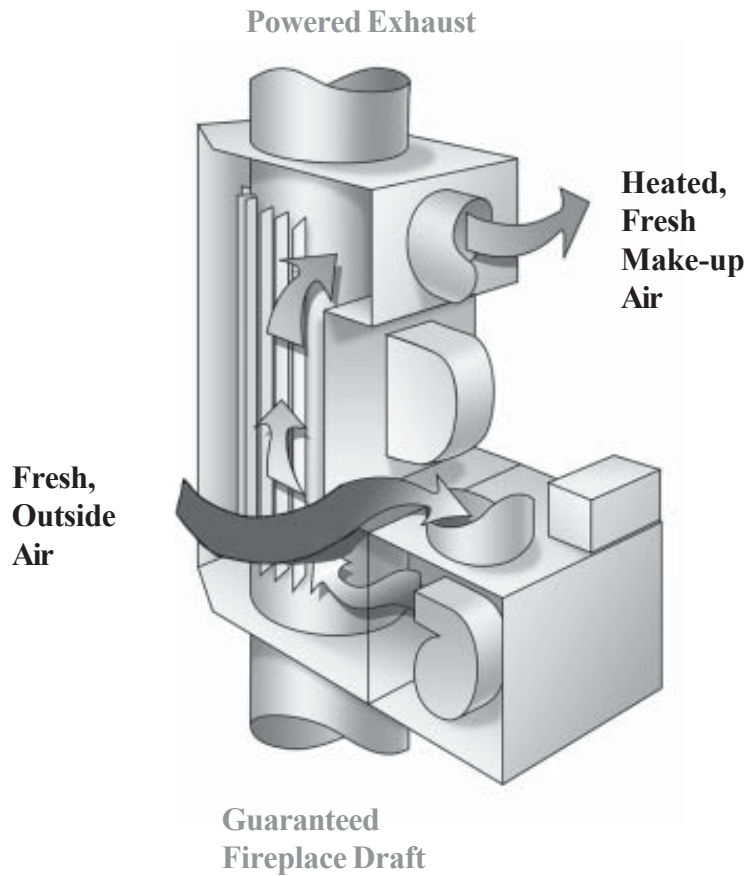




Fireplace Heat Recovery Ventilator

Model (TEM-8)

Installation and Operation Manual



Congratulations on your decision to purchase a **Replenum™** Fireplace Heat Recovery Ventilator! Every fire you burn will have a strong draft, deliver more heat to the room, and will help improve the air quality in your home. All you do is build a fire, and the rest is automatic.

If your Replenum is already in place, it has been carefully balanced by the installer. Only someone familiar with air balancing and the Replenum system should adjust or change any of the settings. Please keep this manual available for service people and for future reference.

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FHRV Parts Checklist

- Assembled ventilator body
- Ceiling joist shield
- Insulated outlet box
- 8"x8" outlet grille
- 6" inlet grille
- Fireplace top heat shield
- Flashing ventilation clips (4) and screws
- Anchoring clamps (2) and screws

Patent pending



The Replenum mounted on a fireplace

Safety Information

Please read this manual before installing and using the FHRV.

Important Notice:

Failure to strictly follow all instructions and warnings could result in a safety hazard and will void your warranty.

Application

- The model (TEM-8) is tested and listed **only** for use with the following fire places:

Temco Fireplace Company models:

TLC36	TLC3922
TLC39	TLC42-4
TLC42	TLC42-4I
TLC36-3MB	A36F-3
TLC42-4MB	A42L-4
TLC36-3	TFC42-4
A36L-3	A42F-4
TLC36-31	TFC3922
TLC363I	TFC36-3MB

- Use of this device with any other manufactured fireplace constitutes a violation of its UL listing and will void the FHRV warranty and the warranty for that fireplace.
- For information as to whether there is an FHRV made for your brand of fireplace, contact your dealer or Condar Company.

Safety Precautions:

For your safety and the protection of your warranty, the following precautions must be observed:

DO NOT - Modify any of the FHRV components. Each of these components has been carefully selected and tested to provide optimum performance and safety.

DO NOT - Adapt or use any electrical or venting components not specifically mentioned in this manual as suitable for the unit.

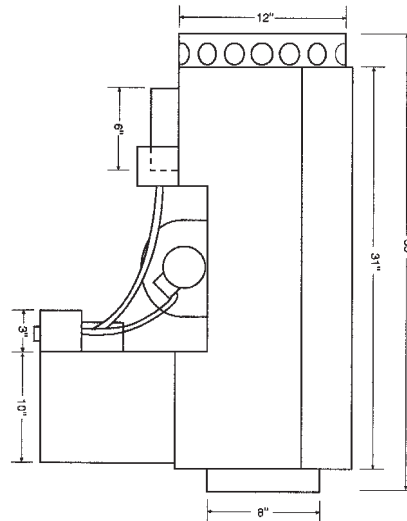
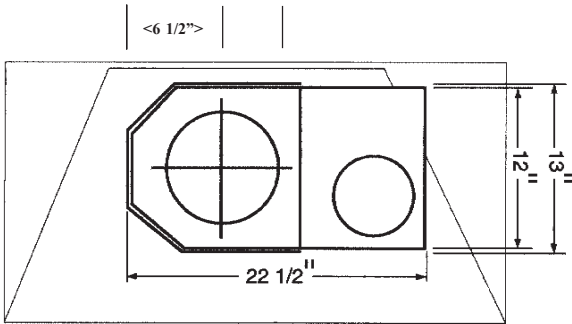
DO NOT - Install the FHRV if there is any apparent damage to the unit or its components.

DO NOT - Install or adapt this unit to any appliance other than those listed in this manual.

DO - Follow all installation and operation instructions outlined both in this manual and the manual that came with your manufactured fireplace.

DO - Consult your local building codes before installing either the fireplace or the FHRV.

Unit Specifications

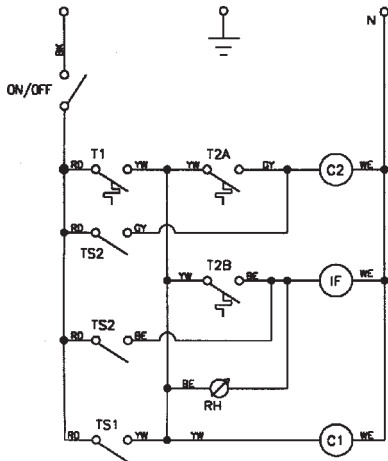


Height	35"
Length	22 1/2"
Width	13"
Shipping weight	88 lbs
Voltage	120 VAC
Draft fan capacity	75-150CFM
Convection fan capacity	75-180CFM

- Each Ventilator Includes
- ✓ ventilator
 - ✓ insulated register box
 - ✓ 8" steel grille (white)
 - ✓ mounting clamps
 - ✓ top heat shield
 - ✓ ceiling joist shield
 - ✓ insulation hardware
 - ✓ exterior intake grille
 - ✓ 6" inlet grille

- Options
- ventilation timer
 - masonry access door
 - cold start timer
 - vane anemometer
 - deluxe vane anemometer

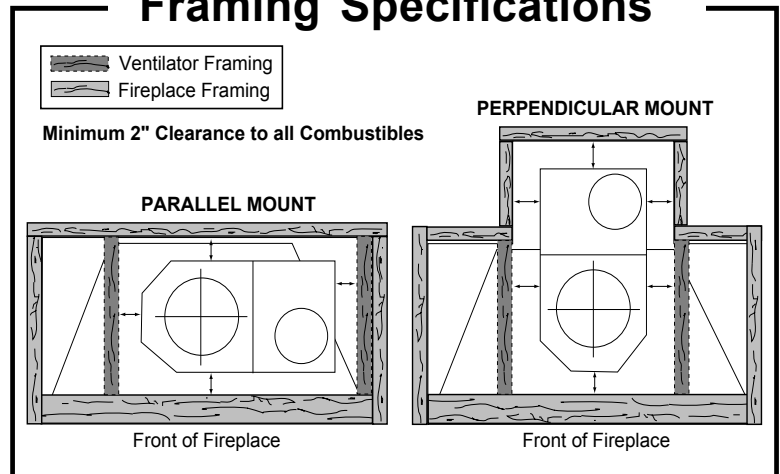
Wiring Diagram



IF	Induction fan
C1	Convection Fan, Low Speed
C2	Convection Fan, High Speed
RH	Rheostat
T1	Thermostat, Low speed
T2	(A & B) Thermostat, High Speed
TS1	Test Switch, Low Speed, SPST
TS2	Test Switch, High Speed, DPDT

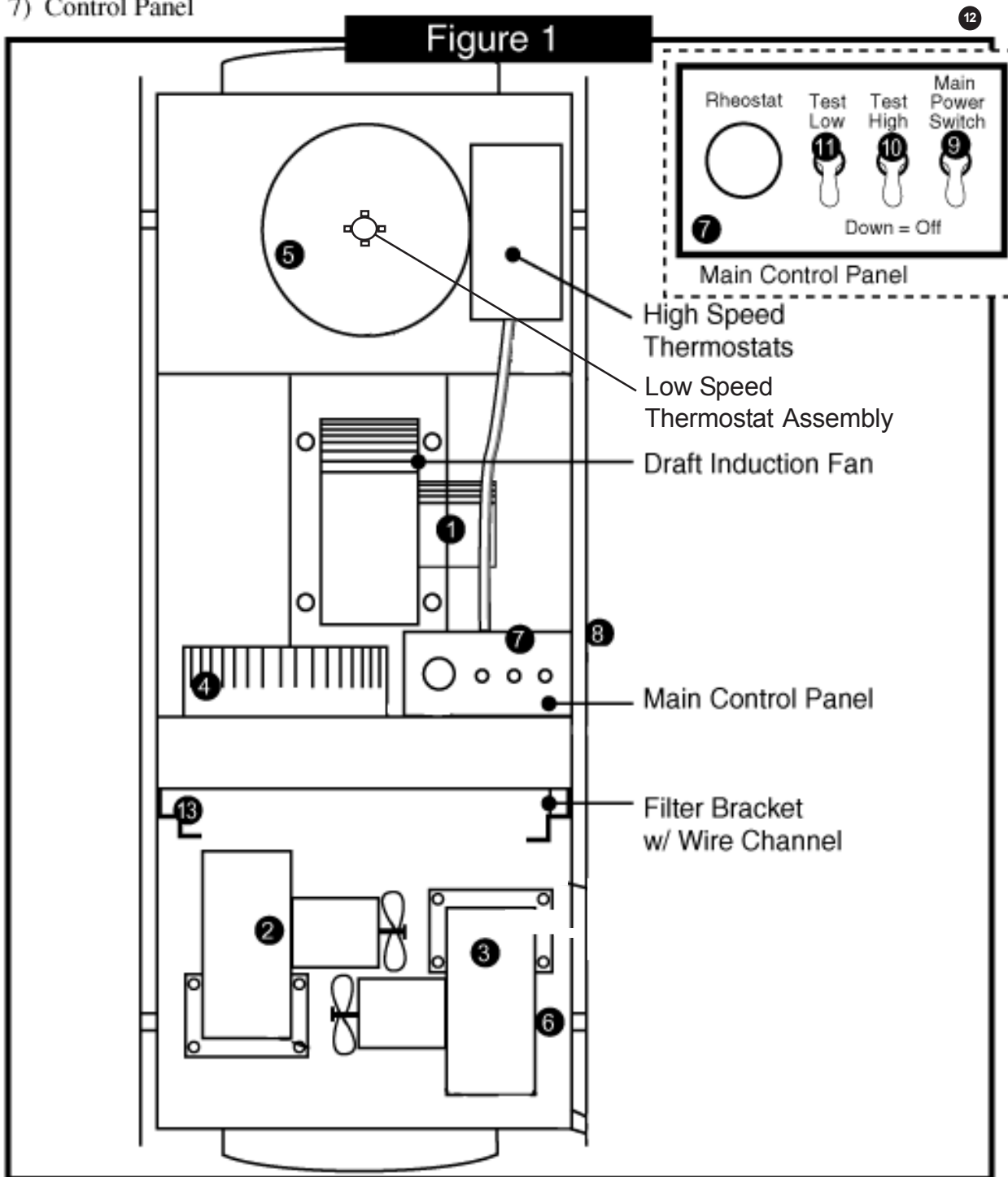
- Also needed for installation (not included)
Temco fireplace and chimney components
6" galvanized duct pipe

Framing Specifications



FHRV Parts

- | | |
|--|---|
| 1) Draft induction motor | 8) Electrical connection |
| 2) Convection Blower, Low | 9) Main power switch |
| 3) Convection Blower, High | 10) High fan operation text switch position |
| 4) Air intake duct connection (from outside) | 11) Low fan operation text switch position |
| 5) Air outlet duct connection (to house) | 12) Automatic operation switch position |
| 6) Convection air adjustment dampers | 13) Filter Frame |
| 7) Control Panel | |



Planning Your Installation

In addition to the plans outlined in your fireplace installation manual, there are some additional considerations you must take into account for the FHRV. Good planning will ensure that the installation is safe, uncomplicated and easy to maintain.

Plan Access to the FHRV

As you plan framing for the enclosure surrounding the fireplace and FHRV consider the following:

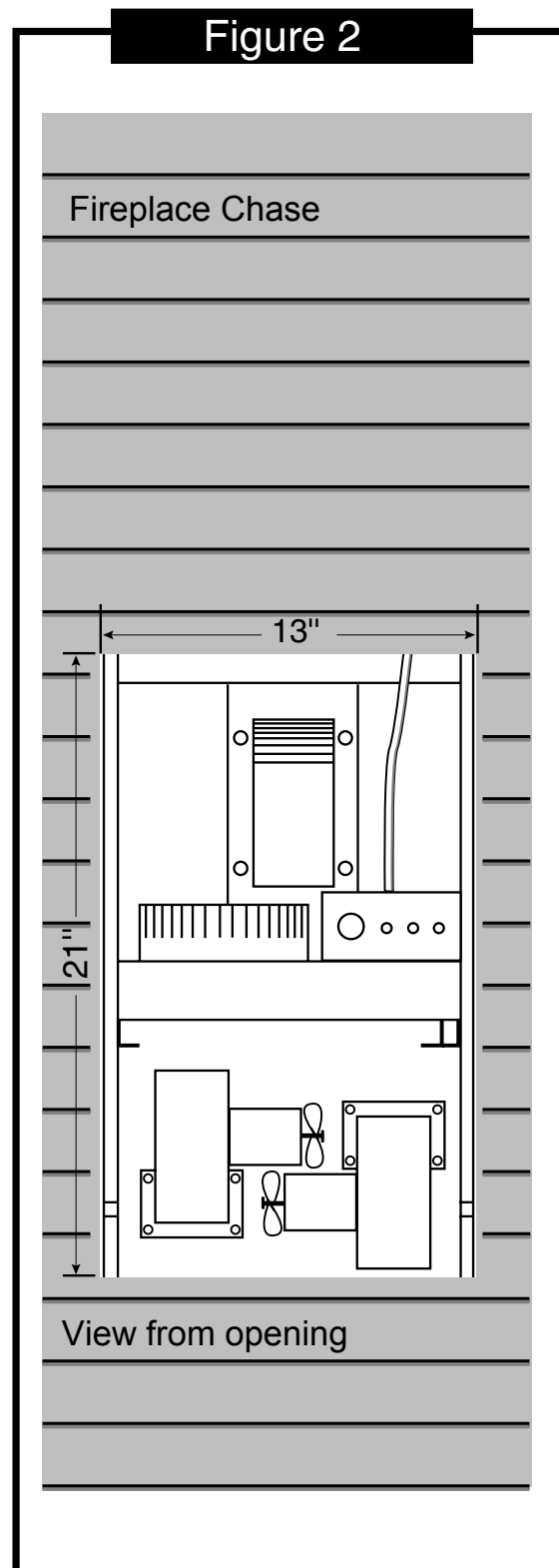
- **You must provide an access door or panel for future maintenance.** This door will be located to the right, left or rear of the fireplace opening and should be a **minimum of 13" wide and 21" tall.**
- The access panel or door should provide direct access to the lower vent connection and draft induction blower of the FHRV (see figure 2). Remember, the bigger the vent access, the easier future maintenance will be.
- If exterior, the access door or panel should be weather tight when closed.
- If the rest of the enclosure is insulated, the access door should also be insulated.
- For masonry, brick, or brick veneer chases, the optional arched metal door provides a quick and attractive means of accessing the unit.

Plan Your Vent Positions

- As you plan the framing around the fireplace and ventilator:
- You must provide for both an interior and exterior vent.
- Read all of the precautions in the vent installation portion of this manual prior to planning.
- Keep all vents as short and straight as possible, and be sure all joints are sealed and secure.

Provide Wiring to the FHRV

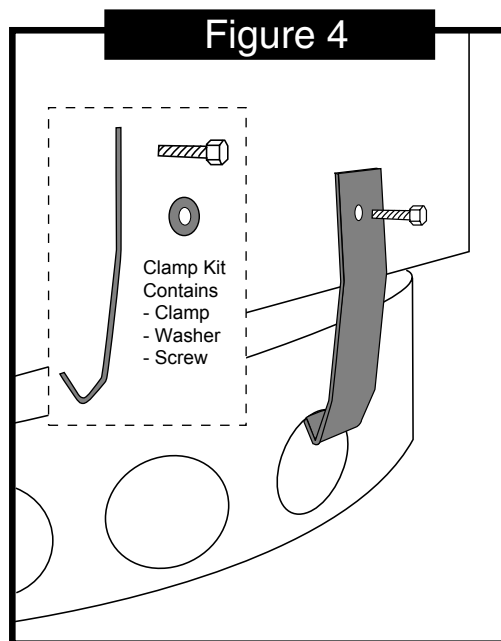
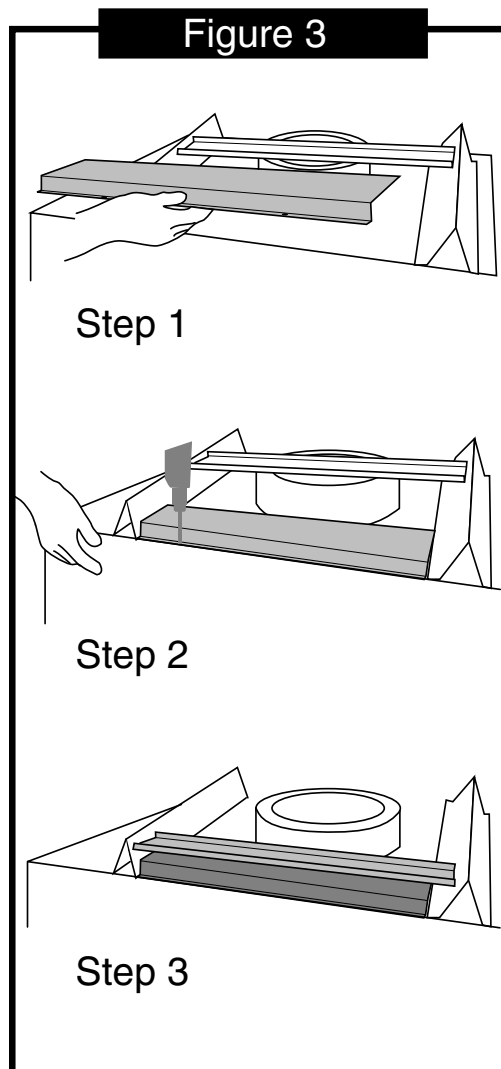
- The FHRV will need a 120VAC, 60Hz wire capable of carrying at least (5) amps.
- This wire should be installed prior to the installation of the fireplace or ventilator.



Installing the FHRV on the Fireplace

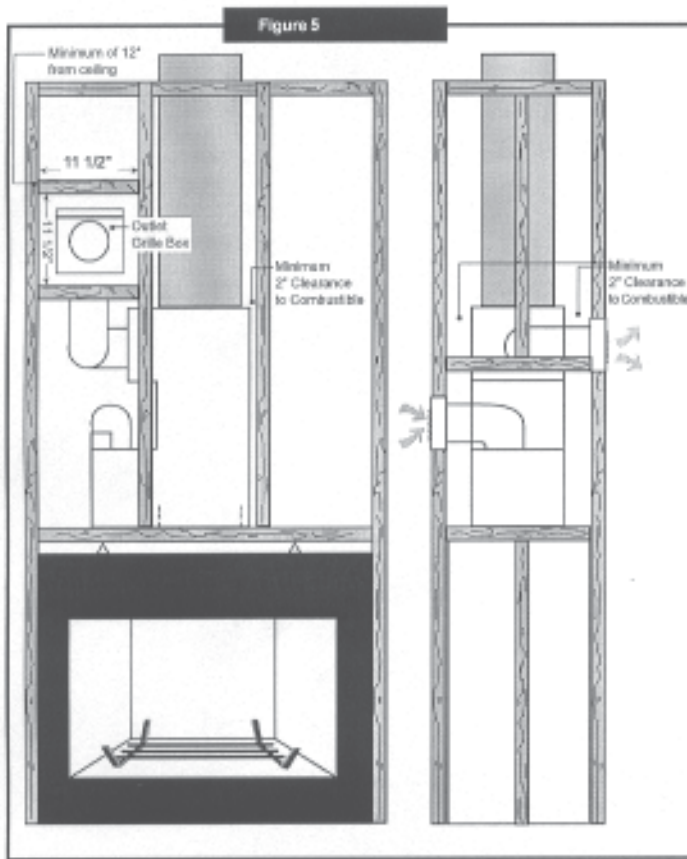
Follow all fireplace installation instructions regarding placement and mounting of the Temco firebox prior to mounting the FHRV.

- 1) Before mounting the FHRV, you must install an additional heat shield on top of the fireplace. To install the heat shield, first remove the four screws that attach the horizontal shield that is between the triangular stand-offs in the front top of the fireplace. This horizontal shield will be replaced after the additional heat shield is installed. Insert the short bent edge of the new heat shield under the two tabs at the front edge of the fireplace top, centering it between the two standoffs. (See figure 3) Secure the shield with two of the self-tapping sheet metal screws provided. Replace the original horizontal shield.
- 2) Attach the outer flue ring to the Replenum. Center the outer ring over the 8" inner flue so that there are 2 inches all around. Attach the ring to the top of the Replenum (**drilling pilot holes makes this easier**) with 3 self-tapping sheet metal screws provided in the hardware kit.
- 3) Install the FHRV directly onto the flue collar of the fireplace.
- 4) The inlet and outlet duct connections should always be accessible through the access panel or door (see above). They may be positioned to the right, to the left, or toward the rear of the fireplace opening.
- 5) Make sure that the fireplace damper is working properly before proceeding with the chimney installation.
- 6) Use the two anchoring clamps to secure the Replenum to the flue collar of the fireplace as shown in figure (4) Insert the "J" shaped end of a clamp into one of the holes on each side of the outer flue ring on the fireplace. Pull the long end of the clamp up as far as it will go on the outer shell of the ventilator. Use the self-tapping $\frac{1}{2}$ " sheet metal screws to secure the clamps to the outer shell.



Important

In addition to the framing specifications outlined in your fireplace installation manual, you must also be sure that **an airspace of at least 2"** is kept between the ventilator and all wood framing, combustible sheathing, gypsum board, and other combustible materials. This must be maintained as air space and may not be filled with insulation or other non-combustible materials. An example of a properly framed system is shown in **figures 5 & 6**.

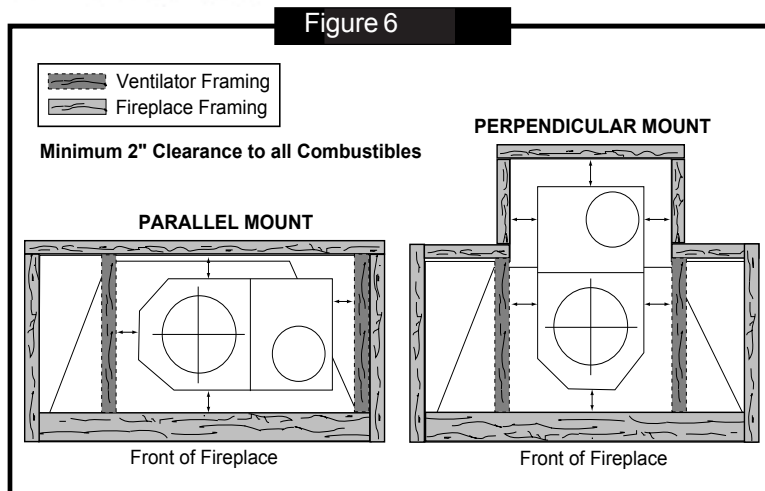


Connecting the Chimney to the FHRV

The Model **TEM8** Fireplace Heat Recovery Ventilator is safety tested and **listed only** as part of a fireplace system using **8" chimney components** provided by **Temco Fireplace Company** for the fireplace models listed at the beginning of this manual.

Note: Do not use any other manufacturers' chimney components with this Ventilator.

The inner and outer flues are designed to mate to the Temco chimney just as they are designed to fit the fireplace. The 12" outer chimney wall will slip over the tabs on the ventilator's outer mounting ring, while the inner flue will fit down into the ventilator's 8" flue exhaust pipe.



Note: Do not block the ventilation holes in the outer mounting ring, as they are a critical part of the cooling system for the chimney.

Follow all of the Temco Fireplace Products instructions for the installation of the rest of the necessary chimney components.

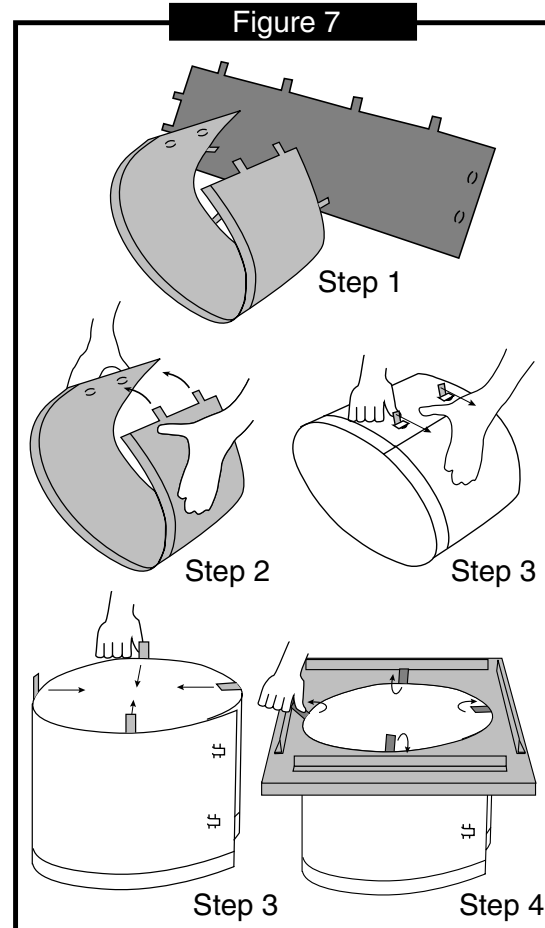
There are a few additional steps in the installation of the Temco chimney when used with the Replenum System.

Install the Ceiling Joist Radiation Shield.

This part will be needed in all installations that pass through floor or ceiling joists. Locate the large sheet metal ceiling joist radiation shield. (7)

- Make the sheet into a tube by inserting the tabs as shown in figure 7.
- Stand the tube on end with the four end tabs pointing up. Bend each of the end tabs at a 90° angle in toward the center of the tube.
- Place the fire stop spacer (Temco part 8204F-1) on top of the tube with the 1/2-inch stand-offs around the tube and pointing toward the floor. Center the 12" hole in the fire stop over the 13" tube you've created. Bend each of the tabs that are pointing at the center of the tube around the edges of the pre-cut circle in the fire stop spacer and press them flat to the top surface.

This fire stop/radiation shield assembly must be used in the ceiling directly above the fireplace/Replenum assembly. Be sure that the entire area of the ceiling joists and any additional blocking or framing is shielded where the chimney pipe passes through.



The ceiling joist radiation shield

Ventilate the Flashing

Locate the four clips in the hardware package. These clips must be inserted over the edges of the flashing so that the 3/16" spacer tab is pointing in toward the chimney. Secure the clips with the self-drilling screws provided. This should create an air space between the chimney and the flue pipe section. In some installations it will be necessary to trim the flashing to create air space. **Do not block or seal this opening.** The storm collar will cover the opening to prevent water infiltration, but should not be pushed down tightly so as to block air flow. If desired, seal the gap in the ceiling joist/radiation shield assembly with a high temp sealant for additional protection from air infiltration.

Connecting the Inlet and Outlet Ducts

Once the fireplace, FHRV, and chimney are installed, install both the fresh air intake duct and the ventilation outlet supply duct.

Air Intake Duct

❑ **The air intake duct must connect to the outdoors.**

❑ **Do not terminate in a garage, attic, or inside the fireplace enclosure.**

Use the intake hood provided, as it is screened to avoid problems with animals. If an alternate intake hood is used, it must be screened with a minimum of 1/4" mesh and have a net area of at least 25 square inches. Use care in situating the intake hood, as this is air that will be heated and used to ventilate the home. Avoid locating the hood near known sources of pollutants and odors, such as parking areas or garbage storage areas.

In addition, the intake vent must be kept:

- At least **five feet** away from any gas regulator.
- At least **ten feet** away from any combustion exhaust which terminates **lower** than the inlet hood, including fireplace, furnace or water heater direct-vent or power-vent terminations.
- At least **three feet** from any combustion exhaust which terminates **higher** than the inlet hood, including those from fireplace, furnace or water heater direct-vent or power-vent terminations.
- At least **three feet** away from an air conditioning unit.

- At least two feet from other house exhaust sources, including kitchen range hood exhaust, bathroom fan exhaust, and dryer vent exhaust.
- At least three feet above ground level (in areas of deep snow, the intake grate should be higher than any anticipated snow level).
- At least one foot away from any opening door or window.

Connecting the Intake Hood to the Ventilator

- ❑ A **6" diameter duct** is needed to connect the intake hood to the ventilator.
- ❑ This must be a **noncombustible rigid or flexible duct material**. Rigid materials are preferable, as they provide less impedance to airflow.
- ❑ Use only corrosion resistant materials, such as galvanized steel, aluminum or high temperature plastic.

Note: If you live in a cold climate, this duct should be insulated to avoid condensation inside the fireplace enclosure.

Connecting Power to the FHRV

Prior to finishing the enclosure, you must connect the power supply wire to the ventilator Junction box. This is easier to do before the intake and outlet vents are installed. The Ventilator should have its own circuit breaker.

- Turn off power at the circuit breaker prior to connecting the wire to the FHRV.
- Only a certified electrician should make wiring connections.
- The junction box, which is connected to a length of flexible conduit, should be mounted to framing in an area that is easily accessible through the access hatch. Wire connections should be made within this box and the cover replaced

- ❑ Do not pass through any fire stop spacers or between two floors of a house with this duct.
- ❑ Avoid using too many elbows when connecting the intake duct.
- ❑ Reduce elbow radii wherever possible. For example, two 45° elbows are better than two 90° elbows. **Make the duct as short and direct as possible.**
- ❑ Make sure all duct connections are tight and secure.
- ❑ Secure the duct to the ventilator with two sheet metal screws. Make sure that the screws are accessible through the access door and that the duct can be easily disconnected for future service.

Air Outlet Duct

Warning—The Air outlet duct can reach high temperatures. Maintain all specified clearances to combustible surfaces, including ceilings, framing, sheathing, insulation and gypsum board.

The air outlet into the room must be located at or above the level at which the outlet pipe exits the ventilator, and must be kept a minimum of 12" below ceiling level or any overhanging combustible material in the room, such as shelving or a fireplace mantle. Use only rigid or flexible metal pipe to connect the ventilator to the outlet grille. Securely fasten all pipe connections with sheet metal screws, metal clamps or other noncombustible materials. Do not use duct tape or foil tape on these connections.

◆ Important

The 6" connector pipe from the ventilator to the outlet grille must be kept a minimum of 3" from combustible surfaces.

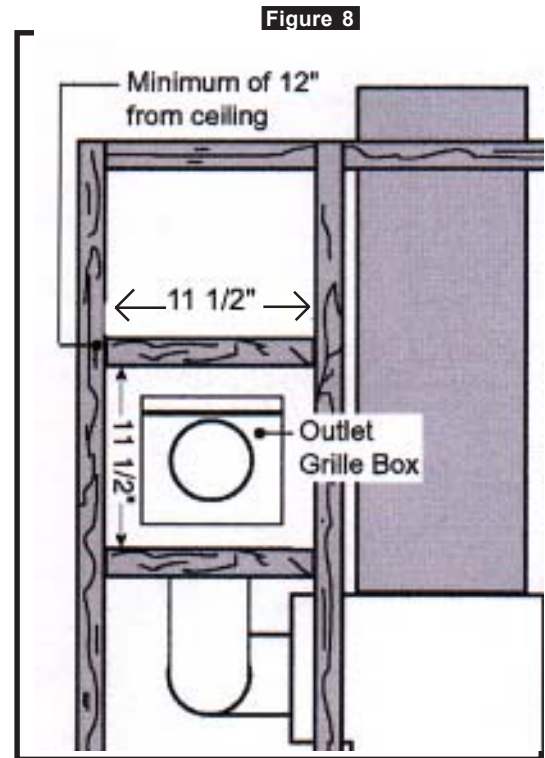


Figure (8) shows the installed insulated grille box that is supplied with the Replenum system. **The insulated box must be used if the duct enters the living space through a wood framed wall, or if combustible materials are used within 12" of the register.** Note that there is a top and bottom to the insulated grille box, with the horizontal heat shield on the side to be installed up.

You must maintain a minimum of 1/2" airspace between the framing and all sides of the insulated grille box. The simplest way to achieve this clearance is with the two 16 inch hanger strips that are included with the Replenum.

The supplied register grille can be painted to match surrounding materials, or another 10" by 10" register cover can be used. Any substituted register grille must be made from noncombustible materials and equal the opening in the supplied grille. **The grille must not have a means of closure by the end user. Do not use a register with louvers that can be closed, or install any type of damper. Blocking or restricting this airflow through the grille during fireplace operation could damage the ventilator and create a fire hazard.**

Balancing the FHRV

Once installation of the Fireplace, FHRV, chimney system, intake duct system, and supply duct system are complete, **it is necessary to balance the FHRV to ensure that it neither pressurizes nor depressurizes the building. The volume of air leaving through the chimney should equal the volume of air entering the home.** All system components must be in place at the time the ventilator is balanced, as each can affect the amount of air delivered or exhausted.

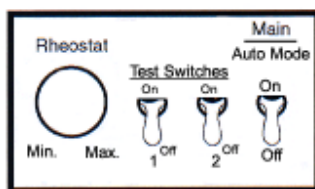
Measuring Airflow

To properly balance the ventilator, you need to accurately measure either the amount of air entering the fireplace or the amount exiting the fireplace chimney. This can be accomplished using either a vane anemometer or a flow hood.

There are **three methods of measuring this flow**:

- a) A flow hood covering the fireplace opening.
 - b) A vane anemometer measuring the flow out of the top of the chimney.
 - c) A vane anemometer measuring the flow into the chimney at the fireplace damper.
- If using a vane anemometer, be sure to take several airflow readings at various points of the duct to insure an accurate reading.
 - Record the flow volume in cfm, l/s, or m/h
 - If your instrument is not equipped to convert air speed to volume, use the charts provided to make the conversion (page 15.)

To Balance the FHRV



Main Control Panel

- 1) Turn on the main power switch
- 2) Turn on both the low and high (**switch 1 and switch 2**) test switches.
- 3) Establish what the maximum airflow up the chimney is while the doors are fully open.
- 4) Make a note of this reference flow in the specification log in this manual.

Fireplaces Equipped with Glass Doors

If the fireplace is equipped with glass doors, it will be necessary to either measure the flow while the doors are closed or to use a mathematical equation to compensate for the effect of the doors on the airflow.

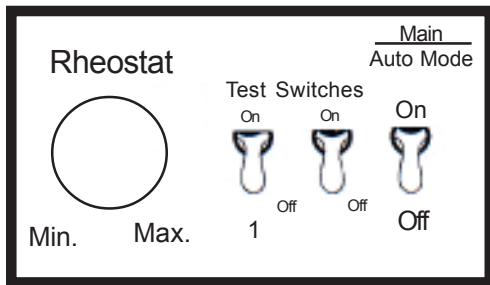
- If using a **flow hood** that covers the door area, **close the doors** and measure the actual flow with both the high and low test switches in the up position.
- Do the same if using a vane anemometer at the top of the chimney.
- If using a vane anemometer at the **fireplace damper**, **close the doors**, turn both the high and low test switches to the “on” positions and measure the flow.

Note: If you are using a vane anemometer in which the vane is detached from the display, use our **optional clip** to affix the vane to the damper in the proper position, leaving the display visible in the firebox.

- If **none** of these options are open to you, multiply the maximum open-door airflow reading by .65 to approximate the effect of the closed doors on airflow up the chimney.
- Record the closed-door airflow number in the specification log of this manual.

Establishing the Low Air Setting

The low air setting is the speed at which both the intake and outflow fans work when the fire is not hot enough to heat the incoming air sufficiently. It is also the minimum ventilation rate when the unit is being used as a source of fresh air for the house. If constant ventilation is a goal of this installation, the required ventilation rate is what should determine the low setting. If proper fireplace operation and air replacement are to be maintained, the low setting must be set to meet the minimum ventilation rate (see page 10 for more information).



Main Control Panel

Establishing the High Air Setting

- 1) Once the low setting has been balanced, turn both the low and high (switch 1 and switch 2) test switches to the on position.
- 2) Using the number you recorded as the maximum airflow (adjusted for glass doors if applicable), open the blower box and adjust the left hand blower as you did the right until you have met the maximum airflow measurement.

Note: Adjust only the left-hand blower— do not readjust the low convection blower.

- 3) Again, it is important that the blower box door be closed between adjustments when you take your reading.
- 4) When you have met the maximum target flow, the ventilator is balanced.
- 5) Turn both of the test switches to the “off” position and leave the main power switch in the “on” position. The ventilator is now set for automatic operation.

- 1) Turn on main power switch
- 2) Turn the low-test switch (switch 1) to the **on position**, leaving the high switch in the off mode.
- 3) Have an assistant adjust the rheostat control on the draft inducer until the targeted flow is measured going up the chimney.
- 4) Once the draft inducer has been set at the desired output, adjust the flow on the first convection fan.
- 5) To do this, open the cover of the blower box and locate the right hand fan. Attached to the fan is a circular shutter that is used to limit the airflow.
- 6) Have an assistant adjust the shutter while you measure the targeted flow at the outlet grille. Be sure to measure the outlet flow between adjustments with the cover of the blower box shut.

Note: There is a stop on the cover to prevent the shutter from closing the air down too low. Do not remove the stop or go below this minimum setting.

Maintenance

Intake grille

Check the air intake grille on the outside of the home regularly for any obstruction of the inlet.

Filter

The Replenum's filter should be checked regularly and replaced when visibly soiled. The filter is not cleanable or re-useable.

Draft induction blower

The draft induction blower should be removed and the blades swept whenever the chimney is cleaned. To remove the blower, take out the four Phillips head mounting screws and gently lift the bottom of the fan housing up and away from the pipe. Remove any soot buildup on the blades and any ash or soot from inside the impeller housing.

The air outlet grille

Remove and clean the air outlet grille as needed. Do not cover or block this grill.

Replenum™ Fireplace Heat Recovery Ventilator Installation Settings Log

Date Installed _____ Installing Company _____

Field Technician _____

Fireplace Brand _____ Fireplace Model _____

Glass Doors Installed on Fireplace? Yes _____ No _____

If yes

Was a direct air volume measurement taken at the chimney with the doors closed? Yes _____ No _____

If the measurement was taken with the door open, was a .65 multiplier used to establish the convection fan settings? Yes _____ No _____

What unit of measurement were your readings taken in (mark one)

cfm _____ l/s _____ cmm _____ Other (list) _____

Measured Chimney Flow—High Test Setting _____

Adjusted Chimney Flow—Low Test Setting _____

Adjusted Convection Fan(s) Flow— High Test Setting _____

Adjusted Convection Fan(s) Flow— Low Test Setting _____

The low convection flow volume was chosen for:

Best Fireplace Performance _____ Targeted Ventilation Rate _____



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Airflow Conversions

If your anemometer is able to convert the air velocity into air flow, you will need to enter a value for the size of the duct you are measuring. In the case of the Replenum Model TEM-8, there are two duct sizes, 8" for the chimney and 6" for the outlet into the room. To get the proper flow rating, use the following values:

6" duct = .2 ft² or .0185 M²

8" chimney = .35 ft² or .0325 M²

If other sized ducts are adapted to the Replenum, the value is determined by converting the area of the duct into a fraction of the desired flow of the unit being measured (i.e. CFM, CMM).

Handy Conversions

1 CFM = .0283 CMM = .472 l/s

1 CMM = 35.31 CFM = 16.66 l/s

1 l/s = 127 CFM = .06 CMM

If your anemometer is only able to record velocity, use the following charts and equations to determine the flow.

6" duct

velocity ft/min	m/s	Flow cfm	cmm
100	0.51	20	0.57
200	1.02	40	1.13
300	1.52	60	1.70
350	1.78	70	1.98
400	2.03	80	2.27
450	2.29	90	2.55
500	2.54	100	2.83
550	2.79	110	3.11
600	3.05	120	3.40
650	3.30	130	3.68
700	3.56	140	3.96
750	3.81	150	4.25
800	4.06	160	4.53
850	4.32	170	4.81
900	4.57	180	5.10
950	4.83	190	5.38

8" duct

Velocity ft/min	m/s	flow cfm	cmm
100	0.51	35.00	0.99
150	0.76	52.50	1.49
200	1.02	70.00	1.98
250	1.27	87.50	2.48
300	1.52	105.00	2.97
350	1.78	122.50	3.47
400	2.03	140.00	3.96
450	2.29	157.50	4.46
500	2.54	175.00	4.95
550	2.79	192.50	5.45
600	3.05	210.00	5.94
650	3.30	227.50	6.44
700	3.56	245.00	6.93

For other sized ducts, you can convert velocity to flow. The equation is always:

$$\text{AIR FLOW} = (\text{AIR VELOCITY}) \times (\text{AREA})$$

For example, if you want to measure the chimney flow in cubic feet per minute, you need to convert the 8" round chimney area into a fraction of a square foot. To determine the area of a circle, we apply the formula.

$$A = \pi \times R^2$$

In this case, the radius is 4", so $R^2 = 16$

$$16 \times 3.14(\pi) = 50.24$$

When the area is determined, simply divide by the unit of measurement, in this case a square foot (144 square inches).

$$50.24/144 = .35 \text{ ft}^2$$

So the value entered into the anemometer for the 8" chimney flow reading would be .35.

This basic principal can be applied to convert any velocity reading to flow regardless of the desired unit of measurement.

Warranty

Body components of the Replenum Fireplace Heat Recovery Ventilator are warranted to be free of defects in materials and workmanship for a period of fifteen (15) years from the date of installation when installed in accordance with Condar Co.s' manufacturer's instructions. Body components include the stainless steel heat exchanger, outer heat shield, main body, flue and duct connectors and other sheet metal components.

Electrical components of the Replenum, including motors, fans, switches, thermostats, and wiring are warranted to be free of defects in materials and workmanship for a period of three years from the date of installation when installed and used in accordance with Condar's instructions. This warranty does not cover damage resulting from improper electrical connections on the part of the installer or damage resulting from accident, abuse, lightning, power surges, floods, fire or other disasters. Damages resulting from exposure to the elements during building construction or due to faulty construction (such as water leakage) are also not covered under this warranty.

Remedies under this warranty are limited to the repair or replacement of defective units or components, at the sole discretion of the manufacturer. This warranty does not cover incidental or consequential damages related to the Replenum or its failure, and the manufacturer assumes no further liability with respect to the sale or use of this product. This warranty is in lieu of all others, expressed or implied, including the warranty of merchantability or fitness for a particular structure installation. This warranty gives you specific legal rights, and you may have other rights that vary from state to state.

This warranty does not cover damages that occur during shipping. Fireplace and chimney components are covered under their separate manufacturers' warranty.



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