>W</sub>
	63	125	250	500	1000	2000	4000	8000	
Supply air to room	73.8	74.8	81.3	62.4	65.3	65.1	56.8	49.9	74.5
Extract air from room	69.9	63.3	72	52	49.5	43.1	36.4	25.4	64
Exhaust air to outside	73.8	74.8	81.3	62.4	65.3	65.1	56.8	49.9	74.5
Fresh air from outside	69.9	63.3	72	52	49.5	43.1	36.4	25.4	64

- Sound power level dB(A) (L<sub>W</sub> re. 10<sup>-12</sup>W) • Supply fan operating at 1200m<sup>3</sup>/h at 300Pa external static pressure.
- Extract fan operating at 1200m<sup>3</sup>/h at 150Pa external static pressure

## CASING SOUND POWER LEVEL (L<sub>WA</sub> RE. 10<sup>-12</sup> W)

Speed	
10V DC (high speed) (dB(A))	61
8V DC (dB(A))	59
6V DC (dB(A))	55
5V DC (dB(A))	49

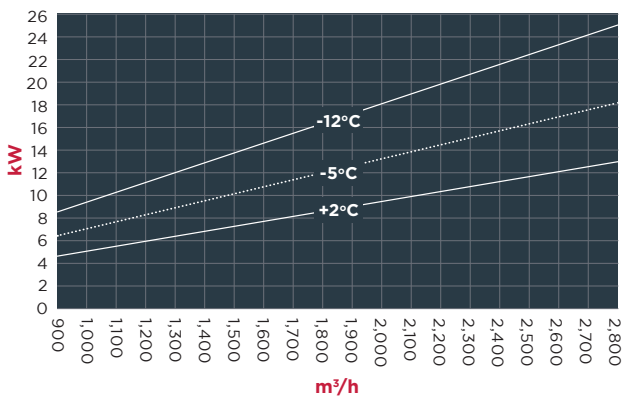
## SOUND PRESSURE LEVEL FOR A TYPICAL ROOM (L<sub>PA</sub> RE. 2 X 10<sup>-5</sup> N/M<sup>2</sup>)

Speed	
10V DC (high speed) (dB(A))	53
8V DC (dB(A))	51
6V DC (dB(A))	47
5V DC (dB(A))	41

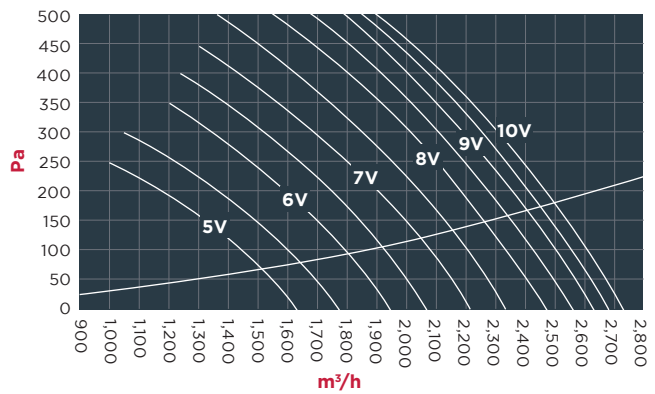
# SAVINGS AND EFFICIENCY

The air2airHR25 contains two energy saving EC fans - a Supply fan and an Extract fan. You can see the airflow performance of the fans below. The airflow performance is a combination of air volume (m<sup>3</sup>/h) and external pressure (Pa). Using these graphs you can select the control voltages of the fans for the units.

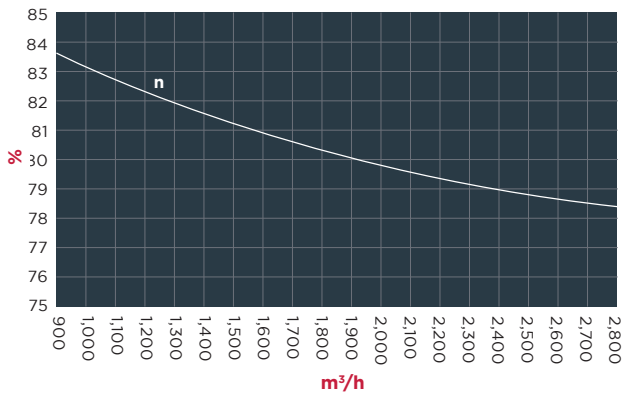
**HEAT RECOVERY OUTPUT**



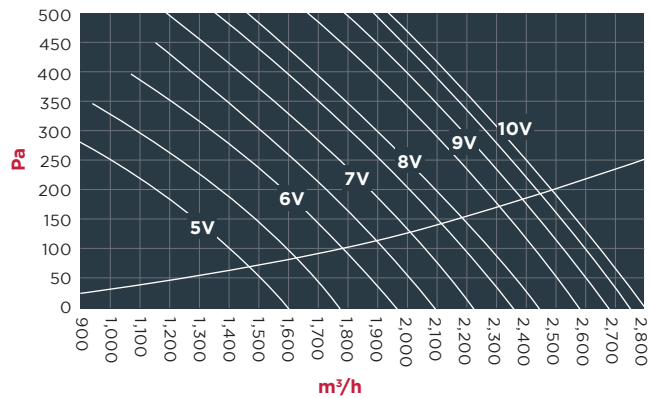
**SUPPLY FAN**



**HEAT RECOVERY EFFICIENCY - DIN EN13053 EUROVENT CERTIFIED**



**EXTRACT FAN**



m<sup>3</sup>/h: Air volume kW: Heat energy saving %: Efficiency Pa: External pressure.

## CALCULATION BASIS

**Air volume:**  
2500 m<sup>3</sup>/h  
**External static pressure:**  
200 Pa  
**Outside temperature:**  
-12 °C

## RESULTS

**Fan speed:**  
10V (supply)  
10V (extract fan)  
**Heat recovery savings:**  
22.5 kW  
**Heat recovery efficiency:**  
78.8%



Electrical supply (V)	230		
Maximum input current (A)	6.8		
Maximum fan power (kW)	1.56		
<b>Weight &amp; size</b>			
Extract fan section (kg)	53		
Supply fan section (kg)	43		
Heat exchanger section (kg)	216		
Fresh air filter (kg)	46		
Extract air filter (kg)	39		
Recirculation damper (kg)	52		
Total (kg)	449		
Size (mm)	3211 x 1558		
Height (mm)	544		
<b>Filter</b>			
Fresh air filter	F7		
Extract air filter	M5		
<b>Speed</b>			
	1	2	3
Supply air volume (m <sup>3</sup> /h)	1795	2190	2500
Extract air volume (m <sup>3</sup> /h)	1810	2280	2500
Sound pressure level at 1m (dB(A))	55	60	66
Efficiency (%)	80.3	79.4	78.8
External Air pressure loss (supply) (Pa)	100	150	200
<b>Operating modes</b>			
Heat recovery	*	*	*
Recirculation	*	*	*
Night cooling		*	
Free cooling		*	*
Heating/cooling with room temperature control	*	*	*
Heating/cooling with supply air temperature control	*	*	*
Automatic mode	*	*	*
Smoke extraction			*

## MAXIMUM IN-DUCT SOUND POWER LEVELS

Heating/cooling	Per octave band in the medium frequency, in dB (Hz)								L <sub>W</sub>
	63	125	250	500	1000	2000	4000	8000	
Supply air to room	69.8	65.6	76.4	75.1	78.8	80.4	78.5	74.1	85.5
Extract air from room	65.7	60.5	70.6	69.9	67.4	70.8	70.9	66.7	76.6
Exhaust air to outside	69.8	65.6	76.4	75.1	78.8	80.4	78.5	74.1	85.5
Fresh air from outside	65.7	60.5	70.6	69.9	67.4	70.8	70.9	66.7	76.6

- Sound power level dB(A) (L<sub>W</sub> re. 10<sup>-12</sup>W) • Supply fan operating at 2500m<sup>3</sup>/h at 300Pa external static pressure.
- Extract fan operating at 2500m<sup>3</sup>/h at 150Pa external static pressure

## CASING SOUND POWER LEVEL (L<sub>WA</sub> RE. 10<sup>-12</sup> W)

Speed	
10V DC (high speed) (dB(A))	74
8V DC (dB(A))	68
6V DC (dB(A))	63
5V DC (dB(A))	58

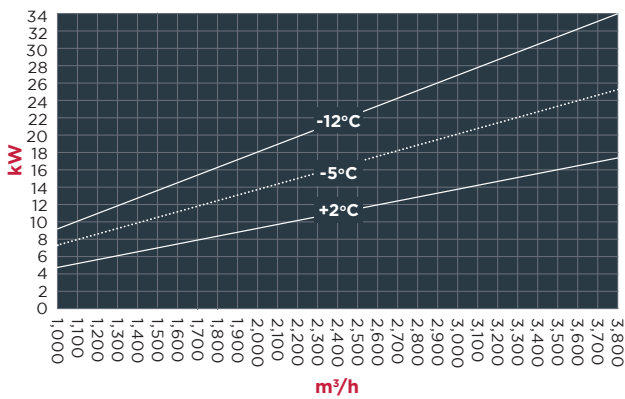
## SOUND PRESSURE LEVEL FOR A TYPICAL ROOM (L<sub>PA</sub> RE. 2 X 10<sup>-5</sup> N/M<sup>2</sup>)

Speed	
10V DC (high speed) (dB(A))	66
8V DC (dB(A))	60
6V DC (dB(A))	55
5V DC (dB(A))	50

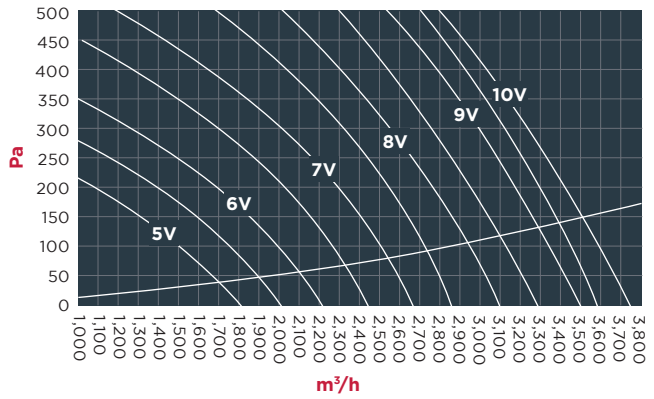
# SAVINGS AND EFFICIENCY

The air2airHR35 contains two energy saving EC fans – a Supply fan and an Extract fan. You can see the airflow performance of the fans below. The airflow performance is a combination of air volume (m<sup>3</sup>/h) and external pressure (Pa). Using these graphs you can select the control voltages of the fans for the units.

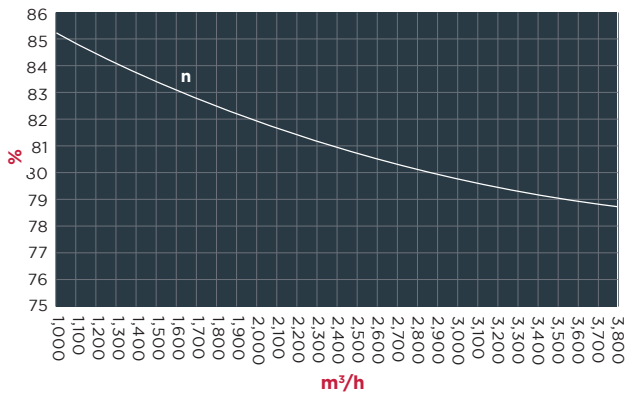
## HEAT RECOVERY OUTPUT



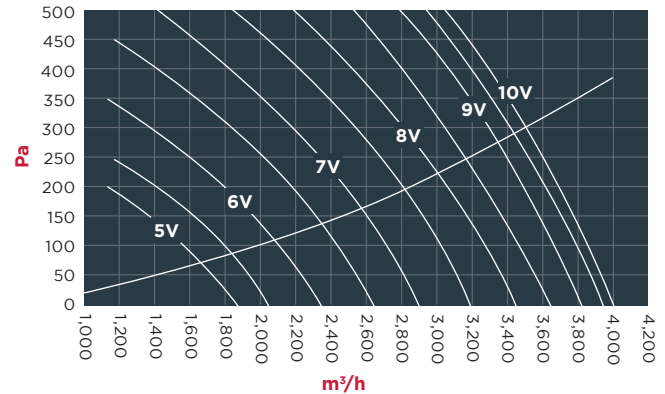
## SUPPLY FAN



## HEAT RECOVERY EFFICIENCY - DIN EN13053 EUROVENT CERTIFIED



## EXTRACT FAN



m<sup>3</sup>/h: Air volume kW: Heat energy saving %: Efficiency Pa: External pressure.

### CALCULATION BASIS

**Air volume:**  
3500 m<sup>3</sup>/h  
**External static pressure:**  
300 Pa  
**Outside temperature:**  
-12 °C

### RESULTS

**Fan speed:**  
10V (supply)  
10V (extract fan)  
**Heat recovery savings:**  
31 kW  
**Heat recovery efficiency:**  
79.2%



Electrical supply (V)	230		
Maximum input current (A)	11.2		
Maximum fan power (kW)	2.64		
<b>Weight &amp; size</b>			
Extract fan section (kg)	70		
Supply fan section (kg)	62		
Heat exchanger section (kg)	287		
Fresh air filter (kg)	57		
Extract air filter (kg)	48		
Recirculation damper (kg)	66		
Total (kg)	590		
Size (mm)	3211 x 2158		
Height (mm)	544		
<b>Filter</b>			
Fresh air filter	F7		
Extract air filter	M5		
<b>Speed</b>			
	1	2	3
Supply air volume (m <sup>3</sup> /h)	2110	3025	3500
Extract air volume (m <sup>3</sup> /h)	2110	2920	3500
Sound pressure level at 1m (dB(A))	56	61	66
Efficiency (%)	81.5	79.8	79.2
External air pressure loss (supply) (Pa)	110	225	300
<b>Operating modes</b>			
Heat recovery	*	*	*
Recirculation	*	*	*
Night cooling		*	
Free cooling		*	*
Heating/cooling with room temperature control	*	*	*
Heating/cooling with supply air temperature control	*	*	*
Automatic mode	*	*	*
Smoke extraction			*

## MAXIMUM IN-DUCT SOUND POWER LEVELS

Heating/cooling	Per octave band in the medium frequency, in dB (Hz)								L <sub>W</sub>
	63	125	250	500	1000	2000	4000	8000	
Supply air to room	75.8	70.7	78.6	78.4	81.3	81.2	78.3	75.4	86.6
Extract air from room	68.6	65.8	75.5	72.3	69.2	70.2	68.2	67.2	76.7
Exhaust air to outside	75.8	70.7	78.6	78.4	81.3	81.2	78.3	75.4	86.6
Fresh air from outside	68.6	65.8	75.5	72.3	69.2	70.2	68.2	67.2	76.7

- Sound power level dB(A) (L<sub>W</sub> re. 10<sup>-12</sup>W) • Supply fan operating at 3500m<sup>3</sup>/h at 300Pa external static pressure.
- Extract fan operating at 3500m<sup>3</sup>/h at 150Pa external static pressure

## CASING SOUND POWER LEVEL (L<sub>WA</sub> RE. 10<sup>-12</sup> W)

Speed	
10V DC (high speed) (dB(A))	74
8V DC (dB(A))	69
6V DC (dB(A))	64
5V DC (dB(A))	60

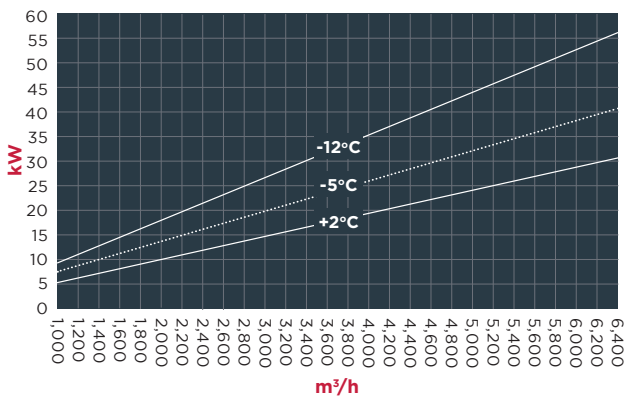
## SOUND PRESSURE LEVEL FOR A TYPICAL ROOM (L<sub>PA</sub> RE. 2 X 10<sup>-5</sup> N/M<sup>2</sup>)

Speed	
10V DC (high speed) (dB(A))	66
8V DC (dB(A))	61
6V DC (dB(A))	56
5V DC (dB(A))	52

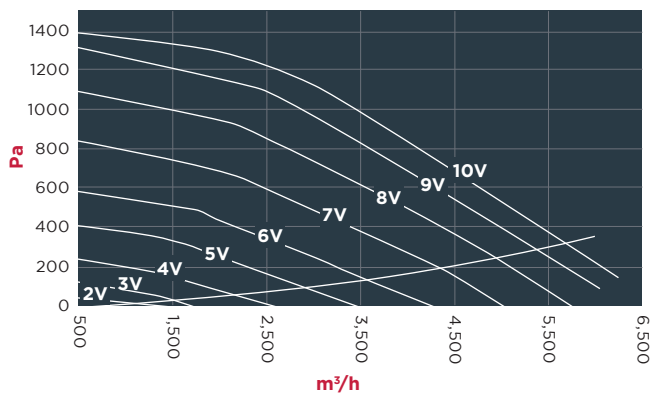
# SAVINGS AND EFFICIENCY

The air2airHR45 has four energy-efficient EC fans: Two supply fans and two discharge fans. The graphs below show the airflow capacity of both fans based on a combination of the air volume (m<sup>3</sup>/h) and the external static pressure (Pa). The energy savings (kW) and efficiency (%) in both illustrations are based on the unit operating in full heat recovery mode.

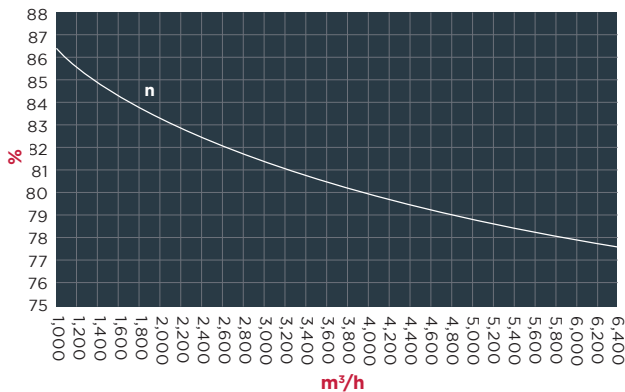
**HEAT RECOVERY OUTPUT**



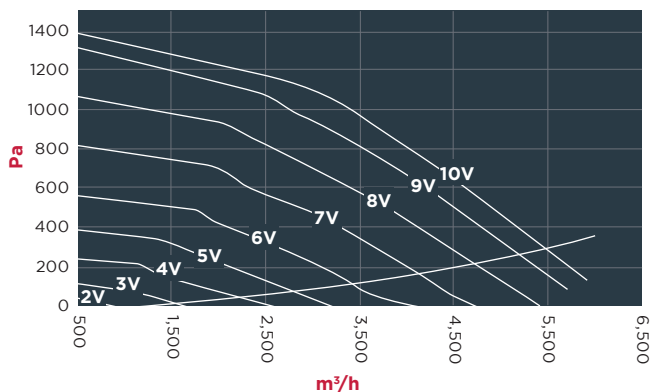
**SUPPLY FAN**



**HEAT RECOVERY EFFICIENCY - DIN EN13053 EUROVENT CERTIFIED**



**EXTRACT FAN**



**m<sup>3</sup>/h:** Air volume **kW:** Heat energy saving **%:** Efficiency **Pa:** External pressure.

## CALCULATION BASIS

**Air volume:**  
4500 m<sup>3</sup>/h  
**External static pressure:**  
200 Pa  
**Outside temperature:**  
-12 °C

## RESULTS

**Fan speed:**  
7.6V (supply)  
7.2V (extract fan)  
**Heat recovery savings:**  
40 kW  
**Heat recovery efficiency:**  
79.3%

Electrical supply (V/ph/Hz)	230		
Maximum input current (A)	31.7		
Maximum fanpower (kW)	6.6		
<b>Weight &amp; size</b>			
Extract fan section (kg)	96		
Supply fan section (kg)	87		
Heat exchanger section (kg)	365		
Fresh air filter (kg)	63		
Extract air filter (kg)	54		
Recirculation damper (kg)	75		
Total (kg)	740		
Size (mm)	3211 x 2758		
Height (mm)	544		
<b>Filter</b>			
Fresh air filter	F7		
Extract air filter	M5		
<b>Speed</b>			
	1	2	3
Supply air volume (m <sup>3</sup> /h)	1475	2785	4500
Extract air volume (m <sup>3</sup> /h)	1575	2950	4500
Sound pressure level at 1m (dB(A))	40	53	65
Efficiency (%)	84.4	81.5	79.3
External air pressure loss (supply) (Pa)	22	77	200
<b>Operating modes</b>			
Heat recovery	*	*	*
Recirculation	*	*	*
Night cooling		*	
Free cooling		*	*
Heating/cooling with room temperature control			
Heating/cooling with supply air temperature control			
Automatic mode	*	*	*
Smoke extraction			*

## MAXIMUM IN-DUCT SOUND POWER LEVELS

Heating/cooling	Per octave band in the medium frequency, in dB (Hz)								L <sub>W</sub>
	63	125	250	500	1000	2000	4000	8000	
Supply air to room	71.9	74	86.7	78.8	80.3	79.8	77.5	71.5	86.2
Extract air from room	69.1	70.3	81.8	74.1	68.7	70.1	67.8	62.8	78
Exhaust air to outside	71.9	74	86.7	78.8	80.3	79.8	77.5	71.5	86.2
Fresh air from outside	69.1	70.3	81.8	74.1	68.7	70.1	67.8	62.8	78

- Sound power level dB(A) (L<sub>W</sub> re. 10<sup>-12</sup>W) • Supply fan operating at 4500m<sup>3</sup>/h at 300Pa external static pressure.
- Extract fan operating at 4500m<sup>3</sup>/h at 150Pa external static pressure

## CASING SOUND POWER LEVEL (L<sub>WA</sub> RE. 10<sup>-12</sup> W)

Speed	
10V DC (high speed) (dB(A))	78
8V DC (dB(A))	75
6V DC (dB(A))	68
5V DC (dB(A))	62

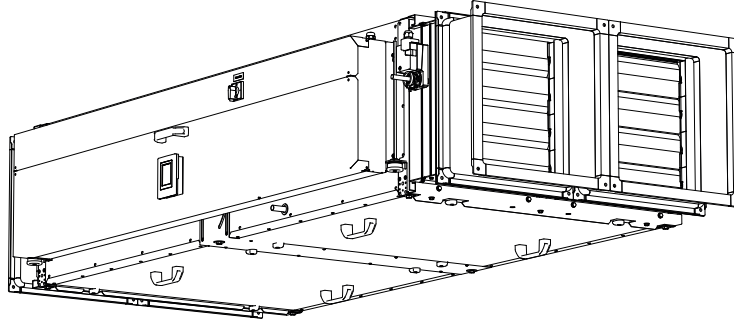
## SOUND PRESSURE LEVEL FOR A TYPICAL ROOM (L<sub>PA</sub> RE. 2 X 10<sup>-5</sup> N/M<sup>2</sup>)

Speed	
10V DC (high speed) (dB(A))	70
8V DC (dB(A))	67
6V DC (dB(A))	60
5V DC (dB(A))	54

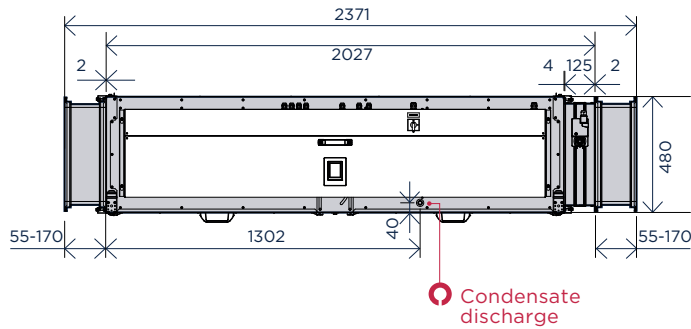


# DRAWINGS

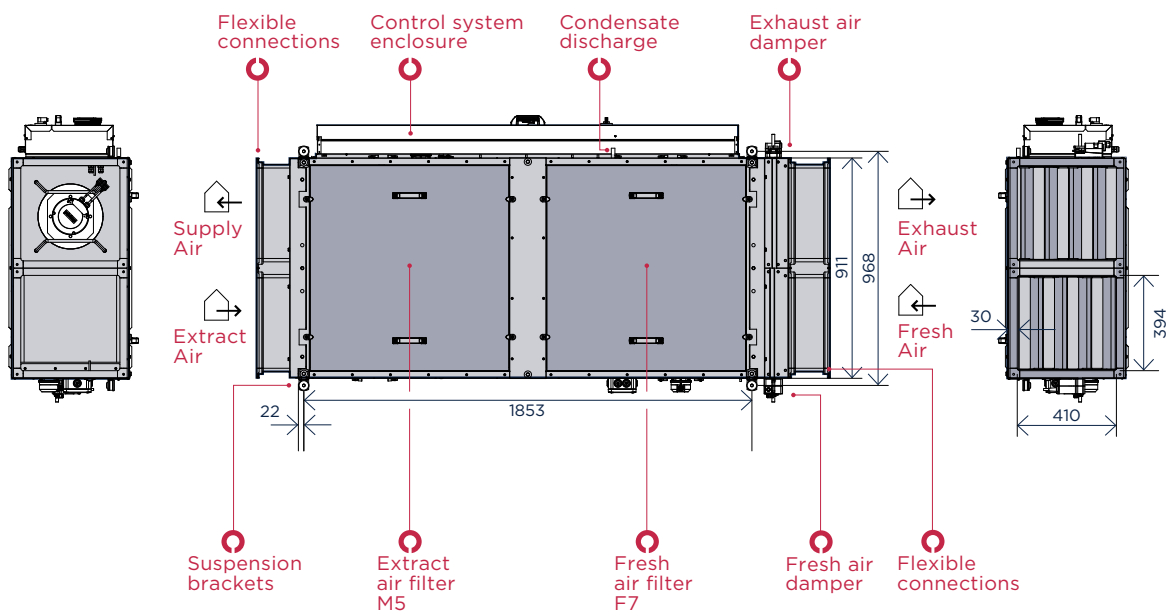
air2air HR12



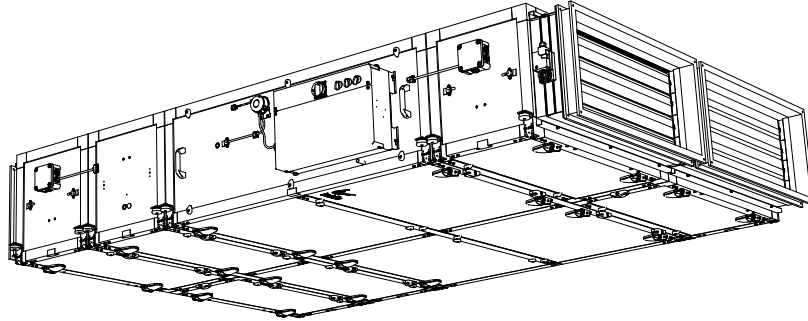
## UNIT OVERVIEW



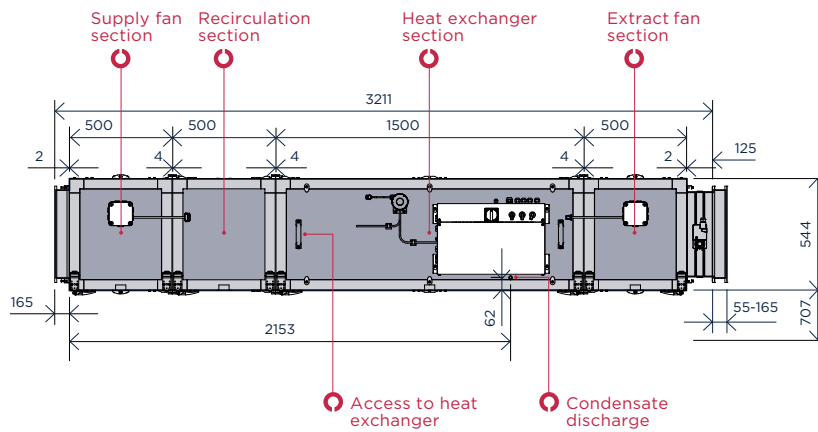
## UNIT DESCRIPTION



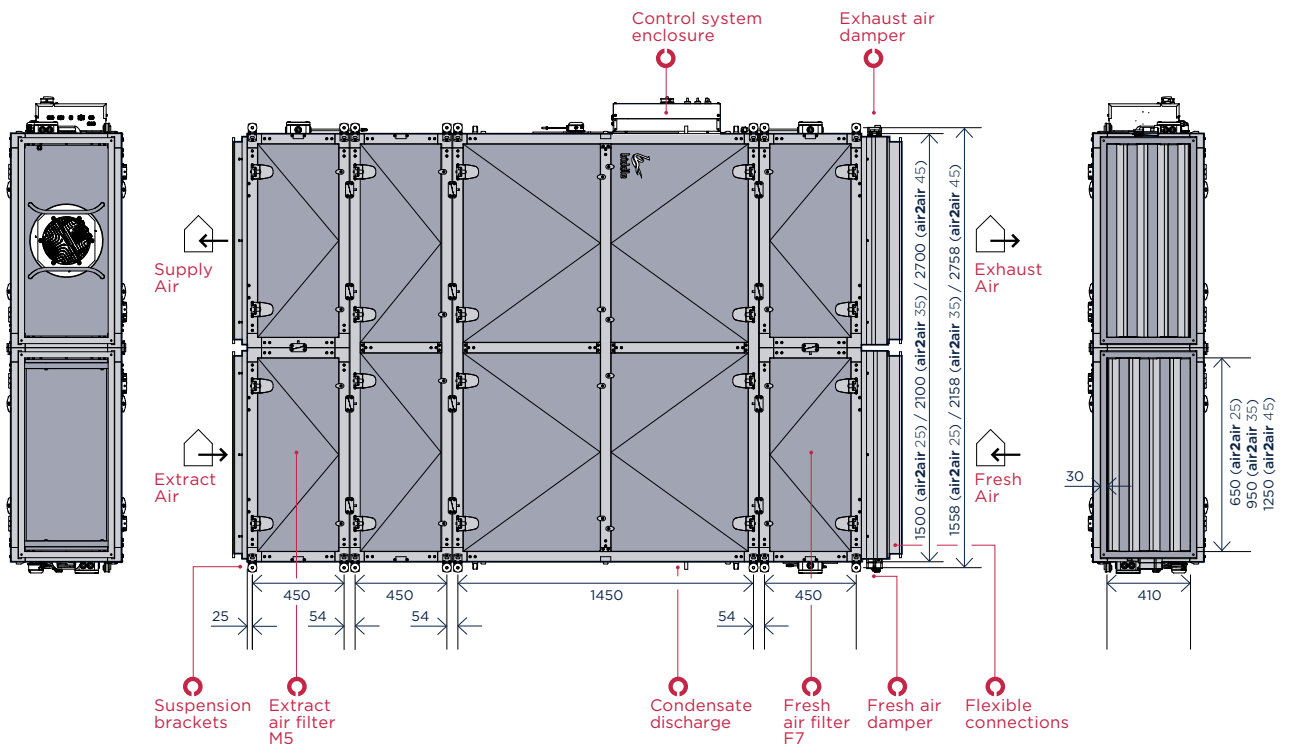
View from the bottom of the unit.  
Please note the drawing is for description purposes only and does not include options



### UNIT OVERVIEW



### UNIT DESCRIPTION



View from the bottom of the unit.  
Please note the drawing is for description purposes only and does not include options

## SPECIFICATIONS

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### CASING

Zinc plated sheet steel with insulated panels.

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### COLOURS

air2air HR12/25/35/45 are supplied in stainless steel. (other RAL colours available on request).

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### MOTOR / FAN ASSEMBLY

air2air HR12/25/35 have two fans : Supply and extract. Both radial backward curved with an aluminium impeller and external rotor motor with EC technology. air2air HR45 - Four fans: Two supply and two extract. All are radial backward curved with an aluminium impeller and external rotor motor with EC technology. Thermal contacts automatically break the electric circuit in the event of the motor overheating.

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### COUNTERFLOW PLATE HEAT EXCHANGER

Eurovent certified, high efficiency, counterflow plate heat exchanger. Made from thin aluminium plates arranged cross-wise to form parallel air passages.

### AIR FILTERS

Fresh air filter type F7. Extract air filter type M5.

The b-touch controller provides an error when the air filter needs to be replaced or cleaned. An indicator light is available as an accessory if the b-touch controller is not specified.

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### ELECTRICAL CONNECTIONS

1 phase electrical supply (1L+N+E) from an integral switched spur provides power for fans and control equipment. Installation should be sized in accordance with the following:

- ⊕ Electrical supply = 230V / 1ph / 50Hz
- ⊕ Rated electrical power input =  
1040W (air2air HR12), 1660W (air2air HR25)  
or 2760W (air2air HR35), 6744W (air2air HR45)  
- with both fans on maximum speed (10V DC control voltage)
- ⊕ Rated current = 4.8 A (air2air HR12),  
7.2 A (air2air HR25) or 12 A (air2air HR35),  
32.42 A (air2air HR45) - with both fans on  
maximum speed (10V DC control voltage)



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St. Mary's Road  
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**T** +44 (0) 2476 384 233  
**E** sales@biddle-air.co.uk  
**www.biddle-air.co.uk**



**Biddle**

Every effort has been made to ensure descriptions are correct at the time of print.  
Errors and omissions excepted. AIR2AIR|V2.1|04|2022