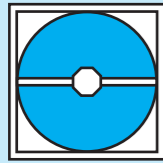


Sorption rotor **HUgo**

KLININGENBURG

# HUgo



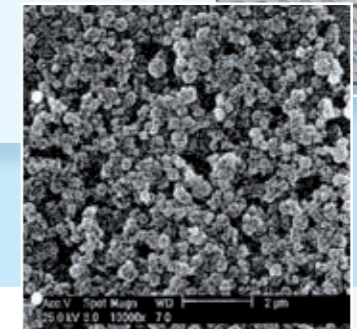
After thousands of hours of test runs we are now ready: The long and intensive work of research has now paid off. With the new patented sorption rotor **HUgo** a new rotor enters the market that sets new standards in terms of quality in the field of total energy recovery. **HUgo** has undergone long term testing and is ARI and Eurovent Certified.



## ... the new Sorption rotor

- adsorbent on corrosion resistant aluminium foil
- no odour transfer
- no fibers
- high performance

Surface electron microscope snapshot of a HUgo coating on aluminium foil. Good visibility of the spherical zeolite-A-particles in the nanometer region.



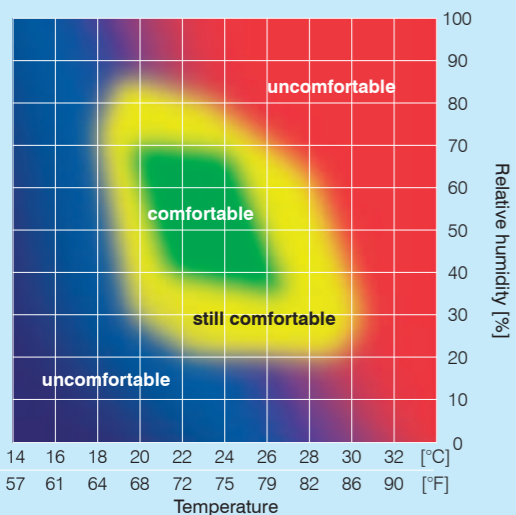
Original size 1.9 mm wave height

### Two in one

Heat exchangers which transfer also moisture besides sensible heat, save expensive energy: in humid climate zones in which outside air is pre-dehumidified and the air conditioning unit's load will be reduced in moderate climate zones; in which outside air will be humidified, the energy demand of the supply air humidification will be minimized.

### Comfort is dependent upon temperature and humidity

Thermal comfort is ensured when people sense the air temperature, air humidity, air movement and heat radiation as optimum for their environment and there



#### Comfort zone Temperature and humidity dependent

The diagram shows the area of warmth and humidity which the human body would classify as comfortable.

The higher the relative humidity the lower the room temperature must be.

is no requirement or wish for any changes to these conditions. Additionally, attention should be paid that the surrounding air is healthy and free from germs. The growth of bacteria and fungi should be avoided. The air humidity plays a large role in this function.

### Important for the customer and operator:

Up to now, those sorption rotors existing on the market working under the principle of adsorption are usually made of SilicaGel or zeolite coating.

#### Silicagel rotors

are precarious regarding germ formation and formation of odours because of their large pore diameter

#### Zeolite rotors

have smaller pore diameters but they are comparatively worse in terms of performance. This disadvantage is mostly compensated through a thicker coating layer which results in a higher pressure loss.

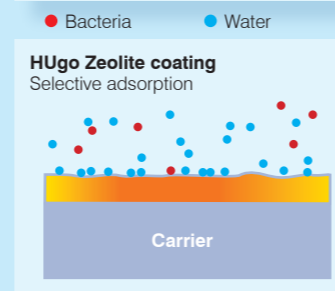
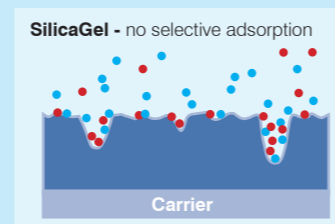
### HUgo is different

**HUgo** is different as the size of its particles are clearly smaller compared to other Zeolites. In consequence the adsorption kinetics (speed of adsorption and desorption) is much higher as the distance to the pore is smaller. Additionally the number of particles are higher and therefore the total surface area is larger.

**HUgo** stands for highest performance without growth of bacterias and without formation of odours and at the same time low pressure losses and fair acquisition costs. In comparison to the sorption rotor model XT the HUgo comes with a further significantly

improved performance Therefore it finds it's position just under the SECO which as an absorption rotor with a larger depth is more expensive and also more sensitive towards surrounding conditions.

#### Comparison of SilicaGel-coating with HUgo zeolite-coating



#### Comparison of sorption materials

	Salts	Silicagel	Zeolites	HUgo Zeolite
Capacity	+	+	-	+
Adhesion	-	-	+	+
Kinetics	+	+	-	+
Avoidance of odours	+	-	+	+
Long term stability	-	-	+	+
Costs performance / ratio	-	+	-	+
Number of possible applications	-	-	+	+
Sum	+++	+++	++++	+++++

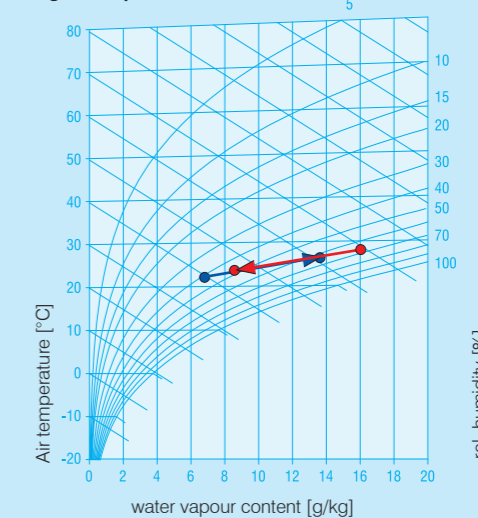
### Advantages of the HUgo Zeolite:

- High capacity of adsorption and desorption
- High speed of adsorption and desorption
- No formation of odours based on equal pore diameter of 0.4 nm
- Thin lamination
- Flush surface
- Excellent adhesion upon foil surface

### The benchmark data:

- HUgo adsorption rotor with corrosion resistant aluminium core. No use of hazardous fibrous respirable elements
- Very high performance by means of high adsorption capacity
- Low pressure drop
- No formation of odours as pore diameters are not larger than 0.4 nm (nanometer)
- Sorption coating requires a thin layer of coating
- No wear and tear of the sorption material
- Layers of the wheels storage mass absolutely flush at front
- Foil thicknesses 0.07 mm - 0.1 mm depending of the application
- Wheels of different packing density / wave height available
- Rotor wheels are built to the customers specifications
- Very long lifespan
- Sizes from Ø 300 mm up to 5000 mm

#### Design example - summer case:



Rotor profile: D17  
 Outside air: 28°C, 65% rel. humidity  
 Return air: 22°C, 40% rel. humidity  
 Face velocity: 3.0 m/s  
 Temperature efficiency: 74.7%  
 Latent efficiency: 75.1%  
 Pressure drop: 142 Pa

# About us

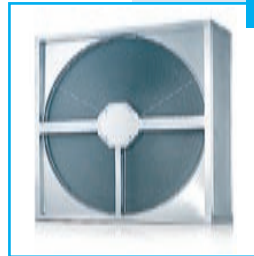
## KLINGENBURG

**Components for air handling systems - for 3 decades - worldwide:**

We are a resourceful company engaged in the production and sales of energy recovery and humidity control products for ventilation systems for more than 30 years.

Our highly innovative products make significant contributions toward saving energy resources and reducing CO<sub>2</sub> emissions.

Klingenburg's high quality and the technological edge of our products are well known throughout the world on the air-conditioning technology market.



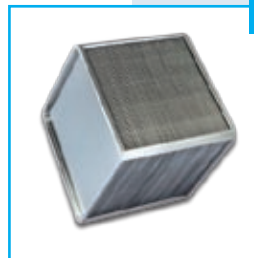
### Rotary Heat Exchanger

- Execution as aluminum, epoxy, enthalpy or sorption rotor
- High Temperature Rotor made of stainless steel



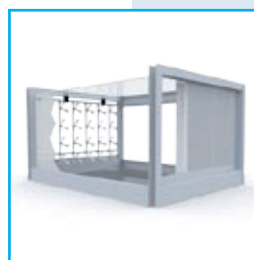
### Counterflow-Plate Heat Exchanger

- Aluminium and epoxy versions available
- Highest efficiency



### Plate Heat Exchanger

- Aluminium, epoxy and stainless steel versions available



### Humidifier CERTO

- Hygienic humidification
- Adiabatic cooling

Klingenburg GmbH  
Boystrasse 115  
D-45968 Gladbeck / Germany

Phone: +49-20 43-96 36-0  
Fax: +49-20 43-7 23 62  
E-mail: [klingenburg@klingenburg.de](mailto:klingenburg@klingenburg.de)  
[www.klingenburg.de](http://www.klingenburg.de)

Regenerative systems  
Recuperative systems  
DEC-systems  
Humidifier  
Shipbuilding