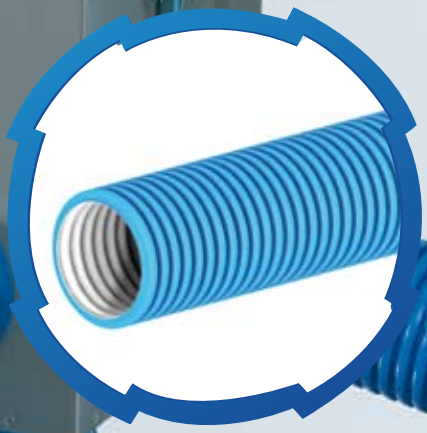
HYBALANSPLUS



INFORMATION AND INSTALLATION GUIDE HYBALANSPLUS

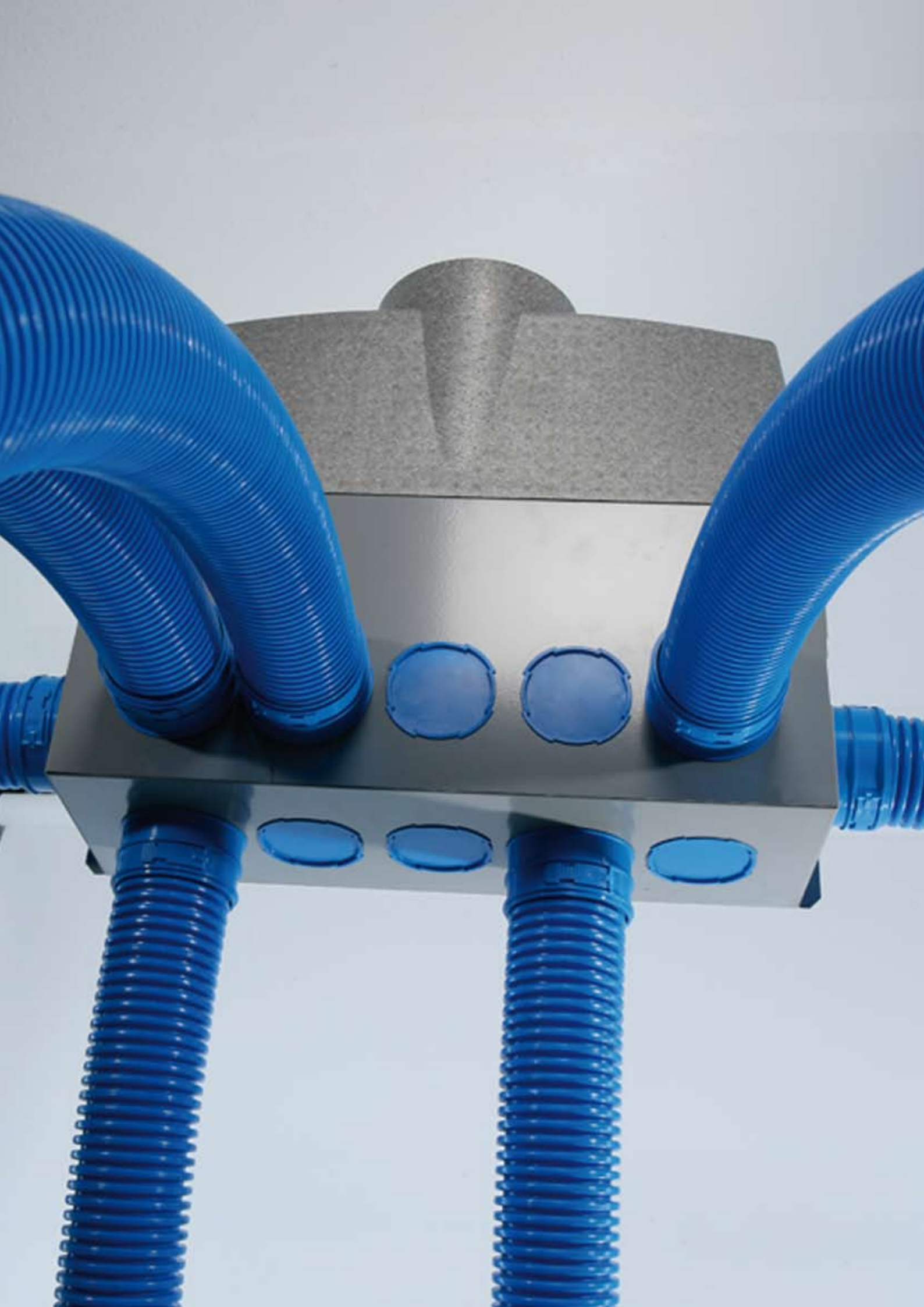


TABLE OF CONTENTS

1 General **2**
1.1 What is Hybalansplus 2
1.2 Applications 2
1.3 System layout 3
1.4 Advantages of the Hybalansplus system 4

2 Requirements **5**
2.1 Airflow requirements according to Building regulations 5
2.2 Fire 5
2.3 Cross talk 5
2.4 Distance between outlet on the roof and inlet on the roof or in the wall 5

3 Product information **7**
3.1 System components 7
3.1.1 Accessories *8*
3.1.2 Valves *10*

4 Installation instructions **11**
4.1 Construction 11
4.2 Renovation application 11
4.2.1 Mounting examples air distributing boxes *11*
4.2.2 Mounting variants installation single-family dwelling for renovation *12*
4.3 New building 12
4.3.1 Mounting variants air distributing boxes new buildings (surface mounted) *12*
4.3.2 Mounting variants newly built single-family dwellings (built in) *13*
4.4 Application of cooker hoods 13
4.5 Design steps 13
4.5.1 Burgerhout calculation programme *14*
4.5.2 Coding of the flexible synthetic ventilating ducts *14*
4.6 Adjustment of the Heat Recovery Ventilation (HRV) units 15
4.6.1 Constant volume fan motors *15*
4.6.2 Pressure-controlled fan motors *15*
4.6.3 Adjustable fan motors *15*
4.6.4 Non-adjustable fan motors *15*
4.7 Installation of components 15
4.7.1 Shortening the synthetic duct *15*
4.7.2 Mounting the synthetic duct on the air distribution box *16*
4.7.3 Mounting the synthetic ducts *17*
4.7.4 Intersecting ducts and cables *17*
4.7.5 Mounting the restriction rings *18*
4.8 Mounting adapters and air valves 19
4.8.1 Mounting valves in valve connector 0 and 90° connection *19*

5 Maintenance **19**
5.1 Maintenance work for the installer 19

6 Warranty **20**

7 Environment **20**

8 Availability **20**

9 Appendices technical information **22**
9.1 Acoustic damping air distribution box 22
9.2 Restriction table 22
9.3 Maintenance instructions for users 23

1 GENERAL

1.1 WHAT IS HYBALANSPLUS

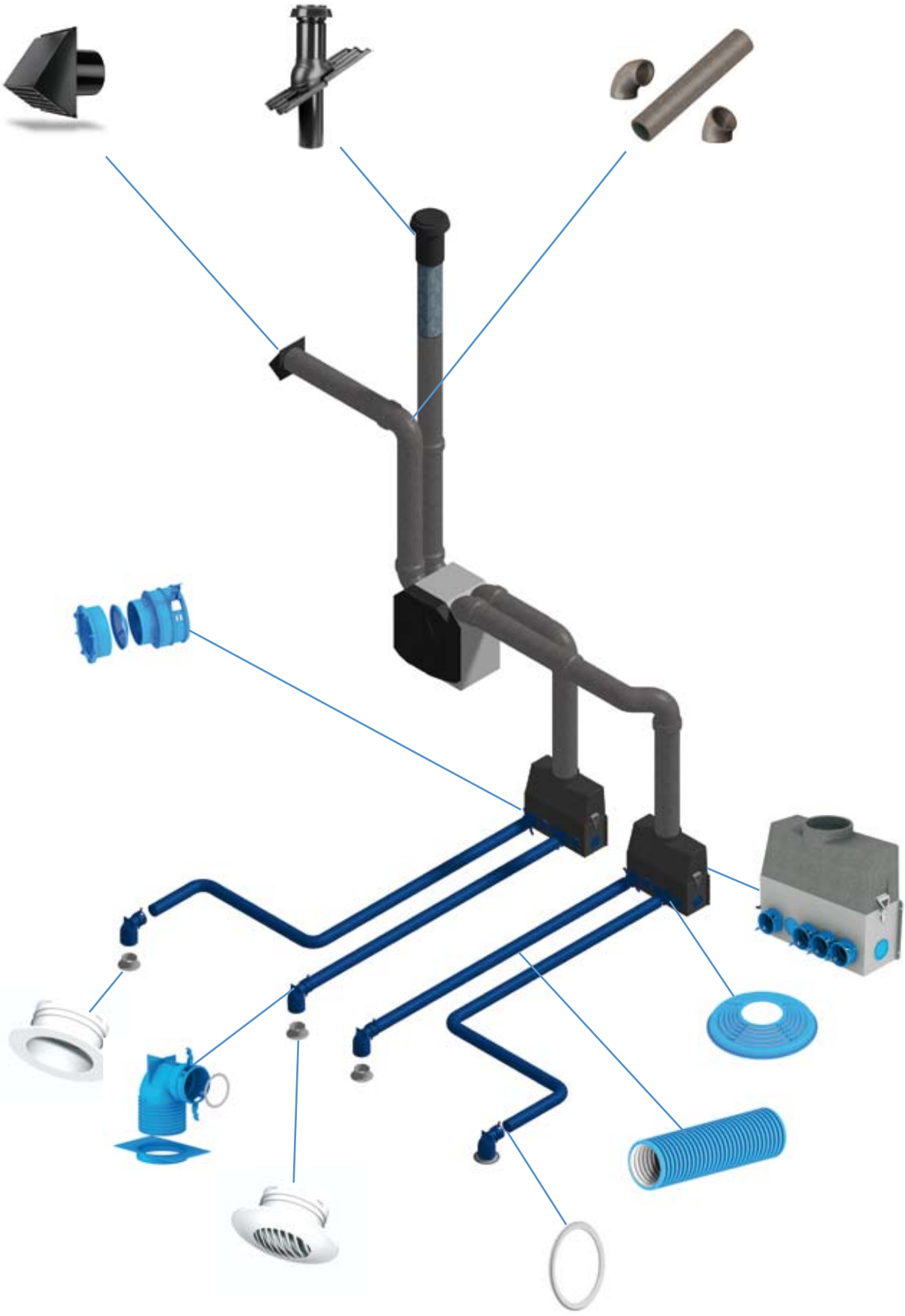
The Hybalansplus ventilation system provides the supply as well as the discharge of ventilating air with the highest possible energy saving and maximum convenience. A Heat Recovery Ventilation (HRV) unit to be selected as desired, provides the movement of ventilating air. The other system parts of the Hybalansplus take care of an optimal movement of air, to and from the various rooms to be ventilated.

Two air distribution boxes are connected to the HRV unit, they ensure an optimal balance between inlet and return air. These distribution boxes are also fitted with acoustic dampers. The flexible synthetic ducts, red for the return air and blue for fresh air, distribute the air to and from the various rooms. Fresh air is distributed to the living room and bedrooms via the supply valves. The same quantity of (polluted) air is extracted via the valves from the kitchen, bathroom and toilet(s). The required spaces underneath the inner doors contribute to a good movement of air in the house. The system is completely self-supporting and operates independently.

1.2 APPLICATIONS

Type of buildings
Hybalansplus can be applied to all kinds of buildings, small utility buildings, with renovation projects as well as newly constructed buildings.

1.3 SYSTEMATIC CONSTRUCTION



1.4 ADVANTAGES OF THE HYBALANSPLUS SYSTEM

1 Minimal maintenance

- Minimal maintenance because of the application of one diameter without branches per suction and supply valve. Gradual crossings between the various parts of the system take care of the permanent absence of turbulences and prevent unnecessary loss of pressure and dirt deposit. The antistatic qualities of the synthetic material contribute to a slower dirt deposit.
- The clever design of the valves, in particular the wide dimensions of the opening, minimizes the chance for dirt deposit.
- Maintenance is limited to cleaning of the components.

2 Noiseless

- Adjustment of air quantities, which is responsible for the development of disturbing noise, does not take place in living rooms.
- Air distribution boxes are fitted with internal acoustic damping.
- No cross talk!!!
- Due to low resistance losses, the working point and fan motor rpm of the HRV unit are reduced. This creates an extra reduction of the system noise.

3 No draughts

Due to the use of special air valves, air is blown into the living areas with low air speed, which prevents draughts.

4 Simple adjustment of the system

The air quantities per air valve are simply centrally adjusted in the air distribution boxes. Adjustment of the air valves is unnecessary.

5 Non-adjustable air valves

The air valves are **non-adjustable**. Also during cleaning there no risk whatsoever that the air distribution is altered, because there are no possibilities for adjustment present. This guarantees correctly adjusted values at all times.

6 Cooling option possible

Depending on the type of waste heat recovery unit, the use of night cooling is possible.

7 Limited number of system components

Hybalansplus has a limited number of system components, which offers advantages in stock management, transport and construction.

8 Simple construction

Construction is carried out with one-diameter flexible synthetic duct. This can be easily shortened to the required length. The click connection between the flexible synthetic ventilating ducts, air valves and the air distribution box makes screwing with self-tappers, taping & gluing the connections unnecessary. This means that the system is designed for reliability. The environmental impact of this construction is significant. By removing toxic glues & duct tape from the installation there is less waste & less packaging.

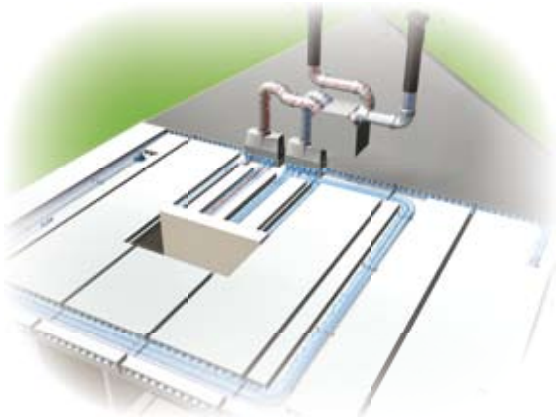
2 REQUIREMENTS

2.1 AIR QUANTITY REQUIREMENTS ACCORDING TO BUILDING REGULATIONS

The required air quantities to be supplied and discharged to and from the various rooms should be calculated in accordance with the national building regulations. Various additional conditions, as mentioned in the construction documents, should be taken into account (e.g. quality guarantee conditions)

2.2 FIRE

Care should be taken to observe the building design parameters in relation to fire containment. Passive fire prevention solutions are available for most scenarios.



2.3 CROSS TALK

The rooms that are to be ventilated with Hybalansplus flexible synthetic ventilating ducts are not mutually connected with, for example, T-pieces. Due to the fact that every room has its own flexible synthetic duct sound transmission via the ducts of the mutual rooms is prevented.

2.4 DISTANCE BETWEEN OUTLET ON THE ROOF AND INLET ON THE ROOF OR IN THE WALL

The selected positions for the outlet and the inlet should be in compliance with national regulation to prevent recirculation of the used air in the inlet of the system.

3 PRODUCT INFORMATION

3.1 SYSTEM COMPONENTS

HR WTW 3000 roof terminal 150 -180 180 - 210

The terminal is mounted with a synthetic tile, lead slate or collar for flat roofs. The roof terminal is fitted with EPS-insulation to prevent condensation. Install the roof terminal in accordance with the accompanying manual.

HR WTW 3000 wall terminal 150 -180 180 - 210

The wall terminal is used to draw in fresh air. The inlet is insulated to prevent condensation forming & to prevent “cold bridging” between building elements.

HR WTW 3000 duct components 150 -180 180 - 210

The high-grade synthetic duct components are used to connect the various system parts on the WTW-unit. The duct components prevent condensation on the inside and outside.

Components to be mounted:

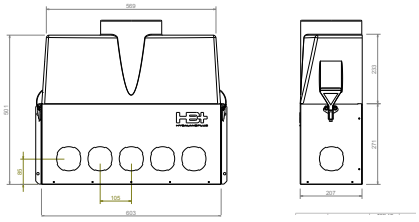
- duct components 1000 mm
- duct components 500 mm
- bend 45 degrees
- bend 90 degrees

Various connection pieces. Please install in accordance with the HR WTW 3000 installation regulations.

HB-plus distributionbox complete

The air distribution box distributes air. The air distribution box for air supply and air discharge are the same. The air distribution box has 12 possible connections, and has an internal acoustic dampening.

The air distribution box is also delivered with a restriction table (see: 9.2). The system data such as duct length, capacity and restriction ring number are to be registered in this table.



HB-plus air distribution box base

When the air distribution box is partly set in concrete, an air distribution box base can be used. This base is fitted with a flat lid to prevent damage and pollution of the air distribution box.

HB-plus air distribution box upper part

The air distribution box upper part is made out of EPP foam with closed cell structure.

3.1.1. ACCESSORIES

HB-plus connecting piece air distribution box complete

The connecting piece connects the ventilating duct to the air distribution box (screw connection). It is also the location of the restriction ring.

HB-plus restriction ring air distribution box

The restriction ring is mounted in the connecting piece of the air distribution box. The air inlet is adjusted by cutting out one or more rings. In this way, each duct has its own fixed adjustment. The inlet can be determined with the help of the calculation programme on www.muelink-grol.nl

HB-plus flex-synthetic duct for supply air (blue) blue red

The flexible synthetic ventilating duct has a minimal bending radius of 150 mm. The ducts are delivered in a roll of 50 metres.
Material outside: HDPE *(high density polyethylene)*
Material inside: LDPE *(low density polyethylene)*
Outer diameter: 92,3 mm
Inner diameter: 75 mm

HB-plus connecting piece

Connecting piece to connect two flexible synthetic ventilating ducts.

HB-plus air valve connecting piece 90° including mounting plate, seal ring and dust cap

The ventilating connection piece is used to connect an air valve at a right angle onto the flexible synthetic duct. It is continuously variable up to 100 mm by means of a mounting plate. The air valve connecting piece is secured to the surface with the mounting plate. The cross-shaped serrated edge facilitates attachment to reinforcements with steel wire.

HB-plus ventilation connection, straight, including mounting plate

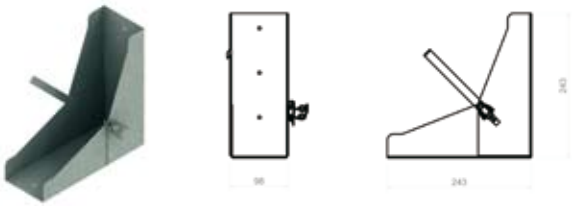
Ventilation connection piece for straight installation. It is continously variable up to 100 mm by means of a mounting plate.

HB-plus dust cap flexible synthetic duc

The outer ends of the flexible synthetic duct that have not been connected to one of the Hybalansplus components should be temporarily fitted with a dust cap, as to prevent fouling during the building process. This part can also be used to code ventilation ducts.

HB-plus bend conductor

For the mounting of a 90-degrees bend from the floor / ceiling, a galvanised metal bend conductor is used. It is fitted with a quick-acting closure.



HB-plus clamping bracket 90°

For the mounting of the flexible synthetic ducts to the floor / wall a galvanised metal clamping bracket is used.

HB-plus extension piece ceiling cover ring

In case of a floor thickness of more than 100 mm one or more extension pieces will be used. For every extension piece ceiling cover ring the ceiling ring is extended with 40 mm.

3.12 AIR VALVES

The Hybalansplus system gives a choice of various air valves. All air valves are suitable for supplying and extaction of air. The air valve type Kwadrant can only be mounted in a wall in case of supplying air.

Type air valves	Model	Max. supply in l/s	Max. discharge in l/s	Feature
	Kwadrant		21	an air valve with almost level ejection and low resistance
	Turn		21	an alignable, inducing air valve
	Conus	14	21	a fixed inducing air valve
	Disc	14	21	a fixed inducing air valve

4 INSTALLATION DIRECTIONS

4.1 INSTRUCTIONS

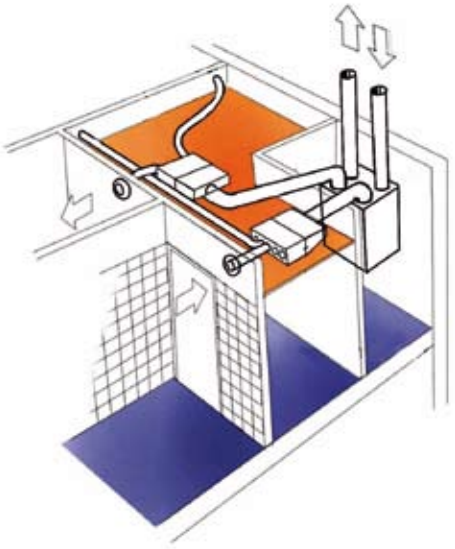
Depending on the design of the installation and the available room, the application of the Hybalansplus makes demands on, for example, the dwelling. The dimensions of the recesses, cable ducts or the installation room will have to be determined at an early stage. The accessibility as well as the possibility to dissemble the air distribution box for maintenance are essential.

Hybalansplus is a house ventilating system for renovation and new constructions. In this case, the renovation and the IFD-variant are surface mounted. In other situations the installation is built in.

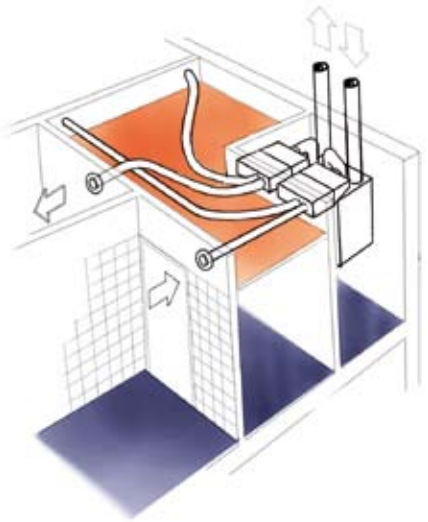
4.2 RENOVATION APPLICATION

4.2.1 MOUNTING EXAMPLES AIR DISTRIBUTION BOXES

This is an example of a variant where the air distribution boxes have been mounted above a lowered ceiling. The lowered ceilings will have to be constructed in such a way that the air distribution boxes remain accessible.

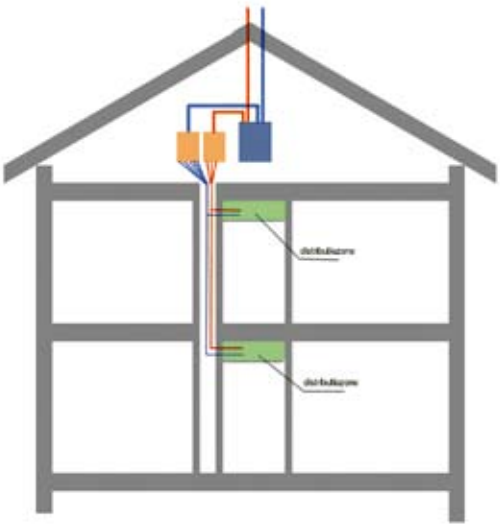


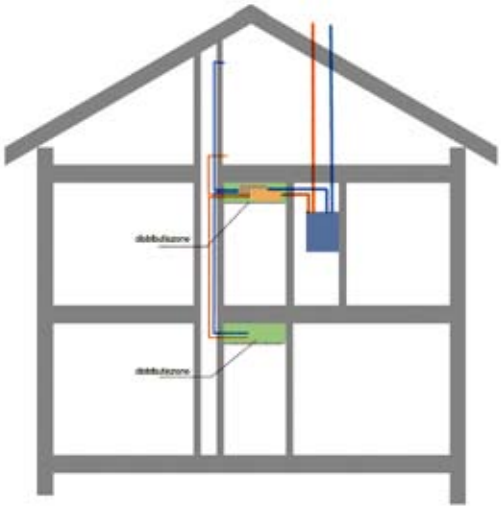
An example of an installation where the air distribution boxes have been mounted in the same room as the HRVunit. A lowered ceiling keeps the ducts out of sight. The air distribution boxes should remain accessible for maintenance.



4.2.2 MOUNTING EXAMPLES INSTALLATION SINGLE-FAMILY DWELLINGS FOR RENOVATION

Vertical distribution of the flexible synthetic ventilating ducts can be done via, for example, cable ducts. The horizontal distribution can be done via lowered ceilings.



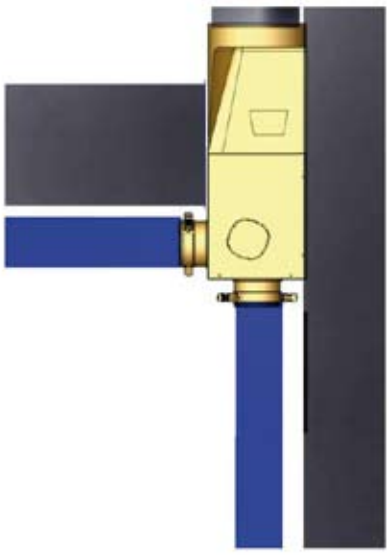


4.3 NEW BUILDING

Hybalansplus offers a number of solutions for new buildings for embedding into concrete. Just to name a few: for example concrete hollow-bore slabs, and on-site poured concrete (tunnel) floors. In all cases, the concrete is poured over the ducts, and the air distribution boxes can be mounted in various ways, depending on the location of the waste heat recovery unit.

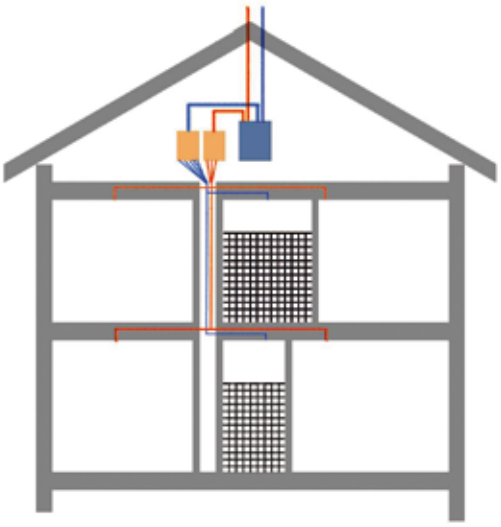
4.3.1 MOUNTING VARIANTS NEW BUILDING (SURFACE MOUNTING / BUILDING IN)

The air distribution box consists of a metal base and a synthetic upper part. The base can be put in concrete in the rough structure. An air distribution box base is delivered with a lid to prevent filling up and internal fouling during the pouring of the concrete. Prior to the pouring of the concrete, the air distribution box should be fixed to prevent floating. Ensure free access to the closure on the short outer sides after the concrete has been poured. The upper part of the air distribution box should remain demountable at all times.



4.3.2 MOUNTING VARIANTS NEWLY BUILT SINGLE-FAMILY DWELLINGS

Vertical distribution of the flexible synthetic ventilating ducts is done via, for example, cable ducts or empty corners beside a staircase. The horizontal distribution is done via the floors. The air distribution boxes are located in the same room as the HRV unit. Other variants also remain possible.



4.4 APPLICATION OF COOKER HOODS

Connecting a cooker hood (without fan motor) is only possible when the Hybalansplus ventilating system is permanently powered on. These cooker hoods should be connected with two Hybalansplus flexible synthetic ducts. The operation of the cooker hoods should be such that the hood is able to catch sufficient steam at 125 m3/h. Cooker hoods with an engine cannot be connected to the Hybalansplus system. These cooker hoods should be fitted with their own discharge duct directly outwards. This has no influence on the operation of the Hybalansplus system.

4.5 DESIGN STEPS

In order to design a good installation, the following steps should be taken:

1. Use the ventilating calculation according to the national building regulations as basis for the design of the Hybalansplus system
2. Based on the ventilating calculation, determine the number of air valves per room to be ventilated. See 3.1.2 for the maximum capacity per air valve.
3. Determine the make and type of the HRV unit, taking into account the air capacity and conveying height.
4. Determine the set-up location of the waste heat recovery unit.
5. Determine the arrangement of the Hybalansplus air distribution boxes.
6. Determine the WTW 3000 duct arrangement between air distribution boxes, waste heat recovery unit, fresh air suction and discharge provisions.
7. Determine the course of the blue flexible synthetic ducts and the length between the air distribution box and the air valves with regard to the air supply.
8. Determine the course of the red flexible synthetic ducts and the length between the air distribution box and the air valves with regard to the air discharge.
9. Calculate the installation with regard to resistance with the help of the calculation programme.
10. Check the design for accessibility of the air distribution boxes in order to be able to fit the restriction rings and carry out maintenance work.

4.5.1 CALCULATION PROGRAMME

CALCULATION PROGRAMME

In order to be able to determine the air distribution, a calculation with the Muelink & Grol calculation programme is necessary.

After entering of the calculation, the following information is obtained on behalf of the air supply and air discharge:

- total air quantity
- operating pressure waste heat recovery unit
- restriction ring per ventilating duct.

In order to obtain this information for the supply air distribution box as well as the discharge air distribution box, the following procedure is necessary:

Column: room description
Copy the description per room in the column "room description" of the calculation. If there are more than one supply and discharge point in one room, please indicate so. In case of three supply points in the living room, this can be entered in the room description as: living room 1, living room 2, living room 3.

Column: flow
Copy the supply and / or discharge air l/s per room in the column "flow" (l/s). The flow is entered for each supply and discharge point. In case of several supply and discharge points the total air quantity should be divided over the various supply and discharge points. If for a living room, a total quantity of 42 l/s should be supplied over three supply points, the following values should be entered in the column "flow" of the table: 14, 14 and 14 l/s. The division of the total air quantity is determined based on the values that are mentioned on, for example, a construction drawing.

Column: duct length
For every supply and discharge point, the duct length (in metres) from the air distribution box up to the air valve connecting piece, should be entered. The duct length should comply with the accompanying room description.

Column: restriction
After entering the room description, flow and duct length, the opening of the restriction ring is automatically determined.

Connection material of wall / roof terminal up to air distribution box
The applied WTW 3000 connection material of wall / roof terminal up to the air distribution box is entered in the column "quantity". The quantity entered constitutes for example the total number of bends from the air distribution box up to the roof terminal. The data entered are important in order to select the appropriate capacity of the waste heat recovery unit (conveying height in ΔPa).

The information obtained from the calculation programme is very important. Without this information, it is not possible to generate a properly operating Hybalansplus ventilating system.

4.5.2 CODING THE FLEXIBLE SYNTHETIC DUCTS

It is important to code the flexible synthetic ducts during installation. At a later stage in the construction process, it will be clear for which room the duct is intended. This coding is necessary in order to be able to determine later which restriction ring should be fitted in which duct (opening). So, there is a fixed relationship between the ventilation per room, the connected flex-synthetic duct and the corresponding restriction ring. The flex-synthetic ducts are shortened to the required length and a dust cap is fitted during the construction of the carcass of the building. In this way the flex-synthetic ducts are kept clean, and the coding can be applied with a waterproof marker pen. If the air distribution box is put in concrete, the flex-synthetic ducts are connected to it. The coding is

indicated on the sticker that will be attached to the air distribution box. It will be clear in the completion phase to which connection on the air distribution box the restriction ring should be fitted.

A restriction table which is part of the installation is included in the user manual for the resident of the house (see: paragraph 9.2). This table should be completed for maintenance and inspection purposes.

4.6 ADJUSTMENT OF HRV UNITS

Apart from other possible intelligent adjustments, the waste heat recovery units have four main types with regard to the applied motors. It is important to know which type of fan motor is fitted to ensure proper operation of the Hybalansplus system.
The four main types are:

- constant volume engines
- pressure-controlled engines
- adjustable engines
- non-adjustable engines

4.6.1 CONSTANT VOLUME FAN MOTORS

The HRV unit is set to always move the total adjusted air quantity. The manner of adjustment differs per manufacturer. For a correct adjustment, the calculated total air quantity as calculated with the Muelink & Grol calculation programme is needed.

4.6.2 PRESSURE-CONTROLLED FAN MOTORS

The fans keep the pressure in the ventilating system constant. The way in which the fans are adjusted differs per manufacturer. Please refer to the manual of the manufacturer concerned. For a correct adjustment, the calculated total system resistance as calculated with the Muelink & Grol calculation programme is needed.

4.6.3 ADJUSTABLE SPEED FAN MOTORS

This type of motor operates at one and the same speed, despite increase or decrease of the resistances and air quantities. The fans have to be adjusted manually or via software to the correct working point. The manner of adjustment differs per manufacturer. Please refer to the manual of the manufacturer concerned. For a correct adjustment, the calculated total air quantity and calculated total resistance as calculated with the Muelink & Grol calculation programme are needed in order to determine the correct working point.

4.6.4 NON-ADJUSTABLE FAN MOTORS

This type of motor operates at one and the same speed, despite increase or decrease of unexpected resistances in the system. The engines cannot be adjusted to the correct working point, either manually or via software. Hence, this type of waste heat recovery unit cannot be used for the Hybalansplus system.

4.7 INSTALLATION OF COMPONENTS

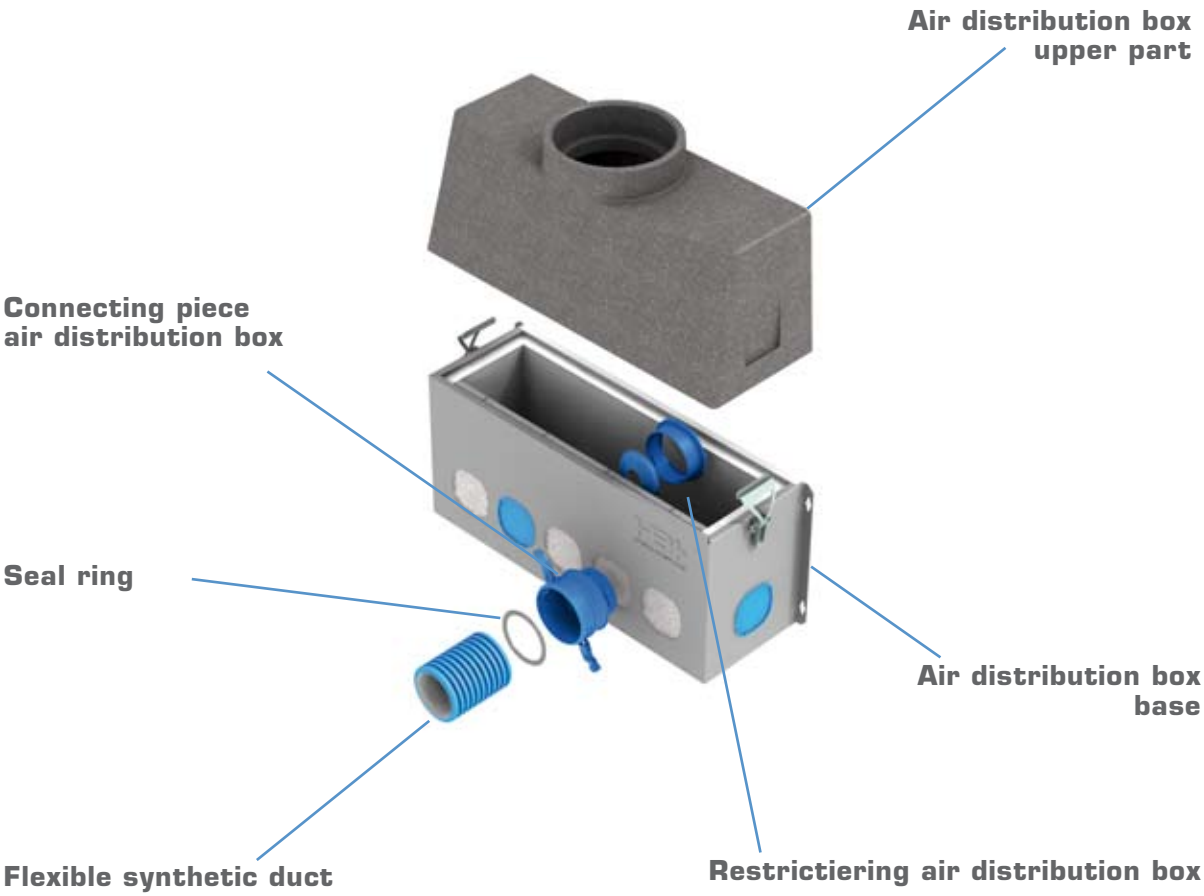
4.7.1 SHORTENING THE FLEXIBLE SYNTHETIC DUCT

The flexible synthetic duct can be easily shortened:

1. Roll the flexible synthetic out on the floor / ceiling / wall to be installed.
2. Mount one side of the flexible duct on the Hybalansplus component to be installed with the click-connection.
3. Shorten the other side to the required length with appropriate tools (for example a knife). Prevent burrs on the inside of the duct.
4. After the duct has been shortened, a seal ring should be placed on the first intact groove of the duct. This will prevent air leakages between connection pieces and the flexible synthetic duct.

4.7.2 MOUNTING THE FLEXIBLE SYNTHETIC DUCT ON THE AIR DISTRIBUTION BOX

1. Remove the upper part of the air distribution box by loosening both click-closures.
2. Remove the correct number of blue covers with a flat screwdriver.
3. Carefully press the acoustic damping rings from the openings in the air distribution box.
4. Place the connection piece on the outside of these openings and secure them with the supplied synthetic nut on the air distribution box.
5. Mount the shortened flexible synthetic duct with a seal ring on the connection piece and close the two clamps.
6. After the flexible synthetic duct has been mounted, close the upper part of the air distribution box to prevent pollution during the building process.



4.7.3 MOUNTING THE HYBALANSPLUS FLEXIBLE DUCTS

In order to prevent the ducts from floating, they can be attached to the floor construction with clamping brackets. When planning the cable ducts on the floor, an intact reinforcement should be taken into account. Possible partial removal of the reinforcement can only be done after consultation with the supplier of the floors. In case of concrete hollow fibre slabs, with or without cable recesses, the ducts are secured with, for example, the specially designed variable clamping brackets and bend conductors.

The bend conductor ensures that a tight bend can be realised swiftly and effectively. It operates as follows:

1. Mount the bend conductor on the floor or wall.
2. Press the Hybalansplus flexible duct component in the bend conductor in such a way that a 90-degrees bend is created.
3. Close the clamp over the flexible synthetic duct component.

4.7.4 INTERSECTING DUCTS AND CABLES

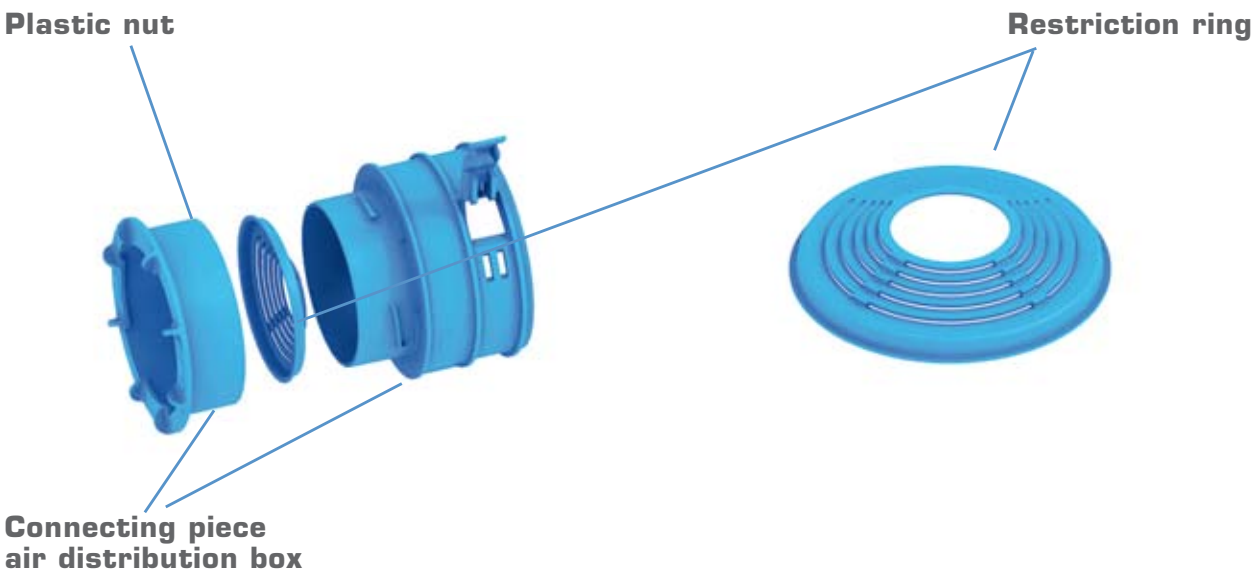
Intersecting the flexible synthetic ducts in concrete floors is not possible because of the thickness of the finishing layer. Intersecting with for example electricity, water and gas pipes, is with regard to the limited height, no problem. In a surface mounting situation the possibilities for intersection depend on the distance between the constructive ceiling and the lowered ceiling.

4.7.5 MOUNTING THE RESTRICTION RINGS

The restriction rings are mounted as follows:

1. Remove the upper part of the air distribution box.
2. Loosen the synthetic nut of the required connection on the inside.
3. Remove the correct number of rings until the number of the opening corresponds with the number according to the calculation programme.
4. Take the restriction ring to the inside of the air distribution box and place it on the connection concerned with the cone pointed towards the ventilating duct.
5. Reattach the nut removed earlier.
6. Record the opening of the restriction ring and the room in the restriction table.
7. If necessary, repeat the procedure for an other connection.

The restriction rings provide a correct distribution of the supply and discharge air in the house. Every ventilating duct – restriction combination is unique and cannot be interchanged. In case of alteration of the house or change of function all restriction rings should be adapted in accordance with new calculations.



4.8 MOUNTING ADAPTERS AND AIR VALVES

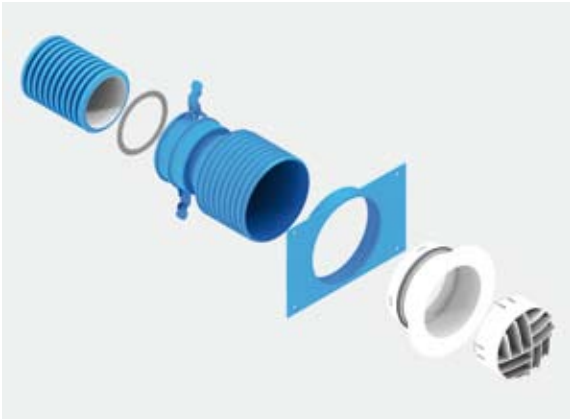
In case of a surface-mounted installation, the following options apply for the mounting of the air valves:

- Air valves mounted in line with the ventilating duct. For example for mounting in walls or reveals of lowered ceilings.
- Air valves mounted under a 90-degrees angle for mounting in lowered ceilings.

When used in a poured concrete floor of various flooring systems, an air valve connection piece of 90° is used for the mounting of the air valve. This will bridge the distance between the ventilating duct in the concrete and the ceiling. The air valve connection piece has a maximum size of 100 mm and is adjusted with a swivel. The mounting plate is attached to the concrete. The air valve connection piece can be lengthened to the desired length with extension pieces. The cam on top of the adapter is used to attach the connection piece with iron wire.

4.8.1 MOUNTING AIR VALVES IN AIR VALVE CONNECTION PIECE - 0° AND 90° CONNECTION

1. Shorten the flexible synthetic ducts to the required length and attach a seal ring in accordance with paragraph 5.1.1.
2. Click the air valve connection piece onto the flexible synthetic duct.
3. Adjust the height with the help of the mounting plate. The bottom of the air valve connection piece should not protrude from the wall / ceiling.
4. Click as many extension pieces on the ceiling ring as needed.



5 MAINTENANCE

The low air speed combined with the smooth inside of the Hybalansplus flexible synthetic ducts, and the resulting laminar air flow contribute to a very low dirt deposit. The deposit of dirt is even more reduced by keeping the suction valves clean. In this way, turbulent air flows and resulting pollution are prevented.

5.1 MAINTENANCE WORK FOR THE INSTALLER

- Draw the resident's attention to the fact that the air valves should be cleaned in accordance with the Hybalansplus user instructions.
- Inspect the restriction rings, inside air distribution boxes and the inside of the flexible synthetic duct for dirt or pollution.
- Cleaning of the restriction rings consists of opening of the air distribution box and cleaning the inside. Remove and clean the restriction rings. Reassemble in reverse order.

Please note: Each restriction ring has a fixed location. Changing the restriction rings will prevent a correct operation of the system. The correct restrictions are registered in the restriction table in the user manual (see paragraph 9.2) and on the sticker attached to the plenum. The air valves and restriction rings can be cleaned in a dishwasher.

- In the section of the air suction the level of pollution is mainly determined by the maintenance to the discharge valves and suck-in openings. Dirt is minimal in the especially designed flowing duct without blind angles, as is the case with the Hybalansplus. When dirt is found at an inspection it is recommended to clean all flexible synthetic ducts.
- For maintenance to the HRV unit, please refer to the manufacturer's manual.

Good and regular maintenance will result in a system that operates properly for a longer period of time, which will benefit the quality of the inner atmosphere.

6 WARRANTY

Muelink & Grol gives a 10-year guarantee upon completion. The following conditions apply if:

- Only Hybalansplus system components have been used.
- Installation was carried out in accordance with the Hybalansplus installation instructions.
- The Hybalansplus calculation programme has been used.
- The data entered on the restriction table correspond with the installation concerned.
- The air quantities, that have been determined for the building application, can be produced.
- The waste heat recovery unit operates correctly and has been adjusted in accordance with the values from the calculation programme.
- The air valves, inner duct components and air distribution boxes have been installed in accordance with this technical manual.

Adjusting the air quantities by removing the restriction rings, contrary to what had been indicated in the calculation, will imbalance the installation and will render an effective operation of the installation impossible and the warranty will expire.

7 ENVIRONMENT

Muelink & Grol pays considerable attention to an environmental-friendly production. All used materials are suitable for recycling. The type of synthetic material used is indicated on the products, where necessary. The parts do no contain detrimental substances, such as halogens (fire-retardant).

8 AVAILABILITY

Muelink & Grol B.V.

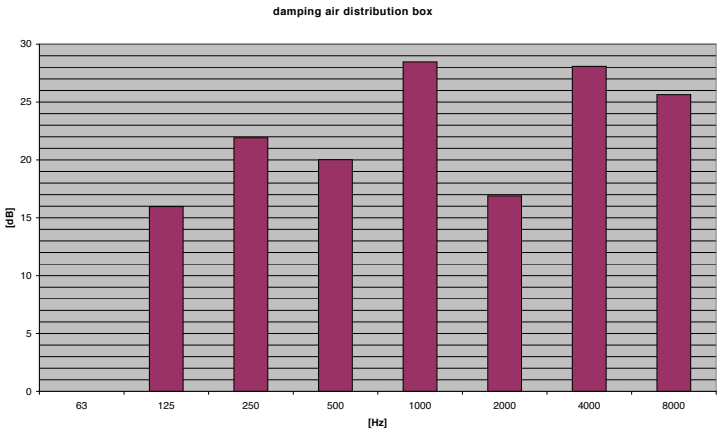
Postbus 509
9700 AM Groningen (Holland)

Tel.: +31 (0)50 313 99 44
Telefax: +31 (0)50 318 54 23

E-Mail: info@muelink-grol.nl
Internet: www.muelink-grol.nl

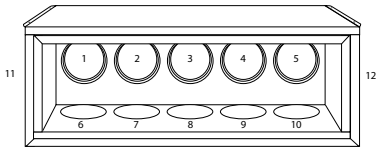
9 APPENDIX TECHNICAL INFORMATION

9.1 ACOUSTIC DAMPING AIR DISTRIBUTION BOX



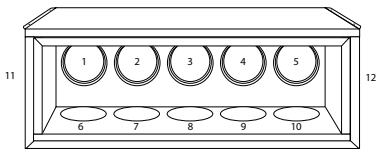
9.2 RESTRICTION TABLE

Air supply restriction table



Connection	Room	Capacity in l/s	Restriction
1	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
2	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
3	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
4	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
5	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
6	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
7	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
8	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
9	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
10	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
11	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
12	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30

Air discharge restriction table



Connection	Room	Capacity in l/s	Restriction
1	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
2	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
3	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
4	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
5	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
6	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
7	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
8	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
9	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
10	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
11	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30
12	.....	.....	None / 63 / 55 / 48 / 42 / 36 / 30

9.3 MAINTENANCE INSTRUCTIONS FOR USERS

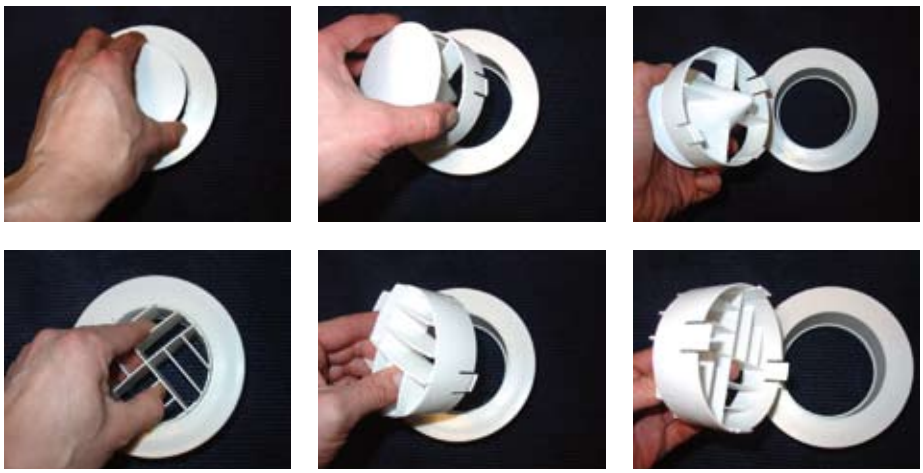
Dear user,

Your home has been fitted with a Hybalansplus ventilating system that provides supply and discharge of ventilating air in your home with the highest possible energy saving and maximum comfort. This is done with a ventilating unit (waste heat recovery unit) which provides discharge of the polluted air from your kitchen, bathroom or toilet. The air that is discharged from your home is used to preheat the supplied air. This is done in such a way that the air is mixed with the supplied fresh air from outside. The waste heat recovery unit is fitted with a so-called heat exchanger. This is your guarantee for 100 % fresh outside air.

The air in your home is supplied and discharged by two unique air distribution boxes placed near the ventilating unit. Several air valves and supply air valves have been fitted in the living quarters of your home. That is your guarantee for a comfortable and energy-saving ventilating system.

Hybalansplus has the following air valves:

Cleaning the air valves:



- Pull the inner cone from the synthetic ring by giving a slight tug. The white outer ring may also come loose from the ceiling or wall, but that is no problem.
- Clean the inside of the white outer ring with a damp cloth or vacuum cleaner.
- Clean the inner cone in the same way. Both parts can also be cleaned in a dishwasher.
- Reassemble the air valve by pressing the inner cone in the outer ring.

With this type of air valve, the synthetic inner ring is not visible. When the valve is removed, there may be no ring present in the ceiling.

Remove the air valve by putting your fingers / nails under the outer ring. Carefully pull the ring. Please do not put your finger-nails into the slats, this may damage or pollute the air valve.

Air valves of the same type can be changed per room. This will not influence the operation of the ventilating system. Please contact your installer for all other maintenance work.

Good and regular maintenance will result in a system that operates properly for a longer period of time, which will benefit the quality of the inner atmosphere.

NOTES

HYBALANSPLUS

Muelink & Grol B.V.

Postbus 509, 9700 AM Groningen (Holland)
Tel.: +31 (0)50 313 99 44, Telefax: +31 (0)50 318 54 23
E-Mail: info@muelink-grol.nl, Internet: www.muelink-grol.nl

M&G