



Air Conditioner Care Guide

Anything mechanical needs maintenance, from automobile engines to printers to washing machines, and refrigeration equipment is no different. It could be a CoolBot powered walk-in cooler or conventional refrigeration system, but when the contents of your cooler are so valuable, it's important to know how to take care of the machinery to optimize its performance and lifespan.

If the CoolBot is the brain of your cooler, then the air conditioner is the engine, doing all the heavy lifting. So, what can you do to keep that A/C engine running smoothly? It starts with...

The right size A/C

If we use too small an A/C for the space to be cooled, it ends up working harder than it should, which can cause early wear and failure. The right size A/C will only need to run its compressor 20% to 40% of the time, which contributes to longer A/C life

How do we know what size A/C to use? First and foremost, don't just "eyeball it", ("Yeah, so I figure 8,000 BTU's should be more than enough...") and don't go by the square foot rating on the A/C box. There is a very specific calculation when using an A/C with a CoolBot to refrigerator temperatures, and we've made that quick and easy with the [Air Conditioner Sizing Calculator](#) on our website. Just enter your cooler's dimensions and desired temperature, and it will tell you what size A/C you need. If there are any special factors at play (like a small insulated glass display window, frequent door openings, product that will be entering the cooler warmer than room temperature, etc.) you may need to add BTU's to that base calculation, so if you have a unique scenario, please give us a call so we can help you choose the right size A/C.

The right insulation

Any refrigeration system needs a properly insulated space to cool. Check your kitchen refrigerator, and you'll see that it has several inches of foam insulation. Any commercial walk-in refrigerator is made with at least four inches of foam insulation, to a value of at least R25, and usually more. Our CoolBot turnkey walk-in cooler packages, for example, are insulated to better than R28 with extremely dense foam. In contrast, a typical room, like a bedroom or a closet, has only "residential" insulation in the walls, usually fiberglass, which is fine if we only want to air condition to comfort temperatures (above 60F/18C), but simply is not adequate for refrigeration temperatures. In short, any walk-in cooler needs to be insulated to at least R25 with rigid foam material. That means four to six inches (4" to 6") of rigid foam, and airtight.

For simple instructions on what type and thickness of insulation to use, and how to install it for an airtight cooler, please check out our [Insulation Guide](#).

If we install an A/C and CoolBot in a poorly insulated space, the best case scenario is that the A/C has to run the compressor more often, shortening its lifespan, and the worst case scenarios include icing problems, excessive condensation, inability to cool, A/C overheating and failure.

Insulating correctly does involve cost, but that investment is recouped in reduced energy costs and longer A/C life. So, remember, every dollar you invest in insulation is a dollar saved in the long run!

The right A/C location

Ok, let's admit, refrigeration equipment is not a living thing, but it still needs to breathe! We want to pick a place for your A/C where it can draw enough surrounding air to effectively cool, without suffocating.

Outside clearance: The part of a window A/C that sticks outside of the cooler, the "hot side" of the A/C needs at least two feet (2') of clearance around it, in all directions. It should not be directly next to a wall, butted up against any objects or structures, or boxed in. Just imagine a two-foot bubble around that part of the A/C, that it needs free and clear, to breathe. See those vents on the sides, top, and back of the A/C? They *all* need to be completely exposed, so be sure that thick cooler walls don't cover them. Boxing in the outside of an A/C means it has to breathe its own hot, recycled air, which will make it work harder than it should, and significantly shorten its life.

Multiple A/C setups: If using more than one window A/C, for a larger cooler, the same two-foot rule applies. A/C's need at least two feet between them, and more is better. The best air flow and most even temperature will be achieved if the A/C's are equally spaced, horizontally, on the longer wall of the cooler. A/C's should never be stacked, one above the other, since incidental condensation dripping from the top one will inevitably damage its neighbor below.

Inside the cooler: If your cooler is an irregularly-shaped space, try to choose a location for the A/C that is central, where it can blow into the larger part of the space. Avoid installing it in any "niches", recessed areas, entrances, or any place where the cold air can stagnate.

Tilt: Installing the A/C perfectly leveled means the condensate (liquid water) that forms will accumulate at the bottom, possibly icing up the A/C and putting excess moisture into the air around it, which is not healthy for its circuit boards. Make the cut-out for the A/C at least 1" larger than the A/C cabinet size, to let it "sag" on the outside. We want at least one inch (1") drop towards the outside, or even a little more, to make sure the water runs out quickly.

Shade: The ambient temperature in direct sunlight can be much hotter than in the shade, so if you can, shade the A/C. A hood built above it helps. Also, if you're building an outdoor cooler, try to put the A/C on the north side (that's if you're in the northern hemisphere; if you're in the southern hemisphere, reverse that), which gets less sun. The cooler the air on the outside of the A/C, the less it has to work, extending its lifespan.

The right electrical

We recommend you have a professional electrician install the outlets for your A/C. A/C's, even small ones, draw a lot of current, so check the spec sheet for whichever model you've chosen. It will tell you how many volts it needs, and the amp rating required for the circuit. Give your A/C a dedicated circuit, so it doesn't have to share amps with other devices.

A quick tip on GFI or GFCI outlets: Most window A/C's have their own GFI plug, with test and reset buttons built in, so plugging that into another GFIC outlet usually makes one or both trip. Just one GFIC is needed.

Using a generator or inverter? Great! Just be sure to check out our [Generator and Inverter Guide](#), to size

the generator adequately for the A/C (spoiler, just triple the A/C's peak wattage to determine required generator or inverter size.)

Extension cords often are not heavy enough gauge to give an A/C enough "juice", so the motors (compressor and fans) are slow to start, overheat, underperform, and sometimes don't work at all. All of that can shorten your A/C's life. So, treat it like a five-year old child, and give it all the juice it needs.

The right environment

Some environments are toxic to refrigeration equipment. For example, breweries use acid and caustic washes for sanitizing and cleaning. Open fermentation, of pickles for example, or kombucha, puts acid vapors into the air which are stronger than you'd imagine. Seafood can put ammonia compounds into the air. Coolers near the coast are subject to salt spray. All of those things in the air can react with metals inside the A/C and cause early coolant leaks, damage to circuit boards, and corrosion in general. So what can you do?

First, never apply any of those chemicals directly to the A/C to "sanitize" it. Try to plan the cooler and A/C placement to keep it away from where those chemical fumes will be strongest, and add extra ventilation if needed.

Cleaning the A/C's fins more often will also help, using just clean water, to rinse away any chemical deposits. There are also specific products designed to treat refrigeration equipment in extreme conditions. Google "air conditioner coil protector", and you'll see plenty of products that can be sprayed onto air conditioner fins and coils when new, to stave off corrosion and extend their life.

The right treatment

Some parts of an A/C are delicate because they have to be. For example, the fins and cooling tubes are very thin, because they have to transfer heat efficiently. That also means they can be easily damaged. So treat them with kid gloves. Be gentle when placing sensors in the fins. If an air conditioner ices up (which it shouldn't), defrost it by placing it in "fan" mode only, no hair dryers or heat guns that make the metal expand quickly and possibly crack. When unboxing, installing, moving, or cleaning an A/C, avoid hard bumps that can cause those thin metal tubes to fissure. Treat it like a baby, and you'll extend its life.

The right cleaning

As shown in our [A/C cleaning video](#), just clean water and a long bristled brush are all you need to clean the inside (cold side) fins of your A/C. It only takes five minutes, and should be done monthly. Clean fins mean quicker heat transfer. Dirty fins means the A/C compressor has to work longer and harder to effect the same amount of cooling, again, shortening its life. Cleaning the outside of the A/C (hot side) takes a bit longer, but should be done yearly, and is just as important to get contaminants, dust, and debris from the condenser coils. [Here is a great video showing that process.](#)

When cleaning, avoid harsh acids (like vinegar, Star San, peracetic acid) or harsh alkalines (like bleach or strong detergents) since they can react immediately with metals and can cause early failure of the tubes that contain the coolant. Clean water or pH balanced A/C coil cleaners are best.

Blowing compressed air into the fins just packs dirt in deeper, so please avoid that. A vacuum with a brush attachment is better, to draw out those contaminants.