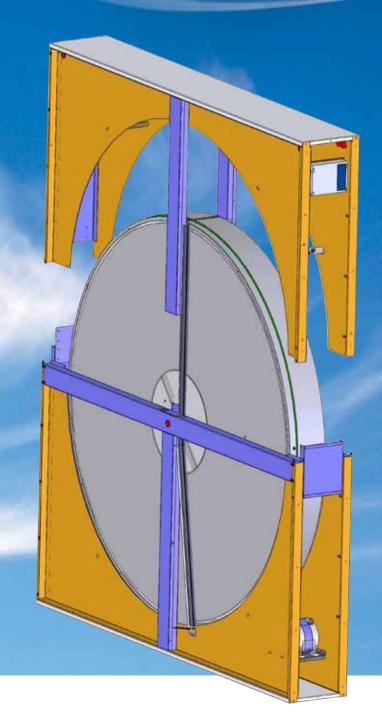
ECONOVENT® PUR (D)

Installation and Maintenance Instruction



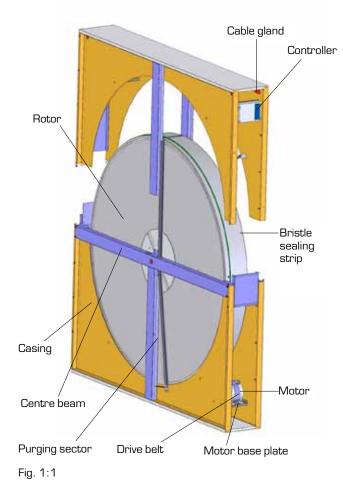


Installation and Maintenance Instruction – PUR (D)

Contents

Delivery Version of PUR (D)	3
Lifting PUR (D)	5
Assembling PUR (D)	6
Handling, Loads on the unit,	
Inspection Facilities PUR (D)	10
Connection, Checks, Rotor Seals PUR (D)	11
Drive Unit, Speed Controller PUR (D)	12
To change the Rotor Bearings PUR (D)	13
Shaft Adjustment PUR (D)	14
To change the Drive Belt PUR (D)	15
Maintenance PUR (D)	17
Service Schedule	19
Dimensions and Weights	20

Delivery Version of PUR (D)



Rotor Diameter 1500 – 2000 mm

Rotor Diameter 2001 – 2500 mm

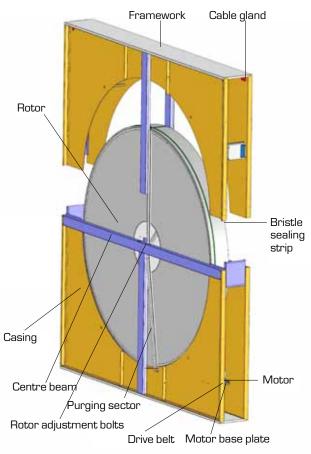
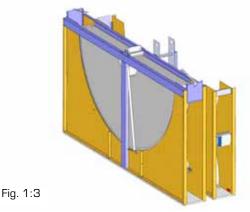


Fig. 1:2

Note!

The PUR (D) is delivered as a split cassette, with sectionalised rotor, to be mounted together according to this instruction, for one piece unit please see PUR (A), document 9334.



Example delivery (size 201-250).

Delivery version of PUR (D)

The cassette version of PUR (D) units are supplied with a cassette made of galvanized steel, stainless steel (304/316L) or AluZink coated and with assembled rotor and drive unit. The cassette can be supplied with (1 or 2) or without inspection cover for the drive system. The cassettes are designed for installation inside a functional section of an Air handling unit, and must not be used as freestanding heat exchanger. The casset version of PUR (D), position d=3 or 4 are cassettes supplied with a casing made of galvanized steel, stainless steel (304/316L) or AluZink coated and with assembled rotor and drive unit. The cased version can be used as freestanding heat exchangers.

Important!

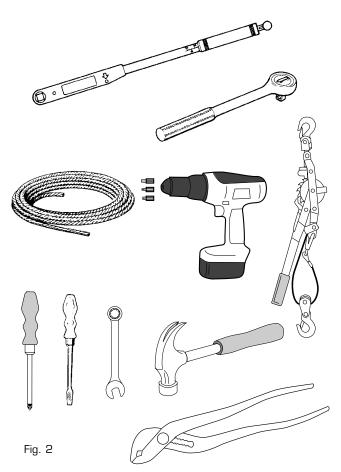
Protect the heat exchangers against contact with water and moisture. Take every precaution to prevent deformation of the rotor surfaces as they are relatively sensitive to mechanical damage.

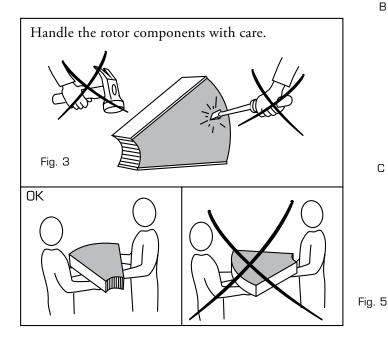
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Delivery Version of PUR (D)

Installing split heat exchanger

Tools and materials needed





Delivery

- A. Units can be transported using a forklift truck or a platform trolley. The heat exchanger is delivered in wooden crates, Fig. 4.
- B. The top part with the rotor half in sections, with transport protection and lifting lugs, Fig. 5.
- C. The bottom half with a ready assembled rotor half and drive motor, Fig. 5.

Plastic bag with the necessary bolts, nuts and washers.

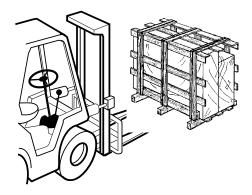
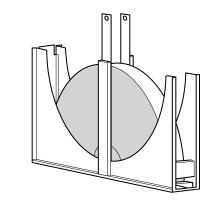
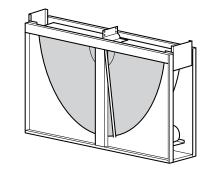


Fig. 4

в

С

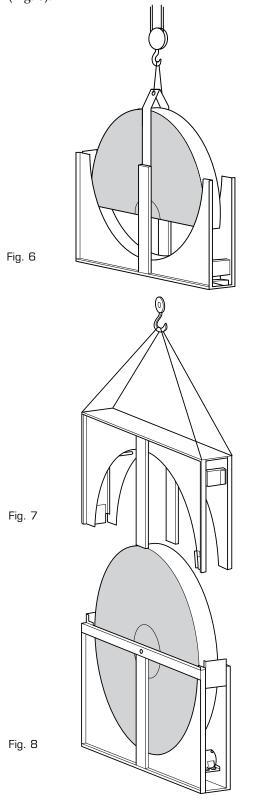




Lifting - PUR (D)

Lifting components

Lift components in accordance with Figures 6, 7 and 8. Use lifting lugs when lifting the lower part (Fig. 6).



Assembly

Regardless of whether or not the heat exchanger is assembled in its final location, the surface supporting it must be flat. Fit spacers under the heat exchanger to compensate for any surface irregularities. The heat exchanger must be accessible from both sides for the final inspection of the rotor and adjustment of the seals. **To prevent the heat exchanger from falling over when it is being assembled in an upright position, secure the bottom half in position before starting the work.** Secure it in accordance with Figures 9 or 10. Assemble the heat exchanger upright. If this is not possible, assemble it flat in accordance with these instructions.

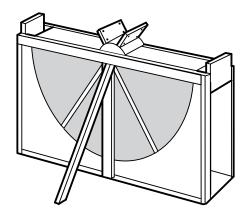


Fig 9. Strut secured in one of the bolts in the diagonal stay.

NOTE! One strut on each side of the heat exchanger.

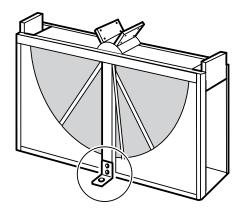


Fig. 10. Stays screwed into the existing corner pieces and to the floor or wall.

Assembling – PUR (D)

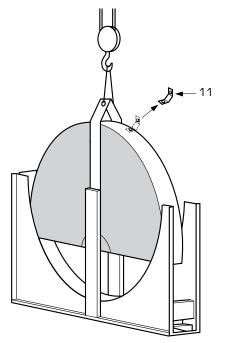


Fig. 11. Remove the rotor protection, transport locking device 11. Lift out the rotor half.

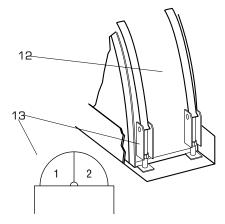


Fig. 12. Remove the rim plates 12, and retaining straps 13. Save the bolts.

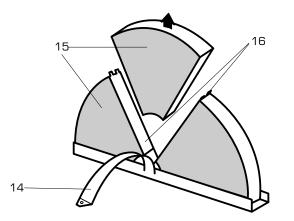


Fig. 13.. Bend down the lifting arms 14, and lift out the rotor segments 15 and spokes 16.

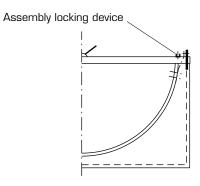


Fig. 14. Lower part

Important! Leave the assembly locking device in place while the rotor segments are being assembled.

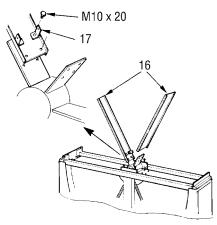


Fig. 14. Fit the spokes 16 to the hub and the locating brackets 17 for the cover plates using the bolts supplied.

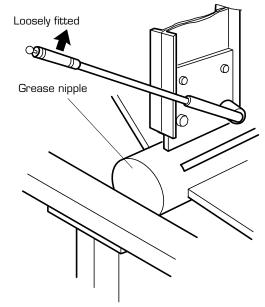


Fig. 16. Tighten the spoke bolts by hand, the spoke must still be able to slide in the bolted joint.

Assembling - PUR (D)

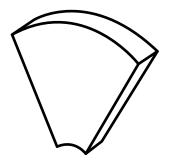


Fig. 17. The rotor segments have ID numbers in accordance with Figure 18.

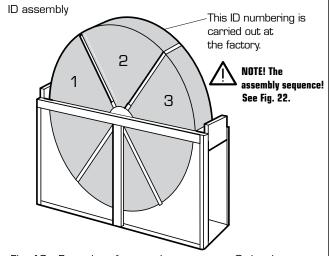
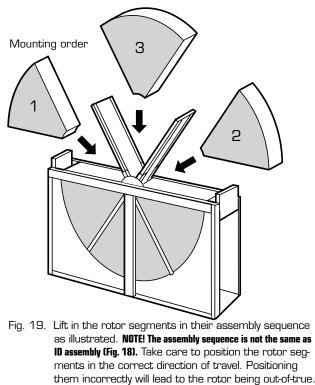


Fig. 18. Examples of external components. Order the segments according to their ID numbers with the digits facing in the same direction.



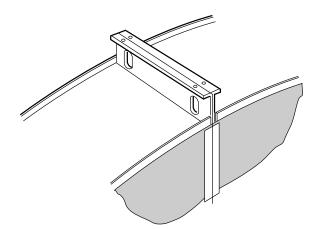


Fig. 20. Position the inner rim plate on the periphery of the rotor.

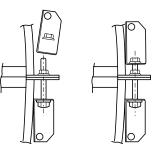


Fig. 21. Fit the retaining straps that are to sit against the lower rotor half.

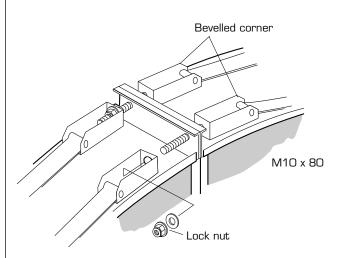


Fig. 22. Fit the other retaining straps. The bevelled corner must face outwards. Use the M10 x 80 bolts supplied, with washers and lock nuts. NOTE! Use lock nuts.

Assembling - PUR (D)

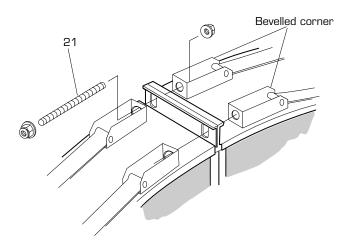


Fig. 23. If the distance for the two last bolts is too great, use threaded rod 21. First tighten one retaining strap until the M10 x 80 bolt can be fitted in the other retaining strap. Remove the threaded rod and fit the remaining bolt.

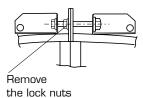


Fig. 24. Before the retaining straps can be tightened, the lock nuts (4) that have been holding the lower rotor half must be removed. Remove the assembly locking devices, see Fig. 28. Rotate the rotor so that the lock nuts are on the top when they are removed.

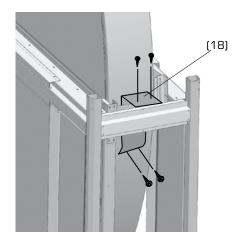


Fig. 25. Remove the transport safety devices (18) on the rotor half, there is one on each side.

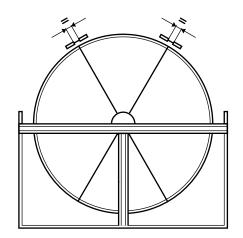


Fig. 26. Slacken off the tightened spoke bolts slightly. Then tighten the bolted joints on the retaining straps in stages. Ensure that the distance between the retaining straps is roughly equal at each spoke. Then tighten all joints to 10 Nm, then to 20 Nm and finally to 25 Nm.

When all retaining strap bolts have been tightened, the position of the spokes and the roundness of the rotor must be checked once more.

After that the spoke bolts are tightened to 50 Nm.

Rotor: $10 \text{ Nm} \rightarrow 20 \text{ Nm} \rightarrow 25 \text{ Nm}$ Spoke: 50 Nm

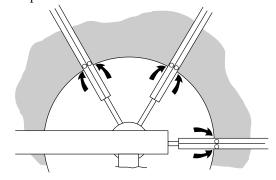


Fig. 27. As a guide value during assembly, the inner perimeter surface of the rotor segments is to be located in the centre of the marking holes in the spokes.

Assembling - PUR (D)

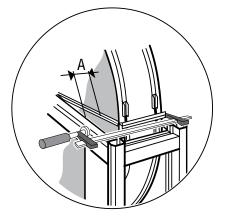


Fig. 28. Measure the flatness of the rotor by measuring the distance A for each spoke. A difference of max. 2 mm is tolerated. Adjust the spoke by slackening off its bolts at the hub, relocking them when the spoke is in the correct position. The spoke can be moved to the correct position using a clamp or lever. Turn the rotor and adjust the other spokes in the same way. The tightening torque for the spoke bolts is 50 Nm. Check the round-ness of the rotor. Maximum deviation 5 mm.

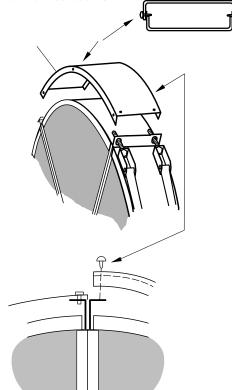


Fig. 30. Fit the outer rim plates 12. Ensure that they fit over the edge of the inner rim plates and lie against the

the edge of the inner rim plates and lie against the flange on the spoke. The flattened section of the pop rivets must lie on the edges of the inner rim plates along the inner flange surfaces of the outer rim plates. See the detailed diagram in Fig. 33. The outer rim plates are secured using pop rivets at both ends as above.

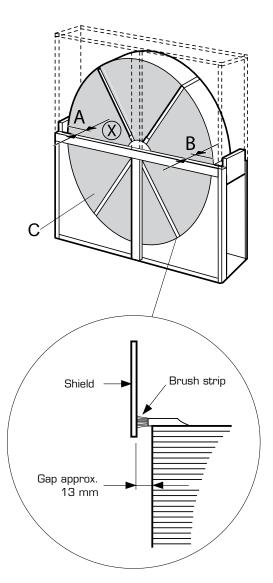


Fig. 31. Adjusting the rotor seal gap: Mark a spoke, with an X for example. Measure the dimension A at the X marked spoke. Turn the rotor a 1/2 turn and measure the dimension B at the same spoke. If dimension A = B the rotor shaft is square. A difference of max. 2 mm is tolerated. Turn the rotor another 1/6 turn so that the X marked spoke gets to a stay at point C and measure the dimension. The maximum permitted difference between A, B and C is 2 mm. Check that the seal gap is 13 mm.

Fig. 29

Handling, Loads on the unit, Inspection Facilities – PUR (D)

Handling

A forklift truck or a crane can be used for lifting and transporting the heat exchangers. Leave the packaging on the unit so as to protect the rotor surfaces until it is time to install the heat exchanger.



Fig. 32

Size 150-200

Fig. 33

For sizes 150-200 use the plug holes on top of the cassette, use appropiate lifting lugs (Fig 33). For sizes 201-250, use the center beam, drill holes all

way through the center beam and use heavy duty lifting lugs. Thighten the lifting lug with a nut underside the center beam. Always make sure that the lifting lugs are strong enough and that there isn't any risk of the heat exchanger falling over.

Size 201-250

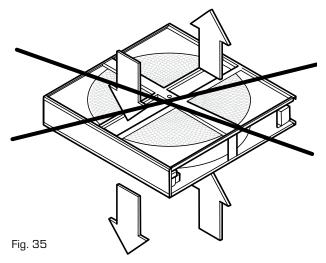
Loads PUR (D) position

The PUR (D) rotor cassette is a heat exchanger in a cassette-type casing designed for slide-in insertion into an Air Handling Unit.

The PUR (D) rotor cassette must not be used as a supporting component inside the Air Handling Unit itself. The rotor cassette is, however, designed for supporting the load of a partition between the supply air and the extract air extract arrangements.

Keep in mind that the PUR (D) rotor cassette is not designed for horizontal installation! (Fig. 35)

Inspection Facilities



To enable rotor inspection and service, install adjustment inspection sections with an inspection cover in the Air Handling Unit: (Fig. 36)

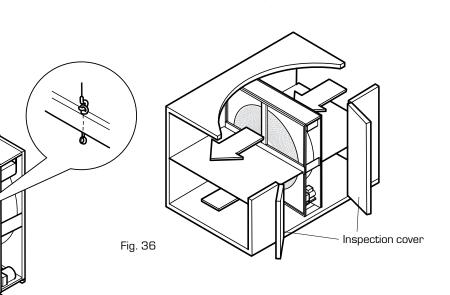


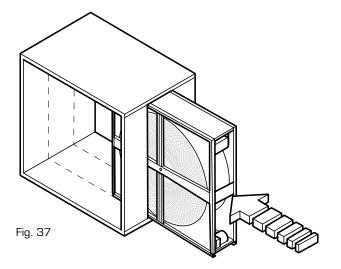
Fig. 34

Connection – Checks – Rotor Seals – PUR (D)

Connection to the Air Handling Unit

The PUR (D) rotor cassette is designed for insertion into an appropriate Air Handling Unit casing (Fig.37), or the cassette can be integrated into the Air Handling Unit already from the beginning.

Make sure that the supporting surface is level and that it can support the weight of the heat exchanger. For particulars of how to connect the supply air, extract air and the airflow directions: See the label on the room side of the heat exchanger. (Fig. 38)



RUMSIDA

- Till denna sida anslutes
- Frånluft från lokalerna
- Tilluft till lokalerna

ROOMSIDE

- The following should be connected to this side:Extract air duct from premises
- Supply air duct to premises

RAUMSEITE

Auf dieser Seite werden Abluftkanal vom Raum

- Bzw. Frischluft zum
- Raum angeschlossen

HUONEPUOLI

- Tälle puolelle liitetään
- Poistolma huonetiloista
- Tuloilma huonetiloihin

J4122668-0001

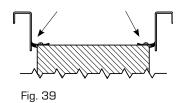
Checks before starting the heat exchanger

- The fans must not be run during the construction

- period if the heat exchanger is not running.
- Also make sure that the appropriate filters have been fitted.
- The rotor is free to rotate
- The peripheral seal of the rotor is in contact with the partition, and that the gap is the same (approx. 8 mm) all round.
- The centre seal is lightly in contact with the rotor all round.
- There is no significant damage to the rotor face.
- To prevent damage of the rotor surfaces, make sure that no foreign objects have been left inside the connected supply air and extract air ducts.

Rotor Seals

The PUR (D) rotor cassette is fitted with sealing strips equipped with synthetic bristles with intervening plastic foil. The sealing strips are



fitted along the rotor periphery and seal there against the inside of the facing plate.



Fig. 40

Label indicating the connection side

Drive Unit – Speed Controller – PUR (D)

Drive Unit

The drive unit of the PUR (D) rotor cassette consists of a motor base plate, drive motor with belt pulley for round drive belt, motor base plate, and the necessary cables and speed controller, if fitted.

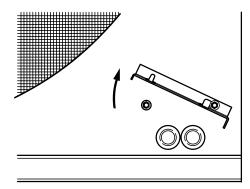
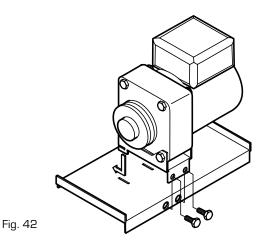


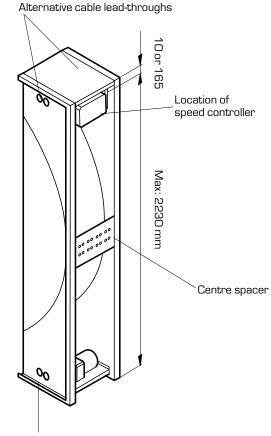
Fig..41

For all major service of the drive unit or rotor, it is advisable to remove the entire motor base plate by backing off the retaining screws, tilting the motor base plate as shown and unhooking it up off the screws. (Fig. 41) The bracket is secured by M6 screws. (Fig. 42) For the size 151-250 units, the drive motor is secured by screws directly to the motor base plate.

After having correctly refitted and secured the motor, fit the drive belt around the belt pulley. The drive belt does not require re-tensioning.



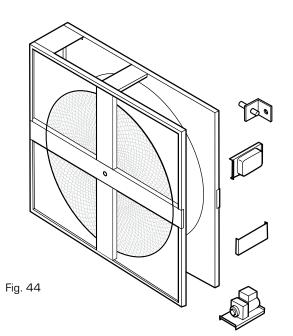
Location of the Speed Controller and Wiring The speed controller should be located 165 mm from the top of the cassette; however, depending on the height of the casing, it should never be higher than 2230 mm from the bottom of the cassette. (See the dimensions in Fig.43).





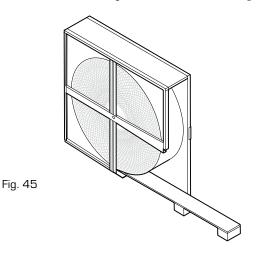
Run the motor or speed controller cables through any of the pre-punched holes in the front plates. The motor and control unit of the variable-speed units are readywired with their cables secured in holes in the centre spacer.

To change the Rotor Bearings – PUR (D) rotor size 150 – 250



A. See Fig. 44. Withdraw the cassette from the Air Handling Unit casing just so far that the rotor shaft retaining screw is accessible. Remove the drive belt from the motor pulley.

Then dismantle the motor base plate, centre spacer, rotation monitor and the speed controller mounting bracket.



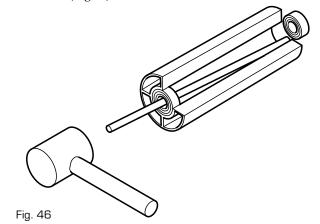
B. See Fig. 45 Block up the rotor and back off the shaft retaining screws. Then dismantle one centre beam. Withdraw the rotor shaft. The rotor can now be rolled out of the cassette.

CAUTION!

Mark how the centre beam is mounted. If it is not refitted correctly, the purging sector will not purge the rotor passages!

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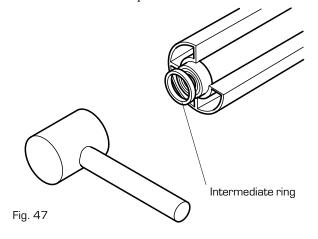
C. The worn bearings can now be tapped out of the rotor hub (Fig 46).



D. Clean the bearing positions and the inside of the bearing casing to remove old grease and fit new bearings. If you first chill the bearings, this will make it easier to fit them.

Use an intermediate ring in front of the bearing to prevent bearing damage. (Fig. 47).

E. Roll the rotor back to its position inside the cassette and refit the other components in the reverse order.



IMPORTANT!

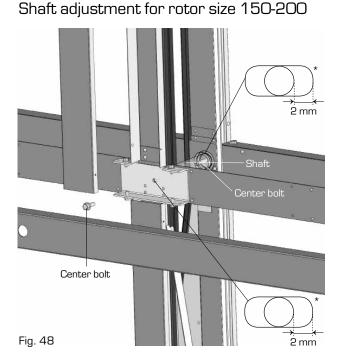
After you have fitted new bearings, adjust the rotor as described on page 14.

Shaft Adjustment – PUR (D)

The rotor position is factory-preset and normally does not need any adjustment.

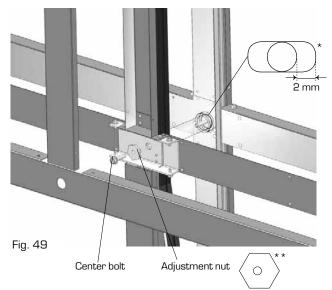
However, adjustment may be necessary in certain cases, for example after fitting new bearings. The rotor position is simple to adjust provided that the recommended inspection sections have been arranged. Otherwise, the cassette will have to be withdrawn out of the Air Handling Unit.

Rotor size 150-200 can be adjusted horizontally and rotor sizes 201-250 can be adjusted both horizontally and vertically.



Loosen the center bolt from both sides of the frame. Adjust the rotor by moving the rotor to the left or to the right. The shaft can be adjusted horizontally 2 mm on both directions and sides. Tighten the locking bolt applying a torque of 50 Nm.

Shaft adjustment for rotor size 201-250



Loosen the center bolt from both sides of the frame. From the purging sector side the rotor can be adjusted both horizontally and vertically by turning the excentric nut. Adjust the position of the shaft by turning the excentric nut with a spanner.

From the other side of the frame: Adjust the rotor by moving the rotor to the left or to the right. The shaft can be adjusted horizontally 2 mm on both directions and sides. Tighten the locking bolt applying a torque of 50 Nm.

* Adj. horizontally

** Adj. horizontally/vertically

To change the Drive Belt – PUR (D)

When the drive belt becomes worn, it must be replaced. The drive belt can be replaced by a ready-welded spare belt. The shaft will then have to be disengaged to allow the new belt to be slipped over it. The procedure is the same as for changing the bearings.

It is however simpler to replace the drive belt with a weldable spare belt. If the new belt is to be up to standard, it is important to weld the belt in a correct manner and using appropriate equipment and material. The welding of belts should be carried out using equipment developed especially for this purpose. This equipment and belt can be ordered from Fläkt Woods . (See spare part list)

Drive belts must not be replaced by belts of another type or other make. They must not be joined together or interconnected in any other way than that specified in this document, without first consulting Fläkt Woods.

1. If this belt welding equipment is used, the rotor need not be withdrawn from the cassette. Cut off and remove the old drive belt.

2. Carefully measure the exact length of belt according to the length calculation method on the next page. Always cut off the belt at a 90 ° angle!

3. Tape one end of the belt to the periphery of the rotor and turn the rotor through one revolution to enable the belt to be welded in position. In most cases, the belt is shorter than the circumference of the rotor and is then easier weld if it is first prised off a bit between rotor sealing strip and the sheet metal periphery plate. Do not stretch the belt during the welding sequence. Protect the belt ends to prevent them from being fouled with grease and dirt.

4. It is important to work at correct temperature, about $270 \,^{\circ}C$ +- $10 \,^{\circ}C$. If the temperature becomes too high, for example if the belt material is heated by exposure to hot sheet metal or is blown with hot air, this will destroy the composition in the polyurethane and the welding result will then be unsatisfactory. This also generates harmful gases.

5. Make sure that the spring in the fixture is set to the correct diameter.

 \emptyset 2-6mm => A,

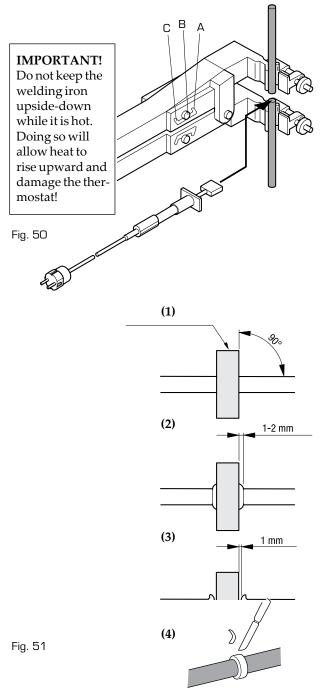
Ø7-8mm=>B,

Ø 10-15mm => C see Fig. 5

Secure the belt ends in the fixture in such a way that they can come into contact with one another after they have been heated.

6. Heat the ends against the welding iron (1) until a 1-2 mm wide fused blub (2) forms. Then relax the application pressure and heat with radiant heat only (3) for about 10 seconds. The belt ends are now heated through without damaging the polyurethane. See Fig. 6.

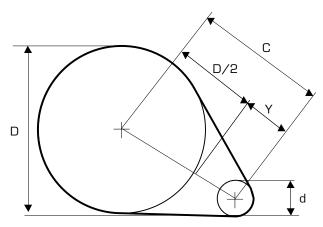
7. Allow the spring of the fixture to press the ends against one another. If the spring pressure is set too high, it will press out the fused mass. If it is set too low, gas pockets will form. Constant pressure is required for 1-2 minutes before the belt can be freed from the fixture.



8. Use an appropriate pair of tongs, a knife, file or abrasive disc to remove the collar (4) formed by fused material. Let the joint thoroughly cool down before refitting and thus loading the belt (5-10 min).

To change the Drive Belt - PUR (D)

Calculating the Belt Length The actual length of the drive belt prior to welding can be calculated as follows:



Rotor diameter D is specified in cm on the product sign.

Dimensions y and d. Calculate the exact belt length as follows:

Length L = 2 x C + 1,57 (D+d) + $(D-d)^2$ 4*C

Cut length = $L \times 0.95$

Example: Rotor D=1000mm Drive pulley d=70mm Distance from drive pulley to rotor y =113 mm Distance between the centres C= 1000/2 + 113=613 mm

 $L = 2 \times 613 + 1.57(1000 + 70) + \frac{(1000 - 70)^2}{4 \times 613}$ = 1226 + 1680 + 353 = 3259 mm

Cut length = 3259 x 0.95=3096 mm

Maintenance – PUR (D)

Service work on the heat exchanger concerns primarily the rotor, seals and drive equipment.

The heat exchanger is accessible for service through inspection doors covering the entire end surface. See to it that no items, that otherwise would make maintenance impossible, permanently block access to the service side of the heat exchanger.

Rotor Diameter 1500 – 2000 mm

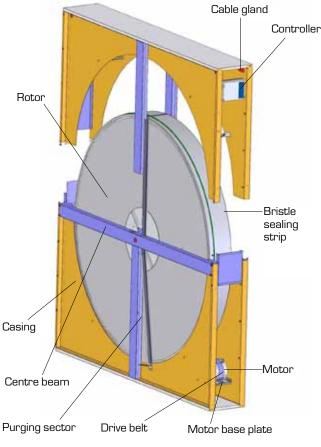


Fig. 52:1

Direction of Rotation

The rotor shall rotate in a direction that enables a given point on the rotor in the extract air to move toward the purging sector.

Rotor Diameter 2001 – 2500 mm

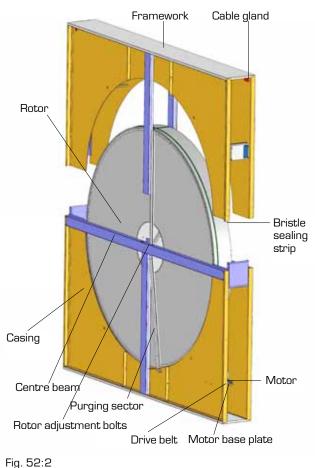


Fig. 52:2

Room side

The following should be connected to this side:

- Extract air duct from premises

- Supply air duct to premises

Maintenance – PUR (D)

Service Schedule

The specified intervals are applicable to an installation on daytime operation. If the actual operating conditions differ widely from the above, e.g. as regards dust, condensation and operating time, the intervals must be reduced.

Maintenance of the heat exchanger will be greatly facilitated if the recommended supervisory and purging equipment is installed.

ltem	Interval	Maintenance work
Face areas of the rotor	6 months	Inspect and clean as necessary
Rotor bearings	12 months	Check the performance
Seals	6 months (1 month ¹⁾)	Check the position of the seal
Drive unit	6 months (1 and 3 months ¹⁾)	Check the performance
Transmission	6 months	Check the performance
Supervisory equipment	12 months	Check the performance

1) Applies during the initial period of operation

CAUTION!

Protect the heat exchanger against contact with water and moisture while it is in storage. Take every precaution to prevent deformation of the rotor surfaces as they are relatively sensitive to mechanical damage!

Rotor

Face surfaces

Check that the rotor surfaces are not coated with dust. If necessary, clean by vacuum-cleaning or blowing with compressed air. In the latter case, blow from the clean side towards the dust-coated side.

If vacuum-cleaning or blowing with compressed air proves to be inadequate (if the dust is greasy), clean the rotor surfaces as follows:

Spray degreasing agent by hand onto the dust-coated surface of the rotor, and then blow with compressed air from the opposite side.

As an alternative, the rotor surfaces can be cleaned with low-pressure steam or with water if facilities are available for collecting the water.

Caution!

Never use methyl ethyl ketone, acetone or aggressive liquids.

Bearings

All sizes of the PUR (A,B,C,D) rotor cassette are equipped with permanently lubricated bearings and require no lubrication.

Check the performance of the bearings every 12 months.

Drive belt

Defective or worn drive belts shall be replaced. (see pages 11 and 12).

The drive belt for the PUR (A,B,C,D) rotor cassette has round cross section and is made of polyurethane and does not need to be tensioned.

Service Schedule

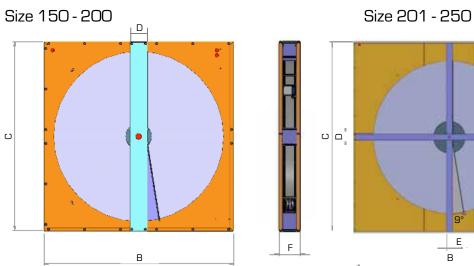
Applies from 20.... - to 20.... -

Item	See page	Service work	6-monthly Date	service Initials	12-month Date	ly service Initials
Face surface of the rotor		Inspect and clean as necessary.				
Rotor bearings		Check the performance.				
Seals by the rotor.		Check the performance.				
Drive belt		Check the performance.				
Transmission		Check the condition of the drive equipment.				
Supervisory and purging equipment		Check the performance.				

Applies from 20.... - to 20.... -

Item	See	Service work				onthly service	
	page		Date	Initials	Date	Initials	
Face surface of the rotor		Inspect and clean as necessary.					
Rotor bearings		Check the performance.					
Seals by the rotor.		Check the performance.					
Drive belt		Check the performance.					
Transmission		Check the condition of the seals.					
Supervisory and purging equipment		Check the performance.					

Dimensions and Weights



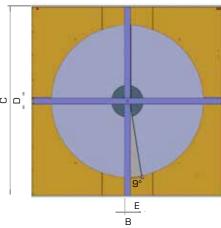


Table 1: Casing dimensions, in steps of 1 cm

Rotor size	А	В	C	D	E	F	Weight (kg)*
ø 150160 (cm)	aaa	+(1050)	+(10110)	10	-	33	
	150	160200	160260	10	-	33	166
	160	170210	170270	10	-	33	182
ø 161190 (cm)	aaa	+(10110)	+(15110)	10	-	33	
Example	170	180280	185280	10	-	33	202
	180	190290	195290	10	-	33	220
	190	200300	205300	10	-	33	239
ø 191250 (cm)	aaa	+(10) ≤300	+(15) ≤300	10	-	33	
Example	200	210300	215300	10	-	33	267
	210	220300	225300	10	9,9	33	299
	220	230300	235300	10	9,9	33	320
	230	240300	245300	10	9,9	33	342
	240	250300	255300	10	9,9	33	365
	250	260300	265300	10	9,9	33	389

aaa = Code position aaa for PUR (A,B,C,D) and PURR

Note!

aaa=code position aaa for PUR (A,B,C,D)
*) Example weight for min cassette dimensions, non hygro rotor and output variant 5 (1,7)
Table 1: when code position d=1 or 3, Table 2: when code position d=2 or 4

Table 2: Casing dimensions	. in steps of '	1 cm when d= 2 or 4 ((with inspection cover	for drive system)

Rotor size	А	В	С
ø 150200 (cm)	aaa	+(1550)	+(15110)
Example	150	165200	165260
ø 200250 (cm)	aaa	+(10) ≤300	+(15) ≤300
Example	250	260300	265300

Notes

We Bring Air to Life

Fläkt Woods is a global leader in air management. We specialize in the design and manufacture of a wide range of air climate and air movement solutions.

Our collective experience is unrivalled. We are constantly aiming to provide systems that precisely deliver required function and performance as well as maximum energy efficiency.



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