
Comfoair 140



Manual

TABLE OF CONTENTS

1.	FOREWORD	3
1.1	GENERAL	3
2.	SAFETY	3
2.1	GENERAL SAFETY REGULATIONS	3
2.2	SAFETY PRECAUTIONS, SAFETY MEASURES.....	4
2.3	INTENDED USE	4
3.	TECHNICAL DATA	5
3.1	SPECIFICATION.....	5
3.1.1	Technical Data	5
3.2	DIMENSIONS.....	6
3.3	CIRCUIT DIAGRAM	7
4.	SYSTEM	7
4.1	INSTALLATION CONDITIONS.....	7
4.2	TRANSPORT AND PACKAGING	8
4.3	INSTALLATION.....	8
4.4	COMPONENT OVERVIEW.....	10
4.5	ELECTRICAL CONNECTION	11
5.	COMMISSIONING	12
5.1	OPERATING PANEL	12
5.2	PROGRAMMING EXAMPLE	14
5.3	SETTING PARAMETERS.....	14
6.	SETTING	17
7.	MAINTENANCE / CARE	18
7.1	GENERAL	18
7.2	FILTER CHANGING	18
8.	MALFUNCTIONS	19
8.1	TROUBLESHOOTING CHART – COMFOAIR 140	19
8.2	BYPASS INSPECTION INSTRUCTIONS	21
9.	END OF LIFE PROVISIONS	21
10.	ANNEXES	22
10.1	ELECTRICAL CIRCUIT DIAGRAM – COMFOAIR 140	22
10.2	EC DECLARATION OF CONFORMITY	23

1. FOREWORD

This operating and installation manual contains installation and operating instructions for the COMFOAIR 140 heat recovery unit.

READ THIS MANUAL CAREFULLY BEFORE PUTTING THE UNIT INTO OPERATION.

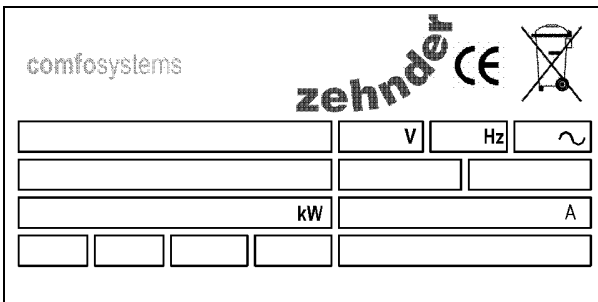
This manual contains all the information and instructions necessary for optimum installation of a heat recovery unit and the Comfoair 140. It serves also as a manual for maintenance and after-sales service work.

The unit is subject to ongoing improvement and further development. It is therefore possible that your unit differs slightly from the description here.

We wish you years of comfort and pleasure with your Comfoair 140.

NOTE: This manual has been produced with the greatest care and attention. However, no rights can be derived from this. We reserve the right to change the contents of this manual, in whole or in part, at any time without prior notification.

Comfoair 140 identification plate



The identification plate is located on the front cover of the Comfoair 140.

1.1 General

Our "General Terms and Conditions" in their latest wording apply to the CA 140.

The warranty period begins with commissioning, but not later than one

month after delivery. This applies to material replacement and does not include the labour. It applies only on proof of maintenance having been performed by a specialist company in accordance with our instructions.

The warranty will be voided if:

- The unit is operated without filter,
- Proper filter maintenance is not carried out,
- Original spare parts were not used, or unauthorised modifications were made to the unit.

1.2 Liability

The Comfoair 140 ventilation unit was designed for comfortable ventilation in residential buildings. Use in any other way is considered as being an unauthorised use that can result in damage to the unit and/or injury to persons, for which the manufacturer cannot be held responsible.

The manufacturer assumes no liability for damage or injury attributable to:

- Failure to observe the safety, operating and maintenance instructions in this manual.
- The use of materials not supplied by the manufacturer. The responsibility here lies solely with the company installing the unit.
- Normal wear.

2. SAFETY

2.1 General Safety Regulations

- Observe the safety regulations and warnings contained in this manual at all times. Failure to do so may result in damage to the unit or personal injury.
- The heat recovery unit and the Comfoair 140 must be installed in accordance with the national building regulations, applicable regulations of the local authorities and the public utilities, the generally acknowledged rules of engineering and the DIN standards in their latest working.
- Only an appropriately qualified company may be employed to install and connect the unit and to put it into operation.
- Store this manual in the vicinity of the unit at all times.
- The instructions on periodic cleaning and/or changing of the filters, the air inlet/outlet valves and the air inlet/outlet grilles must be strictly observed.
- The proper response of the safety functions and precautions must be checked at regular intervals.
- Modifications to the unit are not permitted.
- **The unit may only be connected to a 230 V AC power supply!**

2.2 Safety Precautions, Safety Measures

- It must not be possible to touch the fan wheels with your hand. The unit may therefore only be operated with the duct system connected. The unit cannot be opened without the use of tools.
- In conjunction with possible later warranty claims and in order to ensure the proper function of your system, we recommend that you conclude a service contract with an approved specialist company.

2.3 Intended Use

The Comfoair 140 is intended for the extraction of polluted room air and the supply of warmed or cooled fresh outside air. Use in any other way is considered to be contrary to the intended use.

The manufacturer declines any responsibility for damage, injury or other consequences resulting from such use.

If used in the same building as open fires, the relevant standards and regulations must be observed by the installing company.

3. TECHNICAL DATA

3.1 Specification

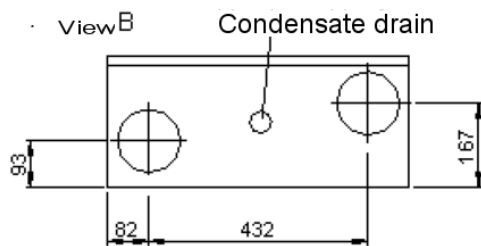
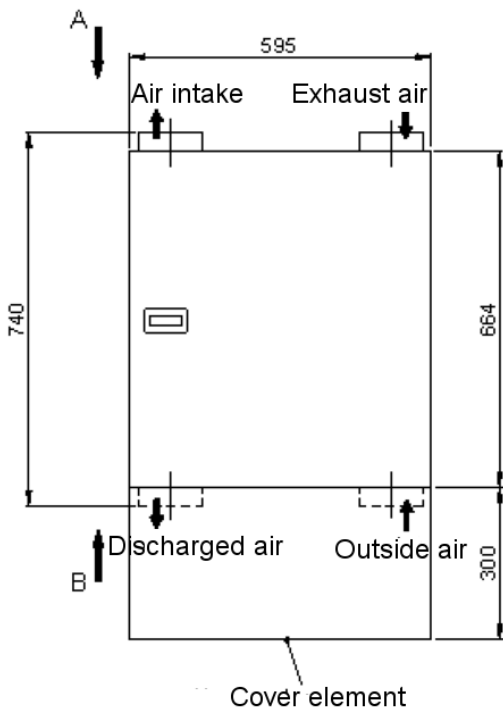
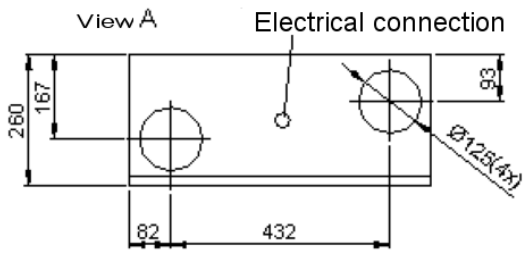
3.1.1 Technical Data		COMFOAIR 140
Heat exchanger efficiency	approx. 92%	
Fans	Constant volumetric flow with parallel flow technology	
Voltage	230 V~, 50 Hz	
Dimensions H x W X D	740 x 595 x 260 mm	
Connection fittings	4x DN 125 mm	
Weight	approx. 28 kg	
Installation position	Wall or ceiling installation	
Heat efficiency level		

The standard unit is delivered as a right-hand version. A conversion of the unit from right to left, and as a ceiling-mounted unit, is possible with little effort.

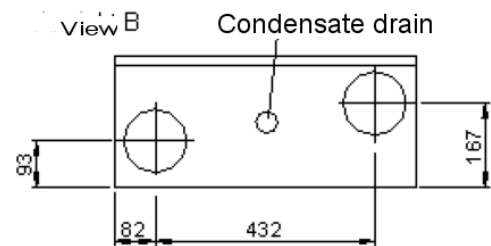
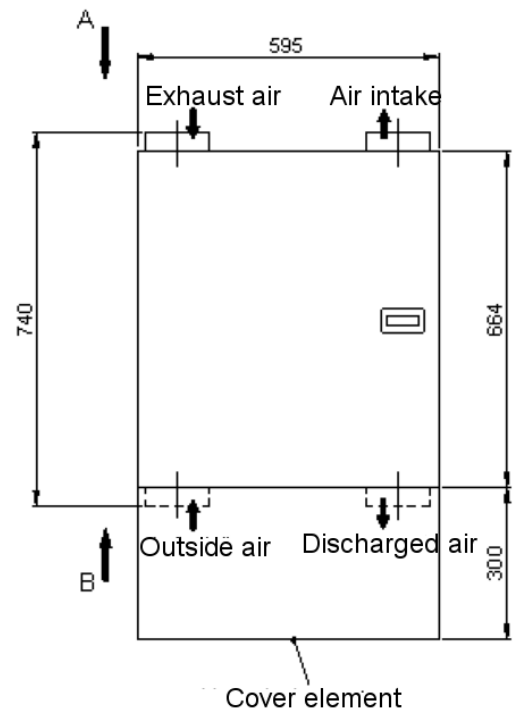
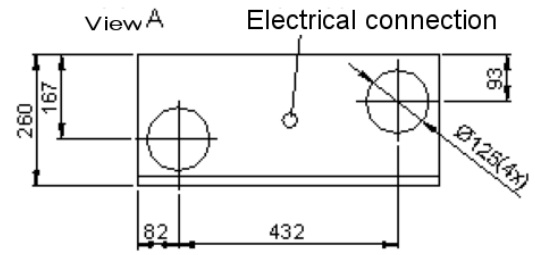
Display		Value	Unit
Ventilation rate (default settings)			
Low	75 m ³ /h at 25 Pa	27	W
Medium	95 m ³ /h at 40 Pa	39	W
High	155 m ³ /h at 110 Pa	106	W
Low	75 m ³ /h at 25 Pa	0.21	A
Medium	95 m ³ /h at 40 Pa	0.30	A
High	155 m ³ /h at 110 Pa	0.81	A
Maximum		0.88	A
Power factor (cos phi)		0.95-0.99	-
Noise level (Lo=10-12W)			
Intake air			
Low	100 m ³ /h at 37 Pa	55	dB(A)
Medium	150 m ³ /h at 81 Pa	64	dB(A)
High	225 m ³ /h at 162 Pa	72	dB(A)
Exhaust air			
Low	100 m ³ /h at 37 Pa	44	dB(A)
Medium	150 m ³ /h at 81 Pa	51	dB(A)
High	225 m ³ /h at 162 Pa	58	dB(A)

3.2 Dimensions

Lefthand version



Righthand version



3.3 Circuit Diagram

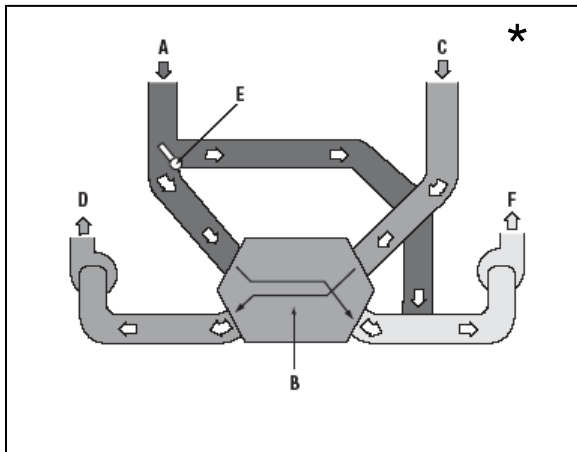


Figure 1

The COMFOAIR 140 is equipped with an anti-freeze system without additional auxiliary energy. A sensor is installed in the discharged air duct that, in the event of the ambient air temperature being too low, reduces the air intake fan electronically in 1% steps via the internal control system. Less energy is thus drawn from the discharged air and freezing of the heat exchanger is prevented.

Component Overview Figure 1:

Exhausting of polluted room air, e.g. from kitchen, bathroom or toilet (A).
The heat exchanger (B) draws heat from the exhausted air.
Fresh outside air is drawn in (C).
The counterflow heat exchanger (B) heats the intaken air.
The fresh heated air is delivered i.a. to the bedroom and living room (D).
The counterflow heat exchanger (B) has a thermal efficiency of approx. 90%.
Post-heating of the intaken air is therefore not necessary.
A 100% bypass (E) ensures that the exhaust air bypasses the heat exchanger. As a result, the cool outside air (e.g. from geothermal heat exchanger) is not heated by the counterflow heat exchanger. Cool outside air flows into the house. This process is controlled automatically according to the set temperature.

*Important installation instruction

If a geothermal heat exchanger is not provided, we recommend the installation of a preheater unit for the outside air. This prevents icing of the heat exchanger at **extreme** ambient temperatures.

4. SYSTEM

4.1 Installation Conditions

The following preconditions must be satisfied for the proper installation of the Comfoair 140:

- The installation location must be selected such that there is sufficient space around the unit for the air intake and outlet connections, the electrical connections and the waste water connections, and for maintenance work.
- The connecting lines for the air intake and outlet, the 230 V power supply and a waste water connection must be available in the room.
- In order to prevent condensation, the outside air and discharged air lines between unit connection and outside wall/roof opening must be insulated vapour diffusion-tight.
- A double-walled or insulated part must be used for the roof or outside wall opening for the discharged air.
- The Comfoair 140 must be installed in a frost-free room. The condensate line must be laid frost-free and with a down gradient.
- Extractor hoods may not be connected to the same system.

In order to ensure **draught-free passage of air** through your house, air gaps under or grilles in the doors must be provided. These must **not be sealed**, as then – just as with the opening of windows (no or reduced heat recovery) – the optimum function of the system cannot be assured. Windows may be opened during the warm part of the year.

4.2 Transport and Packaging

Take the necessary care and attention when transporting and unpacking the unit. Damage to the packaging must be recorded on the delivery note on receipt of the goods.

Dispose of the packaging materials in an environmentally safe manner.

4.3 Installation

Wall Mounting

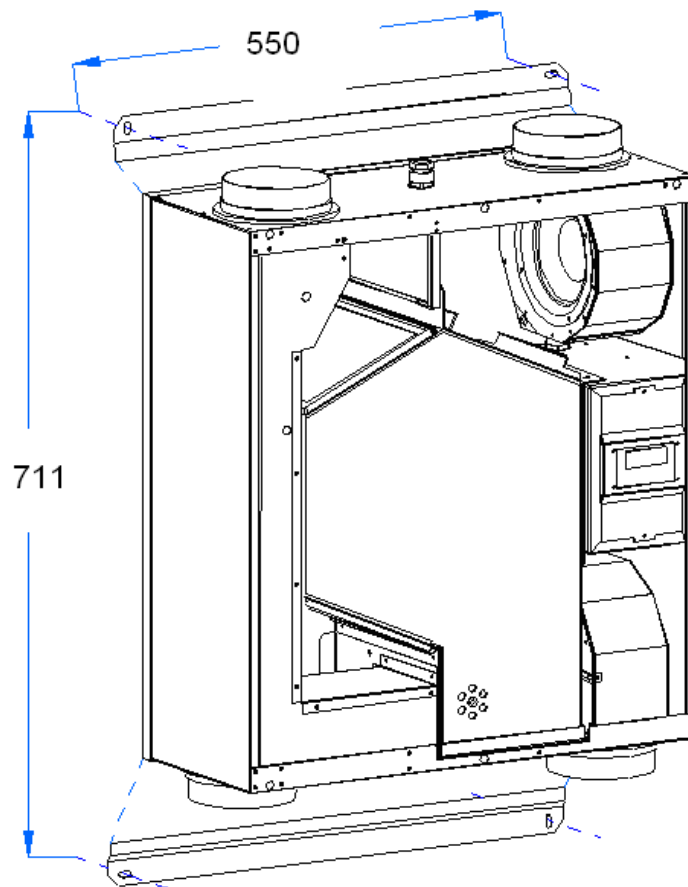


Figure 2: Unit as "right-hand version"

Cover element for wall installation (option)

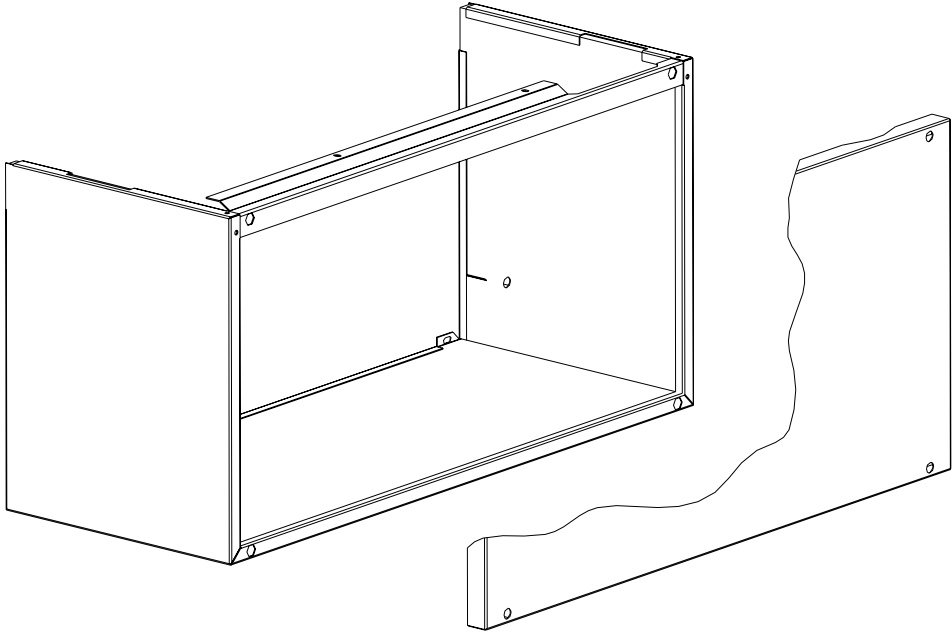
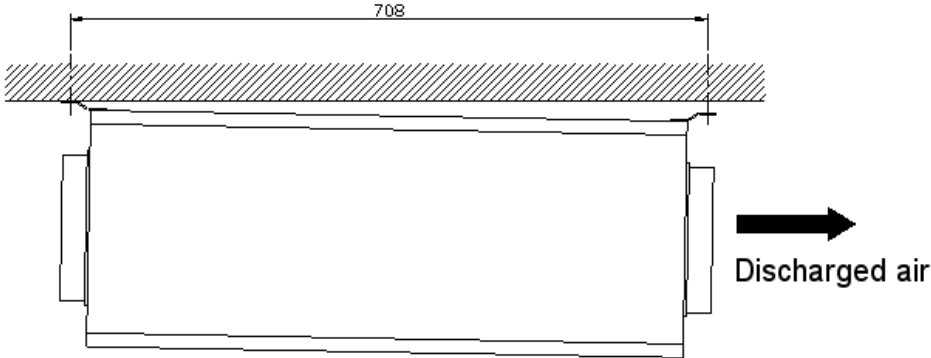


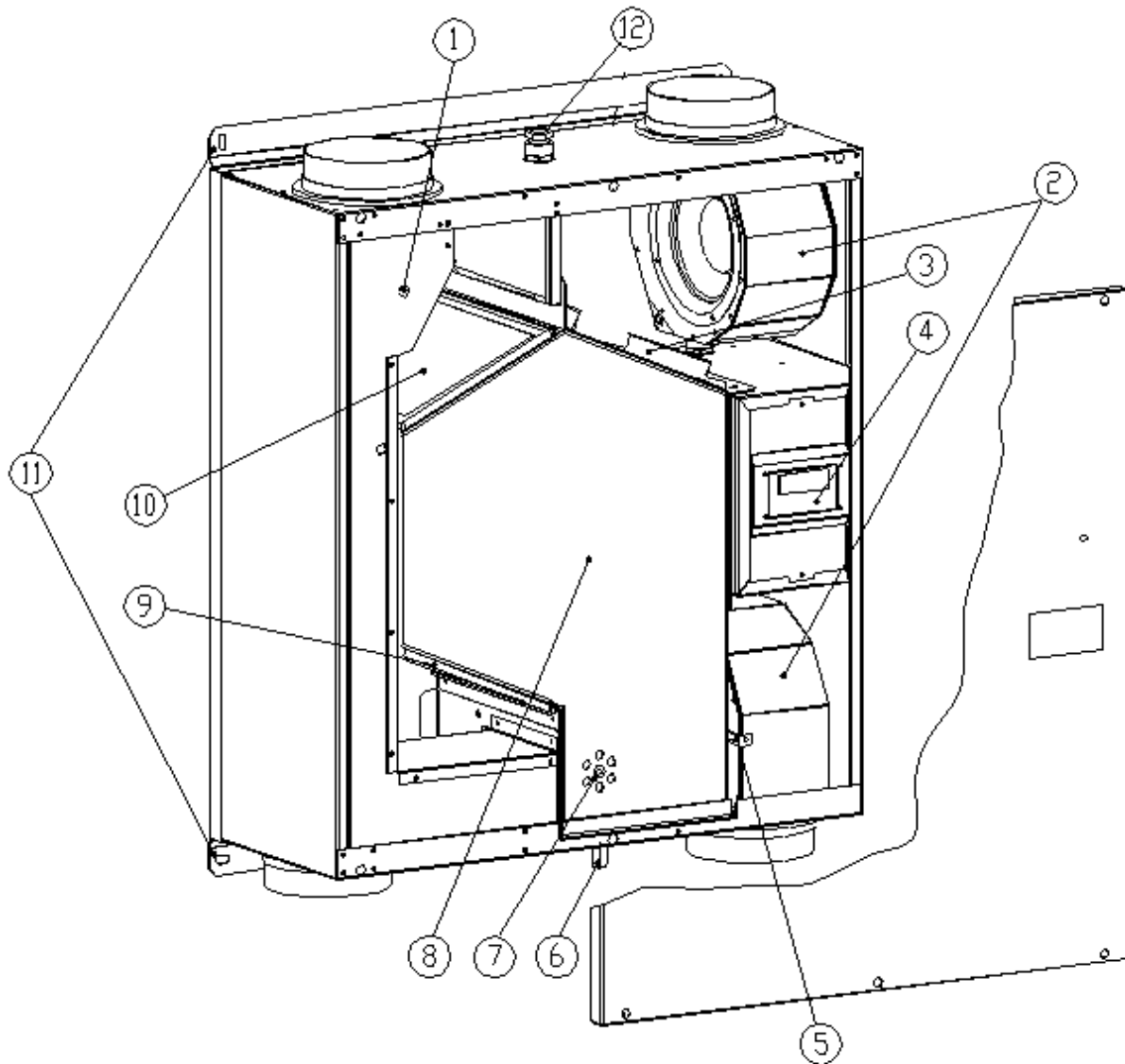
Figure 3

Ceiling Mounting



Caution: Unit must be installed with min. 2% gradient towards the discharged air side!

4.4 Component Overview



- 1 Bypass with synchronous motor
- 2 Intake and exhaust air fan
- 3 Air intake filter F6 (optional)
- 4 Operating panel with display
- 5 Discharged air PTC thermistor
- 6 Condensate drain – wall mounting
- 7 Condensate drain – ceiling mounting
- 8 Counterflow heat exchanger
- 9 Air intake filter
- 10 Exhaust air filter
- 11 Installation rails
- 12 Cable opening for electrical connection

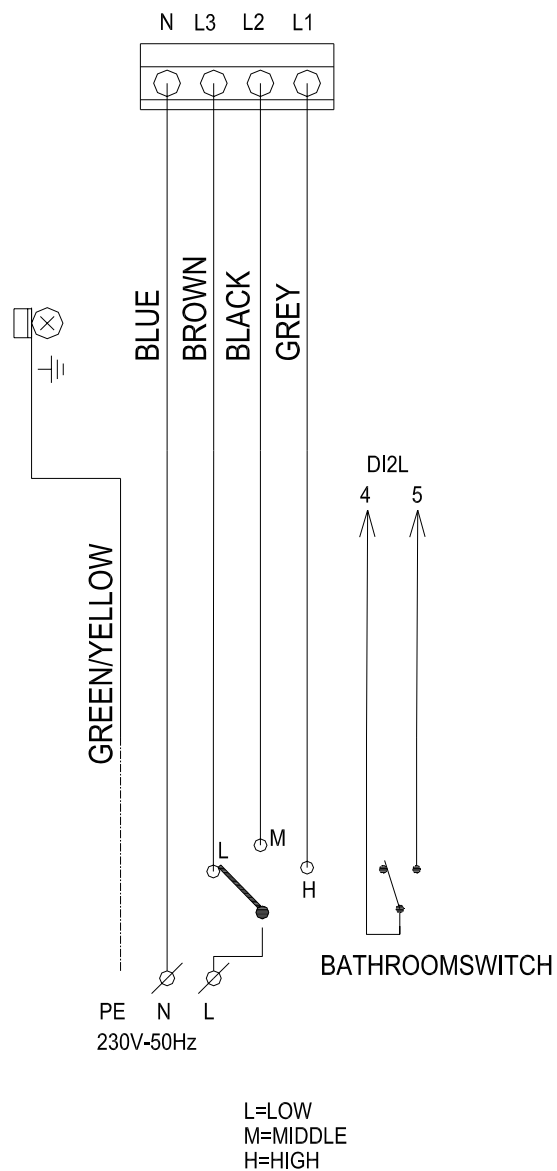
4.5 Electrical Connection

The casing of the COMFOAIR 140 is provided with a cable opening. The electrical connection is made at the terminal box inside the housing. The terminals are numbered.

Observe the conductor designations. Incorrect connection of the cables will result in damage to the electronics.

The bathroom switch must be connected as an off-circuit two-way switch or button.

Wiring Diagram – COMFOAIR 140 with 3-position switch

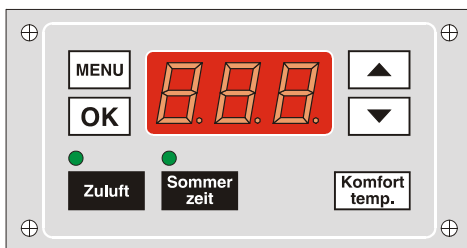


5. COMMISSIONING

5.1 Operating Panel

Displays:

" 1 "	Ventilation	"Level 1"
" 2 "	Ventilation	"Level 2"
" 3 "	Ventilation	"Level 3"
" xx "	Malfunction code	
" . "	Bypass open	




Menu

This button is used to activate and deactivate the menu.

OK

This button is used to confirm set values / parameters and menu points. When cleaning the filters it is used as a reset button.



 When the air intake fan is in operation, the green LED "Air intake" lights up. This button can be used to switch off the air intake fan if windows are opened. The bypass opens and has no further function. If a geothermal heat exchanger (GHE) is used, always leave the air intake fan switched on.

Summer time

No function with this unit type.

Comfort temperature

Comfort temp.

This button allows you to read off the set comfort temperature. If you wish to change this temperature, the desired temperature can be set with the buttons  or . Press OK to store the new value. If three dashes (---) appear when the button "Comfort temperature" is pressed, the bypass must first be activated in menu point 45.



The device tries to achieve the set air intake temperature via the bypass.

Menu structure

The following programmes can be selected using the buttons **MENU**, **▲**, **▼** and **OK**:

Display	Operating mode	User access	Service access
P1	No function	-	-
P2	Forced ventilation times	Yes	Yes
P3	Set fan speeds	No	Yes
P4	Set temperatures	No	Yes
P5	Display and change status	No	Yes
P6	Display malfunctions	No	Yes
P7	Reset	No	Yes

Access to the menus P3 to P7 is possible only after entering the code 352. Changes to the values are made at your own risk. The manufacturer accepts no warranty for incorrectly entered values.

In the event of a malfunction, please contact your installer or Zehnder Service.

Access to the menus

Number	Button	Display	Description
1	Menu	P1	No function
2	▲	P2	Time delays for forced ventilation
3	▲	" 1 -- -- "	Access code necessary
4	▲	" ? -- -- "	First digit of code (3)
5	OK	" -- ? -- "	
6	▲	" -- ? -- "	Second digit of code (5)
7	OK	" -- -- ?."	
8	▼	" -- -- ? "	Third digit of code (2)
9	OK	P3	Ventilation levels
10	▲	P4	Temperatures
11	▲	P5	Status
12	▲	P6	Malfunction register
13	▲	P7	Reset

To quit the programme, press the **MENU** button several times until the current fan speed level is displayed. If no further buttons are pressed, the programme stops after 5 minutes and the current fan speed level is displayed again.

With menu P3, this procedure takes approx. 30 minutes.

5.2 Programming Example

Set the speed level "2" (normal ventilation) of the air intake fan to 40.

Number	Button	Display	Description
1	Menu	P1	No function
2	▲	P2	Time delays for forced ventilation
3	▲	" 1 -- -- "	Access code necessary (352)
4	▲	" ? -- -- "	First digit of code
5	OK	" -- ? -- "	
6	▲	" -- ? -- "	Second digit of code
7	OK	" -- -- ?."	
8	▼	" -- -- ? "	Third digit of code
9	OK	P3	Ventilation levels
10	OK	P31	Exhaust air fan "Low"
11	▲	P35	Select P35
12	OK	50	Current setting
13	▼	40	Select 40
14	OK	P35	Saves the value 40
15	MENU	P3	
16	MENU	1, 2 or 3	Depending on the fan speed level

5.3 Setting Parameters

P1 No function

P2 Time delays

Number	Meaning	Min	Max	Default	Unit
21	Starting delay Level 3 (floating contact)	0	15	5	Min
22	Stopping delay Level 3 (floating contact)	0	120	30	Min

P3 Fan speed levels

Number	Meaning	Min	Max	Default	Unit
31	Exhaust air fan Level 1	15	98	30	%
32	Exhaust air fan Level 2	16	99	50	%
33	Exhaust air fan Level 3	17	100	90	%
34	Intake air fan Level 1	15	89	30	%
35	Intake air fan Level 2	16	99	50	%

Number	Meaning	Min	Max	Default	Unit
36	Intake air fan Level 3	17	100	90	%
37	Current level of exhaust air fan			current value	%
38	Current level of intake air fan			current value	%

P4 Temperatures

Number	Meaning	Min	Max	Default	Unit
41	Comfort temperature	15	28	18	°C
42	Post-heater enable temperature	5	40	18	°C
43	GHE starting temperature low	0	15	7	°C
44	GHE starting temperature high	10	35	23	°C
45	Current value of T1 (outside air)			current value	°C
46	Current value of T3 (exhaust air)			current value	°C
47	Current value of T4 (discharged air)			current value	°C

P5 Status – depends on type

Number	Meaning	0	1	Default
51	No function	-	-	0
52	No function	-	-	0
53	No function	-	-	0
54	Bypass installed	No	Yes	Yes
55	No function	-	-	0



With the COMFOAIR 140, parameters P51, P52, P53 and P55 must always be set to “0” and P54 always set to “1”.

P6 Malfunction register

Number	Meaning	Display
61	Last malfunction	Code, see 8.1 “Alarm and malfunction displays”
62	Last malfunction but one	Code, see 8.1 “Alarm and malfunction displays”
63	Last malfunction but two	Code, see 8.1 “Alarm and malfunction displays”

P7 Reset

Number	Meaning	0	1	Default
71	Acknowledge alarm / malfunction status	No acknowledgement	Acknowledgement	0
72	General acknowledgement: all default values are automatically reset	No acknowledgement	Acknowledgement	0



With Reset P72, "P54" is set to "0". This must therefore be set to "1" again.



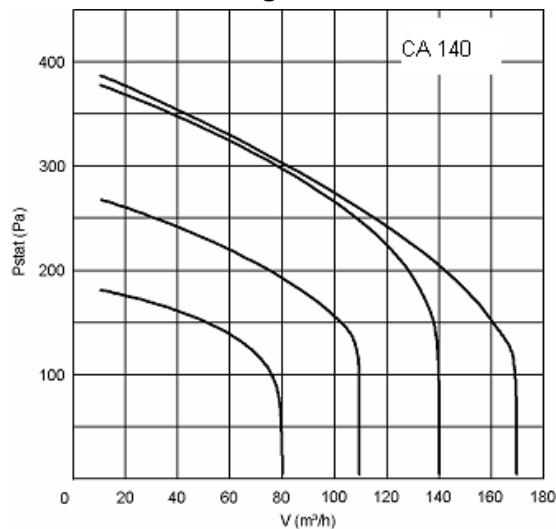
For reading out malfunctions, see section 10.

P8 Auxiliary frost protection control

Number	Meaning	Min	Max	Default	Unit
81	Frost protection safety 1 = Very safe 2 = Safe 3 = Normal 4 = Low	1	4	2	
82	Thawing time in minutes Setting 0 = standard frost protection control	0	240	60	Min

6. SETTING

Characteristic Diagram



Speed	Qv (m ³ /h)
20%	65
30%	75
40%	85
50%	95
60%	110
70%	125
80%	140
90%	155
100%	170

Diagram 7.1

Constant volumetric flow fans:

The Comfoair 140 is equipped with parallel-flow fans with the latest constant volumetric flow technology. This means that a precisely defined volume of air corresponds to every percentage setting (see table above). Intermediate values have to be interpolated.

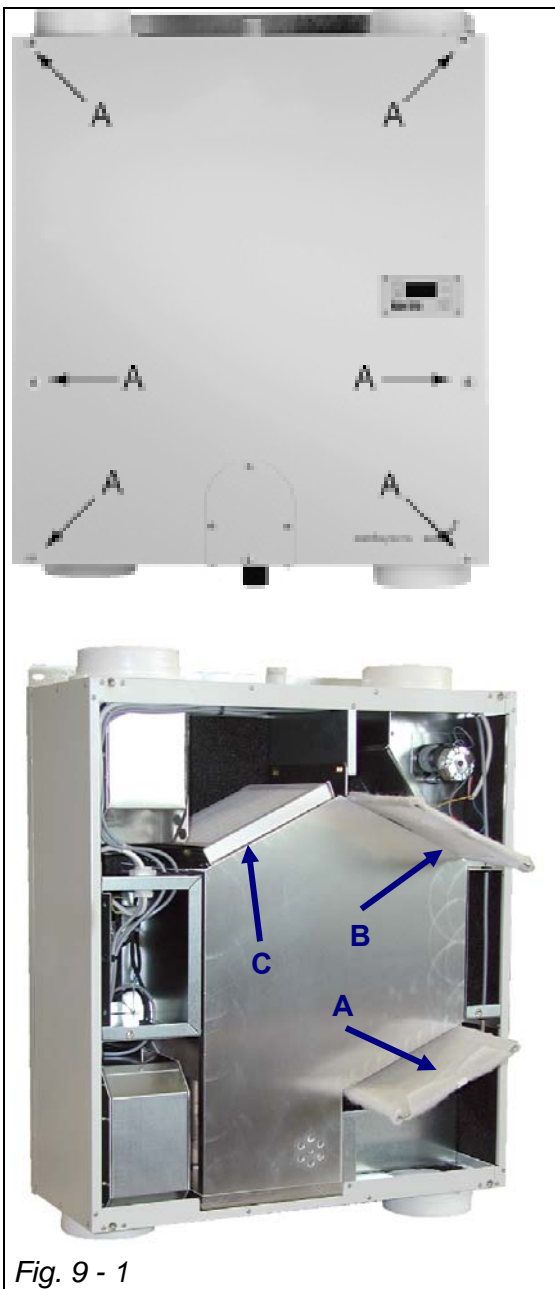
1. Close all doors and windows.
2. Close the room doors and check the through-flow openings (min. 12 cm² per l/s).
3. Check that both fans run at all speeds.
4. Check that the bypass is closed.
5. Switch the Comfoair 140 to level "2".
6. **A.** Install the cup valves/grilles and set these according to the characteristics or the reference dwelling.
OR
B. If no values are known, set the valves/grilles as far open as possible. Measure the air flow rates. First the intake air, then the exhaust air. If the values differ by more than +/- 10% from the nominal value and most of them are in the + range, then set the valves/grilles so that they are **all in the + range**. If the values are in the - range, then set the valves/grilles so that they are **all in the - range**. Leave **one air intake and one air outlet valve open**.
The fan setting can then be changed at the display. In order to minimise energy consumption, the values should be set as low as possible. Ensure that the relationship between HIGH, MEDIUM and LOW remains constant. Use diagram 8-1 for this. Use menu P3 of the menu structure to change the speeds.
7. If the air flow rates now still differ too much, these can be set at the valves.
8. Check the complete system after having set all the valves.
9. Record all the measured and set values in the **setting protocol**.
10. Switch the Comfoair 140 to level LOW.

7. MAINTENANCE / CARE

7.1 General

Maintenance of the unit for the end user is limited to the periodic cleaning of the filters and the intake / exhaust air valves and grilles. Twice a year, the texts “FIL” followed by “tEr” appear alternately on the display as a reminder to clean the filters. Cleaning of the valves / grilles is recommended at the same time as the cleaning of the filters. The system must not be operated without filters. Switch off the unit at the three-position switch or mains power switch before changing the filters.

7.2 Filter Changing



The figure consists of two parts. The top part shows the front cover of the unit with six screws labeled 'A' indicating where to loosen them. The bottom part shows the unit with the front cover removed, revealing the internal components. Three filters are labeled: 'A' (exhaust air filter), 'B' (outside air filter), and 'C' (another filter component).

- Change the filters at least once a year.
- To change or clean the filter, loosen the 6 screws (A). In the case of ceiling-mounted units, the condensate drain must also be removed. Then remove the front cover.
- The unit is equipped as standard with an outside air filter (A) and an exhaust air filter (B) of Class G4.
- Pull the filters out of the unit from the front and clean using a vacuum cleaner or replace.
- Push the filter into the holder again and check that it is seated correctly.
- Fit the front cover again and secure it with the screws. In the case of ceiling-mounted units, fit the condensate siphon again.
- Switch on the unit again and cancel the filter change display with the button OK.

Fig. 9 - 1

8. MALFUNCTIONS

8.1 Troubleshooting Chart – COMFOAIR 140

Fault/malfunction	Symptom	Display	Check	
None	Bypass rotates		Bypass	
	Filter clogged	FiltEr/A1	Filter	
	Bypass does not rotate			Bypass
		A3		Intake air PTC thermistor
		A4		Exhaust air PTC thermistor
		E3		Discharged air PTC thermistor
			“Intake air” button	
All OFF	Voltage connected		Fuse on pcb defective	
			Control pcb defective	
	No voltage		Failure of mains voltage	
			3-position switch	
High air delivery temperature in summer	Bypass remains closed		Bypass Comfort temperature	
		A3	Intake air PTC thermistor	
		A4	Exhaust air PTC thermistor	
		A5	Malfunction in outside temperature PTC thermistor	
		A7	Malfunction in post-heater temperature PTC thermistor	
Low air delivery temperature in winter	Bypass remains open		Bypass	
		E3	Discharged air PTC thermistor	
			Comfort temperature	
No or insufficient intake air	Fan not running	E2	Fan defective	
		E2	Fan power pack defective	
			Control pcb	
		E3	PTC thermistor	
	Fan running			Filter clogged
				Valves clogged
				Heat exchanger clogged by soiling
				Heat exchanger iced
				- Deviation in PTC thermistor
				- Control pcb
				Fan soiled
				Ducts clogged
				Air intake fan speed reduced due to frost risk
				Air intake fan is switched off due to extreme frost risk

Fault/malfunction	Symptom	Display	Check
No or insufficient exhaust air; bathroom or shower remains damp for too long	Fan not running	E1	Fan defective
		E1	Fan pcb defective
			Control pcb defective
	Fan running		Filter clogged
			Valves/grilles clogged
			Heat exchanger clogged
			Fan soiled
	Ducts clogged		
Loud noise	Air intake or air exhaust fan	E1/E2	Impeller binding or is broken
			Bearings defective
			Fan running too fast. No or insufficient intake / exhaust air
	Bypass		Bypass flap jammed
			Bypass motor defective
	Scraping noise		Siphon does not close
	Whistling noise		Air leaks at unit or duct system
	Air flow noise		Valves/grilles not open sufficiently
			Valves/grilles not correctly connected to duct
			Fan running too fast. No or insufficient intake / exhaust air
Condensation leak			Siphon is empty
			Drain clogged
			Drain line leaking at the collecting tray
3-position switch has no function			Wiring fault
			Switch defective
			Control pcb
		E1/E2	Fan
Interference on TV/ stereo system			EMC filter

8.2 Bypass Inspection Instructions

If 230 V AC is measured between DO3H and N, the flap must open / be open.

If 230 V AC is measured between DO4H and N, the flap must close / be closed.

Check the connection between pcb and bypass.

Air intake and air exhaust fan

Check the fans for soiling or mechanical damage.

If the fault E1 and/or E2 is displayed, check the wiring. If the wiring is OK, then the fan is defective.

The supply voltage to the fans is 230 V. The control voltage of the fans lies between 0 and 10 V DC. This voltage can be measured at the terminals AO1L and AO2L on the pcb.

Printed circuit boards

If the fans react to the 3-position switch and the display shows no or wrong values, then the display is defective. Check the connection between display and pcb.

If the fans do not react and the display shows no values, then the pcb or the operating panel is defective.

If the pcb is replaced, the unit has to be set up again. If a protocol of the last setting is available, the set values can also be taken from the protocol.

PTC thermistor

Check the thermistor and the wiring. If they are OK, the thermistor must be replaced. See table of thermistor values.

Temp.°C	-50	-40	-30	-20	-10	0	10	20	25
Ohm	515	567	624	684	747	815	886	961	1000
Temp.°C	30	40	50	60	70	80	90	100	
Ohm	1040	1122	1209	1299	1392	1490	1591	1696	

Heat exchanger

Inspect the heat exchanger for damage and soiling. See also chapter "**Maintenance / Care**".

Three-position switch

Check the function as follows:

Disconnect the cables at terminals L2 and L1 on the pcb. The fans run at level "1".

Connect terminals L3 and L2 on the pcb. The fans run at level "2".

Connect terminals L3 and L1 on the pcb. The fans run at level "3".

Filter

In the event of a filter malfunction, pull out the filters and clean or replace. See also chapter 7 "**Maintenance / Care**".

EMC

If the unit causes interference to the television or stereo system, the EMC filter must be replaced.

9. END OF LIFE PROVISIONS

At the end of the unit's service life, contact the supplier for information on adequate disposal. The statutory regulations in force at the time must be observed.

10.2 EC Declaration of Conformity

J.E. Stork Ventilatoren B.V.
Lingenstraat 2
8028 PM Zwolle-NL
Tel.: 038-4296911
Fax: 038-4225694
Handelsregister Zwolle 22293

EC - declaration of conformity

Description : Heat recovery unit type: G90-140

Conforms the following directives : - Machine directive (98/37/EG)
- Low voltage directive (73/23/EEC)
- EMC directive (89/336/EEC, 92/31/EEC and 93/68/EEC)

Zwolle, 22 november
J.E. Stork Ventilatoren B.V.

E v Heuveln
General manager

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