SAVE ENERGY TODAY FOR A BRIGHTER TOMORROW

PRODUCT OVERVIEW

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OUR CONCEPT

TAKE ADVANTAGE OF OUR EXPERIENCE AND GIVE US A CHALLENGE

WHEN WE STARTED
The company ERI Corporation was established in the year 2010.

TRANSPARENT PARTNERSHIP
Since 2010 we decided to offer our experience at customer disposal.

OUR EXPERIENCE
Despite the young age our trade mark, we have an experience of more than 15 years in air to air exchangers systems behind us.

MODERN TECHNOLOGIES
The innovation become today a necessity for all those companies which want to compete in the global market.

OUR PHILOSOPHY
We believe that the loyalty our customers have shown us has built ERI into the fast growing player it is today.

CONFIDENTIALITY
A key point to produce innovation is to connect our ideas with customers ideas on a secure base.

WHY US?
We are proud that a great many of our customers have stayed with us for so many years and have chosen us as their exclusive supplier.
ROTARY HEAT EXCHANGER WORKING PRINCIPLE

HOW IT WORKS

WINTER TIME
The rotary heat exchanger is heated from the exaust air coming from the inside. Meanwhile the outside air is heated from the heat exchanger and enriched from the humidity released from the hygroscopic treatment.

SUMMER TIME
The rotary heat exchanger is cooled by air exhausted from the inside. The air ventilation, from the outside, and cool impoverishing even moisture adsorbed by the coating layer hygroscopic energy recovery is based on a transfer of sensible heat, related to the temperature difference between exterior and interior, and a transfer of latent heat, related to the condensation-evaporation of moisture adsorption-desorption of air from the paint that covers the hygroscopic metal.

- Through the rotation of a honeycomb-shaped wheel between two air volume currents, heats the warmer Air volume the Honeycomb wheel, in order to carry the heat in the colder current density, enabling to reach a heat recovery rate of above 85%.
- Through special coatings applied on the foil of the wheels, is possible to adsorb humidity and release humidity.
- The standard width of the rotor can be supplied 200 mm or 250 mm.
- The diameter of our rotors can be produced according the customer’s requirement, even in every mm.
- Our standard diameter start from 260 mm up to 5000 mm.
- The construction of the rotor is made through an alternating flat aluminium or steel foil merged with a corrugated one. This process creates small air channels. Depending from the wave height and from the geometry of the corrugation, the efficiency and the pressure drop can be influenced or adjusted.
**CONDENSATION ROTORS CON**
The condensation rotor is made of Aluminium structure and above the dew point does not transmit humidity. This is perfect for DEC applications or normal air conditioning units.

**STEEL ROTORS**
Suitable for temperatures till 550°C and extremely resistant against corrosion attacks. Wave height on request.

**SORPTIONS ROTOR TYPE SOR**
Desiccant wheel to transfer sensible and latent heat energy. Coated aluminium matrix for the transmission of moisture in winter and in summer.

**MARINE-APPLICATION TYPE MA**
Manufactured using instead of traditional alloys as 1200, 3003, the alloy 5005 or the alloy 5052, which are both Magnesium alloys.

**ENTHALPY ROTORS ENT**
This rotor has a hygroscopic coating, and is able to adsorb and release partially humidity. Optimal to recover in transictional periods and in the winter time heat and humidity.

**GOLD EPOXY TYPE GE**
In presence of a high demanding condition, or corrosive air, we recommend to use this coated rotor, suitable against marine corrosion and with a special matrix the perfect solution for DEC equipment, paint booths, ships and coastal regions.

**ANTI BACTERIA**
On all kind of rotors, we can apply an antibacterial treatment against Legionella Pneumophila, Pseudomas Aueruginosa, Escherichia Coli, Stafilococcus Aureus, Aspergilus Niger, Candida Albicans and Bordetella Bronchispetica, the perfect solution for hospitals, schools, housing, ships and all those ambiences where the bacteria could attack through the air in flow.

**SPECIAL ROTORS FOR PAINTING BOOTH TYPE CL**
Rotors with high resistance to corrosion and special Magnesium alloy. Al foil 0.12 mm incl. High pressure Water-Air cleaning device.

**SPECIAL ROTORS FOR SERVER ROOMS TYPE IT**
Rotors with a high corrosion resistance. Outside gasket.
DESIGN ACCORDING TO YOUR WISHES...

To cover the wide spectrum of different applications, we provide not only different coatings of the thermal wheel, but also the rotor housing manufactured specifically to your needs.

ROTOR FRAMES
- Offshore Frames
- Pushing Frame
- Stable casing
- Steel Frame
- IT-Rotor (Server rooms)
- Marine V4A Frame
- Waterproof Frames (Roof units)

EVERY FRAME/ROTOR CAN HAVE THE FOLLOWING OPTIONS
- Insulated
- Drip pan
- Lacquered according customer wish
- Connectors according customer wish
- Cleaning device
- Cleaning device high pressure water/Air
- Crane eyelets
ACCUAIR FOR AIR TREATMENT UNITS

Accuaire, system heat recovery, thanks to its mass high thermal sensitivity, has an efficiency of 90% which allows almost the full energy recovery of the exhausted air.

MOISTURE RECOVERY

Thanks to its specific enthalpy storage structure the system is able to recover the moisture contained in the exhaust air in the winter months. The value of the recovery of moisture exceeds 70%, avoiding in this way in the winter months a too dry air in the room.

ANTIFREEZE

The heat recovery system Accuaire is frost resistant up to a temperature of -25°C. Therefore there is no need of expensive bypass systems or preheating. The system guarantees a high degree of efficiency for the whole year.

The high performance heat accumulator Accuaire represents today the most efficient system in the heat recovery world for air treatment systems. It improves comfort without the addition of further humidification systems.
**OPERATION**

The Accuair system consists of 2 static accumulation masses that alternately are heated by the exhausted warm air. The damper system serves to direct the flow of air in and out in the relevant areas of accumulation. The sector loaded with warm exhaust air is used in the next cycle for the incoming air. This is heated almost to the temperature of the indoor environment and is introduced into the building through the air entrance. At the same time after that the sector with the air inlet has been discharged, it is automatically converted on the flow of exhausted air, in this way the sector is again heated in the next cycle.

**POWER CONTROL**

The adjustment of the performance occurs through the variation on the time interval of the frequency deviation of the dampers, which can be adjusted from 100% to 0%.

With 0% value, the dampers are no longer changed and it enable a free cooling of the building through the air entrance.

The gradual adjustment of the system is regulated through a 0-10 V external signal.
ACCUAIR ECO DESIGN DIRECTIVE 1253

REQUIREMENTS SFP

2016 FORMULA E
\[ E = (\text{Efficiency} - 0.67) \times 3000 \]
SFP calculation formula
max. SVLimit_limit
\[ 1200 + E - 300 \times \frac{q_{\text{room}}}{2} \cdot F, \text{ if } q_{\text{room}} < 2 \text{ m}^3/\text{s} \text{ and} \]
\[ 900 + E - F, \text{ if } q_{\text{room}} > 2 \text{ m}^3/\text{s}; \]

2018 FORMULA E
\[ E = (\text{Efficiency} - 0.73) \times 3000 \]
SFP calculation formula
max. SVLimit_limit
\[ 1100 + E - 300 \times \frac{q_{\text{room}}}{2} \cdot F, \text{ if } q_{\text{room}} < 2 \text{ m}^3/\text{s} \text{ and} \]
\[ 800 + E - F, \text{ if } q_{\text{room}} > 2 \text{ m}^3/\text{s}; \]

CALCULATION WITH ACCUAIR BONUS CALCULATION 2018
\[ E = (0.93 - 0.73) \times 3000 \]
\[ E = 600 \text{ W/m}^3/\text{s} \]

Maximum SFP unit
\[ 1100 + 600 - 300 \times 1.12 / 2 \]
\[ SFP_{\text{max}} = 1532 \text{ W/m}^3/\text{s} \]

RLT Unit SFPint
\[ SFP_{\text{int}} = \frac{\Delta P_{\text{supply}}}{\eta_{\text{fan supply}}} + \frac{\Delta P_{\text{exhaust}}}{\eta_{\text{fan exhaust}}} \]
\[ SFP_{\text{int}} = \frac{220 \text{ Pa}}{0.59} + \frac{200 \text{ Pa}}{0.58} \]
\[ SFP_{\text{int}} = 718 \text{ W/m}^3/\text{s} \]

\[ E = \text{Bonus EFF} \]
\[ F = 0 \text{ when both filters has been taken into consideration} \]
\[ q_{\text{room}} = \text{Airflow in m}^3/\text{s} \]

ECO DESIGN DIRECTIVE 1253

Starting from 01.01.2016 will enter into force the ECO Design directive 1253 of the European Commission for AHU installations. These directives will be even more restrictive starting from 01.01.2018.

DESIGN AND PROJECT WARRANTY

Accuaire heat recovery system already meets without difficulty ECO Design Directive 1253 of 2018. The directive provides that the high values of efficiency by heat recovery go to offset the power consumption of the fans. In this way, with an efficiency of 90%, producers can build much more compact air handling units. Slightly higher pressure drop values, due to the filters, are compensated by the high efficiency.

REQUIREMENT EFFICIENCY

2016 Min. efficiency requested 67%
2018 Min. efficiency requested 73%
### ACCUAIR SIZES

#### UNIT ON TOP OF EACH OTHER

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
<th>Length</th>
</tr>
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<tbody>
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<td>600 - 2400 mm</td>
<td>1510-1810 mm</td>
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<tr>
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<td>600 - 2400 mm</td>
<td>1510-1810 mm</td>
</tr>
<tr>
<td>2505 mm</td>
<td>600 - 2400 mm</td>
<td>1510-1810 mm</td>
</tr>
</tbody>
</table>

**OTHER SIZES ON REQUEST**

#### UNIT SIDE BY SIDE

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<thead>
<tr>
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<th>Width</th>
<th>Length</th>
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<tbody>
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</tr>
<tr>
<td>2505 mm</td>
<td>600 - 2400 mm</td>
<td>1510-1810 mm</td>
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</table>

**OTHER SIZES ON REQUEST**
# ALUMINIUM COUNTERFLOW HEAT EXCHANGER

## PCF SIZES

<table>
<thead>
<tr>
<th>Type</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
<th>G (mm)</th>
<th>H (mm)</th>
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<tr>
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<td>172</td>
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<td>93</td>
<td>106</td>
<td>22 ⚫</td>
<td>248</td>
<td>110-1000</td>
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<tr>
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<td>230</td>
<td>100-1000</td>
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<td>147</td>
<td>22 ⚫</td>
<td>248</td>
<td>110-1000</td>
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<tr>
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<td>496</td>
<td>271</td>
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<td>163</td>
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<td>22 ⚫</td>
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<td>110-1000</td>
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<tr>
<td>PCF 35</td>
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<td>100-1000</td>
<td>193</td>
<td>205</td>
<td>22 ⚫</td>
<td>248</td>
<td>110-1000</td>
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<tr>
<td>PCF 45</td>
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<td>263</td>
<td>22 ⚫</td>
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<td>703</td>
<td>480</td>
<td>100-1000</td>
<td>306</td>
<td>322</td>
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<td>110-1000</td>
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<tr>
<td>PCF 62</td>
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<td>100-1000</td>
<td>347</td>
<td>362</td>
<td>22 ⚫</td>
<td>248</td>
<td>110-1000</td>
</tr>
</tbody>
</table>

* Tolerance: -1 mm +1 mm

## MAIN ADVANTAGES
- Corrosion resistant aluminium
- No odor transfer
- No moisture transfer
- High efficiency by small sizes
- High stability
- High density
- No fire danger
COUNTERFLOW AIR LEAKAGE

Our mission is to provide the ventilation controlled unit producers, air tight exchanger. Therefor we are grant our aluminium counteflow heat exchangers with less than 0.2% air leakage.

DECLARATION
Hereewith we declare that our counteflow heat exchanger described with code PCF are produced and tested in order to grant leakage below 0.2%.

PROCEDURE
Every 10 produced PCF we test random the PCF Counterflow before they are sent to customers.

1. TESTING AND CERTIFICATION
In the optic of improving our products, our counteflow are tested to offer the lowest leakage possible.
Our PCF are tested for the tightness before dispatching the goods to final customer. Tightness test is inspired to the requirements of Eurovent certification.

2. LEAKAGE TESTING
After the gluing process, we test random 1 of 10 exchangers and test the specimen on both sides with air pressure difference from 400 Pa for internal leakage (folding and separators) and with the same pressure for external leakage from the casing.

3. AIR LEAKAGE
Our pursuit of maximum leakage at pressure difference from 400 Pa is standardized on 0.2% from nominal air volume in m³/h.
PCF HYDRO
PCF Hydro series model can be used in winter as counterflow heat exchangers with an efficiency of 90%, as well in summer for an active evaporation cooling process.

COOLING LOAD IN BUILDINGS
Due to the thicker building envelope we have more and more application of ventilation systems. But in the small and medium air ventilation systems there are no active cooling systems. The warm load during hot summer days can not be compensated through the passive cooling of the counterflow heat exchanger. The consequence is that rooms are overheated air ventilation system doesn’t work correctly with a negative impact on people. This situation is typical in offices with negative consequences on concentration and work capacities.

SOLUTION WITH PCF HYDRO
PCF Hydro exchangers have a special coating that allow in summer to be sprayed with water on the exhaust air side of the plate. In this way we have a condensation effect that cool the supply air till 11°C. Since ancient times the condensation effect of water have been used for cooling proposes. The biggest advantage is there is almost no consumption of electrical power. This allows using these systems also in older buildings without the necessity to change the previous electrical system.
DIRECT EVAPORATING COOLING

The evaporating cooling works on a very simple principle. The water sprayed on the exhaust side evaporates as it is heated from the very warm outside air. During the transformation from water in steam with 19 liter water it’s possible to reach a cooling performance of 1 kW.

HYGIENE

Applying cooling water on the exhaust side, thanks to the waterproofed PCF Hydro counterflow plates there is no possibility that water arrives on the supply side. Water remaining is canaled in a condensation tub and then hygienically removed through a sewage system.
SUMMER AND WINTER AIR COMFORT

In traditional domestic ventilation systems with counterflow plates, with outside temperatures of 35°C the supply air temperatures reaches peaks of 30°C (red line).

PCF HYDRO ACTIVE COOLING

Spraying water on the exhaust air it’s possible to keep the supply air temperatures on a constant value 21°C (green line). In this way it’s possible to bring fresh and comfort air in the buildings even during hot summer days.
PCF HYDRO FOR HVAC

In big air ventilation systems the counterflow plates are sprayed with water through fix nozzles. An electronical device assures the correct application of water quantity on the plate's surface according specific necessities.

PCF HYDRO IN HX DIAGRAM

In the hx diagram the PCF Hydro on the supply side behaves like a cooler. In main cases the active evaporative cooling is more than sufficient to grant a comfort supply air even in very hot summer days.

EXTREME OUTSIDE TEMPERATURES

A very important advantage of this system is that in extreme outside temperature conditions over 38°C, it’s possible to improve the cooling performances simply adding more water.
ABOUT PCF KOMBI

Nowadays the market tendency request more and more high efficiency unit to fulfill the increasing demand. We have developed a system which enable to increase the air volume reducing the space. In our kombi unit the air distribution makes it possible to connect 2 same types of heat exchanger in parallel. The air flow rate is doubled for the parallel circuit. The whole combination package is made of seawater resistant aluminium. The sides are completely smooth and therefore easy to build a side by side. On request a program for efficiency calculation is available.

PCF KOMBI SIZES

<table>
<thead>
<tr>
<th>Type</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C max.</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
<th>G (mm)</th>
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<td>899</td>
<td>674</td>
<td>1000</td>
<td>444</td>
<td>458</td>
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<td>1945</td>
<td>1000</td>
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<td>1353</td>
<td>30 *</td>
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</tr>
</tbody>
</table>

* Tolerance: -1 mm + 2 mm
* Tolerance: -1 mm + 3 mm

NEW IN 2016

New in 2016 the Counterflow Kombi Heat Exchanger with Bypass and Damper System. The complete system, ready to install into the air handling unit.
KOMBI COUNTERFLOW HEAT EXCHANGERS FOR HVAC VENTILATION SYSTEMS

HVAC VENTILATION SYSTEM WITH KOMBI COUNTERFLOW HEAT EXCHANGER

The Kombi counterflow heat exchanger from company ERI Corporation has been specifically designed to use the advantages of the counterflow exchanger principle in large ventilation systems.

PLANNING AND PRODUCT SAFETY

With our PCF Kombi counterflow heat exchangers we already fulfill easily all the guideline of ECO design 2018. The directive allows through the high efficiency values of the heat exchangers to compensate with the electrical consumption values of the fans. In this way, with a dry efficiency of 80%, it’s possible to design compact air handling units.

ECO DESIGN GUIDELINE 1253

Starting from 01.01.2016 will enter into force the ECO design directive of the European Commission for the HVAC ventilation systems. These directives will be even more restrictive starting from 01.01.2018.

REQUIREMENTS EFFICIENCY

2016 Minimum efficiency value 67%
2018 Minimum efficiency value 73%
DIFFERENTIAL PRESSURE MEASURES FOR COUNTERFLOW KOMBI HEAT EXCHANGERS

In order to be used for large ventilation systems the heat exchangers have to withstand to the high pressure differential of the fans. With test measurements till 2000 Pa our kombi heat exchangers had not structure deformation. The pressure drop of the heat exchanger was measured constant at 2500 m³/h.
### TECHNICAL SELECTION ACCORDING ECO DESIGN DIRECTIVE 1253

<table>
<thead>
<tr>
<th>Casing dimension B x H</th>
<th>Collocation</th>
<th>Nominal air flow In m³/h</th>
<th>Requirement SVL min Limit</th>
<th>Equipment value SVL min</th>
<th>Type</th>
<th>Height In mm</th>
<th>Length In mm</th>
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<td>1314</td>
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<td>PCF-K-110</td>
<td>1945</td>
<td>2165</td>
<td>2700</td>
</tr>
</tbody>
</table>

Basics: Fan efficiency static 58.3%, Duct pressure loss 300 Pa, Pannel Filter F5 and F7

<table>
<thead>
<tr>
<th>Casing dimension B x H</th>
<th>Collocation</th>
<th>Nominal air flow In m³/h</th>
<th>Requirement SVL min Limit</th>
<th>Equipment value SVL min</th>
<th>Type</th>
<th>Height In mm</th>
<th>Length In mm</th>
<th>Width In mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1830 x 1220</td>
<td>Side by side</td>
<td>16,000</td>
<td>950 W/m³/s</td>
<td>868 W/m³/s</td>
<td>PCF-K-62</td>
<td>1089</td>
<td>1314</td>
<td>3500</td>
</tr>
<tr>
<td>2135 x 1220</td>
<td>Side by side</td>
<td>17,000</td>
<td>956 W/m³/s</td>
<td>858 W/m³/s</td>
<td>PCF-K-62</td>
<td>1089</td>
<td>1314</td>
<td>4000</td>
</tr>
<tr>
<td>2440 x 1220</td>
<td>Side by side</td>
<td>20,000</td>
<td>944 W/m³/s</td>
<td>870 W/m³/s</td>
<td>PCF-K-62</td>
<td>1089</td>
<td>1314</td>
<td>4600</td>
</tr>
<tr>
<td>1525 x 1525</td>
<td>Side by side</td>
<td>15,000</td>
<td>956 W/m³/s</td>
<td>870 W/m³/s</td>
<td>PCF-K-80</td>
<td>1376</td>
<td>1600</td>
<td>2900</td>
</tr>
<tr>
<td>1830 x 1525</td>
<td>Side by side</td>
<td>18,000</td>
<td>959 W/m³/s</td>
<td>908 W/m³/s</td>
<td>PCF-K-80</td>
<td>1376</td>
<td>1600</td>
<td>3500</td>
</tr>
<tr>
<td>2135 x 2135</td>
<td>Side by side</td>
<td>22,000</td>
<td>953 W/m³/s</td>
<td>936 W/m³/s</td>
<td>PCF-K-80</td>
<td>1376</td>
<td>1600</td>
<td>4100</td>
</tr>
<tr>
<td>2440 x 1525</td>
<td>Side by side</td>
<td>25,000</td>
<td>956 W/m³/s</td>
<td>933 W/m³/s</td>
<td>PCF-K-80</td>
<td>1376</td>
<td>1600</td>
<td>4700</td>
</tr>
<tr>
<td>3100 x 1525</td>
<td>Side by side</td>
<td>32,000</td>
<td>953 W/m³/s</td>
<td>940 W/m³/s</td>
<td>PCF-K-80</td>
<td>1376</td>
<td>1800</td>
<td>6000</td>
</tr>
<tr>
<td>1830 x 1830</td>
<td>Side by side</td>
<td>23,000</td>
<td>953 W/m³/s</td>
<td>937 W/m³/s</td>
<td>PCF-K-95</td>
<td>1662</td>
<td>1887</td>
<td>3600</td>
</tr>
<tr>
<td>2185 x 1830</td>
<td>Side by side</td>
<td>27,000</td>
<td>956 W/m³/s</td>
<td>936 W/m³/s</td>
<td>PCF-K-95</td>
<td>1662</td>
<td>1887</td>
<td>4200</td>
</tr>
<tr>
<td>2440 x 1830</td>
<td>Side by side</td>
<td>30,000</td>
<td>953 W/m³/s</td>
<td>930 W/m³/s</td>
<td>PCF-K-95</td>
<td>1662</td>
<td>1887</td>
<td>4600</td>
</tr>
<tr>
<td>3100 x 1830</td>
<td>Side by side</td>
<td>38,000</td>
<td>959 W/m³/s</td>
<td>895 W/m³/s</td>
<td>PCF-K-95</td>
<td>1862</td>
<td>1887</td>
<td>6000</td>
</tr>
<tr>
<td>2440 x 2135</td>
<td>Side by side</td>
<td>34,000</td>
<td>962 W/m³/s</td>
<td>951 W/m³/s</td>
<td>PCF-K-110</td>
<td>1945</td>
<td>2165</td>
<td>4600</td>
</tr>
<tr>
<td>2440 x 2440</td>
<td>Side by side</td>
<td>40,000</td>
<td>963 W/m³/s</td>
<td>933 W/m³/s</td>
<td>PCF-K-110</td>
<td>1945</td>
<td>2165</td>
<td>4600</td>
</tr>
</tbody>
</table>

Basics: Fan efficiency static till 20,000 m³/h 58.3%, till 38,000 m³/h 60 %, 40,000 m³/h 62%
Duct pressure loss 300 Pa, Pannel Filter F5 and F7
BALL SIPHON

ADVANTAGES
The size is very compact, the valve, in absence of condense water close the passage, avoiding bacteria and dirty air coming into the unit.

It works in both conditions Pa+: or even Pa-: Pressure higher than 600 Pa. It is the perfect solution for compact unit. It is possible to add a heater at 230 V or 24 V in case the units are projected for external application to avoid the frost danger.

TECHNICAL DATA:

<table>
<thead>
<tr>
<th>BIE5080</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>230</td>
<td>VAC</td>
</tr>
<tr>
<td>Output voltage</td>
<td>20-32</td>
<td>VAC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BIE5070</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>24</td>
<td>VAC / DC</td>
</tr>
<tr>
<td>Heating resistors</td>
<td>100</td>
<td>OHM</td>
</tr>
</tbody>
</table>

Switching temperature into at 3°C and at 7°C
Green LED = on
Red = warm

FUSE 63 mA
PE L N (230 VAC)  24 VAC
ALIMENTATION 24 VAC / DC
LED RED / GREEN
MK SIPHON

A connector made from propylene, resistant to corrosion and decay is used to drain the condensate in the air conditioning systems of low pressure. The product in the standard package is designed for the maximum pressure 2200 Pa. In the case of extremely low pressure, extension tube or knee can be shortened, or may be placed in inclined position (see size table). Built-in ball valve prevents the suction of air through the conclusion in the absence of condensate. This connector is easy to maintain and care. When connect socket with connector, socket should be moisten with water and soap. Each condensate drain system should be provided with a separate siphon. Pipes after the connector may be mounted on the market range tubes.

MK SIPHON SCHEMA
Special connector is used to drain condensate in air conditioning and ventilation systems

1. Internal screw 1 1/2” - 2 pcs.
2. Rubber adapter 1 1/2” - 1” - 1 pcs.
3. O-ring, 1 pcs.
4. Connecting knee diam. 40 mm, 90°, long
5. Connecting knee diam. 40 mm, 90°
6. Conical sealing ring, 2 pcs
7. Return valve with a conclusion
8. Cap 1 1/2”
9. Ball valve
10. Cap 2”

SIZE TABLE
The height of the connector is set depending on the pressure in the system. Extension tube or connecting knee can be shortened in accordance with this table.

<table>
<thead>
<tr>
<th>PRESSURE IN THE SYSTEM</th>
<th>HEIGHT OF CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2200 Pa</td>
<td>280 mm</td>
</tr>
<tr>
<td>2100 Pa</td>
<td>270 mm</td>
</tr>
<tr>
<td>2000 Pa</td>
<td>260 mm</td>
</tr>
<tr>
<td>1900 Pa</td>
<td>250 mm</td>
</tr>
<tr>
<td>1800 Pa</td>
<td>240 mm</td>
</tr>
<tr>
<td>1700 Pa</td>
<td>230 mm</td>
</tr>
<tr>
<td>1600 Pa</td>
<td>220 mm</td>
</tr>
<tr>
<td>1500 Pa</td>
<td>210 mm</td>
</tr>
<tr>
<td>1400 Pa</td>
<td>200 mm</td>
</tr>
<tr>
<td>1300 Pa</td>
<td>190 mm</td>
</tr>
<tr>
<td>1200 Pa</td>
<td>180 mm</td>
</tr>
<tr>
<td>1100 Pa</td>
<td>170 mm</td>
</tr>
<tr>
<td>1000 Pa</td>
<td>160 mm</td>
</tr>
<tr>
<td>800 Pa</td>
<td>140 mm</td>
</tr>
<tr>
<td>600 Pa</td>
<td>120 mm</td>
</tr>
<tr>
<td>400 Pa</td>
<td>100 mm</td>
</tr>
</tbody>
</table>
MK SIPHON - SECTION SIDE TYPE AK (AK-S)

DESCRIPTION

1. To ensure an undisturbed water outlet and prevent the suction of false air all condensate outlets and other drainage points must be provided with siphons. Each siphon must end in a funnel.

2. The AK-S type Siphon is only suitable for draining areas with negative pressure. It fills and closes automatically and prevents sucking itself empty in case of pressure surges.

3. The max. height of the standpipe that consists of elbow (5) and immersion pipe (6) is 300 mm (Fig. 1). This allows a max. negative pressure of ca. 2.900 Pa at the drainage nozzle of the unit. If the negative pressure is less than that the length of the immersion pipe (6) can be shortened appropriately (Table 2).

4. The construction height can also be reduced by installing the standpipe in a sloped position.

5. The distance between the middle of the intake of the siphon and the floor must be ≥ R (min. 140 mm) (Fig. 4).

6. The intake to the siphon is carried out at one of the two threaded connections (1½") of the non-return valve (3). The unused threaded connection must be closed using the rubber disk (10) and end cap (11).

7. The siphon is connected to the drainage nozzle using the provided connection piece (2) and one of the two rubber sleeves (1a or 1b). Condensate outlets of 40 mm diameter are directly connected to the crimp screwing of elbow (5).

8. The second immersion pipe (6) can be used to provide an extension of the outlet. To be ordered separately, if required.

9. Attention must be paid (at the pipes between the siphon and the outlet) that ventilation, diameter and slope are sufficient and in accordance with the standards of the sanitary engineering. The outlet must not be connected directly to a sewage pipe but shall be able to drain freely.

10. The siphon can be drained via the end cap (11), if required.

ATTENTION: When the end cap is closed again later, rubber disk (10) must be put in again.

ASSEMBLY / CALCULATION

For assembly (see Fig. 1). Attention must be paid during assembly that the pipes are always inserted into the nozzle as far as they will go. The base frame height (GR) can be calculated automatically on our homepage.
**MK SIPHON - SUCTION SIDE TYPE AK (AK-S)**

**Item No.:** 32 404 00 5 004 / 10 (white)
**Item No.:** 32 404 22 5 001 / 12 (transparent)

---

**Table 1**  
Without adapter. Sealing with permanent elastic silicone material.

<table>
<thead>
<tr>
<th>OUTLET</th>
<th>D (MM)</th>
<th>RUBBER SLEEVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼”</td>
<td>28 - 34</td>
<td>l1</td>
</tr>
<tr>
<td>1”</td>
<td>28 - 34</td>
<td>l1</td>
</tr>
<tr>
<td>1 ½”</td>
<td>38 - 44</td>
<td>l1</td>
</tr>
<tr>
<td>1 7/8”</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 2**

<table>
<thead>
<tr>
<th>NEGATIVE PRESSURE (P) IN DRAINAGE NOZZLE [PA]</th>
<th>SHORTENING OF IMMERSION PIPE (6) [MM]</th>
<th>ELBOW (5) [MM]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2900</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2400</td>
<td>50</td>
<td>-</td>
</tr>
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<td>2300</td>
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<td>1300</td>
<td>160</td>
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<tr>
<td>1200</td>
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<tr>
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<td>10</td>
</tr>
<tr>
<td>900</td>
<td>180</td>
<td>20</td>
</tr>
<tr>
<td>700</td>
<td>without</td>
<td>-</td>
</tr>
<tr>
<td>600</td>
<td>without</td>
<td>10</td>
</tr>
<tr>
<td>500</td>
<td>without</td>
<td>20</td>
</tr>
</tbody>
</table>

**EXAMPLE:**

Negative pressure at drainage nozzle = 1.500 Pa and distance A = 70 mm (owing to the design dimension R must be min. 140 mm).

\[
R = \frac{P}{10} + A = \frac{1.500}{10} + 70 = 220 \text{ (mm)}
\]

\[
GR = R - A = 220 - 70 = 150 \text{ (mm)}
\]

**NOTE:** If the drainage nozzle is led through the bottom of the unit, distance A must have a negative sign when entered in the formula for calculating the base frame height.
The special siphon Type AK-D is a manually filled siphon for draining condensate from the chiller, humidifier or other wet areas in air-handling units (AH units) that operate at positive pressure compared to the environment. Considering a safety factor of 1.5 for pressure surges during plant operation (quick release flaps etc.), the height of the pipes is sufficient for a max. positive pressure of 1630 Pa. An extension of the two immersion pipes (6) and (9) for higher pressures is possible. To be ordered separately, if required (Fig. 1). The two immersion pipes (6) and (9) can be shortened accordingly for lower pressures.

For draining the components during the shutdown of the plant the outlet must be at a lower position than the intake.

**DESCRIPTION**
- Siphon AK-D type with end cap for filling and inspection purposes
- For draining components of AH units that operate at positive pressure compared to the environment
- Individual outlet construction and variable installation height
- Suitable for a max. positive pressure of \( P = 1630 \) Pa considering a safety factor of 1.5 for pressure fluctuations in the system
- Made of polypropylene (PP)
- Max. construction height 400 mm / outlet diameter 40 mm
- Water intake connection via crimp screwing or rubber sleeve for outlets of 1/4", 1", 1 1/4" or 1 1/2"

The foundation or base frame height (mm) must be adapted to the structure of the unit near the draining nozzle, the positive pressure \( P \) (Pa) and the pressure height \( H \) (mm) resulting from this.

**EXAMPLE**
Positive pressure at draining nozzle = 1000 Pa and distance \( A = 70 \) mm

\[
H = \frac{P}{10} = \frac{1000}{10} = 100 \text{ (mm)}
\]

The distance between the middle of the intake of the siphon and the floor must be \( R \) (min. 215 mm)

\[
R = \frac{P \times 1.5}{10} + 115 \text{ mm (75 + 40 mm, Bild 3)}
\]

\[
R = \frac{1000 \times 1.5}{10} + 115 \text{ mm = 265 mm}
\]

This results in a minimum base frame height \( GR \):

\[
GR = R - A = 265 \text{ mm} - 70 \text{ mm} = 195 \text{ mm}
\]

**ASSEMBLY / CALCULATION**
One AK-D type siphon must be provided at each outlet on the pressure side of the unit.

For assembly (see Fig. 1), attention must be paid during assembly that the pipes are always inserted into the nozzle as far as they will go. The base frame height (GR) can be calculated automatically on our homepage.
The elbow (5) and the immersion pipes (6) and (9) must be adapted to the existing positive pressure. The connection piece (2) and the rubber sleeves (1a and 1b) for the ¾" to 1 ⅛" draining nozzles are included in the scope of supply. Do not connect the siphon directly to a drainage pipe, it shall be able to drain freely. If longer pipes are used between the siphon and the outlet, attention must be paid that ventilation, diameter and slope are sufficient and in accordance with the standards of the sanitary engineering. Before taking the VAC plant into operation, the siphon must be filled with water through the filling hole (end cap 14).

### MAINTENANCE

The siphon must be checked in appropriate time intervals to prevent air losses in the VAC plant and should be refilled, if applicable. The filling hole can also be used for cleaning purposes. The water outlet in the AH unit must be cleaned regularly. The drainage function must be checked in plants where condensate is produced.

#### Table 1

<table>
<thead>
<tr>
<th>OUTLET</th>
<th>D (MM)</th>
<th>RUBBER SLEEVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾&quot;</td>
<td>28 - 34</td>
<td>1b</td>
</tr>
<tr>
<td>1&quot;</td>
<td>28 - 34</td>
<td>1b</td>
</tr>
<tr>
<td>1 ¾&quot;</td>
<td>38 - 44</td>
<td>1a</td>
</tr>
<tr>
<td>1 ⅛&quot;</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Without adapter. Sealing with permanent elastic silicone material.

### ATTENTION:

Immersion pipes (6) and (9) must always be shortened and extended equally! (max. shortening by 155 mm, therefore dimension R min.

### NOTE:

If the drainage nozzle is led through the bottom of the unit, distance A must have a negative sign when entered in the formula for calculating the base frame height.
SELECTION SOFTWARE

The calculation software calculates the necessary technical operating data of the AHU and is also available as stand alone Black Box or as dll which ready for integration into your running calculation system.

READY TO INTEGRATION

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AIRFLOW IN HVAC VENTILATION SYSTEM FROM 2018

COMPARISON AIRFLOWS IN DIFFERENT HEAT EXCHANGERS ACCORDING ECO DESIGN DIRECTIVE 1253

COUNTERFLOW KOMBI HEAT EXCHANGER

Heat recovery:
- Kombi counterflow heat exchanger
  Type 639
  + Fan 14kg3100b44002
  + casing 612 x 1220 mm
  + Filter

- SVLint in W/m²/s
- SVLint, limit in W/m²/s

Max airflow within the air handling unit:
1.97 m/s

ROTARY HEAT EXCHANGER

Heat recovery:
- Rotork heat recovery wheel 14 1.5 mm
  + Fan 14kg3100b44002
  + casing 612 x 1220 mm
  + Filter

- SVLint in W/m²/s
- SVLint, limit in W/m²/s

Max airflow within the air handling unit:
2.10 m/s

ACCLIAIR

Heat recovery:
- Storage heat exchanger 14 2.0 mm
  + Fan 14kg3100b44002
  + casing 612 x 1220 mm
  + Filter

- SVLint in W/m²/s
- SVLint, limit in W/m²/s

Max airflow within the air handling unit:
2.50 m/s

CROSSFLOW HEAT EXCHANGER

Heat recovery:
- Crossflow heat exchanger type 500 x 550 14 2.0 mm
  + Fan 14kg3100b44002
  + casing 612 x 1220 mm
  + Filter

- SVLint in W/m²/s
- SVLint, limit in W/m²/s

Max airflow within the air handling unit:
1.55 m/s
CONTACTS

OUR SALES OFFICES AND REPRESENTATIVES ARE PLEASED TO HANDLE YOUR QUESTIONS AND ADVISE YOU.

PLEASE CONTACT US DIRECTLY

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