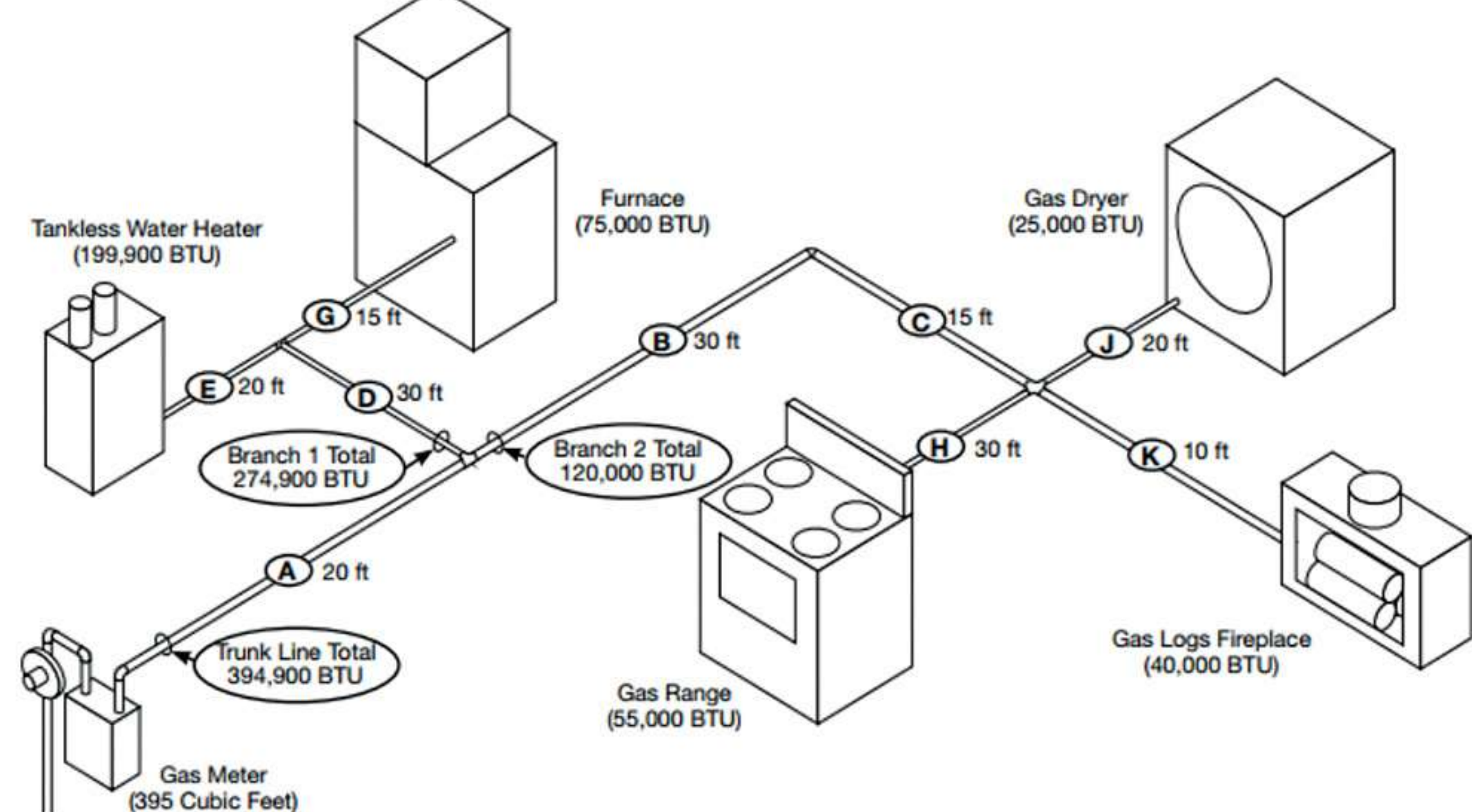


Gas Pipe Sizing and how it affects the functionality of your 45



Figure 1 - Typical Gas System with a Tankless Water Heater



Determining The Required Meter and Regulator size

Find the BTU requirement of each appliance in the home. In our example above, we have the following: 199,900 BTU Tankless, a 75,000 BTU Furnace, a 55,000 BTU Range, a 25,000 BTU Dryer, and a 40,000 BTU Gas Log Fireplace. The sum of these appliances is 394,900 BTU. Since most gas regulators and meters are rated in Cubic Feet per Hour, we need to convert the BTU calculation to ensure they are sized correctly. Divide total BTU by 1,024 to get the estimated Cubic Feet per Hour (CFH) requirement for the meter and regulator; 386 CFH in our example.

If the water heater was a typical tank type at 40,000 BTU, then the overall system requirement would have been just 235,000 BTU with a meter and regulator rated at 235 Cubic Feet per Hour. A typical household meter and regulator is commonly rated at 250 Cubic Feet per Hour. As you can see that in the example above, when you change the water heater to a tankless, the existing regulator and meter would be potentially undersized. It is important to have a properly sized meter and regulator on the system; otherwise, the appliances on the system could experience operational issues. The local gas utility can provide more information on upgrading the meter and regulator for the home.

Hybrid pressure systems, with a 2 psi static pressure with regulators at each appliance, are sized differently than in this example. Consult your local gas supplier or the National Fuel Gas Code in regards to these type systems.

Pipe Sizing Methods

There are two basic pipe sizing methods: longest length and branch length. Proper sizing will allow the system to maintain the required minimum pressure drop.

In the longest length method, the pipe size of each section should be determined by using the longest length of piping from the point of delivery, the gas meter or regulator, to the most remote outlet and the load of the section.

In the branch length method, the pipe size of each section of the longest pipe run, from the point of delivery to the most remote outlet, should be determined by the longest run of piping and the load of the section. The pipe size of each section of branch piping should be determined using the length of piping from the point of delivery to the most remote outlet in each branch and the load of the section. Branch length sizing is the most common method.

Determining Pipe Size by Length and Capacity

We will need to calculate the total load of the system and each branch. In our sample system, Figure 1, measure and add the lengths of pipes at each section. Total the BTU of the appliances for each branch line and the main trunk line back to the gas meter. Select the appropriate sized gas line based on length, BTU capacity, and pressure drop from Table 2, Table 3, or Table 4.

Line Segment	Appliance	BTU Required	Line Length	Minimum Pipe Size Required	
				0.3 w.c. drop	3.0 w.c. drop
Branch 1	E Tankless Water Heater	199,900	20 ft	1"	½"
	G Gas Furnace	75,000	15 ft	½"	½"
	D Branch Main Line	274,900	30 ft	1"	¾"
Branch 2	J Gas Dryer	25,000	20 ft	½"	½"
	H Gas Range	55,000	30 ft	½"	½"
	K Gas Logs	40,000	10 ft	½"	½"
	B + C Branch Main Line	120,000	45 ft	¾"	½"
Main Trunk	A Main Trunk Line	394,900	20 ft	1 ¼"	¾"

You can see that, in a typical gas system, a tankless water heater with a capacity of 199,900 BTU will require a 1-inch pipe size for a 20 ft branch length (based on the 0.3 in w.c. pressure drop in Table 2). The same appliance would require just a ½" pipe size based on Table 4 the 3.0 in w.c. pressure drop.

A branch line is a pipe off the main line that feeds a group of appliances. In our example, we have two branch lines. The pipe size of the main pipe on the branch must be sized based on the total BTU of all the appliances on that branch line and pipe length.

The trunk line pipe is the main pipe from the meter/regulator that feeds the different branches. The trunk line must be sized based on the total BTU from each branch-line system or the sum of the total BTU of all the appliances on the system and pipe length.

Items such as elbows, tees, and valves are not included in these sample calculations. Their equivalent pipe length should be included when sizing gas systems. It is recommend that a licensed gas tradesman size, design, and install the gas system.

Pipe Sizing Formula and Factors

You can calculate the required inside diameter of the piping required for a specific appliance/system capacity and length.

Calculate Q by dividing the BTU capacity of the appliance(s) by 1,024.

To determine the allowable pressure drop, find the system static input gas pressure using a Manometer. Then, find the highest minimum gas pressure from all the appliances, usually listed on the appliances rating label. Subtract the highest minimum gas pressure from the static input gas pressure to get the difference. For example, the input static pressure is 7 in. w.c.; the highest minimum pressure is 6 in. w.c.; leaving a difference of 1 in. w.c. In this example the system can have a .5 in. w.c. pressure drop based on Table 3. If the input pressure was 9 in. w.c., in this example, then a 3.0 in. w.c. pressure drop based on Table 4 would be allowable.

$$D = \frac{Q^{0.381}}{19.17 \left(\frac{\Delta H}{Cr \times L} \right)^{0.206}}$$

For additional sizing information for Hybrid Pressure Systems, Propane Gas Systems, and Corrugated Stainless Steel Tubing, see the 2012 Edition of the National Fuel Gas Code, NFPA 54, ANSI Z223.1, or consult with your local gas utility or code officials.

The information in this brochure is for educational purposes only; it is not meant to be an engineering guide or supplement any national or local code. All national and local codes must be followed. Refer to the National Fuel Gas Code, your local gas supplier, or your local code official for information. Gas systems should be designed, installed, and inspected by a certified and licensed gas fitter, engineer, or tradesman. The information in this guide does not apply for installations in Canada, see CAN/CSA B149.1 for details or consult with your local code official.

Gas Pipe Capacity Charts

Nominal Dia.	Pipe Size (in.)					
	½	¾	1	1¼	1½	2
Length (ft)	Capacity in BTU per Hour**					
10	134,144	279,552	526,336	1,085,440	1,617,920	3,123,200
20	92,160	192,512	363,520	743,424	1,116,160	2,140,160
30	73,728	154,624	290,816	596,992	893,952	1,720,320
40	63,488	132,096	248,832	510,976	764,928	1,474,560
50	56,320	116,736	220,160	452,608	677,888	1,310,720
60	51,200	106,496	199,680	409,600	614,400	1,187,840
70	47,104	97,280	183,296	376,832	565,248	1,085,440
80	43,008	91,136	171,008	351,232	526,336	1,012,736
90	40,960	84,992	160,768	329,728	493,568	950,272
100	38,912	80,896	151,552	311,296	465,920	898,048

** Calculated based ANSI Z223.1-2012 Table 6.2(a) using 1,024 BTU per Cubic Foot of Gas

Nominal Dia.	Pipe Size (in.)					
	½	¾	1	1¼	1½	2
Length (ft)	Capacity in BTU per Hour**					
10	176,128	368,640	694,272	1,423,360	2,140,160	4,116,480
20	120,832	252,928	477,184	979,968	1,464,320	2,826,240
30	97,280	203,776	382,976	786,432	1,177,600	2,273,280
40	82,944	174,080	327,680	672,768	1,008,640	1,945,600
50	73,728	154,624	290,816	596,992	893,952	1,720,320
60	66,560	140,288	263,168	540,672	809,984	1,556,480
70	61,440	129,024	242,688	497,664	745,472	1,433,600
80	57,344	119,808	225,280	462,848	693,248	1,331,200
90	53,248	112,640	211,968	434,176	650,240	1,249,280
100	51,200	106,496	199,680	409,600	614,400	1,187,840

** Calculated based ANSI Z223.1-2012 Table 6.2(b) using 1,024 BTU per Cubic Foot of Gas

Nominal Dia.	Pipe Size (in.)					
	½	¾	1	1¼	1½	2
Length (ft)	Capacity in BTU per Hour**					
10	464,896	971,776	1,829,888	3,757,056	5,628,928	10,842,112
20	319,488	667,648	1,257,472	2,582,528	3,868,672	7,451,648
30	256,000	536,576	1,009,664	2,073,600	3,068,672	5,984,256
40	219,136	458,752	864,256	1,774,592	2,659,328	5,121,024
50	194,560	396,288	765,952	1,572,864	2,357,248	4,539,392
60	176,128	368,640	694,272	1,425,408	2,135,040	4,112,384
70	161,792	338,944	638,976	1,310,720	1,965,056	3,783,680
80	150,528	315,392	593,920	1,219,584	1,827,840	3,519,488
90	141,312	295,936	557,056	1,144,832	1,715,200	3,302,400
100	134,144	279,552	526,336	1,081,344	1,619,968	3,119,104

** Calculated based ANSI Z223.1-2012 Table 6.2(c) using 1,024 BTU per Cubic Foot of Gas

The information in this article is meant for educational purpose only; it is not meant to be an engineering guide or supplement any national or local code. All national and local codes must be followed. Refer to the National Fuel Gas Code or your local gas supplier or code official for information. Gas systems should be designed, installed, and inspected by a certified and licensed gas fitter, engineer, or tradesman.

Gas Piping Facts: Information for properly sizing gas lines for use with tankless water heaters



Eccotemp Systems, LLC. Tankless Water Heating



GAS PIPING FACTS

Information for properly sizing gas lines for use with tankless water heaters

With any gas appliance, it is essential that the gas supply system be properly sized to support the BTU load of the system. Tankless water heaters can be a great solution to provide hot water; however, most tankless water heaters have a BTU capacity ranging from 140,000 to 200,000 or more, which makes a tankless water heater one of the largest single appliances on a typical gas system. It is necessary to ensure that the system can handle the capacity of the tankless water heater along with all other gas appliances on the system. This guide will address the fundamentals and facts of gas pipe sizing for low-pressure (under 2 psi) natural gas systems using rigid iron pipe.

Gas Pipe System Facts

Will a tankless water heater work on a ½-inch gas line?

Yes and No. A typical residential gas system is a low-pressure system, meaning that the home is supplied with a gas pressure around 7 in. w.c. (inches of water column). The piping must be sized sufficiently enough so that the pressure drop is a half an inch of water column or less, when all the gas appliances are on. This can be the limiting factor when trying to use the existing piping and upgrading from a typical tank-type water heater to a tankless water heater. Typically, the gas piping has to be upgraded to support the tankless water heater due to the volume of fuel that is required. Tables 2 and 3 provide the capacity by pipe size and length based on the maximum allowable pressure drops. In all cases, a near 200,000 BTU gas appliance will require a minimum of a ¾-inch gas supply line.

In specific conditions, a ½-inch gas line may be used. In the 2012 National Fuel Gas Code (NFPA54, ANSI Z223.1), a 3.0 in. w.c. pressure drop chart was added for certain conditions. This chart allows a 200,000 BTU gas appliance to be installed on a ½-inch gas line up to 40 ft. in length. However, the following conditions must be met: The minimum static gas pressure must be 8 in. w.c. or greater; The calculated dropped pressure (the static pressure minus the 3.0 in. pressure drop), must be greater than the highest minimum gas pressure required by any of the gas appliances on the system. See Table 4 for pipes sizes and capacities with a 3 in. w.c. pressure drop. To select the correct diameter pipe, first determine the natural gas supply pressure for the system.

Will an existing regulator and meter support a tankless water heater?

Newer construction gas systems are typically a hybrid pressure system, where the incoming pressure is around 2 psi and each appliance or group of appliances are served by a single regulator. In many older areas and buildings, the system is supplied with a single, low-pressure gas system (around 7 in. w.c.) from the provider. In either case, the capacity of the regulator(s) and meter would need to be checked to ensure that the system can supply enough gas to support the addition of a tankless water heater to the system. On low-pressure systems, the pressure must be greater than the highest minimum requirement of the gas appliances plus the associated pressure drop.

What size gas line will I need for my tankless water heater?

The gas line size will depend on BTU rating of the water heater, the other gas appliances, and where they are installed on each branch from the meter and regulator. There are two methods for determining the required pipe size: the longest length method or the branch length method. See "Gas Pipe System Sizing" for more information.

How do I tell what size regulator or meter I have?

Each meter has a capacity in Cubic Feet per Hour (CFH). Locate that number regulator and multiply it by 1,024 (BTUH/CFH) to give you an approximate BTUH capacity for natural gas. The capacity of the meter and regulator must be greater than the total sum of the maximum BTU rating of all the appliances in the home. If the capacity of the system is too small, the gas appliances will not receive the volume of gas required for proper operation.

What do all these different gas pressures mean?

Gas pressure can be measured in two ways: pounds per square inch (psi) or Inches of Water Column (in. w.c.). The high-pressure side of hybrid pressure gas systems commonly measured in pounds per square inch. This pressure is around 2 psi. Inches of Water Column is typically used to measure low-pressure gas systems, which is what feeds most appliances. For example, there are 27.7 in. w.c. in 1 psi.

What is Inches of Water Column?

Inches of water column is a measurement of how much force it takes to push a column of water up by a number of inches. It is typically used to measure low-pressure gas systems.

How do you measure the gas pressure?

You will need an instrument called a Manometer. This tool allows you to measure the pressure of gas in the system. Manometers are available that measures a specific range of pressure in inches of water column or pounds per square inch. A digital Manometer can measure a broader range of pressures. See the manufacturer's instructions for using the Manometer properly.

Where do you find the BTU rating on my appliances?

Each appliance is required to have a rating plate. This plate will list the BTU ratings of the appliance and required gas pressures for proper operation. See the manufacturer's instructions for information on locating the rating plate on each gas appliance.

Can a negative pressure gas valve solve an undersized gas system?

While a negative pressure gas valve in an appliance can operate at a very low gas pressure, it can have adverse effects on an undersized gas system. This style of appliance can actually rob the gas from other appliances, such as a furnace and possibly cause nuisance outages. The piping and system must be sized to pass the volume of gas, not just the pressure.

How would an undersized gas system affect the appliances?

An undersized gas system can cause poor performance in the appliances. It could cause the burners to soot, pilots lights and burners to go out, or cause condensate to form in the heat exchanger of the furnace or water heater. Condensate will cause corrosion and eventual failure in appliances not specifically designed for it. Sooting can clog burners or flues which can cause an appliance to fail or produce harmful exhaust gases such as Carbon-Monoxide.

45HI-LP E1 Code: Troubleshooting Steps

John Smith, Sept 3, 4:57pm

Hi! I need your help; my 45HI-LP keeps giving me an E1 error code. What can I do to fix this? I have a big party coming up and really need this to work. Thanks for the help!

John

Hello John Smith,

Thank you for contacting Eccotemp Systems Help Desk. Our goal is to provide you with the best customer service possible. Please note we have received your request and will take all steps necessary to resolve your issue.

For your records, your ticket number is located above. We regret any inconvenience that this issue may be causing you and please be assured that we will do what is necessary to resolve it. Please don't hesitate to contact us anytime or to update this ticket as needed.

An E1 is directly related to an issue involving your gas supply.

If you are getting an E1 error code,

1. First, verify that your water heater is the correct gas type. On the right side of the water heater, there is a plate that specifies LP for Liquid Propane or NG for Natural Gas. This should match the type of gas that is being supplied. If this matches, verify that your installer checked to make sure that the gas is the correct pressure for your 45H/HI.
2. The pressure needed for this model is 10-13 inches of water column for Liquid Propane and 4-6 inches of water column for Natural Gas.
3. Also, make sure your installer used a regulator capable of delivering the proper gas flow needed for the 140,000BTU 45H/HI. Next, verify that your gas supply is turned on.
4. Lastly, after doing all of this, make sure that you are not out of gas.

Other common causes for an E1 code:

1. Ignition Pack
2. Obstruction in the ventilation and exhaust located on top of the unit.
3. Computer Board
4. Flame Sensor
5. Gas Assembly, Solenoid Issue

1. IGNITION PACK

*****Can you hear the water heater trying to ignite?*****

In a proper ignition sequence:

1. The fan will come on, the display will show ground water temperature, and you will hear a series of fast, high pitched clicking followed by a few lower pitched clicks which are noticeably slower.
2. It should go through this sequence twice if it does not ignite.

If you do not hear the ignition sequence happen like listed above, you could possibly have an issue with the ignition pack. This is an easy part for us to send to you to replace.

2. OBSTRUCTION IN THE VENTILATION OR EXHAUST ON TOP OF THE UNIT

****Sometimes, unintentional debris will get into the exhaust on top of the unit and keep the system from correctly releasing and ventilating the fumes. ****

This will cause you to get an error code.

1. Remove the ventilation from the top of the unit.
2. Look down into the exhaust on the top to see if anything has fallen into it: screws, sheetrock pieces during installation, etc.
3. If it looks clear, try running the unit without the exhaust connected to the ventilation. It could be something clogging the ventilation not attached to the unit. (the piping leading outdoors).
4. If the unit runs fine without being connected to the ventilation to outside, then something is clogging your ventilation system. It's not the unit.

3. COMPUTER BOARD

****Your computer board may be the issue****

Unfortunately, this is sort of the last place we check. No "real" way to tell if it's the computer board until we replace the board and test it. This is something you can replace yourself. We have videos for this as well. Or you can set up a time for one of us to call you to talk you through the installation.

4. FLAME SENSOR

****Your Flame Sensor may need to be replaced if....***

1. The unit fires up but shuts off within 5 seconds.
2. You receive the error because the Flame Sensor is not detecting the flame, so it shuts off.

Replacing the Flame Sensor is very simple. There are only 4 screws. We can provide you with pictures if we determine this is the issue.

5. GAS ASSEMBLY or SOLENOID ISSUE

****May need replacement****

1. Unfortunately, if this is the issue, you will need to send the unit in for repair. This is something that we don't allow customers to replace.

John Smith, Sept 4, 9:01am

Hi there! So, after you sent me these steps to try, I spent last night going through all of the steps. I noticed that I didn't hear the clicking like you mentioned under the IGNITION PACK section. So, maybe it's that? How do I go about getting a replacement for that? Also, is this something I can replace on my own? How difficult is the installation of the new pack?

Thanks,

John Smith

Hi John,

Well, that is good news. The ignition pack is very easy to replace/install. I will process that replacement ignition pack for you today and we can set up an appointment for us to call you when you are replacing the part if you would like. Some customers like for us to talk them through the process, but it's really not difficult. You can also find lots of helpful videos on our support page that can walk you through lots of different things.

<https://support.eccotemp.com/hc/en-us/categories/115001756247-Community>

In the meantime, can you please provide us with the following?:

1. Original order number (This is to help determine warranty questions)
2. Proof of Purchase if you can't remember your order number
3. Shipping address
4. Phone number
5. Photos of your setup

All of this information helps us help you. Thank you so much. We are happy to know that it's most likely just the ignition pack.

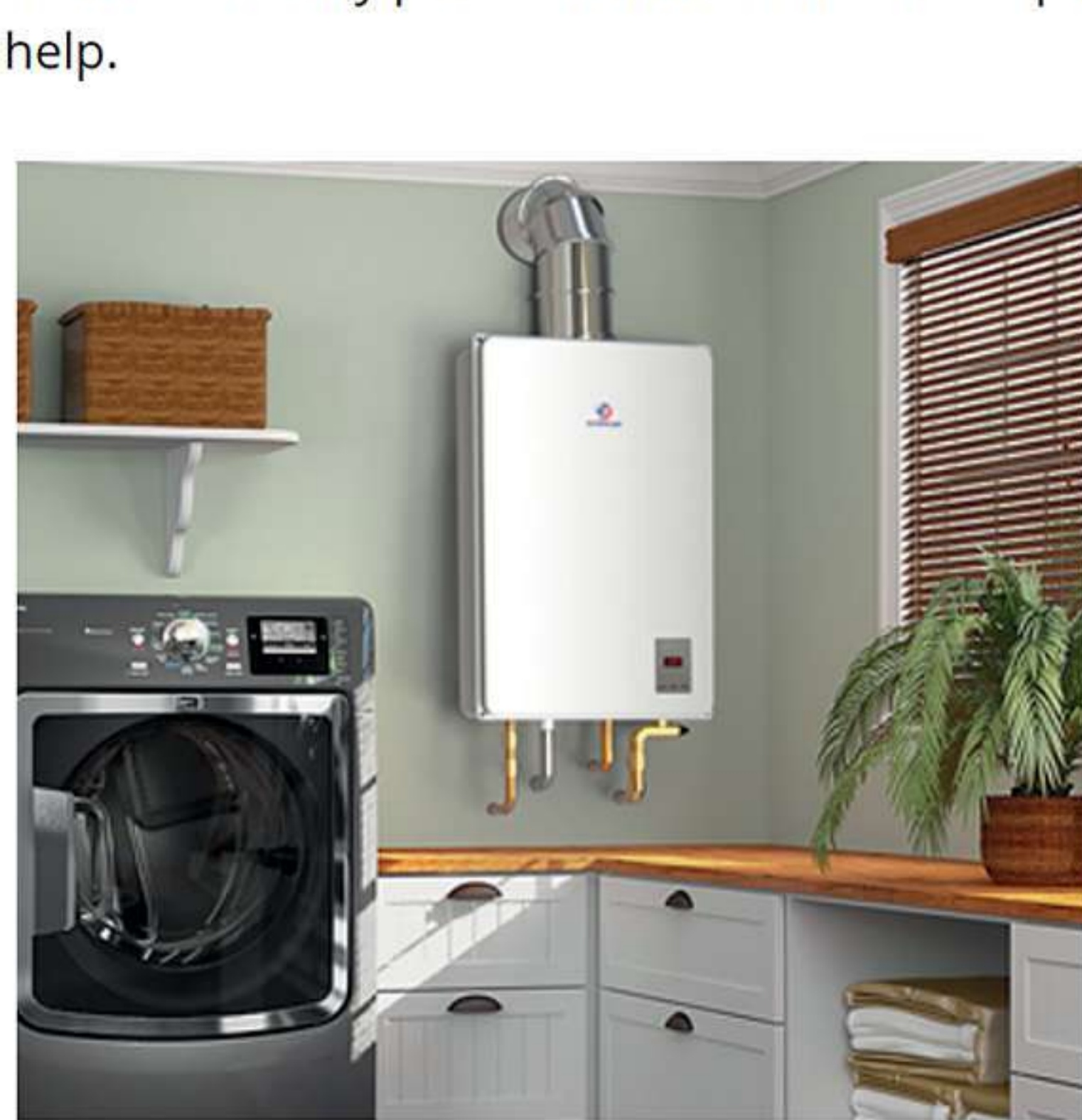
Thank you and glad to help,

Tech Support

Eccotemp Systems, LLC.

John Smith, Sept 4, 12:03pm

I've attached my photo as well. I have it set up in my laundry room. Thanks for all your help.



John

Hi there John,

Upon checking your order number, we see that you are still within the warranty period, so the replacement ignition pack will be of no charge to you. I have already processed your replacement ignition pack order. The order number is #1237894.

Once you receive the replacement part, you can set up an appointment with us to help talk you through the installation process if you feel like you need our assistance. All you have to do is visit, support.eccotemp.com and click on "Schedule a Call".

We are always happy to assist!

You will receive an email with tracking information regarding this order shortly.

Thanks John,

TS: My 45 Won't Power On



My 45H Won't Power On

***Did you know?**

The 45H Outdoor Tankless Water Heater **requires the remote control** to be hooked up to the unit to power it on after any sort of power outage or initial installation.

Other things to check: be sure all breakers are on and the home is fully powered, then check to be sure the water heater is plugged in and you've turned the unit on.

TS: No Error Code Related 45H/HI

Make sure temperature is set to 120 degrees or below.

If there is no error code and the unit does not come on when the HOT water is turned on. This means that the flow meter is not sending a signal to the computer which starts the machine. 1st to fix this you want to locate the flow meter at the bottom right on the inside of your heater. The flow meter sensor will have a white, plastic piece attached to the front of it, with a set of different colored wires coming from the computer board attached to the top of it. The flow meter sensor has red black and yellow wires coming out of a black sensor that is screwed to the flow meter.

2nd check the wire connections; follow the wires to where it connects to the computer board. If both were connected you will want to remove the flow meter. Then, you will need to remove your water inlet on the outside of your heater, at the bottom right side. There is a metal clip that holds the flow meter sensor in place inside the heater. Remove this metal clip, and blow through the meter- it should make a zing sound when the little fan inside spins. Reinsert the flow meter sensor, re-attach your water inlet, and turn hot water on to see if this resolves the issue.

If the display shows two squares rotating up and down. This pertains to the 45H only. 1st push the power button. 2nd If the unit has been in operation for a while and all of the sudden the squares begin rotating. This means power was lost somehow while unit was running. 3rd The flow meter wire is loose on the computer, or the connector where the two wires connect between the computer and the flow meter are loose. 4th The remote itself may have a short, or the power cord going to the computer one of the prongs may not be making a good connection threw the connector or the computer.

Regardless of what the error code is; take the two front screws out of the computer board and it will slide out. Pull the inserts that are lined up along the front of that board and put them back in one by one. Plug the unit back in and see if this solves any issues.

TS: E7/E8 Error Code 45H/HI

An E7 error code indicates that there is an issue with the solenoid valve on the inside of your 45 model tankless water heater.

An E8 error code typically pertains to the 45HI, as the 45H is an outdoor only model and does not have ventilation attached to it. The E8 error code indicates that there is a blockage in your vent pipe. First, remove the top venting from your 45HI, and try to run the heater briefly to be sure this clears said error code. If the heater does not repeat the E8 error code without any ventilation attached, you would need to locate and clear any blockages inside of your ventilation to resolve this matter.

TS: E6 Error Code 45H/HI

An E6 is extremely rare and is caused by the water heater not being able to maintain temperature, but not overheating. This can be due to a low temperature setting, low water flow, a higher than normal ground water temperature, or a combination of the three. Increasing your water flow should fix this.

TS: E5 Error Code 45H/HI

An E5 error code indicates that there is an issue with your fan or venting.

If your fan is coming on, but then giving you an E5, you most likely have a blockage in your venting. This mostly pertains to the 45HI as the 45H models vent directly out of the front of the heater. Check inside of your vent pipe to make sure there is no debris blocking the flow of air.

If your fan is not coming on, then you have an issue with voltage or there is something that is not allowing the fan to spin freely. A common solution for this is to first unplug the water heater from its electrical supply. Next, remove the cover by unscrewing the four screws that hold it in place. The indoor mounted 45HI models have a ribbon cable connecting the display to the computer board. Please be careful as to not damage this wire. You will need to disconnect it using the black connector located 6 inches from the display itself.

Inside the water heater, you will see a grey box which contains the computer board located on the bottom, left side. If you remove the two screws on the face of the computer board, at the bottom two corners, it will slide out freely from the box. Next, disconnect and reconnect all of the wires which are connected to the computer board to verify that everything is seated properly. Lastly, you will see two blue rubber boots on the computer board. Remove the rubber boot from the fuse closest to the middle of the board and check to make sure it is still intact. If it is not intact (the small metal wire in the center of it is broken), replace the fuse. Then, reinstall the board, replace the cover, plug up the water heater to its power supply, and see if your issue is resolved.

TS: E4 Error Code 45H/HI

An E4 error code on your 45 model tankless water heater, indicates that there is an issue involving the flow meter sensor (also referred to as cold water temperature sensor.)

This means that the flow meter is not sending a signal to the computer which starts the machine. First, to fix this you want to locate the flow meter at the bottom right on the inside of your heater. The flow meter sensor will have a white, plastic piece attached to the front of it (which is your auto water flow adjust device), with a set of different colored wires coming from the computer board attached to the top of it. The flow meter sensor has red black and yellow wires coming out of a black sensor that is screwed to the flow meter.

Next, check the wire connections; follow the wires to where it connects to the computer board. If both were connected you will want to then remove the flow meter. Then, you will need to remove your water inlet on the outside of your heater, at the bottom right side. There is a metal clip that holds the flow meter sensor in place inside the heater. Remove this metal clip, and blow through the meter- it should make a zing sound when the little fan inside spins. Reinsert the flow meter sensor, re-attach your water inlet, and turn hot water on to see if this resolves the issue.

TS: E3 Error Code 45H/HI

An E3 Error indicates that the water heater has overheated, meaning it reached very high temperatures and shut itself down so as not to cause damage or harm.

The reason a 45H/HI can overheat is because the temperature is set too high, the water flow is too low, or a combination of the two factors. If your temperature is set higher than 120F, set the water heater to 120F and try to operate it as usual. Lastly, if this is specific to one or two faucets only, check the filter screens in the faucets and free up your water flow as much as possible.

TS: E2 Error Code 45H/HI

An E2 error code indicates that there is something occurring electrically, within the water heater.

A common solution for this is to first unplug the water heater from its electrical supply. Next, remove the cover by unscrewing the four screws that hold it in place. The indoor mounted 45HI models have a ribbon cable connecting the display to the computer board. Please be careful as to not damage this wire. You will need to disconnect it using the black connector located 6 inches from the display itself.

Once inside the water heater, you will see the computer board located on the left-hand side, at the bottom corner of your heater. Next, remove the two screws on the face of the computer board at the bottom. Next, disconnect and reconnect all of the wires one at a time, which are connected to the computer board to verify that everything is seated properly. You can then screw the computer board back in place, replace the cover, plug up the power supply, and attempt to run the water heater as normal.

TS: E0 Error Code 45H/HI

The E0 error code pertains to the outgoing water temperature sensor.

This can typically be corrected by verifying the connection of this sensor with the computer board. The sensor is located on the outgoing water pipe, which is located inside of your 45 model-on the bottom, left corner behind the computer board. To access the sensor, unplug the water heater from the electrical outlet, turn your gas source off to the heater, and remove the cover by unscrewing the four screws that hold it in place. After doing so, then remove your computer board by removing the two screws located at the bottom corners of the gray plastic saddle that houses the computer board. Once you have located the outlet temp sensor (which is a white cord, with a brass nut that connects to the bottom of the copper pipe), then find trace the outlet temp sensor's connection to the computer board, unplug the connector, and reconnect it. The connector goes to the top right corner of the computer board. Once this is complete, you can now plug the water heater back and attempt to run it as usual.

TS: E1 Error Code 45H/HI

An E1 is directly related to an issue involving your gas supply.

If you are getting an E1 error code, first verify that your water heater is the correct gas type. On the right side of the water heater, there is a plate that specifies LP for Liquid Propane or NG for Natural Gas. This should match the type of gas that is being supplied. If this matches, verify that your installer checked to make sure that the gas is the correct pressure for your 45H/HI. The pressure needed for this model is 8-11 inches of water column for Liquid Propane and 4-6 inches of water column for Natural Gas. Also, make sure your installer used a regulator capable of delivering the proper gas flow needed for the 140,000BTU 45H/HI. Next, verify that your gas supply is turned on. Lastly, after doing all of this, make sure that you are not out of gas.

Can you hear the water heater trying to ignite? In a proper ignition sequence, the fan will come on, the display will show ground water temperature, and you will hear a series of fast, high pitched clicking followed by a few lower pitched clicks which are noticeably slower. It should go through this sequence twice if it does not ignite.

Rely on [premium rv plumbing products](#) by [Eccotemp](#) if you're looking for quality and efficiency.