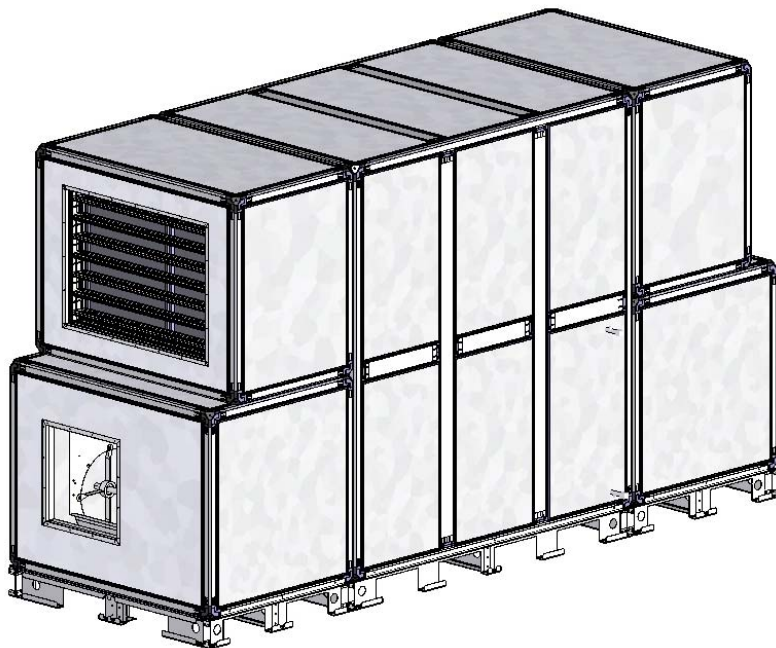


# BasX 2-4-6-10-14

Transport, mounting and installation guide

EN

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Dantherm can accept no responsibility for possible errors and changes  
Irrtümer und Änderungen vorbehalten  
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# Introduction

## Overview

### Introduction

This is the transport-, mounting-, and installation manual for the Dantherm Air Handling BasX units.

The table of contents below gives an overview of the main sections.

After reading this section, you will be able to:

- Unload the unit
- Transport the unit
- Unwrap the unit
- Mount the unit
- Mount coils and connect the drain, the water trap, and the rotary heat exchanger to the unit before start-up

NB: Not all units are supplied with all the components described in this manual.

### Contents

This manual covers the following topics:

Topic	See page
Requirements for the site	next page
Unloading and transport of the unit	5
Assembly	7
Roof assembly	10
Connection of coils	14
Connection of drain and water trap	15
Connection of the rotary heat exchanger	16
Connection of motor valve	20
How to adjust the number of fan rotations	21

### Not included

This manual does not include:

- Information regarding start-up, adjustment or use of the unit  
This information is available in separate manuals

### Warning

**It is the responsibility of the operator to read and understand this manual and other information provided and to use the correct operating procedures**

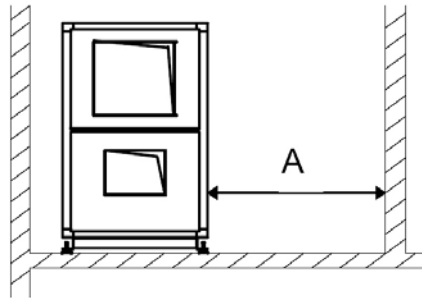
## Requirements for the site

**Introduction** It is important that the assembly site meets certain conditions before the unit is placed and mounted.  
These conditions are reviewed in this section.

**Weight** It is important that the materials and systems can carry the weight of the BasX unit.

**Foundation** To decrease the transmission of vibrations, the unit should be placed on a hard, level and vibration absorbing foundation.  
The prerequisite for a correct assembly of the fan modules is a level and even surface.

**Space requirement** The distances below are recommended for mounting, operation and service in front of the unit:



Model	Min. mm
BasX 2	1000
BasX 4	1000
BasX 6	1000
BasX 10	1000
BasX 14	1200

**Water trap** Installation of the units must be done in such a way that the water trap can be correctly fitted. Read more in the section "Connection of drain and water trap", page 15.

## Unloading and transport of the unit

### Introduction

This section will provide you with all the information needed from unloading the unit at delivery to placing the unit on the assembly site.

The unit is delivered in modules. Fittings and bolts (see the section assembly) are supplied for assembly of modules. If the unit is delivered with a base frame, the ancillary feet are not fitted.

### Important

Do **not** put the unit down horizontally due to the fact that mechanical parts may be damaged.

Do **not** lift or move the unit without support (base frame or shipping pallet).

Do **not** lift the unit by the top frame.

### Packaging

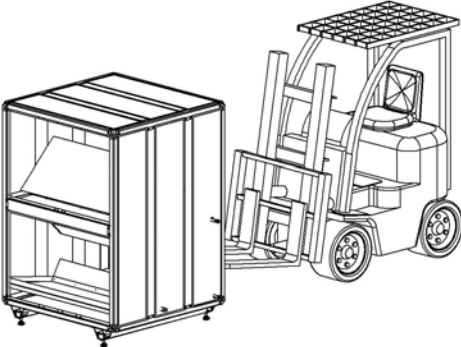
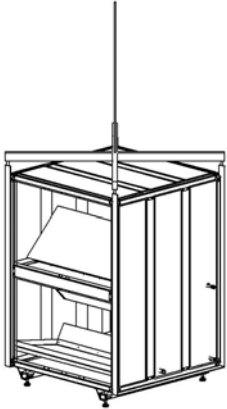
The BasX is delivered in modules either on a shipping pallet or mounted on a base frame.

Each module is wrapped in protective packaging.

Keep the modules in their packing until placed at the assembly site to avoid damage on cabinet parts or projecting connections.

### Transport of modules

The modules are constructed for easy transport either by lifting the unit by forklift truck or crane.

Forklift truck	Crane
<ul style="list-style-type: none"> <li>• Lift the module with base frame between the trapezoid base profile</li> <li>• Drive over to the module, as shown below</li> <li>• The forks must minimum have the same length (L) as the modules</li> <li>• Be extra careful in case of narrow modules</li> <li>• Lift modules on shipping pallet ON the pallet</li> </ul> 	<ul style="list-style-type: none"> <li>• Use lifting yokes and soft lifting straps</li> <li>• Lead the straps through the profiles when lifting modules with base frame or through the holes in the profiles</li> <li>• Put the straps below the pallet when lifting modules on shipping pallets</li> </ul> 

*Continued overleaf*

## Unloading and transport of the unit, *continued*

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**Caution!** Rough and incorrect handling may damage the unit thus resulting in loss of function

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**Building the modules together** Follow this procedure to place one module on top of another:

Step	Action
1	Use the forklift truck to lift the module to be built together with another module. The lower edge of the module should be level with the upper edge of the bottom module
2	Push the module from the shipping pallet on to the below module

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# Assembly

## Introduction

The unit is delivered in modules to be assembled on the mounting site.

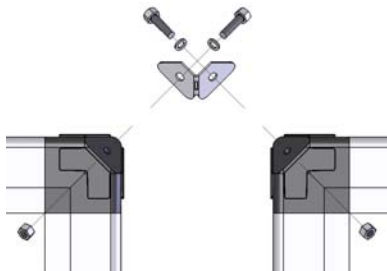
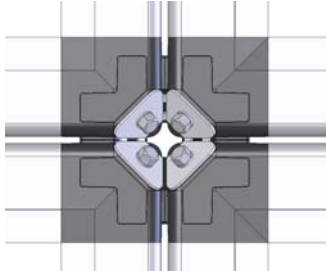
The modules are factory fitted with seal gaskets.

The units are supplied with 4 types of fittings.

- One type is designed for external assembly of the modules.
- The 2<sup>nd</sup> type is designed for internal assembly of the modules (See step 5 and 6 in the procedure below).
- The 3<sup>rd</sup> type is designed for assembly of the base frame
- The 4<sup>th</sup> type, the locking wedge, is exclusively designed for units including rotary heat exchanger modules BasX 10 R or BasX 14 R.

## Procedure

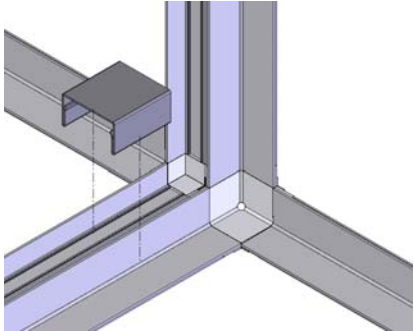
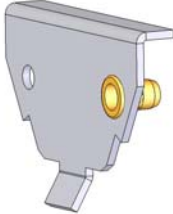
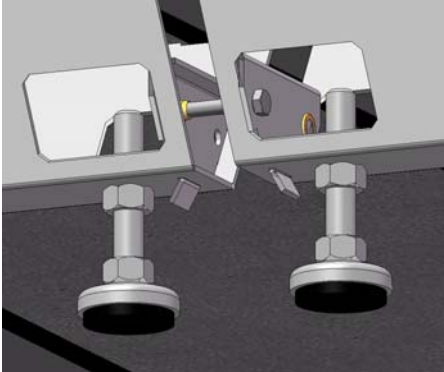
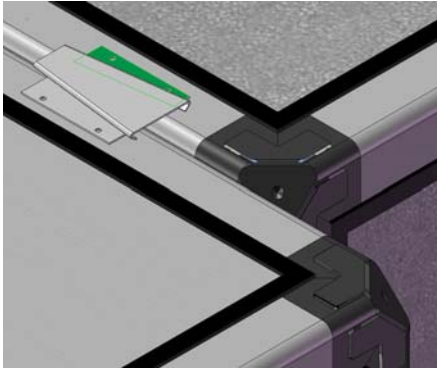
Follow this procedure to assemble the unit:

Step	Action				
1	Read the section "Requirements for the site", page 4 and take the necessary measures to prepare for assembly				
2	Unwrap each module				
3	<p>Mount the feet on the base frame (accessory) just before the modules are placed on the site Important: When the feet are mounted, the modules can exclusively be lifted (not pushed) as the feet else will bend or break</p> <p>Place the modules in the correct order (study the drawing of the unit for the correct order)</p> <p>It is important that the adjustment of the modules are corrected thus all modules flush with each other and are on the same level:</p> <table border="1" data-bbox="497 1281 1428 1413"> <thead> <tr> <th>With a base frame</th> <th>Without a base frame</th> </tr> </thead> <tbody> <tr> <td>Adjust the height using the adjustable feet on the base frame</td> <td>Ensure safe support in another way</td> </tr> </tbody> </table>	With a base frame	Without a base frame	Adjust the height using the adjustable feet on the base frame	Ensure safe support in another way
With a base frame	Without a base frame				
Adjust the height using the adjustable feet on the base frame	Ensure safe support in another way				
4	Check that all gaskets are intact before the modules are built together				
5	<p>Assemble the modules externally with fittings (see the figures below).</p> <p>The fittings are available in 4 types adapted to the number of modules touching each other.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>2 modules</p> </div> <div style="text-align: center;">  <p>4 modules built together</p> </div> </div>				

*Continued overleaf*

## Assembly, *continued*

### Procedure, *continued*

Step	Action	
6	Fit extra internal clips (see step 7) if external fittings are not an option e.g. if the unit is placed up against a wall	
7	Fit the clips supplied for internal assembly of the modules. <ul style="list-style-type: none"> <li>• Use 2 clips for frame lengths up to 1 m</li> <li>• Use 3 clips for frame lengths up to 2 m</li> </ul> If an external fitting is not an option, fit an additional clips inside the unit by the corner	
8	Place these connection brackets in the base frames	
9	Connect the base frames with M8 x 50 bolts	
10	Mount the R-module of the BasX 10 and 14 modules with rotary heat exchanger by means of locking wedges on top. Hammer the locking wedge in place with a soft hammer	
11	Follow the instructions in the next sections	

*Continued overleaf*



## Assembly, *continued*

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### **How to mount components on the cover panels**

The cover panels are constructed with the purpose of obtaining an efficient thermal insulation. They are made as a sandwich construction composed of an efficiently insulating polyurethane core covered with relatively thin steel plates.



If components are to be mounted on the cover panels of the unit, we recommend to use bolts in through-going holes and fender washers on the reverse side of the cover panels.

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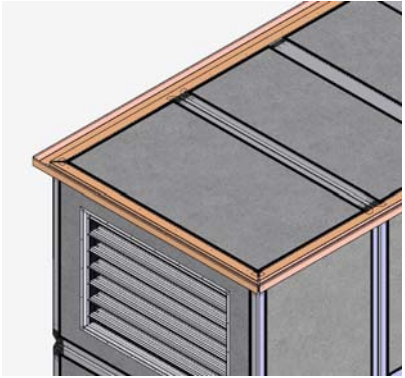
## Roof assembly

**Introduction** This section describes in detail how to assemble the roof (accessory).

**Supplied parts** The following parts are supplied for the roof assembly:

- Drain profile 
- Centre profile 
- Roofing
- Black screws, 4.8 x 25 mm  
Used for assembly of roofing in the drain- and centre profile
- Black screws, 4.8 x 22 mm  
Used as lap screw
- Self-drilling screw M4 x 16 mm  
Used for fixing of drain- and centre profile in the aluminium frame

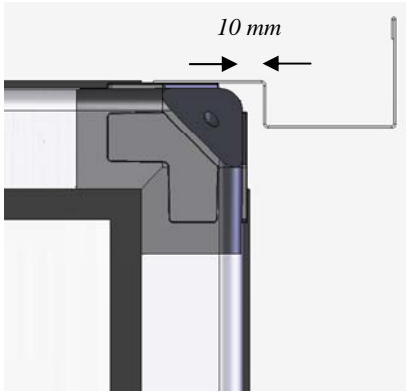
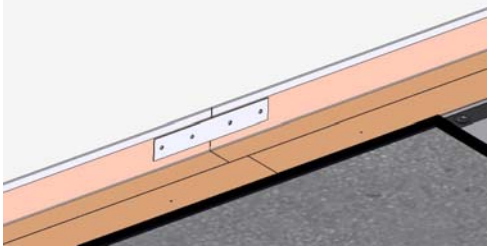
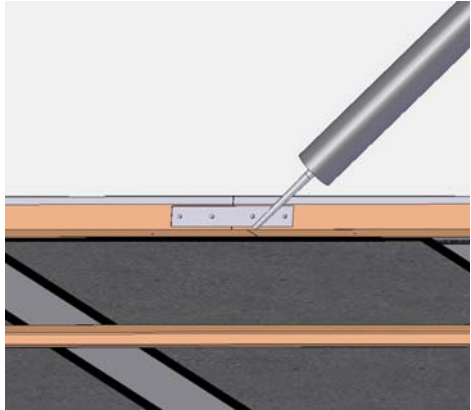
**Procedure** Follow this procedure to assemble the roof:

Step	Action	
1	Follow the instructions in the assembly section page 7, if not already completed	
2	Fit the drain profile along all sides with the supplied self-drilling screws M4x16 mm. Fit the drain profile in the aluminium frame	

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## Roof assembly, *continued*

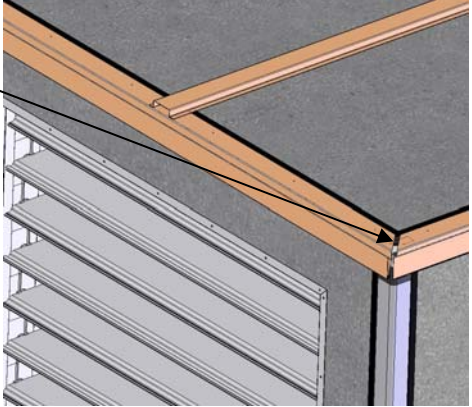
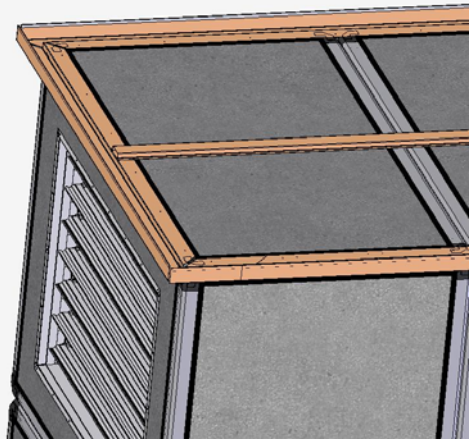
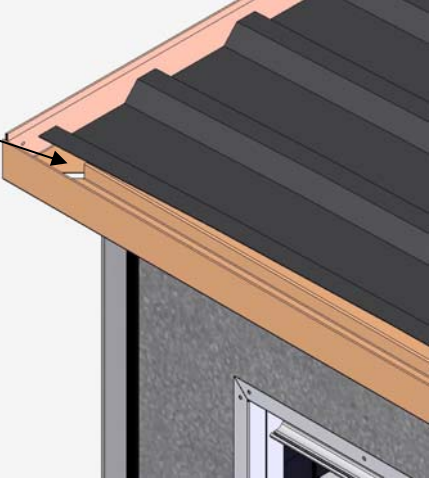
Procedure, *continued*

Step	Action	Action
3	Fit the drain profile with a 10 mm projection	
4	Flush the drain profiles and assemble them with four tubular rivets and fittings	
5	Seal the joint with silicone joint sealant after assembly of the drain profile	

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## Roof assembly, *continued*

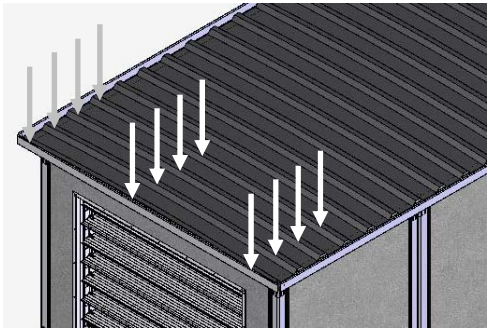
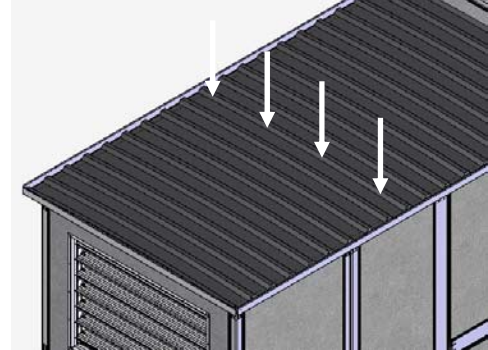
Procedure, *continued*

Step	Action	Action
<p>6</p> <p>Cut the drain profile at 45 degrees with a metal shear. Make a 10 mm distance in the angle joint enabling the water from the roof to drain off.</p> <p><b>Note!: Do not use an angle grinder as the heat will degrade the corrosion characteristics</b></p> <p>Fit the centre profile alongside the unit with the supplied self-drilling screws M4x16 mm. Fit them on the framework and not on the sandwich plates!</p>		 
<p>7</p>	<p>Fit the roofing with an air gap of 20-40 mm for all drain edges</p>	

*Continued overleaf*

## Roof assembly, *continued*

### Procedure, *continued*

Step	Action	Action
8	Fit the roofing to the centre profile and the framework using the longer of the two types of screws. Use one screw in each valley of corrugation. Screw the screws in the centre- and drain profile  <b>Note: Use a metal shear to cut the roofing and not an angle grinder</b>	
9	Use the short screws as lap screws alongside the roofing. Fit one lap screw per 200 mm	
10	Follow the instructions in the next section to continue the installation	

## Connection of coils

### Branches

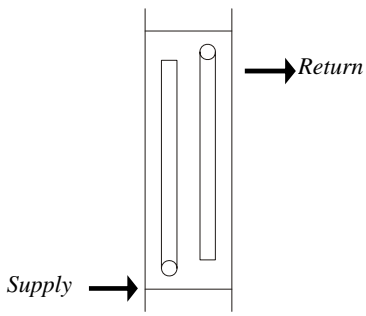
Branches for the LPHW heating coils are placed outside the cabinet.

### LPHW heating coils

Especially for LPHW heating coils are that these have always supply at the bottom and return in the top.

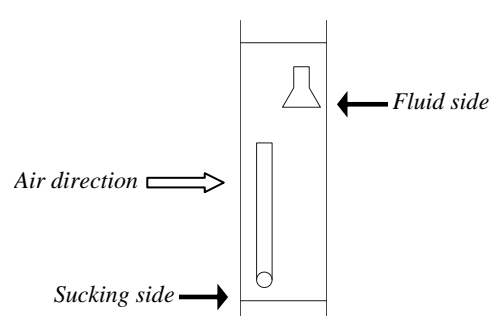
### Procedure, LPHW heating coil/cooling coil

Follow this procedure to connect the coils:

Step	Action
1	<p>Connect the supply so that this is most distant from the air inlet at the back:</p>  <p>The diagram shows a vertical rectangular cabinet with two vertical pipes inside. The left pipe has a small circle at the bottom, labeled 'Supply' with an arrow pointing to it. The right pipe has a small circle at the top, labeled 'Return' with an arrow pointing to it. The pipes are connected to a horizontal pipe at the top of the cabinet.</p> <p>Tip! Make sure air relief in the pipe system is possible plus possibility of future separation of the pipe system</p>

### Procedure, cooling coils for direct expansion (DX)

Follow this procedure for connection of the cooling coils:

Step	Action
1	<p>Connect the fluid side to the upper branch and the sucking side of the unit to the lower branch:</p>  <p>The diagram shows a vertical rectangular cabinet with two vertical pipes inside. The top pipe has a flange-like top, labeled 'Fluid side' with an arrow pointing to it. The bottom pipe has a small circle at the bottom, labeled 'Sucking side' with an arrow pointing to it. A horizontal pipe at the top of the cabinet is labeled 'Air direction' with an arrow pointing to the right.</p>

## Connection of drain and water trap

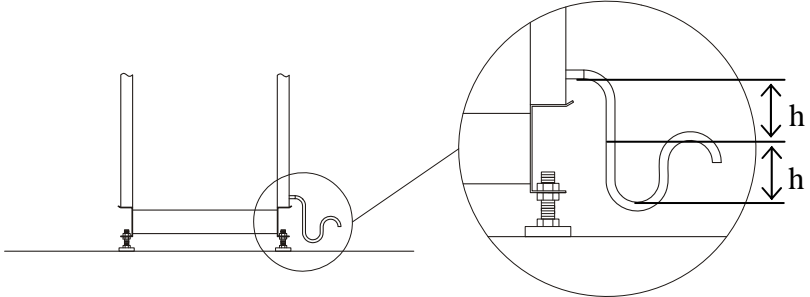
### Drain and water trap

Drainage from the condensate tray is taking place through a pipe that is lead through the side of the cover plate.

For units that produce condensate, Dantherm Air Handling A/S recommends the installation of a drain pipe trap including a water seal that corresponds to the negative pressure, so that no air is taken in through the drain pipe.

### Procedure

Follow this procedure to install the water trap:

Step	Action
1	Find the maximum negative pressure in the unit for use for when installing (1 mm VS = 10 Pa)
2	Mount the water trap so that the effective water trap height (h on the drawing) is bigger than the maximum negative pressure in the unit (step 1)
	
3	Mount the water trap so that the height difference between the drainage branch and the water trap outlet has the same height (h on the drawing)
4	Fill the water trap with water before starting up

### Tip!

To save height a ball drain trap can be used instead of the referred/shown water trap!

## Connection of the rotary heat exchanger

### Description

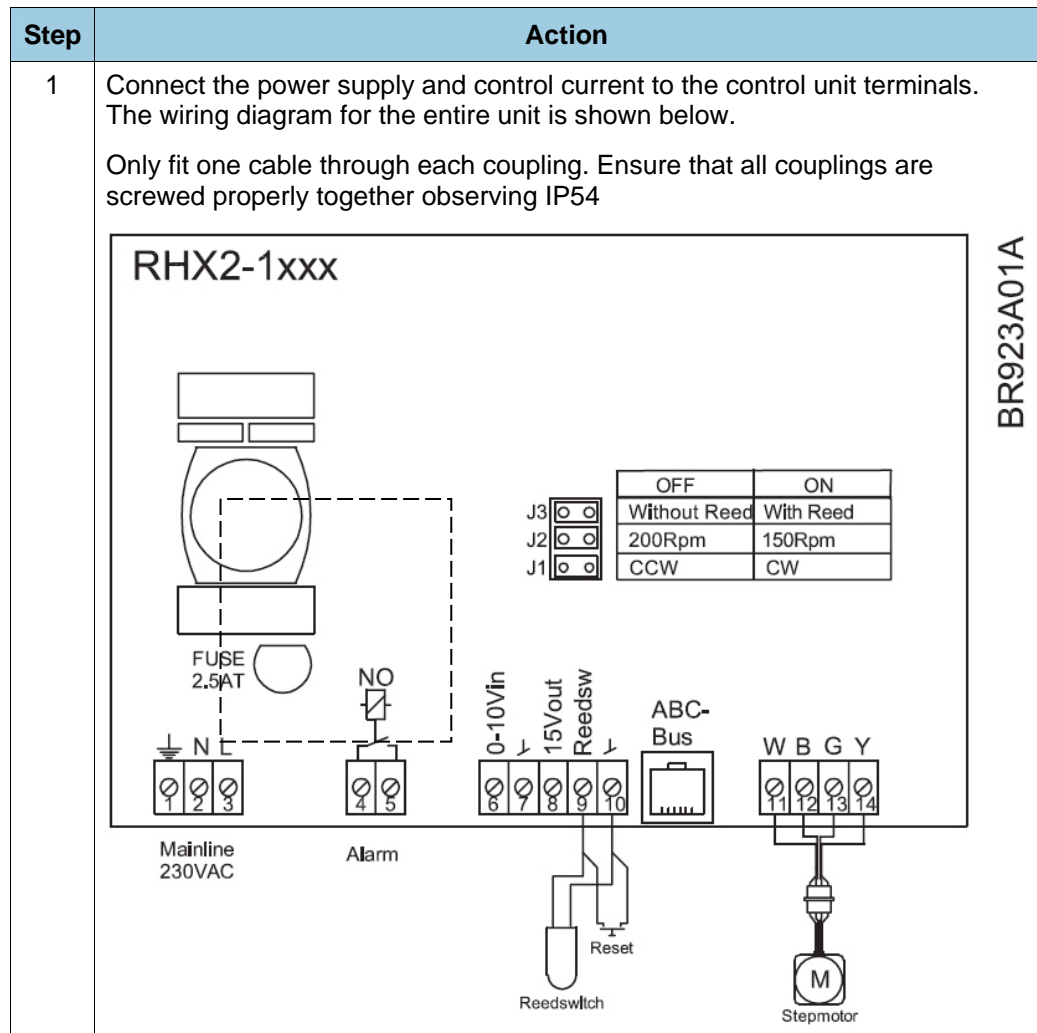
The rotary heat exchanger is driven by a step motor with control box. The step motor and the control box are inter-connected and tested before leaving the factory.

Furthermore, the unit is fitted with a rotation guard composed of a magnet fitted the rotary heat exchanger and a reed switch connected to the control box (See wiring diagram below).

The motor and the control box are placed right behind the cover plates of the modules in the tending side of the unit.

### Procedure

Follow this procedure to connect the rotary heat exchanger:


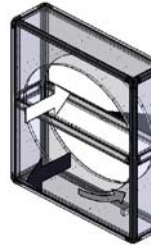
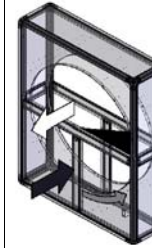
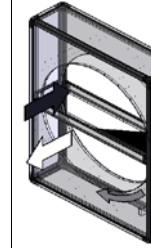

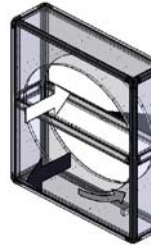
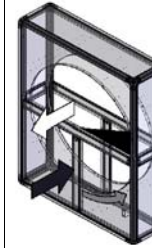
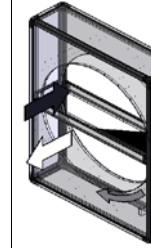

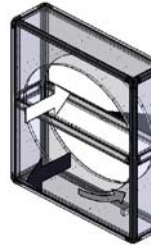
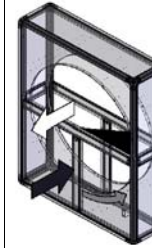
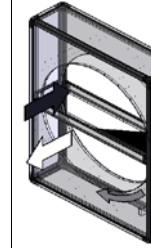


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## Connection of the rotary heat exchanger, *continued*

### Procedure, *continued*

Step	Action																																																									
2	<p>Ensure that the jumpers are set for the current operating situation The control box PCB is fitted with 3 jumpers, J3, J2 and J1.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Rotation guard – jumper 3</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td colspan="2">The unit is fitted with a rotation guard as standard</td> <td>ON</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Max. motor speed – jumper 2</th> <th>J2 Setting</th> </tr> <tr> <th>Model</th> <th>Rotor diameter, mm</th> <th>Pulley diameter, mm</th> <th>Motor speed, RPM</th> <th></th> </tr> </thead> <tbody> <tr> <td>BasX 2</td> <td>800</td> <td>56</td> <td>150</td> <td>ON</td> </tr> <tr> <td>BasX 4</td> <td>1050</td> <td>56</td> <td>200</td> <td>OFF</td> </tr> <tr> <td>BasX 6<sup>*)</sup></td> <td>1250</td> <td>63</td> <td>200</td> <td>OFF</td> </tr> <tr> <td>BasX 10</td> <td>1550</td> <td>77</td> <td>200</td> <td>OFF</td> </tr> <tr> <td>BasX 14<sup>**)</sup></td> <td>1950</td> <td>99</td> <td>200</td> <td>OFF</td> </tr> </tbody> </table> <p><sup>*)</sup> BasX 6 units produced until February 2008 are equipped with a pulley <math>\varnothing 80</math> and must be set to motor speed 150 RPM (J2 ON)</p> <p><sup>**)</sup> BasX 14 units produced until February 2008 are equipped with a pulley <math>\varnothing 140</math> and must be set to motor speed 150 RPM (J2 ON)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Direction of motor rotation for rotor exchanger – jumper 1</th> </tr> <tr> <th>J1: OFF</th> <th>J1: ON</th> <th>J1: ON</th> <th>J1: OFF</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">Pos. right unit with fresh air inlet in the bottom</td> <td style="text-align: center;">Pos. right unit with fresh air inlet in the top</td> <td style="text-align: center;">Pos. left unit with fresh air inlet in the top</td> <td style="text-align: center;">Pos. left unit with fresh air inlet in the bottom</td> </tr> </tbody> </table>	Rotation guard – jumper 3		Setting	The unit is fitted with a rotation guard as standard		ON	Max. motor speed – jumper 2				J2 Setting	Model	Rotor diameter, mm	Pulley diameter, mm	Motor speed, RPM		BasX 2	800	56	150	ON	BasX 4	1050	56	200	OFF	BasX 6 <sup>*)</sup>	1250	63	200	OFF	BasX 10	1550	77	200	OFF	BasX 14 <sup>**)</sup>	1950	99	200	OFF	Direction of motor rotation for rotor exchanger – jumper 1				J1: OFF	J1: ON	J1: ON	J1: OFF					Pos. right unit with fresh air inlet in the bottom	Pos. right unit with fresh air inlet in the top	Pos. left unit with fresh air inlet in the top	Pos. left unit with fresh air inlet in the bottom
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## Connection of the rotary heat exchanger, *continued*

**Technical data** The control box has a built-in thermal fuse preventing an overload of the electronics.  
**A separate type G fuse must be installed to protect the main cable.**

	Controller inputs
Supply voltage:	50 – 60 Hz, 230 V AC +/- 15 %
Max. prefuse:	16 A
Voltage signal	0 – 10 V DC
Impedance (voltage signal)	10 kOhm
Serial communication	RS485 ABC-Bus
Rotation guard	Reed switch (also active in purging operation)
Supply for Hall element	15 V DC (internal pull-up 1.1 kOhm resistance)
	Controller outputs
Relay output for alarm	NO relay 5 A, 250 V
LED indication	2-colour (green/red)
Torque	2 Nm, 4 Nm and 6 Nm
Enclosure	IP54

**Environmental data** This table shows the environmental data:

Power consumption	Motor size <sup>*)</sup> , Nm	Power, W
Standby/holding torque	-	3 W
Max. load/150RPM	2 Nm	45 W
	4 Nm	90 W
	6 Nm	150 W

<sup>\*)</sup> Actual size is apparent from the motor name plate

**Functions** The functions below are available in the controller:

Purging operation	Rotation	10.0 RPM
	Purging interval	8 hours
	Purging timer	120 seconds
Motor stop	Reference < 0.5 % of max. RPM	
Motor start	Reference > 1 % of max. RPM	

*Continued overleaf*

## Connection of the rotary heat exchanger, *continued*

### Indication of operating state

During operation, the LED diode in the front of the control box will provide information on the operational state

Diode display	Information
Green	Normal operation and motor running
Green blink	The LED will blink each time the rotation guard is activated
Red	General alarm
Red blink	Rotation guard alarm; To reset rotation guard alarm, the rotation guard input must be short circuited (see wiring diagram)

If the controller cannot detect rotation, the motor is ramped down to 0 RPM and the speed is then ramped up to the reference speed. This is repeated 3 times, and only then is the alarm relay activated and the diode blinks red. Until the motor has been ramped up 3 times no alarm is indicated.

## Connection of motor valve

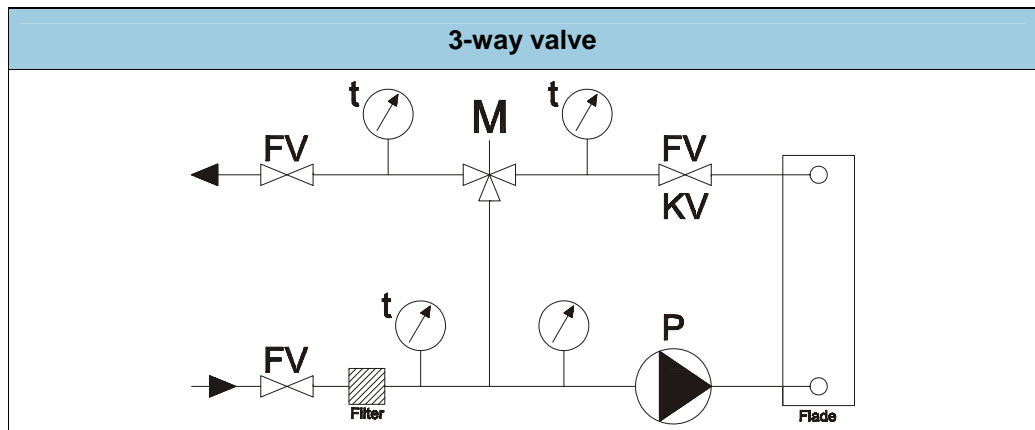
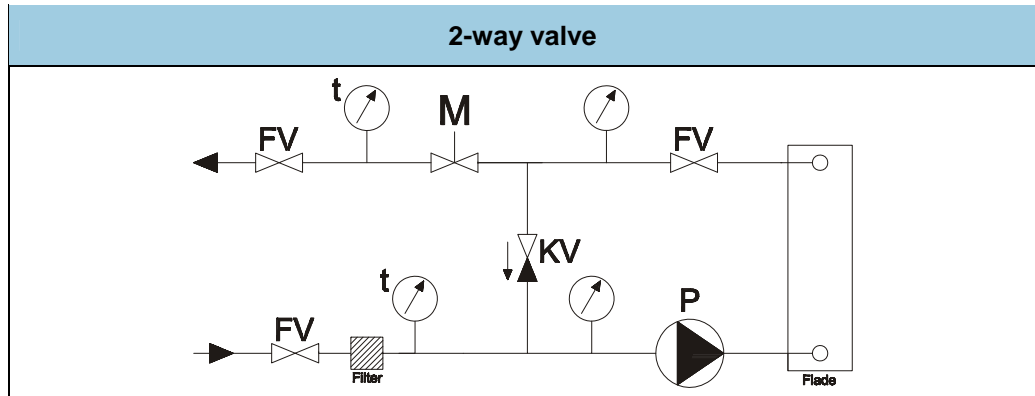
### 2-/3-way valve

The control of the LPHW heating coil can either be by means of a 2- or a 3-way valve, which are both controlled by a channel thermostat.

To achieve the fastest adjustment of the heat the illustration shows, how the installation of a 3-way valve always results in having hot water available at the LPHW heating coil.

### Illustration

Use these illustrations when the valve is to be installed:

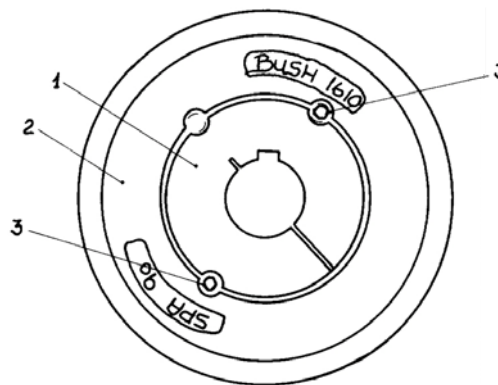


## How to adjust the number of fan rotations

**Note!** Considering the motor size and the allowed working range of the fan the adjustment of the number of fan rotations should be done by a specialist.

**Adjustment of fan pulleys** By pulley-driven fans the motor and fan shafts have Taperlock pulleys for quick change of fan rotations.  
The number of fan rotations is defined by the number of motor rotations and the relation between the diameters of the two pulleys.  
Dependent on the motor size the pulleys have 1-, 2- or 3 grooves.

**Illustration** Taperlock pulley:



**Part/function** This scheme applies to the above drawing:

Part	Function
1	Taperlock
2	Pulley
3	Screws

**Procedure** Do as follows to replace the pulleys:

Step	Action
1	Unscrew the Allen screws ③ and pull off the pulley ② from the motor shaft
2	Fit a new pulley, smaller or larger, that matches the requested RPM and re-fix the Allen screws

*Continues overleaf*

## How to adjust the number of fan rotations, *continued*

**Calculation of flow** The flow of the unit can be calculated by measuring the pressure difference between the suction side of the fan and the inlet cone of the fan.

BasX- modules with plug fans are fitted with a measuring stub which is positioned on the suction side of the fan and a stub which is positioned in the inlet cone of the fan.

In case of flow a pressure difference will be created between the two measuring points. The negative pressure in the inlet cone of the fan is getting bigger than on the suction side of the fan.

**Flow and pressure difference** The relation between flow and pressure difference is as follows:

$$V = K * \sqrt{\Delta p_w}$$

Symbol	Description	Unit
V	Messured flow	[m <sup>3</sup> /h]
$\Delta p_w$	Pressure difference	[Pa]
K	Constant specifically valid for each single unit size (see table below)	-

### K factor

K for each unit size is shown in the table:

Type	K Factor
BasX 2	60
BasX 4	121
BasX 6	154
BasX 10	252
BasX 14	381