



PERSONAL AIR COOLER

Dovranov Mekan

student of the Faculty Cyberphysical systems Oguzhan Engineering Technologies
University of Turkmenistan
Ashgabat, Turkmenistan

Baymyradov Turkishmyrat Baymyradovich

student of the Faculty Cyberphysical systems Oguzhan Engineering Technologies
University of Turkmenistan
Ashgabat, Turkmenistan

Hajiyev Begench Ismailovich

student of the Faculty Cyberphysical systems Oguzhan Engineering Technologies
University of Turkmenistan
Ashgabat, Turkmenistan

Meredova Bahar

student of the Faculty Cyberphysical systems Oguzhan Engineering Technologies
University of Turkmenistan
Ashgabat, Turkmenistan

Seyitmuhammedova Merjen Seyitmuhammedovna

student of the Faculty Cyberphysical systems Oguzhan Engineering Technologies
University of Turkmenistan
Ashgabat, Turkmenistan

Have you ever walked into a hot room and wished for a magical solution to beat the heat? Air coolers are like the superheroes of summer, saving you from the scorching heat with their magical ability to cool down a room. By drawing in hot air and passing it through moistened pads, these gadgets work their magic and release blissful cool air into your room.

But, have you ever stopped to wonder how an air cooler works? Let's delve into the science behind air coolers and understand how they keep you cool and comfortable, even on the hottest of days.

What is an Air Cooler?

Wondering how does an air cooler work? Before you dive into that, it is important to understand what this home appliance can do for you, especially during summer.

An air cooler is a device that is used to cool the air in a room or an outdoor space. It operates by drawing in hot air and passing it through moistened pads, which cools the air as it evaporates the water. The cooled air is then expelled into the room, creating a refreshing and comfortable environment. The process is repeated continuously until the desired temperature is reached.

Air coolers are an energy-efficient alternative to air conditioning, making them a popular choice for those who want to beat the heat without breaking the bank.

Also Read: [All about Air Coolers](#)

How Does an Air Cooler Work? The Evaporative Cooling Principle

Air coolers work on the principle of evaporative cooling. The basic idea is to use a fan to circulate air over a wet surface, causing evaporation of the water and cooling the air.

- **Evaporative cooling:** The air cooler uses a fan to blow hot air over a wet evaporative pad. As the air passes over the pad, the water in the pad evaporates, which removes heat from the air and cools it.
- **Cool air production:** The cooled air is then blown into the room, reducing the overall temperature of the room.
- **Releases fresh air:** The air cooler also helps in adding moisture to the air, making it fresher and more comfortable to breathe.

The amount of cooling that can be achieved with an **air cooler working principle** is directly related to the relative humidity of the air. The **working of an** air cooler is most effective when the relative humidity is low, as the air can absorb more moisture and hence more heat can be removed. When the relative humidity is high, the air is already saturated with moisture and the cooler will not be as effective.

A Deep Dive into the Parts of an Air Cooler

An air cooler is composed of several components that ensure the smooth functioning of the cooling appliance.

- **Water tank:** This is where the water is stored for evaporation. The size of the tank varies depending on the capacity of the air cooler.
- **Water pump:** The water pump is responsible for circulating the water from the tank to the cooling pads.

- **Cooling pads:** These are the medium through which air passes and is cooled by the water evaporating from them. They are typically made of cellulose or synthetic fibres.
- **Fan:** The fan pulls the warm air into the air cooler and blows it over the cooling pads, which cools the air. The cool air is then blown out into the room or space.
- **Motor:** The motor is responsible for powering the fan and the water pump.
- **Control panel:** The control panel allows the user to set the speed of the fan, adjust the water level, and turn the unit on and off.
- **Exhaust vents:** These are the openings through which the cool air is blown out into the room or space.

Want to learn more about how to use an air cooler with and without water? Let's take a look at the **function of an air cooler** in the following ways.

How does an Air cooler work with Water?

Most air coolers have to be used with water so that the room can receive sufficient cooling. Here are the steps you need to follow.

- **Prepare the water:** Fill the water tank to its maximum capacity with clean water. You can also add ice to the water to enhance the cooling effect.
- **Adjust the settings:** Adjust the fan speed, air flow direction, and temperature as desired to get your air cooler to function in the correct manner.
- **Check for leaks:** Keep an eye on the water level and make sure there are no leaks. If there is a leak, turn off the air cooler and repair it before continuing to use it. After this, switch on the air cooler and enjoy a cool breeze.

It is also important to understand that these steps may vary depending on the model of your air cooler. Hence, make sure to refer to the manufacturer's instructions for more information.

How to Use an Air Cooler without Water?

Using an air cooler without water is not recommended as the cooling effect of an air cooler is based on the principle of water evaporation. However, if you still want to use an air cooler without water, you can follow the steps below:

- Turn off the air cooler and unplug it from the power source
- Remove the water tank and empty it of any remaining water
- Remove the cooling pads and clean them thoroughly to remove any dirt or debris
- Reinstall the cleaned cooling pads in the air cooler
- Turn on the air cooler and set the fan speed to the desired level
- The air cooler will function as a regular fan without the cooling effect of water evaporation. You can use it to circulate air in the room and create a gentle breeze.

It is important to note that using an air cooler without water may cause the unit to overheat, which can damage the motor and other components. Therefore, it is recommended to use an air cooler as intended with water in the water tank to achieve the cooling effect it is designed for.