

Which is Best Gas water heater

[Water heater manufacturers](#)

[How to install gas water heater](#)

All manufacturers make good heaters. There are three major manufacturers of residential water heaters: AO Smith, Bradford White and Rheem.

Each manufacturer makes different grades of the same product. Each manufacturer has folks that like-or-dislike their product.

This webpage offers specific things to consider when purchasing a water heater.

Which is best? Short answer:

A. If you have plumber install water heater: Choose the one he normally installs, and maintains.

-Avoid tankless recommendation for *whole house*: the \$4-8 per year energy savings does not warrant additional cost of installation, and additional risk and expense of repair.

-Avoid heat pump and other computer-chip water heaters because savings is not proven for all installations, and regular maintenance might be required. All electronic water heaters are susceptible to surge, parts are proprietary, and best-case energy savings does not warrant additional risk and expense of repair.

-As *general rule*, electronic water heaters cannot be repaired by homeowner and offer no proven savings long term for average family. Exception: Gas water heaters with electronic gas control valve thermostats can be diagnosed, and replaced DIY. [Gas control valve troubleshoot](#) Electronic gas valve have been standard with HVAC for many years,

B. If you install and maintain water heater yourself: then 6-12 year Whirlpool from Lowes, 6-9-12 year Kenmore from Sears are good choice. Both are same design, made by AO Smith companies, and include the brands Whirlpool, Kenmore, Craftmaster, American, State, Reliance etc. Get store coupons if available.

[DIY resource: How to install gas water heater](#)

[Difference between surge and ground](#)

Reasoning behind short answer:

If plumber installs, then he knows the product and has relationship with manufacturer. Note: new water heaters are larger today. They are wider and sometimes taller because of 2015 energy standards that mandate water and energy saving appliances. Make sure plumber knows the size and installation differences since the old heater in the corner might not fit the same. Differences can cause delay and additional cost. For example if the old water heater is 60 gallon, you might want to downsize the gallonage to fit the space and the budget. If the plumber has to move gas line or vent, then a permit might be required.

If you buy and install water heater yourself, then read more below:

Remember new water heaters are larger today...

Plan ahead. Check manufacturer website for dimensions. MEASURE before you buy. Measure door openings, stairways, location of vent, TP valve, and available space.

Incoming gas line might need to be moved. Vent pipe shortened or offset elbow installed.

[DIY resource for handling gas lines etc: How to install gas water heater](#)

The challenge of installing new larger water heater is real. In one example, [see photo](#), the plumber

tipped new water heater to one side so the vent pipe lined up with old vent line. The nice new Bradford White tank was pushed into the gas shut off causing slight dent. The water heater worked fine, but customer was unhappy with the crooked installation, and home buyer might see it as a negative. The plumber saved cost of installing elbow on the 4" double-wall vent pipe, or moving gas line a few inches. A permit would probably be required if plumber altered either the vent or gas line, and this would cause delay and increase cost. Good argument for installing yourself, and measuring before you buy.

[DIY resource: How to install gas water heater](#)

1) Warranty:

Warranties are same across all brands. And same for 6 year, 9 year, 12 year tanks, as outlined below:

- First year parts-tank-labor are covered for original homeowner and non-commercial installation when installed by instructions outlined in product manual.
- After first year, parts-tank are covered, but no labor.
- Anode rods are not covered by any warranty.
- Required maintenance is not covered, such as inspecting and cleaning burner parts, but a failed thermocouple or new burner assembly is covered.
- In some cases, you might need local service technician to verify installation to get warranty coverage. For example, the warranty might not cover if water heater was installed in wet environment, non-ventilated space, dirty crawlspace or storage room with chemicals since dust, dirt, lack of air supply, bad venting, exposure to water and trace amounts of chemicals will affect gas appliance performance. [Read about air supply](#). Clorox, pool chemicals, even in trace amounts, are inhaled by gas appliances and can destroy combustion parts. [Read about corrosive environments](#). Dirt and dust can trigger FV failure and cause lock out. [Read about FV failure](#).

Read warranty information before you buy, and install according to manual.

- Simple one-dimensional Math shows that shorter warranty has greater percentage of full coverage. But other factors are excluded, for example, what if you need a new gas valve in year 7.

Note: Anode rod is not covered under any warranty because it is made to sacrifice itself to prevent tank from rusting. Often, the warranty coverage requires you to perform maintenance shown in product manual, which means inspecting anode to prevent tank from rusting ... plus cleaning combustion parts periodically, cleaning air intake and avoiding dust, chemicals and flammables. Non-code grounding of electric panel to water pipes instead of ground rod can cause stray current corrosion, making pipes more reactive to water, rusting out tank prematurely despite anode rod.

[DIY resource: How to replace anode rod](#)

[How to install gas water heater](#)

[Troubleshoot gas water heater](#)

2) 6 year, 9 year or 12 year?

- Generally, the main difference between 6-9-12 year warranty is anode rod diameter, or sometimes 2 anode rods. You can convert 6 year tank into 12 year or 15 year by inspecting anode each 1-3 years, and maintaining tank as shown in product manual.

[DIY resource: How to replace anode rod](#)

[How to maintain water heater](#)

There may be other differences that are not considered on this webpage, such as heavier materials associated with longer warranty tanks. For example, commercial water heaters are made much heavier, and this implies that longer-warranty residential heaters are better than shorter warranty. Exactly what is the difference? It would be nice if manufacturer's informed the public, but dynamic of commodity prices, design changes, competition, and the legal environment might make it difficult for manufacturer to say what is being used.

After digging around available resources, Kenmore reveals the difference between 3-year and 6-year tanks is anode, drain valve, inlet tube, nipples, burner orifice and manifold door assembly. Each of these items is repairable.

No differences were shown in critical safety components, implying that gas control valve thermostat, TP valve, flammable vapor resistance, and thickness of tank wall were not lesser quality between 3 and 6 year tanks. This casual analysis is an example of possible differences, but not a reliable sample.

I do not recommend 3 year tank except as a lower-price opportunity.

[DIY resource: Gas valve resources](#)

Simple math comparison between 6 and 12 year heaters: if 6 year heater cost \$550, and 12 year heater cost \$800, the cost difference is \$250. In exchange you get 6 years of extended part warranty, or \$41 per year for longer warranty. Since a typical gas control valve costs \$100 - \$140 to purchase at retail (2016), the longer warranty might be best choice.

[DIY resource: Gas valve resources](#)

Cost of installation is a factor. Let's say installation cost for do-it-yourself is \$100 no matter which heater you choose, then that adds 18% onto the price of the cheaper heater, but only 12% onto the more expensive heater. Typical items you might need include new flexible water connectors, flue pipe elbow, flue tape, screws.

If new heater is larger than existing space, then the additional cost could include moving gas line, walls etc, unless you opt to buy water heater with less gallonage.

Can you buy heaters larger than 55 gallon?

Yes. You can still buy 60-100 gallon water heaters. Shop around. Except the uniform efficiency descriptor that took effect in April 2015, changed standards so heaters larger than 55 gallon must have high technology to meet the efficiency guidelines. The efficiency standards apply to all appliances so the electric grid can meet future growth. [Read about the grid.](#)

Options; Buy smaller gallonage heater, raise temperature of tank and install mixing valve to temper the hot water. Adding 20 gallon electric point of use heater can offset some issues since average shower uses 9 gallons hot water. Conservation is best solution, but if you need more hot water for oversized bathtub, I recommend installing two heaters if you need more than 60 gallons. This lets you turn off one heater when not needed.

[Resources: Two water heaters](#)

[Advantages of mixing valve](#)

[Point of use water heater](#)

[Ways to increase amount of hot water](#)

[Gas water heater timer](#)

3) Don't buy expensive water heater, like tankless, or hybrid heat pump:

High-tech water heaters do not save money overall, do not last longer than ordinary tank heaters, do not have longer warranty, and are expensive to maintain and repair.

Tankless and Heat Pump, and Condensing heaters over 60 gallon size, are expensive to buy and maintain.

For example, tankless cannot be exposed to more than 11 grains hard water, and burner must be delimed each year to maintain efficiency. Tankless have no service manuals, and are not DIY repair. Local technicians might not be qualified to service the particular brand and model of tankless.

Heat Pump heaters are electric and not gas, but are mentioned here as a less efficient option to

gas. Heat Pumps are not DIY repair. There might not be service manuals, and part replacement can be expensive.

My recommendation: If you need more than 60 gallon, install two heaters.

[Resource: Two water heaters](#)

4) Why buy ordinary Whirlpool or Kenmore gas water heater ?

- Sold at local store. Easy returns if needed.
- Can be maintained and repaired by homeowner. -Air intake is located on bottom and can be cleaned easily.
- Tip: Set 3-legged water heater on bricks so air intake can be inspected and cleaned periodically.
- Whirlpool and Kenmore are made by AO Smith parent company. Other brands made by AOS are Reliance, State, American, Craftmaster etc.
- Service manuals are posted online, parts are designed for quick, ez replacement. -Key point: Installation manual shows how to perform maintenance.

[Troubleshoot gas water heater](#)

5) Avoid Rheem?

Why? Rheem makes Reliant, Richmond, Ruud, and GE

- Rheem makes a good product just like the other manufacturers. Except my website is for do-it-yourself folks.
- Cleaning arrestor screen requires removing burner. Combustion parts might be held in place with tamper-proof screws. Punch out center, and use regular hex to remove.
- Service manuals are not available online.... this is a major point for folks who want DIY repairs. Rheem phone call might yield assistance.

- The installation manual does NOT show how to perform basic maintenance, and says customer must call for service. I disagree with this attitude toward do-it-yourself since people can fix water heaters, and a skilled public makes a better workforce.
- Rheem does not offer products that somehow need specialized treatment. I think the long-term plan is designed to funnel customers into brand-loyal service providers and installers ... which will be large company manned by a few people who are trained to sell add-on service.
- Remember gas appliances are dangerous, and do-it-yourself carries risk. However skilled technicians, handymen, DIYers, and the homeowner sometimes want to see a service manual and be able to check basic stuff, and Rheem web resources do not provide service manual or show maintenance steps. While other companies do.

[Service manuals and Troubleshoot for gas water heater](#)

6) Bradford White makes good heater:

- All manufacturers make good heaters
- Are BW made better? Warranty is identical to other brands.
- Service manuals are available.
- Must remove combustion parts to clean air intake, otherwise the overall design is highly recommendable.
- Parts are ez to replace, except for anode rod.

- One negative: In 2016 Bradford White uses uses combo anode rod that is connected to hot water nipple. You have to remove hot-side nipple to inspect anode rod, but the nipple on top of new heaters doesn't stick up far enough to attach a wrench. [How to remove short nipple](#)

Other companies use standard hex-head anode for *most*, but not *all* models. To determine which model has standard hex head anode vs combo, look for 2" diameter hole in the sheet steel with a

plastic plug located on top of heater [see image](#), then it's most likely a hex head anode. Remove plastic plug and use 1-1/16" deep socket to remove anode.

You can replace nipples on new water heater and install longer pex-lined nipple. But 2016, you cannot buy a combo anode rod that has a longer nipple. The short nipple is intended to keep connections on new heaters the same height as old heaters. I hope the problem of short nipples will be addressed by manufacturers.

Anodes are not a problem until the tank rusts or hot water has odor. The anode prevents rust, but sometimes causes odor when exposed to some types of water sources. The cost of new heater and need to stretch budgets into the future make the anode a real consideration for maintain your investment. [Read about anodes](#)

Note: Warranties do NOT cover anode rods. And some warranties say you must follow the maintenance to have warranty coverage ... which includes inspecting the anode rod. So there you are. The combo nipple on Bradford White heaters is too short to easily remove. So inspection of combo anode rod is difficult, yet you should perform the inspection..

[Read about anode rods](#)

[How to remove short nipple](#)

7) Thickness of insulation

Insulation is thicker on new 30-55 gallon water heaters due to 2015 energy standards. This ends decades of mystery surrounding water heater insulation, and apparently has corrected years of factual vagueness by manufactures who stopped showing thickness as a feature while claiming an additional insulation blanket was unnecessary and voided warranty. As a footnote: improperly installed insulation blanket can cause gas heater to malfunction and cannot be installed over top of heater or over air intake or over TP valve..

- Despite having more insulation on sides and top of new heaters, the nipples on top of tank are still about the same height from floor, the flue pipes is in the center but may be higher, and the TP valve on side can be slightly different than older tank.

- One negative: the short nipples makes it hard to remove or replace.

Some water heaters have combo anode rod connected to short hot-side nipple which is difficult to remove. [Read about anode rods](#) [How to remove short nipple](#)

You can still add thermal blanket if you choose, but it cannot cover air intake, combustion chamber at lower part of heater, TP valve, or top of heater. Note: 5-20 gallon under-counter electric water heaters are not affected by energy standard and are same size. A 20 gallon electric heater can supplement the choice of a smaller main water heater by boosting the amount of available hot water, or by preheating incoming cold water.

Resources: [9-ways to save with water heater](#)

[Low hot water pressure](#)

[How to wire under counter water heater](#)

[Ways to increase amount of hot water](#)

[Tempering tank](#)

8) Energy factor / residential tanks 30 - 55 gallon: forget about it:

Why forget about it? 3 reasons:

1) EF (energy factor) is NOT efficiency. EF is a formula for calculating efficiency for residential heaters.

2) Manufactures are selling 'residential duty commercial heaters' to get around the standard for EF, using UEF metric for the efficiency, which might be EF but it's not clear.

3) Rule of thumb: above 55 gallon and water heaters are too expensive to give any energy benefit vs cost. Below 55 gallon, the 40 gallon has more efficiency than 50 gallon. So downsize heater to

40 gallon or 30, or install 2 heaters if you need larger volume.

If you want more information, just be aware that I researched this morass for days and could not make sense of it... except for above 3 reasons.

Residential heaters below 55 gallon have EF, which is a calculation, and means nothing without doing the math. Commercial heaters use Thermal Efficiency instead of EF, but the calculation is not apparent at this time. All water heater numbers are based on the UEF (uniform energy factor) test procedure set by DOE (department of energy) that applies to water heaters manufactured after April 2015. [Read pdf](#)

The EF formula for residential gas water heaters between 30 and 55 gallons is $.675 - (.0015 \times V)$ = efficiency. The formula means you subtract .0015 x volume of heater in gallons to calculate efficiency.

50 gallon: .675 minus (.0015 x 50 gallon) yields efficiency of .60.

40 gallon: .675 minus (.0015 x 40 gallons) = .62 efficiency.

30 gallon = .63 efficiency.

All efficiency numbers are approximate, and based on correctly calibrated thermostat set at 125°F instead of older standard of 135°F. Actual efficiency varies widely depending on air supply, venting, long-term condition of heater, and other factors. The efficiency numbers for older heaters and new heaters are summed up in the following chart from AO Smith: [Efficiency comparison](#) More information is available on following pdf: [April 2015 EF factor](#)

What does this mean to you? 1) Probably confusion because manufacturers no longer post efficiency numbers on product spec sheets as they did previously, and show no efficiency rating, or refer to the DOE standard using EF or UEF without clarifying need for calculation. 2) After April 15, the calculated efficiency of EF heaters apparently improved by .02 over older heaters, except the new test method is for thermostat set at 125°F instead of older standard of 135°F. If efficiency actually improved .02, then it works out to less than one penny per bath maybe [see calculation for bath](#). This would mean considerable savings over life of heater, except you use same amount of hot water no matter if thermostat is 125°F or 135°F. The savings is clouded further if using a flue damper heater that consumes electricity. 3) The higher cost of buying new energy-compliant heater *might* exceed consumer's financial gain from improved efficiency, especially when adding increased installation, repair costs, electric consumption, and future cost of replacement.

What is known for sure: 1) Downsizing from 50 gallon to 40 gallon will give greater efficiency, same as it did before the April 2015 standard. 2) Maintaining water heater will keep efficiency higher and investment will last longer. [How to maintain water heater](#) 3) New heaters are more efficient than old heaters because all things work less well as they get older.

Gas water heaters that plug into 120 volt outlet

If you do not have outlet located within 10 feet of water heater location, then a flue-damper type heater with higher efficiency is not correct choice, or install new 120 volt line with surge protection. [See basic household wiring](#)

Dedicated outlet offers less interference and is recommended for electronic gas control valves.

Dedicated outlet means no other outlet, light or appliance is served by that circuit breaker. [See image](#)

Outlet must have correct polarity and be grounded. [See image](#)

Loose electric plugs can cause interference with water heater. Plug directly into outlet. Do not use extension cord.

I suggest using surge protection outlet. It's okay for circuits to have more than 1 surge protector.

Outlet must have correct polarity and be fully grounded for the gas control valve sequence to work correctly. Use outlet tester.

Reversed polarity [see image](#) will cause continual and difficult-to-diagnose problems with

electronic devices.

Outlet that is not grounded can cause error codes.

Resources:

[Can you unplug water heater to act a timer? no](#)

[Install whole-house surge protector](#)

[Difference between surge and ground](#)

-Note about electric surge:

-Any electrical device that plugs into outlet, or is connected to grounded copper pipes is susceptible to power surge.

Electronic gas controls can fail during a surge event.

Surge can be caused by nearby lightning strike, or simple power outage. [Install whole-house surge protector](#)

9) Electronic gas control valve is OK:

-Electronic vrs old-style mechanical gas control valve

-Electronic gas controls have been used on Heat-AC units for many years, and are reliable.

-Water heater error codes are handy.

[See error codes and temperature adjustment by type of gas control](#)

Low Nox

Low nox water heaters have a burner that reduces amount of pollution from nitrous oxide.

Pollutants from burning fossil fuel include CO₂, CO, NO, SO, acidic water. These pollutants are puffing out of every vent stack across the globe.

Resources:

[Is gas clean-burning?](#)

Alternative energy sources

Resources:

[Connect AC electric water heater directly to solar panels/ high voltage DC](#)

[Connect AC electric water heater to solar panels/ low voltage DC](#)

[Should you buy solar glycol water heater](#)

10) Buy water heater on Internet is ok.

-Save receipt.

-You have a contract with seller, but check warranty coverage.

[Water heater manufacturers](#)

-Warranty is probably through manufacturer's insurance carrier.

-It is easier to return defect water heater to local box store if water heater has a defect, or chronic problem.

-You might need local service technician to verify installation to get warranty coverage.

Tankless

Avoid whole house tankless. Smaller electric tankless are useful for point-of use applications but are expensive for whole house.

Resources:

[How to wire tankless electric](#)

[How to troubleshoot Rheem tankless water heaters](#)

Home automation water heaters/ privacy concerns?

I am skeptical about privacy issues if manufacturer has included pre-installed wifi on appliances.

When smart meters were installed across the country... there were privacy concerns ... except smart meters broadcast such small packets of information that nothing of value was available for the amount of investment needed to gather it. The lack of useful information was one reason why the 'rash of new smart-grid products' has not materialized.

Compare smart meter with modern wi-fi.... wi-fi sends huge packets of information over the internet.

You do not own internet content. You are a consumer. You are using somebody else's product when you consume internet... and the owners profit by taking your information and selling it to other parties. I'm not talking about the waterheatertimer.orgs of the world, since we collect nothing. I'm talking about googles, bings, firefoxes, email trackers, and ad servers etc... because those services own the internet, and you are using their 'product.'

When you agree to terms-of-service for a product that has wi-fi connection, then your information is being collected. Your right to privacy is yielded.

But wait... the terms of service include a 'privacy policy?'

In my opinion, the privacy policy guarantees that *you* cannot see what private information has been collected and distributed about you, because the information-they-collect-about-you is 'private.' This means the owner of your information can accumulate 'preferences' that might stop you from seeing full array of choices, or set a pre-determined price point based on past spending habits, or perhaps target you socially or legally. Additionally the privacy invaders can sell your contract to a service provider who will control which businesses appear in your search bar.

2016/ For example Windows 10 has huge potential for privacy invasion: Tracking location, e-mails, contacts, writing 'style' etc. And now Windows 10 is embedded inside medical equipment. Consider Windows 10 interface next time the doctor sticks a probe in your ear. However you can rest comfortably knowing that your cousin cannot see the x-ray because of 'privacy' but the entire office staff, hospital and insurance company can see the results, and your boss can glimpse a copy for the price of purchase.

Since your private information is valuable, I assume future water heaters will offer wi-fi on all models ... letting the manufacturer accumulate 'error codes' from your equipment. Of course you agreed to terms of service when you purchased the thing, opening the door to a soft text message every six months suggesting a check-up or risk losing your warranty coverage. Then when water heater breaks down, you automatically receive 'repair offers from several competing service providers' which all come from the same company disguised as several companies. And that single company purchased the rights to your service contract from the manufacturer. Just be careful, but it's probably too late because the 'smart' TV heard you say it, which is why the police are being dispatched to your location.

3-phase electric water heaters for home use:

People frequently have opportunity to own commercial grade 3-phase electric water heater. Three-phase electric water heaters are not more efficient, unless they are fully balanced and connected to commercial three-phase power.

Most commercial electric water heaters are non balanced, and have same efficiency as residential heaters.

3-phase (non-balanced or balanced) can be converted to single phase for home-use with wiring change-over.

When installing 3-phase commercial water heater in residential home, pay attention to thermostat range and element rating.

Elements and thermostats are generic for both residential and non-balanced, and can be replaced, however if element is rated 440 volt, then it will only produce 1/4 the heating power when connected to residential 240 volt power. Solution: look at rating printed on end of element and

[change element](#)

Likewise, commercial thermostats look the same and work fine with residential power, but the temperature range is higher, approaching 170-180°F. Residential hot water over 135° is extremely dangerous. Solution: make sure temperature setting is 120°F.

Resources:

[How to convert 3-phase water heater to single phase](#)

[Commercial 3-phase thermostats](#)

Which is best commercial gas water heater:

When you buy commercial-grade table saw... it is big and heavy and WILL cut wood without a doubt.

Same with commercial grade water heaters.

They will heat the water and last for years.

Sales price usually includes professional installation.