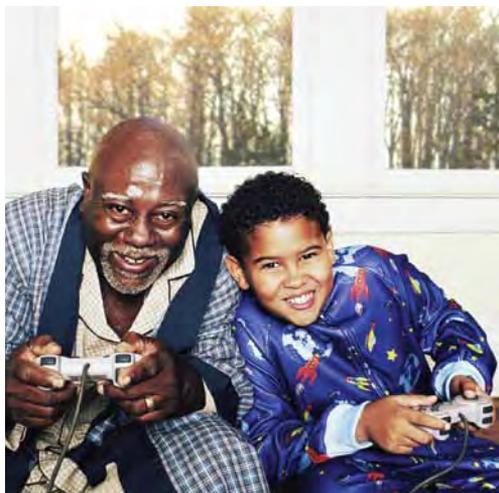


furnaces

get the right heating system



taking responsibility

As an individual, your efficient use of energy brings benefits such as lower bills, improved comfort levels in your home and a reduced personal impact on the environment.

Acting together, our individual choices add up—for the benefit of our community, our environment and our energy future. That's the power of working together.

As your community energy company, we are committed to sharing our experience and energy expertise. You can always contact us for:

- Answers to your energy questions.
- Energy efficiency information and advice.
- Help in evaluating energy-saving options.
- Assistance in finding energy-efficient products.

Need a new furnace?

Comparing warranty coverage terms and conditions are important steps. Beyond warranties, this booklet offers practical advice to consider when shopping for a furnace. While MGE does not recommend one brand over another, our goal is to help you make a better decision. For more information, visit mge.com or call us at 252-7117.

Table of contents

Put our experience to work	2
Need a new furnace?	2
Look for this symbol when you shop.	3
Furnace terms and buying tips	3
Variable-speed furnaces	5
Sizing a new furnace.	7
Supplemental furnace equipment.	7
New furnace differences.	9
How much will it save?	9
Questions for your contractor	10
Read the warranty.	12
Resources	12

Please note: MGE representatives are available to discuss furnace selections. They cannot recommend or endorse specific brands of furnace equipment or installation contractors.

Put our experience to work

Remodeling? Buying new appliances? Making your home more comfortable? Check with the experts at MGE. Call the Home Energy Line at 252-7117 for:

- Answers to energy-related questions.
- Information on energy-saving topics.
- Resources for products that save energy.
- Help selecting the right energy-saving products.

Need a new furnace?

Look for two features

1. Sealed combustion.

MGE recommends sealed combustion furnaces. Sealed combustion furnaces have an air-intake pipe as well as an exhaust pipe. Using outside air for combustion:

- Prevents furnace damage caused by vapors from laundry products. The vapors can mix with indoor combustion air to corrode furnace parts.
- Avoids using indoor air that you have already paid to heat.
- Reduces the danger of backdrafts (pulling exhaust gases down a chimney).

2. 90% efficiency.

There are two furnace-efficiency range choices: 89% to 97% (condensing furnaces) and 78% to 83% efficient. We recommend condensing furnaces.

Nine out of 10 new furnaces sold in the Madison area are condensing furnaces. They cost about \$400 to \$700 more than those in the 80% efficiency range.

Look for this symbol when you shop



ENERGY STAR® labeled products use less energy than other products. They reduce your energy costs and help to protect the environment. We're an ENERGY STAR partner. Learn more about furnaces and other qualifying products at www.energystar.gov or call the MGE Home Energy Line at 252-7117.

Furnace terms and buying tips

AFUE—Annual Fuel Utilization Efficiency. The higher the AFUE, the more efficient the furnace.

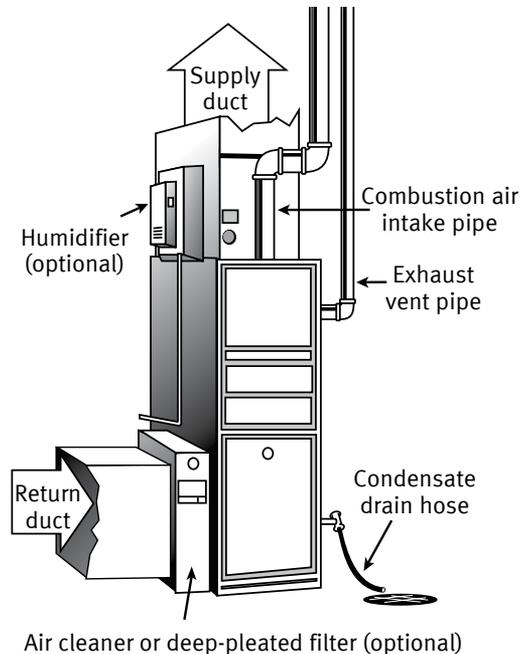
Chimney liner—A protective metal tube inserted into a chimney. Get a liner that has building code approval and is made for use as a chimney liner.

Condensate—The mixture of water and combustion by-products formed by a condensing furnace.

Condensing furnace—A furnace with an AFUE of 89% or higher. Efficiency is achieved by extracting heat from the exhaust to the point where water is condensed out.

Ducts—Supply ducts deliver heated air from the furnace to the home. Return ducts bring cooler air back to the furnace for

Typical condensing furnace



reheating. Seal ducts with butyl-backed foil tapes or water-based duct sealants. Common duct tape does not seal well. Pay special attention to sealing and insulating ducts in attics, garages and crawl spaces.

Forced air—A heating system that uses a blower to circulate warm air through the house.

Heat exchanger—The part of the furnace that transfers heat from the burners to the air circulating through the furnace.

Heat loss—The rate at which heat is lost from the home (measured in Btu per hour). The contractor should calculate the heat loss for the coldest weather expected (about 15°F below zero in Madison).

Humidifier—A device that adds moisture to the house air. Used only during the heating season.

Power venting—To blow exhaust outdoors using a small fan. Usually, the vent pipes for a condensing furnace emerge from the side of the house.

Sealed combustion—All the air used by the furnace burners comes from outdoors.

Setback—To turn the thermostat down during sleeping hours as well as when no one is home. Setbacks are the best way to reduce your fuel costs. Programmable (clock setback) thermostats do setbacks automatically. Ask your doctor the proper temperature for your home if you are elderly or have other health concerns.



Vent—The passageway that carries furnace exhaust gases outdoors.

Variable-speed furnaces

Variable-speed furnaces can operate at low fan speed and low fire (reduced burner output). Another name for this is two-stage firing or multistage firing. The result is quieter operation, slower airflow from registers and better temperature control.

Variable-speed furnaces Q&A

What is a variable-speed furnace?

Variable speed means the furnace fan can automatically change the airflow through the ducts as needed.

What's the difference between a variable-speed furnace fan and a conventional furnace fan?

Most variable-speed furnace fans use energy-efficient fan motors which save electricity. Typically, these motors are called ECMs (electronically commutated motors) or brushless DC (direct current) motors. Conventional AC (alternating current) motors are less efficient but are found in some variable-speed furnaces. Be sure to ask if the variable-speed furnace you're considering has an ECM motor that saves electricity.

What are the benefits of variable-speed furnaces?

In addition to the electricity savings from ECM motors, variable-speed furnaces are quieter and reduce temperature swings.

How much do energy-efficient fan motors save?



Electricity cost with fan set to “auto” * (Fan cycles on and off when heating or air-conditioning)			
ECM energy-saving motor costs about		Conventional AC motor costs about	
<u>\$24</u>	<u>\$16</u>	<u>\$65</u>	<u>\$26</u>
Heating season	A/C season	Heating season	A/C season



Electricity cost with fan set to “on” * (Fan runs continuously year-round)	
ECM energy-saving motor costs about	Conventional AC motor costs about
\$136	\$572
Annually	Annually

Setting the fan to “on” increases electricity use and hurts humidity removal when running a central air conditioner.

**At \$.13 per kilowatt-hour. Actual savings will vary.*

Beware! Not all furnaces with two-stage gas valves have ECMs. A two-stage furnace with a conventional AC motor doesn’t save any electricity.

Check the warranty

ECM motors can cost several hundred dollars to replace, so check the warranty coverage carefully.

Sizing a new furnace

Heating contractors recommend a furnace sized to match the heat loss of your home. Size refers to the heating capacity, measured in Btu per hour.

MGE recommends getting more than one bid before buying a new furnace. A contractor should not size a furnace based solely on the square footage of the house. Insulation levels, window area and air leakage should be considered.

If you plan on using thermostat setbacks, ask your contractor how long the furnace will take to “catch up” on a very cold day.

Oversizing a condensing furnace does not substantially increase energy costs. But, oversizing can cause uncomfortable temperature swings and too much airflow out of the heating registers. Undersizing is a less common problem. Contractors would rather provide too much heat than too little.

Supplemental furnace equipment

These products can increase the efficiency or safety of your furnace.

A **chimney liner** is often required by the furnace manufacturer if the new furnace is in the 80% efficiency range. Never vent a new furnace into a chimney that doesn't meet the manufacturer's requirements.

A chimney liner is usually needed when the new furnace is vented with plastic pipe, but a gas water heater still vents to the chimney. Ask your heating contractor if a chimney liner is required. If a liner is required for the water heater, compare the cost to replacing the water heater with a power-vented model.

Filters or **air cleaners** help to avoid furnace repairs.

Pleated 1-inch- or 2-inch-thick filters provide better dust removal and last longer than unpleated filters.

For better filtration, use deep-pleated filters about 9 inches thick or electronic air cleaners. These systems are most cost-effective if installed along with a new furnace because the required duct modifications can be done as part of the furnace installation.

For convenient access, request an external filter slot. A cover for the filter slot helps to seal your ductwork.

Programmable thermostats allow you to wake up (or come home) to a comfortable home. Plus, they never forget to do desired setbacks.

Humidifiers can be mounted in the ductwork above the furnace. They need to be serviced yearly, as leaks can severely damage your furnace. The humidity level in the house can go up after a new furnace is installed. You may not need to add a humidifier.

Furnace zoning allows the temperature in different areas (zones) of the house to be controlled by individual thermostats or sensors for increased comfort and efficiency.

Zoning for forced-air heating systems costs at least \$800 per zone.

New furnace differences

You may notice an increased airflow from the heating registers. This air may be delivered at lower temperatures, and the furnace blower may run longer.

New furnaces don't have continuously burning pilot lights and have more safety controls.

Condensing furnaces have a plastic drain hose running from near the bottom of the furnace to a drain. Plastic exhaust pipe vents through the sidewall or roof. Both the drain hose and the vent pipes need to be kept free of obstructions for proper furnace operation.

How much will it save?

Old furnaces are often around 60% AFUE, which means they waste 40 cents of every heating dollar. Changing from a 60% AFUE furnace to a 90% AFUE furnace should save about one-third of your space-heating costs.

Be sure to subtract gas not used for heating (such as the water heater, dryer and stove) when you calculate space-heating costs.

For example, if your average summer gas use is \$20 per month, multiply this by 12 to find your annual gas used for purposes other than heating. Subtract this amount from your annual gas bill to find your yearly heating cost. (See calculation example on page 10.)

Call MGE's Home Energy Line at 252-7117 for help in estimating savings from improved furnace efficiency.

Example:

\$20/month x 12 months = \$240 gas use

Total gas use for the year = \$850

\$850 - \$240 = \$610 annual heating cost

Estimated annual savings from improved furnace efficiency*

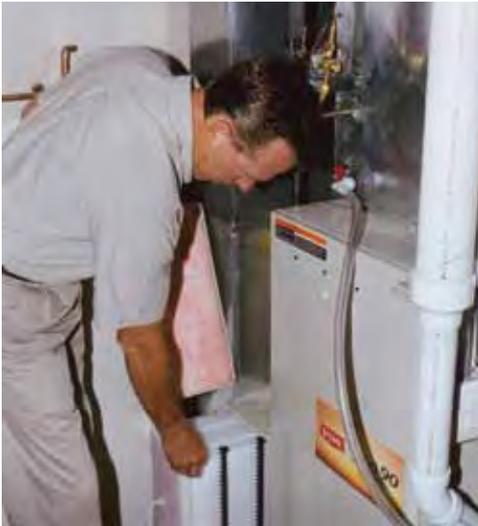
Current annual heating cost	Savings from 80% AFUE new furnace	Savings from 93% AFUE new furnace
\$500	\$125	\$177
\$650	\$163	\$231
\$800	\$200	\$284
\$950	\$238	\$337

*Assumes existing furnace efficiency of 60%.

Questions for your contractor

- How long is the warranty and what does it cover? (Extended warranties from manufacturers are usually more reliable than those from another firm.)
- If the furnace is vented through the sidewall, where will the vent go and what will it look like? (If you prefer another location, discuss it before the work starts.)
- If you are purchasing a condensing furnace, will the furnace be checked for proper condensate drainage? (Condensing furnaces need to be level. Exhaust piping must be properly supported and sloped so condensate can drain out.) Where will the condensate drain hose be placed?
- Does the furnace have sealed combustion with all combustion air drawn from outside?
- Will the existing chimney be used? If so, does it need a chimney liner?

- Will the furnace be raised up on bricks or pads to prevent water damage if the basement gets wet?
- What's required to change or clean the filter? How often will it need changing? How much does a new filter cost?
- How long has this model been in production, and how long has the contractor installed it?
- Is a new thermostat included? Is it a programmable (setback) model?
- Can the existing ductwork handle the increased airflow from the new furnace? If not, what will it cost to modify it?
- What does the contractor charge to check and adjust the furnace after the first heating season?



- Will it cost less to buy the furnace during the off-season?
- How did the contractor calculate the heat loss to size the furnace?
- Can the contractor supply references?

Read the warranty

Warranty coverage varies with the manufacturer, so compare terms and conditions before you buy. Check the length of coverage, the parts covered and the type of service available. Keep the written warranty with your sales receipt.

Resources

www.energystar.gov – Information on ENERGY STAR® qualified furnaces, choosing a contractor and duct sealing.

Focus on Energy – Cash-back rewards for furnaces and boilers that meet requirements, plus flue closure rewards in some situations. Call 1-800-762-7077 or visit www.focusonenergy.com. Focus on Energy offers a fact sheet: “Choosing an efficient furnace.”

listening. learning.

MGE takes responsibility to provide information and education to serve our customers and stakeholders. We educate customers today to help inform their decision making. We educate tomorrow's stakeholders so they can help plan our energy future.

Check the furnace filter monthly. Changing to a clean filter can improve furnace efficiency and save energy.

Working together we can make a difference.

Contact us for information about:

- Heating/Air-conditioning.
- Insulating/Weatherizing.
- Lighting.
- Windows/Doors.
- Appliances.
- Water heating.

Get more home energy information at:

- mge.com/home.
- Home Energy Line 608-252-7117.
- 1-800-245-1125.

Questions about billing? Call:

- 608-252-7222.
- 800-245-1125.

 printed on recycled paper



your community energy company