



Chiller Systems Service
COMMERCIAL/INDUSTRIAL HVAC

A Property Manager's Complete Guide to Boiler Maintenance

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Providing exciting amenities such as on-site fitness centers, versatile common areas, and other recreational attractions are great for drawing in potential tenants, but whether they stay depends less on the bells and whistles and more on the solid foundation of infrastructure that you provide. Tenants need to know that they can depend on your properties' HVAC systems to keep them cool in the sweltering summer months, your boiler systems to keep them warm in the frigid winter months and provide hot water year-round, and your maintenance personnel to rapidly fix problems that come up with the appliances in their units and the infrastructure that manages your buildings' climates.

As a property manager, ensuring your tenants' comfort year-round is paramount. And as the temperature drops, maintaining the boiler systems on your property becomes even more critical to ensuring that your tenants are happy, healthy, and warm throughout the winter—and that they won't want to move elsewhere.

From the 19th century onward, boilers have become an essential part of any building's infrastructure, especially in the winter. When they were first introduced, lack of safety and standards for manufacture and maintenance made boiler explosions a frequent hazard for tenants, but from the early 1900s onward, government and professional organizations took massive strides to make boilers safer, developing codes and standards for boiler design, manufacture, and maintenance to ensure their reliability and keep the people who rely on them safe.

Today, boiler explosions are a thing of the past, but boiler system failures are not. And while landlords and tenants alike can count their blessings that boiler failures today are far less likely to injure people today than they were long ago, that's cold comfort when your tenants are being forced to bundle up because your property's boiler broke down on the first cold day of the season.

Keep your tenants warm and comfortable as the seasons turn. Read on for a comprehensive look at the best practices for maintaining your boilers and keeping your tenants warm and happy in their living spaces through even the coldest winter months.





Preventative Maintenance for Boilers – A Property Manager's Best Friend

The best time to fix a problem with your property's boiler system is before they become problems. When your area has its first snowfall, many of your tenants will likely all rush for their thermostat and turn up the heat all at once, which can heavily tax your boiler system. Preventative maintenance keep your boiler system at its peak performance and ready to handle the strain of your tenants' needs so that you don't have to worry about boiler failure during the first days your tenants need it.

With a comprehensive preventative maintenance plan for your boiler, you'll be able to keep your boiler running reliably, lengthen the lifespan of your equipment, and protect your workers from on-site injuries.

Reliable Boiler Operation

A lack of rigorous preventative maintenance leads to unnoticed wear and tear on your boiler system that can impact its efficiency. For example, a leak or buildup of corrosion can negatively impact your boiler's operation and lead to inconsistent performance or failure when the system is put under heavy strain.

Longer-Lived Boiler Equipment

Without preventative maintenance, your boiler's components—such as its drum, headers, tubing, piping, and deaerators—will deteriorate long before their time. Much like how a human body requires a good diet, exercise, and regular checkups with a doctor in order to ensure a long and healthy life, looking after your boiler's health by performing regular maintenance will ensure that your boiler will continue working as expected for a long time.

Conversely, negligence of your boiler can cause it to break down and long before its expected lifespan runs out. If you keep on top of your boiler's maintenance, repairs can be cheap and easy. However, without preventative maintenance, the cost of making repairs to your boiler could outweigh the cost of getting an entirely new boiler system—both of which would cost a pretty penny.





Keeping Your Workers Safe

The first boiler safety laws in the world were passed in 1908 in Massachusetts after a factory's boiler exploded and killed 58 people, injuring 117 others.

Boilers today carry significantly less risk of catastrophic failure due to the influence of these sorts of laws over the past century. Modern boilers have a great deal of redundant systems and advanced controls to prevent catastrophic and explosive failures. However, a catastrophic failure resulting from a lack of maintenance can still happen.

Most people today do not realize just how much energy your average boiler contains. A thirty-gallon home hot-water tank that undergoes explosive failure can produce enough force to hurl a car over the roof of a fourteen-story apartment building!

Even a less catastrophic boiler failure can still cause severe injury to nearby operators or maintenance workers. This is why proper boiler maintenance is required by law.

Still, as low as the risk of catastrophic danger is, it's always of vital importance that whenever your operators or maintenance personnel need to service or inspect your boiler, they adhere to all necessary safety protocols and best practices, including wearing appropriate Personal Protective Equipment (PPE) such as eye protection and protective headwear and following Lockout-Tagout (LOTO) procedures.

Regular boiler inspections and preventative maintenance to its drum, headers, piping, and other components helps you ensure that the boilers on your properties meet state and national standards and codes and massively reduce the risk that a boiler failure will lead to injury of nearby personnel.





The Three-Tiered Approach to Preventative Boiler Maintenance

When it comes to preventative boiler maintenance, being diligent and thorough doesn't just make sense—it makes dollars, too. You'll prolong the lifespan of your equipment, save on costly repairs and replacements in the long run, and have safer workers—and happier tenants who will be more likely to stay with you for years to come.

The most important part of your boiler system's preventative maintenance plan is the annual maintenance checkup, but to get the most of your boiler system, don't be so quick to discount the usefulness of periodic (i.e. once per month or bimonthly) and even daily maintenance checks.

With a tiered, regular preventative maintenance plan in place for your boiler, the annual checkup serves as the most comprehensive and thorough look into your boiler system's health. Periodic checkups are less thorough, but useful for catching issues such as leaks, blockages, or signs of wear before they become major problems down the road. And daily or weekly maintenance checks are just quick check-ups for warning signs that might indicate potential problems.

With all three tiers of preventative maintenance, your goal is to spot little problems before they can become big problems and nip them in the bud. The more consistent, thorough, and regular your maintenance plan for your property's boiler system is, the lower your chances of a nasty boiler issue sneaking up on you—and your tenants—is.

With this three-tiered system, it may sound more labor-intensive in the short term, but the longevity and reduced issues with your boiler system in the long term will certainly make up for it in spades!





Daily/Weekly Boiler Maintenance

On a daily or weekly basis, have a maintenance technician quickly look over your boiler system, noting any problems such as leaking water, unusual noises, or obstructions. During these maintenance checkups, the technician should make sure temperature and pressure readings are all in range and that any error codes that pop up are recorded and swiftly relayed to your boiler's service manager.

Your checklist for daily or weekly boiler maintenance:

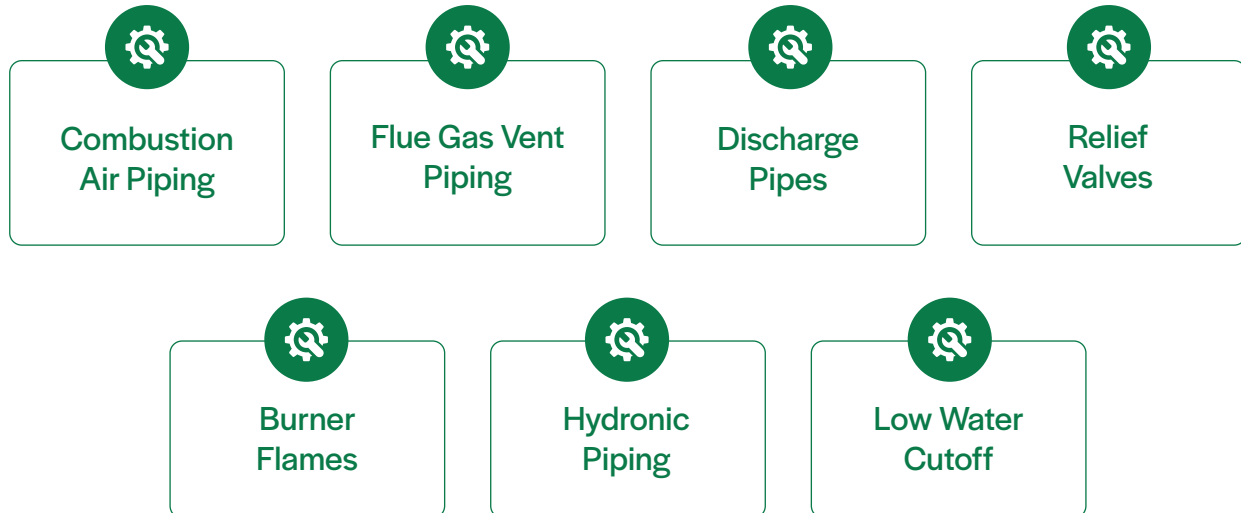
- ✓ Look for leaking water around and under your boiler equipment.
- ✓ Clear away any materials that may cause obstruction from the area around your boiler system.
- ✓ Make sure temperature and pressure readings are within acceptable ranges.
- ✓ Make sure there are no obstructions or blockages with the vent termination or combustion air openings.
- ✓ Keep an ear out for unusual vibrations or noises from your boiler system.
- ✓ If you see error codes or service codes on your display panel, record them and inform your service contractor.

Your daily maintenance inspection is a quick and high-level overview of your boiler system.



Periodic Boiler Maintenance

On a monthly, bi-monthly, or quarterly basis, have your technicians and maintenance personnel perform a more comprehensive inspection of your boiler system. In this more comprehensive inspection, your workers should check for issues such as leaks, blockages, and signs of wear or corrosion in the piping, valves, and other areas, such as:

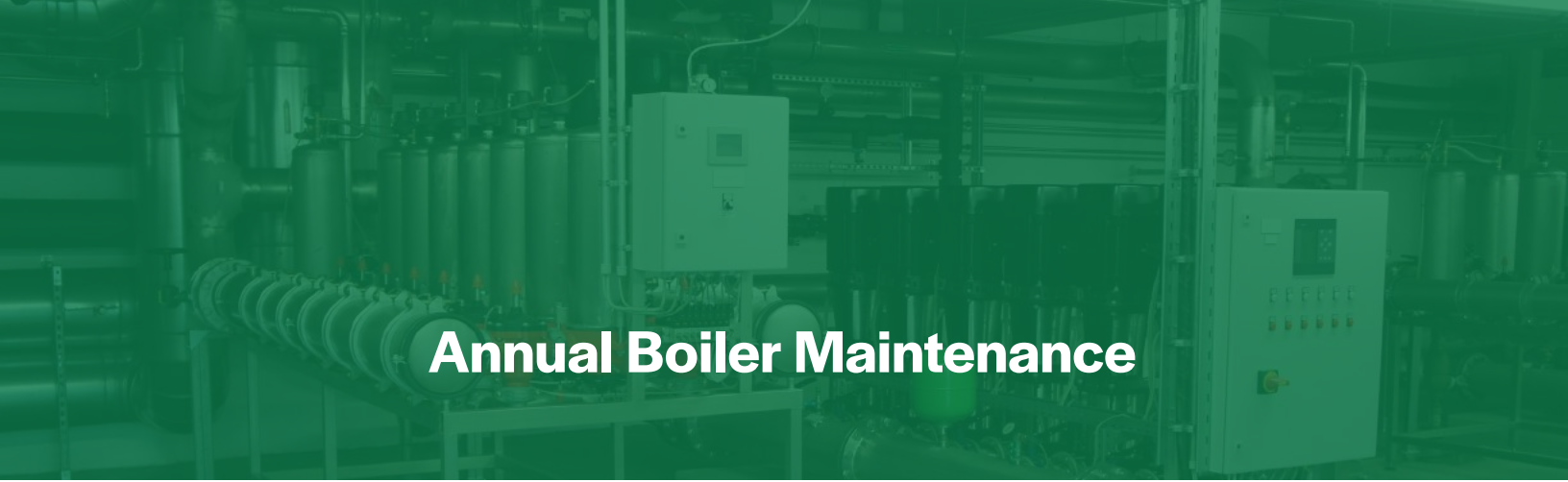


Your checklist for monthly or quarterly boiler maintenance:

- ✓ Conduct a visual inspection of your boiler's combustion air piping and flue gas vent piping for signs of leakage, blockage, corrosion, or deterioration.
- ✓ Check the boiler relief valve and the relief valve discharge pipe for any signs of leakage or weeping.
- ✓ If you have a condensing boiler, check the condensate drain line, PVC fittings, drain system, and drain tap for blockages.
- ✓ Check the boiler hydronic piping for leaks.
- ✓ Take a close look at the burner flame and take corrective action if it looks at all different from normal.
- ✓ On a quarterly basis, schedule testing for your boiler's low water cutoff to make sure it is working properly, so that water levels inside your boiler will not fall below manufacturer-recommended levels.

Your monthly or quarterly maintenance inspection is a more intensive inspection of your boiler system, delving deeper into your boiler equipment to search for warning signs of potential problems or areas where your boiler's performance can be improved.





Annual Boiler Maintenance

One a year, perform a thorough, comprehensive deep dive into your boiler's physical health and performance. For an annual maintenance inspection, you will want to bring in a licensed service professional. This licensed professional should be highly trained and equipped to inspect every part of the boiler system, diagnose issues, repair problems, and conduct additional maintenance work to ensure your boiler system will be healthy and long-lived.

During your boiler's annual maintenance, a licensed professional can:

- ✓ Rigorously test your boiler's capacity and capabilities
- ✓ Clean your boiler's heat exchanger
- ✓ Check your boiler's connections and wiring and ensure that they are intact
- ✓ Test your boiler's water pH levels and ensure they are within the proper range
- ✓ Clean and flush your boiler's condensate systems as necessary
- ✓ Clean your boiler's flame sensors, burner assembly, and ignitor
- ✓ Find any signs of deterioration, blockage, or corrosion in the venting system and ensure that all pipe and joint connections are secure
- ✓ Check vent terminations and air inlets for obstructions
- ✓ Check control settings
- ✓ Test safety controls and operating controls

Repair any problems encountered over the course of the examination or source parts to replace components in need of replacement

Annual boiler inspection and servicing should only be conducted by an experienced service agency or professional licensed to perform inspections and maintenance.





How to Develop and Optimize Your Boiler Preventative Maintenance Plan

Putting in place a preventative maintenance plan for your boiler is essential to ensuring that your daily, periodic, and annual inspections prove fruitful.

Some tips to keep in mind for developing your preventative maintenance plan:

- ✓ Create checklists that outline specific procedures for each preventative maintenance operation.
- ✓ Include time estimates for each task, using data from previous work orders on your boiler system.
- ✓ Take the cost of replacement parts, tools, and safety measures into account.
- ✓ Do not skimp on safety for the sake of productivity.

The clearer and more precise the outlines and checklists for your boiler maintenance plan is, the more reliably and efficiently your maintenance technicians will be able to complete their inspections quickly and with minimal risk of human error getting in the way.

To begin developing your own boiler preventative maintenance plan, first make sure to consult the owner's manual.



Consult Your Boiler's Owner's Manual

Each boiler is different. The owner's manual for your property's boiler system will provide you with the manufacturer's recommendations for maintenance and upkeep of your system. Use this as the foundation and framework of a more comprehensive preventative maintenance plan that works for you.

No preventative maintenance plan is one-size-fits-all. Your owner's manual will provide specific instructions regarding the unique properties of your boiler, including guidance on inspection. Make sure to keep a copy of your boiler's startup and inspection manual on file so that you and your employees can refer to it as needed.

Consult the US DOE Checklist on Preventative Maintenance for Boilers

The US Department of Energy provides a checklist for preventative maintenance measures for a wide range of infrastructure equipment and systems, including boilers, chillers, steam traps, pumps, cooling towers, and lighting systems.

In this checklist, you will find comprehensive information regarding the key components of a boiler system, common failure modes for these components, and how these components are assessed by nondestructive testing professionals to ensure compliance with all regulations, standards, and codes. These can be extremely helpful in crafting your boiler preventative maintenance plan.

Collect Data on Your Preventative Maintenance Plan

Your boiler's preventative maintenance plan is not carved into stone tablets, but rather a living document, like the US Constitution. As time goes by, you will find opportunities to tweak and adjust your plan in order to best suit the health and continued safe and reliable operation of your boiler system so that you can do the most good and get the most out of your system with the least amount of necessary labor and monetary investment.

In order to find these opportunities, you will need to store and collect data regarding your boiler's operation, starting with work orders regarding previous repair, maintenance, or replacement actions your workers have taken.

Collect data on your boiler's health, how frequently failures and incidents have occurred in the past, completion times for repairs, and repair costs so that you can intelligently build and optimize your maint

Analyze Your Data

Analyzing the data you've collected is about identifying trends, such as how many corrective maintenance actions your workers have had to take in the past and the average time between maintenance actions.

If you find that your technicians are having to do a lot of corrective maintenance work on certain components in particular, for example, you've found a trend that your preventative maintenance plan needs to take into account.

Make Tweaks and Adjustment As Needed

Experts suggest a “golden ratio” of six preventative maintenance actions to every one corrective maintenance operation. That is to say, one in six preventative maintenance routines should reveal corrective work that needs to be done, such as replacing or repairing a component.

Fewer than six preventative maintenance operations per corrective maintenance operation on average indicates, for example, that you aren't performing enough preventative maintenance on your boiler system. More than six, on the other hand, means you are overperforming certain preventative maintenance operations.

Keep tweaking and adjusting your preventative maintenance plan and targeting this “golden ratio” and you will ensure that your plan continues to work smoothly and efficiently to keep your boiler healthy and reliable in the long term.

If Needed, Implement Condition Monitoring

Condition monitoring is the bridge between your preventative maintenance plan and a predictive maintenance plan. With a predictive maintenance plan, you use the data you receive from sensors set up in your boiler system to monitor factors such as drum pressure and temperature to detect extremely early warning signs of potential issues or safety hazards and nip them in the bud as soon as possible.

A predictive maintenance system relying on condition monitoring tools can make daily or weekly preventative maintenance checks less necessary, which can help you save money in the long run.



Trust Chiller for Commercial Boiler Services in the Denver, Colorado Area

When it comes to having your boiler's annual preventative maintenance inspection, always put your trust in licensed and experienced experts in commercial and industrial boiler maintenance, servicing, and repair.

The intensive and in-depth work required for an annual inspection to identify potential warning signs and ensure your boiler system is healthy requires extensive and specific expertise.

At Chiller Systems, our factory-trained technicians have provided comprehensive boiler solutions for industrial, commercial, and institutional clients of all sizes throughout the Metro Denver area. We specialize in installation, repair, retrofitting, and replacement, in addition to preventative maintenance.

We're dedicated to helping our clients, including property managers of all sizes, find and maintain reliable, high-performance, energy-efficient boiler solutions for their properties—no matter how many properties you have—so that you can provide maximum comfort for your tenants. We work with people as well as we work with equipment so that you can feel comfortable turning to us whenever you need help with your boiler system.

If you're a Denver area property manager in need of help developing a preventative maintenance plan for your boiler system and you're looking for somebody who can provide in-depth preventative maintenance, corrective maintenance, and expert consultation, look no further than Chiller Systems Service.

Contact Us

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