



Development Services

From Concept to Construction

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1900 SW 4th Ave, Portland, OR 97201

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APPEAL SUMMARY

Status:

Appeal ID: 6680	Project Address: 539 SE 59th Ct
Hearing Date: 11/4/09	Appellant Name: Tad Everhart
Case No.: M-001	Appellant Phone: 503-239-8961
Appeal Type: Mechanical	Plans Examiner/Inspector: Ben Howell
Project Type: residential	Stories: 2 Occupancy: R-3 Construction Type: V-B
Building/Business Name:	Fire Sprinklers:
Appeal Involves: Alteration of/additional to an existing structure LUR or Permit Application No.: 09-156160-RS	
Plan Submitted Option: mail [File 1]	Proposed use: Single family residence

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	OMSC 105.2, 202, and 1302.1
Requires	<p>We wish to install a ZehnderAmerica ComfoAir 350 HRV as part of the air distribution system in our house.</p> <p>Currently, this HRV is not approved by an Approved Agency; however, the City's Alternative Technology Advisory Committee found that it had equivalent testing and certification as well as a history of widespread use in Europe and recommends this appeal be granted so that we may install the HRV even before ZehnderAmerica obtains UL or ETL listing as it plans.</p> <p>The ATAC's recommendation is online at http://www.portlandonline.com/bds/index.cfm?a=255008&c=48661</p>
Proposed Design	We hope to install the HRV as part of our air distribution system to provide balanced, mechanical ventilation with heat recovery.
Reason for alternative	<p>We are attempting to meet the Passive House standard for energy-efficiency because our house will be more sustainable. In order to meet that standard, we need to install an HRV that combines high thermal efficiency as well as low electrical consumption.</p> <p>There is no HRV with UL or ETL listing that combines the high efficiency and low consumption and will supply adequate airflow for a building of our size.</p> <p>The ZehnderAmerica ComfoAir 350 has the European Conformity seal, a history of over 250,000 successful installations, and the manufacturer has a number of ISO quality ratings.</p> <p>This appeal incorporates by reference the materials we submitted to the ATAC as well as the evidence we produced during the hearing. If you wish, we can provide another copy of the materials we submitted to the ATAC.</p> <p>Additionally, I believe Terry Whitehill of BDS is an ex officio member of the ATAC. Mr. Whitehill was</p>

present during the ATAC hearing and had an opportunity to review the evidence we submitted. I believe that if asked, Mr. Whitehill will be able to provide information to support this appeal.

APPEAL DECISION

1. Unlisted heat recovery ventilation unit: Granted as proposed.

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9 June 2009

To: Alternative Technology Advisory Committee
Bureau of Development Services
c/o Debbie Cleek
1900 SW 4th Avenue, Suite 5000 (5th floor)
Portland, OR 97201

From: Barry Stephens
Zehnder America, Inc

Re: ATAC application: Tad Everhart – Zehnder/JE StorkAir ComfoAir 350 Heat Recovery Ventilator

Date: 9 June 2009

Tad Everhart has indicated interest in utilizing the CA 350 Heat Recovery Ventilator manufactured by JE StorkAir, a Dutch subsidiary company of Zehnder Group, AG of Switzerland. As the National Sales and Marketing Manager for Zehnder America, Inc, I am submitting the following information to the Portland ATAC for their consideration for recommendation for inclusion in Mr. Everhart's Passive House Institute residential construction project. I have included the following documents for review:

- 1) ISO 9000 and ISO 14001 Certificates for JE StorkAir (English)
- 2) ComfoAir 350 Operating Manual (English)
- 3) TUV Test Certificate (German)
- 4) Passive House Institute Certificate (German)
- 5) SAP Test Certificate (English)
- 6) WHR 950 Literature (English)

At this writing, we are in the process of producing English versions of those items indicated as being in German. The ComfoAir 350 (CA 350) and WHR 950 are the same product, sold under different brands in different markets.

JE StorkAir has been in operation in The Netherlands since 1937, and is the premier ventilation manufacturer in Europe. Zehnder Group, formerly Zehnder AG, has been in operation since 1895 in Switzerland. We now have manufacturing facilities throughout Europe, in China and in Ward Hill, MA (Runtal North America) and Buffalo, NY (Hydro-Air). Zehnder America, Inc has been operating from offices in NH since September 2001.

Our companies which have been operating in the USA have established themselves as premier brands in our respective product categories, and we provide extended warranties on all of our products. With established networks for sales, marketing, distribution and service throughout North America, we are confident in our plans to provide the same committed support for service and support for new products, including our HRV/ERV products manufactured by JE StorkAir and other subsidiary ventilation companies.

The ComfoAir 350 and other JE StorkAir products have a significant history of reliability and quality, and the service and maintenance required for these products is minimal. This is one reason for introducing these products as our initial introduction of energy efficient residential HVAC products in North America. Additionally,

All Zehnder Group products are covered with comprehensive product liability insurance, and contractors, vendors, or homeowners can request proof of insurance and be provided certificates of same.

Zehnder America, Inc is planning for production of UL/ETL/CSA listed versions of the ComfoAir 350 and other key products. This process requires a protracted time frame, and to date we do not have an estimated time to completion for this process.

The ComfoAir 350 is compatible with existing HVAC components sold in North America, and will not require any retrofit to operate and function to its full potential. We have fitted the North American units with a standard 220 V plug which can be plugged in to standard code approved 220 V service outlets. The controls are integral to the unit, and standard English measured ducting will be fully compatible with the duct ports on the unit.

I have been operating a ComfoAir HRV (the previous model) in a ComfoBox geothermal system in my home in Maine for two years with not a single problem or issue. I have changed the filters as recommended, and the unit has operated 24/7/365 for the entire two years. I performed the installation personally, and had no issues, difficulties or challenges whatsoever.

Please feel free to contact me at my office in NH if there any further questions or requirements for this application.

Zehnder America, Inc 540 Portsmouth Avenue
Greenland, NH 03840
USA

Tel. 603 422 6700
Toll Free 888 778 6701
Fax 603 422 9611



City of Portland, Oregon
Bureau of Development Services
1900 SW 4th Avenue, Suite 5000
Portland, Oregon 97201
(503) 823-7300

Alternative Technology Advisory Committee Application Form

For information about the Alternative Technology Advisory Committee, instructions for filling out this application form and a list of submittal requirements please see our web site at www.portlandonline.com/bds/atac

Co-Applicant Information:

Name: Charlie Stephens
Email Address: cstephens@spiritone.com
Address: 14115 SE Fair Oaks Avenue.
City: Oak Grove
Phone No.: (503) 786-7316

Company Name: Adjuvant Consulting

State: Oregon Zip Code: 97267
FAX No.: ()

Name: Tad Everhart
Email Address: tad.everhart@comcast.net
Address: 539 SE 59th Court
City: Portland
Phone No.: (503) 239-8961

State: Oregon Zip Code: 97215-1969

Project Information:

This application involves (check one):

A technology not associated with a specific project

~~A specific project currently under review~~

Project Address:

Tax Account number:

Building Permit No.:

LU Case No (if applicable):

Other (specify):

I. Overview of Technology

A. Proposed Technology: Please describe the material/product/construction method you would like to have reviewed by the committee

Zehnder/JE StorkAir ComfoAir 350 Heat Recovery Ventilator ("StorkAir 350 HRV") manufactured by J.E. Stork Ventilatoren (JE Stork).

B. Application of Technology: Please describe the specific application of the technology. How, when and where will this technology be used?

Tad Everhart wishes to install the StorkAir 350 HRV in his family's home in Portland, Oregon as soon as the City of Portland permits. If the City of Portland approves the StorkAir 350 HRV, we anticipate approximately 5 installations in 2009 and the number of installations doubling each successive year.

C. Code Conflicts: Please describe any known building code issues related to this technology.

The StorkAir 350 HRV is not yet approved by Underwriters Laboratories or ETL SEMKO.

II. Sustainability

A. Sustainable Elements: Describe how this alternative substantially reduces the environmental impact on the planet over similar technologies currently allowed by the code? ***Please attach any documentation that supports your answer.***

In Portland's climate, energy-efficient homes are virtually air-tight. Otherwise, "random" or "accidental" ventilation through the "building envelope" (ceiling, walls, and floor) causes uncontrolled heat loss in the heating season and heat gain in the cooling season. For this reason, designers and building scientists recommend air-tight buildings with balanced, mechanical ventilation.

Most energy-efficiency building standards recommended by local and state governments and the United States include an air-tightness standard. Local examples are the Northwest Energy Star standard of no more than 7 Air Changes per hour (ACH) at 50 Pascals (50 Pa) depressurization by a blower door. The Oregon High Performance Home standard is 5 ACH @ 50 Pa. The Passive House Institute U. S. standard is 0.6 ACH @ 50 Pa.

Buildings this air-tight require mechanical ventilation, and in Portland's climate, an HRV is the only energy efficient means for balanced mechanical ventilation.

An HRV's operating performance is measured in two ways: 1) thermal efficiency (the degree to which it transfers heat) and 2) electric power consumption (to produce rated airflow).

HRVs approved by UL and ETL SEMKO are readily available in the Portland area (Please see the attached chart prepared by Mr. Stephens comparing the StorkAir 350 HRV with UL-approved, relatively high-performance ERVs and HRVs). Some of them have relatively high thermal efficiency or relatively low power consumption. The StorkAir 350 HRV combines thermal efficiency with low electric power consumption better than any other ERV or HRV on the list.

Buildings that meet the Passive House standard are so air-tight and well insulated that "internal" heat from occupants, typical residential electrical appliances, and residential activities (particularly cooking and bathing) meet virtually the entire heating load and annual heat demand. Portland residents can live and work in Passive House buildings that consume so little energy that today it is feasible to supply all of the buildings' operating energy with renewable energy.

However, this "passive" strategy depends on energy-efficient HRVs and ERVs. The Passive House Institute recommends the HRV have at least 75% thermal efficiency and consume no more than 0.45 Watt hours per cubic meter (0.012744 watt-hrs per cubic foot) of air flow. Typically, a building cannot meet the Passive House standard without a HRV this efficient. Thus, the Passive House Institute certifies only HRVs meeting this standard (including the StorkAir 350 HRV).

B. Reason for Alternative: Describe why this alternative is desired?

Radically reducing building operating energy consumption is widely accepted by the City of Portland and its citizens as desirable for a number of reasons including but not limited to:

1. Increasing national security
2. Reducing building operating costs
3. Reducing environmental harm caused by extracting and burning fossil fuels
4. Speeding implementation of on-site renewable energy systems
5. Passive Houses are more comfortable and quiet than conventional homes

Applicant Everhart wishes to install the StorkAir 350 HRV in his home as part of a Passive House Retrofit to meet either the Retrofit standard or the Passive House standard. Several other persons would like to install the StorkAir 350 HRV or other comparable high-performance HRVs in 2009 and 2010. It is highly unlikely that HVI testing and UL or ETL certification for the StorkAir 350 HRV will be completed by 2010. Recent experience with UL/ETL suggests that there could be long delays in getting the products like the StorkAir 350 HRV through these testing and certification processes, and that delay would deprive our market of the most efficient, highest quality HRVs available today.

C. Comparison to Other Technologies: How does this technology provide equivalent life safety and/or fire protection than the current technologies allowed by the code?

The StorkAir 350 HRV is a current technology allowed by the code but not yet tested or certified by HVI, UL, or ETL. The StorkAir 350 HRV incorporates superior design, heat transfer core, and electronically-commuted motors.

J.E. Stork's StorkAir 350 HRV's safety is proven by successful sales of approximately 250,000 units over 12 year, J.E. Stork's ISO ratings, J.E. Stork's assurances of conformity with relevant European Community Directives, and certification by a number of recognized and well-respected 3rd party certification programs.

J.E. Stork products are certified in accordance with Europe's CE standards. These are as stringent or more stringent than UL, ETL, or CSA standards. Further, the StorkAir product lines have no history of safety issues over the many years of their production. Because UL/ETL/CSA certification processes can take many months, and often years, we are proposing that the ATAC consider the CE certification equivalent to that of UL, ETL or CSA until such time as the product achieves these North American certifications.

To the extent that the StorkAir 350 HRV makes energy-efficient buildings possible, it increases national security and decreases environmental harm---thereby providing greater life safety and fire protection than currently permitted HRVs.

III. Supporting Documentation

A. Testing Data: Describe any testing that has been performed on this technology to show how it may be able to meet code requirements. ***Please attach all available testing data.***

The StorkAir 350 HRV bears the European Conformance mark ("CE") at on page one of the Introduction of the attached Operating Manual (at page 5 of 56 page attachment)). Additionally, please see page 49 of the Operating Manual for J.E. Stork's assurance of conformity with the 3 European Community Directives that apply to it: 1) the Machine Safety Directive, 2) the Low Voltage Directive, and 3) the Electromagnetic Compatibility Directive (at page 53 of 56).

We have also attached the 5 relevant Directives that the J.E. Stork's assurance of conformity references.

A brief explanations of the European Union's consumer safety assurance and testing program and mandatory conformity mark **CE** is at http://en.wikipedia.org/wiki/CE_mark.

The Passivhaus Institute in Germany has tested and certified the StorkAir 350 HRV for its thermal efficiency (84%) and its electrical power consumption (0.29 Watt hours per cubic meter of air flow). Please see attached PHI Certificate and note that PassivHaus has used its own efficiency certification methodology, so it's ratings may not match those of the manufacturer or other common third-party ratings.

The manufacturer, J.E. Stork, meets the Quality Management System Standard ISO 9001:2008 and the Environmental Management System Standard ISO 14001:2004. Please see attached Lloyd's Register Quality Assurance certificate for each Standard.

B. History of Use: Describe all known instances where this technology has been applied to a constructed building, including approximate date, location and building type. ***Please attach any documentation that supports your answer.***

J.E. Stork has produced and sold approximately 250,000 HRVs similar to its 350 HRV featuring counterflow heat exchangers and electronically-communited permanent magnet DC motors since 1997. It expects to sell 25,000 in 2009. It has produced HRVs since the late 1980s.

Mr. Barry Stephens (Charlie Stephens' brother) has operated the StorkAir 350 HRV in his own home in Maine for two years without any problems (please see attached June 9th letter from Barry Stephens).

Responsibility Statement:

As the applicant submitting this application I am responsible for the accuracy of the information submitted. I have submitted all the relevant information available about the technology I am requesting the Alternative Technology Advisory Committee to review. I believe the information submitted to be a compete and accurate representation of the proposed technology and I am aware that any omission (either voluntary or accidental) could cause the application to be denied. I understand that more information may be requested before the committee can make a recommendation on my application.

I understand that the recommendation from the committee is not binding. In addition a favorable recommendation from the committee is not a guarantee that the Administrative Appeals Board will approve a subsequent building code appeal. The City of Portland and the committee members have no implied or expressed liability associated with the conclusions of the Alternative Technology Advisory Committee. By my signature, I indicate my understanding and agreement to the Responsibility Statement.

Applicant's signature:

**Date:
6/24/2009**



Co-Applicant and Property owner's signature (if applicable): Tad Everhart

Date:

For Office Use Only:

Received By:

Date Received:

Receipt No.:

Stephens & Everhart HRV ATAC Application Form final draft 62409

100 Rittling Blvd.
Buffalo, NY 14220 USA

Attn: Tad Everhart

July 16, 2009

Dear Tad,

I'm writing this letter to clarify any questions regarding the HRV that the city of Portland may have.

1. What modifications to the HRV will be required for installation in the US?

Simply, the unit comes in from the manufacture with pre existing terminal blocks for incoming power. A 600v 15amp rated linecord with a 220v plug will be purchased and installed. The installation will consist of feeding the linecord through a cord grip and attaching the wires to the proper terminal blocks.

2. Is the equipment rated for both 50 and 60 hertz?

The equipment is rated for 50 and 60 Hz, although the nameplate for the equipment states 50 Hz only. All component specifications (controllers, blowers, etc) indicate 50/60 Hz.

3. Provide the FLA (Full Load Amps)

There are 5 different settings:			FLA
Absent	6w	.09amp	.11amp
Low	23w	.24amp	.30amp
Medium	106w	.87amp	1.09amp
High	240w	1.77amp	2.21amp
Max	241w	1.78amp	2.23amp

4. Provide MOCP (Maximum Overcurrent Protection)
15AMPS

5. Provide the RLA (Rated Load Amps)

There are 5 different settings:

Absent	6w	.09amp
Low	23w	.24amp
Medium	106w	.87amp
High	240w	1.77amp
Max	241w	1.78amp

6. Illustrate how the equipment will be grounded for a US installation, it is anticipated that the inspectors in the US will want "line to line" grounding. Europe uses line to neutral grounding.

The 220v incoming power will be a 3-wire hookup which the two hot legs will land on the designated terminals as would the European 220v. Included will be the ground wire Attached to the designated chassis ground of the unit.

Please do not hesitate to call with any questions that you may have. Thank you.

Regards,

Darin Heppner

Sr. Electrical Engineer

Email : dheppner@rittling.com

Phone : 716-827-6517 ext34



CERTIFICATE OF APPROVAL

This is to certify that the Environmental Management System of:

J.E. Stork Ventilatoren B.V. Zwolle, The Netherlands

has been approved by Lloyd's Register Quality Assurance
to the following environmental management system standard:

NEN-EN-ISO 14001 : 2004

The Environmental Management System is applicable to:

**Development, manufacturing and sales of ventilation
systems including all components and accessories, used for
controlling air quality in homes and
small commercial buildings.**

Approval
Certificate No: 663622

Original Approval: 27 January 2009

Current Certificate: 27 January 2009

Certificate Expiry: 26 January 2012

Issued by: LRQA (Rotterdam)



This document is subject to the provision on the reverse
This approval is subject to the company maintaining its system to the required standards, which will be monitored by LRQA.
macro speccert rev 1



CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

**J.E. Stork Ventilatoren B.V.
Zwolle, The Netherlands**

has been approved by Lloyd's Register Quality Assurance
to the following Quality Management System Standards:

ISO 9001 : 2008

The Quality Management System is applicable to:

**Development, manufacturing and sales of
ventilation systems including all components and
accessories, used for controlling air quality in
homes and small commercial buildings.**

Approval Certificate No: 934501

Original Approval: 26 October 1993

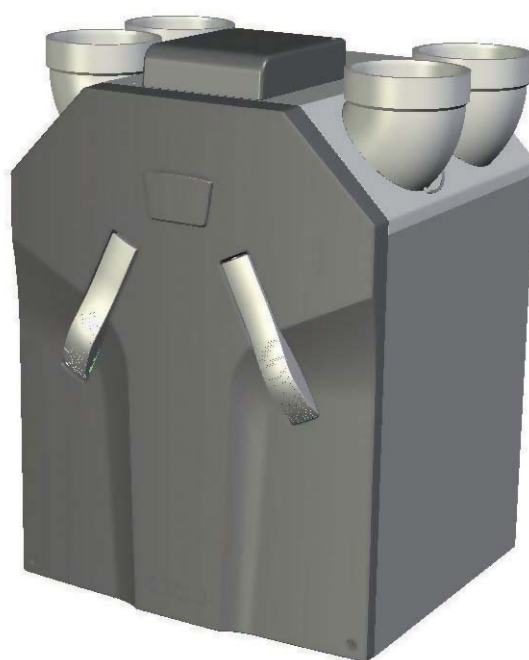
Current Certificate: 10 March 2009

Certificate Expiry: 31 October 2011

Issued by: LRQA (Rotterdam)



ComfoAir 350



Operating Manual

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1 Introduction

This chapter contains general information on the ComfoAir 350.

1.1 Foreword

Apart from this general chapter, this operating manual consists of:

- A section for the user,
- A section with technical specifications, and ...
- A section for the installer.



Read this operating manual carefully before putting the unit into operation.

- User → Chapters 1 to 3.
- Installer → Chapter 4.

This operating manual contains all the information required for safe and optimum installation, operation and maintenance of the ComfoAir 350. In addition, it should serve you as a reference manual during service work so that this can be carried out safely and responsibly. The unit is subject to ongoing improvement and further development. Your ComfoAir 350 may therefore differ slightly from the descriptions in this operating manual.

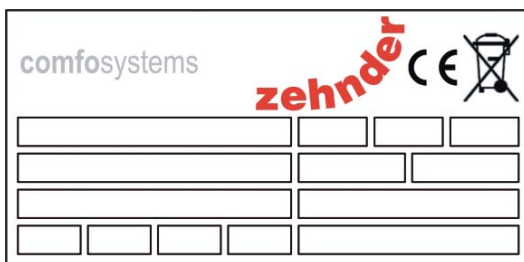
NOTE:

This manual has been produced with the greatest care and attention. However, no rights can be derived from this. Furthermore, the company reserves the right to change the contents of this operating manual at any time without prior notification.

1.2 CE Symbol

The unit is marketed under the name ComfoAir 350. The ComfoAir 350 is a balanced ventilation system with heat recovery for healthy, balanced and energy-saving ventilation of living premises.

The year of construction of the ComfoAir 350 is shown on the identification plate of the ComfoAir 350.



1.3 Warranty and Liability

1.3.1 General

Our "General Terms and Conditions" in their latest wording apply to the ComfoAir 350. The warranty period begins with commissioning, but not later than one month after delivery. This applies to material replacement and does not include labour. It applies only on proof of maintenance having been performed by a specialist company in accordance with our instructions.

1.3.2 Warranty Terms

The manufacturer's warranty on the ComfoAir 350 is for a period of 24 months after installation, but up to a maximum of 30 months after the date of manufacture of the ComfoAir 350. Warranty claims can be made only for material flaws and/or design errors discovered during the warranty period. In the event of a warranty claim, the ComfoAir 350 must not be dismantled without the prior written authorisation of the manufacturer. The manufacturer's warranty covers spare parts only if these have been installed by an installer approved by the manufacturer.

The warranty will be voided if:

- The warranty period has expired;
- The unit is operated without filter;
- Parts not supplied by the manufacturer are installed;
- Unauthorised changes or modifications are made to the unit.

1.3.3 Liability

The ComfoAir 350 has been developed and manufactured for use in "balanced ventilation systems". Use in any other way does not constitute an 'intended use' and can result in damage to the ComfoAir 350 or in personal injury for which the manufacturer accepts no liability.

The manufacturer accepts no liability for damage or injury resulting from the following causes:

- Failure to observe the safety, operating and maintenance instructions contained in this operating manual.
- Installation of spare part not supplied by the manufacturer.
- The responsibility for the use of such spare parts lies solely with the installer.
- Normal wear.

1.4 Safety

1.4.1 Safety Precautions

Observe the safety precautions given in this operating manual at all times. Failure to observe the safety precautions, warnings, comments and instructions can result in personal injury or damage to the ComfoAir 350.

Only an approved installer is authorised to install, connect, commission and service the ComfoAir 350 in a way other than that described in this operating manual.

- The ComfoAir 350 must be installed in accordance with the general local building, safety and installation regulations of the responsible public utility and other relevant safety authorities (such as the GIW - Dutch Institute for Certified Builders).
- Follow the safety precautions, warnings, comments and instructions given in this operating manual at all times.
- Store this operating manual in the vicinity of the ComfoAir 350 at all times during its whole service life.
- The instructions on the regular cleaning and/or changing of the filters and air inlet/outlet valves must be strictly observed
- The specifications contained in this document must not be altered.
- All modifications to the ComfoAir 350 are strictly forbidden.
- The ComfoAir 350 is not suitable for connection to an AC power supply.
- In order to ensure that the unit is inspected at regular intervals, we recommend that the user concludes a service contract. Your supplier can provide you with the addresses of authorised installers in your vicinity.

1.4.2 Safety Installations and Safety Measures

- The ComfoAir 350 cannot be opened without the use of tools.
- It must not be possible to touch the fans with your hand. An air duct must therefore be connected to the ComfoAir 350. The minimum duct length is 900 mm.

1.4.3 Symbols Used

The following symbols are used in this operating manual:



Caution!



Danger of:

- **Damage to the unit, or**
- **Physical injury to the user, or**
- **Impairment of the operating of the unit**
if the instructions are not correctly followed.

2. Instructions for the User

This chapter describes how you should use the ComfoAir 350.

Congratulations, you are now the owner of the ComfoAir 350, the heat recovery unit from Zehnder Comfosystems. We wish you every comfort.

2.1 Definition of Terms


The ComfoAir 350 has the following functions:

- Balanced ventilation.
- Heat recovery.
- Bypass for free cooling.
- Frost protection.
- Chimney sweep control.
- Moisture recovery (option).

These terms/properties are described in more detail briefly in the following sections.

2.1.1 Balanced Ventilation

The ComfoAir 350 is a balanced ventilation system. This is the most economical and balanced form of ventilation for homes. In a balanced ventilation system, polluted air from kitchen, bathroom, toilet and possibly even store room is drawn off and replaced by an equal volume of fresh air in the living room and bedroom. Air gaps under the doors ensure good air circulation in the home. This air circulation is literally balanced.

 **Ensure that these gaps are not covered by, for example, rubber door seal strips or high-pile carpets. This would prevent the system from operating optimally.**

2.1.2 Heat Recovery


Apart from ensuring the right balance between supply and exhaust air, the ComfoAir 350 also offers the advantage that the heat from the exhaust air is given off to the fresh, generally cooler outside air. This is made possible by the integral heat exchanger. In this way, roughly 95% of the discharged heat is recovered. The supply air can enter the rooms almost at room temperature. Draughts are now a thing of the past.


2.1.3 Bypass for Free Cooling

Apart from transferring heat from the exhaust air to the fresh, generally cooler outside air, the ComfoAir 350 also offers the possibility of discharging the warmer exhaust air directly into the atmosphere without passing through the heat exchanger. This is made possible by the integral bypass. The bypass is an additional circulating air duct that (temporarily) interrupts the heat transfer between the exhaust air and supply air. The cool outside air is then not preheated before it enters the dwelling.

The bypass is used particularly on warm days dur-

ing the summer months. Admitting the cool night air on warm days allows the room temperature in the home to be reduced. The bypass functions automatically. You simply have to set your comfort temperature. See section 2.3.2 for further information. The ComfoAir 350 then maintains this temperature as closely as possible.

 **Ensure that the comfort temperature in winter is not set below the temperature you prefer.**

 **If the comfort temperature in winter is below the preferred temperature, it is possible for the heating to be switched on with the bypass open. That is a waste of energy.**

2.1.4 Frost Protection

The ComfoAir 350 also has a frost protection system. This protects the heat exchanger (or the optional combined heat and moisture exchanger, see section 2.1.6) from freezing. The risk of freezing exists in the winter months with moderate to heavy frost. The ComfoAir 350 is equipped as standard with an automatically activated frost protection system that - when there is a risk of frost - temporarily reduces the supply of outside air so that condensation in the exchanger cannot freeze. A preheater can also be installed in the ComfoAir 350 as an option. This has the advantage that the balanced ventilation then remains operational. The inlet of cold outside air then no longer needs to be reduced. In addition, this option offers greater comfort as the supply air is again preheated to more or less room temperature. If there is no preheater installed in your ComfoAir 350, ask your installer about the possibilities.


2.1.5 Chimney Sweep Control

The ComfoAir 350 also has a chimney sweep control system. This is a system that prevents the ComfoAir 350 from creating an imbalance in the ventilation system, i.e. between the supply and exhaust air. The chimney sweep control system functions automatically. This system blocks or resets other ventilation control systems that could possibly create an imbalance in the ventilation system and that can be automatically switched on and off by the software. One example of this is that the supply and exhaust air fans cannot be switched off separately when the chimney sweep control system is active.

The chimney sweep control system is employed in dwellings with open fire, as here air can be drawn back by the draught of the chimney. If problems occur with the smoke discharge via the draught of the chimney, this situation must on no account be caused (or exacerbated) by the ComfoAir 350. The chimney sweep control system then interacts with the existing ventilation control systems in such a way that the ComfoAir 350 cannot (or can no longer) cause an imbalance in the ventilation system.

2.1.6 Moisture Recovery (Option)

In addition to the heat transfer from the exhaust air to the fresh, generally cooler outside air, the ComfoAir 350 also offers the possibility of transferring part of the moisture of the exhaust air to the fresh, generally dryer outside air. This is made possible by the (optional) integral moisture exchanger. The moisture exchanger is supplied as a combined heat and moisture exchanger and is not installed as an additional exchanger alongside the heat exchanger of the ComfoAir 350. This exchanger then has an additional function, i.e. recovering moisture in addition to the recovery of heat. In this way, up to 65% of the moisture is recovered from the exhaust air. The supply air can thus enter the rooms with an increased moisture content.

 ***The ComfoAir 350 is equipped as standard with only a heat exchanger. The exchanger with combined heat and moisture recovery can be ordered as an option.***

2.2 Available Operating Aids

The ComfoAir 350 is equipped with the following operating aids:

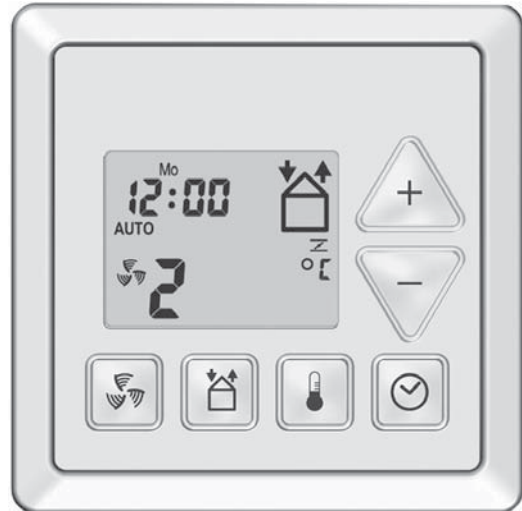
- CC Ease operating unit of the ComfoAir 350.
- Position switch (option) for setting the ventilation levels.
- Bathroom switch (option) for temporarily setting the highest ventilation level.

These operating aids are described in more detail briefly in the following sections.

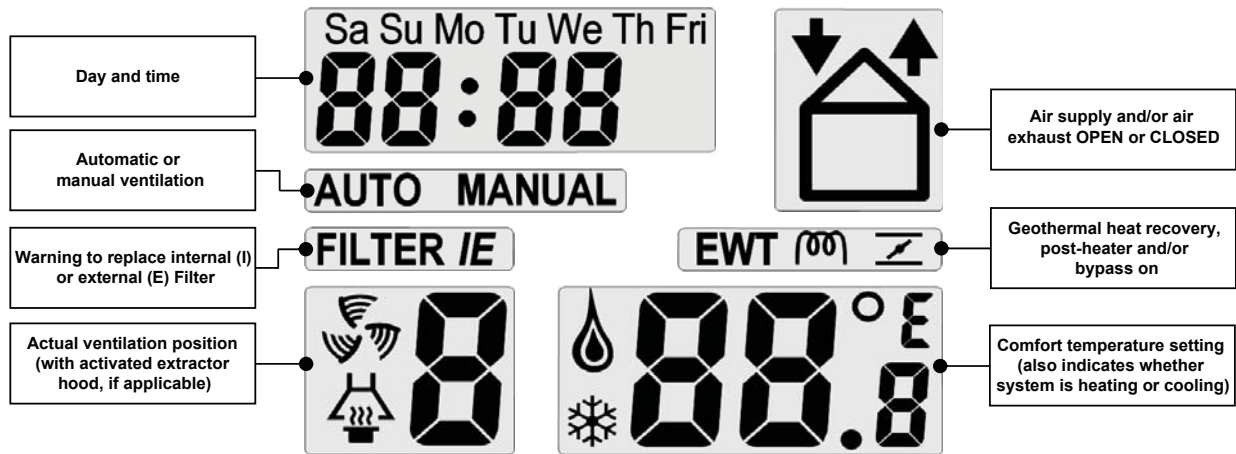
2.2.1 CC Ease Operating Unit

The ComfoAir 350 is operated using the CC Ease operating unit.






The CC Ease (= Comfort Control Ease) operating unit is installed on the wall in the living room and communicates from there with the ComfoAir 350.



The next section describes briefly what information can be read off.

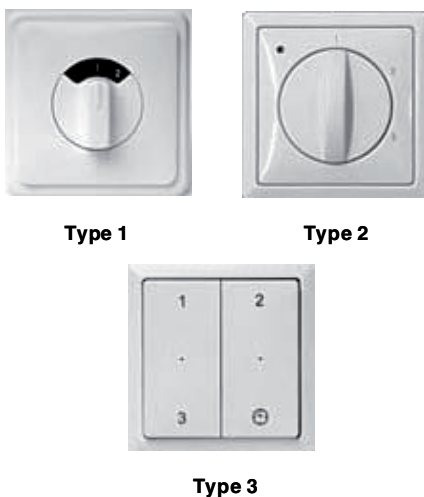


The CC Ease operating unit has various keys for operating and setting the ComfoAir 350. These keys are explained below.

	This key is used to switch the extractor hood on or off. - Press for less than 1 second → ON. - Press for longer than 1 second → OFF.
	This key is used to switch the supply and/or discharge of air on or off. - Press once → SUPPLY OFF (and EXHAUST ON). - Press twice → SUPPLY and EXHAUST OFF. - Press three times → EXHAUST OFF (and SUPPLY ON). - Press four times → SUPPLY and EXHAUST ON.
	This key allows you to read off or set the comfort temperature. - Press for less than 1 second → READ OFF. - Press for longer than 1 second → SET.
	This key allows you to switch from AUTO to MANUAL ventilation. - Press for less than 1 second → Set ventilation programme. - Press for longer than 1 second → Set date and time.
	These keys allow two functions to be set: - In AUTO ventilation → Select the ventilation level. - In MANUAL ventilation → Enter the setting values.

2.2.2 3-position Switch (Option)

Ventilation with the ComfoAir 350 can also be operated by means of a 3-position switch.



A 3-position switch can be used to set the ventilation levels of the ComfoAir 350. One or more 3-position switches can be installed in a home (for example, in the kitchen). The exact version may differ slightly from the images above. The following switch types are available:

- Type 1 → Standard 3-position switch.
- Type 2 → 3-position switch with LED for malfunction and filter indication.
- Type 3 → Wireless 3-position switch with: LED for malfunction and filter indication.
Auxiliary switch: position 3 is activated for a given time (2 possibilities for setting the time).

2.2.3 Bathroom Switch (Option)

Ventilation with the ComfoAir 350 can also be operated by means of a bathroom switch.

A bathroom switch can be used to temporarily set the highest ventilation level of the ComfoAir 350. This switch can be installed in the bathroom, for example, for discharging excess moisture as quickly as possible after showering. As the bathroom switches can have very different designs, no switch is illustrated here.

If desired, the user can also enter an activation and deactivation delay for the bathroom switch via the CC Ease operating unit (see section 2.3.7). This allows the user to specify, for example, that the ComfoAir 350 switches to the highest ventilation level 5 minutes after the bathroom switch is activated and then returns to the normal (or originally set) ventilation level automatically after 20 minutes.

In many cases, however, no separate bathroom switch is installed and the bathroom ventilation control is integrated into the bathroom light switch. The ComfoAir 350 then switches automatically to the highest ventilation level when the bathroom light is switched on. The ComfoAir 350 then returns to the normal (or originally set) ventilation level as soon as the bathroom light is switched off. Here again, an activation and deactivation delay can be set via the CCE Ease operating unit.

2.3 Use of the CC Ease Operating Unit

The following functions can be set using the CC Ease operating unit:

- Reading off and setting date and time.
- Reading off and setting the comfort temperature.
- Reading off and setting the ventilation levels.
- Switching the extractor hood on and off (option)*.
- Switching the supply and exhaust air fans on and off.
- Setting an individual ventilation programme.
- Setting additional ventilation control functions/options in the P menus.

These functions are described in more detail briefly in the following sections.

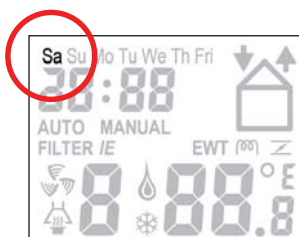
2.3.1 Setting Date and Time

Via the CC Ease operating unit it is possible:

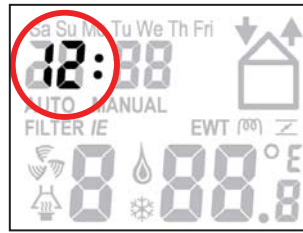
- To set the date and time.

Proceed as follows:

1. **Press** for two seconds on "🕒".
2. **Wait** until the day, e.g. "Sa", starts to flash.
3. **Select** with "▲" or "▼" the correct day.



4. **Press** "🕒" briefly.
5. **Wait** until the hours, e.g. "12", start to flash.
6. **Select** with "▲" or "▼" the correct hour.



7. **Press** "🕒" briefly again.
8. **Wait** until the minutes, e.g. "00", start to flash.
9. **Select** with "▲" or "▼" the correct minutes.



- 10 **Press** "🕒" briefly again to quit the menu.

2.3.2 Reading and Setting Comfort Temperature

Via the CC Ease operating unit it is possible:

- To read off and set the comfort temperature.

The comfort temperature is the temperature at which the ComfoAir 350:

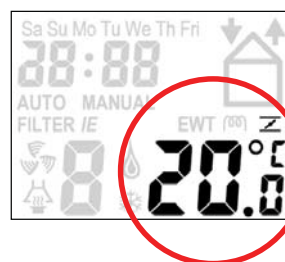
- (a) Uses the heat exchanger for heat recovery;
- (b) Switches on the bypass (hence bypassing the heat exchanger) to (temporarily) interrupt the exchange of heat between the exhaust air and the supply air.

You can read off the comfort temperature, but also set the desired temperature. The ComfoAir 350 will then automatically maintain this temperature as closely as possible after setting. The comfort temperature generally corresponds to the temperature that you have set on the room thermostat (of your central heating).

Reading off the comfort temperature

Proceed as follows:





1. **Press** "🔒".
2. **Wait** until the comfort temperature is displayed.
3. **Press** "🔒" briefly now to quit the menu.



👉 **Without pressing the key, the menu is quit automatically after 30 seconds.**

Setting the comfort temperature

Proceed as follows:

1. **Press** for two seconds on "  ".
2. **Wait** until the comfort temperature, e.g. "20.0", starts to flash.
3. **Select** the desired comfort temperature with "  " or "  ".
4. **Press** "  " briefly now to quit the menu.



2.3.3 Reading and Setting Ventilation Level

Via the CC Ease operating unit it is possible:

- To read off and set the ventilation level.

Reading off the ventilation level

The currently set ventilation level, e.g. "2", is shown as standard on the CC Ease display. The ComfoAir 350 normally regulates the necessary ventilation level automatically. During automatic ventilation, "AUTO" is shown on the CC Ease display.




Setting the ventilation level

You can also set the ventilation level by hand and thus increase or decrease the level. You have a choice of 4 ventilation levels. These are:

- Level A → Absent.
- Use during absence.

 **In level A, the dwelling is ventilated with the prescribed minimum air volume.**

 **If level A is set on the CC Ease operating unit, the 3-position switches cannot be used.**

Position 1 → Low.

- Use for a low ventilation requirement.

Position 2 → Normal.

- Use for a normal ventilation requirement.



Position 3 → High.

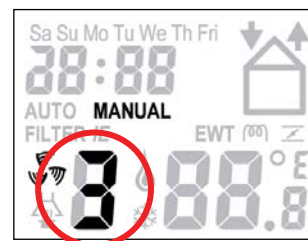
- Use this level during cooking, showering and when additional ventilation is desired..



As far as the ventilation is concerned, the ComfoAir 350 adjusts to the highest ventilation level set in the dwelling, unless otherwise set in the automatic software control.

The ventilation level can be set as follows:

1. **Press** "  " to increase the ventilation level.
2. **Press** "  " to decrease the ventilation level.



During ventilation set by hand, the indication "MANUAL" appears on the CC Ease display.




3. **Press** "  " to quit the menu.

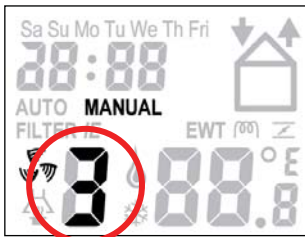



2.3.4 Switching Extractor Hood On and Off (Option)*

Via the CC Ease operating unit it is possible:
To switch the extractor hood on and off.

Proceed as follows:

4. **Press** for two seconds on "  ".
5. **Wait** until the symbol for the extractor hood appears.
6. **Select** with "  " or "  " the ventilation level, e.g. " 3".



7. **Press** "  " briefly to switch off the extractor hood.


After switching off the extractor hood, the symbol for the extractor hood disappears again from the CC Ease display.

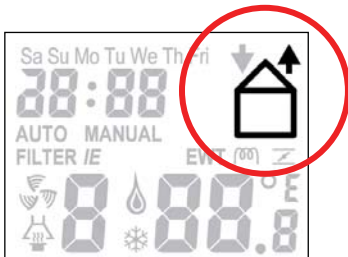


2.3.5 Switching Supply and Exhaust Air Fans On and Off


Via the CC Ease operating unit it is possible:
To switch the supply air or exhaust air fan on and off.

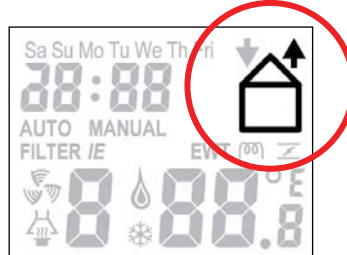
Proceed as follows:


1. **Press** "  " once to switch off the supply air fan.

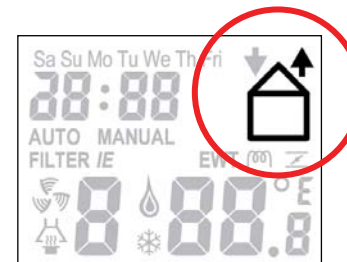



This level can be used in the summer when the windows are open. The fresh air is then drawn into the house through the open windows and not via the supply air valves.


2. **Press** "  " twice to switch off the exhaust air fan (and at the same time switch on the supply air fan again).



3. **Press** "  " three times to switch on the supply and exhaust air fans again.



 **Note that by switching off the supply or exhaust air fan, you temporarily have no balanced ventilation with heat and (if installed) moisture recovery in your home.**

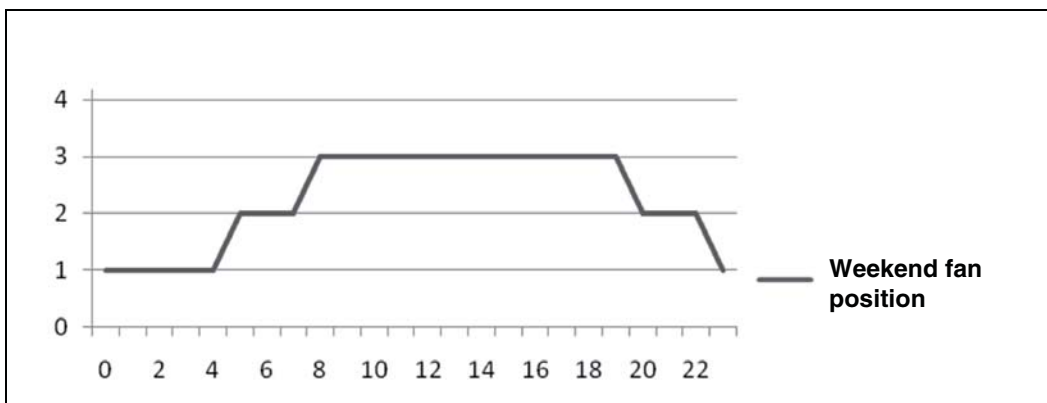
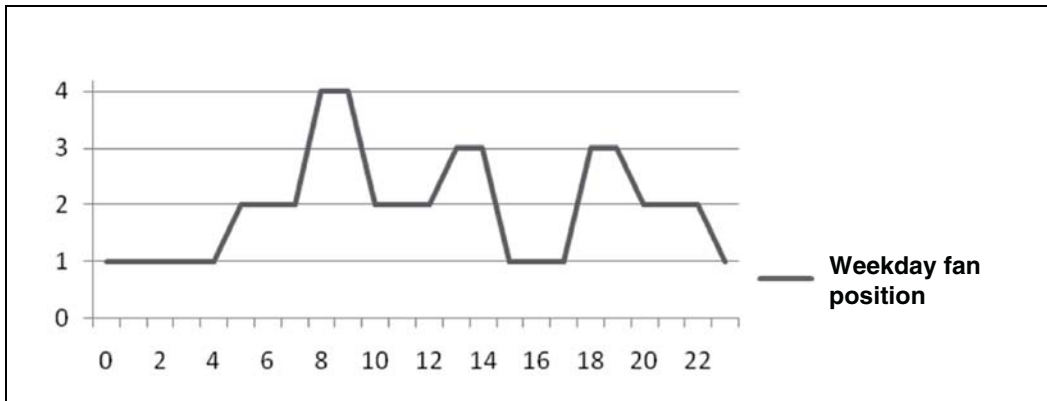
 **Never leave the fans switched off for longer than 12 hours.**

2.3.6 Setting Ventilation Programme



Via the CC Ease operating unit it is possible:
To set an individual ventilation programme.

A standard ventilation programme was set on the ComfoAir 350 during manufacture.



This ventilation programme offers a suitable ventilation pattern for most homes. If you wish, you can adapt this standard ventilation programme to your own ventilation requirements. For example, for a week and a weekend programme.



The ventilation programme can be set/changed as follows:

1. **Press** simultaneously for two seconds on "  " and "  ".


 **This functions only with ventilation set to "AUTO".**







2. **Wait** until the day appears.
3. **Program** the desired days or a sequence of days.
 - **Select** the desired day/days with "  " or "  ".

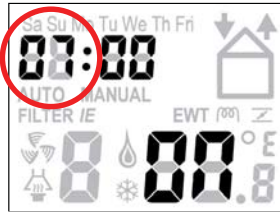
You have the following choices:




- Sequence of days: "SaSu".
- Sequence of days: "MoTuWeThFri".
- Sequence of days: "SaSuMoTuWeThFri".
- Individual days: "Sa", "Su", "Mo", "Tu", "We", "Th" and "Fri".






 The number of the switching moment flashes in the bottom right-hand corner.

- **Select** the switching moment by pressing "  " or "  ".
 - **Press** "  " to confirm the switching moment.
4. **Program** the starting time for the desired ventilation level.
 - **Press** "  ".
 - **Select** with "  " or "  " the desired time in hours.



- Press "  " again.
- Wait until the minutes, e.g. " 00 " start to flash.
- Select with "  " or "  " the desired time in minutes.



- Press "  " again.
- Wait until the ventilation symbol starts to flash.
- Select the desired ventilation level with "  " or "  ".



- Press "  " to store the switching moment.

5. **Program** the next ventilation programme, if required.
 - Then perform steps 1 to 5 for the next ventilation programme.

2.3.7 Setting Additional Functions via the P Menus

Via several P menus of the CC Ease operating unit you can:



- Read off the status of various ventilation functions;
- Activate or deactivate time delays for various ventilation functions;
- Set time delays for various ventilation functions.





In the P menus the user may:
 - only set the additional functions P1, P2 and P9.
 The remaining P menus P3 to P8 are reserved for the installer.





Access to the P menus

Proceed as follows:

1. Press "  " and "  " simultaneously.

2. Wait until "P menu" appears on the display.
3. Select the desired P menu with "  " or "  ", e.g. " 2 ".






4. Press "  " to confirm the P menu.
5. Select the desired P sub-menu with "  " or "  ", e.g. " 23 ".
6. Press "  " to confirm the P sub-menu.




Making settings in the P menus



The minimum and maximum values for the available ventilation functions are stored in the software.

7. Select a new value for the function with "  " or "  ".
8. Press "  " to save the value.
9. Repeat steps 5 to 8 to set several P sub-menus in turn in the same P menu.

Or

Return to the P menu; press once on "  " and possibly start again at step 3.



Or

Return to the main window

Press "  " twice.



Menu P1 → Status of the functions

Sub-menu	Description	Ventilation functions
		Activated / not activated
P10	Menu 20 currently active?	Yes (1) / No (0)
P11	Menu 21 currently active?	Yes (1) / No (0)
P12	Menu 22 currently active?	Yes (1) / No (0)
P13	Menu 23 currently active?	Yes (1) / No (0)
P14	[Not available]	[Not available]
P15	Menu 25 currently active?	Yes (1) / No (0)
P16	Menu 26 currently active?	Yes (1) / No (0)
P17	Menu 27 currently active?	Yes (1) / No (0)
P18	Menu 28 currently active?	Yes (1) / No (0)
P19	Menu 29 currently active?	Yes (1) / No (0)

Menu P2 → Set time delays

Sub-menu	Description	Time delay values		
		Minimum	Maximum	Default setting
P20 (Option)*	Deactivation delay for extractor hood function. <ul style="list-style-type: none"> 'x' minutes after pressing the extractor hood switch, the ComfoAir 350 returns to the previously set level. 	0 Min.	180 Min.	30 Min.
P21 (Option)* Note: Only for systems with wired switch and only if your system is equipped with a second position switch in the bathroom.	Activation delay for the bathroom switch (to switch to the HIGHEST LEVEL). <ul style="list-style-type: none"> 'x' minutes after turning on the bathroom switch, the ComfoAir 350 switches to the HIGHEST LEVEL. 	0 Min.	15 Min.	0 Min.
P22 (Option)* Note: Only for systems with wired switch and only if your system is equipped with a second position switch in the bathroom.	Deactivation delay for the bathroom switch (to switch to the NORMAL LEVEL). <ul style="list-style-type: none"> 'x' minutes after turning on the bathroom switch, the ComfoAir 350 returns to the NORMAL LEVEL. 	0 Min.	120 Min.	30 Min.
P23 Note: Only for systems with a wired position switch.	Deactivation delay for ventilation position 3. <ul style="list-style-type: none"> When position 3 (HIGHEST LEVEL) is switched on briefly (< 3 seconds), the ComfoAir 350 remains at this position for the time set in this menu. <p>If, within the run-down time, the position switch or the radio remote control is activated, the ComfoAir 350 switches immediately to the set ventilation level.</p>	0 Min.	120 Min.	30 Min.
P24	Filter warning <ul style="list-style-type: none"> Here the user can select when "FILTER DIRTY" is to appear on the CC Ease display. 	1 week	26 weeks	16 weeks

P25	Deactivation delay for ventilation position 3 (with "☺"). Note: Only for systems with a remote control switch.	1 Min.	20 Min.	10 Min.
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Sub-menu	Description	Time delay values		
		Minimum	Maximum	Default setting
P26	Deactivation delay for ventilation position 3 (with "☺"). Note: Only for systems with a remote control switch.	1 Min.	120 Min.	30 Min.
P29 (Option)*	Setting the Levels for the Extractor Hood. When the extractor hood is switched on, the ventilation levels for the extractor hood can be set a few percent higher than the corresponding 'normal' ventilation levels.	1%	99%	10%

Menu P9 → Status of the functions (from menu P5)

Sub-menu	Description	Ventilation functions
		Activated / not activated
P90	Chimney sweep control active?	Yes (1) / No (0)
P91	Bypass open (=yes) / closed (=no)?	Yes (1) / No (0)
P92 (Option)*	Valve of the geothermal heat exchanger open (=yes) / closed (=no)?	Yes (1) / No (0)
P93 (Option)*	Post-heater active?	Yes (1) / No (0)
P94 (Option)*	0 – 10 V control active?	Yes (1) / No (0)
P95	Frost protection (standard or preheater) active?	Yes (1) / No (0)
P96 (Option)*	Extractor hood control active?	Yes (1) / No (0)
P97	Moisture control active?	Yes (1) / No (0)

2.4 Use of the Switch(es) (Option)

 **Leave the ComfoAir 350 at the highest position for some time after cooking and showering to remove excess moisture and odours as quickly as possible.**

 **If several position switches are installed in the apartment, the ComfoAir 350 adjusts as far as the ventilation is concerned to the highest ventilation position unless other values are set in an automatic software control.**

2.4.1 Setting Ventilation Using 3-position Switch(es)

A 3-position switch allows 3 ventilation levels to be set.

- Position 1 → Low.
- Use for a low ventilation requirement.
- Position 2 → Normal.
- Use for a normal ventilation requirement.
- Position 3 → High.
- Use this level during cooking, showering and when additional ventilation is required.



 **The CC Ease operating unit allows an additional ventilation level, the absence level, to be set in addition to these 3 ventilation levels. For further information, see section 2.3.3.**

2.4.2 Setting Ventilation Using Bathroom Switch(es)

A bathroom switch allows the ComfoAir 350 to be temporarily set to the highest ventilation level (position 3):

- **Actuate** the bathroom switch for maximum ventilation.
- **Actuate** the bathroom switch again to return to the normal (or previously set) ventilation level.

 **You can set an activation and deactivation delay for the bathroom ventilation control in P menus P21 and P22. For further information, see section 2.3.7.**

 **The bathroom ventilation control can also be integrated into the bathroom light switch.**

2.5 Service by the User

As user you have to service the ComfoAir 350 as follows:

- Clean or replace the filters.
- Clean the valves (in the home).

These measures are described in more detail briefly in the following sections.

 **If these measures are not performed (regularly), there is a danger that the ComfoAir 350 will cease to function correctly.**

2.5.1 Cleaning or Replacing Filters

As soon as the corresponding warning appears on the display of the CC Ease operating unit, the filters have to be cleaned or replaced.

- "FILTER I" → The internal filters must be cleaned or replaced.
- "FILTER E" → The external filters* must be cleaned or replaced.

One of the filter indications shown above then appears on the CC Ease display.



👉 The internal filters are supplied as standard with the ComfoAir 350. The external filters* form part of the duct system of the ventilation system and do not belong to the ComfoAir 350.

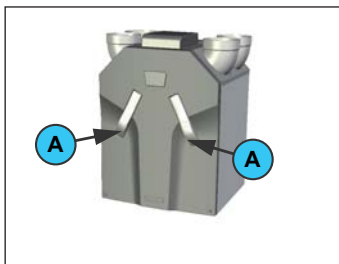
The ComfoAir 350 is equipped as standard with two internal filters. The external filters* form part of the duct system of the ventilation system and do not belong to the ComfoAir 350. Should your ventilation system be equipped with external filters, the monitoring of these filters must be connected to the PCB panel (extended version) of the ComfoAir 350.

👉 Monitoring of the external filters* must be connected to the PCB panel (extended version) of the ComfoAir 350 by the installer.

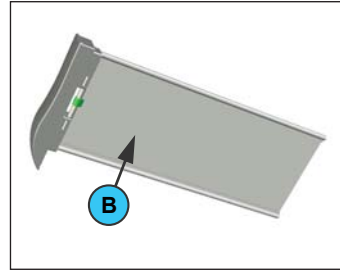
For cleaning ...


You can clean the filters when necessary:

- **Remove** the mains plug from the plug socket.
- **Pull** the filters (A) out of the ComfoAir 350.



- **Clean** the filters (B) using a vacuum cleaner.

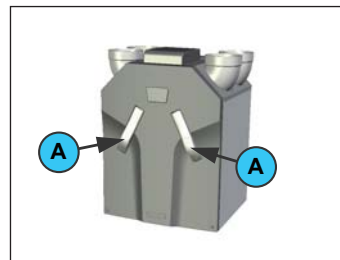


- **Push** the filters (A) back into the ComfoAir 350.
- **Insert** the plug of the ComfoAir 350 into the plug socket again.
- **Press** "  " to cancel the filter indication.

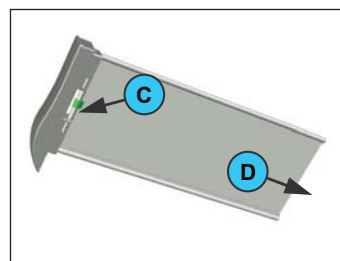
For replacement ...

As soon as the filters have to be replaced, proceed as follows:

- **Remove** the mains plug from the plug socket.
- **Pull** the filters (A) out of the ComfoAir 350.



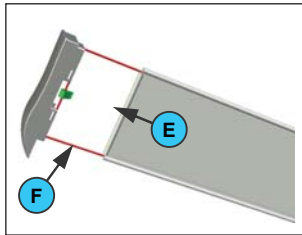
- **Remove** the clamps (C) holding the two filter cloths to the filter brackets.
- **Push** the filter cloths (D) off the filter brackets (F).




⚠️ Ensure that the cloth is not damaged by the corners of the filter bracket.

⚠️ Before putting the ComfoAir 350 into operation the first time, you should clean the filters (and the valves) because the ventilation system may have been soiled with building dust during the building phase.

- **Push** the new filter cloths (E) over the filter brackets (F).
- **Fasten** the clamps (C) again.
- **Push** the filters (A) back into the ComfoAir 350.

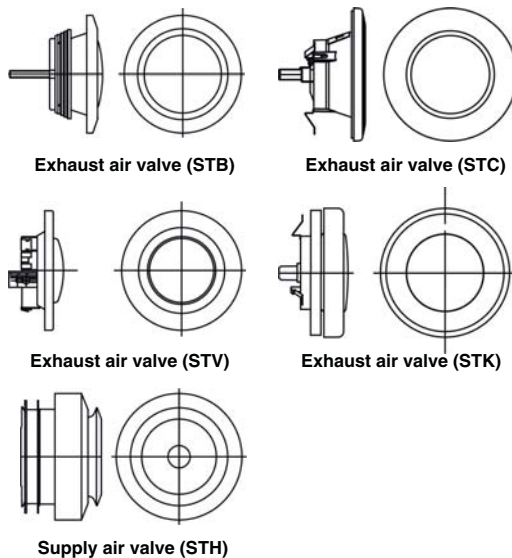


- **Insert** the plug of the ComfoAir 350 into the plug socket again.
- **Press** "  " to cancel the filter indication.

 **Replace all filters (at least) once a year.**

2.5.2 Cleaning Valves (in the Home)

The ventilation system is equipped with the following valves:




These valves have to be cleaned (at least) twice a year.

- **Remove** the valve from the wall or ceiling.
- **Clean** the valve in a warm soap solution.
- **Rinse** the valve thoroughly and **dry** it carefully.
- **Install** the valve again **EXACTLY IN THE SAME POSITION** (and **IN THE SAME HOLE**).
- **Repeat** this procedure for the other valves.

On the position of the valves ...

The installer has set all the valves so that the ventilation system operates optimally with respect to the volumetric air flows. Do not therefore change the setting of the valves.

 **Ensure that you ALWAYS install all the valves in exactly the same position (and in the same ventilation slot in the wall or ceiling) after cleaning, otherwise optimum operation of the ventilation system cannot be assured.**

The ventilation air is admitted and discharged via valves. Gaps under the doors in the dwelling ensure that the air circulates in the right direction. In order to ensure that the right volume of ventilation air is maintained in the right rooms, pay attention to the following points:

- Do not seal the gaps.
- Do not change the setting of the valves.
- Do not interchange the valves.

2.6 Malfunctions

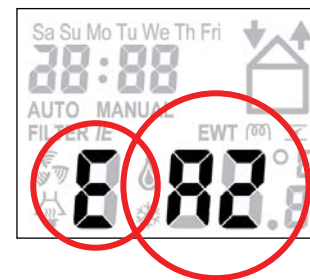
A malfunction in the ComfoAir 350 is displayed as follows:

- A malfunction indication appears on the display of the CC Ease.
- The malfunction LED on the 3-position switch lights up.

These measures are described in more detail in the following sections.

2.6.1 Malfunction indication on the CC Ease Display

In the event of a malfunction, a malfunction code appears on the CC Ease display. The display then always shows an 'A' or 'E' code with the corresponding numbers. By referring to the overview of malfunctions in section 4.7.1, you can find out what the particular malfunction indication means.




2.6.2 3-position Switch with Malfunction LED

In the event of a malfunction, 3-position switches with a malfunction LED start to light up. Depending on the type of 3-position switch, this takes place in one of two ways:

- 3-position switch with malfunction LED.
 - The LED lights up in the event of a malfunction (and in the event of a filter warning).
- Wireless 3-position switch with malfunction LED.
 - The LEDs light up as soon as the 3-position switch is used. The LED lights up green once to signal that a communication has been made. In the event of a malfunction or a 'Filter dirty' warning, both LEDs light up red three times. Finally both LEDs light

up green again.



 **The malfunction LED on the 3-position switch lights up not only in the event of malfunctions, but also in the event of a 'Filter dirty' warning.**

2.6.3 What to Do in the Event of a Malfunction?

In the event of a malfunction, please contact the installer. Note the malfunction code that appears on the display of the CC Ease operating unit. Also note your ComfoAir 350 type. It can be found on the identification plate on the top of the ComfoAir 350.

The plug must always remain in the plug socket as long as the ComfoAir 350 does not have to be shut down due to a serious malfunction, for filter cleaning or replacement or for some other urgent reason. If the plug were to be removed from the plug socket, the dwelling would no longer be mechanically ventilated and moisture as well as fungus problems could occur in the longer term. Avoid at all costs leaving the ComfoAir 350 switched off for prolonged periods.

2.7 End of Service Life

Discuss with your supplier what you should do with your ComfoAir 350 at the end of its service life. If you cannot return the ComfoAir 350 to your supplier, do not simply throw it away; contact your local authorities to find out about possibilities of re-using components or the environmentally safe recycling of the materials.

- Do **not** throw the batteries of the wireless switches into the domestic refuse; dispose of them at the official waste collection point.

3 Function of the System

This chapter describes the design of the balanced ventilation system and its function in conjunction with the ComfoAir 350.

3.1 Components of the Balanced Ventilation System

The complete balanced ventilation system consists of the following components:

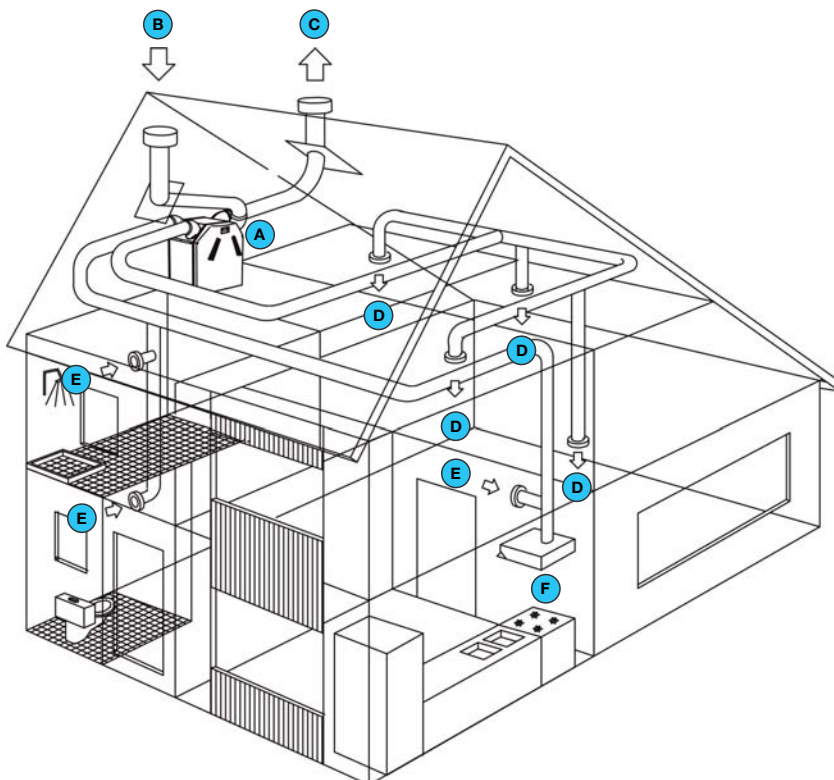
- ComfoAir 350 with CC Ease operating unit with software prepared for the connection of the following options:
 - Preheater.
 - Enthalpy exchanger (heat and moisture recovery).
 - 3-position switch without malfunction and filter display or 3-position switch with malfunction and filter display.
 - Wireless 3-position switch(es).
 - Bathroom switch.
 - Sensors with 0 – 10 V control (2x).
- Options that can only be connected to the ComfoAir 350 Luxury versions.
 - Exhausting via extractor hood.
 - Post-heater in duct system.
 - Sensors with 0 – 10 V control (2x).
 - Moisture sensor in living areas of the dwelling.
 - Geothermal heat exchanger.
 - Chimney sweep control with pressure sensor in the chimney.
 - Malfunction indication (with signal) (see wiring diagram).
 - ComfoControl Avignon (touch screen remote control with additional operating options compared with the CC Ease operating unit).
- Duct system.
 - Supply and exhaust air duct system.
 - Supply and exhaust air valves.

These components/functions of the ventilation system are described in the following sections.

3.2 Controlled Ventilation System

A balanced ventilation system generally consists of the following elements:

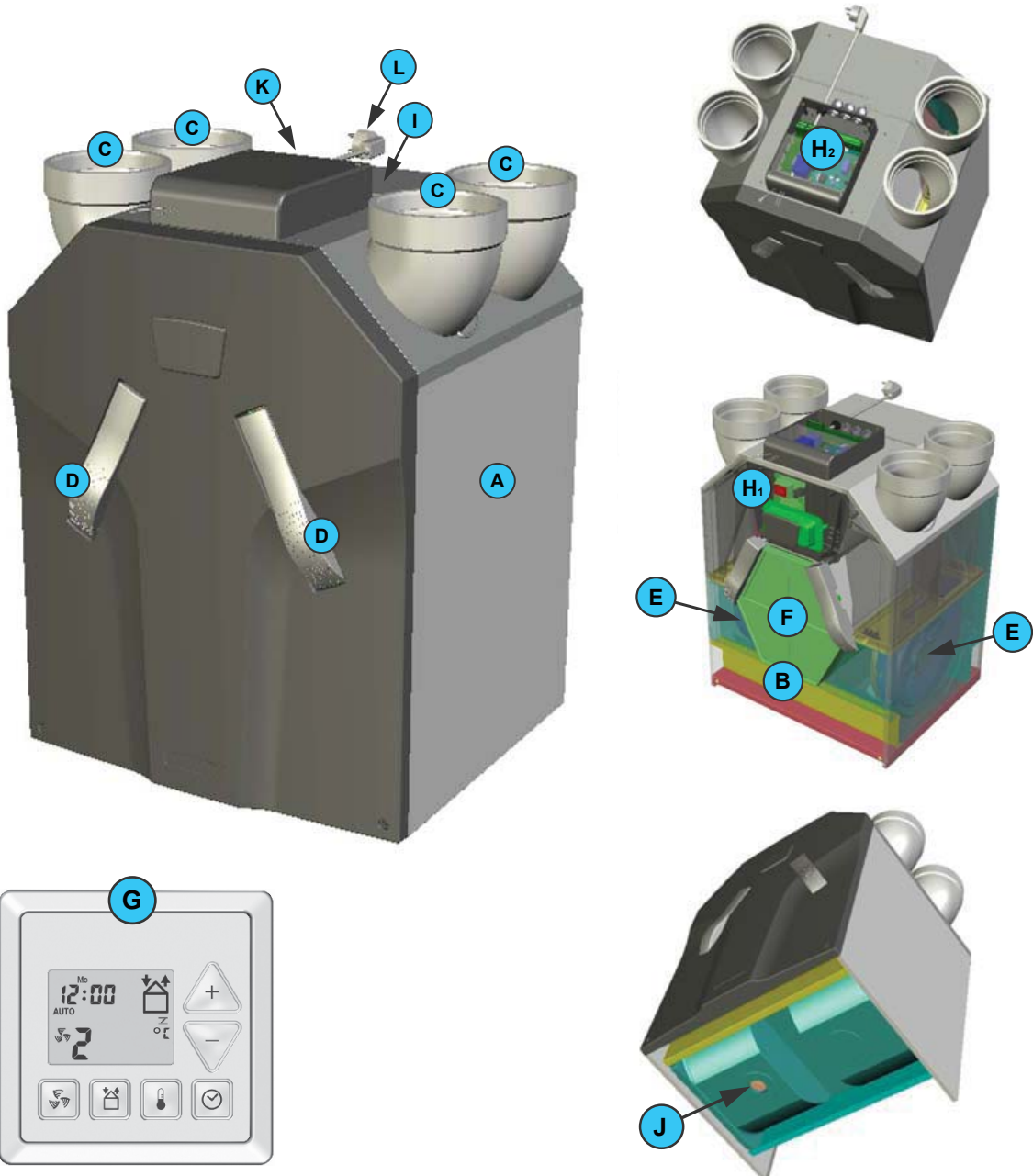
- ComfoAir 350 (A).
- Duct system for the intake of outside air (B) and the discharge of indoor air (C).
- Air supply valves in the living rooms and bedrooms (D).
- Exhaust air valves in the kitchen, bathroom, toilet and possibly the store room (E).
- Non-powered extractor hood with 3-position switch (F).



3.3 ComfoAir 350

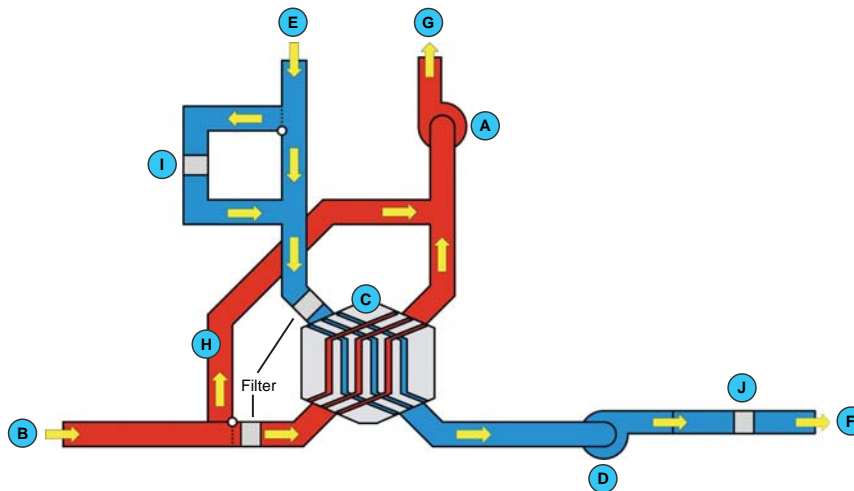
The ComfoAir 350 consists as standard of the following components:

- Outer casing (A) of coated sheet steel.
- Inner lining (B) of high-quality expanded polypropylene (E)PP.
- 4 rotatable air-side connections (C) for the air ducts.
- 2 G3 filters (D) for air filtration.
- 2 energy-saving DC motors (E) with high-speed impeller.
- (High-efficiency) heat exchanger (with optional moisture exchanger) (F) with a thermal efficiency exceeding 95% in which moisture as well as heat is recovered from the exhaust air.
- CC Ease operating unit (G) for reading off data and for settings.
- PCB panel (H2) with connections for the CC Ease operating unit, the enthalpy exchanger and the sensors with 0 - 10 V controller (2x).
- PCB panel (H1) with connections for the fans, bypass, preheater, temperature sensors (T1 to T4), 3-position switch with or without malfunction and filter display (option) and the bathroom switch (option).
- Identification plate (I) with the data on the ComfoAir 350 (not visible).
- Condensation drain (J) for discharging the condensation from the warm exhaust air.
- Sticker (K) with the air connections (not visible).
- 230 V plug (L).



ComfoAir 350 Methods of Operation

The ComfoAir 350 has been designed and produced as a system for controlled ventilation of residential buildings. It comprises two air flows that hygienically exchange their energy.



- Polluted air is drawn off by the exhaust air fan (A) from, for example, the kitchen, toilet and shower (B).
- The heat exchanger (C) absorbs the heat from the exhaust air.
- The supply air fan (D) draws in fresh air from outside (E).
- The heat exchanger (C) heats up the intaken air using the heat absorbed from the exhaust air.
- If a moisture exchanger is installed (option), moisture is also transferred from the exhaust air to the supply air (for further information, see section 2.1.6).
- The heated fresh air is delivered into the living rooms and bedrooms (F).
- The now cooled polluted air from the kitchen, bathroom and toilet is discharged into the atmosphere (G).
- The bypass (H) allows the exhaust air to be discharged to the atmosphere without passing through the heat exchanger so that no heat is transferred to the fresh air (for further information, see section 2.1.3).
- The preheater (I) (option) ensures preheating of outside air so that balanced ventilation with heat recovery is assured even with moderate to severe frost (up to 150 m³/h at -15° C) (for further information, see section 3.4.2).
- The post-heater (J) (option) additionally heats the supply air (after it has already been heated in the heat exchanger) before it is delivered into the living rooms (for further information, see section 3.4.3).

The balanced ventilation system contributes to energy saving, a healthy room climate and an optimum living climate and prevents problems with moisture.

3.4. Additional Options

Only for ComfoAir 350 Luxury versions, with the exception of the preheater that can be installed in any ComfoAir 350.

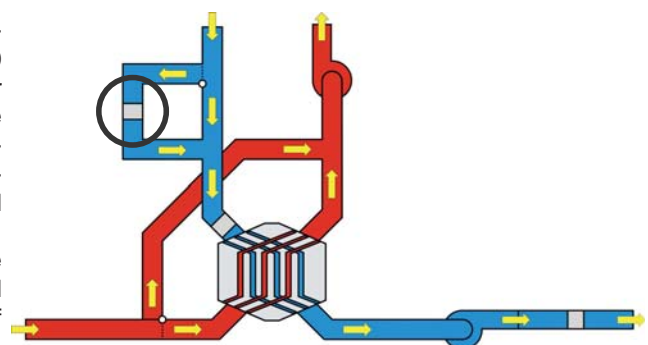
- ☞ Please refer to the identification plate on the top of the ComfoAir 350 to determine whether you have a basic or luxury version of the system.
- ☞ These are external devices that can be connected to the ComfoAir 350 Luxury versions (preheater also to Basic versions).

3.4.1. Preheater in ComfoAir 350

All ComfoAir 350 systems with "VV" in the device name (see identification plate on the top of the ComfoAir 350) are equipped as standard with a preheater. All other ComfoAir 350 versions can be equipped with a preheater as an option.


The preheater is a heating element that is installed in the outside air duct of the ComfoAir 350 just upline of the heat exchanger. The preheater heats the cold outside air before it reaches the heat exchanger in the event of moderate to severe frost. In this way the heat exchanger is protected against freezing in addition to the standard frost protection system.

The advantage of the preheater compared with the standard frost protection system is that balanced ventilation can be maintained even in the event of frost. In the event of a frost risk, the intake of out-



side air no longer has to be temporarily reduced (or even interrupted for a short time) in order to prevent condensation freezing in the heat exchanger. Instead the preheater is temporarily switched on. In addition, this option offers greater comfort as the supply air is preheated to more or less room temperature.


The preheater is switched on and off automatically. As soon as the temperature of the outside air is below 0 °C for a certain period, the air duct of the preheater is opened and the preheater is switched on to heat the intaken outside air to at least 1 °C. Here a temperature sensor in the supply air duct of the ComfoAir 350 measures the temperature. This preheating control ensures balanced ventilation up to a maximum of 150 m³/h at -15 °C. The user cannot influence the automatic preheater control. The installer has to modify the preheating control, for example during installation of the ComfoAir 350, in menu P52 via the CC Ease operating unit (for further information, see section 4.4).

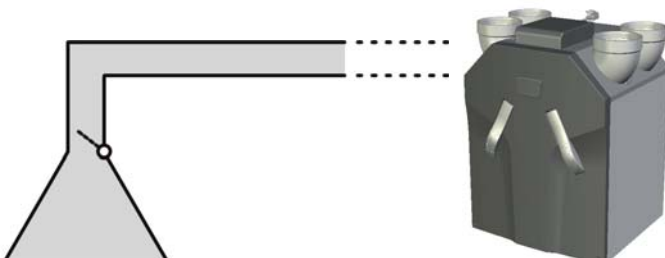
 The preheater and the corresponding temperature sensor must be connected to the PCB panel behind the front panel of the ComfoAir 350 by the installer. In the event of retrofitting, installation instructions are supplied with the installation kit.

3.4.2. Ventilation via Extractor Hood*

An extractor hood can be connected to the ComfoAir 350.

This allows moisture (steam) and food odours to be discharged as quickly as possible via the ventilation system. For this, the extractor hood must be connected to the PCB panel (extended version) of the ComfoAir 350. The extractor hood can then be operated via the CC Ease operating unit of the ComfoAir 350.

 Switching the extractor hood on and off, see section 2.3.4.



As soon as the extractor hood is switched on using the CC Ease operating unit, the valve of the extractor hood opens and the ComfoAir 350 switches to the 'Extractor hood' function. Ventilation positions 1, 2 or 3 can be set. These ventilation positions for the extractor hood correspond to the 'normal' ventilation positions. Please note, however, that these ventilation positions for the extractor hood are always slightly higher (by x%) than the 'normal' ventilation positions. The user can set this x% value himself in menu P29 on the CC Ease operating unit (see also section 2.3.7). The following increase values can be selected:

In addition to this ventilation via the extractor hood, a temperature sensor is also installed in the extractor hood. This temperature sensor measures the temperature of the air discharged via the extractor hood. Should this temperature become too high, i.e. more than 60 °C, the valve in the extractor hood will close to protect the ComfoAir 350 and in particular the heat/moisture exchanger.

3.4.3 Post-heater* in Duct System

As an option, the ventilation system can also be equipped with a post-heater.


The post-heater is a heater element that is installed in the duct system of the ventilation system, in other words downstream of the ComfoAir

Menu P29: Setting the rate of increase		
• Rate of increase	Minimum	1%
• Rate of increase	Standard	10%
• Rate of increase	Maximum	99%

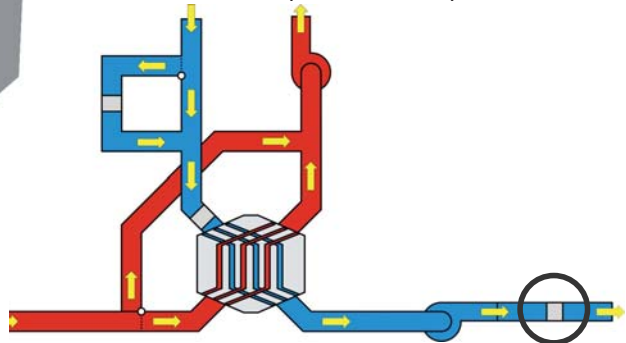


350. The post-heater ensures that after the outside air has first been heated in the heat/moisture exchanger of the ComfoAir 350, the supply air is additionally heated before it enters the living rooms.

The advantage of the post-heater is that the supply air can be directly admitted to the living rooms at the comfort temperature set for the dwelling. That means additional comfort.


 The post-heater is not supplied as standard with the ComfoAir 350. It is actually part of the duct system of the ventilation system and does not belong to the scope of supply of the ComfoAir 350.

The post-heater is switched on and off automatically. As soon as the temperature of the supply air drops below the set comfort temperature, the post-heater is switched on to heat up the supply air to the comfort temperature. A temperature sensor



in the duct system measures the temperature of the supply air immediately behind the post-heater. The user cannot influence the automatic post-heater control system. The post-heater reacts to

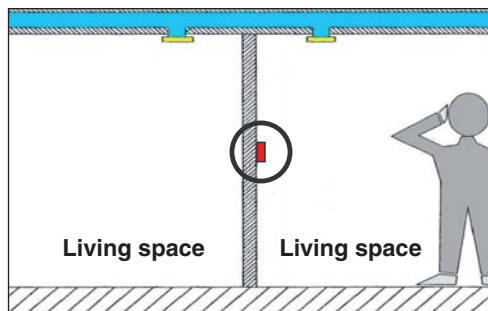
the set comfort temperature. This temperature can, however, be altered by the user (for further information, see section 2.3.2). The installer simply has to indicate whether or not a post-heater has been integrated into the ventilation system in menu P55 of the CC Ease operating unit during installation of the ComfoAir 350 (for further information, see section 4.4).

 **The post-heater and the corresponding temperature sensor must be connected to the PCB panel (extended version) of the ComfoAir 350 by the installer.**

3.4.4 CO2 Sensor* in the Home

A CO2 sensor can be connected to the ComfoAir 350.

This CO2 sensor allows the ComfoAir 350 to regulate the CO2 concentration in the house. For this, a CO2 sensor is installed in one of the living rooms to measure the current CO2 concentration in the indoor air.



If the CO2 concentration is too high compared with the set (and hence highest admissible) CO2 concentration, the settings of the supply and exhaust air fans will be gradually increased to reduce the CO2 concentration. In this way the air in rooms with a high carbon dioxide concentration that can occur, for example, during a party with a large number of people, can be quickly 'exchanged' by additional ventilation. The user can set the maximum admissible CO2 content (within the given limits) himself in menu P27 via the CC Ease operating unit (see also section 2.3.7). The following CO2 concentrations can be set:


Menu P27: Setting CO ₂ concentration		
• CO ₂ concentration	Minimum	ppm to be decided
• CO ₂ concentration	Standard	ppm to be decided
• CO ₂ concentration	Maximum	ppm to be decided



The starting point for this CO2 control is the assumption that the outside air is generally the fresh(er) air. The CO2 concentration can be reduced by this system in

that (a) fresh air is drawn in faster with the supply

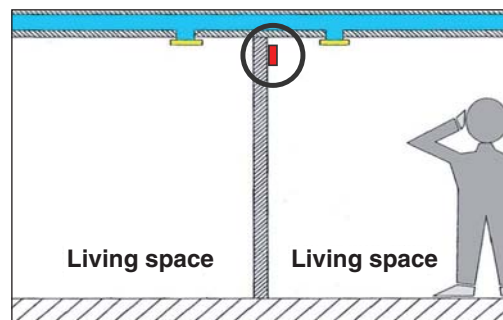
air fan, and (b) the old air is drawn off faster by the exhaust air fan. As soon as the CO2 concentration in the house has reached acceptable values again, the settings of the two fans are gradually reduced again.

 **The CO2 sensor must be connected to the PCB panel in the electronics casing on the top of the ComfoAir 350 by the installer.**

3.4.5. RH Sensor* in the Home

A RH sensor can be connected to the ComfoAir 350.

This RH sensor allows the ComfoAir 350 to regu-



late the relative humidity in the house. For this, an RH sensor is installed in one of the living rooms to measure the current relative humidity of the indoor air.


If the humidity is too high compared with the set (and hence highest admissible) humidity, the settings of the supply and exhaust air fans will be gradually increased to reduce the humidity. Living rooms with an excessively high humidity, such as bathrooms during showering, are quickly freed of the humidity by the additional ventilation. Problems due to high humidity can thus be avoided in this way. The user can set the maximum admissible humidity (within the given limits) manually in menu P28 via the CC Ease operating unit (see also section 2.3.7). The following humidity levels can be selected:

Menu P28: Setting the humidity level		
• Humidity level	Minimum	0%
• Humidity level	Standard	60%
• Humidity level	Maximum	100%



The starting point for this humidity control is the assumption that the outside air is generally the dry (drier) air. The humidity can be reduced by this system in

that (a) dry air is drawn in faster with the supply air fan, and (b) the humid air is drawn off faster by the exhaust air fan. As soon as the humidity in the dwelling has reached acceptable values again, the settings of the two fans are gradually reduced again.

 **The RH sensor must be connected to the PCB panel in the electronics casing on the top of the ComfoAir 350 by the installer.**

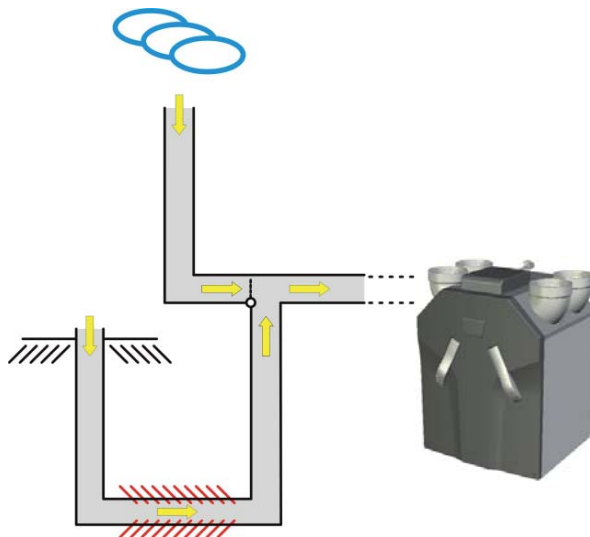
3.4.6 Underground Geothermal Heat Exchanger*

As an option, the ventilation system can also be equipped with a geothermal heat exchanger.

The geothermal heat exchanger is an additional underground air duct at a depth of at least 1 metre and with a length of 20 to 40 metres that forms part of the ventilation system. The geothermal heat exchanger allows the outside air to be admitted to the house under ground instead of above ground. The heat of the soil is thereby given off to the outside air as it flows through the geothermal heat exchanger.


The geothermal heat exchanger is thus an outstanding solution both in winter and in summer. In frosty weather, the outside air can be heated by the underground geothermal heat exchanger before it enters the house via the ComfoAir 350. During hot weather in the summer, on the other hand, the outside air can be cooled by the underground geothermal heat exchanger before it enters the house via the ComfoAir 350.

The geothermal heat exchanger functions automatically. A temperature sensor installed anywhere on the outside of the house measures the temperature of the outside air. As soon as



the temperature of the outside air is between 0 and 15 °C in winter months and between 10 and 25°C in summer months, the geothermal heat exchanger is activated to allow the outside air to flow through the heat exchanger. The user cannot influence the automatic geothermal heat exchanger control system. The installer simply has to indicate whether or not a geothermal heat exchanger has been integrated into the ventilation system in menu P60 of the CC Ease operating unit during installation of the ComfoAir 350 (for further information, see section 4.4). The installer


can modify the automatic control of the geothermal heat exchanger to a slight extent in menu P61 at the CC Ease operating unit, if necessary.


 **The geothermal heat exchanger and the corresponding temperature sensor must be connected to the PCB panel (extended version) of the ComfoAir 350 by the installer.**

3.4.7 Chimney Sweep Control

Apart from the chimney sweep control set as standard in the software, an additional unit can be connected to the PCB panel (extended version) of the ComfoAir 350 as an option that can switch off the fans of the ComfoAir 350 via a floating contact.

By means of a pressure sensor installed in the room in which the hearth to be monitored is installed, the unit measures the pressure in the room with the hearth. The pressure in the room in which the hearth is installed and the adjacent rooms must not exceed - 4 Pa so that fumes and smoke cannot enter the house. At a pressure higher than - 4 Pa, the fans of the ComfoAir 350 are switched off. Malfunction code "E4" appears on the display. In this case, please contact the installation company that installed the pressure sensor and/or the heating. There is probably a problem with the discharge of the fumes from the hearth.

 **The additional unit and the corresponding pressure sensor do not belong to the standard scope of supply of the ComfoAir 350.**

 **The additional unit and the corresponding pressure sensor must be connected to the PCB panel (extended version) of the ComfoAir 350 by the installer.**

The installer cannot influence the automatic chimney sweep control system. It reacts to settings at the PCB panel (extended version) stored in the software. The installer simply has to indicate whether or not a chimney sweep control system has been integrated into the ventilation system in menu P50 of the CC Ease operating unit during installation of the ComfoAir 350 (for further information, see section 4.4).

3.5. Technical Specifications

ComfoAir 350 nL (normal Air Volume)			
Position	Ventilation rate	Value	
Absent	50m ³ /h at 10 Pa	6 W	0,09 A
Low	100 m ³ /h at 45 Pa	16 W	0,18 A
Medium	150 m ³ /h at 105 Pa	42 W	0,39 A
High	225 m ³ /h at 195 Pa	106 W	0,87 A
Maximum	350 m ³ /h at 225 Pa	241 W	1,78 A

Power supply	
Supply voltage	230/50 V/Hz
Power factor (cos phi)	0,54 – 0,60

Noise output supply air fan		
Position	Ventilation rate	Value
Absent	50m ³ /h at 10 Pa	37,3 dB(A)
Low	100 m ³ /h at 45 Pa	50,4 dB(A)
Medium	150 m ³ /h at 105 Pa	60,0 dB(A)
High	225 m ³ /h at 195 Pa	68,9 dB(A)
Maximum	350 m ³ /h at 225 Pa	74,8 dB(A)

Noise output exhaust air fan		
Position	Ventilation rate	Value
Absent	50m ³ /h at 10 Pa	37,2 dB(A)
Low	100 m ³ /h at 45 Pa	40,8 dB(A)
Medium	150 m ³ /h at 105 Pa	48,3 dB(A)
High	225 m ³ /h at 195 Pa	53,7 dB(A)
Maximum	350 m ³ /h at 225 Pa	61,1 dB(A)

ComfoAir 350 nL (normal Air Volume)			
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Position	Ventilation rate	Value	
Absent	50m ³ /h at 10 Pa	6 W	0,09 A
Low	125 m ³ /h at 55 Pa	23 W	0,24 A
Medium	225 m ³ /h at 195 Pa	106 W	0,87 A
High	300 m ³ /h at 350 Pa	240 W	1,77 A
Maximum	350 m ³ /h at 225 Pa	241 W	1,78 A

Power supply	
--------------	--

Supply voltage	230/50 V/Hz
Power factor (cos phi)	0,54 – 0,60

Noise output supply air fan		
-----------------------------	--	--

Position	Ventilation rate	Value
Absent	50m ³ /h at 10 Pa	37,3 dB(A)
Low	125 m ³ /h at 55 Pa	54,2 dB(A)
Medium	225 m ³ /h at 195 Pa	68,9 dB(A)
High	300 m ³ /h at 350 Pa	75,7 dB(A)
Maximum	350 m ³ /h at 225 Pa	74,8 dB(A)

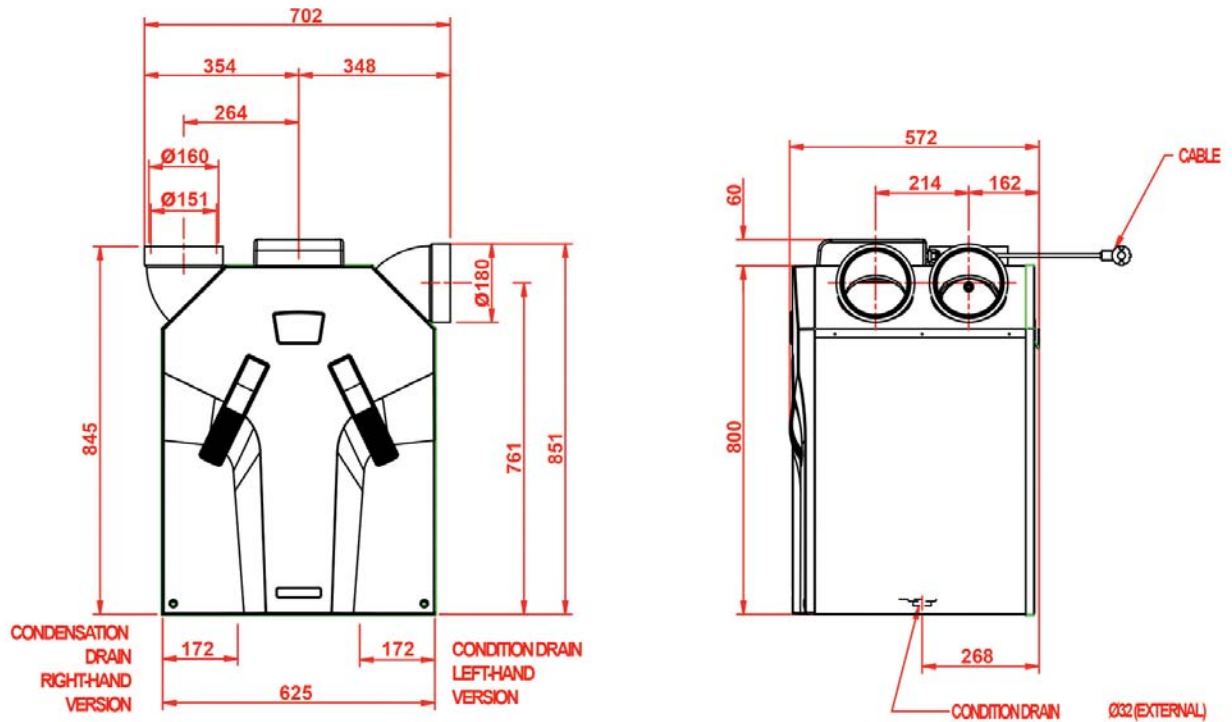
Noise output exhaust air fan		
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Position	Ventilation rate	Value
Absent	50m ³ /h at 10 Pa	37,2 dB(A)
Low	125 m ³ /h at 55 Pa	42,1 dB(A)
Medium	225 m ³ /h at 195 Pa	53,7 dB(A)
High	300 m ³ /h at 350 Pa	60,7 dB(A)
Maximum	350 m ³ /h at 225 Pa	61,1 dB(A)

General specifications of the ComfoAir 350	
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HE exchanger material	Polystyrene
Inner lining material	(E)PP / PA
Heating capacity	95%
Weight	39 kg

3.6 Dimension Sketch



4 Instructions for the Installer

This chapter describes how you have to install the ComfoAir 350.

4.1 Preconditions for Installation

In order to be able to assess whether the ComfoAir 350 can be installed in a particular room, please pay attention to the following points:

- The ComfoAir 350 must be installed in accordance with the local safety regulations and installation instructions of i.a. the public utilities, and in accordance with the instructions in this manual.
- The installation location must be selected such that there is sufficient space around the ComfoAir 350 for air connections and for carrying out maintenance work.
- The following installations must be present in the room:
 - Air duct connections.
 - 230 V power supply with fused wall plug socket.
 - Installations for condensation drainage.
- Roof openings must be air and vapour-tight. The outside air and exhaust air ducts must be insulated vapour-tight between the roof/gable opening and the ComfoAir 350. This prevents the formation of condensation on the outside of the ducts.
- The exhaust air duct must have a double-walled or insulated roof opening. This prevents the formation of condensation between the layers of the roof. The exhaust air duct must be laid with a gradient towards the ComfoAir 350.
- The ComfoAir 350 must be installed in a frost-free room. The condensation must be discharged frost-free, with a downward gradient and using a siphon. The ComfoAir 350 must be firmly connected to the siphon.
- The ComfoAir 350 may only be connected to a non-powered extractor hood. Any other type of extractor hood system would interfere with the basic function of the balanced ventilation system.
- We recommend that silencers are installed on both the air intake and air discharge sides of the ComfoAir 350. For further information, please contact your supplier.

In order to ensure a good and draught-free ventilation of the dwelling, gaps were deliberately left under the inside doors. If these gaps are sealed, for example with door seals or high-pile carpets, the ventilation in the apartment will stagnate. This would prevent the system from operating optimally.

4.2 Installation of the ComfoAir 350

4.2.1 Transport and Unpacking

- Work carefully when transporting and unpacking the ComfoAir 350.



Ensure that the packaging materials are disposed of in an environmentally favourable manner.

4.2.2 Checking the Scope of Supply

Should you discover any damage or missing parts of the supply product, please contact your supplier without delay. The scope of supply includes:

- ComfoAir 350.
- Check the identification plate to see whether it is the correct type.
- 4 x 45° connection elbows.
- Mounting brackets.
- Operating Manual.

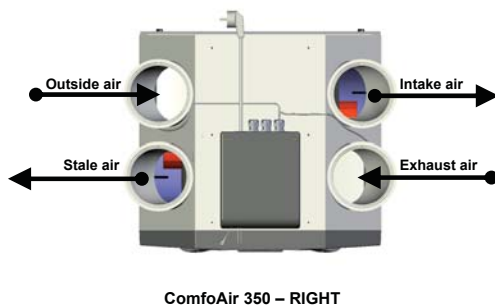
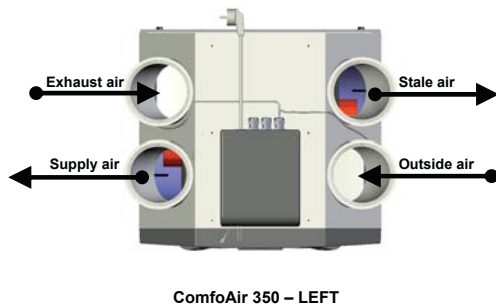
The ComfoAir 350 is available in the following types:

Type
ComfoAir 350 L
ComfoAir 350 R
ComfoAir 350 L VV
ComfoAir 350 R VV
ComfoAir 350 L Luxe
ComfoAir 350 R Luxe

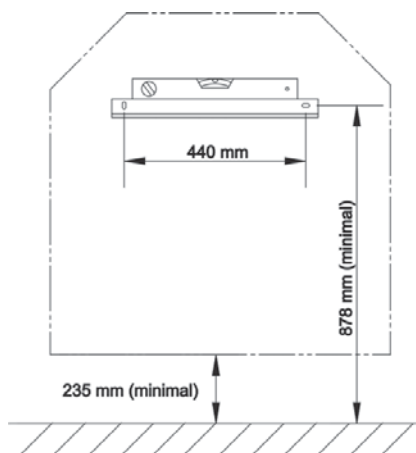
Type
ComfoAir 350 L Luxe VV
ComfoAir 350 R Luxe VV
ComfoAir 350 L Luxe CC
ComfoAir 350 R Luxe CC
ComfoAir 350 L Luxe CC VV
ComfoAir 350 R Luxe CC VV

Meaning of the suffixes:

- L = Left.
- R = Right.
- VV = Preheater.
- Luxe = Refers to the extended version of the PCB panel.
- CC = ComfoControl Avignon. This is the touch screen remote control with additional operating options compared with the CC Ease operating unit.



4.3 Wall Mounting



Install the ComfoAir 350 on a wall with a load-bearing capacity of at least 200 kg/m².

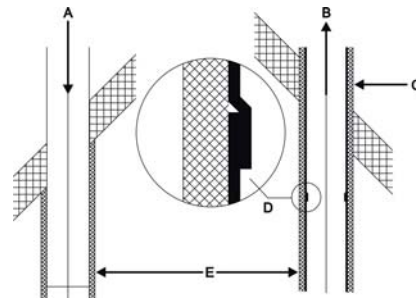
For other walls we recommend the use of a base for installation on the floor (available as an option, see section 4.8 with service parts). This helps to avoid the transmission of structure-borne noise.

- **Fasten** the supplied mounting bracket to the wall horizontally.
- **Connect** the condensation drain (not supplied) to the underside of the ComfoAir 350. The value shown of 235 mm is only an indicative value. The actual value depends on the type of condensation drains selected, see also section 4.3.2 for the connection of the condensation drain.
- **Ensure** that at least 1 metre of space is left in front of the ComfoAir 350 for later maintenance work.

No space is required to the sides of the ComfoAir 350 for its proper operation.

- Do not install the ComfoAir 350 with a side against a wall to avoid possible contact noise.

4.3.1 Connection of the Air Ducts

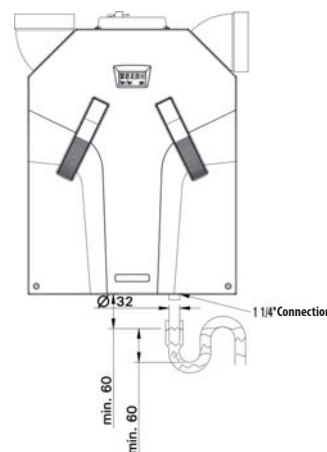


Install a suitable silencer directly at the air intake and air discharge connections. Information on silencers is available from your supplier.

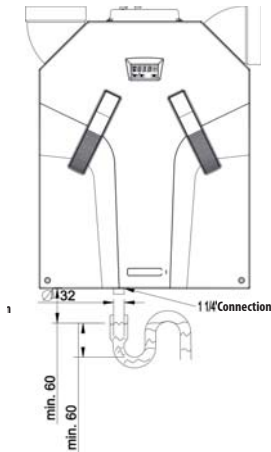
The air ducts to be connected, minimum diameter 150 mm, must be installed with as little air resistance as possible and air tight.

- **Insulate** the outside air duct and the stale air duct vapour-tight between the roof/gable opening and the ComfoAir 350. This prevents the formation of condensation on the outside of the ducts.
- **Install** the exhaust air duct with a gradient towards the ComfoAir 350.

4.3.2 Connection of the Condensation Drain



ComfoAir 350 – LEFT





ComfoAir 350 – RIGHT

The warm exhaust air is cooled by the outside air in the heat exchanger. As a result, the moisture contained in the room air condenses in the heat exchanger. The condensation forming in the heat exchanger is discharged via the condensation tray into the condensation drain.

The connection for the condensation drain has an outside diameter of 32 mm. This is located on the underside of the ComfoAir 350.

- **Connect** the condensation drain to the water lock of the home drainage system using a pipe or hose.
- **Position** the upper edge of the water lock at least 40 mm below the condensation drain of the ComfoAir 350.
- **Ensure** that the end of the pipe or hose ends under the water level.

 Ensure that the water lock of the connection to the house sewage system is always filled with water.

 Ensure that the hose end terminates at least 60 mm below the water level. This will prevent the ComfoAir 350 from drawing in air.

4.4 Commissioning the ComfoAir 350


The ComfoAir 350 can be put into operation after installation.



Commissioning can be carried out with the P menus via the CC Ease operating unit. These P menus allow various settings (in particular for ventilation control) to be selected for the ComfoAir 350. An overview of the available P menus is given below:

Menu	Possibilities
P1	Read off the status (from menu P2)
P2	Set time delays (and indication "FILTER DIRTY" and setting values for extractor hood and sensors)
P3	Setting the ventilation levels
P4	Read off the temperature, relative humidity and CO2 concentration.
P5	Setting additional control functions
P6	Setting additional control functions
P7	Read off and reset malfunctions (and system information)
P8	Setting 0-10 V connections
P9	Read off the status (from menu P5)




The P menus P1, P2 and P9 are accessible for the user and serve mainly for reading off statuses and for setting time delays. For further information, see section 2.3.7. The remaining P menus P3 to P7 are reserved **exclusively** for the installer.

 **In the P menus the user may:**
 - only set the additional functions P1, P2 and P9.
 The remaining P menus P3 to P7 are reserved for the installer.

Access to the P menus

Proceed as follows:



- 1 **Press** simultaneously on "" and "".
- 2 **Wait** until the "P menu" appears on the display.
 The P menus P1, P2 and P9 are now accessible.



- 3 **Press** " \triangleup " and " ∇ " simultaneously for 2 seconds.
- 4 **Wait** until the "P menu" P3 appears on the display.
 🖱️ The P menus P3 to P8 are now accessible.



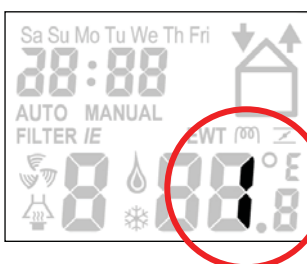
- 5 **Select** with " \triangleup " or " ∇ " the desired P menu, e.g. "5".
- 6 **Press** " \odot " to confirm the P menu.



- 7 **Select** with " \triangleup " or " ∇ " the desired P sub-menu, e.g. "51".
- 8 **Press** " \odot " to confirm the P sub-menu.

Making settings in the P menus

🖱️ **The minimum and maximum values for the available setting parameters are stored in the software.**



- 9 **Select** a value for the parameter with " \triangleup " or

" ∇ ".

- 10 **Press** " \odot " to confirm the value.

- 11 **Repeat** steps 7 to 10 to set several parameters in turn in the same P menu.

Or

Return to the P menu: Press " \square " once.

Or

Return to the main window



- 1 **Press** " \square " twice.

Menu P3 → Set ventilation controls

Sub-menu	Description	Values for ventilation controls		
		Minimum	Maximum	Standard
P30	Setting the power (in %) of the exhaust air fan in position "Absent".	0%	97%	Normal / High 15% / 15%
P31	Setting the power (in %) of the exhaust air fan in position "Low".	16%	98%	Normal / High 35% / 40%
P32	Setting the power (in %) of the exhaust air fan in position "Medium".	17%	99%	Normal / High 50% / 70%
P33	Setting the power (in %) of the exhaust air fan in position "High".	18%	100%	Normal / High 70% / 90%
P34	Setting the power (in %) of the supply air fan in position "Absent".	0%	97%	Normal / High 15% / 15%
P35	Setting the power (in %) of the supply air fan in position "Low".	16%	98%	Normal / High 35% / 40%
P36	Setting the power (in %) of the supply air fan in position "Medium".	17%	99%	Normal / High 50% / 70%
P37	Setting the power (in %) of the supply air fan in position "High".	18%	100%	Normal / High 70% / 90%
P38	Current power (in %) of the exhaust air fan.	-	-	Current %
P39	Current power (in %) of the supply air fan.	-	-	Current %


Menu P4 → Read off the temperatures (% and ppm)

Sub-menu	Description	Read off the temperatures (% and ppm)		
		Minimum	Maximum	Standard
P40	Current value of T _{POST-HEATER}	-	-	Current °C
P41	Comfort temperature	12 °C	28 °C	20 °C
P42	Current value CO ₂	-	-	Current ppm
P43	Current value relative humidity.	-	-	Current %
P44	Current value of T _{EXTRACTOR HOOD}	-	-	Current °C
P45	Current value of T1 (= temperature of the outside air)	-	-	Current °C
P46	Current value of T2 (= temperature of the supply air)	-	-	Current °C
P47	Current value of T3 (= temperature of the exhaust air)			Current °C
P48	Current value of T4 (= temperature of the stale air)			Current °C
P49	Current value of T _{GHE} (= temperature of the outside air for geo-thermal heat exchanger)			Current °C

Menu P5 → Setting additional control functions

Sub-menu	Description	Values for additional control functions		
		Minimum	Maximum	Standard
P50	Activation of the chimney sweep control system.	0 (= No)	1 (= Yes)	0
P51	Indicate whether preheater is installed. Note: change only if a preheater was subsequently installed. If the ComfoAir 350 has to be reset to the works settings via P75, a subsequently installed preheater will be reset as standard to "ABSENT". • Check the presence of the preheater after a general reset via menu P75.	0 (= No)	1 (= Yes)	0
P52	Setting the preheater control. • Level 0 Particularly safe setting. • Level 1 Safe setting. • Level 2 Nominal setting. • Level 3 Economy setting. Note: The PREHEATER IS SWITCHED ON EARLIEST WITH THE particularly safe setting. This level thus offers the greatest safety for maintaining balanced ventilation. On the other hand, the preheater is switched on the latest in the ECONOMY SETTING. This level thus offers the least safety for maintaining balanced ventilation. During commissioning of the ComfoAir 350, the preheater control can generally be left on Level 2: NOMINAL SETTING (= works setting). Only in areas with cold winters (with daytime temperatures regularly approx. -10°C or below) should Level 1: SAFE SETTING or even Level 0: PARTICULARLY SAFE SETTINGS be selected.	0	3	2

Sub-menu	Description	Values for additional control functions		
		Minimum	Maximum	Standard
P53	Indicate presence of an extractor hood. Note: If an extractor hood is connected to the ventilation system, the user can set the ventilation levels for the extractor hood via P29.	0 (= No)	1 (= Yes)	0
P54	Indicate presence of a bypass. Note: The ComfoAir 350 is equipped with a bypass as standard. The value can therefore be left at '1'.	0 (= No)	1 (= Yes)	1
P55	Indicate presence of a post-heater.	0 (= No)	1 (= Yes)	0
P56	Setting the necessary air volume for the dwelling. • nL: "Normal air volume". • HL: "High air volume". Note: Setting the air volume in P56 (to "nL" or "HL") forms the basis for setting the air specifications and hence for setting the fans. For further information, see section 4.5 and P30 to P37.	nL	HL	nL




Sub-menu	Description	Values for additional control functions		
		Minimum	Maximum	Standard
P57	Setting the ComfoAir 350 Type. <ul style="list-style-type: none"> Li = Left-hand version. Re = Right-hand version.  Note: The ComfoAir 350 is set correctly at the factory. <ul style="list-style-type: none"> Refer also to the identification plate for these data. 	Li	Re	Li
P58 (Not yet available)	Setting the fan type. <ul style="list-style-type: none"> 0 = Standard. 1 = Constant volume. 2 = Constant pressure. Note: The ComfoAir 350 is set correctly at the factory. <ul style="list-style-type: none"> Constant volume or constant pressure fans cannot be installed subsequently. 	0	2	0
P59	Enthalpy exchanger installed	0 (= No)	1 (= Yes) with moisture sensor	2 (= Yes) without moisture sensor

Menu P6 → Setting additional control functions

Sub-menu	Description	Values for additional control functions		
		Minimum	Maximum	Standard
P60	Indicate presence of a geothermal heat exchanger (GHE).	0 (= No)	1 (= Yes)	0
P61	Setting the percentage that the supply air fan must run higher when the valve of the geothermal heat exchanger (EWT) is open.	0%	99%	0%
P62	Tghe, low	0%	15%	7%
P63	Tghe, high	10%	25%	23%
P64	Tnaheater, desired	5%	40%	18%

Menu P7 → Read off malfunctions (and system information)

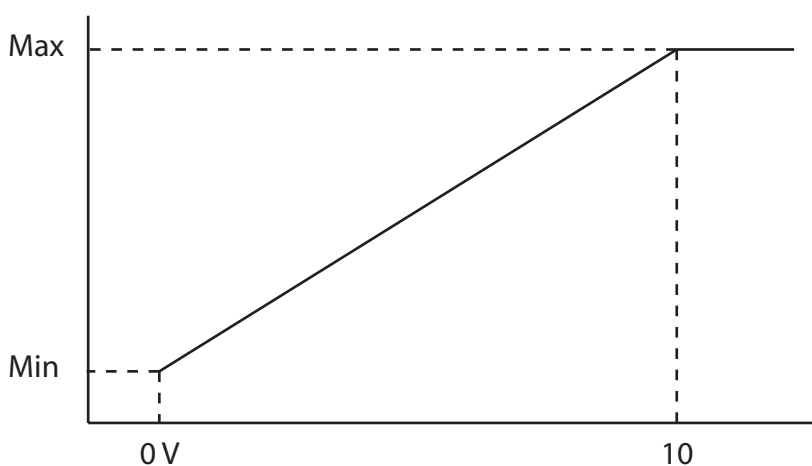
Sub-menu	Description	Values (malfunction) information		
		Minimum	Maximum	Standard
P70	Current software version.	Software version number		
P71	Last malfunction.	Code corresponding to alarm and malfunction display (see section 4.7)		
P72	Last malfunction but one	Code corresponding to alarm and malfunction display (see section 4.7)		
P73	Last malfunction but two	Code corresponding to alarm and malfunction display (see section 4.7)		
P74	Reset a malfunction on the ComfoAir 350.	0	1	0

Sub-menu	Description	Values (malfunction) information		
		Minimum	Maximum	Standard
P75	Complete reset. • Press "☺" for 5 seconds to carry out a complete reset. A complete reset returns all settings to the original works settings.	0	0	0
	<p> After a complete reset, the ComfoAir 350 prompts you to enter "nL / HL" (see P56) and "Li / Re" (see P57) again.</p> <p> After a complete reset, all settings in menus P2 and P3 and the existing controls P5 and P6 have to be made again.</p> <p> If the ComfoAir 350 is equipped with a preheater, this must be logged in again in menu P51, as it is set to "Logged out" as standard after a complete reset.</p>			
P76	Self-test of the ComfoAir 350.	0	1	0
	Explanation The ComfoAir 350 switches to the highest level immediately after activation of the self-test. In addition, the bypass valve opens and closes immediately after activation of the self-test. If this self-test is completed without malfunctions, the valve of the preheater (if installed) then opens and closes.			

Menu P8 → Open-loop and closed-loop control

Selection between open-loop and closed-loop control

Sub-menu	Description
P80	0= Open-loop control 1 = Closed-loop control (by analogy with input 1)
P81	0= Open-loop control 1 = Closed-loop control (by analogy with input 2)
P82	Min. setting by analogy with input 1
P83	Max. setting by analogy with input 1
P84	Min. setting by analogy with input 2
P85	Max. setting by analogy with input 2



4.5 Setting the Air Specifications

The ComfoAir 350 must be set after installation.

This can be performed using the air specifications of the ComfoAir 350 shown above.

- Setting the normal air volume 'nL' corresponds to the presetting of the G 90.
- Setting the normal air volume 'nL' corresponds to the presetting of the G 91.



The standard settings of the ComfoAir 350, nL, are as follows:


Position ABSENT	15%
Position LOW	35%
Position MEDIUM	50%
Position HIGH	70%

The standard settings of the ComfoAir 350, HL, are as follows:


Position ABSENT	15%
Position LOW	40%
Position MEDIUM	70%
Position HIGH	90%

To set the ComfoAir 350 (after installation), proceed as follows:

- **Switch** the ComfoAir 350 to the setting mode.
 - **Press** simultaneously for two seconds on "  " and "  ".
 - **Wait** until "InR" appears on the CC Ease display.

 ***In setting mode, bypass and preheater are always deactivated. The ComfoAir 350 switches the setting mode off again automatically after 30 minutes.***

- **Close** all windows and outside doors.
- **Close** all inside doors.
- **Check** the presence of air circulation systems in the building (at least 12 cm² per l/s).

 ***The air circulation systems in the building must achieve at least 12 cm² per l/s.***

- **Check** whether both fans function in the three speed ranges.
- **Switch** the ComfoAir 350 to the high position.
- **Install** all the valves and **set** them according to the instructions or as in the reference dwelling.

If no data are known:

- **Install** the valves and **open** them as far as possible.
- **Measure** the air volumes, first the supply air and then the exhaust air.
- **differ** by more than approx. 10% from the nominal air volumes and the majority of the deviations are in the plus range, **adjust** the fan so that all the deviations are in the plus range. If the majority of the deviations are in the minus range, **adapt** all the devia-

tions so that they are all in the minus range. **Ensure** also that a supply and an exhaust valve remain fully open.

- **Change** the fan settings in the P menus P30 to P37 via the CC Ease operating unit.
 - **Select** the lowest possible setting in order to minimise energy consumption.
 - **Ensure** that the ratio of the air volumes between high, medium and low remains the same.

 ***Use the ComfoAir 350 air specification diagram for setting the fans.***


- If the previously set air volumes still differ too much:
 - **Adjust** the valves further.
- **Check** the whole system again after adjustment of all the valve stages.
- **Switch** the ComfoAir 350 (back) to ventilation position 2.

4.6 Maintenance by the Installer

As installer you have to service the ComfoAir 350 as follows:

- Inspect the heat exchangers and fans
- Clean the filter if a preheater is installed.

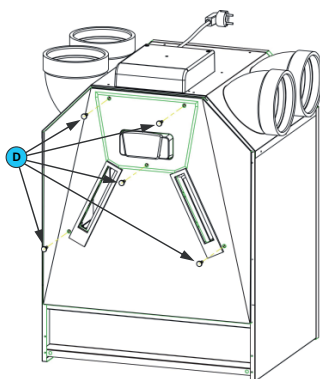
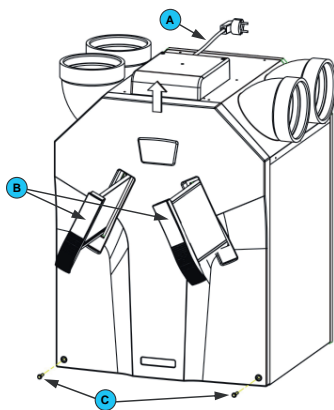
These measures are described in more detail briefly in the following sections.

 ***If these measures are not performed (regularly), there is a danger that the ComfoAir 350 will cease to function correctly.***

4.6.1 Inspection of Heat Exchanger and Fans

The fans and the heat exchanger must be inspected every 4 years.

- **Remove** the mains plug (A) from the plug socket.
- **Pull** the filters (B) out of the ComfoAir 350.
- **Remove** the front plate by removing the screws (C).
- **Push** the front plate in the direction of the arrow and remove it from the ComfoAir 350.
- **Remove** the sealing plate by removing the screws (D).



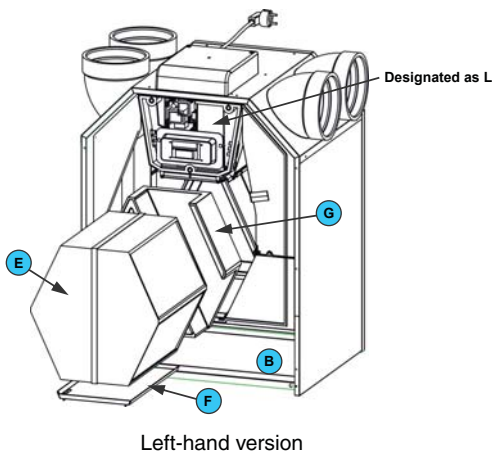
During installation of the sealing plate, its underside must first be inserted behind the raised edge so that a good seal is achieved.

ComfoAir 350 – L

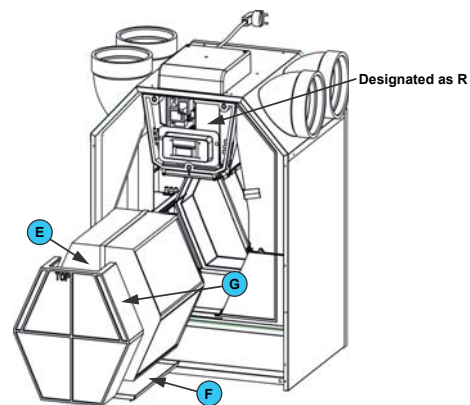
- Pull the tape (E) to remove the heat exchanger (F) and the drain plate (G).
- Remove the bypass duct (H) on the left-hand version of the ComfoAir 350.

ComfoAir 350 – R

- Remove the bypass duct (H) on the right-hand version of the ComfoAir 350.
- Pull the tape (E) to remove the heat exchanger (F) and the drain plate (G).



Left-hand version



Right-hand version

Then:

- Remove the heat exchanger (F) from the drain plate (G).



Caution!
There may still be water in the heat exchanger!

- Clean the heat exchanger (F), if necessary.
 - Immerse the heat exchanger in warm water (max. 40° C) to clean.
 - Finally rinse the heat exchanger thoroughly with warm tap water (max. 40° C).
 - Hold the heat exchanger with both hands at the green side surfaces and shake out all the water.



Caution!
On no account should aggressive or solvent-based cleaning agents be used.



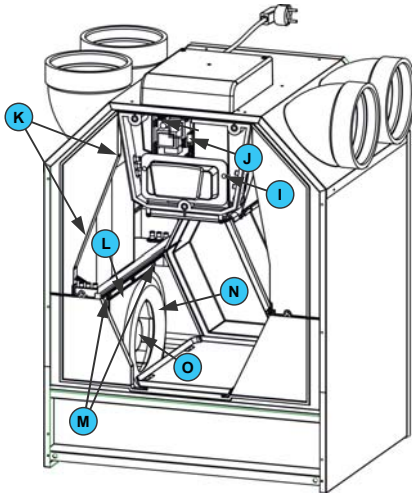
Do not install the heat exchanger yet (the fans can be removed, inspected and cleaned, if necessary, in the following steps).



If an enthalpy heat exchanger is installed, observe the corresponding instruction.

Do not install the heat exchanger yet if the fans are also to be inspected. The following section describes how to remove, inspect and clean the fans, if necessary, after the heat exchanger:


- Remove the plastic plate (I) in front of the PCB panel by loosening the two screws.
- Loosen the connectors (J) and the earth cable (J) at the PCB panel and remove the cables with the two grommets (K) completely.
- Remove the complete fan casing (L) by pressing in the tabs (M).
- Remove the inlet neck (N) by pressing in the tabs around the fan casing.
- Clean the fans (O).




 Use a soft brush to clean the fan blades.


 Remove dust using a vacuum cleaner.

 **Caution!**
Take care not to damage the fan blades.

 **Caution!**
Take care not to damage the temperature sensor.

- Install all the parts again in the reverse order.
- Carry out the self-test described under P76, see section 4.4.

 Install the drain plate (G) again correctly under the heat exchanger. The holes in the drain plate must be on the side of the condensation drain.

 **Tighten the screws to a maximum torque of 1.5 Nm. This corresponds to roughly level 2 of a normal screw drill.**


4.6.2 Filter Cleaning, if Preheater is Fitted


The filter of the preheater (if installed) must be cleaned every 4 years.

- Remove the mains plug (A) from the plug socket.
- Pull the filters (B) out of the ComfoAir 350.
- Remove the front plate by removing the screws (C).
- Push the front plate in the direction of the arrow and remove it from the ComfoAir 350.
- Remove the sealing plate by removing the screws (D).
- Remove the plastic plate (I) in front of the PCB panel by loosening the two screws.
- Loosen the connectors (J) and the earth cable (J) at the PCB panel and remove the cables with the two grommets (K) completely.
- Remove the cable (P) of the PCB panel.
- Remove the bottom (Q) of the preheater.

– The bottom is secured in the electronic carriage by 4 tabs. Two tabs are located on the front side (visible) and two on the rear side (not visible).

- Clean the filter using a brush.
- Remove any caked soiling with a damp cloth.
- Install all the parts again in the reverse order.
- Carry out the self-test described under P76, see section 4.4.

 Install the drain plate (G) again correctly under the heat exchanger. The holes in the drain plate must be on the side of the condensation drain.

 **Tighten the screws to a maximum torque of 1.5 Nm. This corresponds to roughly level 2 of a normal screw drill.**

4.7 Malfunctions

In the event of a malfunction in the ComfoAir 350:

- A malfunction indication normally appears on the display of the CC Ease operating unit.

Not all malfunction indications appear on the CC Ease display, however, even when there is a malfunction (or problem). Both types of malfunction (or problem) are described briefly in the following sections.

4.7.1 Malfunction Indications on the CC Ease Display

The following table contains an overview of the malfunction indications that are shown on the CC Ease display.

Code	Description
A0	NTC sensor TEWT defective.
A1	NTC sensor T1 defective. (= temperature of the outside air)
A2	NTC sensor T2 defective. (= temperature of the supply air)
A3	NTC sensor T3 defective. (= temperature of the return air)
A4	NTC sensor T4 defective. (= temperature of the exhaust air)
A5	Bypass motor malfunction.
A6	Preheater motor malfunction.
A7	Preheater does not heat up sufficiently.
A8	Preheater becomes too hot.
A10	NTC sensor Tch defective.
A11	NTC sensor Trh defective.
E1	Exhaust air fan not running (M1).
E2	Supply air fan not running (M2).
E3	Temperature sensor extractor hood too high.
EA1	Enthalpy sensor measures excessively high moisture values.
EA2	No communication with the enthalpy sensor.



Caution!

The electrical connections must not come into contact with moisture.



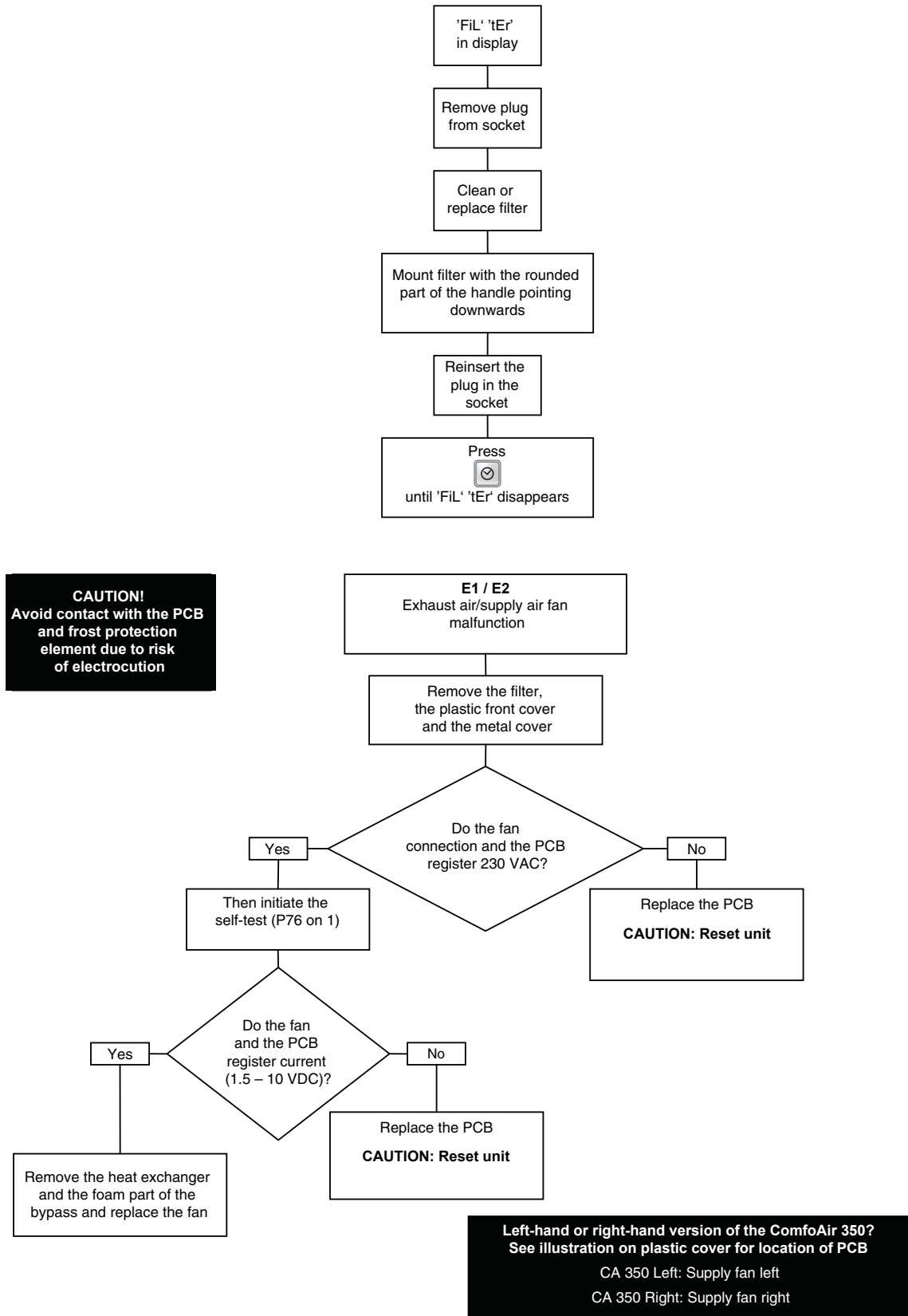
Pay attention during installation of the heat exchanger and drain plate that the condensation drain is on the same side as the condensation drain fitting.

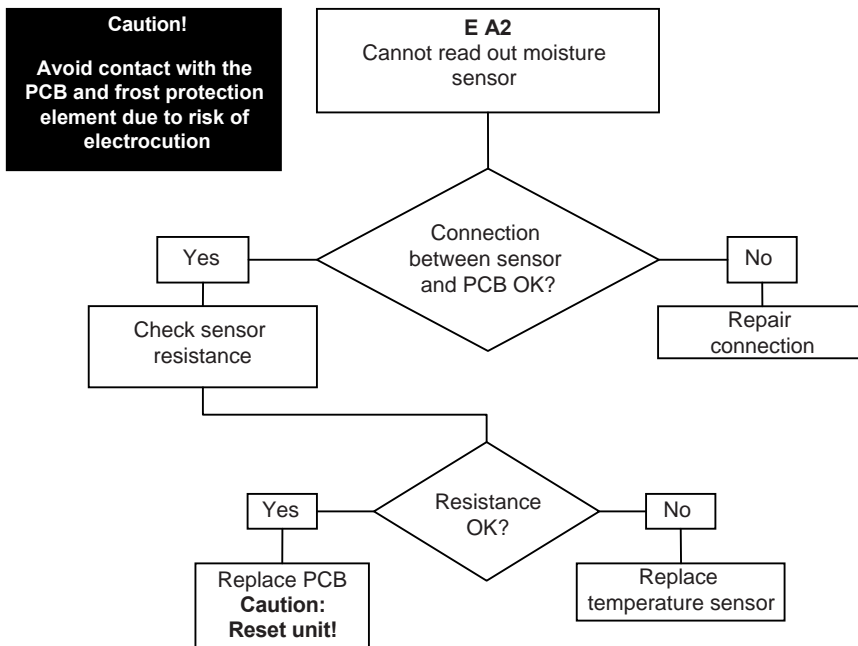
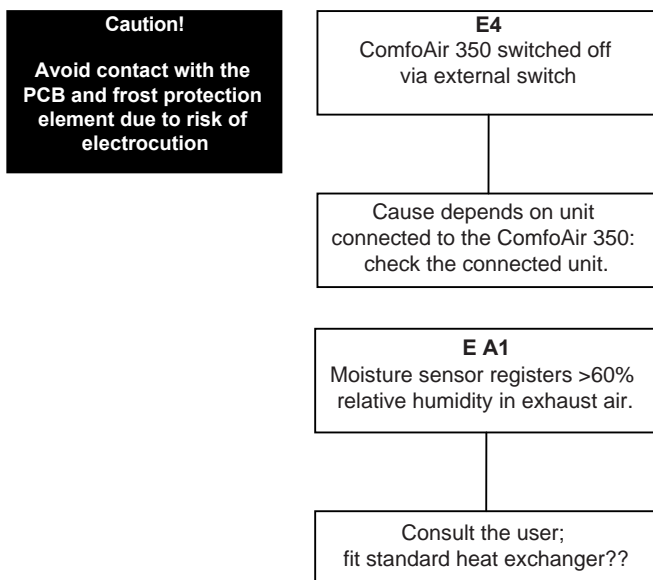
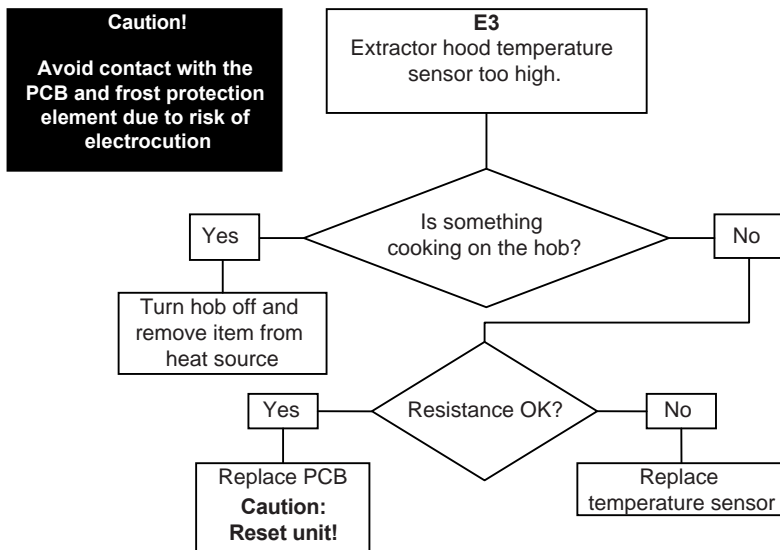


Inspect the components of the condensation drain every 2 years.

4.7.2 Malfunction indications on the CC Ease Display à Remedy

This section contains tips on remedying the malfunctions described in section 4.7.1 that can appear on the CC Ease display.





CAUTION!
Avoid contact with the PCB and frost protection element due to risk of electrocution

A1 / A2 / A3 / A4
Temperature sensor malfunction
T1 / T2 / T3 / T4

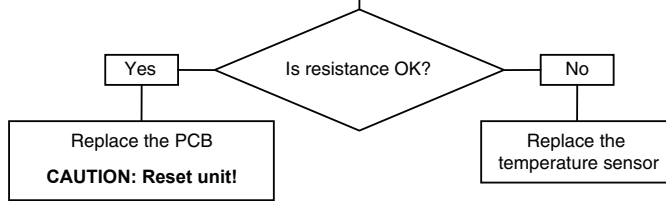
Remove the plug from the socket

Remove the filter, the plastic front cover and the metal cover

Remove temperature sensor from the PCB

Check temperature sensor resistance; see table

	Resistance [kΩ]		
	□□□	□□□□	□□□□
10	19.570	19.904	20.242
15	15.485	15.712	15.941
18	13.502	13.681	13.861
19	12.906	13.071	13.237
20	12.339	12.491	12.644
21	11.801	11.941	12.082
22	11.291	11.420	11.550
25	9.900	10.000	10.100
30	7.959	8.057	8.155

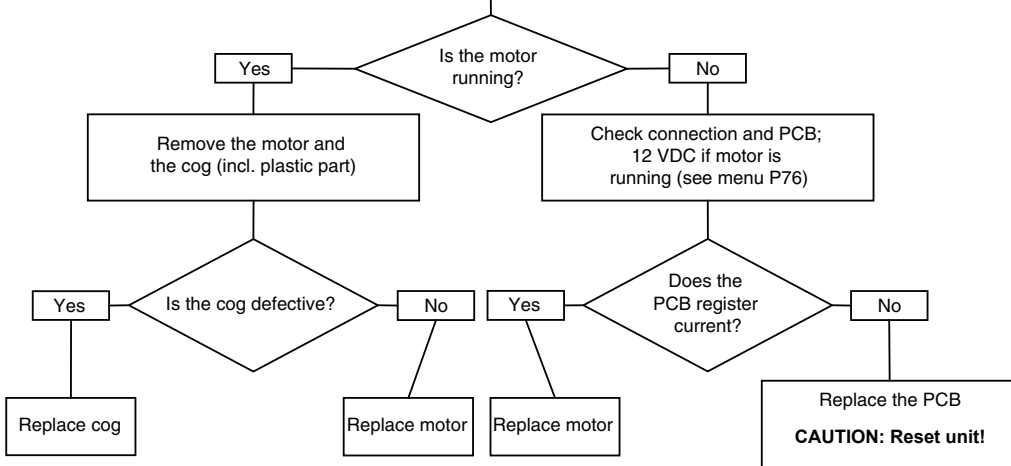


□□□□□□
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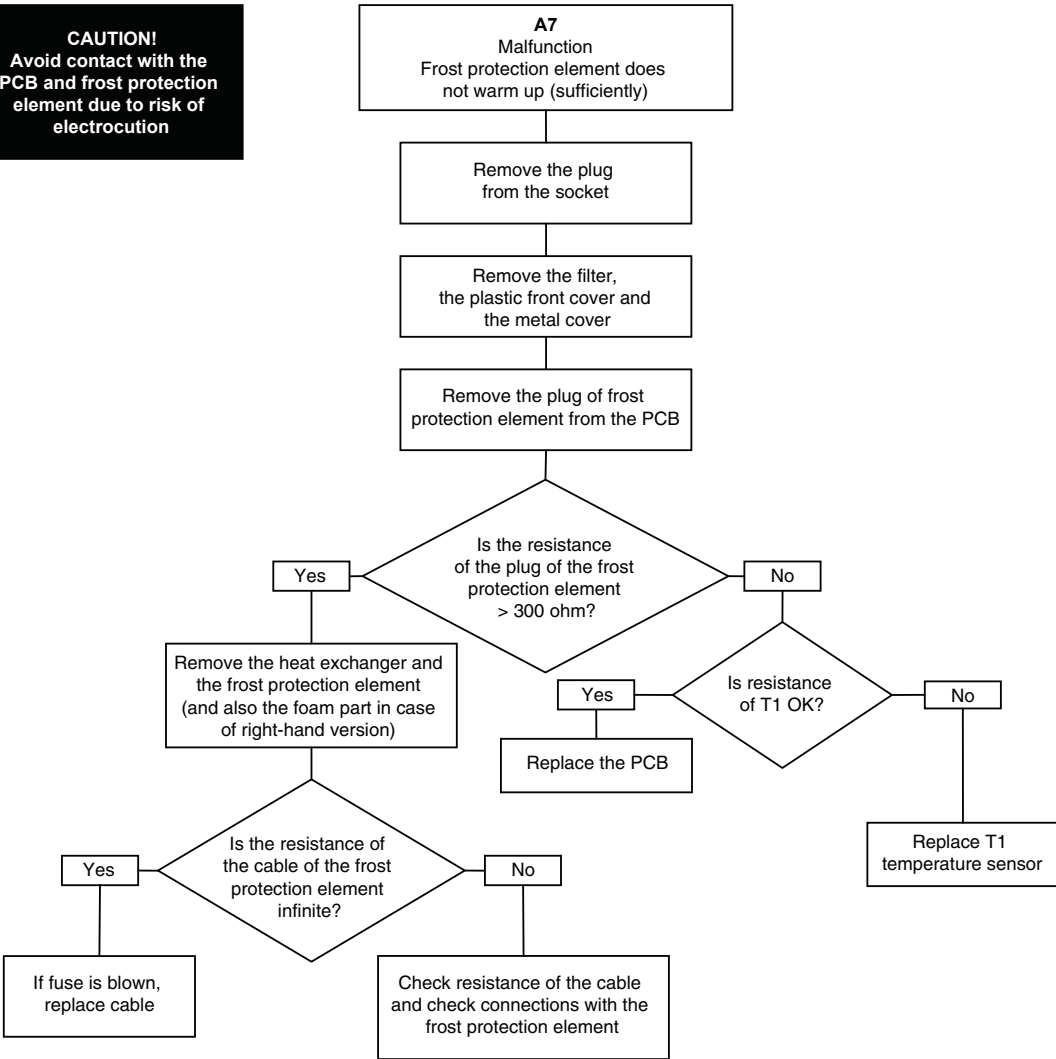
A5 / A6
Motor bypass / frost protection element malfunction

Remove the filter, the plastic front cover and the metal cover

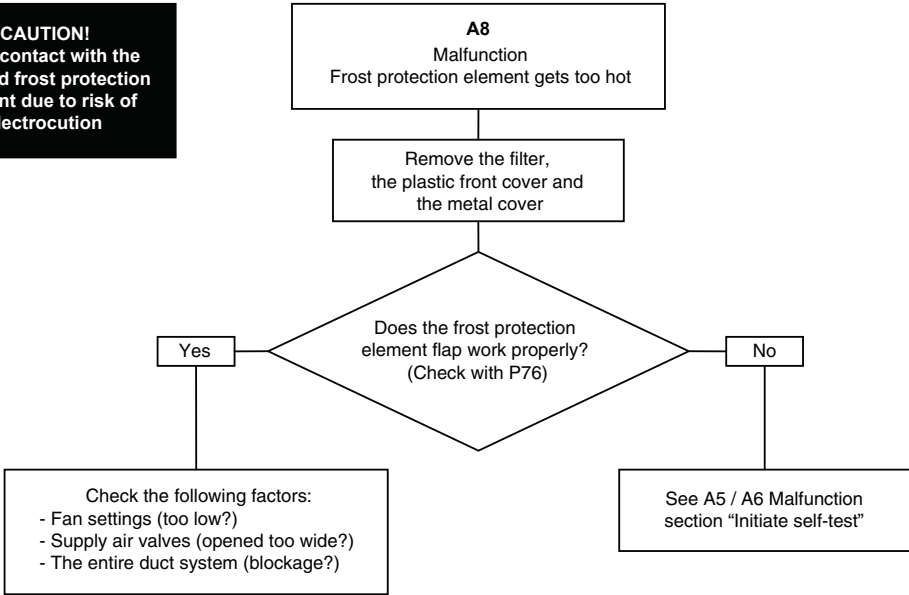
Then initiate the self-test (P76 on 1)



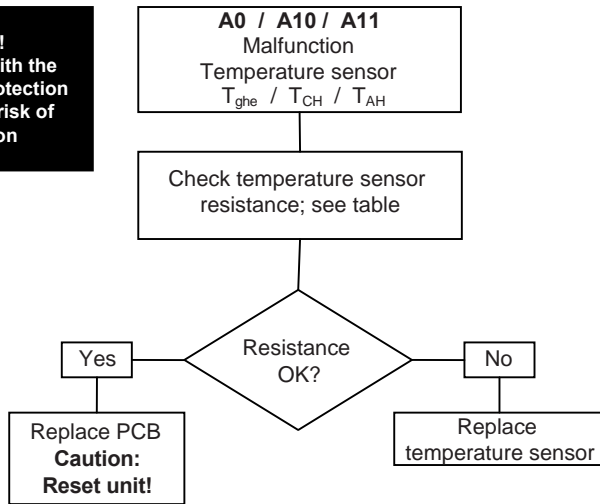
CAUTION!
Avoid contact with the PCB and frost protection element due to risk of electrocution



CAUTION!
Avoid contact with the PCB and frost protection element due to risk of electrocution



CAUTION!
 Avoid contact with the PCB and frost protection element due to risk of electrocution



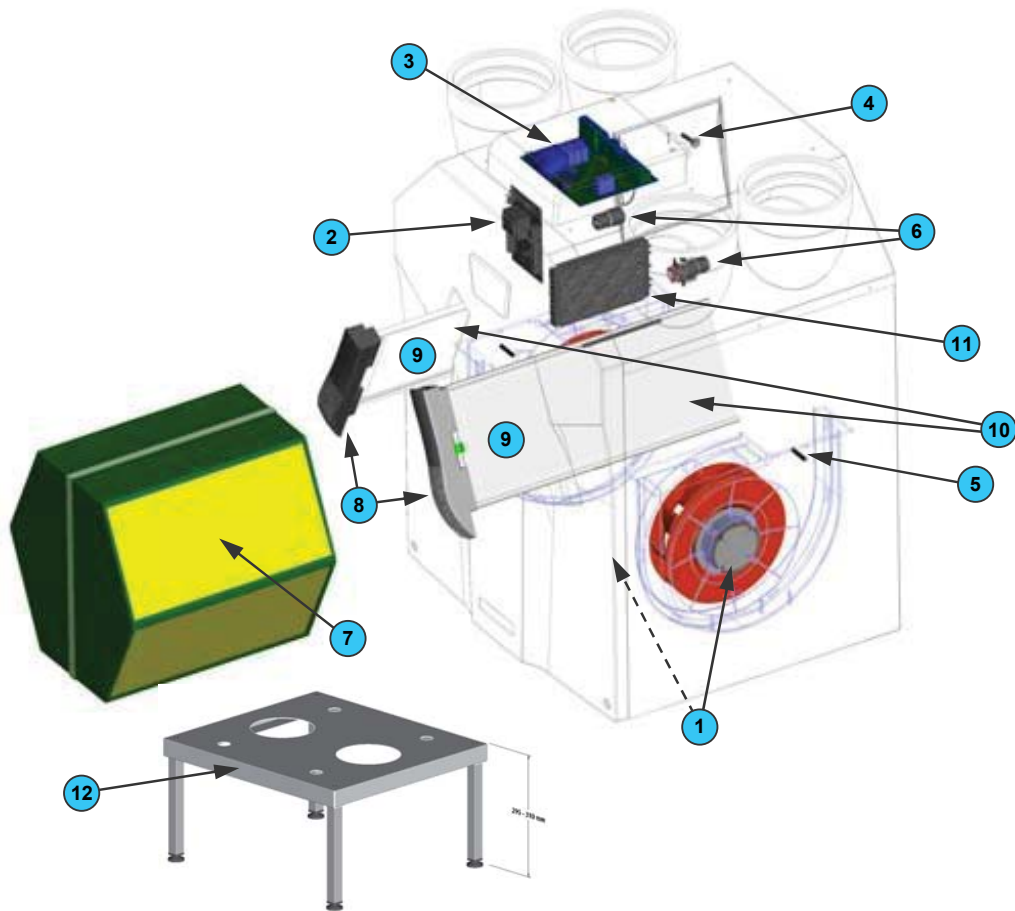
Temp. [°C]	Resistance [KΩ]		
	MIN.	MED.	MAX.
10	19.570	19.904	20.242
15	15.485	15.712	15.941
18	13.502	13.681	13.861
19	12.906	13.071	13.237
20	12.339	12.491	12.644
21	11.801	11.941	12.082
22	11.291	11.420	11.550

4.7.3 Malfunctions (or Problems) without Indications

This section gives an overview of the malfunctions (or problems) that are not displayed on the CC Ease display.

Problem/Malfunction	Cause	Check / measure
All OFF	Supply voltage	Check the fuse on the PCB panel. • If the fuse is OK, the circuit board is defective.
	No supply voltage	The mains power supply has failed.
High air delivery temperature in summer	Bypass remains closed	Lower the comfort temperature.
Low air delivery temperature in winter	Bypass remains open	Increase the comfort temperature.
No or insufficient air supply, shower remains wet	Filter clogged	Replace the filters.
	Valves clogged	Clean the valves.
	Heat exchanger clogged by dirt.	Clean the heat exchanger.
	Heat exchanger frozen	Thaw the heat exchanger.
	Fan dirty	Clean the fan.
	Ventilation ducts clogged ComfoAir 350 in frost mode	Clean the ventilation ducts.
Too noisy	Fan bearings defective	Replace the fan bearings.
	Fan settings	Change the ventilation control settings.
	Scraping noise • Siphon is empty • Siphon does not seal	Install the siphon again.
	Whistling noise • An air leak somewhere in the system	Seal the air leak.
	Air flow noises • Valves do not seal against duct. • Valves not sufficiently open	Install the valves again. Set the valves again.
Leaking condensation	Condensation drain clogged	Clean the condensation drain.
	Condensation from exhaust duct does not run into drain plate	Check whether the connections are correct.
Wired 3-position switch does not function	Wiring is not OK	Check the circuitry of the 3-position switch using a voltmeter: • Voltage only on N & L3: [The fans run at position 1]. • Voltage only on N & L3 & L2: [The fans run at position 2]. • Voltage only on N & L3 & L1 or N & L3 & L2 & L1: [The fans run at position 3].
	Switch is defective	
Wireless 3-position switch does not function	Battery is discharged	Check the battery. • Replace the battery, if necessary.

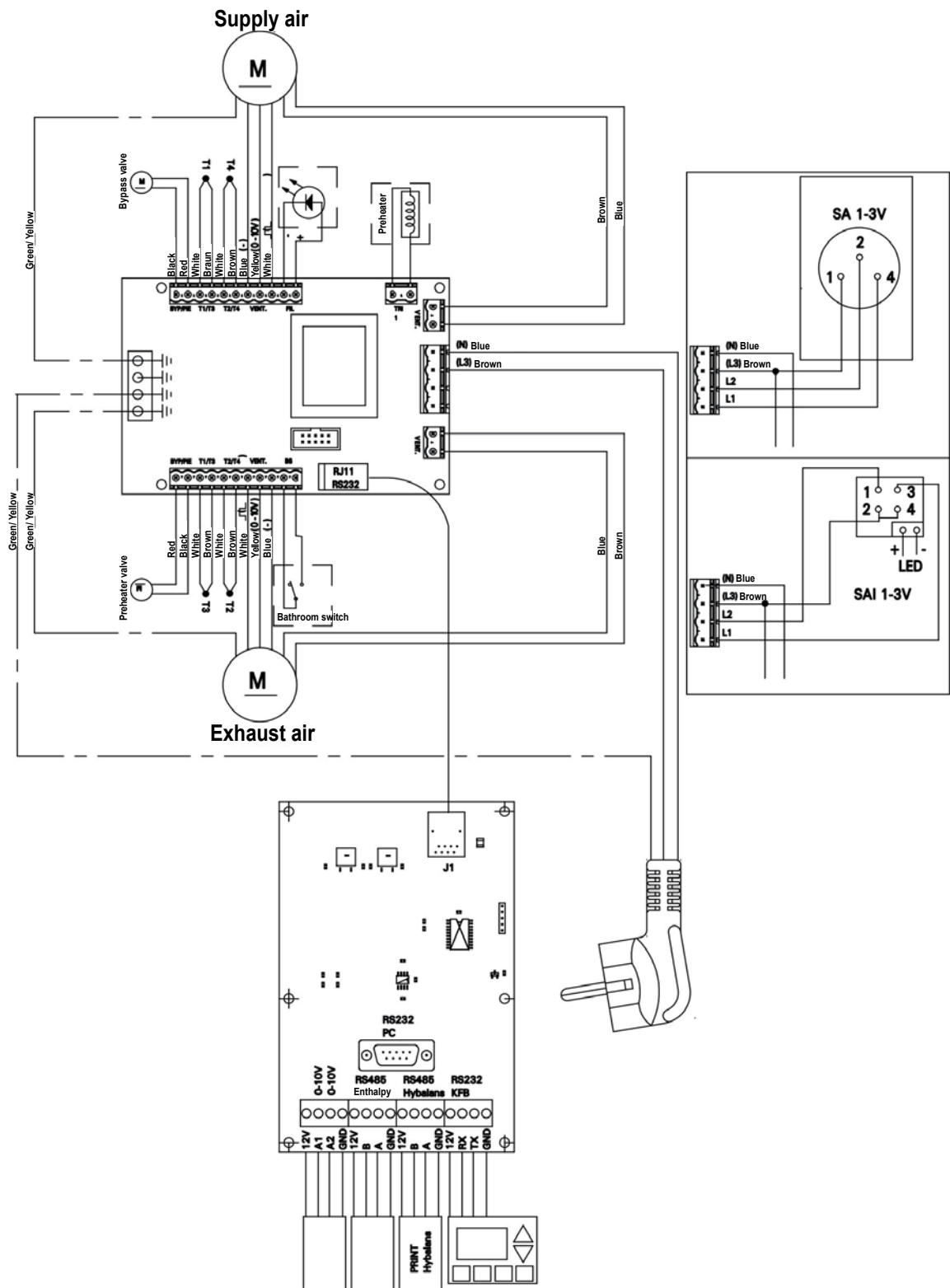
4.8 Spare Parts



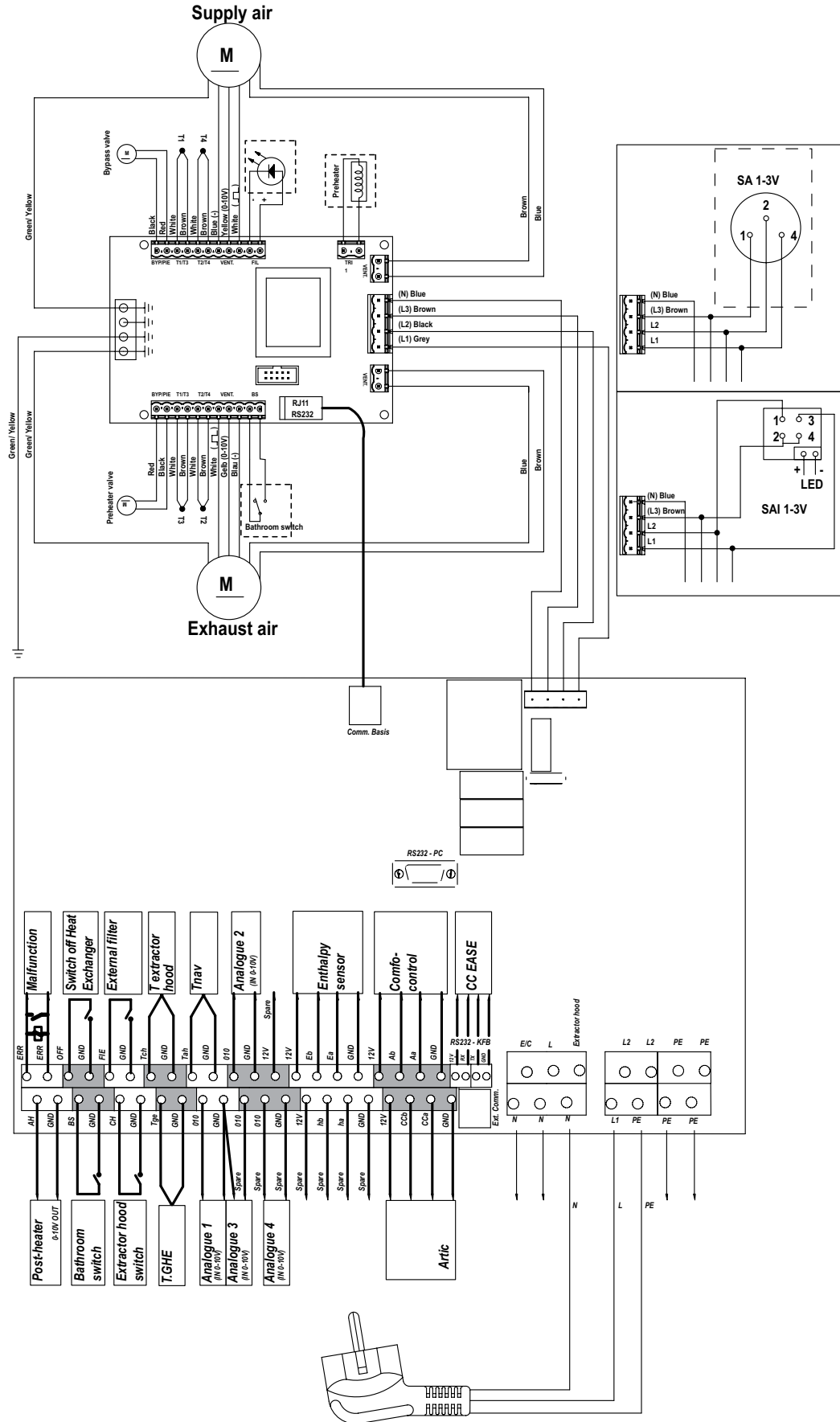
The following table contains an overview of the spare parts available for the ComfoAir 350.

Number	Part
1	Fans (left and right)
2	PCB panel in ComfoAir 350.
3	PCB panel in top-mounted casing, Basic or Luxury version.
4	Temperature sensors T1 / T3 (in top of unit, on electronic carriage).
5	Temperature sensors T2 / T4 (in fan casing of both fans).
6	Servo motor & cable (for bypass and preheater)
7	Heat exchanger (or combined heat/enthalpy exchanger)
8	Filter clamp (2x)
9	Filter cloths (2x)
10	Filter set (with filter clamps, filter cloths and filter holders).
11	Preheater (also available as an optional kit for subsequent installation).
12	Mounting frame for installation on the floor (option).
13	Remote control transmitter (option)
14	Display (option).

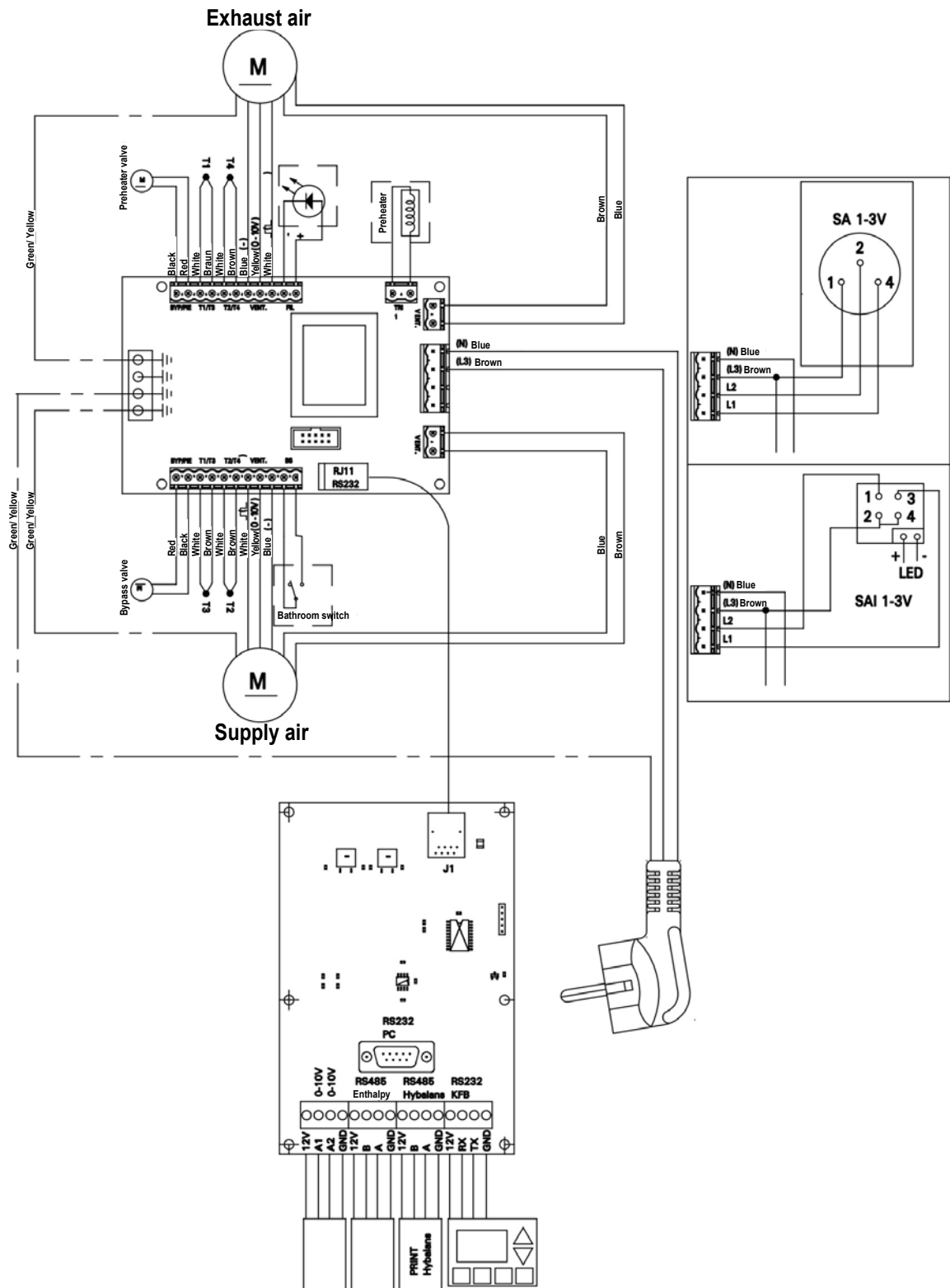
4.9 Wiring Diagram: ComfoAir 350 – LEFT-HAND Standard Version



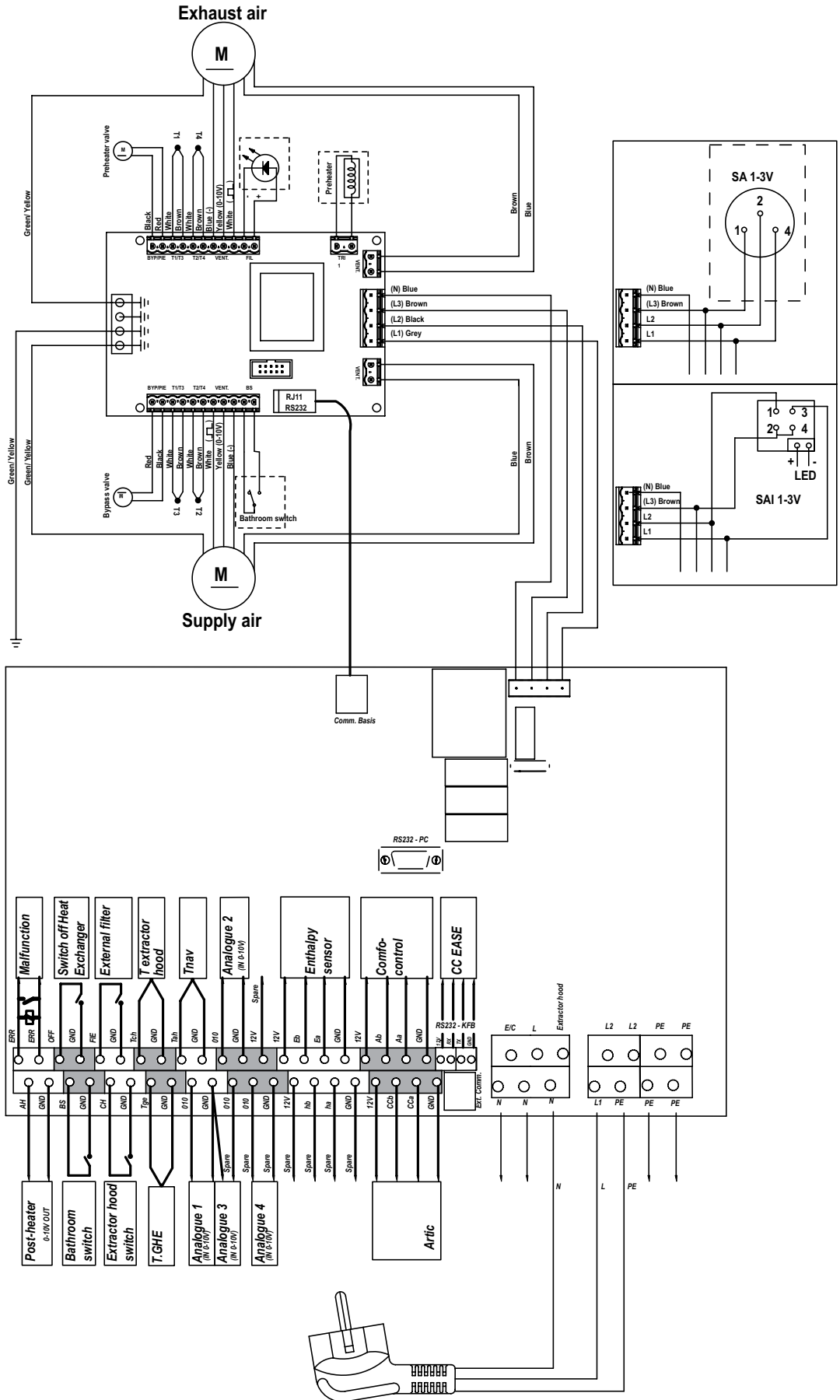
4.10 Wiring Diagram: ComfoAir 350 – LEFT-HAND Luxury Version



4.11 Wiring Diagram: ComfoAir 350 – RIGHT-HAND Standard Version



4.12 Wiring Diagram: ComfoAir 350 – RIGHT-HAND Luxury Version



4.13 EC Declaration of Conformity

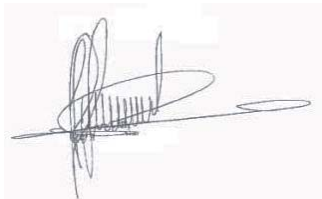
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Commercial Register Zwolle 22293

EC Declaration of Conformity

Designation of the appliance: : Heat Recovery Unit: ComfoAir 350

Conforms to the directives : Machine Safety Directive (98/37/EC)
Low Voltage Directive (73/23/EEC) (98/37/EC)
EMC Directive (89/336/EEC, 92/31/EEC, 93/68/EEC)

Zwolle, 16 June 2007
J.E. Stork Ventilatoren B.V.

A handwritten signature in black ink, appearing to be 'E v Heuveln', written over a light pink rectangular background.

E v Heuveln,
General Managing Director