Check the furnace filter monthly. Change when dirty to prevent problems. *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:
- mgenergy.com/home.
- 800-245-1125.

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 printed on recycled paper
taking responsibility

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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.

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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 doesn't recommend brands or contractors, 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
Just because it’s old doesn’t mean it’s low-efficiency ............................ 3
Variable-speed furnaces ......................... 3
Sizing a new furnace .............................. 5
Supplemental furnace equipment ................ 6
Furnace terms and buying tips .................. 7
Maintaining high-efficiency condensing furnaces ............................ 9
How much will replacing a low-efficiency furnace save? .................. 9
Questions for your contractor ......................... 10
Read the warranty ................................. 11
Resources ....................................... 12

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MGE recommends sealed combustion furnaces. Sealed combustion furnaces have two plastic pipes, 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 backdrafting (pulling exhaust gases down a chimney).

2. 90% or higher efficiency.
There are two furnace-efficiency range choices: 89% to 98% (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.

• Is a new thermostat included? How do I program it? If it has batteries, how do I change them, and how often?
• Can the existing ducts handle the airflow from the new furnace? If not, what will it cost to modify them?

What does the contractor charge to check and adjust the furnace after the first heating season?
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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.
Call MGE’s Home Energy Line at 252-7117 for help in estimating savings from improved furnace efficiency or from adding insulation and sealing air leaks.

Questions for your contractor

Be sure to tell your contractor about comfort or noise problems.

- How long is the warranty and what does it cover? (Extended warranties from manufacturers are usually more reliable than those from another firm.)
- Do you offer 24/7 service if the furnace needs repairs?
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- If 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?
- Do I 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?

Just because it’s old doesn’t mean it’s low-efficiency

High-efficiency furnaces came on the market in the 1980s.

Q: How do I know if I already have a high-efficiency furnace?
A: If your furnace vents through plastic pipe it’s a high-efficiency furnace. However, it may or may not have an efficient fan motor (ECM) that saves electricity.

Low-efficiency furnaces vent through metal pipes

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Q: Does MGE offer furnace rebates?
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Variable-speed furnaces

Variable-speed furnaces can operate at low fan speed and low fire (reduced burner output). Variable-speed furnaces can have two-stage, multistage or modulating burners. The result is quieter operation, slower airflow from registers and tighter 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.

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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.

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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.

Maintaining high-efficiency condensing furnaces
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 replacing a low-efficiency furnace save?
Furnaces that vent through metal pipe are often around 70% efficient, which means they waste 30 cents of every heating dollar. Changing from a 70% efficient furnace to a 93% efficient furnace should save about one-quarter of your space-heating costs.
**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 reheating. If needed, 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. Duct leaks in these areas can waste a lot of money. Focus on Energy can help you find contractors experienced in testing and fixing leaky ducts.

**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. Not all homes need moisture added.

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

Beware! Not all multistage furnaces have ECMs. A multistage 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 output in Btu per hour. Pay attention to the **output** when comparing furnaces.

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 insulating and sealing air leaks, ask your contractor how this will affect sizing options.
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 single-stage furnace can cause uncomfortable temperature swings and too much airflow out of the heating registers.

If you choose a furnace with a multi-stage burner, moderate oversizing is seldom a problem because the furnace will simply run at low-fire and low-fan speed more of the time. If you like to set back your thermostat, a multistage furnace can recover more quickly after a setback if sized appropriately.

**Supplemental furnace equipment**

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

A **chimney liner** for the furnace 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 for the water heater is usually needed when the new 90%+ furnace is vented with plastic pipe, leaving the gas water heater as the only device that 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 of a liner to the cost of replacing the water heater with a power-vented model that doesn’t need a liner.

**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. However, they plug up more quickly if neglected.

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.

Smart thermostats and Wifi thermostats allow you to change the temperature remotely via an app on your mobile device or via the Internet.

**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 replacing a furnace that vented through metal pipe. 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 $900 per zone.

**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.
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Focus on Energy – Cash-back rewards for furnaces and boilers that meet requirements. Call 1-800-762-7077 or visit focusonenergy.com.

Focus on Energy
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MGE partners with Focus on Energy to bring energy-saving resources and incentives to our customers.
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MGE Madison – YouTube video on how to tell if a furnace is high efficiency: youtube.com/watch?v=KsYNtM0ldtY
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