Well-Connect
Installation Guide

Model WCVC-16
Model WCVC-24

Hybrid Geothermal
WELL CONNECT

Congratulations on your purchase of a Well-Connect Hybrid Heating System! Your satisfaction is very important to us.

Read and follow this installation guide as it contains instructions and best practices for installing your Well-Connect; note that while some homeowners do possess the necessary skills to properly install this product, Well-Connect recommends that a qualified HVAC or plumbing professional be contracted for the installation.

As always, the installer should contact the local municipality to obtain any permits that may be required, and the installation must comply with applicable state and local mechanical and electrical codes.

Watch the video!
Go to www.youtube.com/watch?v=gHsCRgC6t-c
or simply search YouTube for “Well-Connect Installation”

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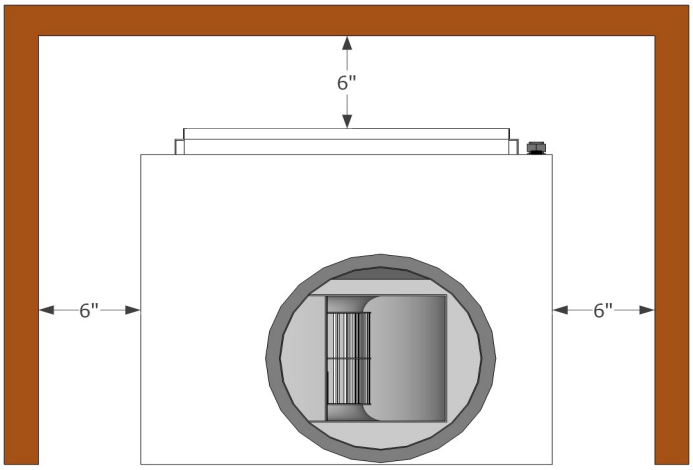
IMPORTANT SAFETY INSTRUCTIONS

WARNING: To reduce the risk of fire, explosion, electric shock, or personal injury when using your Well-Connect, follow all basic safety precautions, including but not limited to the following:

1. Please read all instructions before using your Well-Connect.
2. As with any piece of equipment that uses electricity and has moving parts, there are potential hazards. To ensure the safe operation of this appliance, proper care must be taken. Therefore, anyone using or installing it must heed all warnings, precautions and instructions.
3. Never install or operate your Well-Connect in an explosive, corrosive or otherwise hazardous environment. Doing so may result in equipment damage, property damage and personal injury.
4. Install your Well-Connect in a dry indoor environment ONLY. Do not install or store this appliance where it will be exposed to the weather. Internal water lines may burst if exposed to freezing conditions leading to equipment damage and potential property damage.
5. Only install your Well-Connect on a level floor that supports the weight.
6. Your Well-Connect must remain in an upright position at all times. If it is subject to any other orientation, even temporarily, contact us before attempting to operate it.
7. This appliance must be properly grounded. Never plug the appliance cord into a receptacle that is not grounded adequately and in accordance with local and national codes.
8. Connect your Well-Connect to a water source that can provide a constant flow, at a minimum rate of (2) gallons per minute for Model WCVC-16 or (3.5) gallons per minute for Model WCVC-24 at a temperature of 45°F (7°C) or warmer. Some shallow wells may not be able to produce the flow volume and/or temperature needed for proper operation. If you are unsure whether your well can meet these requirements, consult your Well-Connect dealer or local water well professional/supplier.
9. DO NOT install your unit where surrounding clearances are less than those depicted on the next page in Figure 1.
10. DO NOT install or operate the unit where it may be subject to dusty or dirty conditions, such as during a construction phase of building or remodeling.

SUBJECTING YOUR WELL-CONNECT TO ANY OF THE PRECEDING UNDESIRABLE CONDITIONS SHALL VOID ALL WARRANTIES.

Top View



Side View

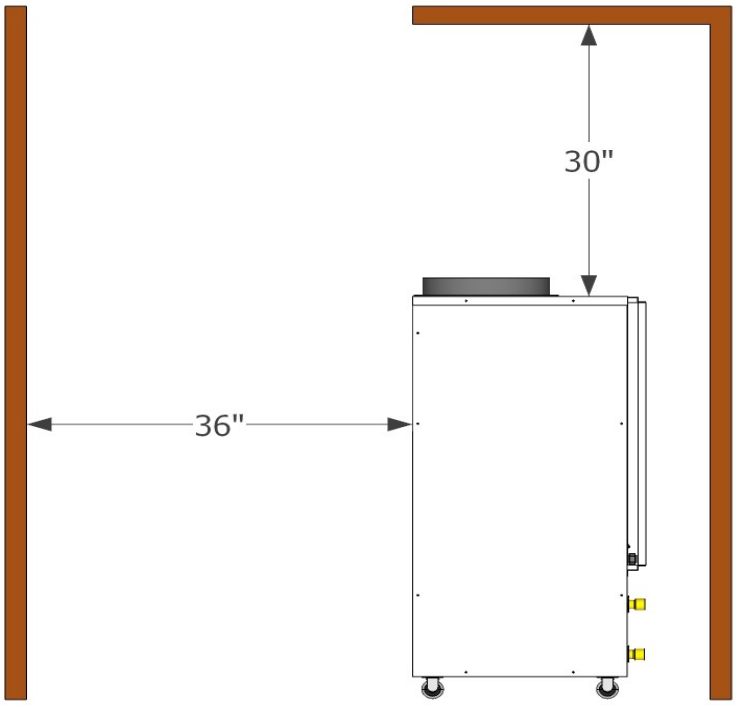
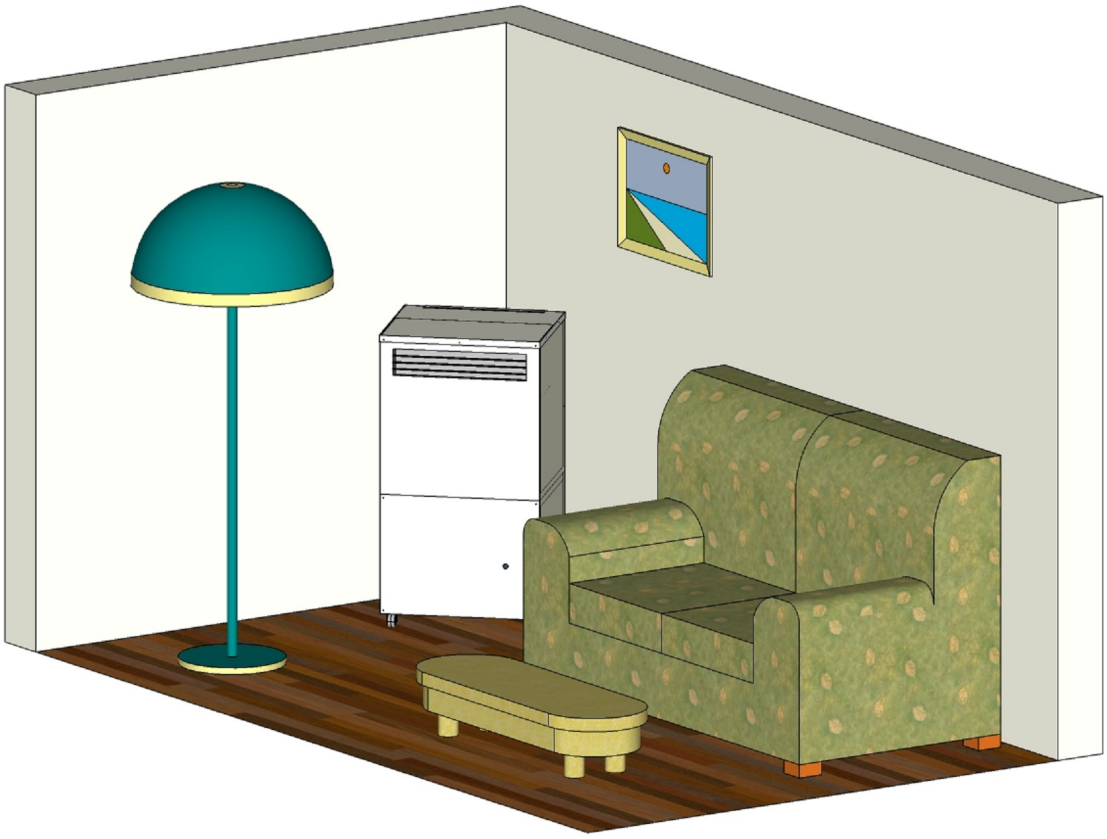


Figure 1

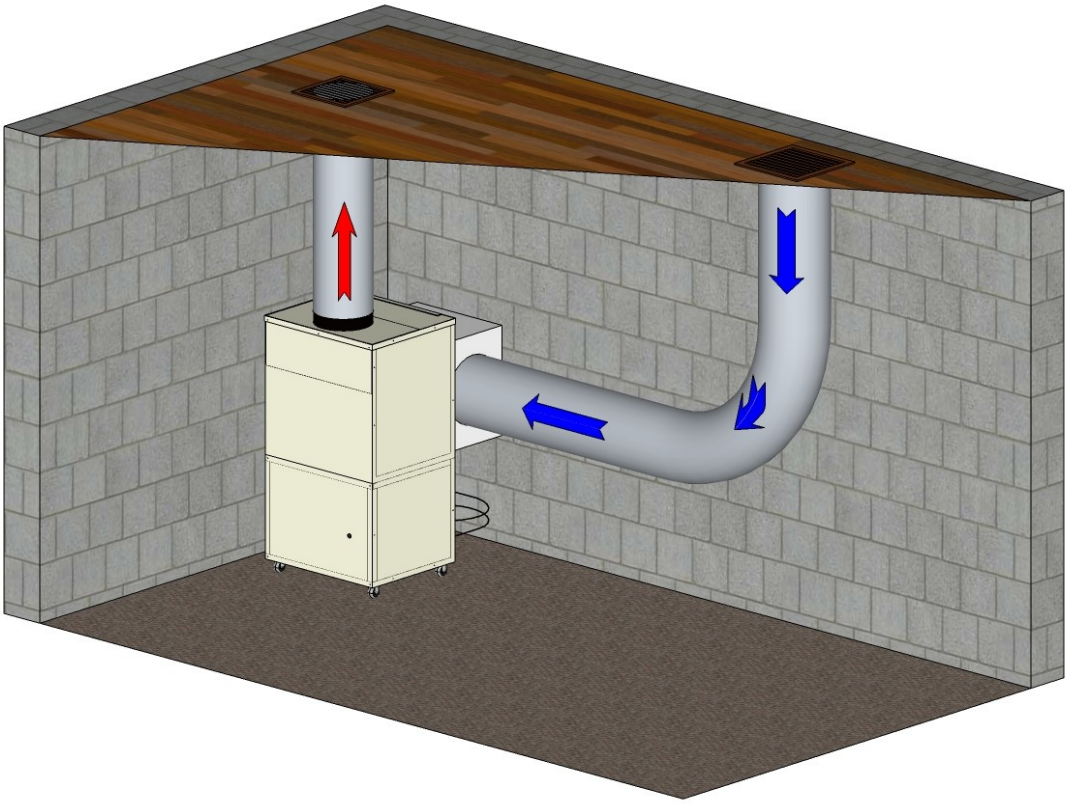
1. Location

A *Stand-Alone (or Free-Standing)* Well-Connect is installed in a space for heating and cooling and is not connected to any type of air delivery system or ductwork. Conditioned air is simply delivered from louvers incorporated into the front panel of the Well-Connect and returned through the filter area on the back. A stand-alone Well-Connect is typically used to condition a single open space, usually where people spend a lot of time (living room, family room, office, etc.) Use good judgment when selecting a location for a stand-alone Well-Connect so it will not interfere with other activities in the area or be subject to unnecessary abuse.

The thermostat should be placed in the area where the Well-Connect is installed, or close to it. However, do not allow the heated or cooled air from the Well-Connect to blow directly on the thermostat.

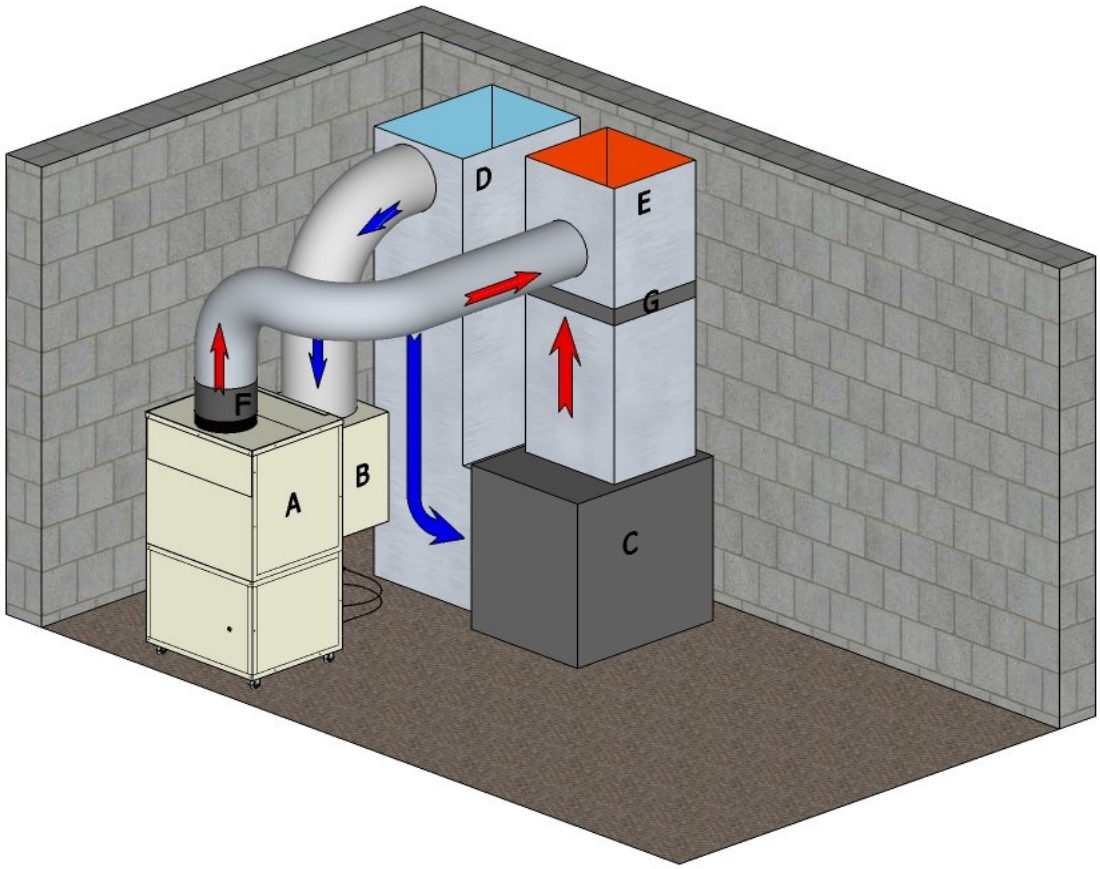


A *Self-Ducted* Well-Connect has a 12” diameter duct collar incorporated into the top panel and the conditioned air is delivered to a given space via ductwork installed just for this purpose. This is often used in houses without existing ductwork, such as those with hot water or electric baseboard heat. In this instance, a Well-Connect might be installed in a basement and ducted to the main floor, or to another room, etc. The ductwork could be as simple as a single register, or as complex as a whole-house distribution and return system depending on the feasibility of the application and the desires of the homeowner.



A *Hybrid (or Integrated)* Well-Connect is directly connected into existing heating and cooling system ductwork, allowing conditioned air from the Well-Connect to be distributed throughout the entire building or home. A hybrid Well-Connect is a two-stage heating and cooling system that is installed in parallel with the existing furnace system. The Well-Connect becomes the primary heating and cooling system (stage one) and the existing system then becomes the secondary heating and/or cooling system (stage two).

A. Well-Connect
B. Optional Return Air Plenum
C. Fossil Fuel Furnace
D. Return Air
E. Supply Air
F. Round Backdraft Damper
G. Custom Backdraft Damper



2. Electric Supply

Well-Connect is a cord-connected appliance and is equipped with an NEMA 6-20P-240v plug. This must be used with a compatible receptacle (See Figure 2) and wired to a single outlet 240 volt, 20-amp circuit using 12 AWG wire in accordance with all state and local codes. Be aware there is an integrated power switch near the power cord on the back of the unit which is also a circuit breaker. Every Well-Connect also includes a data logger which requires a separate 110v outlet for power (see section 10 for more details.) Contact your local electrical contractor for assistance.

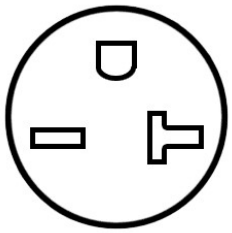


Figure 2

Note Many electric utility providers offer a reduced electric rate for running a geothermal heat pump. This should be investigated before proceeding with any electrical upgrades so a second meter base can be installed on the heat pump circuit if required, as is often the case.

3. Water Supply

Most residential wells utilize a submersible-type well pump, drawing from an aquifer 20ft or more underground. These wells are typically capable of providing anywhere from 6 to 12 gallons per minute of water, but some cannot! A 1.5-ton Well-Connect requires 2 gallons per minute, and a 2.5-ton Well-Connect requires 3.5 gallons per minute, and during very hot or cold days the Well-Connect may run nearly continuously. If you have any doubts about the ability of your well to serve all the needs of your household **PLUS** the Well-Connect, consult your local well drilling professional before proceeding any further.

Note If you have an artesian (flowing) or shallow well with a jet pump, it may be difficult to adapt such a system for use with a Well-Connect for two main reasons:

a. **Temperature:** Being near the surface of the ground, the temperature of the water in a shallow well can vary considerably with the season. That means in the winter, the incoming water temperature may drop below the 45 degree (F) minimum needed to operate a Well-Connect.

b. **Volume:** Most jet pumps struggle to move more than a couple gallons per minute at the higher pressures experienced toward the end of a pump cycle. This means the pump may run for a very long time trying to "catch up" and cycle off; many never do, and will run continuously as long as the Well-Connect is on. This situation is more likely to occur with the 2.5-ton Well-Connect than with the 1.5-ton, but the issue may arise with either model. While not detrimental to the Well-Connect itself, this can result in markedly higher than expected overall power consumption.

Supply water for the Well-Connect must be obtained by tapping into the main household water supply piping. ¾" PEX is often the most convenient material to use for this purpose, but copper, PVC, or CPVC may also be used. Connect the supply water line ahead of (before) any water softener or household iron filter if present, as the Well-Connect does not require softened water.

A spin-down type water filter is included with every Well-Connect (See Figure 3). This must be installed somewhere in the supply water piping, in an accessible location and with a shut off valve ahead of it to allow for easy cleaning. There should also be shut off valves on the supply and discharge lines where the included hoses will connect to the building plumbing for ease of installation and maintenance (See Figure 4). Plan to place these within a couple feet of the back of the Well-Connect.

Figure 3

Figure 4

Follow all applicable state and local codes regarding water piping materials and practices, and insulate all water lines that run through any area of the building or home where condensation is undesirable.

4. Pressure Tank

If the water system relies on a conventional pressure tank setup to maintain household water pressure, Well-Connect recommends sufficient tank capacity to allow a minimum 8-10 minute pump cycle rate when the Well-Connect is running in order to avoid excessive pump cycling. To achieve this, it is recommended that you have a minimum of 16 gallons of draw down available from the well system for the WCVC-16 model and 28 gallons for the WCVC-24 model. Additional pressure tank capacity may be required to achieve the minimum draw down volumes. The following chart (Figure 5) gives general pressure tank capacities, dimensions, and draw down volumes. 60 gallons of tank capacity for the WCVC-16 and 120 gallons for the WCVC-24 are typical. For exact specifications of a given tank, contact the tank manufacturer.

Tank Volume Gallons	Dimensions (in.) Diameter	Height	Draw down (Gallons) 30/50psi
7.6	11	22	2.4
10.3	15	18	3.2
14.0	15	22	4.3
14.0	15	25	4.3
20.0	15	32	6.2
26.0	15	39	8.0
32.0	15	47	9.9
34.0	22	30	10.5
44.0	22	36	13.6
62.0	22	47	19.2
86.0	26	47	26.6
119	26	62	36.8

Figure 5

Note Draw down as expressed in gallons is not equal to the tank capacity expressed in gallons; draw down is much less. Most homes have a single 20 gallon tank for normal household usage. Therefore, a larger or additional tank is often necessary to achieve the desired draw down volume.

If additional tanks are added, they should be located as close to the existing tank as possible and connected with large diameter tubing (1" at least, and greater if the tanks are more than a couple feet apart). If there is too much pressure drop in the line between the tanks, they won't fill evenly and the available drawdown volume may be greatly reduced.

Setting the correct air pressure in any expansion tank is crucial to obtaining the optimum amount of draw down. To do this you will need an air pressure gauge (such as a tire gauge). Proceed with the following steps:

a. Shut the well pump off at the circuit breaker.

b. Open a faucet so water begins to flow out of the system.

c. Monitor the pump pressure switch very closely. Determine the pressure at which the switch closes (they make an audible CLICK). In most cases there is an existing dial-type pressure gauge on the system you can watch, but if it's missing or stuck you may need to take a pressure reading from the existing/old tank at that precise moment using a tire gauge.

d. Let the water continue to flow from the faucet until it stops; at this point the tank (or tanks, if there are more than one) should be completely empty of water.

e. Adjust the air pressure in the tank or tanks so that as they sit empty the air pressure inside is 2 psi **lower** than the cut-in pressure of the switch. For example, if the pump switch closed at 30 psi, the empty tanks should be set to 28 psi. In most cases this means letting air bleed out of a new tank, as they usually come pre-charged with more air than is needed. However, it's possible air may need to be added to an older tank. This can be done with an air compressor or even a bicycle pump.

f. Turn the well pump circuit breaker back on and close the faucet. The system should now be optimized for the greatest amount of drawdown.

If the water system utilizes a constant pressure controller with a variable frequency drive (or "VFD") instead of a traditional on/off pressure switch, special piping and control arrangements should be made to the branch line that supplies the Well-Connect. This is to prevent the pump from consuming substantially more power than necessary when providing a steady, low flow of water over long periods of time. See Figure 6.

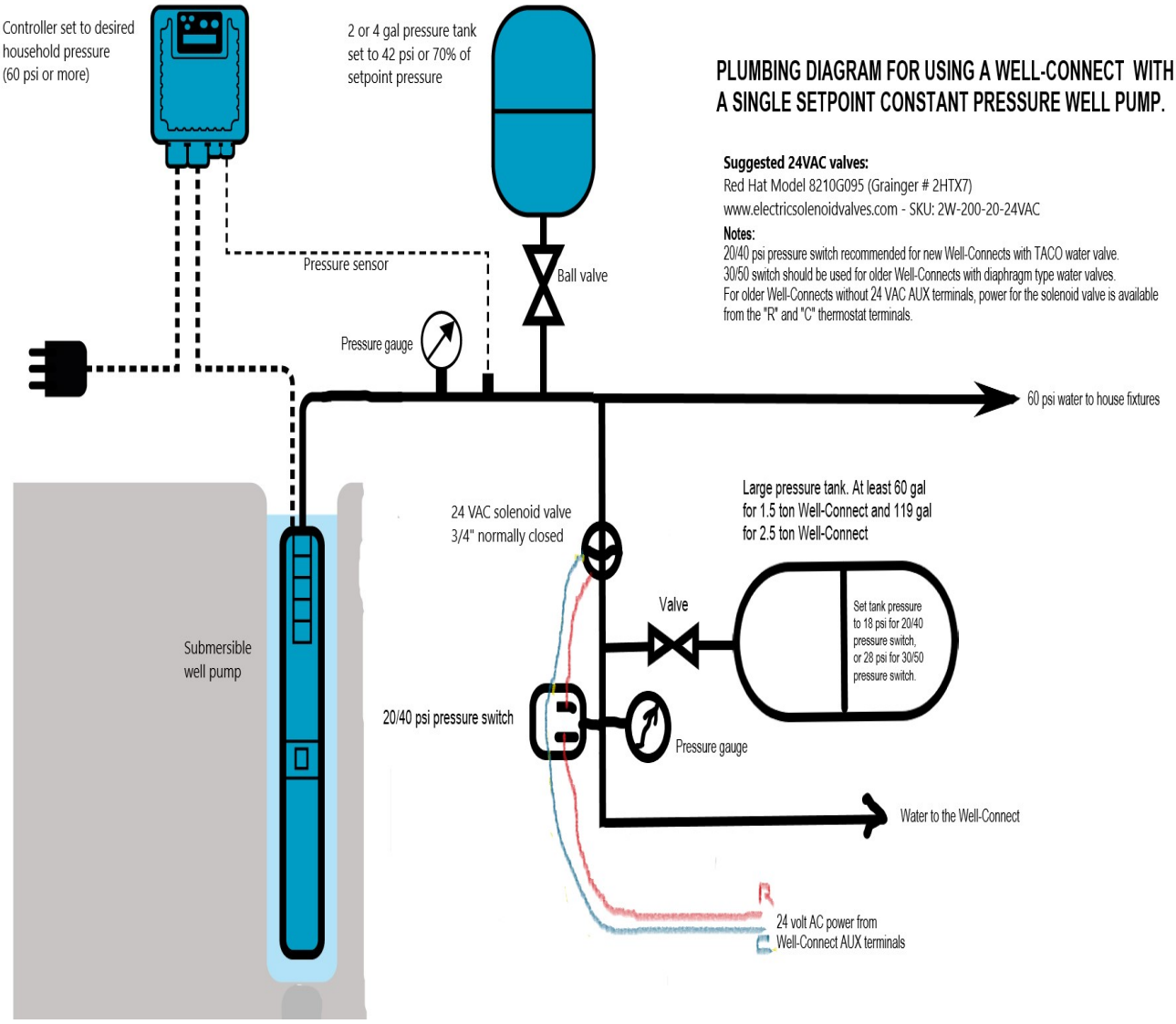


Figure 6

Note You may encounter "cycle stop" valves on the market, which some manufacturers imply produce an effect similar to a variable frequency drive, but at a far lower cost. Don't be fooled, as they are not equal! In fact, a cycle stop valve will cause the well pump to consume more energy than it otherwise would. Cycle stop valves are not appropriate for the low flow rates required by the Well-Connect and should not be used for this application.

5. Discharge Water

Discharge water must be routed outside the building to an "acceptable point of release" which will be site-specific. The discharge water may be routed to a dry well or drain tile, a nearby ditch or body of water, or anywhere that the flow will not create a damaging or nuisance condition. Discharge water should **NOT** be routed into a septic field or other sanitary sewer system, nor can be it dumped into the same well it was pumped out of.

Discharge water lines must be installed in accordance with all state and local codes. The discharge water lines that are inside of the building must be at least 1/2 inch ID (inside diameter) and for best results, the pipe size should be increased to 1.5 inch ID several feet before the pipe exits the building. It **MUST** be sloped downwards toward the exit point; this is to ensure all water drains out of the pipe when the unit shuts off, eliminating the chance for any ice buildup.

The discharge line must be installed in such a manner that it cannot freeze. Well-Connect highly recommends an "air gap" on the outside of the home to allow the complete evacuation of water from the exterior piping when the Well-Connect shuts off. A PVC air gap/freeze stop fitting designed to do exactly this is available for purchase; freezing and system shut down is likely to occur if this is not utilized. The fitting also provides an overflow exit for the discharge water if freezing or blockage occurs in the piping downstream of the fitting. It is highly recommended that all discharge piping configurations include an open end point. Metal fittings should be avoided outside, as they will increase the possibility of freezing. Be sure to thoroughly seal the wall penetration. An example of an air gap set up is shown in wall penetration detail Figure 7.

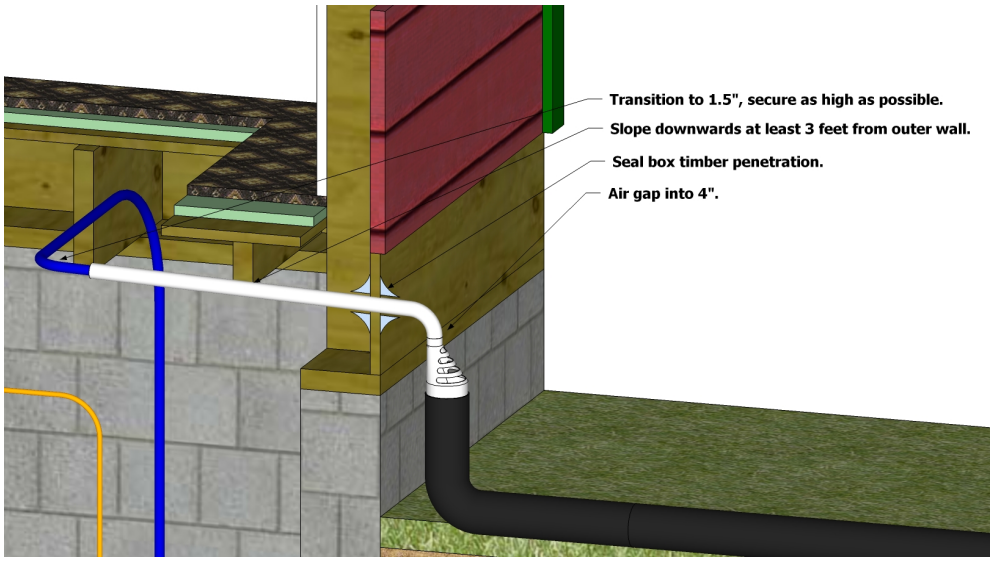


Figure 7

Possible configurations include, but are not limited to, the following examples:

Ground Surface Discharge

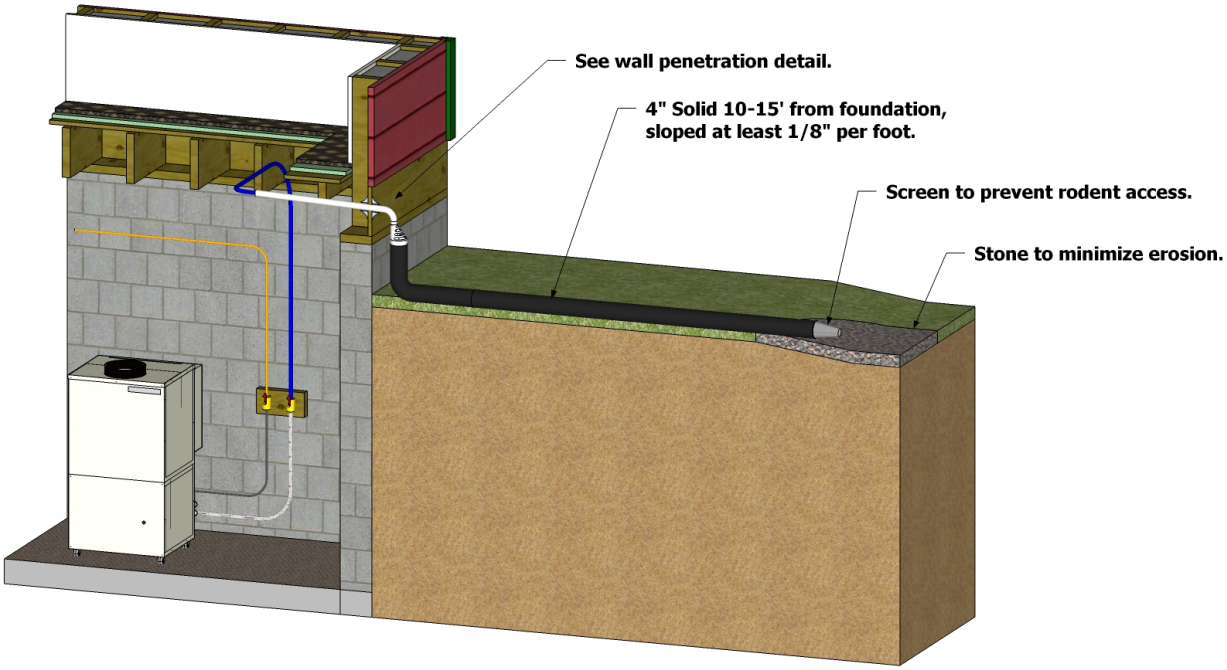


Figure 8

Drain Tile Discharge

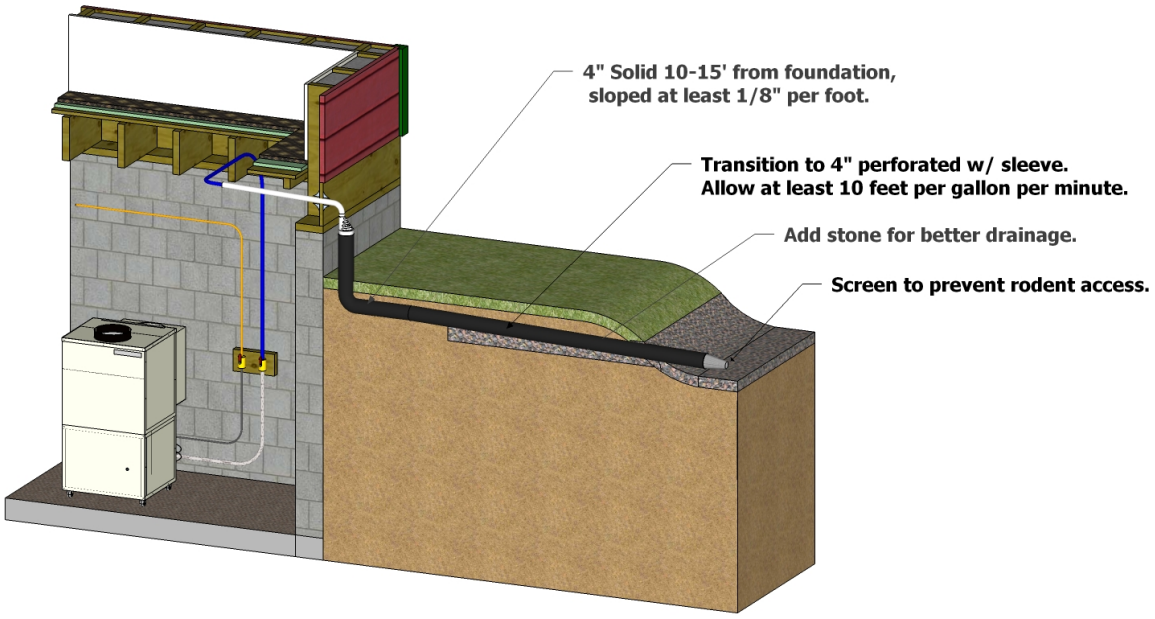


Figure 9

6. Backdraft Dampers

When a Well-Connect is added to an existing furnace in a hybrid application, backdraft dampers **MUST** be installed to ensure proper airflow and to prevent "short-cycling". This type of system will need dampers both **on the outlet of the Well-Connect**, and **on the outlet of the fossil fuel furnace**, upstream of where the Well-Connect supply duct connects to the main duct. Well-Connect can provide a twelve inch (12") round damper for the outlet of the Well-Connect itself. The other damper will need to be sized to the existing ductwork in the home. Examples of these are shown below in Figure 10. Well-Connect has a range of sizes available for both horizontal and vertical mounting configurations; please contact us for details.

Figure 10

Figure 11 below depicts the components involved in a typical hybrid ducted system:

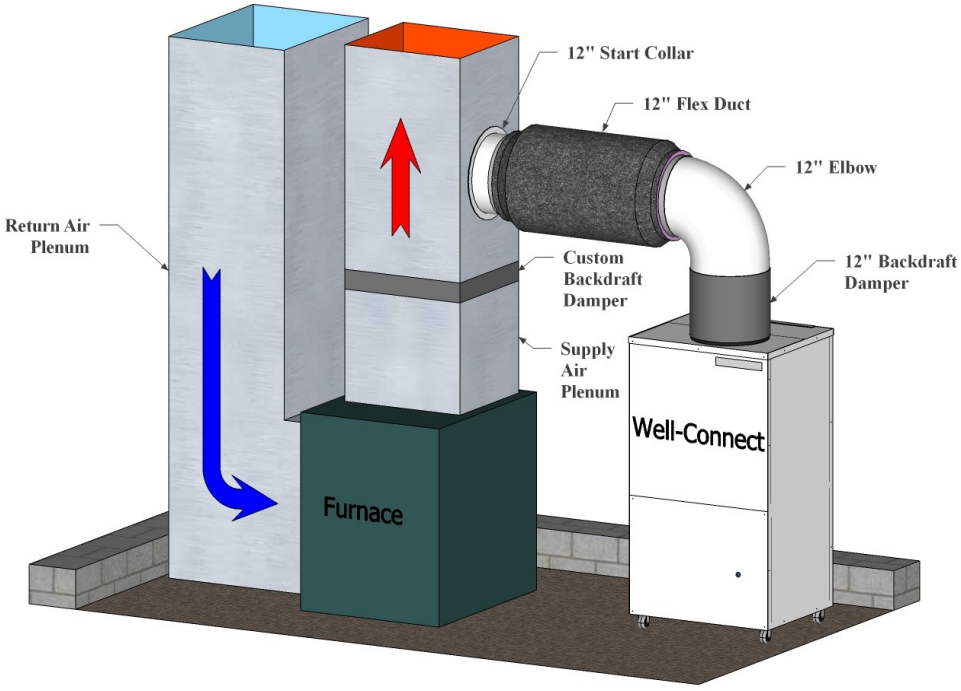


Figure 11

7. Duct Connections

Use good judgment and proper industry practices when designing a ducted air distribution system for the Well-Connect. Keep in mind any exposed supply ductwork may sweat when the Well-Connect is used for air conditioning, so in some cases insulating the ductwork may be necessary. Supply air (and return air, if applicable) must be routed through ductwork suitable for carrying and distributing 600 CFM for Model WCVC-16 or 1000 CFM for Model WCVC-24 with no more than ½" total static pressure. In a hybrid application the ductwork must be arranged such that the Well-Connect is in parallel with, rather than in series with, the fossil fuel furnace and ideally the ductwork can be sized such that both the Well-Connect and fossil fuel furnace can run at the same time. In rare applications it may be necessary to only run one at a time, or to create a separate return duct for the Well-Connect. It is up to the installer to determine what is both possible and practical based on trial and actual pressure measurements, as well as installer experience. Some systems may be easy to adapt to, while some may require ductwork modifications, and still others may simply not be a good fit for this type of Well-Connect application.

The Well-Connect has a constant torque ECM blower motor that is pre-set for the most efficient operation. To a certain degree, the motor will automatically adjust its speed to maintain proper airflow. However, the ECM motor cannot compensate for extremes such as poorly designed and sized ductwork or extremely dirty air filters. If the steady state air side heating Δ T is greater than 30°F (17°C) with a new air filter in place, consult a factory rep for diagnosis and possible solutions. Do not change the sealed ECM motor speed taps without factory authorization.

If a ducted return is desired, a special return air plenum is available that mounts on the back of the Well-Connect just inside the flanges and can be adapted to a number of return air configurations. The plenum is roughly 29" high, 19" wide, and 12" deep. It can accommodate round duct flanges up to 14" diameter on any of three sides, so you can determine how best to fit the return ducting for your application. An image of Well-Connects fitted with this return plenum (as seen from behind) is shown in Figure 12. Note the round ducting is not included, it is shown for illustration purposes only.

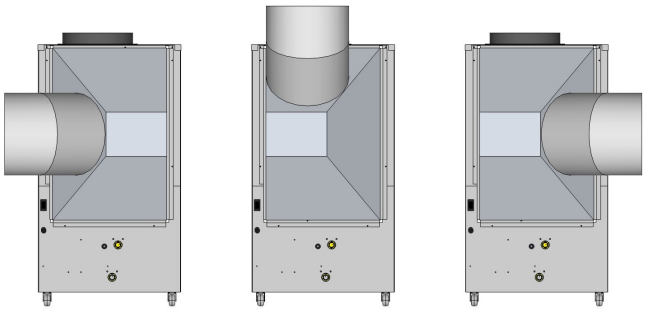


Figure 12

An Important Note Regarding Return Duct Location and Sizing:

Careful return air duct sizing and take-off location is critical to proper stage-2 hybrid operation. Overly restrictive return air configurations will result in very high (and inefficient!) air deltas during stage-2 operation, and could cause the furnace or Well-Connect to trip their high-limit safety switches during stage-2 run time. While this can be an issue with any furnace and Well-Connect combination, it is most pronounced in situations where a 2.5 ton Well-Connect is paired with a furnace of 80,000 btus or more, and where the Well-Connect return duct has been tied in very close to the furnace intake in a section of borderline-sized return duct. The photos below in Figure 13 show three such systems, all experiencing high deltas causing furnace hi-limit faults or Well-Connect hi-pressure lock-outs.

Figure 13

In the first photo, the section of return duct feeding the furnace where the Well-Connect return duct is attached is only 10" x 24", which is just large enough to provide enough air for the 125K BTU furnace on high fire (a furnace needs 2 sq.in of return duct per 1000 BTU). When the Well-Connect and the furnace are both running there is simply not enough air available in that section of duct, so both units are starved for air resulting in high temperature rise in both. In all three photos, the Well-Connect returns are tied into a vertical return duct very close to the inlet of the furnace itself; this should be avoided. Such vertical returns generally connect to trunk ducts that provide appropriate connection points for the WC return duct. In extreme cases where the entire existing return duct configuration is undersized it may be necessary to provide a separate return duct serving just the Well-Connect.

Alternately, if the return is not ducted at all, make sure there is an unobstructed return air path from the household supply registers back to the Well-Connect. Air can't move through closed doors!

Note the air filter flange is made of four separate pieces, each held in place by two screws. This is so you can remove the air filter from the top or either side, depending on which direction is easiest to access for a given application.

An Important Note Regarding Use Of Bypass Humidifiers:

A bypass humidifier, also called a 'flow-through" humidifier, allows a portion of the hot air from the furnace discharge plenum to flow directly back into the return air duct, bringing with it some 'humidity' picked up as the hot air passes over the wet pad in the humidifier. This arrangement actually creates a 'short circuit' that lets heated air just recirculate between the supply and return ducts of the furnace rather than moving through the duct system to the rooms of the house (see Figure 14). Because most fossil fuel furnaces are significantly oversized, a bypass humidifier can operate without noticeable impact on furnace performance.

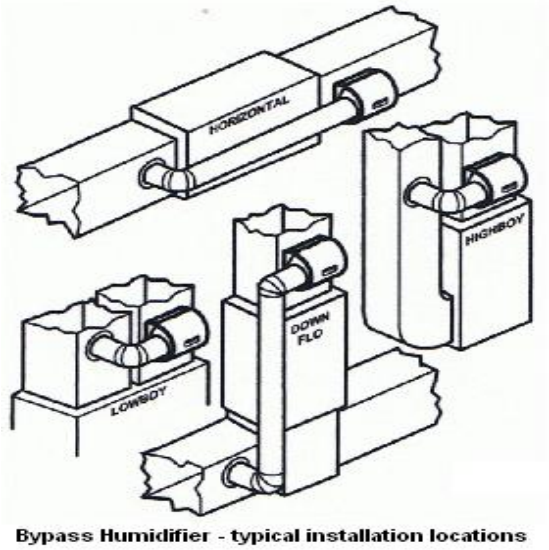


Figure 14

When a Well-Connect is installed in a hybrid application with a furnace, the bypass humidifier arrangement can significantly reduce the capacity and efficiency of the Well-Connect because up to 50% of the Well-Connect's air flow can remain 'trapped' in the short circuit created by the bypass humidifier rather than carrying heat to the living space of the house. To prevent this, a damper must be installed in the bypass duct and kept in the closed position. Some bypass humidifier installations may already have a damper in place (Figure 15) especially if the furnace has air-conditioning. Also, many newer bypass humidifiers have a damper built right into the humidifier body. **The damper must be closed** for proper operation of the Well-Connect.

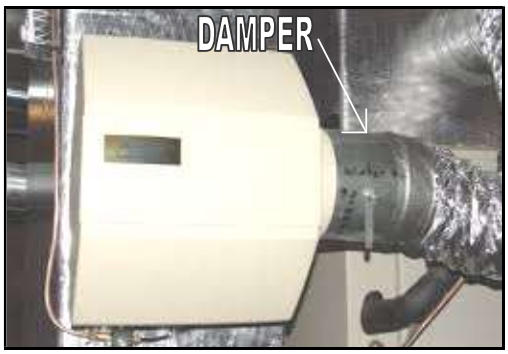


Figure 15

Options For Humidifying In A Well-Connect Hybrid System:

Because the heated air leaving the Well-Connect is not as hot as the air produced by a fossil fuel furnace, there is typically less need for humidification. That said, an existing bypass humidifier can be set up to allow humidification whenever the furnace is called on for supplemental heating, typically during the coldest weather when humidification is most needed. To do this, the manual damper in the humidifier duct must be replaced with a motorized damper that will open automatically whenever the furnace is providing heat. With most furnaces this is easily accomplished by using a readily available 6" normally-closed damper with a 24 VAC motor that is wired to the 'C' (common) and 'W' (heat) terminals on the low voltage terminal strip in the furnace (Figure 16).

6" Normally Closed Motorized Damper

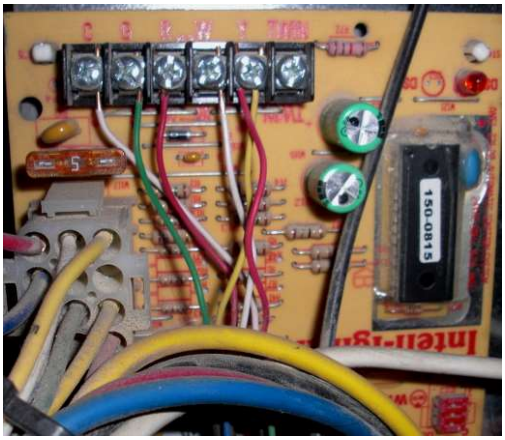
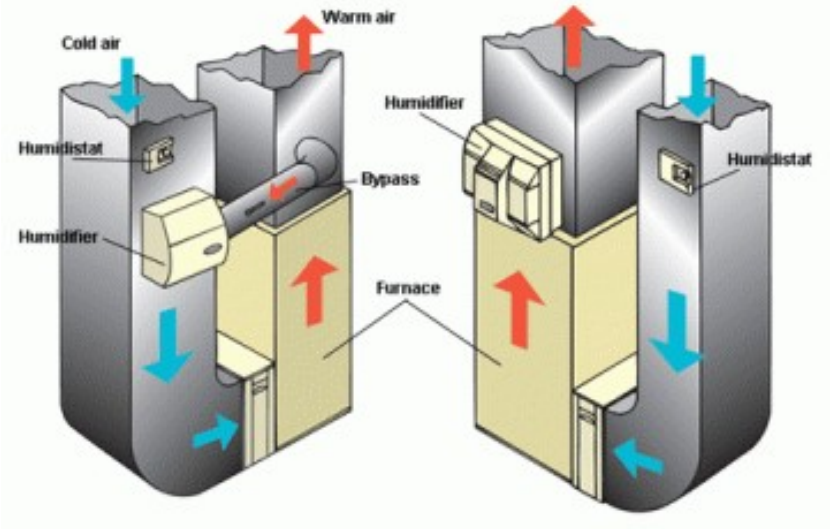


Figure 16

Another option is to use a fan powered humidifier that mounts directly on the supply duct of the furnace, does not require a bypass duct, and can be operated whenever the Well-Connect and/or the furnace is providing heat for the house. For best results, a fan powered humidifier can be mounted on a plenum fabricated for the Well-Connect itself. Figure 17 below illustrates the difference between a bypass humidifier and a fan-powered humidifier.



Bypass Humidifier | Fan-Powered Humidifier | Fan-Powered Humidifier on a Well-Connect

Figure 17

8. Hose Kit

Your Well-Connect includes one stainless steel braided supply water hose and one black rubber discharge water hose. Both supply and discharge lines should terminate at the Well-Connect using the included flexible hoses to facilitate movement of the Well-Connect should it be necessary for service, maintenance, wall access, etc. Screw the brass flow restrictor to the "water in" port on the back of the Well-Connect and attach the stainless supply water line to it (See Figure 18). Connect the black discharge water line to the "water out" port. These hoses should then be connected to the valves depicted back in Figure 4. Should you ever need to replace the supply side hose, rubber hoses are not recommended because they may deteriorate, leak or burst over time; both hoses should be pressure rated hoses, which are available in most home improvement stores.

Figure 18

When connecting fittings and/or tightening the water hoses, be sure to use a backup wrench to secure the copper fittings protruding out of the Well-Connect. Allowing them to turn, even slightly, may cause serious damage to internal components. Furthermore, being garden hose connections, the hoses shouldn't be torqued much beyond "hand tight" to seal properly anyway.

Note There is also a 3/8" barb connection for condensate water discharge. This must be run to a drain or other acceptable point of release, and may be done with flexible vinyl tubing. Do not route this line more than ten feet above the unit or the internal condensate pump may not be able to expel water properly.

9. Control Wiring

Thermostat selection: A thermostat capable of controlling a heat pump and at least one stage of second stage heat is recommended for this application; this is often denoted as "2-heat, 1-cool heat pump" operation. The relay necessary to operate an existing fossil fuel furnace to provide second stage heating is already installed in the Well-Connect control box. Operating more than two stages of heat or one stage of cooling will require more advanced controls.

If the Well-Connect is being installed in an existing house (as opposed to new construction) it may be worthwhile to consider using a wireless thermostat, as this eliminates the need to fish a multi-conductor wire through walls and other spaces that may be difficult to access. These thermostats come with two main components: a battery powered thermostat that goes on the wall in the house, and a receiver that can be located near the equipment to be controlled (in this case, the Well-Connect). The Well-Connect can then be wired to the receiver with a much shorter section of wire than what would normally be needed.

Note You may also encounter "Wi-Fi" thermostats, but be aware that **"Wireless" and "Wi-Fi" are not the same thing**! Wi-Fi enabled thermostats can connect to the internet, but are not necessarily "wireless" to the equipment; these are two completely different designations.

Thermostat wiring: Controlling the Well-Connect itself requires five conductors, but six conductor thermostat wire is recommended to allow for second stage heat operation. Connections are made at the terminal block just inside the lower front panel as seen in Figure 19. (You may want to run the thermostat wire into the machine through a grommet in the back.)

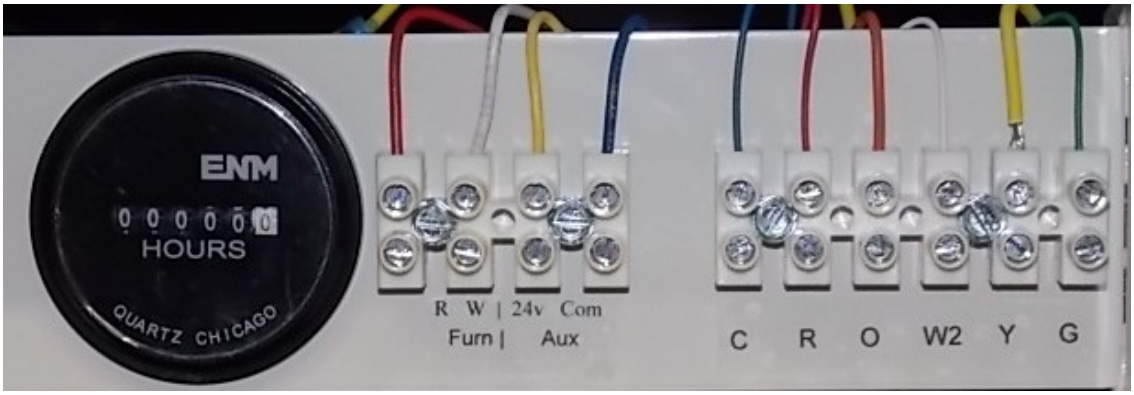


Figure 19

The function of these terminals, and the wire colors that would normally be used, are as follows:

C – 24v common (blue)

R – 24v power (red)

O – reversing valve, energize in cooling (orange)

W2 – second stage heat relay (white)

Y – compressor contactor (yellow)

G – fan relay (green)

Broadly speaking, the corresponding terminals in your thermostat (or t-stat receiver) should use the same designations as those on the terminal block in the Well-Connect. However, as every thermostat model is unique, refer to your thermostat's installation manual for guidance.

You'll notice there are four other terminals in the Well-Connect, marked R-W (Furn) and 24v-COM (Aux). The terminals marked R-W (Furn) are for operating the existing furnace as second stage. To do this, run a piece of two-conductor thermostat wire between these R and W terminals in the Well-Connect and the matching terminals in the existing furnace -- i.e., connect the R on the terminal strip to the R in the furnace, and the W on the terminal strip to the W in the furnace. If the low voltage terminal strip in the existing furnace has W1 and W2 terminals, use only the **W1** terminal for the connection to the Well-Connect. **Do not remove any existing wires from the terminal strip in the furnace.** It is OK to have two low voltage wires on the same terminal, allowing the existing thermostat to operate the existing furnace if needed.

Note If a 2-stage furnace is used for supplemental heat and ductwork is too restrictive, a situation may arise where the 2-stage furnace only trips the limit switch when it goes into high fire. In this case the furnace should be configured to only operate on low fire, which in most cases will still be more than adequate for supplemental or even whole house heat. Most 2-stage furnaces can be set up to run on a single stage thermostat, which means the furnace uses a timer based logic to decide when to go from low fire to high fire. There is typically a dip switch setting on the furnace control board that determines whether it responds to a 1-stage or 2-stage thermostat. It needs to be set for 2-stage operation, with the Well-Connect wired to the "R" and **"W1"** terminals in the furnace. This will ensure the furnace only operates in low-fire mode when providing supplemental heat as needed.

The remaining terminals in the Well-Connect, marked 24v and COM, are an extra 24vac terminal pair powered through the Well-Connect's internal transformer that may be used to operate auxiliary controls such as relays, dampers, valves, etc.

Note The Well-Connect is not configured to control another appliance for second stage cooling. If a home has an existing central air unit, the easiest way to operate it may be to simply leave the setpoint for the thermostat that controls it a few degrees above the cooling setpoint for the Well-Connect; that way, if the Well-Connect doesn't maintain temperature on a hot day, the other system will activate on its own. Alternatively, some thermostats can be configured to activate multiple stages of cooling, and it may be possible to automate this transition using a relay configuration. This would need to be devised by the installer however, as each installation may be slightly different.

Thermostat Placement: For stand-alone and self-ducted Well-Connect applications, the thermostat may be placed almost anywhere in the space to be conditioned. However, avoid locations where it may be subject to temperature changes from direct sunlight, discharge air from the Well-Connect, or any other heating or cooling source. For a hybrid application, the thermostat should be placed in close proximity to the existing thermostat (Figure 20).

Figure 20

Thermostat programming: **Most digital thermostats will require configuration of several parameters within a setup menu upon initial startup in order to function correctly.** Here again, every thermostat model is unique and you will need to follow the manufacturer's instructions carefully. In general though, here are a few settings you'll want to make sure are entered accurately:

- System Type should be set to "heat pump" as opposed to "conventional". More specifically, this is a single stage heat pump with auxiliary heat, or "2-heat, 1-cool".
- Auxiliary heat should be set to "electric" even if it's a fossil fuel furnace: this will allow both first and second stage to operate simultaneously.
- The "O" terminal should be energized in cooling mode.

Thermostat calibration: In some cases, the Well-Connect thermostat may need to be calibrated to match the existing thermostat. For calibration procedures reference the thermostat owner's manual.

If you have any questions during setup, please contact your dealer for assistance.

10. Data Logger

Every Well-Connect includes a wireless “Nano” data logger which monitors system performance. It allows the homeowner to observe system operation from any device with internet access, helps keep track of energy savings, and can even send alerts to a service contractor if certain parameters get out of the desired range. The Nano needs two things to operate: power and Wi-Fi internet access.

Power:

To activate a “Nano” wireless data logger, first make sure the included wall transformer is plugged into a nearby outlet and the barrel plug is fully inserted into the port labeled "J1 Pwr" in Figure 21 here:

Figure 21

If power is connected, the status light should be visible (it may blink one of several colors) through the end of the enclosure, as seen here:

Connecting to the Internet, Option 1: WPS Button

There are two ways to connect the Nano to the home network. The preferred method is to use the WPS button recessed into the end of the enclosure near the status LED. It can be activated using a pen point or paper clip. To connect the Nano to a wireless router, click the Nano WPS button (the status light should change to BLUE) and then press the WPS button on the home's router within two minutes.

Note: depending on the make and model of the wireless router, it may or may not have a button labeled "WPS". Different manufacturers may use a symbol instead, such as  or  or something else entirely. If you're unsure where the button is, consult the wireless router owner's manual.

The Nano's status LED should change to blinking GREEN once it connects to the internet. Once connected, the Nano will remember the new credentials and use them in the future. No further action is necessary.

Connecting to the Internet, Option 2: Manual Entry

If the router has no WPS button or the wireless network is configured in a manner such that connection via the WPS protocol is prohibited, there is a second method available. The Nano has a built-in access point and web server that can be used to enter the Wi-Fi information. To do this you will need a Wi-Fi device with a web browser (such as a smart phone or laptop) and the home's Wi-Fi name and password.

Once the Nano is powered up, search for it among available Wi-Fi networks. It will appear as it's own Wi-Fi network, where the SSID will be: NANO_WELXXXX (with XXXX being the Nano's individual ID, which is a four digit number printed on the lid of the logger). A password is required to gain access. The default password is: WellConnect

Once you have connected to the Nano, enter the following IP address into the browser's URL entry field:

http://192.168.4.1

This address will take you to the Nano's home page, which will display the WEL ID and allow you to enter the Wi-Fi name and password. (Hint: If you click on the word "Scan" on this page, it will find all available networks. Then you only have to enter the password next to the network you wish to use.) Enter the data (capitalization does matter) and click the "Submit" button. The LED should change to blinking GREEN once the Nano connects to the internet.

Status Light Indicators:

Green Slow Blink: Nano is online and able to post data.

Green Medium Blink: Nano is currently connecting to Wi-Fi router.

Green Fast Flash: Nano is currently posting data.

Blue Medium Blink: WPS Mode: Nano is waiting for WPS button press on Wi-Fi router.

Blue Fast Flash: Nano is synching time with internet.

Red Slow Blink: Nano is posting data, but there is a problem with a temperature sensor.

Red Medium Blink: Nano is connected to Wi-Fi router but cannot post data.

Red Fast Flash: Nano is not able to connect to the Wi-Fi router.

Amber Medium Blink: The Nano is checking for new firmware from the web.

Amber Fast Flash: The Nano is downloading new firmware from the web.

Accessing the "Live View" Web Page:

Note your Nano ID number, which is a four-digit figure located on the tag on the cover. The live view can be seen at www.welserver.com/perl/view/(your logger number here). As an example, if your logger number was 7000, your website would be:
www.welserver.com/perl/view/7000

If there is a power outage, or you lose internet for any reason, the Nano will automatically re-connect when the utilities are restored. If you have any further questions or issues, contact the Well-Connect office.

11. System Start Up

When you're ready to start the Well-Connect, first make sure both the supply and discharge water valves are open. Then turn the power switch on (located near the power cord on the back of the unit) and set the thermostat to your desired temperature. When the thermostat calls for heating or cooling, the blower will start first, then water will flow, then the compressor will start and the unit will begin providing heating or cooling as requested.

Note If the Well-Connect was sitting in a sub-freezing environment immediately prior to startup, the anti-frost switch on the air coil vapor line may have opened, which will prevent the compressor from starting. In this case, the installer will need to set the thermostat to heating mode, manually open the water valve, and push in and hold the buttons in the center of the contactor to force the compressor to operate. After two minutes, the contactor can be released and the unit should stay running.

The Start Up Report at the front of this manual **MUST** be completed by a qualified individual and submitted to Well-Connect to activate the warranty. (It can be a picture of the report, filled out.) This means the Well-Connect along with the second stage systems must be run in both heating **AND** cooling modes until steady-state operation is achieved, and ensure all system Δ Ts remain within acceptable ranges for the equipment involved.

12. Geothermal Tax Credit Certificate

GEOTHERMAL TAX CREDIT CERTIFICATE

This Manufacturer's Certification Statement certifies that certain Terra Caloric products meet or exceed the requirements of the Energy Star program with regard to efficiency and therefore are eligible for the tax credits identified in the American Recovery and Reinvestment Act of 2009. The IRS published a tax Notice 2009-41 detailing guidance regarding "Credit for Residential Energy Efficiency Property."

In accordance with the IRS guidelines, Terra Caloric has determined the following products are "Eligible Residential Energy Efficient Property" and qualify for the credit allowed under the Internal Revenue Code Section 25D, Section (a)(1) for the Well-Connect Geothermal Heat Pump plus installation costs when purchased and installed through December 31, 2021 on or in connection with a qualified dwelling unit in the United States.

Terra Caloric Products Eligible for Tax Credits:

Well-Connect Geothermal Heat Pump: Model WCVC16XX
Well-Connect Geothermal Heat Pump: Model WCVC24XX

Under penalties of perjury, I declare that I have examined this certification statement, and to the best of my knowledge and belief, the facts are true, correct and complete.

Tim Schultz
President, Terra Caloric, LLC

For your records (homeowner to complete this section):

Taxpayer's Name: _____

Product Purchased: _____

Price Paid for Product: _____

Date of Purchase: _____

Name of Installer: _____

Date of Installation:

The tax payer should retain this certification statement as part of their tax records.
Note: All information is based upon our understanding of the legislation.
The taxpayer is advised to consult their tax professional.

Terra Caloric, LLC
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Hybrid Geothermal
WELL CONNECT

Installation Guide

REV 12-16-2022