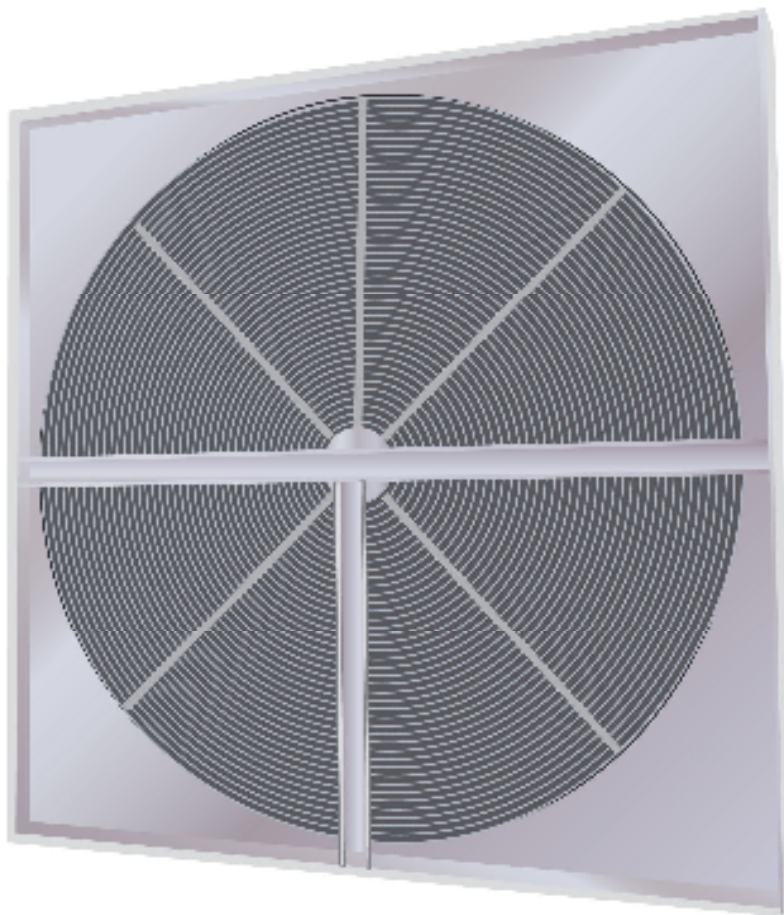




HEAT EXCHANGER

# MODEL B

TECHNICAL SPECIFICATIONS



## Committed to Excellence

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Owing to continued product development Heatex AB reserves the right to introduce alternations both in design and prices without prior notice.

## Matrix

Our standard rotary heat exchanger models W and B are available in four different standard materials: two condensation materials and two hygroscopic/enthalpy materials.

### Aluminium - A

As standard Heatex offer rotary heat exchangers in aluminium. The model B and W in aluminium are as standard available in sizes up to 2500 mm and in width 200 mm. Other width is available on request.

### Epoxy - E

Heatex offer epoxy coated aluminium for use in corrosive environments. The material is of the same high standard as the uncoated aluminium covered with a self sealing epoxy coating. The model B and W in epoxy are as standard available in sizes up to 2500 mm and in width 200 mm.

### Adsorption - D (silica gel)

Our adsorption material is an enthalpy transferring material of high quality. The material consists of an aluminium core with a silica gel based coating that has a high moisture transfer capability. Model B and W in absorption material are as standard available in sizes from 500 mm up to 2500 mm and in width 200 mm. There is a small amount of surplus material that might leave the matrix during the first time of usage. This will NOT affect the hygroscopic properties.

### Hybrid - K

The matrix referred to as hybrid is a combination of a corrugated aluminium foil and a non-corrugated foil with a silica gel based coating that has a high moisture transfer capability. The hybrid matrix is available in model B and W in sizes from 500 mm up to 2500 mm and in width 200 mm. There is a small amount of surplus material that might leave the matrix during the first time of usage. This will NOT affect the hygroscopic properties.

### Well height

The wheel consists of two foils, one even and one corrugated. The corrugated foil comes in three different configurations:

#### Very High efficiency

1.5 mm well height, gives a high efficiency due to its large heat transferring surface but also a higher pressure drop due to its small channels.

#### High efficiency

1.7 mm well height, gives a high efficiency due to its large heat transferring surface but at a lower pressure drop.

#### Standard

2.0 mm well height, our most common configuration due to its high efficiency and moderate pressure drop.

#### Low pressure

2.5 mm well height, gives a very low pressure drop at the expense of a lower efficiency.

To secure stability in the wheel, aluminium spokes are welded in hub and wrap. The entire rotor (except bearings and shaft) is made of aluminium.

## Bearings

Heatex offer two different types of bearings: standard ball bearings for vertical applications and angular contact bearings for wheels in horizontal applications.

The bearings are chosen for their low maintenance and long lifetime. In a worst case scenario with a 2500 mm wheel and 500 Pa pressure difference the lifetime has been calculated to 55 000 h. The construction with internal bearings (well protected against dirt) is chosen to increase life time and decrease maintenance needs.

## Casing

The self supported casing is made of rolled metal sheet and thus, do not require maintenance. The casing comes in vertical or horizontal configuration and for side by side or top/bottom ducts and in two different designs:

### Casing

Undivided self supporting metal sheet (Alu-Zink 150g) casing. Slide in configuration with uncovered sides,

bottom and top. Available up to 2650x2650 mm.

### Covered casings

Undivided self supporting metal sheet (Alu-Zink 150g) casing with covers on all sides, bottom and top. Equipped with an inspection hatch to facilitate access to the motor and controller. Available up to 2650x2650 mm.

All casings have adjustable brush sealants.



Picture 1. Brush sealant

### Purge sector

The purpose of the purge sector is to clean the wheel from exhaust air before turning over to supply air side. This prevents exhaust air from leaking into the supply air (fresh). The purge sector is made of metal sheet in the size of 5° with start at centre of the wheel. Brush sealants are assembled at the upper and lower side. Purge sector is an option and positioned in all four positions according to customers request.

Purge sector is only recommended for differential pressures (between supply air before rotor and exhaust air after rotor) of about 200 Pa to 800 Pa.

Purge sector should also be avoided when the supply side fan is after the heat

exchanger and the exhaust side fan is before the heat exchanger.



Picture 2. Purge sector

## Drive

Heatex offers constant drive or variable drive for rotary heat exchangers in all sizes. Motor is placed in optional corner fully protected inside the casing. Transmission is made via an elastic round belt or Powerbelt. Neither belt type need a tensioner. In rotors equipped with controller the control-box is placed on the same side opposite corner as the motor. In casings smaller than 900x900 mm the control-box is delivered loose with 1 m cabling.



Picture 3. Drive

## Belts

### Round belt

Our elastic round belt is easy to use since it requires no maintenance or tension device. The endless belt is vulcanized for highest strength and lifetime. The belt comes in three sizes, 6mm, 8mm and 10mm, depending on rotor size.



Picture 4. Round belt

### Powerbelt

This belt is used without tensioning device and can be used at temperatures up to 110°C and in humid climate. The belt is easily joined together without any tools or locks and is therefore easy to maintain. Powerbelt can be offered for all rotor diameters.



Picture 5. Powerbelt

## Constant drive

Depending on size and rotation speed (10 rpm for condensation/hygroscopic and 17 rpm for adsorption) the motor is either an AC-motor (15-40W) or an induction motor (90-370W). All motors are equipped with thermo contacts.

Condensation and hygroscopic Rotor	Adsorption Rotor	Nominal Power	Supply (V/Hz)	Nominal Speed (RPM)	Nominal current (A)	Pole number	Iso class	IP class	Mass with gear (kg)
-900	-600	25 W	1x230/50	1200	0.23	4	-	IP54	2.1
			3x230/50	1350	0.28	4	-	IP54	2.1
			3x400/50	1250	0.14	4	-	IP54	2.1
901-1100	601-1100	40 W	1x230/50	1250	0.37	4	-	IP54	4.1
			3x230/50	1350	0.39	4	-	IP54	4.1
			3x400/50	1300	0.21	4	-	IP54	4.1
1101-1500	1101-1300	90 W	3x400/50	1350	0.29	4	56	IP55	3.9
1501-2100	-	180W	3x400/50	1350	0.58	4	63	IP55	5.1
-	1301-1700		3x400/50	2820	0.5	2	63	IP55	4.5
2101-2500	1701-2500	370 W	3x400/50	2740	1.0	2	71	IP55	7.6

## Variable drive

### EMS-VVX

EMX-VVX is a new generation of speed controllers specially developed for controlling rotary heat exchangers. The unit includes motor and control unit with integrated rotation detector. Due to its technique with Switched Reluctance motors this system requires no gear.

- Motor without gear and fan
- High efficiency
- IP54
- Easy to use without any needs of adjustments.

EMS-VVX is available for all sizes.

Controller	VVX-15	VVX-25	VVX-35
Power	40W	100W	160W
Supply	230VAC +/- 15% 50/60Hz	230VAC +/- 15% 50/60Hz	230VAC +/- 15% 50/60Hz
RPM range	5-250rpm	5-250rpm	5-250rpm
Torque	1,5 Nm	4 Nm	6 Nm
Weight	5 / 1,7 kg	8 / 1,7 kg	11 / 1,7 kg
IP class	IP54	IP54	IP54

## MicroMax

The unit includes motor, rotation detector and controller. Frequency controller allowing use of standard 3-phase motors.

- Standard motors
- IP54
- Alarm indication

MicroMax – series is available for all sizes.

Controller	MicroMax	MicroMax 180	MicroMax 370	MicroMax 750
Power Max	90W	180W	370W	750W
Supply	1 x 230VAC 50/60Hz	1 x 230VAC 50/60Hz	1 x 230VAC 50/60Hz	1 x 230VAC 50/60Hz
Output	3 x 0-230V	3 x 0-230V	3 x 0-230V	3 x 0-230V
Temp. min-max	0-45°C	0-45°C	0-45°C	0-45°C
Weight	1,4 kg	1,4 kg	1,4 kg	1,4 kg
IP class	IP54	IP54	IP54	IP54

Condensation and hygroscopic Rotor	Adsorption Rotor	Nominal Power	Supply (V/Hz)	Nominal Speed (RPM)	Nominal current (A)	Pole number	Iso class	IP class	Mass with gear (kg)
-800	-700	25 W	3x230/50	1350	0.28	4	-	IP54	2.1
801-1100	701-1100	40 W	3x230/50	1350	0.39	4	-	IP54	4.1
1101-1500	1101-1300	90 W	3x230/50	1350	0.8	4	56	IP55	3.9
1501-2100	1301-1700	180W	3x230/50	1350	1.2	4	63	IP55	5.1
2101-2500	1701-2500	370 W	3x230/50	1350	2.1	4	71	IP55	7.9

## Application limits

Recommended temperature limits for rotary heat exchanger:

Min: -40°C

Max: 65°C

It is however important not to exceed the temperature limits on mounted components:

Component	Min	Max
Bearing temp.	-40°C	110°C
Belt temp.*	-40°C	66°C
Motor temp.**	-10°C	40°C
Emotron Controller	-30°C	40°C
Standard Controller	0°C	45°C

\* Powerbelt max 110°C.

\*\*Thermo contacts release at 150°C inner temp.

Temperature inside casing is approximately the mean temperature of supply and exhaust air temperatures.

Recommended pressure drop and differential pressure for rotary heat exchanger:

- Pressure drop max 300 Pa
- Pressure drop recommended 100-200 Pa
- Differential pressure max 600 Pa.

The maximum recommended pressure difference (between supply air inlet and exhaust air outlet) based on the life time expectations of the bearings is 500 Pa but should be kept to a minimum since otherwise wear of bearings and brush seals will be high and the leakage rate will also increase with pressure difference. A high pressure difference may also cause the casing to deflect. Please be aware of that for the purge sector to work the pressure difference should be higher than about 200 Pa and lower than about 800 Pa.

Recommended fan configuration is to have both fans on the exit sides of the heat exchanger and to always make sure that pressure is higher on the supply side than on the exhaust side so leakage will go from the fresh air side to the exhaust side.

## Freezing

Mean temperature of supply and exhaust inlet temperatures below 0°C does not necessarily cause a freezing problem. The freezing process depends on the level of condensation building up and freezing when the matrix is below freezing temperature. Frost becomes a problem when it builds up faster than it melts. This process normally takes many hours. It is important to be observant if the pressure drop increases during long periods of cold inlet temperatures. Frost building up in the matrix can cause high pressure differences leading to severe damage on bearings.

### Preventive measure

There are several methods to prevent frost to build up.

- Preheating of the outdoor air to a temperature that prevents the exhaust air from intersecting with the saturation line.
- Varying the rotor speed to reduce the moisture transfer. Exhaust air temperature and supply air temperature will approach each other when the rotor speed is reduced.
- By using a bypass to reduce the transfer rate to a point when the exhaust air no longer intersect with the saturation line

## **Support**

For questions or other requirements regarding this product, please state order number, product name and message.

Heatex AB is available for your support during office hour (0800am – 0430pm weekdays).

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