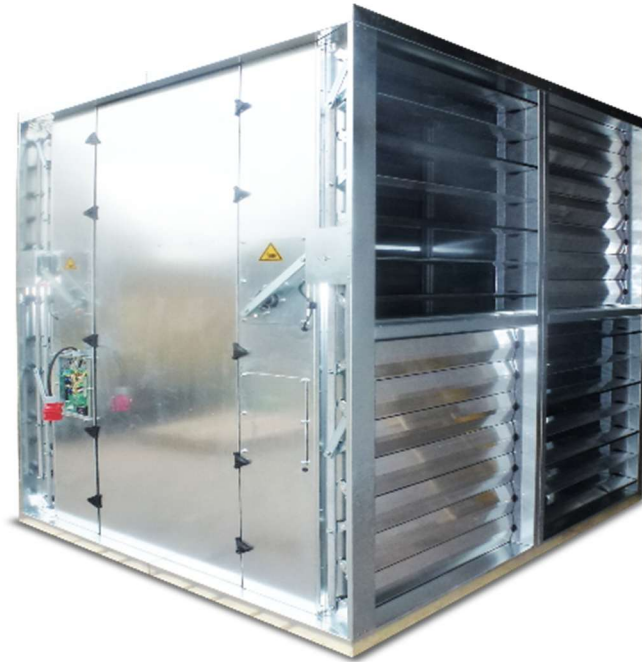




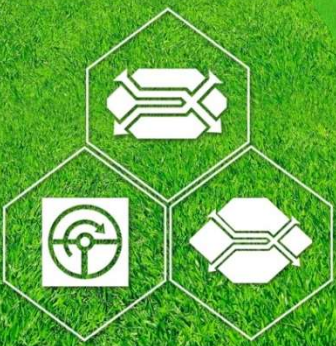
ERI CORPORATION

ENERGY RECOVERY AND VENTILATION COMPONENTS



ACCUAIR
high-performance
regenerative heat recovery system

SAVING ENERGY TODAY FOR A
BRIGHTER TOMORROW



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Contact:

<https://ericorporation.com/>

info@ericorporation.com

ACCUAIR advantages and features



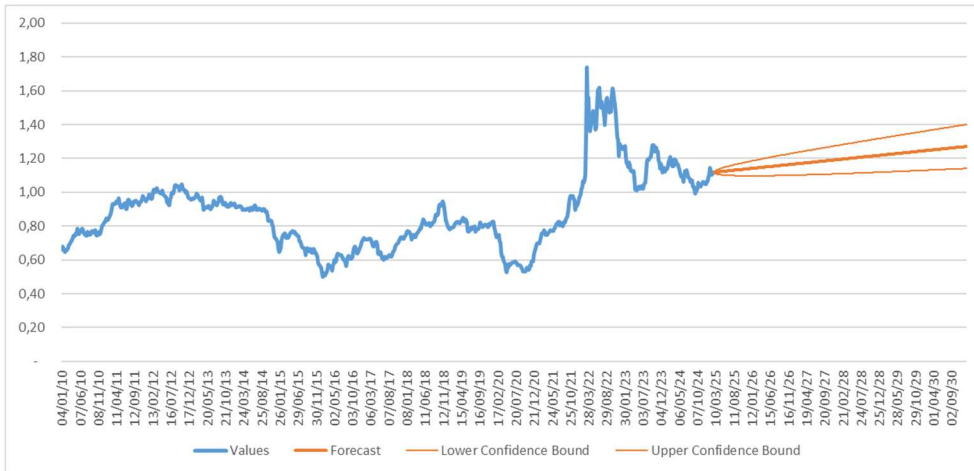
Main advantages and features

- The regenerative heat recovery system is very efficient, up to 93%.
- Almost the entire supply air heating load is performed by the heat exchanger during the heat recovery process.
- Post-heating or anti core freeze protection solutions, their consequent installation and their energy costs can be reduced to zero.
- In operation with low outdoor conditions due to the constant switching between outdoor and extract air the core is not prone to freezing.
- It is possible to dispense with heating systems or larger boilers for the heat requirement of ventilation. The thermal need for ventilation is significantly reduced compared to conventional systems.
- In winter the ACCUAIR system recovers the humidity contained in the exhaust air through condensation, improving the hygiene of the room climate. Humidity recovery up to 80%.
- In summer when room air is lower temperature than outdoor air it can be used to pre cool the incoming outdoor air, reducing building cooling load.
- Low air leakage thanks to the specially manufactured dampers with side seals achieve air tightness according to EN 1751 class 2.
- Integrated control for heat recovery, cold recovery and free outside air cooling. Controllable via a 0-10V signal.
- Suitable for new building and the renovation of existing ventilation systems.
- Several sizes available.
- ACCUAIR also acts as a silencer (see later values). The heat storage mass effectively dampens the noise emissions from the fans.
- The cores could be made with several materials (Plain Aluminium, Sorption Aluminium and Thermally conductive Polymer) to match best the project requirements.
- The cores can be pulled out from the side for maintenance and cleaning in accordance with the VDI 6022 standard.

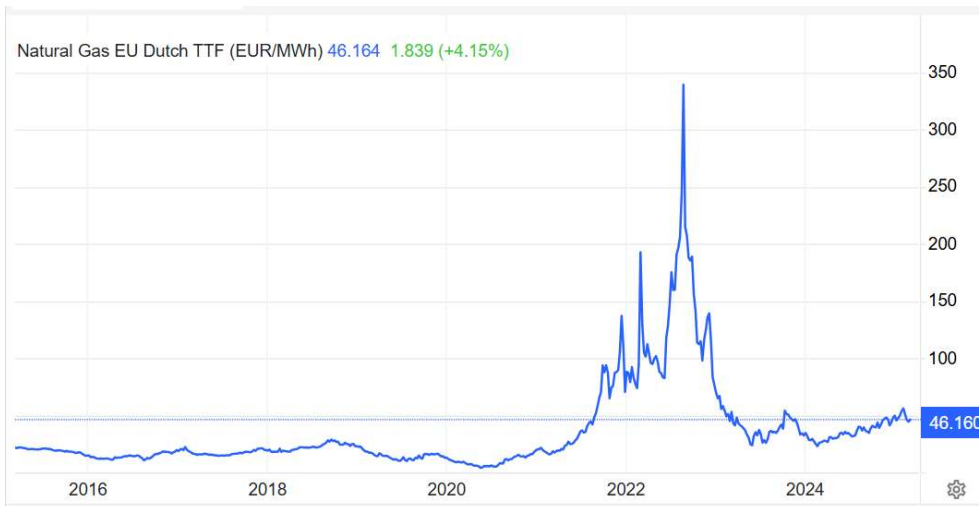
Energy saving and cost forecast

Energy cost – forecast price increase.

Included CO₂ emissions (European Commission)



Heating gas oil cost €/l – costs since 2010 with price increase forecast up to 2030.

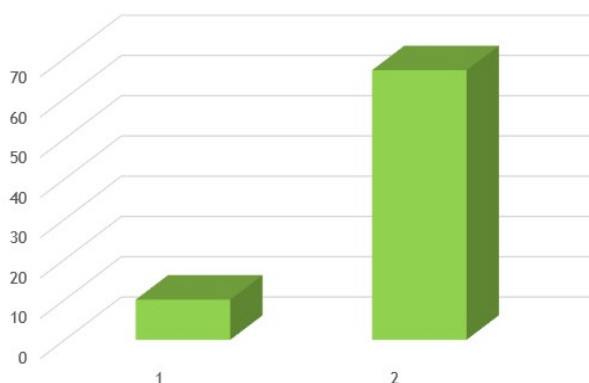


Natural gas cost €/MWh – costs since 2015 up to February 2025

Rely on the highest possible energy efficiency for your ventilation systems in order to keep your energy costs for fresh air requirements under control.

Use the most efficient heat recovery system currently available on the market.

Reduction of the heating output for the ventilation heat demand



Representation of the required heating power for a ventilation system with 10'000 m³/h at -12 °C and 20 °C supply air temperature.

1. 10 KW power connected to ACCUAIR.
2. 67 KW power connected to a plate heat exchanger with defrosting pre-heating system.

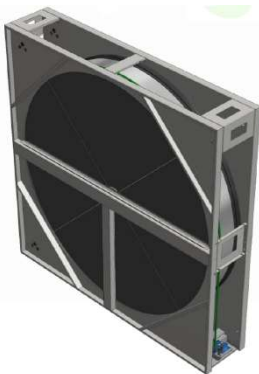
- ACCUAIR is ideal for low-energy consumption buildings.
- ACCUAIR is ideal for new buildings and old building renovation.

Performance comparison



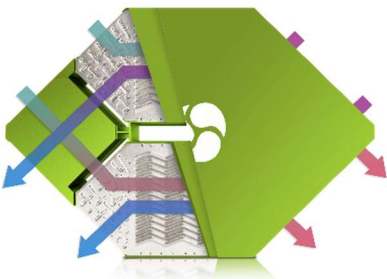
ACCUAIR SYSTEM

| | |
|--|-----|
| Heat recovery | 93% |
| Moisture recovery | 75% |
| Cross contamination at 250Pa | 3% |
| No pre-heating required | |
| No core frost protection required | |



ROTARY HEAT EXCHANGER

| | |
|--|------|
| Heat recovery | 78% |
| Moisture recovery | 46% |
| Cross contamination at 250Pa | 2,6% |
| Post-heating required | |
| No matrix frost protection required | |



COUNTERFLOW HEAT EXCHANGER

| | |
|---------------------------------------|------|
| Heat recovery | 80% |
| Moisture recovery | 0% |
| Cross contamination at 250Pa | 0,5% |
| Post-heating required | |
| Frost protection mode required | |


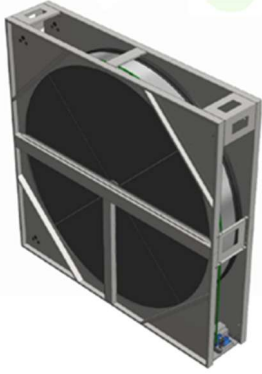


CROSSFLOW HEAT EXCHANGER

| | |
|---------------------------------------|------|
| Heat recovery | 73% |
| Moisture recovery | 0% |
| Cross contamination at 250Pa | 0,5% |
| Post-heating required | |
| Frost protection mode required | |

Performance comparison: Accuair vs. Rotary heat exchanger

Performance comparison within the winter season

| | |
|---|--|
|  |  |
| Input environmental data: | |
| OA 15000m ³ /h OA -30°C; 100% RH | RA 15000m ³ /h RA 22°C; 30% RH |
| Additional relevant data: Sorption coated Aluminium applied to the heat recovery media of these products Products dimensions H x W: 2500mm X 2500mm | |
| Output performance data: | |
| SA 18°C; 30% RH Accuair efficiency: 93% Humidity efficiency: 85% Recuperation power: 296kW | SA 12°C; 28% RH Rotary heat exchanger efficiency: 78% Humidity efficiency: 75% Recuperation power: 231kW |

Example energy costs

Heat exchangers hidden costs – energy costs

(values based on European market data)

- 1800 m² - room dimension
- Air change 5 times / hour
- 21'000m³/h – airflow volume
- City of München
- Operating hours 7:00 a.m. - 10:00 p.m., electricity cost € 0.26, heating cost € 0.13
- Weather data METEO DATA

ACCUAIR SYSTEM

| | |
|---------------------------|----------------------|
| Energy cost / electricity | 2844,00€/year |
| Energy cost / heating | 2769,00€/year |
| Total | 5613,00€/year |

ROTARY HEAT EXCHANGER

| | |
|---------------------------|----------------------|
| Energy cost / electricity | 1706,00€/year |
| Energy cost / heating | 5672,00€/year |
| Total | 7378,00€/year |

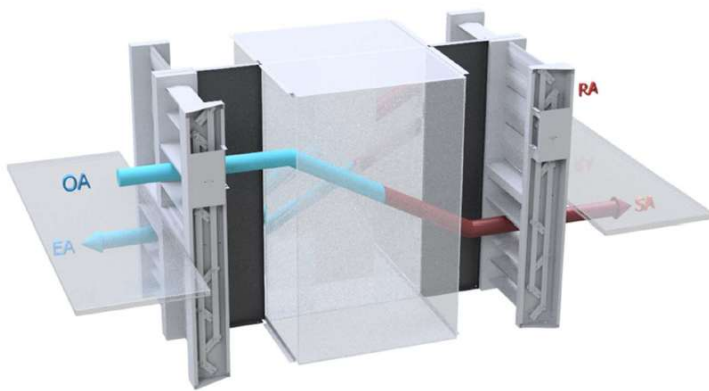
COUNTERFLOW HEAT EXCHANGER

| | |
|---------------------------|----------------------|
| Energy cost / electricity | 1649,00€/year |
| Energy cost / heating | 5669,00€/year |
| Total | 7318,00€/year |

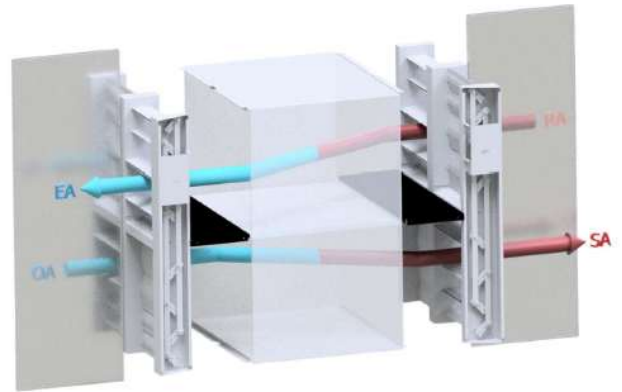
CROSSFLOW HEAT EXCHANGER

| | |
|---------------------------|----------------------|
| Energy cost / electricity | 2503,00€/year |
| Energy cost / heating | 6640,00€/year |
| Total | 9143,00€/year |

ACCUAIR function description



Air ducts on top of each other



Air ducts side by side

ACCUAIR for ventilation systems

Based on a thermally highly sensitive storage mass, the ACCUAIR heat recovery system with its up to 93% efficiency can recover almost all the energy in the exhaust air.

Moisture recovery

This regenerative storage system also recovers the moisture contained in the exhaust air in the winter months. The degree of humidity recovery is up to 80% and avoids too dry room air humidity in the winter months.

Frost protection

The ACCUAIR heat recovery system core is frost-proof down to -40°C and does not need to be protected by energy-consuming bypass systems or preheating. The system guarantees a very high level of efficiency throughout the year. External parts of the ACCUAIR such as dampers, flaps and casing parts may require control of ambient conditions to prevent frost formation on uninsulated surfaces.

Power regulation

The power regulation takes place via the time intervals of the switchover and can be regulated down from 100% to 30%. Below 30%, the blades of the damper are no longer switched and the building is freely cooled with outside air. The stepless regulation takes place via an externally controlled 0-10 V signal.

Functions

- Heat recovery adjustable from 30 to 100%
- Cold recovery adjustable from 30 to 100%
- Free cooling with outside air
- Moisture transfer 0 – 75%

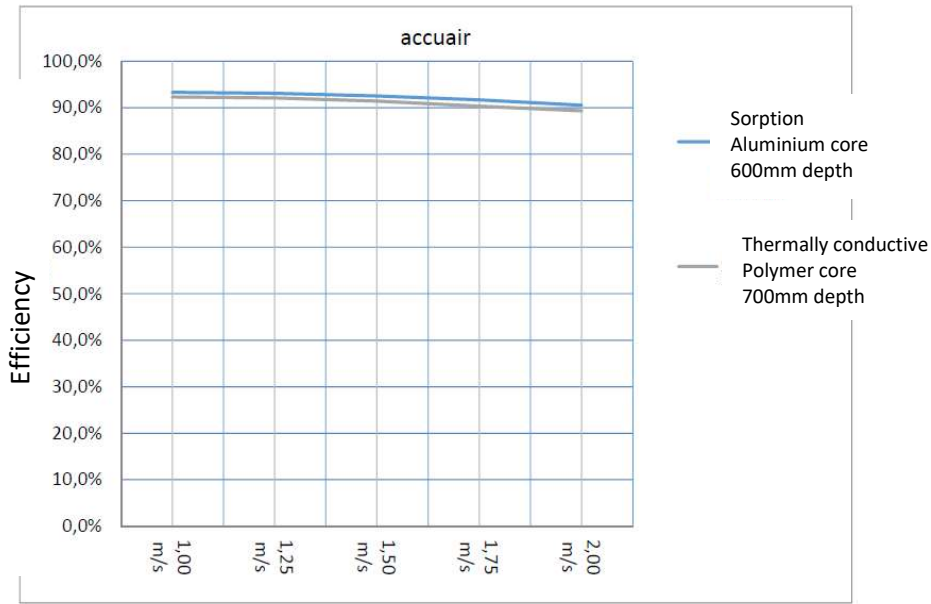
Functionality

The ACCUAIR storage mass system consists of two static cores which in winter are alternately heated by the warm exhaust air. The upstream and downstream flap systems divert the exhaust air and outside air into the respective core sector.

The core charged with heat from the extract air is used for the supply air in the next cycle. As a result, the fresh air is warmed up almost to room temperature and is fed into the building through the supply air. At the same time, the discharged reservoir of the supply air is switched back to the exhaust air flow. This core is preheated again for the next switchover cycle.

The process is the same for summer months when the storage mass is pre cooled by the room air before cooling the outdoor air.

Efficiency



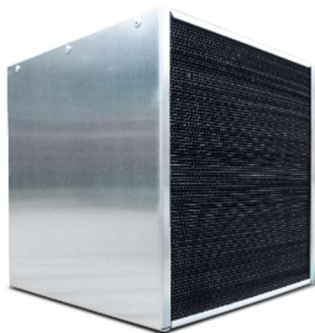
ACCUAIR SYSTEM EFFICIENCY

Thermally conductive Polymer core and Sorption Aluminium core
Measurement according to EN 308 standard

Plain Aluminium core – available
Sorption Aluminium core – available

Thermally conductive Polymer core
(here below)

Accuair installed within an AHU
(here on the right)



ACCUAIR limits and control



Application limits

- Permissible exhaust air class ETA 1
- Exhaust air class ETA 2 is only permissible if the fresh air overpressure is guaranteed to the exhaust air.

Temperature application limits

- -40°C up to +40°C
(Thermally conductive polymer core)
- -40°C preheating has to be applied

Application limits winter

- Fresh air humidity up to 100%
- exhaust air humidity up to 45%.
- Exhaust air temperature up to a maximum of 25 ° C in Winter period.

Important notice

When using additional re-humidification, no exhaust air humidity above 45% may be set at outside temperatures below 0 ° C.

Then a condensate drain will be required.

Improper use

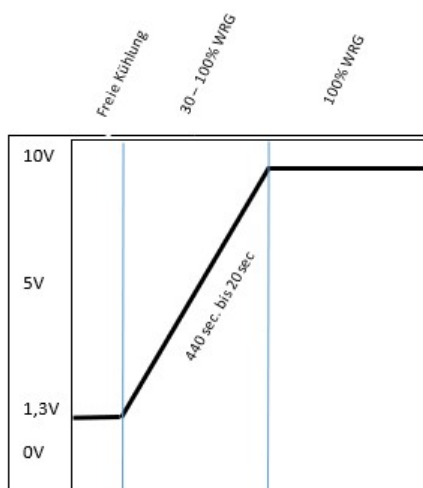
- Not suitable for explosive media.
- Not suitable for corrosive media.
- Not suitable for high temperatures.
- Not suitable for high exhaust air humidity.
- Not for exhaust air classes ETA 3, ETA 4

Power regulation

With the 0-10V signal, the intervals between the switching cycles are regulated and thus the output of the transferred thermal energy and moisture recovery in the event of condensation.

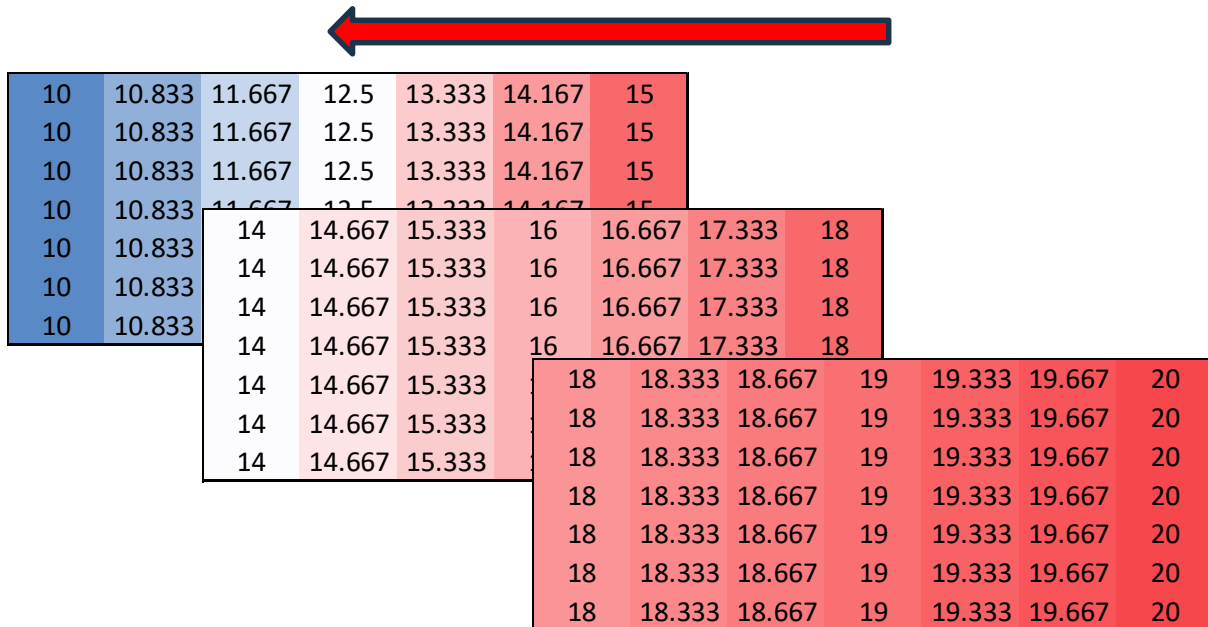
min. 20 sec. - max. 440 sec.

| | |
|-------------|---|
| 0V – 1,3V | no changeover, free cooling mode. dampers open. |
| 1,3V – 10 V | Heat recovery 30–100%. 10V = 100% WRG = 20 sec 1,3V = 30% WRG = 440 sec |

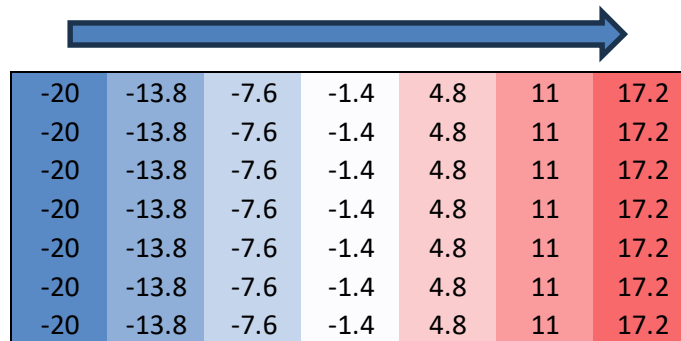


How the ACCUAIR works

As the warm extract air passes over the thermal core the temperature of the material rises



The switching of the dampers causes the cold winter air to pass over the pre warmed thermal core, raising the temperature of the incoming air



Fixing switching time at maximum efficiency can maintain almost room condition supply temperature as outside condition changes

| | | | | | | | | | | | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Switching time (s) | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Signal (V) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Heat recovery (%) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Max heat recovery (%) | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Efficiency | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Outdoor air | -20 | -18 | -16 | -14 | -12 | -10 | -8 | -6 | -4 | -2 | 0 | 2 | 4 | 6 | 8 | 10 |
| Extract air | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| Supply air | 19.06 | 19.2 | 19.34 | 19.48 | 19.62 | 19.76 | 19.9 | 20.04 | 20.18 | 20.32 | 20.46 | 20.6 | 20.74 | 20.88 | 21.02 | 21.16 |
| Exhaust air | -17.1 | -15.2 | -13.3 | -11.5 | -9.62 | -7.76 | -5.9 | -4.04 | -2.18 | -0.32 | 1.54 | 3.4 | 5.26 | 7.12 | 8.98 | 10.84 |

In mid season if room temperature rises due to internal heat gains ACCUAIR supply air temperature can be reduced by increasing switching time to reduce efficiency (or switching ACCUAIR off) to provide free cooling.

Imbalanced air flow will effect the efficiency of the heat recovery process. Reduced amounts of extract air will reduce heat recovery efficiency, it is recommended that air flows are balanced or close to balanced flow rate for maximum heat recovery potential.

ACCUAIR Dimensions

Indicative dimensions - road transport only sizing

| | | Width (mm) | | | | | | | | | | | | | | | | | |
|-------------|-------|------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 2990 | 3200 | 3400 | 3600 | 3800 | 4000 |
| Height (mm) | 875 | 1340 | 1836 | 2331 | 2827 | 3322 | 3818 | 4313 | 4809 | 5304 | 5800 | | | | | | | | |
| | 991 | 1550 | 2117 | 2683 | 3250 | 3817 | 4383 | 4950 | 5517 | 6083 | 6650 | | | | | | | | |
| | 1137 | 1750 | 2400 | 3050 | 3700 | 4350 | 5000 | 5650 | 6300 | 6950 | 7600 | 8250 | | | | | | | |
| | 1205 | 1870 | 2564 | 3257 | 3951 | 4645 | 5338 | 6032 | 6725 | 7419 | 8113 | 8806 | 9500 | | | | | | |
| | 1335 | 1870 | 2550 | 3231 | 3911 | 4591 | 5272 | 5952 | 6632 | 7313 | 7993 | 8673 | 9354 | 10000 | | | | | |
| | 1467 | 2310 | 3163 | 4015 | 4868 | 5721 | 6574 | 7426 | 8279 | 9132 | 9984 | 10837 | 11690 | 12500 | | | | | |
| | 1535 | 2390 | 3278 | 4166 | 5054 | 5941 | 6829 | 7717 | 8605 | 9493 | 10381 | 11269 | 12157 | 13000 | | | | | |
| | 1665 | 2600 | 3571 | 4541 | 5512 | 6483 | 7454 | 8424 | 9395 | 10366 | 11336 | 12307 | 13278 | 14200 | | | | | |
| | 1797 | 2850 | 3900 | 4950 | 6001 | 7051 | 8101 | 9151 | 10201 | 11252 | 12302 | 13352 | 14402 | 15400 | | | | | |
| | 1865 | 2950 | 4042 | 5134 | 6226 | 7318 | 8410 | 9502 | 10594 | 11686 | 12778 | 13871 | 14963 | 16000 | | | | | |
| | 1995 | | 4300 | 5460 | 6620 | 7779 | 8939 | 10099 | 11259 | 12419 | 13579 | 14738 | 15898 | 17000 | | | | | |
| | 2127 | | 4600 | 5842 | 7084 | 8326 | 9568 | 10810 | 12052 | 13294 | 14536 | 15778 | 17020 | 18200 | | | | | |
| | 2195 | | | 6000 | 7307 | 8613 | 9920 | 11226 | 12533 | 13839 | 15146 | 16452 | 17759 | 19000 | | | | | |
| | 2325 | | | 6450 | 7812 | 9174 | 10535 | 11897 | 13259 | 14621 | 15983 | 17344 | 18706 | 20000 | | | | | |
| | 2457 | | | 6800 | 8227 | 9654 | 11081 | 12509 | 13936 | 15363 | 16790 | 18217 | 19644 | 21000 | | | | | |
| | 2635* | | | | 8000 | 9500 | 11000 | 12500 | 14000 | 15500 | 17000 | 18500 | 20000 | 21425 | 23000 | 24500 | 26000 | 27500 | 29000 |
| | 2705* | | | | 8150 | 9711 | 11271 | 12832 | 14393 | 15954 | 17514 | 19075 | 20636 | 22118 | 23757 | 25318 | 26879 | 28439 | 30000 |
| | 2835* | | | | | 10200 | 11838 | 13477 | 15115 | 16754 | 18392 | 20031 | 21669 | 23226 | 24946 | 26585 | 28223 | 29862 | 31500 |
| | 2965* | | | | | 10700 | 12415 | 14131 | 15846 | 17562 | 19277 | 20992 | 22708 | 24337 | 26138 | 27854 | 29569 | 31285 | 33000 |
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| 3165* | | | | | 11500 | 13346 | 15192 | 17038 | 18885 | 20731 | 22577 | 24423 | 26177 | 28115 | 29962 | 31808 | 33654 | 35500 | |
| 3295* | | | | | 12000 | 13923 | 15846 | 17769 | 19692 | 21615 | 23538 | 25462 | 27288 | 29308 | 31231 | 33154 | 35077 | 37000 | |
| 3365* | | | | | 12250 | 14215 | 16181 | 18146 | 20112 | 22077 | 24042 | 26008 | 27875 | 29938 | 31904 | 33869 | 35835 | 37800 | |
| 3495* | | | | | 12750 | 14788 | 16827 | 18865 | 20904 | 22942 | 24981 | 27019 | 28956 | 31096 | 33135 | 35173 | 37212 | 39250 | |

- Flow rate stated in m3/hour for standard volume flow rate
- Flow rate based on approximately 1.75m/s face velocity, 200Pa, 92% temperature efficiency, 80% humidity efficiency
- Units can be made to bespoke dimensions not restricted to table above
- For road transport sizing housing height up to 2605mm outside size, casing material galvanised steel (S)
- For container sea freight sizing housing height up to 2305mm outside size, casing material galvanised steel (S)
- Housing greater than this casing constructed using aluminium framework (P) - indicated by * above
- Approximate length galvanised steel frame, core length + 1110mm
- Approximate length aluminium frame, core length + 1360mm
- For actual selection details including performance, dimensions and weight contact our representative or visit our web site

ACCUAIR Dimensions

Indicative dimensions - container sea freight sizing

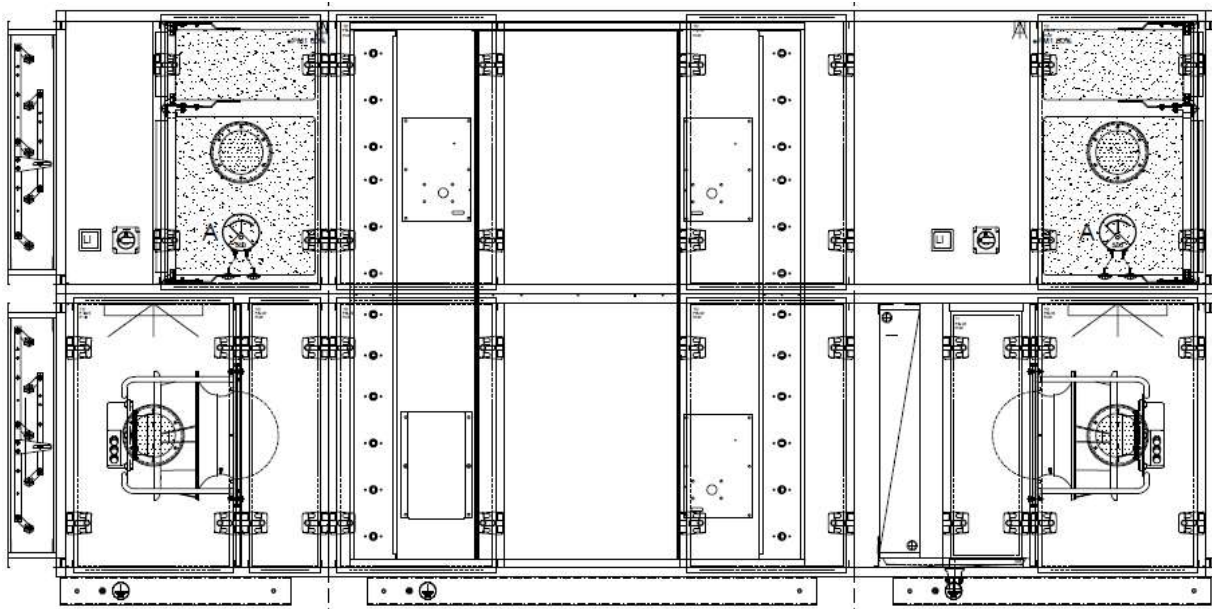
| | | Width (mm) | | | | | | | | | | | | | | | | | |
|-------------|-------|------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
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| | 2076 | | 4325 | 5492 | 6658 | 7825 | 8992 | 10158 | 11325 | 12492 | 13658 | 14825 | 15992 | 17100 | | | | | |
| | 2127 | | | 5842 | 7084 | 8326 | 9568 | 10810 | 12052 | 13294 | 14536 | 15778 | 17020 | 18200 | | | | | |
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| | 2305* | | | | 6900 | 8211 | 9521 | 10832 | 12143 | 13454 | 14764 | 16075 | 17386 | 18631 | 20007 | 21318 | 22629 | 23939 | 25250 |
| | 2375* | | | | 7150 | 8514 | 9879 | 11243 | 12607 | 13971 | 15336 | 16700 | 18064 | 19360 | 20793 | 22157 | 23521 | 24886 | 26250 |
| | 2505* | | | | 7550 | 8996 | 10443 | 11889 | 13336 | 14782 | 16229 | 17675 | 19121 | 20496 | 22014 | 23461 | 24907 | 26354 | 27800 |
| | 2635* | | | | 8000 | 9500 | 11000 | 12500 | 14000 | 15500 | 17000 | 18500 | 20000 | 21425 | 23000 | 24500 | 26000 | 27500 | 29000 |
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- Approximate length galvanised steel frame, core length + 1110mm
- Approximate length aluminium frame, core length + 1360mm
- For actual selection details including performance, dimensions and weight contact our representative or visit our web site

Air handling unit design

Fan arrangement

- For the ACCUAIR system, both fans must always be arranged on the suction side.
- Fan distance from ACCUAIR should be sufficient to ensure even air distribution across the core.
- The pressure loss of the ACCUAIR heat recovery should not exceed 250Pa.
- Connection ducts with 180 ° bends or significant reductions in the duct cross-section must be avoided. Otherwise, pressure fluctuations can occur in the duct network.



Accuair installation

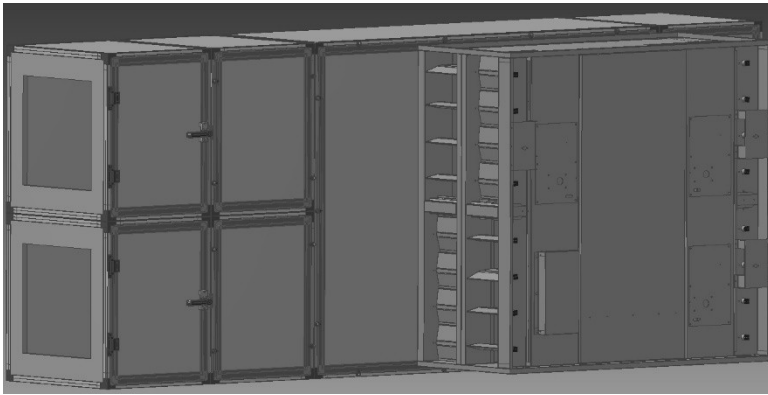
- The ACCUAIR is designed to be installed in an insulated section of an AHU.
- The ACCUAIR must be fully supported by the AHU and no AHU components or ductwork should rely on the ACCUAIR for support.
- The ACCUAIR is provided with an uninsulated casing therefore the outer surface of the casing and dampers can become cold, it is the installers responsibility to suitably ventilate or heat the ACCUAIR enclosure to prevent frost formation on the outer surface of the ACCUAIR.
- Due to the possibility of condensation on the outside of the ACCUAIR during extreme winter conditions it is recommended that the interior base of the AHU is designed in such a way to form a drain pan.

ACCUAIR sound absorption

| Octave band [Hz] | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz |
|------------------|-------|--------|--------|--------|---------|---------|---------|---------|
| Sound data [dB] | | | | | | | | |
| Aluminium | 2,2 | 4,4 | 6,2 | 7,8 | 9,2 | 10,6 | 11,7 | 12,5 |
| Plastic | 1,7 | 3,5 | 4,8 | 6,1 | 7,2 | 8,3 | 9,1 | 9,8 |

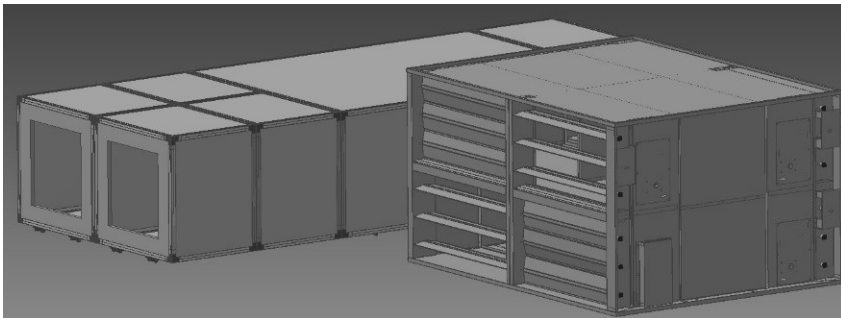
- ACCUAIR heat exchangers also act as silencers in the ventilation unit.

Air flow arrangement



ACCUAIR system on top of each other

- Efficiency up to 93%
- Max. height 3165 mm
- Max. width 4000 mm



ACCUAIR system side by side

- Efficiency up to 93%
- Max. height 3165 mm
- Max. width 4000 mm



Construction specifications

ACCUAIR high performance regenerative heat recovery system

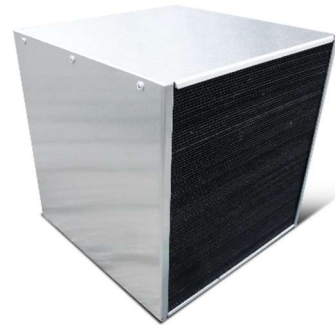
Damper system

- The damper flaps are made of corrosion resistant Aluminium with high quality rubber gaskets for very low air leakage (EN 308).
- The bushes are made of high-performance plastics which works maintenance free and without contact corrosion to the shafts.
- The bushing construction is removable for easy service.
- The shafts are made with special coated Aluminium for long-term working time.
- The special side sealing allows very low leakage over the damper system according VDI 6022 and DIN 1946-4.



Core system

- Thermally conductive Polymer (lower weight solution)
- Plain Aluminium
- Sorption Aluminium



Controller system

- No contact controller for long-term working time.
- Software is saved on SD Card which allow an update for new software per mail contact to installer.
- Removable 400V relays on controller board.
- Security door contact (ACCUAIR doesn't work when somebody open the door) if connected.
- Optical view with countdown for next damper change.
- With the 0-10V signal, the intervals between the switching cycles are regulated and thus the output of the transferred thermal energy and moisture recovery in the event of condensation.

min. 20 sec. - max. 440 sec.

0V – 1,3V no changeover, free cooling mode. dampers open.

1,3V – 10 V Heat recovery 30–100%.

10V = 100% WRG = 20 sec

1,3V = 30% WRG = 440 sec

