DAIKIN

INDOOR AIR QUALITY

Energy Recovery Ventilator (ERV)

MADE IN SAUDI ARABIA

The importance of good indoor air quality

According to the World Health Organization (WHO) **"Air pollution from both outdoor and indoor sources represents the single largest environmental risk to health globally"**, and causes 7 million deaths a year, worldwide.

On average, people spend 90% of their lives indoors (and some, such as the elderly, even more). This has caused the level of indoor air pollutants to increase 2-5 times higher than outdoor levels.

Indoor air pollution can lead to serious short and long-term health problems. There has also been growing evidence that air pollution impacts mental health and may be a factor in conditions such depression and bipolar disorder. It may also have a detrimental effect on children's learning ability, patient recovery and workforce productivity.

For building owners, poor indoor air quality (and poor indoor environments in general) can hit the bottom line: demands from leaseholders and tenants can result in having to carry out costly remedial works to both the building fabric and M&E systems (from lighting to climate control). This can lead to higher running costs and potentially affect market and rental values.

Fresh and Pure Indoor Air

To create the perfect indoor climate, there are 5 main components to consider when measuring the quality of indoor air and controlling it using our range of ventilation solutions

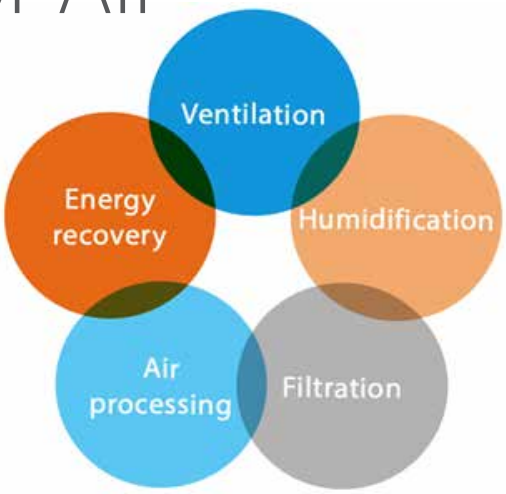
Ventilation: ensures the provision of fresh air

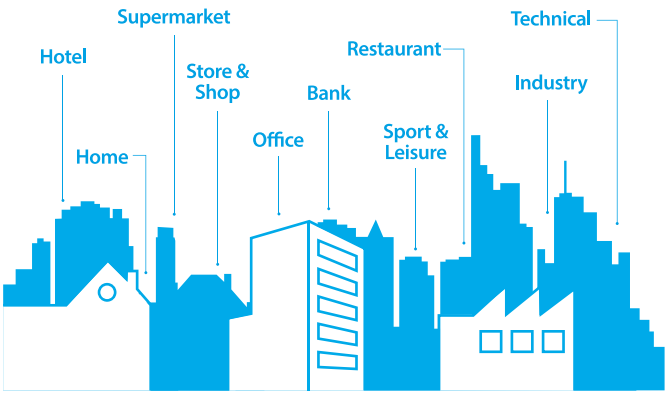
Energy recovery: recovers heat and moisture from outgoing air to maximize comfort and efficiency

Air processing: heats or cools incoming fresh air to maximize comfort and minimize the load on the air conditioning installation

Humidification: optimizes the balance between indoor and outdoor humidity

Filtration: removes dust, pollution, and odours from the air





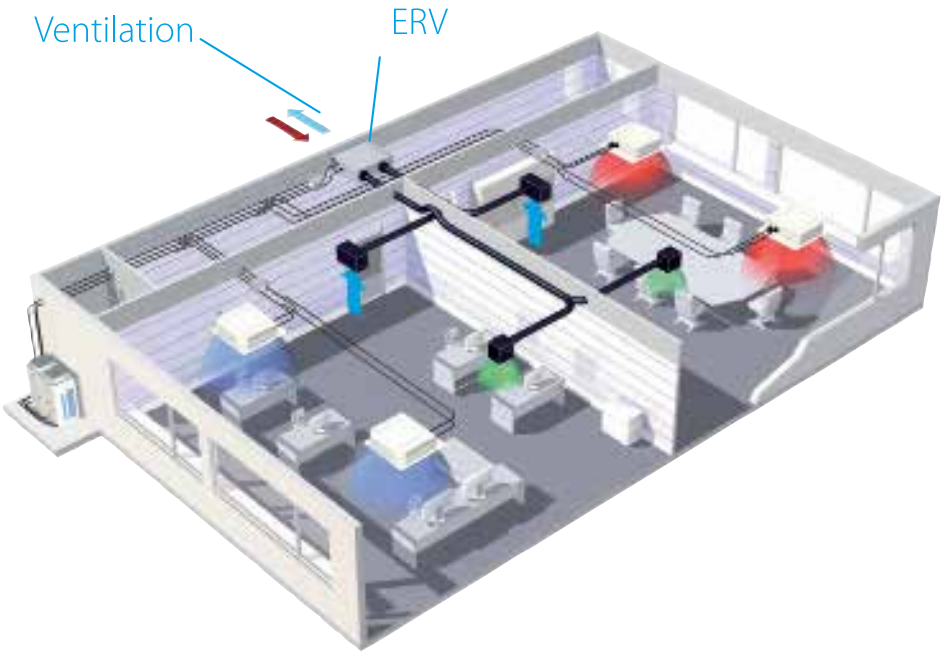
Delivering Fresh Air and Clean Air

While the airtight infrastructure of today's modern buildings guarantees superior insulation and energy efficiency, it also means there can be a lack of fresh air, which can cause humidity, microbes, and allergens to accumulate. To solve this issue, Daikin offers a variety of ventilation solutions to provide fresh and clean air in the most efficient way.

Energy Recovery Ventilator (ERV)

Daikin Energy Recovery Ventilator (ERV) Unit is a complete system, where the ventilation rate is controlled via supply and extract fans. An air-to-air heat exchanger transfers heat from the extracted air into the incoming supply fresh air and precool the fresh outside air, this helps to prevent energy losses from over ventilation while improving indoor air quality

Ideal for Residential and commercial applications to provide ventilation air to the space at lower temperatures and maintain outdoor air changes (ACH) to eliminate air borne infections.

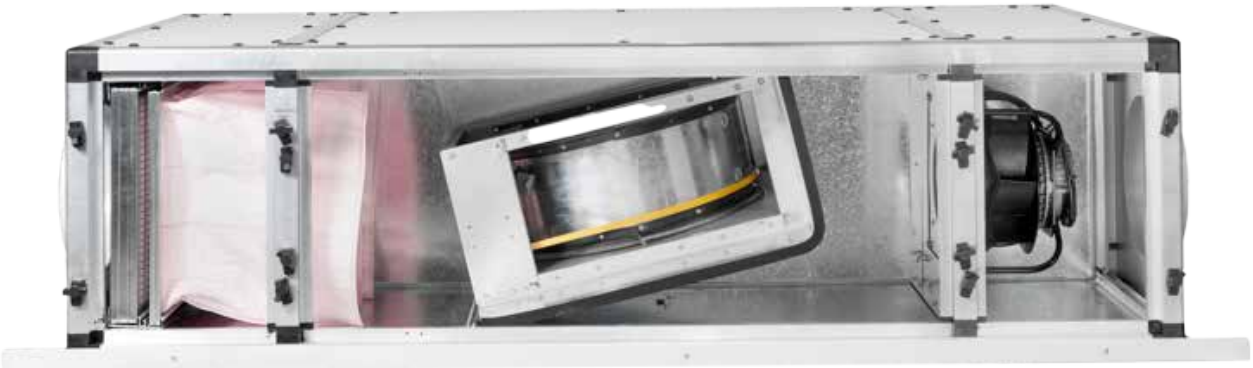


Efficient solution

Daikin ERV is equipped with EC Fan to ensure lower power consumption and Sorption, molecular sieve 3Å Energy Recovery Wheel to recover both sensible and latent heat ensuring higher heat exchange with lower energy consumption due to lower pressure drop.

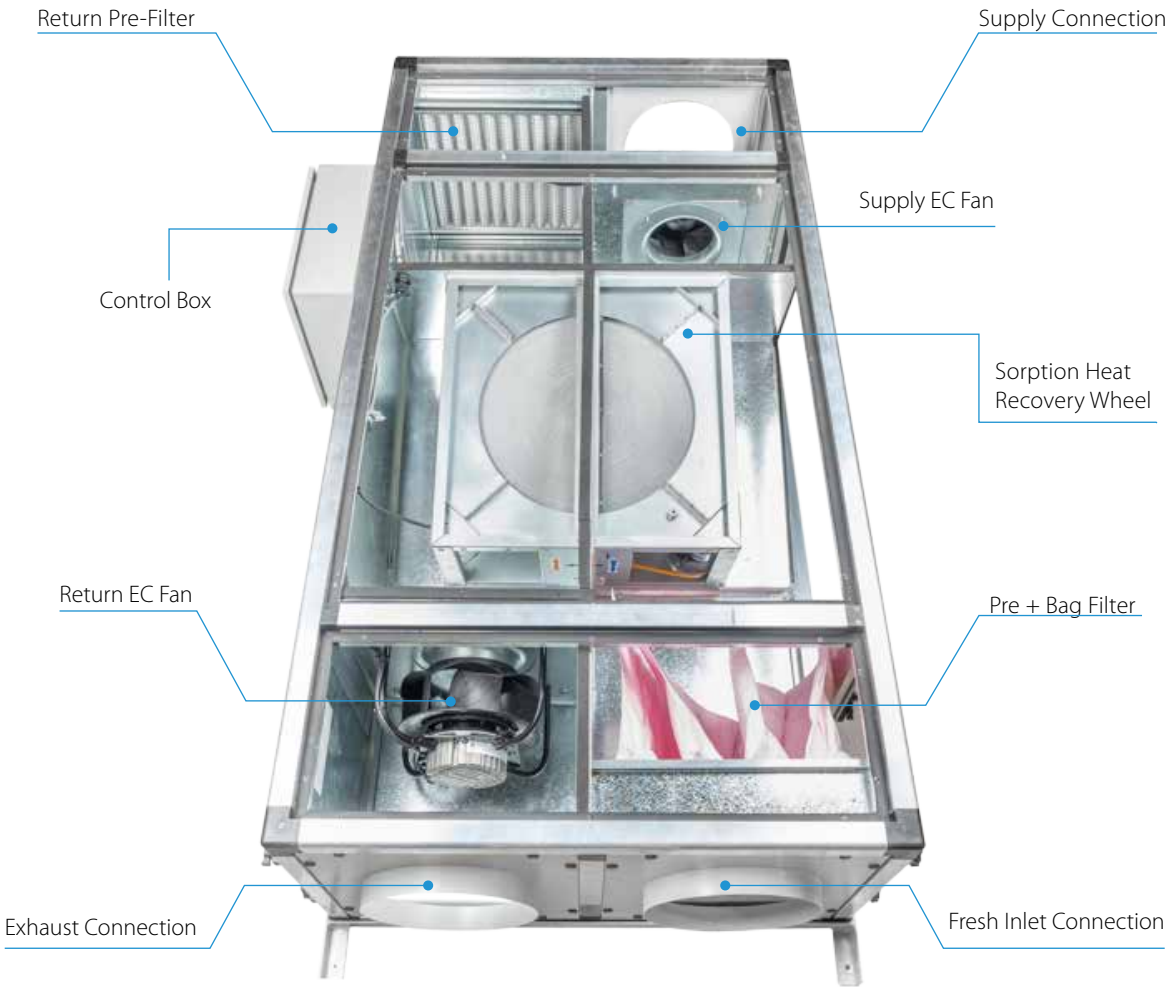
Product Highlights

- 4 Sizes Covering Nominal Airflow of 250, 500, 750 & 1000 CFM
- Double Skin Casing with 42mm thick insulation
- Compact Horizontal Design ideal for Ceiling application
- Multiple filtration stages on supply side
- Energy saving ventilation via 3Å Energy Recovery Wheel and EC Fans
- Suitable for power supply 220-240V/1Ph/50-60 Hz



Unit Components

Unit Diagram



Component Description

Frame & Panel

- Profile made of extruded aluminum alloy
- Internally rounded Profiles (10mm), ensuring frame is flush with the internal housing surfaces and completely smooth to avoid dirt accumulation
- Double chambered profiles ensuring screws are totally concealed and there are no projections inside the unit
- Structure is completed with three way connecting corners made of glass reinforced nylon
- 42mm Double skin panel with PIR insulation (Polyisocyanurate insulation), overall density of 40-42 kg/m^3 and thermal conductivity of 0.02 W/m °K.
- External Skin 0.7 mm thick Precoated Steel and 0.5 mm thick G90 galvanized steel inner skin

Prefilter

- Efficiency Class G4(EN779) / MERV 8
- Multipleat filters made from polyester synthetic media with PVC coated galvanized wire mesh
- High Dust holding capacity with longer service life
- Mettalic Frame made of Galvanized steel

Bag Filter

- Efficiency Class F7 (EN779) / MERV 13
- High-Loft, layered, melt blown synthetic media with non-shedding, water resistant
- Ultrasonically welded media ensuring optimum media utilization and eliminates leakage
- Metallic Frame made of Galvanized steel

Heat Recovery wheel

- Sorption, molecular sieve 3Å, Rotor to recover sensible heat and latent heat
- Storage matrix made of aluminum foil set up of alternating layers of flat and corrugated foils
- Foil layers stabilized together by means of interior radial spokes, fixed at hub and rim for long term stability
- Geared motor for constant velocity at maximum rotational speed

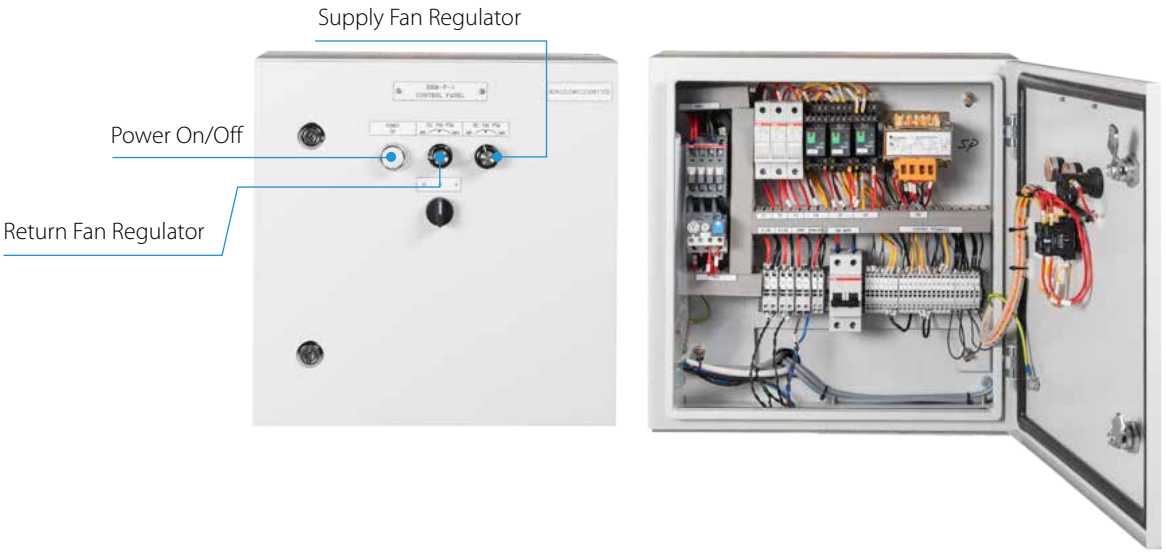
Component Description

High Efficiency EC Fan

- High efficiency backward curved impeller.
- External rotor motor with integrated control electronics. IE4 efficiency motors with Permanently lubricated ball bearings

Control Box

- IP 66 enclosure
- Supply and Return fan regulator
- Manual and Auto switch



Technical Performance Specification

Fresh Air Temperature 48°C DB / 31.6°C WB

ERV Series			**250D**	**500D**	**750D**	**1000D**
Nominal Supply Airflow		CFM	250	500	750	1000
Nominal Return Airflow		CFM	215	425	640	850
Nominal Supply Airflow		Lps	118	236	354	472
Nominal Return Airflow		Lps	102	201	302	401
Supply Fan ESP		Pa	75	75	75	75
Return Fan ESP		Pa	75	75	75	75
Outside Air DB/WB		°C	48 / 31.6	48 / 31.6	48 / 31.6	48 / 31.6
Return Air DB/WB		°C	24 / 17	24 / 17	24 / 17	24 / 17
Supply Air DB/WB		°C	32.9 / 23.7	33.8 / 24.2	33.8 / 24.2	33.7 / 24
Heat Wheel	Rotor Type		Sorption	Sorption	Sorption	Sorption
	Dia	mm	400	500	600	700
	Effectiveness [3]	%	73.3	69.8	69.3	70.1
	Motor	kW	0.04	0.04	0.04	0.04
Dimensions	Length	mm	1940	1940	1940	1940
	Width	mm	1000	1000	1000	1000
	Height	mm	550	550	550	550
Net Weight		Kg	196	215	221	228
Power Supply			220-240V/1Ph/50-60 Hz			
Fan Type			EC Fan	EC Fan	EC Fan	EC Fan
Supply Fan	Fan Power Input [1]	W	90	183	244	331
	Fan Operating Current [1]	A	0.8	0.8	1.1	1.5
	Fan Nominal Power	W	169	500	500	500
	Fan Nominal Current	A	1.35	2.3	2.3	2.3
Return Fan	Fan Power Input [1]	W	46	99	132	180
	Fan Operating Current [1]	A	0.4	0.5	0.6	0.8
	Fan Nominal Power	W	169	500	500	500
	Fan Nominal Current	A	1.35	2.3	2.3	2.3
Sound Pressure Level [2]		dBA	53	56	53	56

Notes

1. Power Input and Operating current at design air flow and ESP
2. Sound Pressure level @ 1 meter. Simple source in free field, Semi-Spherical propagation
3. Temperature Effectiveness

Technical Performance Specification

Fresh Air Temperature 46°C DB / 19°C WB

ERV Series			**250D**	**500D**	**750D**	**1000D**
Nominal Supply Airflow		CFM	250	500	750	1000
Nominal Return Airflow		CFM	215	425	640	850
Nominal Supply Airflow		Lps	118	236	354	472
Nominal Return Airflow		Lps	102	201	302	401
Supply Fan ESP		Pa	75	75	75	75
Return Fan ESP		Pa	75	75	75	75
Outside Air DB/WB		°C	46 / 19	46 / 19	46 / 19	46 / 19
Return Air DB/WB		°C	24 / 17.0	24 / 17.0	24 / 17.0	24 / 17.0
Supply Air DB/WB		°C	32.1 / 16.8	32.9 / 17.0	33.0 / 16.0	32.9 / 17.1
Heat Wheel	Rotor Type		Sorption	Sorption	Sorption	Sorption
	Dia	mm	400	500	600	700
	Effectiveness [3]	%	73.3	69.8	69.3	70.1
	Motor	kW	0.04	0.04	0.04	0.04
Dimensions	Length	mm	1940	1940	1940	1940
	Width	mm	1000	1000	1000	1000
	Height	mm	550	550	550	550
Net Weight		Kg	196	215	221	228
Power Supply			220-240V/1Ph/50-60 Hz			
Fan Type			EC Fan	EC Fan	EC Fan	EC Fan
Supply Fan	Fan Power Input [1]	W	90	183	244	331
	Fan Operating Current [1]	A	0.8	0.8	1.1	1.5
	Fan Nominal Power	W	169	500	500	500
	Fan Nominal Current	A	1.35	2.3	2.3	2.3
Return Fan	Fan Power Input [1]	W	46	99	132	180
	Fan Operating Current [1]	A	0.4	0.5	0.6	0.8
	Fan Nominal Power	W	169	500	500	500
	Fan Nominal Current	A	1.35	2.3	2.3	2.3
Sound Pressure Level [2]		dBA	53	56	53	56

Notes

1. Power Input and Operating current at design air flow and ESP
2. Sound Pressure level @ 1 meter. Simple source in free field, spherical propagation
3. Temperature Effectiveness

Technical Performance Specification

Fresh Air Temperature 34°C DB / 32°C WB

(As per Dubai Green building system)

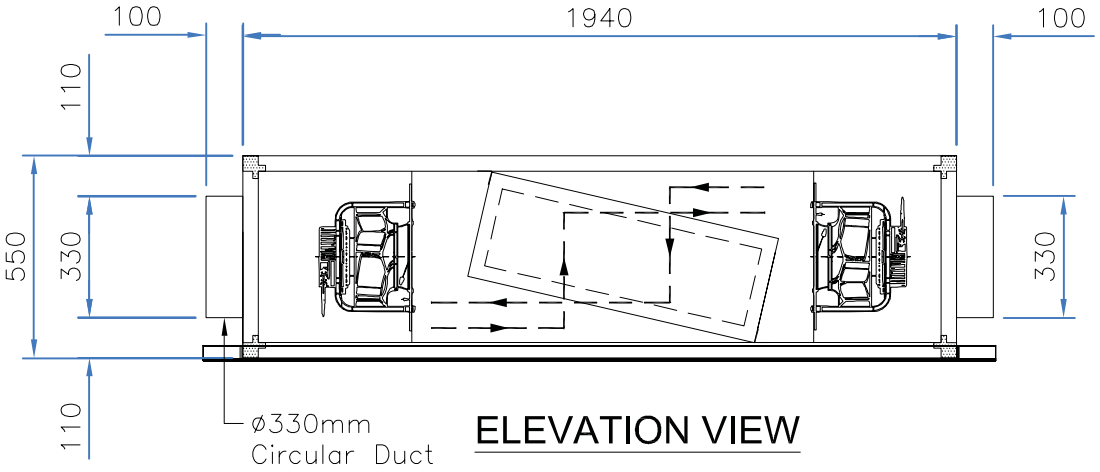
ERV Series			**250D**	**500D**	**750D**	**1000D**
Nominal Supply Airflow		CFM	250	500	750	1000
Nominal Return Airflow		CFM	215	425	640	850
Nominal Supply Airflow		Lps	118	236	354	472
Nominal Return Airflow		Lps	102	201	302	401
Supply Fan ESP		Pa	75	75	75	75
Return Fan ESP		Pa	75	75	75	75
Outside Air DB/WB		°C	34 / 32	34 / 32	34 / 32	34 / 32
Return Air DB/WB		°C	24 / 17	24 / 17	24 / 17	24 / 17
Supply Air DB/WB		°C	27.7 / 24.2	28.1 / 24.6	28.1 / 24.6	28 / 24.4
Heat Wheel	Rotor Type		Sorption	Sorption	Sorption	Sorption
	Dia	mm	400	500	600	700
	Effectiveness [3]	%	73.3	69.8	69.3	70.1
	Motor	kW	0.04	0.04	0.04	0.04
Dimensions	Length	mm	1940	1940	1940	1940
	Width	mm	1000	1000	1000	1000
	Height	mm	550	550	550	550
Net Weight		Kg	196	215	221	228
Power Supply			220-240V/1Ph/50-60 Hz			
Fan Type			EC Fan	EC Fan	EC Fan	EC Fan
Supply Fan	Fan Power Input [1]	W	90	183	244	331
	Fan Operating Current [1]	A	0.8	0.8	1.1	1.5
	Fan Nominal Power	W	169	500	500	500
	Fan Nominal Current	A	1.35	2.3	2.3	2.3
Return Fan	Fan Power Input [1]	W	46	99	132	180
	Fan Operating Current [1]	A	0.4	0.5	0.6	0.8
	Fan Nominal Power	W	169	500	500	500
	Fan Nominal Current	A	1.35	2.3	2.3	2.3
Sound Pressure Level [2]		dBA	53	56	53	56

Notes

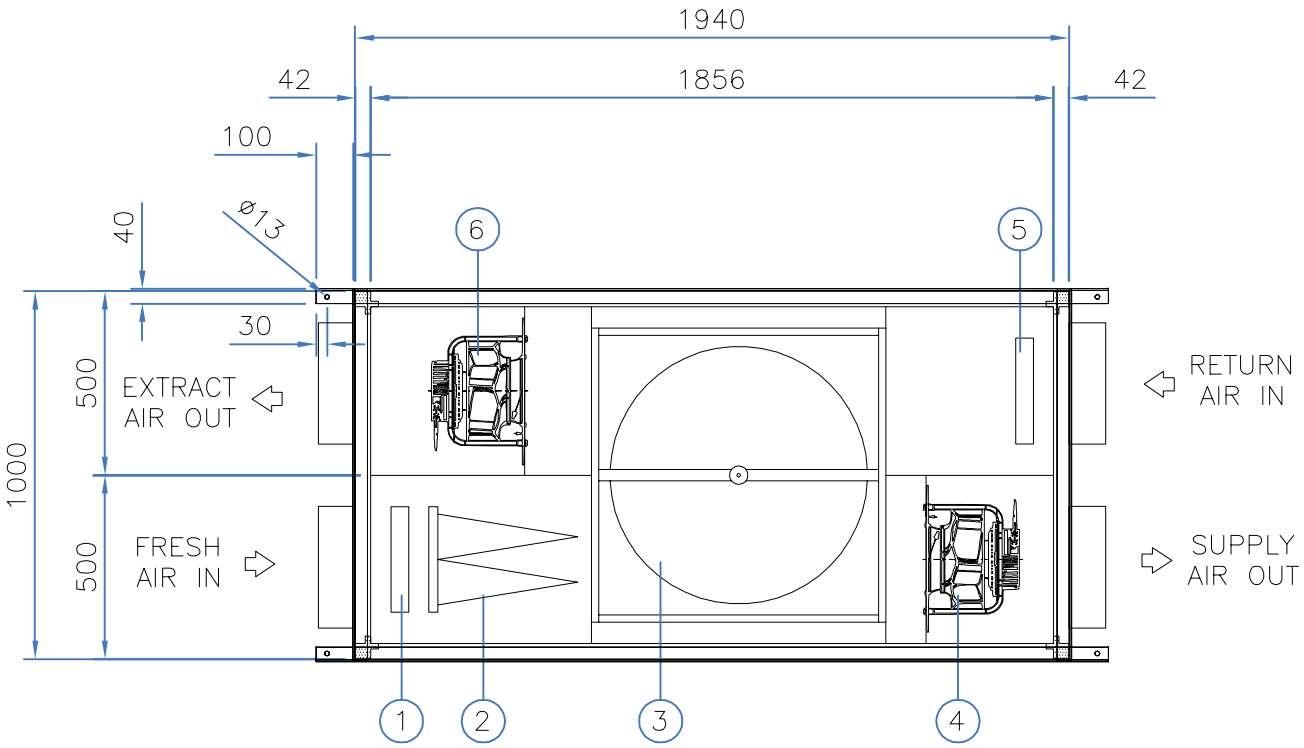
1. Power Input and Operating current at design air flow and ESP
2. Sound Pressure level @ 1 meter. Simple source in free field, spherical propagation
3. Temperature Effectiveness

Dimensional Drawings (Ceiling Suspended)

(250D,500D,750D,1000D)



ELEVATION VIEW

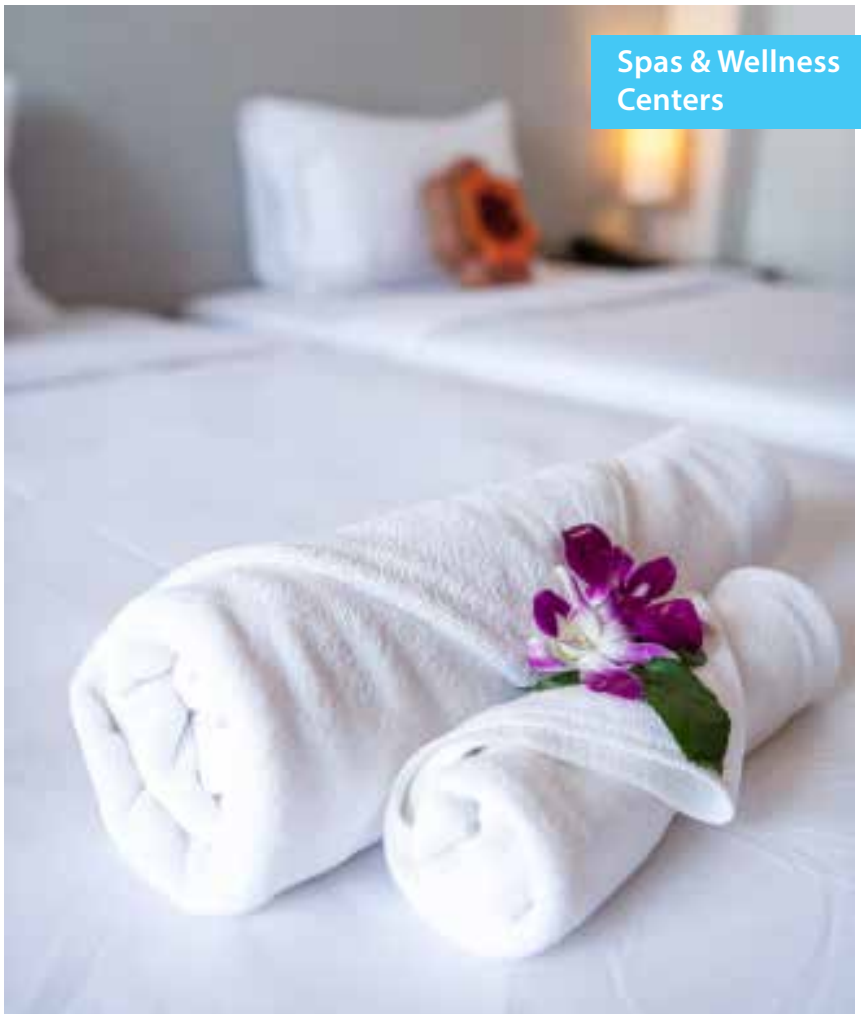


PLAN VIEW

LEGENDS

① 2"THICK PRE FILTER | ② 20"THIC BAG FILTER | ③ HEAT WHEEL | ④ EC FAN SUPPLY | ⑤ 2"THICK FLAT FILTER | ⑥ EC FAN RETURN

Applications



Guide Specifications

Casing

AHU Profile shall be made of extruded aluminum alloy. Substitutions including galvanized painted profile or Frameless design will not be permitted

Profiles shall be internally rounded (10mm), ensuring that frame is flush with the internal housing surfaces and completely smooth to avoid dirt accumulation and guarantee excellent cleanability

Unit casings shall be double skin with 42 mm thick PIR insulation (Polyisocyanurate insulation) CFC free sandwiched between 0.7 mm thick Precoated Steel outer skin and 0.5 mm thick G90 galvanized steel inner skin. Single skin casing will not be permitted.

Filters

Unit should be equipped with 2 stage filtrations for the supply air stream and Prefilter for the extract air stream

Prefilter shall have an efficiency of MERV 8, when tested as per ASHRAE 52.2

Prefilters should have the highest dust-holding capacity to ensure longer life for the filter. Filters should be UL-classified.

Bag filters shall have an efficiency of MERV 13, when tested as per ASHRAE 52.2

Heat Wheel

The rotor media shall be coated with a combination of a corrosion-prohibiting and non-migrating adsorbent Molecular Sieve 3A desiccant to recover sensible heat and latent heat to a very high degree

The Rotor shall be constructed of alternate layers of corrugated and flat aluminum foil. The Rotor surface shall be reinforced to achieve a polished smooth face surface to ensure negligible leakage & which provides optimal sealing surface for brush seals

Foil layers shall be stabilized together by means of interior radial spokes, fixed at hub and rim in special design for long term form stability

Purge sector shall be provided to limit cross contamination at appropriate design conditions

Geared motor shall be provided to ensure constant velocity at maximum rotational speed

EC Fan

Single inlet: direct drive EC Plug Fans shall be provided

High-performance radial impeller shall be with circumferential diffuser mounted on an electronically commutated external rotor

Motor shall be with integrated control electronics. Radial impeller shall be made of PP plastic blades

EC external-rotor motor efficiency class shall be IE4 without “rare earth” magnets being used, with maintenance-free ball bearings and permanent lubrication. Type of protection shall be minimum IP54

Motor and Impeller shall be statically and dynamically balanced in two planes to balancing grade G 4.0 as per DIN / ISO 1940

About
Saudi AHU Factory

Daikin's factory based in Saudi, Riyadh is a well-equipped facility built to design, manufacture, and assemble a variety of products and solutions in Daikin's extensive range.

Factory Certifications

DAIKIN

www.daikinmea.com

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