

WHAT CAN
GO
WRONG
WITH YOUR HVAC SYSTEM

AND HOW WE CAN
TAKE
CARE
OF IT!



Your major whole-house appliances - furnace, boiler, air conditioner and water heater - have become complex machines over recent decades. Mechanical subsystems have been replaced by electronic controls and CPUs that control embedded software for fine-tuning a unit's operation. The increased complexity conserves energy and improves comfort for the home's occupants. However, complexity and specialized components may increase servicing costs especially if high-value parts fail.

How Things Go Wrong with HVAC Equipment

Gas or Electric Furnaces

Most modern furnaces have similar failure modes as older models:

- The supply of warm air to the home is diminished due to blocked ductwork, clogged filters or a malfunctioning fan system.
- Thermostats or zone control systems may misread temperature or send bad data to the main control unit, which results in the indoor temperature being too hot, too cold, or in too large a range.
- The furnace heating mechanism, electric or gas, may fail due to a heating element crack or broken gas burners or heat exchanger.
- Exhaust gases or condensing moisture may collect inside a house if the flue or wastewater pipe is blocked. This causes a decrease in efficiency or, worse, an accumulation of carbon monoxide in the home.

Household Boilers

Heating systems that use boilers distribute heat via radiators in each room or tubing under a home's sub-floor. They have their own set of potential malfunctions:

- Loss of pressure in the boiler or distribution system can be caused by joint or tubing leaks or bad pressure valves. If a good pressure valve leaks, then too much pressure is being generated.
- Kettling is a process whereby mineral deposits build up in the boiler vessel. This is accompanied by a distinctive rumbling sound in the boiler.
- If air enters the system, it may create flow-blocking air locks or strange sounds emanating throughout the system.
- Radiators or tubing can go cold due to a broken pump, valve or a pipe blockage.

Famous Boiler Explosions

Boilers have been used for centuries in industrial applications. It is extremely unlikely that your home boiler system would ever explode, although leaks in the gas system serving a boiler have made for some spectacular explosions in residences.

Boiler explosions can be caused by bad safety valves, corrosion, low water levels or failure of components, such as the boiler tank, to stand up against the internal steam pressure.

Two boiler explosions in the 19th and 20th centuries stand out in history.

In 1858, the boiler of the side-wheeler steamboat Pennsylvania catastrophically failed while navigating the Mississippi River near Memphis, Tennessee. There were 450 passengers on board, of which 250 were killed. Among the dead were Henry Clemens who was Mark Twain's younger brother.

A spectacular boiler explosion occurred in San Antonio, Texas in 1912. The recently repaired Engine #704 was idling at a siding when the boiler tank split a seam. The several ton boiler cylinder rocketed hundreds of feet into the air along with wheels, pipes, levers, grates and plate iron. When these pieces returned to earth, they destroyed nearby homes. Furthermore, the pressure wave from the burst boiler disintegrated the many nearby workshops and carried the debris into the neighbourhoods. Dozens of people were injured and up to 40 were killed.

Air Conditioners

Air conditioning units often work under extreme conditions. In addition, they are usually located outdoors. They share some problems common to furnaces, but also have unique problems:

- Like furnaces, your home's air and the conditioning unit itself are protected by air filters. If the filters are dirty or blocked, cool air is absent.
- A low level of refrigerant means no cold air and an overworked unit.
- Faulty relays or electronic control mechanisms within an A/C unit may cause continuous running or frequent cycling.
- Leaky ductwork wastes most of your A/C unit's output.
- Dirty coils reduce unit efficiency and coupled with a bad fan may freeze the unit.
- If the condenser fan malfunctions, the unit overheats, which leads to higher energy use and discomfort inside the home.
- If the thermostat control system needs repair, your air conditioner will leave you uncomfortable during hot weather.

Hot Water Heaters

Hot water heaters are commonly of two types: tank heaters or on-demand tankless heaters. Either type may be fueled by electricity or gas. They have shared common problems and other problems that are unique to the type or design:

- Failure of the energy supply, electric or gas, is the usual reason for complete lack of hot water. With a gas heater, there may be a problem with the pilot light or ignition system.
- Tank heaters lose heating capacity if sediment is not removed or the internal dip tube cracks.
- If input water flow is insufficient in a tankless heater, it will not activate.
- Like boilers, tank heaters may suffer from kettling due to internal mineral deposits. A buildup of minerals or sediment can permanently damage a tankless heater.
- Like furnaces, gas water heaters malfunction if the flue is blocked.
- All types of water heaters may suffer from thermostat breakdown. Control mechanisms in tankless heaters are the most complex.
- The water pipes entering and exiting the system are subject to leaks, which may be difficult to locate.

Average Cost for Furnace or Boiler Repairs

Setting aside the cost for regular maintenance of your furnace, when it does break down, the minimum cost is around \$100 for a non-emergency house call, diagnosis and remedy. The most expensive repairs are typically \$800 or more.

These minimum and maximum costs are the outliers, however. The majority of furnace repairs fall right in between at about \$450. That amount is disruptive to most people's monthly budget. Since such repairs often happen during the colder months when you need your furnace the most, expedited service may push the bill higher.

Insuring Against Whole-House Unit Breakdown

Just as you can insure your automobile against a budget-wrecking collision, you can insure against major breakdowns of your furnace, boiler, water heater and air conditioning system. Most plans pay for any needed parts and labor to repair the problem, though many charge a deductible. Some plans include free yearly maintenance as well.

Only the ClimateCare cooperative, established in 1992, offers both deductible free, full protection plans and the largest network of highly qualified, independent HVAC technicians in Ontario. To remain qualified, these specialists must undergo continual training and testing. Of course, their member technicians possess all required licenses and certifications.

WeCare Maintenance Plan

For a modest monthly fee, ClimateCare's WeCare Maintenance Plan provides five key benefits:

- 1 The regular maintenance that comes with the plan extends the life of your HVAC unit.
- 2 Yearly precision tune-ups ensure that you are getting the most for your energy dollar.
- 3 Your service request is given the highest priority using a ClimateCare member.
- 4 You enjoy peace of mind and maximum comfort throughout the year.
- 5 Plus a discount off our regular labour rates if repairs are ever required.

There is no other HVAC protection plan more comprehensive than the ClimateCare WeCare Protection Plus Plan:

- Labor and parts are completely covered for any repair to your furnace or air conditioner
- You only need make one call to get a quality technician to repair your problem
- There are no hidden costs, even for nighttime or weekend service

Since the plan comes with regular maintenance that is automatically scheduled at a convenient time for you, your heating or cooling system will likely avoid untimely, catastrophic breakdowns and its service life will be longer, so replacement costs are reduced. When replacement is required, ClimateCare offers its clients generous discounts for new equipment.

Rest Easy

ClimateCare eliminates worries about major HVAC repairs while maintaining year round home comfort. They have a maintenance or protection plan to suit any budget and are always ready to answer your questions or concerns.

What to Expect if You Do Not Have HVAC Breakdown Protection

Without ClimateCare WeCare protection, you take on the responsibility yourself for maintaining and repairing your heating, cooling and hot water systems:

- You need to qualify local repair shops to find one that is highly qualified and does not charge an arm and a leg. ClimateCare technicians have already been assessed for the necessary skill levels for accurate diagnosis, repair and installation of HVAC equipment.
- You will likely experience long wait times for service, especially during the coldest and warmest months.
- You must remember to schedule regular maintenance visits. Further more, not all shops include the same checks and may try to upsell you an unnecessary procedure.
- You have to assure yourself that the work done by the repair shop does not void your appliance's warranty. With ClimateCare, this is never an issue.
- If it is an emergency, you can expect to pay extra for nighttime or weekend service.
- If you have used multiple repair shops, it may be difficult to put together a coherent service record.

ClimateCare WeCare Maintenance & Protection Plus Plans provide a complete service record of your covered appliances and the plan is completely transferable to the next homeowner if you ever sell your home.