Installation Manual

Zehnder Comfosystems Heat and Energy Recovery Ventilation

Zehnder Balanced Ventilation:

The Heart of a Healthy Home

zehnder
always the
best climate
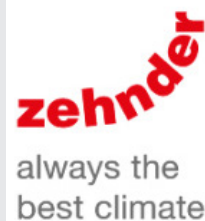
Health

- Reduces health risks associated with asthma, allergies and other respiratory diseases.
- Maintains peak concentration and energy by reducing CO2 levels.
- Reduces VOCs and other indoor air pollutants with continuous ventilation.

Comfort

- Delivers a constant supply of fresh filtered air without extra noise or drafts.
- Helps maintain temperature and humidity levels for maximum comfort.
- Replaces stale, smelly air with fresh, filtered outside air.

Energy Efficiency

- Operates with ECM motors for very low power consumption.
- Saves on heating and cooling with up to 90% efficient heat recovery ventilation.
- North America's only residential HRV/ERVs certified by the Passive House Institute.

Ease of Installation

- Designed as a complete system with all the necessary distribution components.
- Requires few tools and minimal expertise due to the modular, quick-connect format.
- Allows for easy duct runs in interior walls and joist bays with small, flexible duct options.

Fit and Finish

- Blends neatly into interiors with low-profile diffusers and paintable metal grilles.
- Provides flexible design options to meet varying aesthetic requirements.
- Stays clean with simple lines and durable powder coat finishes.

Table of Contents

Zehnder ComfoAir System Components

ComfoFlex is a Zehnder proprietary 3" flexible duct that can be routed through 2x4 stud walls. It connects to Zehnder distribution components with our unique twist-connect system.

ComfoWell manifold/mounting plates enclose the silencer box and provide multiple home-run connections for the 3" ComfoTube ducting.

ComfoWell silencer boxes on both the supply and return air sides attenuate fan noise as well as room noise within the system. Optional filter casing modules may also be mounted to the supply air silencer.

ComfoWell mounting kits and end plates provide varying options for connecting the distribution components to the HRV/ERV; silencer/manifold boxes may be mounted directly on the unit or remotely.

Register boxes provide terminations for one, two, or three 3" ComfoTube ducts, as needed, and a variety of diffusers and grilles may be selected to provide the correct airflow with adjustability.

Stainless steel exterior grilles for intake and exhaust are fitted with durable wire mesh varmint guards and gasketed duct connections.

Programmable controllers provide a basic user interface as well as access to the system's advanced features to enable continuous balanced ventilation with normal, boost, and away modes. Additional options are available such as boost switches and CO_2 and RH sensors.

ComfoPipe insulated duct connects the HRV/ERV to the exterior air. The rigid foam construction provides an airtight, insulated conduit that eliminates condensation inside conditioned space. 90 degree elbows and sleeves allow for various configurations.

Removable filters protect the HRV/ERV core and can be vacuumed clean or replaced as needed. Filters are available in MERV 7/8 or MERV 13.

Highly efficient Heat Recovery Ventilators and Energy Recovery Ventilators provide fresh air while reducing energy costs.

HRV and newer model ERV cores are removable for inspection and easy washing.

"Waterless" p-traps are installed for condensation drainage; airtightness is maintained even when no water is in the p-trap

Introduction

This guide is intended to be more or less universal for North American applications. However, it must be understood that construction methods and site situations vary greatly from installation to installation such that it is not possible to cover every single contingency that may occur.

However, every effort is made while designing the Zehnder system to take different construction methods and site conditions into account in the customized quotes provided by the technical sales engineers for your project. These instructions therefore are intended to cover as many different situations as possible in the space allowed and to provide sufficient guidance for the qualified installer to install a properly designed Zehnder ventilation system.

This guide is intended to be used as a reference rather than a definitive set of job specific instructions - with critical aspects of the system design, installation, and operation highlighted in the instructions where appropriate.

All installations of Zehnder Ventilation systems should be performed by competent construction professionals according to local building standards and codes.

Zehnder Whole House System Showing Air Circulation.

- Fresh Conditioned Air
- Return Air
- Fresh Outside Air
- Exhaust Air

Balanced ventilation extracts stale air from bathrooms and kitchen and supplies fresh air to bedrooms and other living spaces.

The Zehnder ComfoAir System Overview

Zehnder ventilation systems consist of some combination of the following major components:

HRV Heat Recovery Ventilator

- The HRV core is made up of hundreds of layers of thin plastic channels through which the supply and exhaust air streams flow.
- Heat is transferred across the thin plastic barriers from one air stream to the other as they pass through the adjacent channels.
- Supply and exhaust air streams are physically separated, avoiding cross-contamination.

ERV Energy (or Enthalpy) Recovery Ventilator

- The ERV core is made up of hundreds of layers of semi-permeable membrane that form channels for the air streams.
- Both heat and humidity are Transferred across the membranes from one air stream to the other.
- Used to reject outdoor humidity in humid climates and/or to preserve indoor humidity in very dry climates.
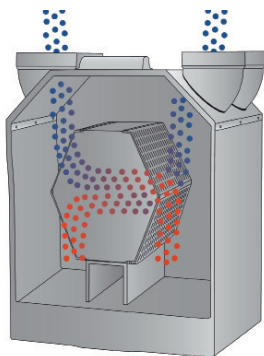
Zehnder Comfosystems Ventilators

ComfoAir 160

Centralized HRV/ERV. 48 cfm (72 boost). Vertical or horizontal mounting options.

ComfoAir 200

Centralized HRV/ERV. 72 cfm (108 boost). Vertical or horizontal mounting options.

ComfoAir 350

Centralized HRV/ERV. 110 cfm (165 boost). Vertical mounting on wall or stand. Optional geothermal heat exchanger available.

ComfoAir 550

Centralized HRV/ERV. 200 cfm (300 boost). Vertical mounting on wall or stand. Optional geothermal heat exchanger available.

Zehnder ComfoWell Components: Silencers and Manifolds

Zehnder's modular approach to assembling the system allows for many different configurations to suit each project's unique requirements. The complete line of manufactured components means every installation can be clean and professional looking and function as designed without air leaks.

The ComfoWell air distribution components serve four main purposes:

1. To silence the sound of air distribution with the CW-S (ComfoWell Silencer).
2. To provide a connection to the HRV/ERV with the CW-P (ComfoWell End Plate) or CW-K (ComfoWell Mounting Kit).
3. To provide connections to the 3" ComfoTube or ComfoFlex ducts with the CW-M (ComfoWell Manifold).
4. To provide the option of additional filtration with the CW-F (ComfoWell Filter Casing).

ComfoWell components are available in the following sizes…

- "520" for distribution to 10 tubes
- "320" for distribution to 6 tubes
- "220" for distribution to 4 tubes

ComfoWell components are modular, and can be separated by trunk lines (fig A) or assembled and mounted together (fig B) as suits the installation.

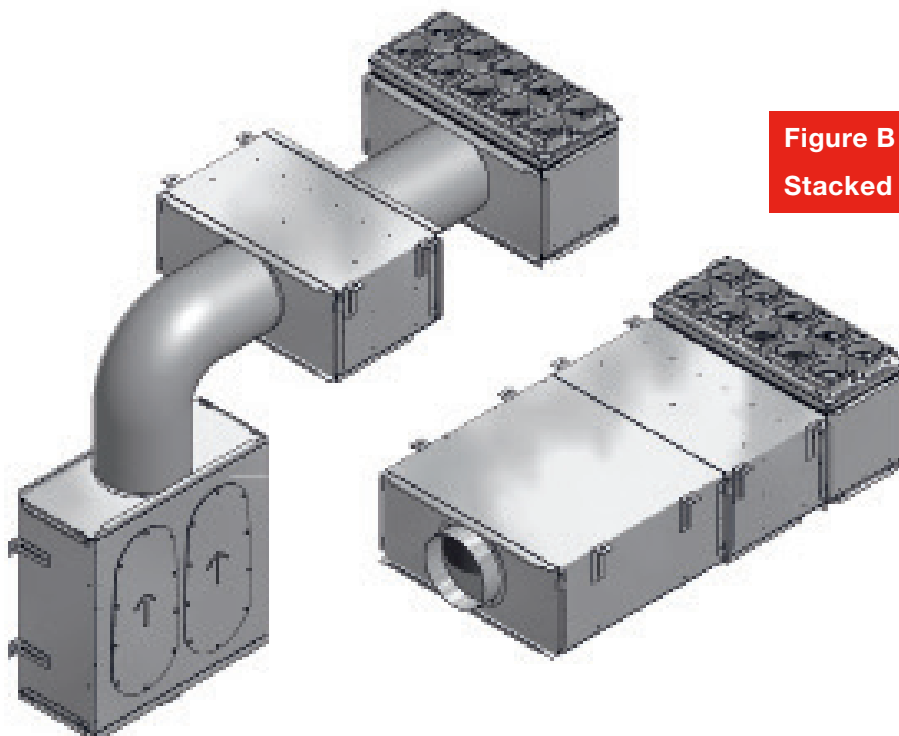**Figure A**
Separated

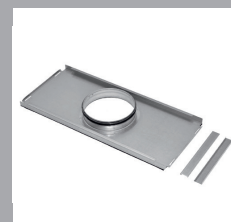**Figure B**
Stacked

Silencers

CW-S 520

(other sizes available)

End Plates

CW-P 520

(other sizes available)

Mounting Kits

CW-K 520

(other sizes available)

Manifolds

CW-M 520

(other sizes available)

Filter Casings

CW-F 520

(other sizes available)

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Zehnder ComfoPipe: Insulated Ducting

- Connects the Zehnder HRV/ERV to the exterior of the building for Outside Air intake and Exhaust Air.
- Rigid foam duct prevents condensation and is easily cut to length.
- Each piece is 39" long and is supplied with a sleeve for coupling to additional pieces or to elbows.
- 90 degree elbows are supplied with a sleeve and may be cut into two 45 degree elbows.
- Additional sleeves may be ordered.
- Stainless steel exterior grilles include a wire mesh varmint guard and a gasketed nipple that fits inside the ComfoPipe ducting.
- ComfoPipe is supplied in 125mm, 150mm, 160mm, and 180mm inside diameters depending on system airflow requirements.

Zehnder ComfoFlex

- ComfoFlex is a proprietary, UL listed option for interior ducting (this is not typical flex duct).
- When installed according to instructions, ComfoFlex meets the same or better airflow performance characteristics as ComfoTube.
- ComfoFlex ducting is 3¼" outside diameter and is ordered in lengths of 50 feet.
- Shorter lengths of ComfoFlex may be spliced together as necessary.
- Airtight connections are made to manifolds and diffuser boxes by threading the spiral profile onto the twin connector fitting and sealing with foil tape rated as UL-181a.

Code Requirements for Ducting

HDPE plastic ComfoTube ducting is not accepted by all building officials. Be certain you understand the code requirements of your local jurisdiction before installing any duct work.
Samples and specifications for both ComfoTube and ComfoFlex are available from Zehnder America to assist you in evaluation and planning before you begin installation.

Zehnder ComfoTube: Inside Air Ducting

- Double walled plastic tubing includes a strong, flexible outer layer and smoother inner layer.
- Designed to minimize air losses and installation time.
- 3" outside diameter is easily run through 2x4 interior walls.
- Each roll of ComfoTube is 162.5 ft long, may be cut to length, and includes a sleeve for splicing shorter pieces together.
- ComfoTube is connected to manifolds and diffuser boxes using the tubing's exterior ridges to secure an O-ring for air-tightness and to receive a mounting clip for locking in place inside the bayonet fitting.

Zehnder Supply And Return Registers

Zehnder Comfosystems include a range of registers with diffusers and grilles that complete the modular installation approach, ensuring ease of installation, high performance, and aesthetic options. Round or rectangular options are available for both supply and return points to meet every project's design requirements.

CLD - 2T Register Box

- Rectangular register box.
- Suitable for wall or ceiling installation.
- Shallow enough to fit between 2x4 studs.
- Can be connected to either 1 or 2 ComfoTube or ComfoFlex ducts.
- Fitted with Roma grill (fixed 6-1/4" x 10-1/4" grill; no adjustable diffuser).
- Roma grilles are available in either white or stainless steel finish.
- May be used for either supply or return (stainless Roma grill recommended if exhausting in humid locations like shower rooms).
- When used as a return register, a CLD filter must be installed in the box, behind the Roma grill.
- If adjustments to air flow are required during commissioning, a ComfoSet damper must be installed (this is done by the commissioning agent, not by the system installer).

TVA - 2T and - 3T Register Boxes

- Register box with 5" diameter port for diffuser and 3" diameter ports for ComfoTube or ComfoFlex ducts.
- 5" port an be cut to length to be flush with room finish
- Primarily for ceiling installation, but may be installed in a thicker wall, soffit or chase.
- Can be connected to either 1, TVA-2T, or TVA-3T ComfoTube or ComfoFlex ducts.
- May be fitted with any of the following diffusers:
  - STB-1 or STB-2 diffusers (for return only; adjustable airflow)
  - Luna Supply diffuser (for supply only; adjustable airflow)
  - Venezia grill, white (primarily for supply; may be used for return in dry locations; fixed grill with no adjustable airflow; commissioning agent may adjust airflow with ComfoSet damper)
- When used as a return register, both STB and Venezia type diffusers must be installed with a 125mm cone filter.

## Selecting Register Boxes and Diffusers

Select wall or ceiling location, depending on:
- Locations of thermal/air barriers
- Possible duct routes
- Minimizing duct length
- Aesthetic preferences

Select register box and diffuser/grill type, depending on:
- Ceiling or wall installation (proper framing depth)
- Supply or return
- Aesthetic preferences
- Ease of airflow adjustment during commissioning

Zehnder CLD Boxes with Roma Grilles
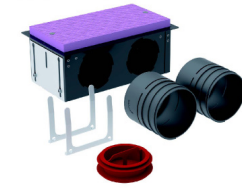
CLD-2T
(2 port, twist-connect)

Roma Grill
(white finish)

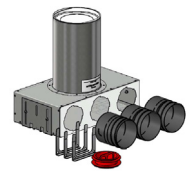Roma Grill
(stainless finish)

Zehnder TVA Boxes with Diffusers/Grilles

TVA-2T   TVA-3T
(2 port, twist connect) (3 port, twist connect)

Supply-Luna   Return—STB

Venezia Grill (white only)

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Zehnder Controls

Zehnder offers a range of controls that give access to all the innovative features built into every ComfoAir HRV/ERV. Systems can be set up to run very simply with minimal adjustment or with advanced controls to vary the operation based on a number of parameters.

Zehnder ComfoSense 67 Controller

- Included with every system sold by Zehnder America.
- Hard-wired to the unit with shielded low-voltage cable.
- Often located in the living space, but may be installed in the mechanical space as well.
- Includes both manual and auto modes.
- Manual mode provides easy selection of low, medium and high fan speeds.
- "Away" mode may also be selected (very low fan speed).
- "Party" mode may be selected to run the system at high fan speed for a few hours at a time.
- More advanced "auto" mode may be used to configure scheduled programs to adjust fan speeds.
- Advanced menus may be accessed during commissioning to establish baseline system settings.

Wired Boost Switches

- Installed in every toilet and/or shower room.
- May be installed in other spaces where immediate boost control is desired.
- Simple, one-touch switch that initiates a boost period (high fan speed).
- Duration of the boost period may be set through a menu using the ComfoSense controller.
- Hard-wired to the unit with low-voltage cable.
- Single-pole, momentary contact switch.

CO₂ Sensor

- Designed to monitor room CO2 levels.
- Signals the HRV/ERV to adjust fan speeds based on CO2 levels using 0-10v input.
- LEDs on the sensor indicate CO2 level and current ventilation level.
- Hard-wired to the HRV/ERV with shielded, low-voltage cable.

Relative Humidity (RH) Sensor

- Designed to monitor room RH levels.
- Signals the HRV/ERV to adjust fan speeds based on RH levels using 0-10v input.
- Hard-wired to the HRV/ERV with shielded, low-voltage cable.

ComfoSense 67 Controller

Wired Boost Switch

CO2 Sensor

Relative Humidity (RH) Sensor

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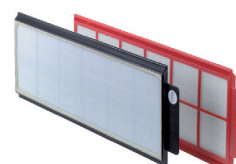For the most current update of this manual visit zehnderamerica.com.

Zehnder Filters

A selection of standard and optional filters is available to protect the HRV/ERV core and to help create a more comfortable indoor environment for occupants, including allergy sufferers.

Unit Filters

- Two filters are included inside every HRV/ERV.
- The supply side filter removes particles from outdoor air, protecting the HRV/ERV core, the supply ducts, and the house from pollen and other outdoor dust.
- The return side filter removes indoor dust from the return air, protecting the HRV/ERV core.
- Filter grade options for the unit include G4 (MERV 7/8) and F7 (MERV 13).

Return Diffuser Filters

- Return diffuser filters prevent airborne dust and dirt that is inside the rooms from entering the return ducts, helping keep the ducts clean and protecting the HRV/ERV core.
- A 125mm cone filter must be installed at every STB exhaust diffuser and at every Venezia grill that is being used for exhaust.
- A G3 CLD filter must be installed behind every Roma grill that is being used for exhaust.

ComfoWell Filters

- Additional options are available using the ComfoWell Filter Casings.
- Larger filtration capacities than available with the unit filters.
- Filter options for particular sensitivities, including MERV 13, MERV 15 and Activated Carbon.

Zehnder Filters

MERV 7/8 and MERV 13

Return Diffuser Filter

CLD Return Filter

Fine Particle
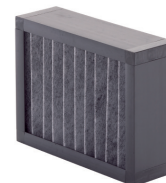
Activated Carbon

Optional Pre-heaters

Extreme Cold

Zehnder ComfoAir HRV/ERVs monitor air temperatures continuously and are programmed to adjust fan speeds as necessary to prevent freezing of any condensation in the core when outdoor air temperatures are extremely cold. As the outdoor temperatures drop, the ventilator will shift from continuous balanced ventilation to imbalanced ventilation, which reduces the amount of cold outdoor air coming into the unit. This allows the core to stay warm enough that any humidity passing through won't freeze. If the outdoor air temperature falls beyond the limits of this imbalanced mode, the ventilator will temporarily shut down until it senses that the outdoor air temperature is warm enough to resume operation.

Balancing Ventilation

Unbalanced ventilation is a good strategy for short periods of colder weather, but unbalanced mode is not recommended when a home has an open fireplace or any appliance with a natural draft chimney. The operating range of continuous balanced ventilation can be extended in longer periods of cold weather if the outdoor air is actively pre-heated before entering the ventilator. Zehnder America offers pre-heater options that may be selected depending on the project's climate and budgetary requirements.

## Zehnder ComfoFond-L Geothermal Heat Exchanger

- Liquid-to-air heat exchanger.
- Connected to a closed glycol-based ground loop.
- The ventilation system's outdoor air intake passes through the ComfoFond-L heat exchanger before entering the ComfoAir ventilator.
- Constant ground temperature pre-heats cold outdoor air in winter and pre-cools warm outdoor air in summer.
- Available only for ComfoAir 350 and 550 HRV/ERVs.

Internal Pre-Heaters

- Available for all Zehnder ComfoAir HRV/ERVs.
- Built-in to the unit.
- Operate by highly efficient electric resistance heating.
- Controlled automatically by the HRV/ERV unit's program.
- Can keep HRVs operating down to about 7 degrees Fahrenheit in homes without an open fireplace.
- Can keep ERVs operating down to about 2 degrees Fahrenheit in homes without an open fireplace.

ComfoInline Heater

- Can be sized to provide more heat than available with an internal pre-heater.
- Site-installed in line with the outdoor air intake.
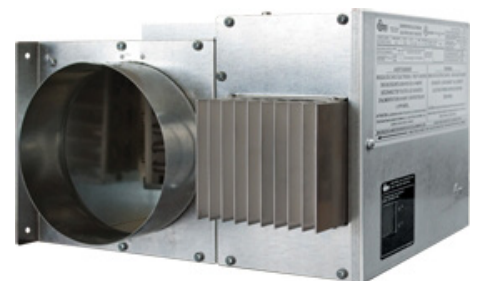
The actual installation sequence may vary due to system design or job site logistics, but in general the following sequence is a good guideline. (Specific instructions are provided for each of these tasks in later sections of this manual.)

Rough-in Sequence

1. Establish the exact location where the HRV/ERV unit will be installed, and confirm duct routes based on whether the unit is right or left hand.
2. Install exterior grilles and attach at least short sections of ComfoPipe (or other duct) through the building envelope so that the building can be made airtight and weather-tight.
3. Install electrical boxes and run line voltage wiring to power the unit. (See Electrician Information section in back of manual.)
4. Install electrical boxes and run low voltage control wiring for ComfoSense controller, bathroom boost switches, and any other controls (CO2 or RH). (See Electrician Information section in back of manual.)
5. Provide drain lines or pump-up lines for condensate.
6. Mount diffuser/register boxes in interior ceilings and/or walls. (Optional: Trim 5" port on TVA diffuser boxes to length prior to installation, leaving enough length for drywall.)
7. If remote silencer/manifold boxes will be concealed within building cavities, they should be mounted during the rough-in, along with any trunk lines to be concealed.
8. Run ComfoTube or ComfoFlex ducts from diffuser/register boxes back to the silencer/manifold locations.
9. Connect ComfoTube/ComfoFlex to diffuser/register boxes. (Ensure dust caps, port plugs or masking tape are installed in all remaining diffuser/register openings to prevent dust and debris from collecting during the rest of construction.)
10. If a ComfoFond-L geothermal heat exchanger is being installed, prepare connections for ground loop and drainage for condensate.

Sequence-Optional Tasks

The following tasks may be completed during either the rough-in phase or the finish phase, at the installer's discretion.

- Installation of the HRV/ERV unit (and ComfoFond-L, if applicable). If installed during the rough-in phase, provide protection from dust and impact for the duration of construction.
- Installation of outside air and exhaust air duct runs to the unit.
- Connect control wiring to the unit (Note: On some models this must be done before mounting manifolds to the unit).
- Installation of silencer/manifold assemblies.
- Installation of trunk lines, if silencers are located remotely from the unit.
- Connection of ComfoTube/ComfoFlex lines to the manifolds.
- Installation of waterless p-trap on unit (and condensate pump or tie-in to drain).

Finish Sequence

The sequence for finish installation is less critical, but it is important that all components are installed (including filters) and that the building has been cleaned following construction before the HRV/ERV unit is activated.

1. Trim 5" ports on TVA diffuser boxes to drywall (if not done during rough-in).
2. Install diffusers/grilles (include filters on all return air diffusers).
3. Ensure filters are installed at unit (and in ComfoWell Filter Casings, if included in design).
4. Install ComfoSense controller.
5. Install bathroom boost switches and cover plates.
6. Install main power receptacle and plug the unit in.

Installation Sequence for Retrofit Applications

Existing building conditions and discoveries made during selective demolition may require adjustments to the installation sequence; however, to the extent possible, follow the same sequence as for new construction.
It is not unusual for retrofit installations to take significantly longer than new construction installations.

Follow the layout

Before starting, be sure you have your dealer-supplied layout on hand and fully understand the design.

Do not make any changes to the design without consulting the dealer or technical sales person who prepared the layout.

Unit Location

The clean design and quiet operation of Zehnder ComfoAir HRV/ERVs allow for a variety of locations to suit a project's requirements. In addition to mechanical spaces in conditioned basements and attics, Zehnder units may be located in living spaces like laundry rooms, closets and exercise rooms.

The unit location must be established prior to beginning the installation of rough-in components.

The following points should be followed when selecting a location for the HRV/ERV...

- The unit (and all distribution components) should always be located within conditioned space.
- Basements and attics within the building's thermal/air barriers are suitable locations.
- Locate the unit so as to minimize the length of interior duct runs to remote rooms.
- In general, lengthening duct runs to the exterior in order to shorten interior duct runs is a good practice.
- Do not locate the unit in bedroom spaces unless inside a sound-insulated closet with a gasketed door (At higher fan speeds the unit may be louder than night-time ambient noise).
- The unit may be hung on a wall with the included bracket.
- The ComfoAir 350 and 550 may be placed on a stand (optional stand available from Zehnder).
- Ensure sufficient height for a condensate drain to be installed below the unit and for silencers, manifolds and/or filter casings to be installed above (unless installed remotely).
- Ensure that there is sufficient space for all required ducting.
- Ensure enough space in front of the unit to perform maintenance (wiring at the top of the unit, removing the front cover and core, and replacing unit filters).

Exterior Grilles:

Zehnder exterior grilles are highly recommended because they are specified for the correct airflow and designed to connect with an airtight seal to Zehnder ComfoPipe.

If the Zehnder exterior grilles are not used, the substitute must provide the same airflow, weather protection, and pest protection as the Zehnder grilles.

Location of Exterior Grilles:

- Wall-mounted grilles are preferable. Roof-mounted terminations are a suitable option, but are not supplied by Zehnder America. Roof terminations must be selected and located by the installer to meet the same characteristics of wall-mounted grilles.

- Outdoor Air (intake) and Exhaust Air grilles should be located a minimum of 10' from each other to avoid cross-contamination (separation maybe horizontal or vertical).

- If grilles are separated by a vertical distance, it is preferable that the Exhaust Air grill is located higher than the Outdoor Air (intake) grill.

- If grilles are located around the corner from each other on an exterior corner, check local codes for the minimum distance between them.

- Grilles must be located above typical snow accumulation.

- Grilles must be accessible for regular maintenance.

- Outdoor Air (intake) grilles:

  a. Must be located a minimum of 10' from a chimney or any other combustion vent.

  b. Should not be located at driveways where running vehicles may be parked.

  c. Should not be located near trash containers or other sources of odors.

  d. Should not be located within 2' of grade or under porches where excessive moisture may be drawn in.

  e. Should not be located on walls immediately over lower roofs.

  f. Should not be located in contact with shrubbery or other landscaping plants or trees.

  g. Should not be located directly on a public way (to avoid tampering).

  h. Ideally, located on the south side of the building in a cold climate and on the north side of the building in a warm climate.

- Exhaust Air grilles should not be located at the front entry, in outdoor living areas or in other locations where cooking and bathroom odors, or exhaust noise, would be unwanted.

Installing Exterior Grilles:

1. Cut a hole through the exterior wall that is approximately ½" larger in diameter than the outside diameter of the duct that will be connected to the grill.

2. Open the cover of the exterior grill and fasten the grill body to the exterior wall surface.

   a. Center the gasketed nipple in the oversized hole that was cut through the wall.

   b. Depending on siding material and flashing options, the use of a mounting block may be advisable to allow the cover of the grill to open on its hinge.

   c. As with all other exterior details, provide proper flashing/sealing to prevent water from penetrating around the grill into the wall assembly.

3. Replace the grill cover.

Zehnder Exterior Grilles come in 3 sizes

125mm (4.92")
Duct Size

150mm (5.91")
Duct Size

180mm (7.09")
Duct Size

Installing Exterior Grils

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Exterior Grilles: continued

Duct Connections to Exterior Grilles

During rough-in on a new construction installation, at least a short section of duct should be attached to each exterior grill so that it penetrates the entire building envelope, allowing insulation and any other building components to be installed around the penetration.

A properly sized Proclima Roflex gasket should be used with each duct penetrating to the exterior to maintain the integrity of the building's air barrier.

1. Stretch the Roflex gasket over the end of the duct that will be connected to the grill. Pull it down the duct as necessary to provide clearance for the end of the duct to be inserted through the hole in the wall.

2. From the interior, insert the end of the duct through the wall and over the gasketed nipple. Ensure the duct fits snugly against the gaskets on the nipple. If not, use mastic and/or foil tape to make an airtight connection between the duct and the exterior grill nipple.

3. Once the duct is in place, from the interior, pull the Proclima Roflex gasket to the surface of the wall assembly (sheathing, rim board or wherever the air barrier is) and use the Proclima tape supplied with the Roflex gasket to tape all 4 sides of the gasket to the interior surface (apply per manufacturer's instructions).

   a. Ensure that the wall surface is brushed free of debris or dirt before applying the Proclima tape.

   b. Ensure that the tape is not applied under tension, with the gasket pulling away from the wall surface. Adjust the gasket so that the 4 edges are lying relaxed against the wall surface before applying the tape.

ComfoPipe duct routed to exterior grill

Sealing the duct penetration with Roflex gasket
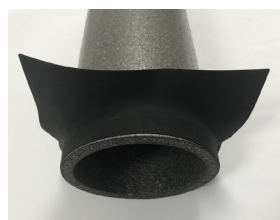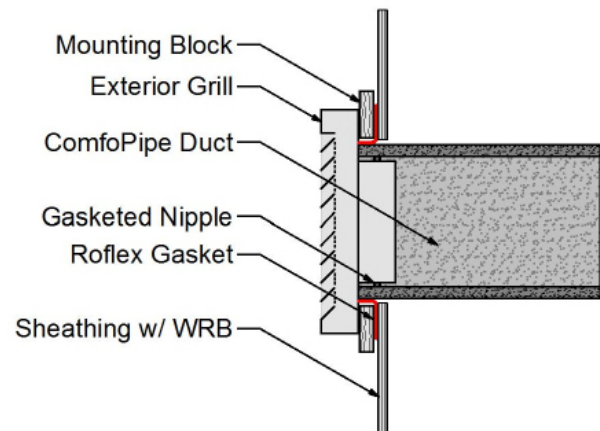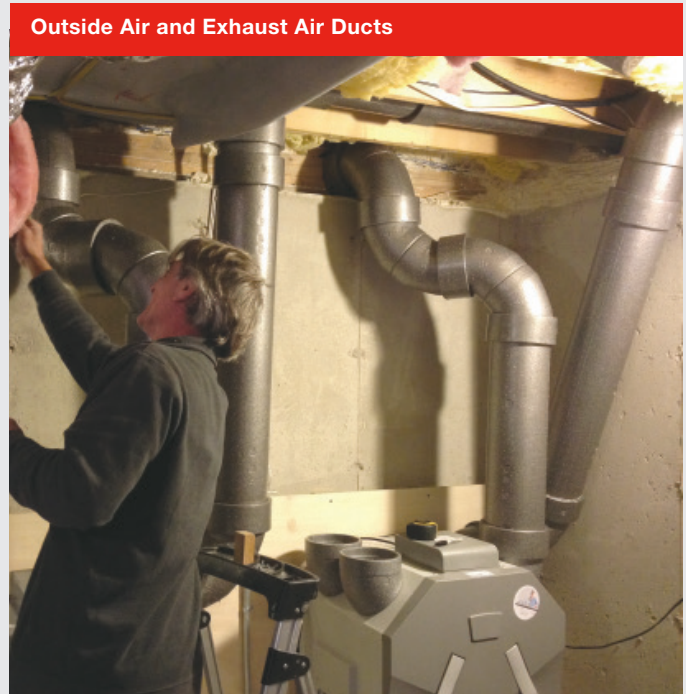

Roflex gasket on ComfoPipe

Mounting block installed over Roflex gasket

Ducting:
Duct runs to exterior.

- Be careful to identify whether the unit being installed is a left-hand or right-hand unit, and ensure that ducts for Outdoor Air and Exhaust Air are connected to the correct ports on the unit. Port locations vary between models and depending on left/right hand orientation.

- Always follow the duct diameter specifications provided on the layout design prepared by the Zehnder Technical Sales Representative.

- If duct lengths to exterior exceed what was originally planned for, review the installation with a Zehnder Technical Sales Representative to determine if the duct diameters need to be enlarged to avoid excessive pressure loss.

- Ducts connected to the exterior must be insulated, air sealed, and vapor sealed when they run through conditioned space to avoid condensation on the exterior of the ducts when cold winter air is inside the ducts. This is true for both the Outdoor Air and the Exhaust Air.

- Zehnder ComfoPipe is recommended to connect to exterior grilles, because it provides an air tight, vapor tight, insulated duct in one product that is easily cut to length and can be assembled without tools, sealants, or tapes.

- If running galvanized rigid pipe and elbows, make sure to seal all joints and elbow seams with mastic and insulate properly to a minimum of R5 (or greater, if required by local codes). Insulation must also be air sealed and vapor tight.

- In general, keep duct runs as short and straight as possible.

- Install the Outdoor Air intake duct with at least one elbow configured so that the duct run can be accessed and disassembled for cleaning. Zehnder ComfoPipe is highly recommended because its ducts, elbows, and sleeves can be press-fit together for an airtight seal without using fasteners, sealants, or tape. This allows the duct to be easily disassembled for cleaning.

- Install the Exhaust Air duct with a constant pitch back toward the unit or to the outside. Do not create any dips or traps in the Exhaust Air duct where condensation might collect and grow mold.

Outside Air and Exhaust Air Ducts

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Installation of Zehnder ComfoPipe

- ComfoPipe is available in 125 mm (nominal 5"), 150mm (nominal 6"), and 180mm (nominal 7") diameters. This refers to the inside diameter. Refer to the ComfoPipe Technical Specification for a complete list of dimensions for each component.
- Each 39" length of ComfoPipe Duct and each ComfoPipe 90 Degree Elbow are shipped with a ComfoPipe Sleeve included for joining ducts and elbows together. Additional ComfoPipe Sleeves may be ordered if required.
- The foam ComfoPipe Ducts can easily be cut to length as required using a knife or fine-tooth saw blade.
- ComfoPipe 90 Degree Elbows are scored in the middle and may be cut in half on the score line to make 45 degree elbows.
- Connect sections of ComfoPipe to each other and to elbows by pressing the ends into the sleeves until they are fully seated against the inside stop of the sleeve.
- No mastic or tape is required to make ComfoPipe duct runs airtight as long as the components are fully seated in the sleeves.

Cutting ComfoPipe to Length

Make Sure ComfoPipe Ends are Fully Seated

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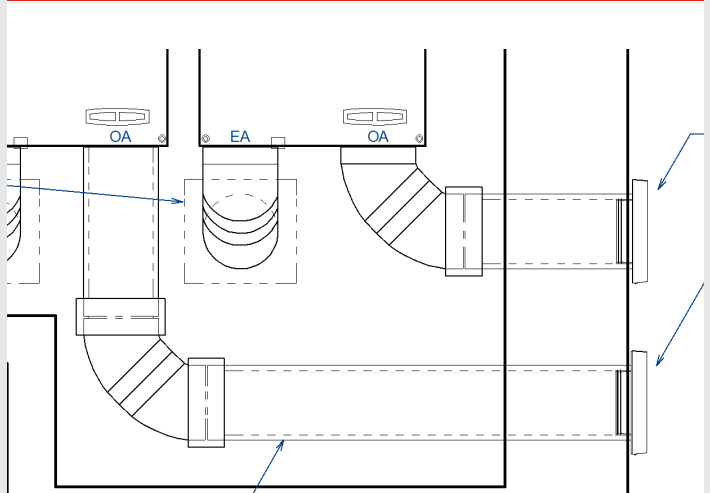
ComfoPipe Connections to HRV/ERV

ComfoAir 160

125mm ComfoPipe (4.92") connects to the ports on the ComfoAir 160 without any adapter. Just press the ComfoPipe over the port. If the fit does not seem snug, wrap the connection with foil tape for air-tightness, or seal with mastic.

ComfoAir 200

125mm ComfoPipe connects to the ports on the ComfoAir 200 with a Straight Connector DN 125mm (4.29" connector).

150mm ComfoPipe connects to the ports on the ComfoAir 200 without any adapter. Just press the ComfoPipe over the port. If the fit does not seem snug, wrap the connection with foil tape for air-tightness, or seal with mastic.

ComfoAir 350

150mm ComfoPipe (5.91") connects to the ports on the ComfoAir 350 with a 150mm ComfoPipe sleeve.

ComfoAir 550

180mm ComfoPipe (7.09") connects to the ports on the ComfoAir 550 with a Straight Connector DN 180mm.

160mm ComfoPipe Connection to ComfoAir with ComfoPipe Sleeve

ComfoPipe Sleeves are available in 125mm, 150mm, 160mm, and 180mm.

Straight connertors (nipples) are available in 125mm, 150mm, 160mm, and 180mm.

Determining Register Box Locations

- Diffusers and registers should be located within the rooms designated on the layout prepared by the Zehnder Technical Sales Representative. The installer has some flexibility to locate the diffuser or register within the room wherever the structure, architectural design, or duct routes allow.

- All diffusers and registers must be located within a minimum 18" x 18" flat surface on the ceiling or wall so that the commissioning agent can place the flow hood flat against the surface to get a proper air flow measurement.

- All supply diffusers mounted in ceilings should be a minimum of 3' from any surrounding wall, if possible (to provide better air distribution within the room and to avoid depositing room air dust in a pattern on the wall).

- Any registers or grilles mounted in walls should generally be located high on the wall (to avoid being blocked by furniture and to avoid creating a draft that might be felt by someone standing in the room).

- Return diffusers or grilles in Kitchens should be a minimum 8' from any cook top (to avoid drawing oil droplets into the system).

- Return diffusers or grilles in a Bathroom should not be located directly in a shower. However, locating them near the shower is ideal.

- Do not locate diffusers or registers…
  - In cabinet toe kick spaces
  - In tight locations above cabinets
  - Behind toilets
  - In closets where they might be blocked by clothing or other objects
  - Directly in shower spaces
  - Above doorways with narrow space between the door and ceiling
  - In locations too high to reasonably reach with a stepladder

Diffuser and Register Locations

- ☐ Minimum 18"x18" flat surface
- ☐ Accessible for commissioning
- ☐ Accessible for filter maintenance
- ☐ Won't be blocked by furnishings

Rough in TVA 2

Rough in CLD

Mounting TVA Register Boxes

TVA diffuser/register boxes are rough-in boxes with a large 125mm (4.92") diameter port for installing Zehnder's various round diffusers and the Venezia grill. TVA boxes come in versions with two or three 75mm (2.95") ports for making ComfoTube/ComfoFlex connections.
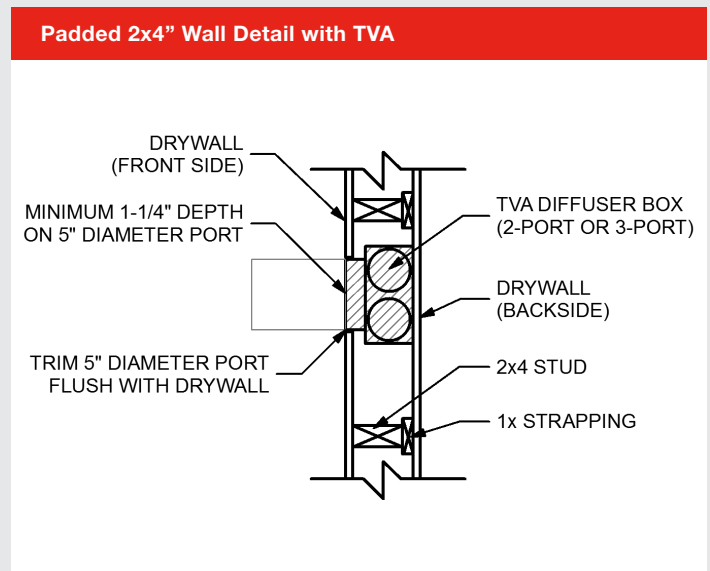
- At the discretion of the installer, diffuser boxes may be mounted with or without the supplied brackets. The goal is to provide a secure connection to the framing that will keep the box in place when connecting the ComfoTube/ComfoFlex ducts and when installing and removing diffusers/grilles during commissioning and filter maintenance.

- Brackets can be removed from the TVA box and turned in various directions as required for installation.

- ONLY USE A HAND SCREWDRIVER FOR TIGHTENING THE BRACKET SCREWS ON THE BOX. POWER TOOLS MAY APPLY TOO MUCH TORQUE AND STRIP THE THREADS.

- As an alternative to the supplied brackets, diffuser boxes may be secured directly to wood blocking or framing. Diffuser boxes may also be secured with 3rd party telescoping brackets. Ensure any penetrations in the housing are sealed with mastic or caulking.

- If there is a finished floor above, ensure TVA boxes are set down enough from the subfloor to avoid being punctured by flooring fasteners.

Diffuser and Register Locations

- Minimum 18"x18" flat surface
- Accessible for commissioning
- Accessible for filter maintenance
- Won't be blocked by furnishings

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Mounting TVA Register Boxes in Walls

- Walls need enough thickness to allow a minimum 1¼" length on the 5" port after it is trimmed. (Typically this means the base of the 5" port set back at least ¾" from the framing, assuming ½" drywall finish.) This 1¼" length provides enough depth inside the port for the diffuser or grill to seat properly.

- 2x6" walls are ideal, but a 2x4" wall may be padded out ¾" to provide sufficient depth.

- Attic walls or walls with other voids behind do not need to be padded out.

Padded 2x4" Wall Detail with TVA

DRYWALL (FRONT SIDE)

MINIMUM 1-1/4" DEPTH ON 5" DIAMETER PORT

TVA DIFFUSER BOX (2-PORT OR 3-PORT)

DRYWALL (BACKSIDE)

TRIM 5" DIAMETER PORT FLUSH WITH DRYWALL

2x4 STUD

1x STRAPPING

Mounting TVA Boxes in Retrofit Situations

- If the TVA box is being mounted in an attic, a dropped ceiling, or other accessible unfinished space, a 5" hole saw may be used in the drywall or ceiling tile to cut an opening for the 5" port.
- If it is not possible to access the other side of a finished wall or ceiling, some selective demolition will be required to provide sufficient access to install the box and make the final connections of ductwork to the box.

Trimming the 5" Diameter Port on TVA Boxes

- The port can be trimmed flush with drywall using a multi-tool with metal-cutting blade after the box and the drywall is installed. Or it can be trimmed to length before installation with a metal-cutting grinding disc or multi-tool.
- The port can be trimmed to whatever length suits the installation; however, there must be at least 1-1/4" of length left for diffuser or grill to seat properly when installed in the opening.
- Reinstall the 5" diameter dust cap to protect the box and ducts from dust until the diffuser/grill is installed.

Mounting CLD Register Boxes

- CLD register boxes may be mounted in walls or ceilings.
- CLD boxes may be secured directly to framing with screws through the holes in the flange.
- Optionally, CLD boxes may be secured to framing with the use of the attached brackets (these brackets may be removed and turned in whatever direction is required).
- CLD boxes should be mounted so that the flange on the face of the box is flush with the face of the studs, joists, or strapping (drywall will be installed over the glange).
- Ensure the foam dust cover remains installed in the box throughout construction.

ComfoWell Distribution Components

All ComfoWell components are modular and can be assembled in various combinations because of the uniform joining rail and slide clamp assembly technique.

All ComfoWell components are available in three sizes:

ComfoWell 220 (corresponding to a 4-port manifold)

ComfoWell 320 (corresponding to a 6-port manifold)

ComfoWell 520 (corresponding to a 10-port manifold)
See ComfoWell spec sheets for dimensions and part numbers.

Assembling ComfoWell Components

To assemble ComfoWell components together:

- Join the gasketed surfaces of the components and align them so that the tabs set into slots on the joining rails.

- From one end, slide the clamp over the joining rails on one side of the assembly. Then slide the clamp over the joining rails on the other side of the assembly. This may take some firm pressure, especially when sliding the second clamp on after the first clamp has compressed the gaskets. If necessary, tap the clamp all the way down the joining rails with a mallet.

ComfoWell Silencers

- The installation of ComfoWell Silencers are strongly advised in every project, as they work both to reduce fan noise through the ducts and to reduce telephonic transmission of ambient sounds from one room to another room through the duct system.

- ComfoWell Silencers should always be installed with the arrow(s) on the side pointing in the direction of air flow (away from the unit on the supply side and toward the unit on the return side).

ComfoWell Manifold

- The Manifold consists of a plate with multiple 3" twist connect ports (4, 6, or 10) and is designed to connect all the 3" ComfoTube or ComfoFlex ducts to the central distribution.

ComfoWell End Plate

- Includes a single large port for a duct connection.

- Typically used to connect a round trunk line from the unit to the silencer.

- End plates are available with different size ports to attach to various sized ducts.

- Mounting Kits (see below) include End Plates that are sized to mount directly on the main ports on the HRV/ERV.

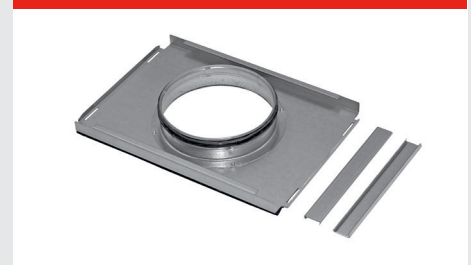**ComfoWell Sliding Clamp**
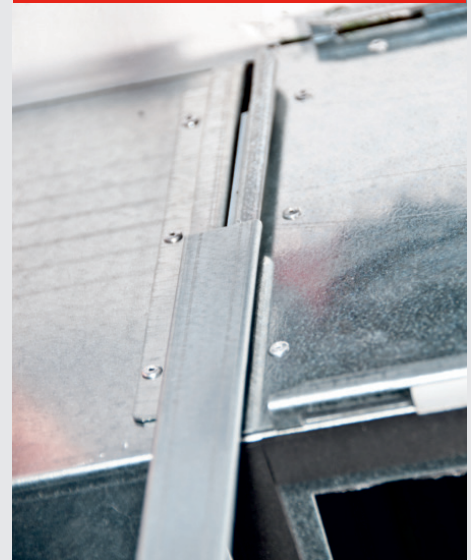
ComfoWell Silencer

ComfoWell Manifold

Silencer Mounting Bracket
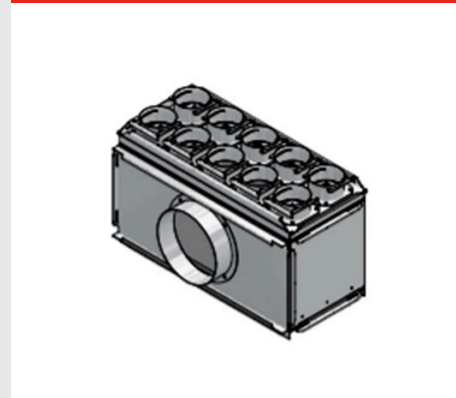

ComfoWell End Plate

ComfoWell Filter Casing (Optional)

- If an optional ComfoWell Filter Casing is being used on the supply side, it should be installed between the unit and the silencer. (The silencer should be the last component the air flows through before entering the Manifold plate and the individual ComfoTube or ComfoFlex ducts.)
- The Filter Casing should be oriented so that the direction of airflow presses the filter against the internal gasketed flange.
- There are two filter retainer clips inside the Filter Casing. One is located on the inside of the hinged cover and the other is located in the bottom of the casing. These retainer clips are secured with offset screw holes and can be removed and reversed to adjust to the width of the filter.
- Once the filter retainer clips are adjusted as required, the filter should be fully seated down inside the casing between the retainer clip and the internal gasketed flange.
- Note the airflow direction on the filter and ensure it is being installed with the proper orientation.
- Press the filter towards the gasketed flange and close the cover. The retainer clip inside the cover should press the filter against the gasketed flange as it is closed.
- Hinged cover should be tightened snugly to compress the cover's gasket.

ComfoWell Distribution Casing (Optional)

- An optional ComfoWell Distribution Casing may be used in two scenarios:
  1. If the available space or orientation of the system requires a 90 degree turn between the silencer and the manifold plate.
  2. If for some reason a Silencer is not being used, the End Plate and Manifold plate can be mounted on a Distribution Casing instead.
- The ComfoWell Distribution Casing has a removable cover plate that can be located in either one of two positions, allowing the other position to be used for the ComfoWell Manifold plate. This allows the Casing to be used for either a straight or right angle transition to the ComfoTube or ComfoFlex ducts.

Locating ComfoWell Components

The silencer/manifold assembly can either be mounted directly onto the unit with the ComfoWell Mounting Kit, or remotely mounted with rigid trunk lines depending on the layout of the system.

ComfoWell Mounting Kits

If a mounting kit is used, ensure there is enough height in the location for the total height of the required drain clearance, the HRV/ERV unit, the silencers, any optional filter or transitional casings, the manifold plates, and any space needed to connect and transition the ComfoTube or ComfoFlex ducts.

> **WARNING**: For ComfoAir 350 and 550, complete all finished wiring at the ventilation unit before installing a ComfoWell mounting kit. Access to the connection terminals will be obstructed by the mounting kit.
> Additionally, the screws on the wiring cover may be removed from the side under the mounting kit and left off permanently to ease future access to the terminals.

ComfoWell Filter Casing

ComfoWell Distribution Casing

ComfoWell Mounting Kit

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ComfoWell Mounting Kit Installation
CW-K 320 CA 200.

1. CW-K 320 installation set CA 200

2. Attach end plate to CA 200
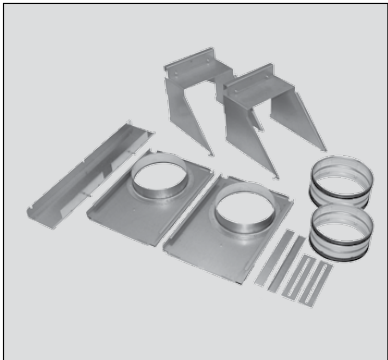

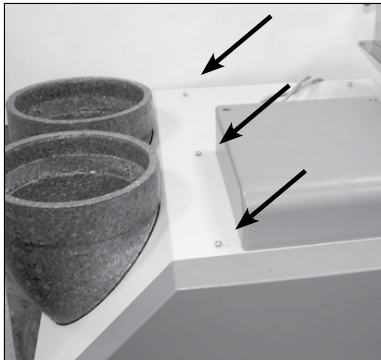3. Attach other end plate

4. Place attenuator on the end plate

ComfoWell Mounting Kit Installation
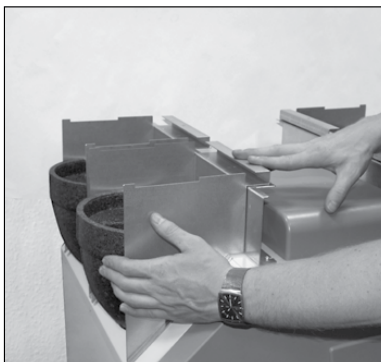## CW-K 320 CA 350.

1. CW-K 320 installation set CA 350

2. Unscrew screws approx. 3 mm out of the CA 350

3. Locate U-profile and screw onto the CA 350

4. Attach the mountings to the U-profile

5. OK

6. Insert the 160 mm nipple into the CA 350

7. Mount end piece plate

8. Secure two end piece plates with one screw each

9. Place ComfoWell on the end plate

ComfoWell Mounting Kit Installation
CW-K 520 CA 350.

Ensure wiring connections to the unit are made prior to installation of mounting kit.
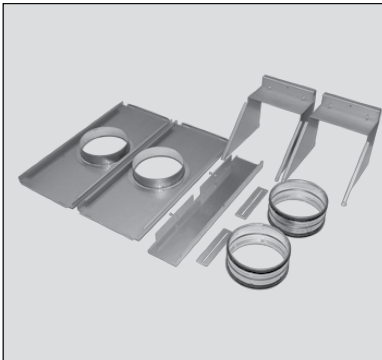

1. Installation set
CW-K 520-CA 350
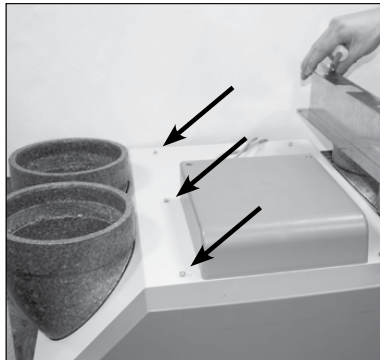
2. Unscrew screws approx.
3 mm out of the CA 350

3. Locate U-profile and screw
onto the CA 350

4. Attach the mounting to the
U-profile

5. OK
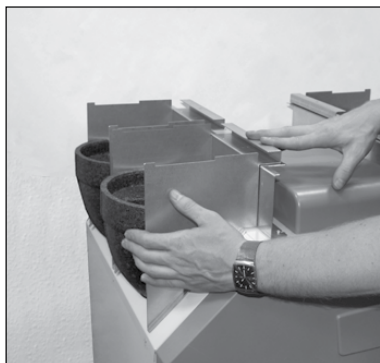
6. Insert the 160 mm nipple
into the CA 350

9. Mount end piece plate
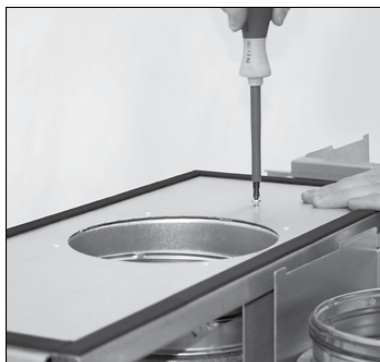
10. Secure end piece plate with
one screw

11. OK

ComfoWell Mounting Kit Installation
CW-K 520 CA 550.

Ensure wiring connections to the unit are made prior to installation of mounting kit.
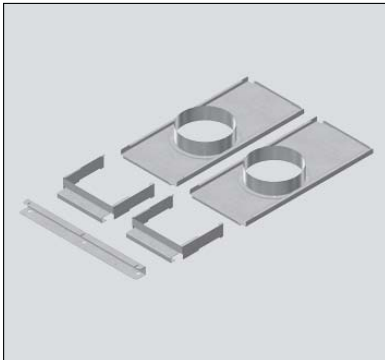
1. CA 550 CW 520 installation set

2. Unscrew screws

3. Screw U-profile to CA 550

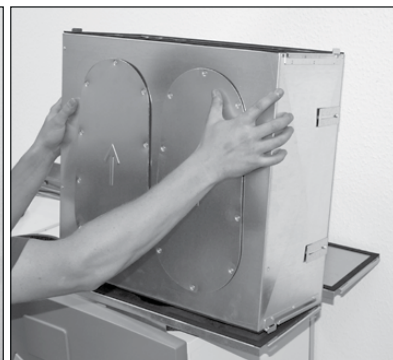4. Attach the mountings to the U-profile
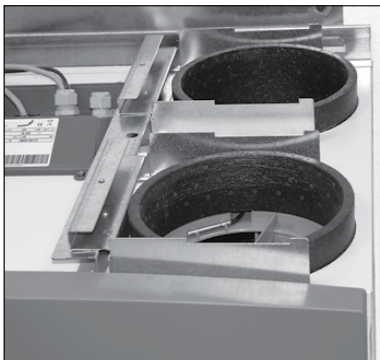
5. OK

6. Mount end piece plate

7. Secure end piece plate with one screw

8. OK

9. Place ComfoWell onto the end plate

Remote-Mounted Silencer/Manifold Assemblies

Remote mounting of silencers allows for flexibility in the layout and can improve airflow when the duct runs would otherwise be excessively long. For the purposes of these instructions, remote-mounted may mean on the other side of the room, or several rooms away. Remote-mounted simply means not mounted directly on the HRV/ERV, but connected via a trunk line to the unit.

- As with all other system components, locate silencers and duct runs within conditioned space only.

- Silencers for the supply side and return side can be located separately if necessary, and multiple silencers connected by wyes can be located separately as well (separate floors or separate rooms).

- Plan silencer locations so that duct runs are as straight and short as possible.

- If possible, opt for longer trunk lines to silencers instead of longer 3" tubing runs.

- Longer trunk lines may need larger ducts to avoid excessive pressure loss.

- Trunk lines should only be rigid metal duct. Do not use flex duct for trunk lines.

- If running galvanized rigid pipe and elbows, make sure to seal all joints and elbow seams with mastic.

- Zehnder ComfoPipe may be used for duct runs between the HRV/ERV and remote Silencer/Manifold assemblies. While the insulated duct is not necessary inside conditioned space, the use of ComfoPipe may be desired for labor-saving benefits, because it provides an air tight, duct in one product that is easily cut to length and can be assembled without tools, sealants, or tapes.

Remote-mounted Silencer/Manifold Assemblies

Remote-mounted Silencer/Manifold Assemblies

ComfoTube within a concrete slab.

- Only ComfoTube can be buried in concrete; ComfoFlex is not suitable for use in concrete.

- If ComfoTube is buried in load-bearing concrete, have a structural engineer review for stuctural approval.

- Prior to pouring the concrete slab, lay out the ComfoTube, ensuring sufficient depth to maintain the strength of the concrete where the tube is located.

- Securely anchor the ComfoTube to the ground or structure every few feet so that it will not float up or be moved from its location while the concrete is being poured and worked.

- Securely anchor the points where the ComfoTube will emerge from the slab.

- Cap or tape over the cut ends to prevent concrete or other debris from fouling the tubes.

- Clearly mark both ends of each tube to indicate where they are being routed to/from and whether they are for supply or return air.

Preparing the duct routes through building framing.

- Before cutting any framing member, confirm that the cuts or holes are permitted by code and will not compromise the structural integrity of the building.

- Holes through wall plates or joist webs should be made with a 3-¼" hole saw for ComfoTube.

- Holes through wall plates or joist webs should be made with a 3-½" hole saw for ComfoFlex.

- Inspect tubing routes before running the ComfoTube to ensure nails or screws won't gouge through the tubing wall.

- Avoid routes through exterior walls or spaces that will be unconditioned or under-insulated.

Running ComfoTube or ComfoFlex ducts through the frame.

- It is typically most efficient to stage the ComfoTube rolls or ComfoFlex boxes at the point where the manifold(s) will be located.

- It may be helpful to slide the roll of ComfoTube onto a PVC pipe or spool.

- Begin by pulling/pushing the duct through the route that has been prepared providing enough slack to make transitions through turns in walls/floors/ceilings.

- BE CAREFUL not to pull ducts against fasteners, sharp objects or abrasive edges. If a small tear occurs, use foil tape to wrap the duct so it is air sealed. If a large tear occurs, cut that portion of the duct out and splice in a new section (see splicing instructions below).

- It may be necessary at times to have a second person to help provide enough slack to make the transitions.

- Once the duct has been entirely routed, cut it to length and IMMEDIATELY tag the end at the manifold location, writing the location of the diffuser on the tag. Use elastic tags provided by Zehnder (blue for supply ducts; red for return ducts).

- If ducts will not be immediately connected to diffusers or manifolds, the ends should be capped or taped over to avoid construction debris and dust from collecting in the duct.

- Avoid running ducts in areas where fasteners are likely to penetrate cavities and could create air leaks. Install nail protection plates where ducts penetrate top or bottom wall plates.

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- In general, try to make duct runs as straight and as short as possible.

- Make transitions as smooth as possible; create sweeping turns rather than sharp turns and elbows.

- Secure ducts in open areas with strapping or clips every 3-4 feet.

Splicing lengths of ComfoTube together

- A ComfoTube Sleeve is included on each roll of ComfoTube so that ends of rolls can be joined together.

- Extra ComfoTube Sleeves are available to order.

- Cut ComfoTube to length as required with a utility knife or fine-toothed hacksaw blade.

- Make cuts as square as possible for uniform ends.

- Install a ComfoTube O-ring around the last complete groove at the cut end of the ComfoTube.

- If a ComfoTube Sleeve is already installed on one end of a tube, ensure that an o-ring is visible through the translucent sleeve. If not, remove the sleeve by prying the tabs open with a flat-head screwdriver and install an o-ring on the end of the tube.

- Fully seat the end of the tube against the inside stop midway down the sleeve.

- The o-rings make the splice airtight; no other sealing is necessary.

Splicing lengths of ComfoFlex together

- Thread the end of one piece of ComfoFlex into the end of the other like threading a screw into a nut, with the reinforcing wire helix acting as the thread. Make 2 to 3 full turns to ensure enough overlap.

- To optimize air flow in a spliced ComfoFlex

Code Requirements for Ducting

HDPE plastic ComfoTube ducting is not accepted by all building officials. Be certain you understand the code requirements of your local jurisdiction before installing any duct work. Samples and specifications for both ComfoTube and ComfoFlex are available from Zehnder America to assist you in evaluation and planning before you begin installation.

duct ensure air is flowing from the "male" inner duct to the "female" outer duct.

- Wrap the end of the outside duct with UL 181B foil tape (2 full wraps) to provide an air-tight seal. Ensure that the tape is pressed firmly around the profile of the helix to eliminate leaks.
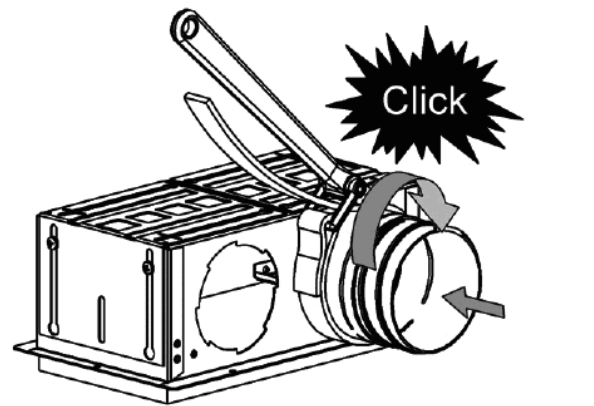
Terminating ComfoTube Ducts

Connecting ComfoTube to plastic twist connector ports

- This procedure is the same whether connection is to register boxes or to manifold plates.
- Insert the connector into the port on the manifold or box and give a slight clockwise turn until the plastic connector locks in with an audible click.
- Be Careful! A plastic twist connector cannot be removed from the manifold or register box once it is locked into place.
- Cut ComfoTube to length as required with a utility knife or fine-toothed hacksaw blade.
- Make cuts as square as possible for uniform ends.
- When connecting to the manifold, be sure to tag the tube (blue for supply or red for return) and mark the diffuser location.
- Install a ComfoTube O-ring around the last complete groove at the cut end of the ComfoTube.
- Lubricate the o-ring with a silicone lubricant.
- Insert the tube end into the connector until it is fully seated and the o-ring is inserted past the retaining clip groove on the port.
- Push the retaining clip into the grooves on the connector, engaging the grooves on the tube to lock the tube in place.

Install the twist connector before ComfoTube

Use of a strap wrench is optional.
Hand fastening is a typical method.

Click

**ComfoTube inserts into installed twist connector**

Silicone Lubricant

1

2

3
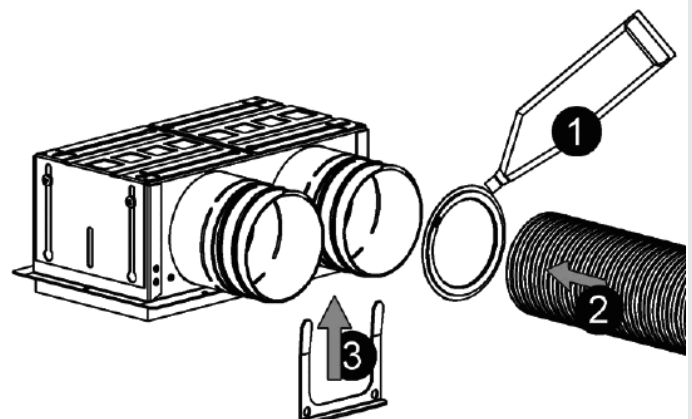
# Terminating ComfoFlex Ducts

Connecting ComfoFlex to plastic twist connector ports

- Do not attach the plastic twist connector to the manifold or box until the duct is completely secured to the connector. A twist connector cannot be removed from the manifold or register box once it is locked into place.

- When connecting to the manifold, be sure to tag the duct (blue for supply or red for return) and mark the register location.

- Thread the helix of the ComfoFlex onto the threads on the outside of the plastic twist connector (turn all the way until the ComfoFlex reaches the bottom of the threads on the connector).

- Wrap the ComfoFlex connection with UL 181B foil tape to make an airtight seal.

- Be sure to tightly cover the clip slots on the plastic connector with tape.

- Insert the twist connector into the port on the manifold or box and give a slight clockwise turn until the plastic connector locks in with an audible click.

- Fastening clips are not used with ComfoFlex. They may be discarded.
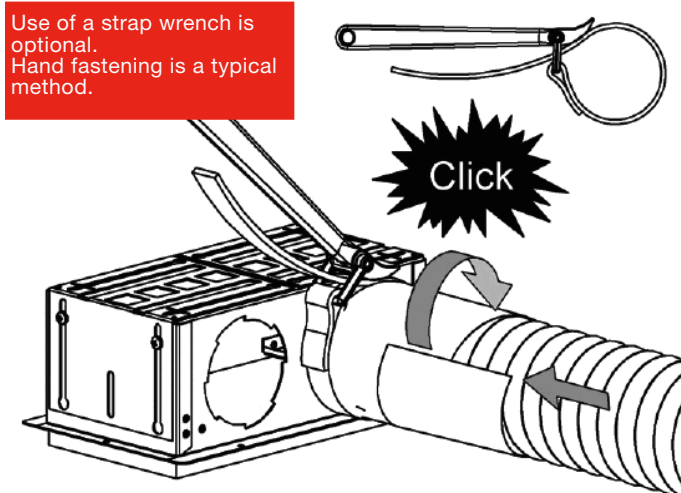
Attach twist connector to ComfoFlex first
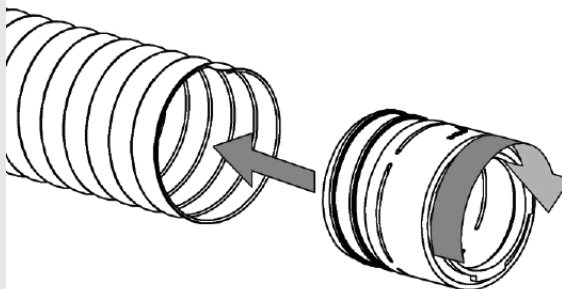
Tape to provide airtight seal

UL 181B rated
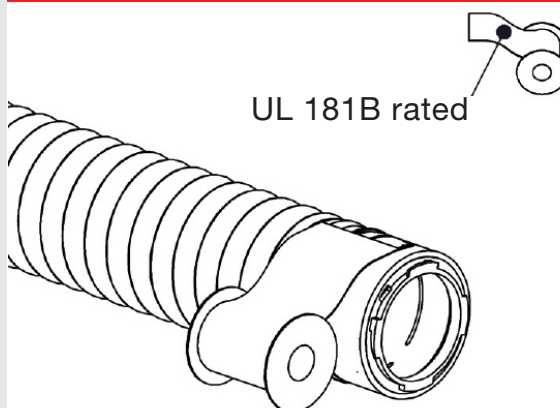
Install connector after ComfoFlex is attached

Use of a strap wrench is optional.
Hand fastening is a typical method.

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Mounting the HRV/ERV Units

• All Zehnder ComfoAir units may be hung on a wall with supplied brackets.

• ComfoAir 160 and 200 may be hung horizontally from ceiling (slight pitch must be provided to allow for drainage).

• ComfoAir 350 and 550 may be mounted on an optional stand (supplied as an option by Zehnder America).

• Optional ComfoFond-L geothermal heat exchangers for ComfoAir 350 and 550 may also be wall-hung or stand-mounted.

• See unit specific manuals included in shipment mounting instructions.

Installing Finish Diffusers and Grilles

Finish diffusers and grilles should only be installed after construction is completed and dust and debris has been cleaned from the building.

Installing STB Return Diffusers in TVA Boxes

- STB-1 or STB-2? Check your layout to ensure you're installing the correct diffuser for each location. STB-1 and STB-2 diffusers look very similar at first glance.
- Remove the dust cap from the TVA rough-in box and ensure the 5" port is trimmed flush with the drywall.
- Seal the gap between the drywall and the 5" port by applying caulking or foam sealant around the port.
- Prior to installing, ensure the STB diffuser is adjusted to about half way open. (The commissioning agent will adjust the diffuser to its final setting.)
- Pull a 125mm cone filter over the rubber gasket of the STB diffuser.
- Insert the STB diffuser into the 5" port of the TVA rough-in box so that the cone filter is pinched in place between the rubber gasket and the circumference of the TVA port. Push all the way so that the diffuser sits in contact with the drywall.

Installing Luna Supply Diffusers in TVA Boxes

- Remove the dust cap from the TVA rough-in box and ensure the 5" port is trimmed flush with the drywall.
- Seal the gap between the drywall and the 5" port by applying caulking or foam sealant around the port.

Finished Return Diffusers

Installing 125mm Cone Filter

Finished Supply Diffusers

- Prior to installing the Luna supply diffuser remove the cover and ensure it is adjusted to its fully open position. (The commissioning agent will adjust the diffuser to its final setting.)
- Replace the cover and press diffuser up into the TVA register box.

Installing Venezia Grilles IN TVA Boxes

- Remove the dust cap from the TVA rough-in box and ensure the 5" port is trimmed flush with the drywall.

- Seal the gap between the drywall and the 5" TVA port by applying caulking or foam sealant around the metal port.

- For return registers, pull a 125mm cone filter over the neck of the Venezia grill before installing the grill.

- Press the Venezia grill into the TVA port until the grill seats against the drywall.

Installing Roma Grilles in CLD Boxes

- Remove the dust cover from the CLD register box and vacuum out any dust or debris that may have collected.

- Apply caulking or mastic around the drywall opening to seal between the CLD box and the drywall edge.

- Remove the Roma grill and mounting pins from the packaging and screw the pins into the rear face of the Roma grill.

- For return grilles, insert a CLD filter before installing the grill.

- Align the pins on the back of the grill with the mounting clips in the CLD box and press firmly until the grill seats against the drywall. If pins are too short, extensions are avail able from Zehnder.

Venezia Grill

Roma Grill

Roma Stainless Grill

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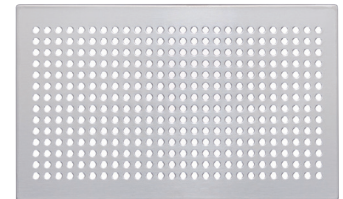
Installing the Waterless P-Trap

"Is a drain required on my system?"

A drain is required on a ComfoAir HRV. Condensation will form in the Return/Exhaust air stream during cold weather and will collect inside the bottom of the unit.

A drain is required on a ComfoFond-L Geothermal heat exchanger. Condensation will form during warm humid weather and will collect inside the bottom of the unit.

A drain is optional on an ERV, but is advisable as a safety precaution. Generally, water vapor will move across the core membrane and not condense inside the unit. However, in unusually cold weather with unusually high indoor humidity it is possible for condensation to form in the Return/Exhaust air stream and collect inside the bottom of the unit.

If a drain is required, a Waterless P-Trap is required.

An open drain will create a major air leak in the system. In an HRV/ERV return air will be pulled through the drain, reducing airflow through the return air ducts. In a ComfoFond-L geothermal heat exchanger, intake air will be pulled through the drain, reducing the amount of outdoor air. For these reasons, a trap must be installed.

A waterless p-trap uses a hollow ball to close the trap when no condensation is present. When enough condensation collects in the trap, the hollow ball is floated up and the trap is opened to the drain.

There are two styles of waterless p-trap supplied by Zehnder. One style is for the ComfoAir 160 and 200 HRV/ERV. The other style is for the ComfoAir 350 and 550 HRV/ERV and for the ComfoFond-L geothermal heat exchanger.
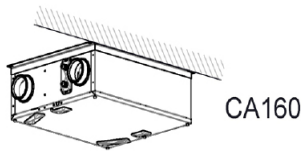
P-Trap Kit for ComfoAir 160 and 200

Configuring the Waterless P-Trap
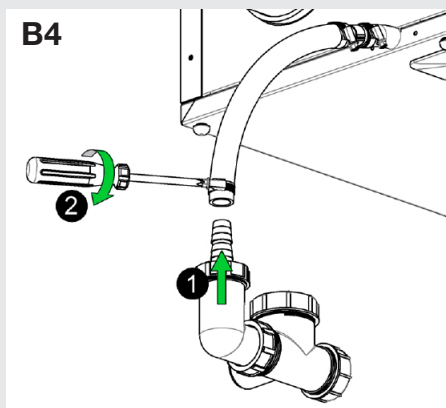
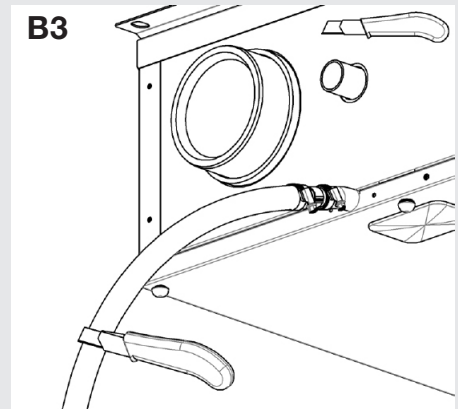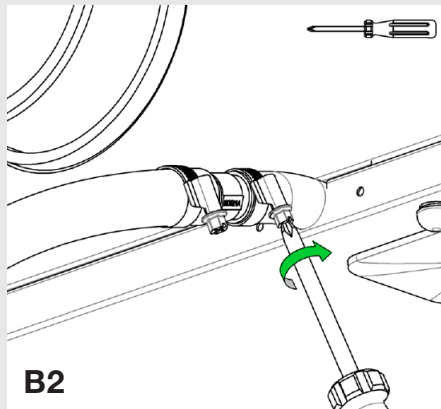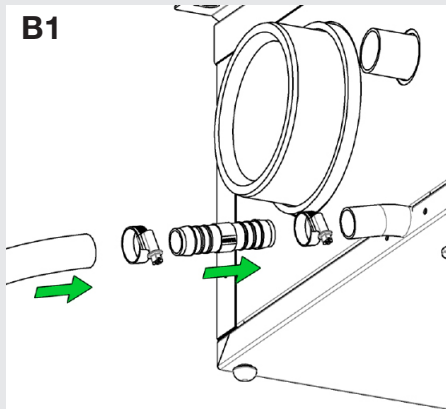## Configuration A - Vertically-mounted ComfoAir 160

CA160

A1

255 mm

min. 70 mm

A2

A3

A4

A5

A6

A7
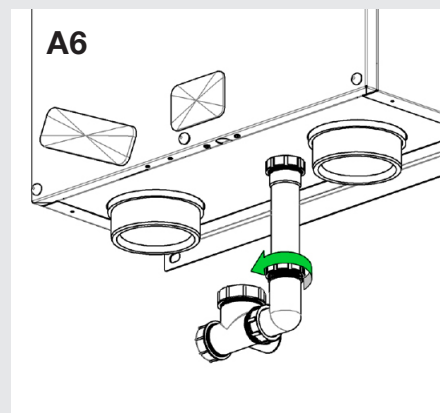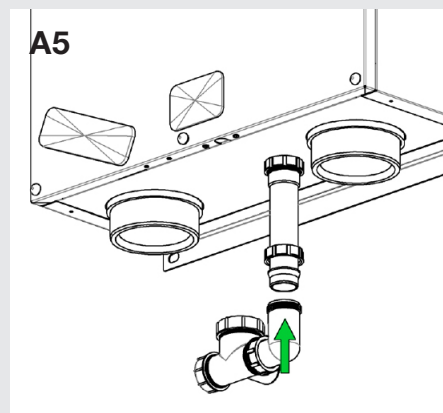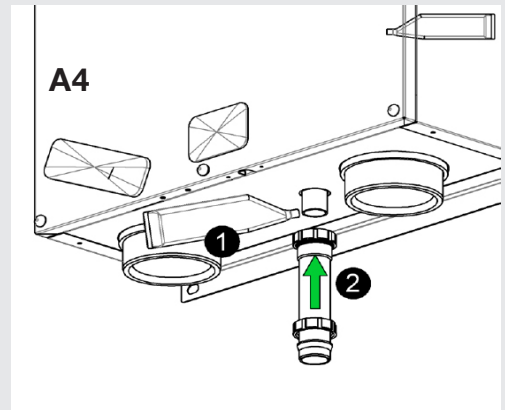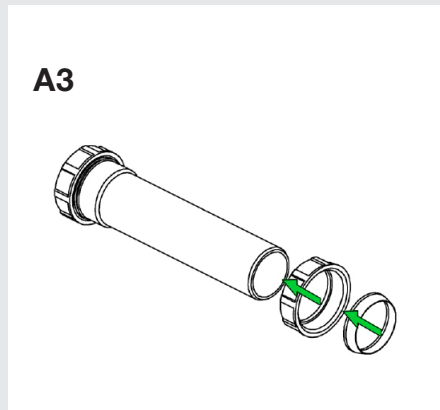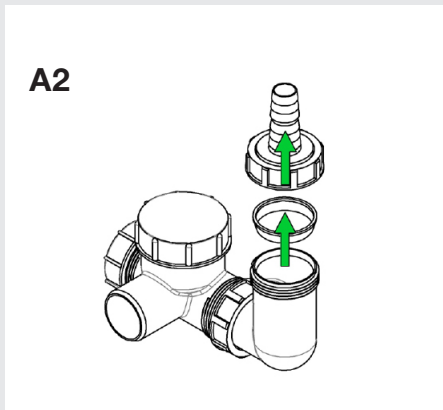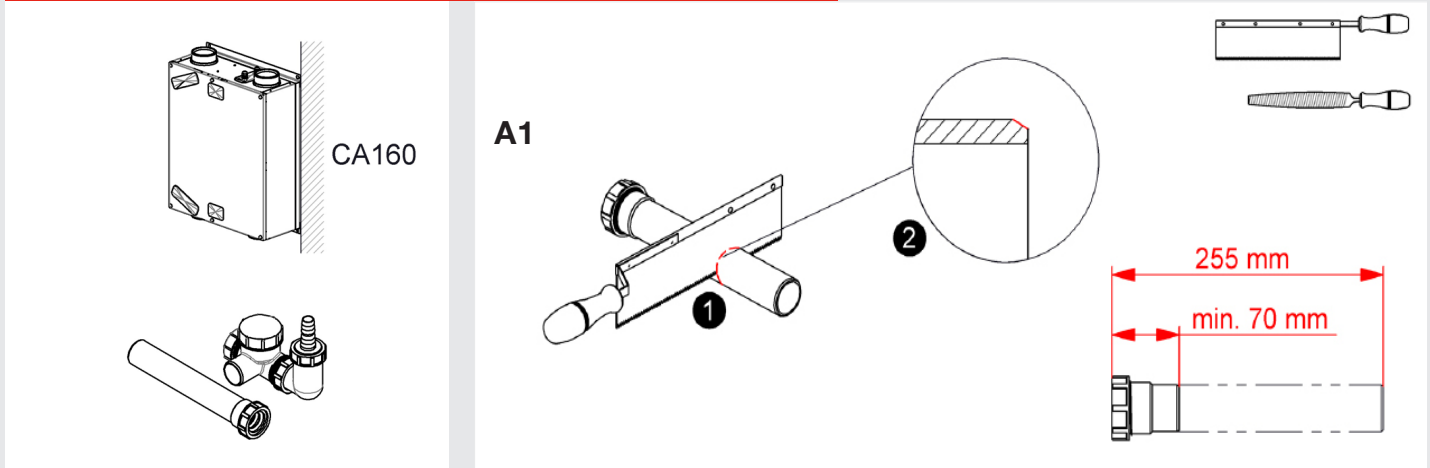
Connect 1$\frac{1}{4}$" Schedule 40 PVC Pipe to P-Trap with Fernco PTC-150 adapter
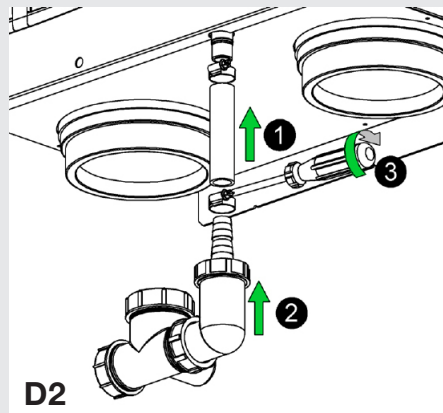
Configuration B-Horizontally-mounted ComfoAir 160

Before beginning, install the CA160 Horizontal Drain Adapter kit.

CA160

B1

B2

B3

B4

B5

Connect 1$\frac{1}{4}$" Schedule 40 PVC Pipe to P-Trap with Fernco PTC-150 adapter

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Configuration D-Vertically- or Horizontally-mounted ComfoAir160

CA200

D2

D3
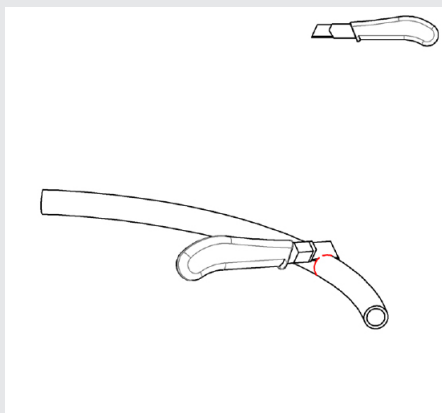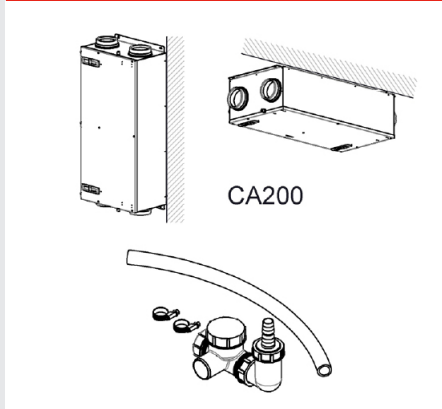
Connect $1\frac{1}{4}$" Schedule 40 PVC Pipe to P-Trap with Fernco PTC-150 adapter

P-Trap Kit for ComfoAir 350 and 550

How the kit arrives

Adapter shipped on HRV power cord

The ComfoAir 350 and 550 ship with a pair of drain adapters secured to the power cord. Select the adapter that has an o-ring and twist-connect feature at one end and an outside thread at the other end.

How the kit assembles

BAG 1 (2 items)

Adapter Gasket (fits inside adapter)

Adapter for CA350/CA550

BAG 2 (3 items)
Flat Rubber Gasket

Hard Plastic Ring

Soft Rubber Seal

Rubber seal inside (not in bag; pre-installed at factory)

GEBERIT Waterless P-Trap

Adapter attached at top of p-trap

In addition to the twist-connect drain adapter, your CA 350 or 550 unit may also ship with either of these straight-pipe adapters. They may be discarded.

Connecting the Waterless P-Trap

P-traps should be drained either to a condensate pump or to the waste plumbing system via an indirect drain (with air gap, per code).
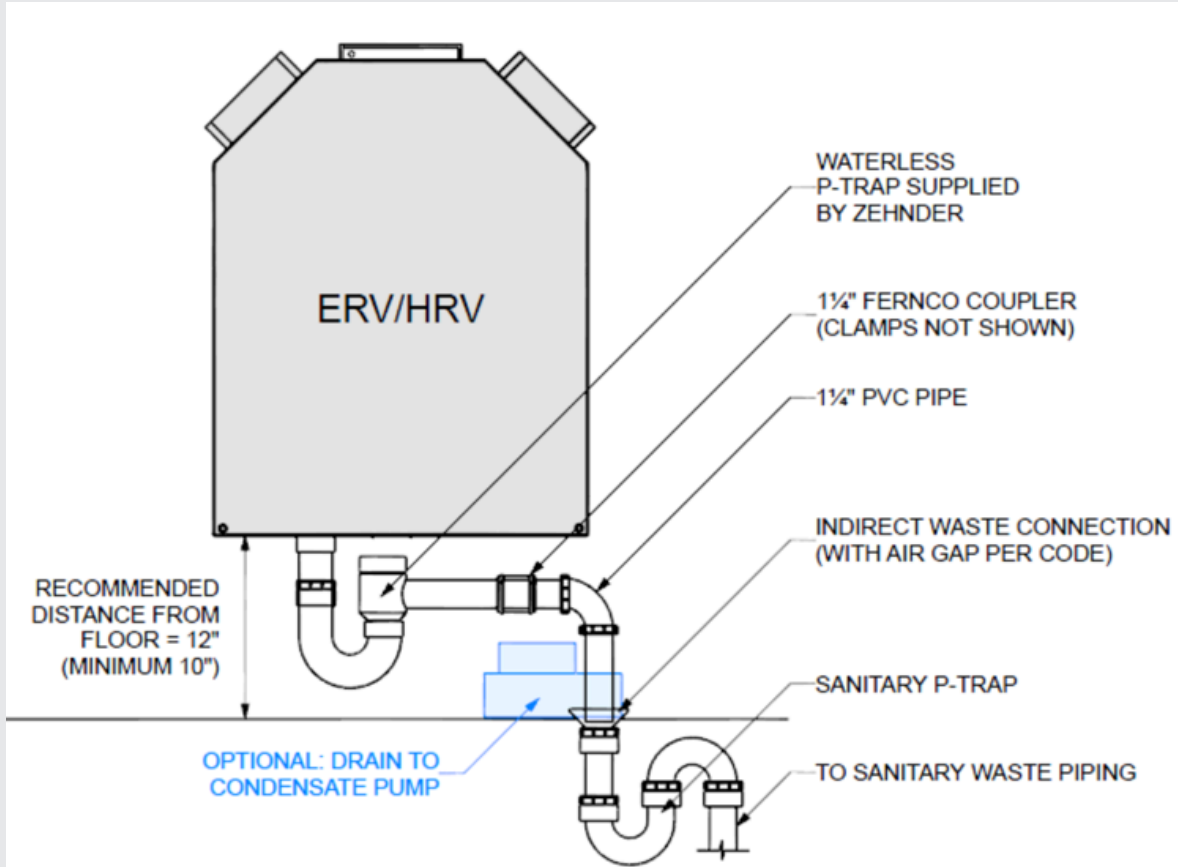
> Do not attempt to glue the waterless P-trap to PVC piping. The P-trap is made of polypropylene and cannot be attached using PVC adhesive.

Connect the drain end of the P-trap to 1-1/4" Schedule 40 PVC pipe (1-1/2" o.d.) using a Fernco PTC-150 flexible coupling.
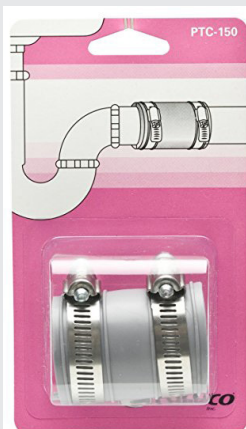
Completing the Installation

The final steps to the installation process ensure that the system is operable and prepare the system for commissioning by the Zehnder commissioning agent.

System Activation

BEFORE plugging the unit in:

- Be sure construction is complete and all spaces have been cleaned of major dust.
- Be sure the filters are installed in the unit.
- Be sure the filters are installed in all return diffusers.
- Be sure all adjustable diffusers are approximately half way open.
- Be sure exterior grilles are installed and not obstructed.
- Test the ComfoSense controller in manual mode, changing back and forth between low, medium and high speeds. If the speed doesn't change, the wiring is likely incorrect.
- Test each bathroom boost switch (initiate boost with the switch and use the ComfoSense controller to change back to low or medium speed).

Pre-Commissioning Checklist

The following checklist should be completed by the installer prior to commissioning. This is the same checklist that will need to be confirmed on the website when submitting a "Request for Commmissioning".

1. HRV/ERV fully installed and connected to ducting system.
2. HRV/ERV plugged in to 240V/60Hz power, and in running condition.
3. Control wired, and system operating (with speeds changing) using control unit on wall.
4. Where applicable, boost switches connected and operating.
5. All ducts connected, system installed per design specification.
6. All Diffusers and Register Covers installed.
7. All Diffusers and Register Covers accessible for measurement of flows by agent using a flow hood.
8. Ladder or equiv. available so that agent can access each supply and return with flow hood.
9. Intake and exhaust grilles installed at outside of dwelling.
10. Home substantially completed, with doors and windows installed throughout, and finish work substantially completed.
11. Filters in HRV/ERV clean, or new set available on site.

It is important that this checklist is completed conscientiously and reported accurately. The commissioning agent will likely be scheduling an entire day around the commissioning and they may be unable to complete their work if the system or jobsite is not properly prepared. This may result in additional costs to the customer.

Leaving the Jobsite Ready for Commissioning

- If construction is complete and the building is being occupied, the unit may be left plugged in and running at medium speed with all diffusers at least half way open.
- If construction is not complete and/or the building is not being immediately occupied, the unit should be left unplugged. Do not use the ventilation system as a way to filter construction dust out of the air or help building materials to cure.
- Gather all spare filters (for the unit, return diffusers and any ComfoWell filter casings) and any ComfoSet dampers in a box and leave them on or next to the unit.

Electrician Information: Rough-in

Line Voltage Rough-in Wiring

- A dedicated 240v/60Hz/15A circuit is required to operate Zehnder units. The outlet format is NEMA 6-15.
- Check the power cord to make sure the correct outlet is installed by a licensed professional.
- Confirm the electrical requirements by referencing the wiring diagram in the specific HRV/ERV unit manual.
- Note: For the ComfoAir 160, the power cord ships as a separate part from the unit itself, and will need to be connected to the unit.

ComfoSense Controller Rough-in Wiring

- The ComfoSense controller can be located anywhere within the building, but it is typically located near the kitchen so that it can be readily accessed for activating "party mode" or making other adjustments.
- A shielded 18-4 cable is required to connect the ComfoSense controller to the unit.
- AVOID running low voltage wiring alongside line voltage cables. Crossing over line voltage cables is acceptable, but running in parallel adjacent to line voltage can interfere with the control signals.
- The mounting box included with the ComfoSense controller is suitable for surface mounting, but the control panel may also be installed flush with drywall without using the mounting box.
- Some installers have successfully used the mounting box as a recessed rough-in box by mounting it on recessed blocking, achieving a flush-mount installation of the control panel.

Bathroom Boost Switch Rough-in Wiring

Bathroom boost switches are standard Decora-style momentary-contact rocker switches that are wired to the low-voltage circuit terminals on the unit's circuit board.

NEMA 6-15 Outlet

Electrostatic Discharge

The installer or technician must wear an electrostatic discharge (ESD) bracelet connected to ground anytime contact is made with the circuit boards inside the equipment. Failure to do so may result in damage to the circuitry.

Shielded 18-4 cable for ComfoSense Wiring

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Electrostatic Discharge

The installer or technician must wear an electrostatic discharge (ESD) bracelet connected to ground anytime contact is made with the circuit boards inside the equipment. Failure to do so may result in damage to the circuitry.
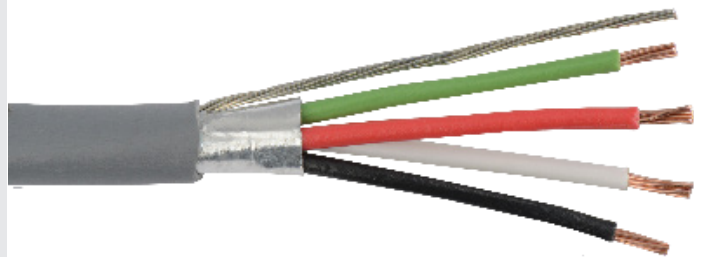
18-2 cable for Bathroom Boost Switch Wiring

- An 18-2 cable is required to connect each bathroom boost switch to the unit.

- Multiple pairs of boost wires should be connected to a pair of pigtails; then the pigtails will be connected to the connection board inside the ventilation unit (see finish wiring section).

- AVOID running low voltage wiring alongside line voltage cables. Crossing over line voltage cables is acceptable, but running in parallel adjacent to line voltage can interfere with the control signals.

- Line voltage must not be connected to the boost switches. They operate only with the low-voltage supplied by the unit.

- A standard electrical rough-in box should be installed for the switch.

- Sufficient length of wire should be left at the unit location to allow for any minor adjustments in position while other components are being installed.

Rough-in Wiring for Other Control Devices

Additional low-voltage wiring may be required for CO2 sensors, RH sensors or 3rd party controls. Consult the specifications for those devices during the rough-in phase to confirm the wiring requirements.

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Electrician Information:
Finish

Line Voltage Wiring

- A dedicated 240v/60Hz/15A circuit is required to operate Zehnder units. The outlet is NEMA 6-15.
- Check the power cord to make sure the correct outlet is installed by a licensed professional.
- Confirm the electrical requirements by referencing the wiring diagram in the specific HRV/ERV unit manual.
- Note: For the ComfoAir 160, the power cord ships as a separate part from the unit itself, and will need to be connected to the unit.

Installing and Wiring the ComfoSense 67 Controller

- The ComfoSense controller can be located anywhere within the building, but it is typically located near the kitchen so that it can be readily accessed for activating "party mode" or making other adjustments.
- A shielded 18-4 cable is required to connect the ComfoSense controller to the unit.
- Avoid running low voltage wiring alongside line voltage cables. Crossing over line voltage cables is acceptable, but running in parallel adjacent to line voltage can interfere with the control signals.

Mounting Options

Option A: Flush Mounting

- Prepare a hole in the wall surface at the location where the shielded 18-4 cable has been run.
- The hole pattern on the mounting plate is set for a European-style junction box.
- If you do not have access to such a box, use the octagonal opening in the plate to trace a cutting guideline on the wall.
- Cut a slightly larger octagonal-shaped opening in the wall so the mounting plate can sit flush on the wall.
- If installing in drywall, pre-drill and install the plastic screw anchors for the mounting plate in the corner locations outside of the octagonal opening.
- Install the mounting plate with screws fastened in the drywall anchors (or junction box or other wall material).

Option B: Surface Mounting

- Install the ComfoSense mounting box on the surface of the wall (use anchors as appropriate for the wall material).
- The mounting box may also be used as a recessed junction box (see "Electrical Wiring" instructions in the rough-in portion of the installation sequence).
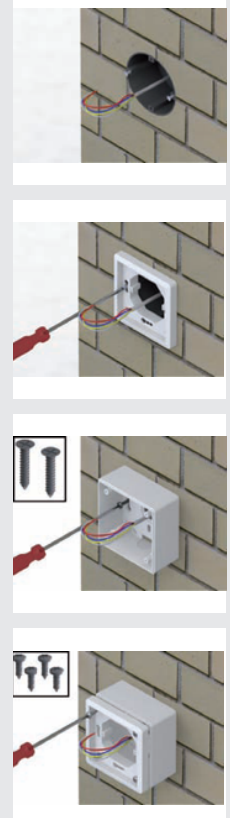- Install the mounting plate with screws fastened to the mounting box.
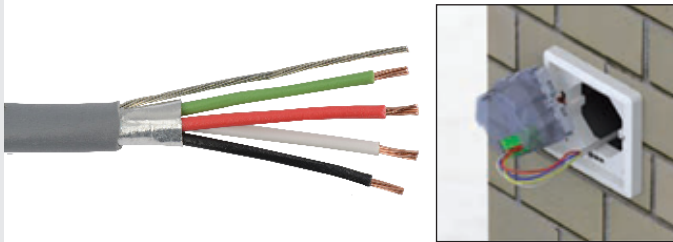
NEMA 6-15 Outlet

ComfoSense 67 Controller

Mounting Options

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The installer or technician must wear an electrostatic discharge (ESD) bracelet connected to ground anytime contact is made with the circuit boards inside the equipment. Failure to do so may result in damage to the circuitry.

Shielded 18-4 cable for ComfoSense Wiring

Preparing the Shielded 18-4 Cable

• Pull the shielded 18-4 cable through the octagonal opening in the mounting plate.
• Strip about 1" of the outer insulation off the cable.
• Strip about ¼" of the insulation off each of the 4 conductors.

Connecting the ComfoSense Controller

• Ensure that the ERV/HRV unit is unplugged while wiring the ComfoSense controller.
• Connect the cable to the controller and to the terminals on the connection board (labeled RS232) in the ERV/HRV per the wiring diagram (see the ERV/HRV unit manual for specific location of the connection board).

Completing the ComfoSense Controller Installation

• Secure the control panel to the mounting plate with the screws provided.
• Peel the protective plastic film off the control panel.
• Press the touch panel into place.
• Read the "Completing the Installation" section of this manual before powering the unit up.

Completing ComfoSense Controller Installation

Connecting ComfoSense Controller
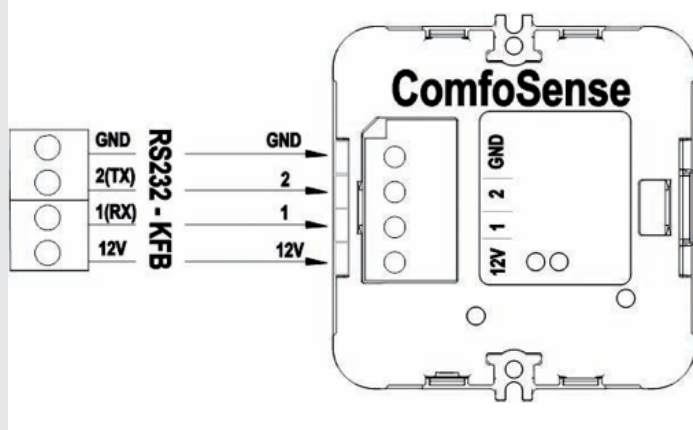
Location of Controller Connection

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Boost Wiring Diagram
Using a Momentary Leviton Switch

Bathroom Boost Switch Wiring

Bathroom boost switches are standard Decora-style momentary-contact rocker switches that are wired to the low-voltage circuit terminals on the unit's circuit board.

- An 18 awg bell wire with 2 conductors is required to connect each bathroom boost switch to the unit.
- Wiring for multiple bathroom boost switches will be connected in parallel; each boost switch should have its wiring home-run to the unit location.
- Avoid running low voltage wiring alongside line voltage cables. Crossing over line voltage cables is acceptable, but running in parallel adjacent to line voltage can interfere with the control signals.
- No line voltage is required for the bathroom boost switches. They operate only with the low-voltage supplied by the unit.
- A standard electrical rough-in box should be installed for the switch.
- Sufficient length of wire should be left at the unit location to allow for any minor adjustments in position while other components are being installed.

18-2 Cable for Bathroom Boost Switch Wiring

Wiring Diagram 1

This is a wiring diagram for "Momentary, 1-Pole, Single Throw" boost switch. This can be use on Zehnder CA160, CA200, CA350, CA550 units.

There is no power to be applied to this circuit. Any power applied to this circuit WILL damage the electronics on the Zehnder ventilation unit.

Wearing an ESD (Electrostatic Discharge) band is required when connecting or working on the Control or Connection boards on the CA units

The connection must be done by a qualified technician.

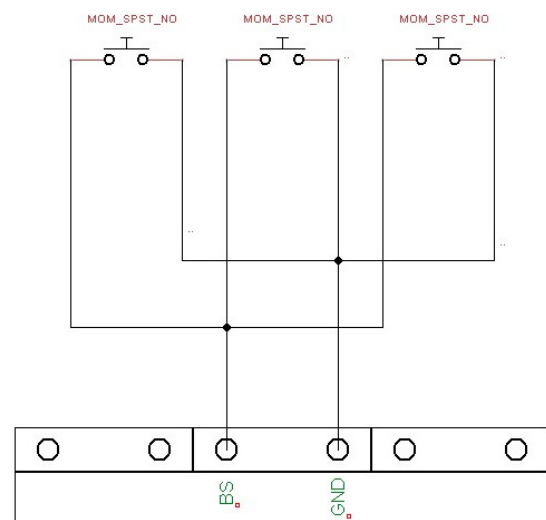WARNING: Death or injury and/or system damage can occur.

There is no polarity or color requirements for this circuit (it is non-powered, dry connection, no potential).

Multiple switches shall be wired in parallel. This example shows 3 Momentary Switches.There is no limit to the number of switches connected for the boost.

Nomenclature Dia #1:
MOM_SPIT_NO = Momentary Switch – Normally Open
BS = Bathroom Switch connection
GND = Ground connection

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Bathroom Boost Switch Wiring continued

1. Disconnect the 240VAC power supply to the CA unit

2. ESD (Electrostatic Discharge) band
   a. Must be worn by the installer

3. Connect wiring to the momentary switch(s)
   a. 18 gauge minimal
   b. Shielded cable is recommended
      i. Thermostat wiring may or may not work
   c. Be consistent with colors to the connections
   d. The Green connection is not required on the switch, this only used for power circuits. This circuit Must NOT have power to it.
   e. Use the screw connections only

4. Connect all the same color wiring together to a "pig tail" before the connections on the connection board.
   a. All the black together and all the white together
   b. If all wires are the same color it may be difficult to separate the two pairs. This is not advisable

5. Connect one set "pig tail" to the BS terminal and the other to the GND terminal.
   a. Tighten terminal screws firmly, be cautious not over tighten
   b. Be sure sufficient wire insulation is stripped off; however, no bare wire should be visible after the connections have been made.

6. Setup the momentary switch if needed

7. To test:
   a. Restore Power to the unit
      i. ComfoSense must be connected
      ii. Will the ComfoSense change the speed of the ventilation system

8. Set the P21 (delay timer) to 0 minutes

9. Set the P22 (over run timer) to 1 minute

10. Press the momentary switch(s) one at a time
    a. The boost will run for one minute
    b. Try each switch separately to verify they all work

11. Set the P22 to the desired time to run the boost
    a. 0-120 minutes (0 would mean it will not run)
    b. Press a momentary switch to be sure fan goes into boost

12. Unplug unit unless the unit is ready for operation.
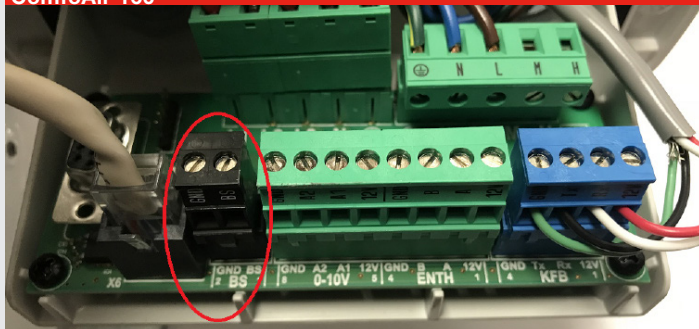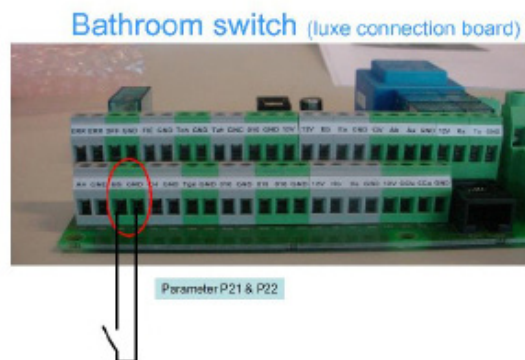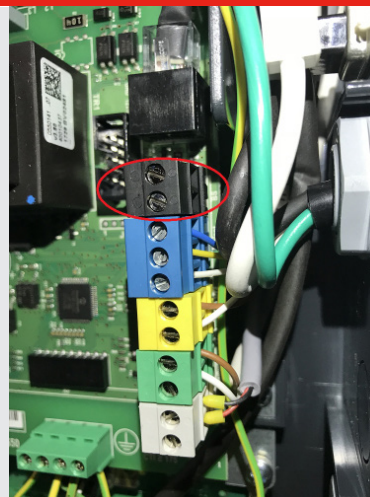
Controller Board Diagram

Dia #2
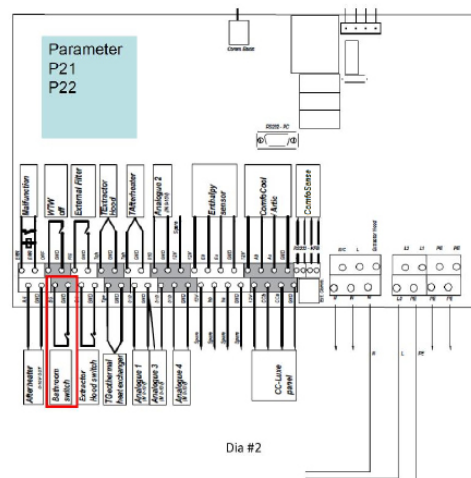
Bathroom Switch Connection for ComfoAir 350/550

Bathroom switch (luxe connection board)

Parameter P21 & P22

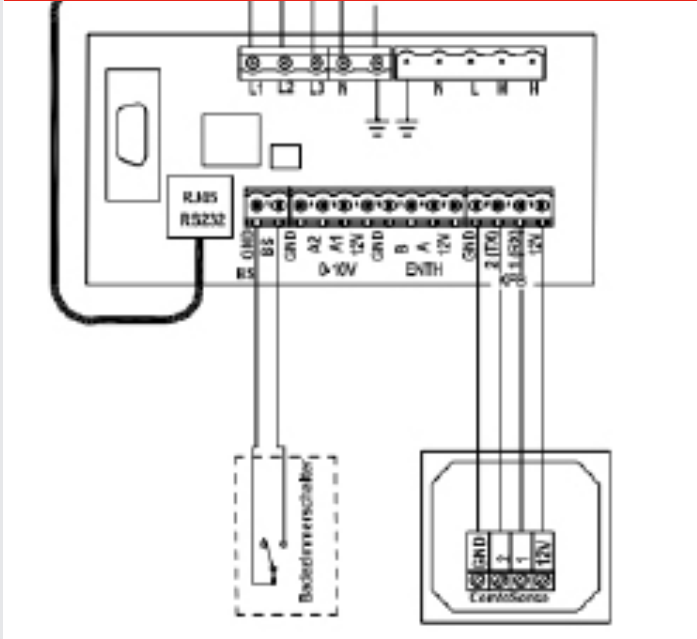## Bathroom Switch Connection for ComfoAir 200

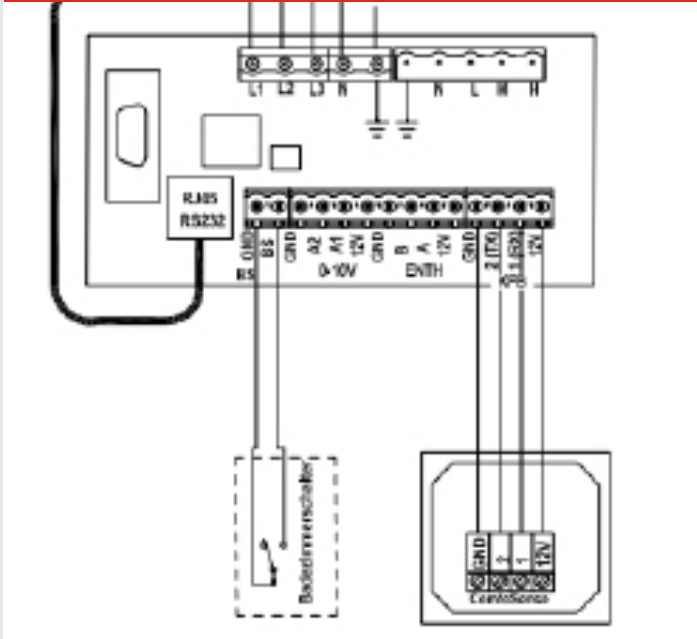## Bathroom Switch Connection for ComfoAir 160

Zehnder ComfoAir Wiring Diagrams

Zehnder ComfoAir 160

Zehnder ComfoAir 200

Zehnder ComfoAir 350/550

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