

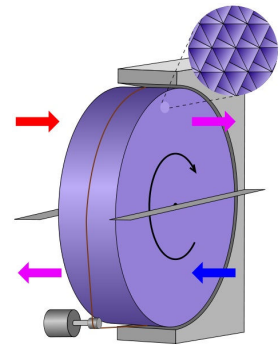
## Material and rotor description.

### Why we use aluminum series 8000?

Due the very good manufacturing characteristics and resistance against corrosion **AMARANT** has chosen to use the 8000 series alloy both for rotary heat exchangers produced from plain material and coated material. Different types of surface treatment improve properties as corrosion resistance and absorption of the material. Strong and light, low weight is an advantage during assembly in many applications, and it is great conductor for heat. This makes aluminum the best choice for energy-efficient systems.

### How it works?

**AMARANT** rotary heat exchanger is built up of two layers of foil, where one is corrugated and the other totally flat. The air flows through the channel between the layers, warming up or cooling down the foil. While rotating the heat exchanger part of the heat exchanger are heated or cooled by the air. The channels change place and when entering the opposite side, heating process or cooling process will take place.



### Efficiency and pressure-drop.

Efficiency depends on the rotor size plus well-height, and will increase by using smaller distance.

**AMARANT** offer today 6 different well-heights: 1.3 / 1.5 / 1.7 / 1.9/2.0 and 2.4mm

Not to forget is that the pressure-drop is then also increasing when using smaller distance.

Condensation can occur, and drain-pan is therefor recommended.

### AMARANT Quality

To secure highest standard in quality, no gluing of the layers or welding in **AMARANT** rotor is used. This results in a repeatable high quality product. Airflow will be uniform through the channels and thereby conformable with the calculated air pressure drop, and superior geometry of the rotor.

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## **Heat terminology.**

### **Sensible heat.**

When an object is heated, its temperature rises as heat is added. The increase in heat is called sensible heat. Similarly, when heat is removed from an object and its temperature falls, the heat removed is also called sensible heat. Heat that causes a change in temperature in an object is called sensible heat.

### **Latent heat.**

All pure substances in nature are able to change their state. Solids can become liquids (ice to water) and liquids can become gases (water to vapor) but changes such as these require the addition or removal of heat. The heat that causes these changes is called latent heat.

Latent heat however, does not affect the temperature of a substance - for example, water remains at 100°C while boiling. The heat added to keep the water boiling is latent heat. Heat that causes a change of state with no change in temperature is called latent heat.

Appreciating this difference is fundamental to understanding why refrigerant is used in cooling systems. It also explains why the terms 'total capacity' (sensible & latent heat) and 'sensible capacity' are used to define a unit's cooling capacity. During the cooling cycling, condensation forms within the unit due to the removal of latent heat from the air. Sensible capacity is the capacity required to lower the temperature and latent capacity is the capacity to remove the moisture from the air.

### **In simple words - Sensible heat/Latent heat.**

Sensible heat is the heat due to temperature change and latent heat is the heat due to phase change in phase of the water content in the air

## **Materials.**

### **Pure aluminum rotor. (*Mainly sensible heat recovery*)**

Pure aluminum rotor from **AMARANT** is called *condensation rotor*, or *thermal wheel*, a cost-efficient solution for heat recovery, and is the most suitable choice for standard heat recovery applications. Mainly sensible heat recovery is taking place inside the rotor, but when condensation occurs latent heat recovery is also taking place.

### **Epoxy coated aluminum rotor. (*Mainly sensible heat recovery*)**

**AMARANT** epoxy coated aluminum rotor is also called *condensation rotor* or *thermal wheel*, also a cost-efficient solution for heat recovery. Most suitable choice for standard heat recovery applications where corrosion resistance is required. Epoxy coating protects aluminum from outside environment and is used mostly close to cost areas, swimming halls, heavy industry, ships and where high pollution can be expected. Mainly sensible heat recovery is taking place inside the rotor, but when condensation occurs latent heat recovery is also taking place.

### **Hygroscopic Rotor. (*Sensible and latent heat recovery*)**

**AMARANT** hygroscopic rotor, also called *enthalpy rotor* is also made of aluminum, but the hygroscopic surface of this foil, supports humidity transfer, either by adsorption or absorption. Typically used for standard applications in comfort ventilation systems to recover humidity, capable of recovering both heat and humidity.

### **Absorption rotor. (*Sensible and latent heat recovery*)**

**AMARANT** *absorption rotor* is made from aluminum alloy, coated with molecular sieve material, also called *desiccant wheel*, adsorb moisture more than silica gel. Absorption rotors are especially designed for summer season, cooling recovery and dehumidification of supply air. This rotor keeps a high rate of humidity recovery from the exhaust air, but also very efficient dehumidification of supply air in hot and humid summer conditions. High dehumidification of supply air in these conditions, results in much lower needs of cooling load. Savings become both economically and mechanically. Cooling units can be smaller and this way more cost-efficient. High adsorption capacity at low relative humidity.

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## Housing.

AMARANT housing is made of galvanized steel. Geometry of the housing depends on the size of the rotor. All rotors can be delivered in either galvanized or painted casings (corrosion protecting paint). All casings are sealed with brush-profiles

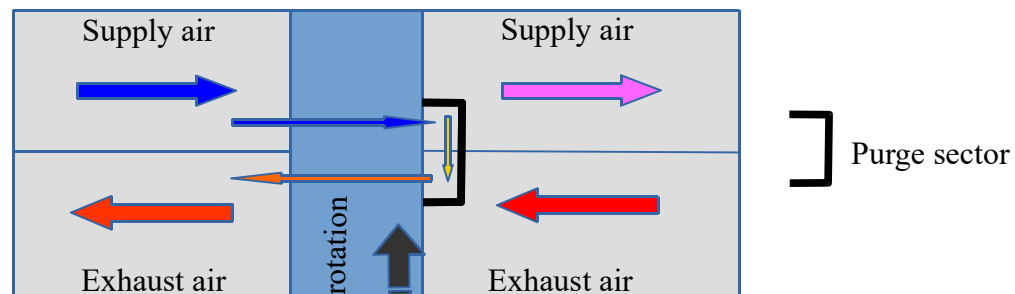
Geometry according below table.

Rotor diameter mm	Standard casing (W x H), mm	Depth mm	Well-height
500 - 1085	Rotor diameter +100mm	270	1.3/1.5/1.7/1.9/2.0/2.4
1086 - 1550	Rotor diameter +100mm	320	1.3/1.5/1.7/1.9/2.0/2.4
1551 -2700	Rotor diameter +150mm	320	1.3/1.5/1.7/1.9/2.0/2.4

**IMPORTANT! Always transport the rotor in housing vertically**

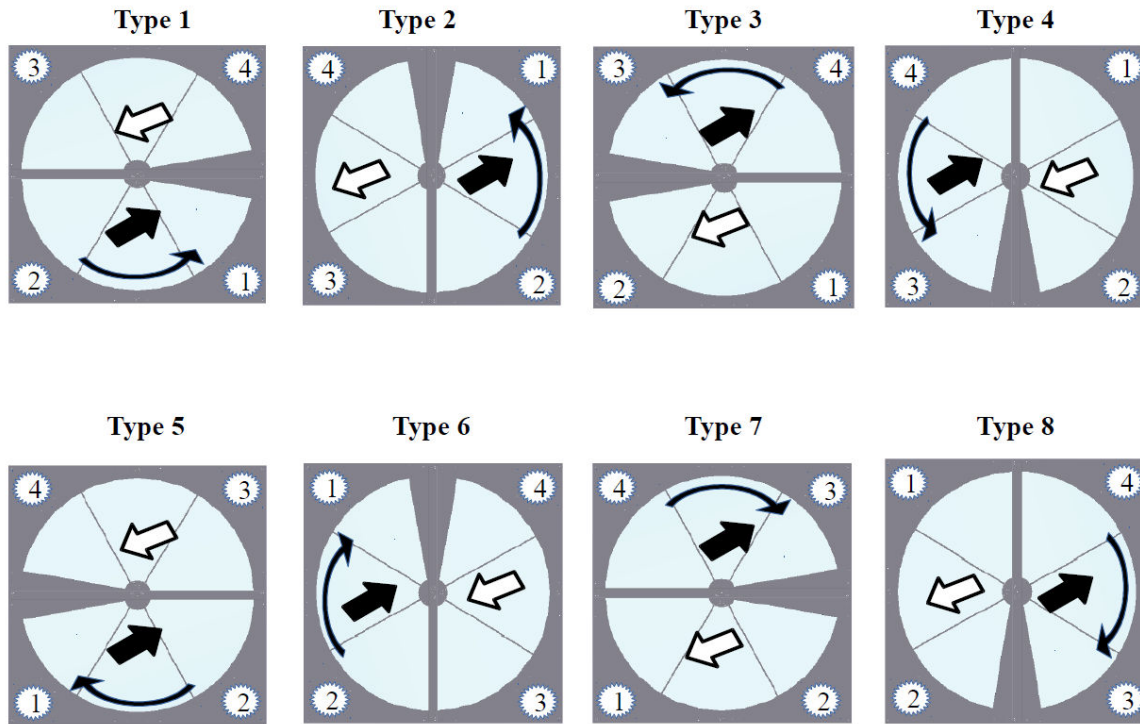
## Purge sector.


To avoid cross contamination, (waist air to fresh air), a purge sector can be mounted on the cross beam of the rotor. Purpose of the purge sector is to clean the rotor channels before they enter fresh air area from waist air, this minimize the cross contamination in the rotor. Works only when the air streams are opposite to each other, and according below working conditions.





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Purge sector & drive position




 Rotor (HEX) rotation

 Supply air(out from paper)

 Exhaust air(into paper)

 1-4 Drive position

 Point of view!

Description according AMARANT product key description “Rotor in housing”

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### **Drive sets and Control units.**

Our drive systems and control units comes from well reputed companies as:

IBC Automatic and

Emotron / CG DRIVES & AUTOMATION

Both constant speed drives, drive sets and control units are adapted to fit with requested rotor size and function. Drives are chosen depending on rotating speed and rotor size. All drives are secured as standard by a thermal contact and as option can be equipped with rotating sensor.

The rotation sensor stops the control unit and alarms if the wheel stops rotating.

Input signal 0 – 10 V

The speed of the heat exchanger and its efficiency is regulated stepless by the control unit so that the speed of the wheel is in proportion to the input signal from the central control. If the input signal is below the set up threshold value, the wheel will stop.

Cleaning function

When the wheel has been stopped for 10 or 30 minutes, the cleaning function is activated and the wheel rotates, to keep it clean.

#### Working conditions

from -30°C up to +40°C Emotron / 45°C IBC Automatic

### **Constant speed -**

VP0500VKCEE – VP3000VKCEE

Made by IBC Automatic

### **Drive sets and control units -**

VariMax series 25, 50 and 100 – by IBC Automatic

MicroMax series 25, 90, 180, 370 and 750 – by IBC Automatic

EMX-R series 15, 25 and 35 – by Emotron

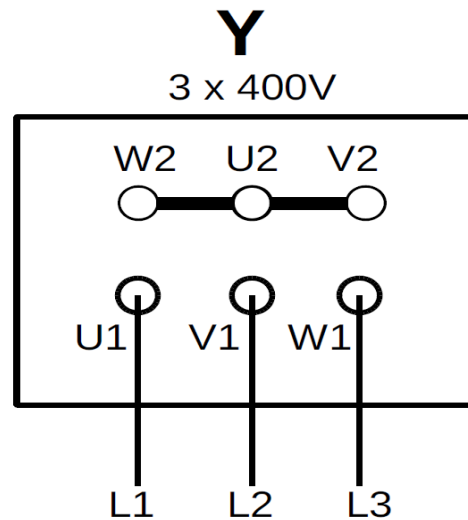
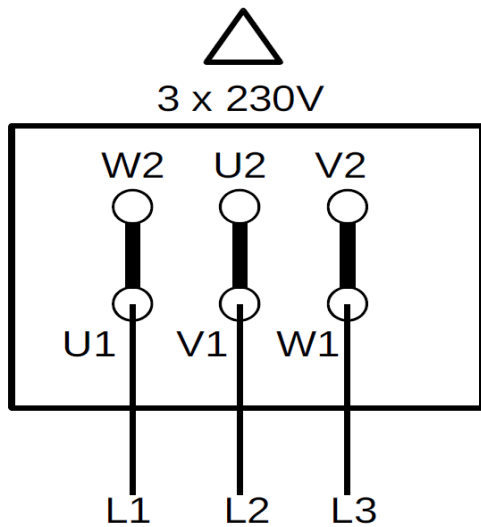
**IMPORTANT! All electrical work must be performed by qualified electrician.**

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Drive and control option rotor size Ø 500 – Ø 3900 mm		
Unit	Rotor size in mm	
IBC Varimax 25	Alu/Epoxy 500 - 1500, Hygro 500 - 1200	3 x 230 V, 110 W
IBC VariMax 50	Alu/Epoxy 500 – 2500, Hygro 500 – 2000	3 x 230 V, 240 W
IBC VariMax 100	Alu/Epoxy 500 – 3900, Hygro 500 - 3000	3 x 230 V, 500 W
IBC MicroMax 25	Alu/Epoxy 500 – 800	3 x 230 V, 25 W
IBC MicroMax 90	Alu/Epoxy 800 – 1500	3 x 230 V, 90 W
IBC MicroMax 180	Alu/Epoxy 1500 - 2500	3 x 230 V, 180 W
IBC MicroMax 370	Alu/Epoxy 2500 – 3500,	3 x 230 V, 370 W
IBC MicroMax 750	Alu/Epoxy 3500 - 3900	3 x 230 V, 750 W
IBC Constant 25	Alu/Epoxy/Hygro 500 – 800	3 x 230 V, 25 W
IBC Constant 90	Alu/Epoxy/Hygro 800 – 1500	3 x 230 V, 90 W
IBC Constant 180	Alu/Epoxy/Hygro 1500 - 2500	3 x 230 V, 180 W
IBC Constant 370	Alu/Epoxy/Hygro 2500 - 3000	3 x 230 V, 370 W
Emotron EMX 15	500 - 1500	40 W
Emotron EMX 25	1500-2500	100 W
Emotron EMX 35	2500 - 3500	160 W

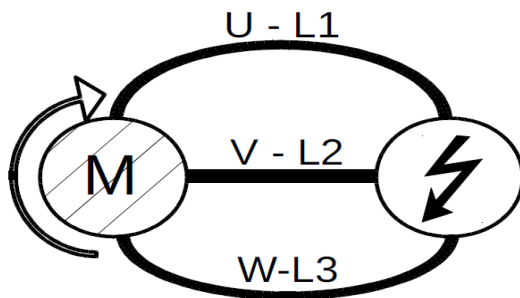
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### 3-phase AC in accordance with the following specification

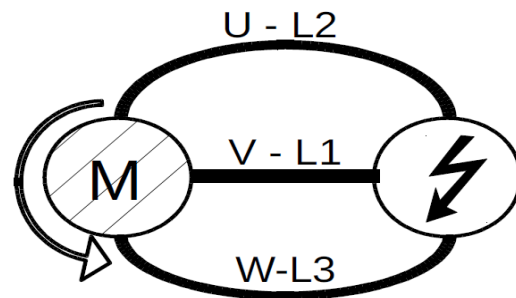


### Motor rotation

Clockwise



Anti clockwise



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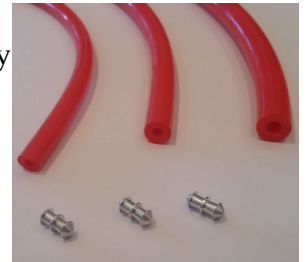


## Drive belts.

AMARANT use two types of belts:

### Round belt

Our round belt is hollow and made from polyurethane. This belt can quickly and easily be joined with metal connectors, so that there is no welding required. This belt provides excellent abrasion resistance, high elasticity, and is also self-tensioning. Belt tension should be ca: 5% \*. Tension of the belt should be re-examine after the first 48 hour of action. 8, 10 and 12mm diameter belts are used.



### Power-belt

Power-belt is made from composite polyester/polyurethane, proven to outlast and outperform rubber belts, especially on curves. Unaffected by extreme temperatures, water, steam, oil, grease, and common industrial chemicals and solvents, an operating temperature range, with no loss of performance, of -40° C to +66° C. Conventional SBR/chloroprene brand V belts simply can't compete. Tension of the belt should be re-examine after the first 48 hour of action. Belt tension should be 1-2%.\*



*\*All belts require adjustment, some once other a couple of times, depending on the environment they work in. Belt should be shorter then calculated length. When it comes to the power-belt, 1% is equal to 1 link per meter belt.*

### Shaft

Shaft can be supplied in various lengths. Standard size: from 220mm to 250mm.

Other lengths on request.

### Bearing

Standard bearing is ball-bearing. Other bearings on request.

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### **When receiving the goods.**

**AMARANT** work only together with logistic companies that has a long experience of our products, but sometimes accident happens. Please check the pallets and rotors strict and critical for any external damages, before signing the documents. If you see a damage, don't forget to make a note about it on the CMR or packing list and ask the forwarder to sign it. All damages must be notified **AMARANT** immediately, either by e-mail or letter.

Please check arrived goods correspond to your order.

Hidden damages can be notified up to 7 days after receiving.

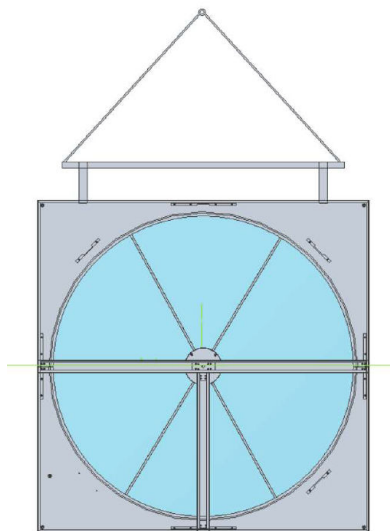
### **Storage.**

The rotary heat exchanger either in casing or without, should be stored in a dry place, due to material and electric components. Rotors in casing, standing / or during maintenance in vertical position, should be secured so they can't fall. Rotor in casing can have a weight of up to 600 kg, an accident can cause serious health injury. Please store the rotors in a way so external damage impact is minimized. The rotor itself is quite fragile if hit by external impact.

### **Lifting instructions.**

When lifting make sure no one is standing close to the rotor, hand, foot or body crashing injury can result in long term disablement.

Hook and lift the exchanger in the bended gables that constitute front and back of the heat exchanger. Lift careful and make sure no electrical wires or belts are in clamp. Please see the pic. below.



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For any questions regarding our heat exchanger or its components  
please contact us at:

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