



What impact does air humidity have on air compressors?

The humidity of the air changes with the change of the air state. When the air is compressed, its temperature increases and the relative humidity decreases. When compressed air expands and the temperature of the air drops, its relative humidity increases, and water will usually precipitate. So, what effect does air humidity have on air compressors?

What is air humidity?

Air humidity is a physical quantity that expresses the degree of dryness and humidity of the air. In layman's terms, it reflects the amount or percentage of water in the air. Humidity is divided into absolute humidity and relative humidity. What is absolute humidity? Simply put, it is the mass of water vapor contained in the air in 1m^3 volume under standard conditions, the unit is g/m^3 . Relative humidity is the ratio of the actual amount of water vapor contained in humid air to the maximum possible amount of water vapor at the same temperature. That is to say, the relative humidity reflects the water absorption capacity of the air at this temperature. The smaller the relative humidity, the greater the water absorption capacity, and finally reaches saturation, at which time the air no longer absorbs water.

How does air humidity affect air compressor operation?

When the air compressor sucks in moist air from the outside and compresses it, the density of water vapor increases and the temperature rises. As compressed air cools, the relative humidity increases. When the temperature continues to drop until the relative humidity reaches 100%, it is saturated and cannot hold any more moisture. If the temperature continues to drop, water droplets will precipitate from the air, which may cause corrosion inside the air compressor, such as the oil separator core and oil drum cover. Moreover, if the air contains too much moisture, it will also increase the resistance to air flow in the air compressor pipeline. Since we are using air, if there is more water, there will naturally be less air, which will also affect the volumetric efficiency of the gas and reduce the lubrication effect of the oil.



What are the direct effects of air humidity on air compressors?

1. The moisture in the air narrows the compressed air path and increases the resistance to air flow;
2. Affect the volumetric efficiency of gas;
3. It is not conducive to the compression of the machine, causing the compression equipment and pneumatic machinery to suffer hydraulic impact. If a large amount of water accumulates in the cooler and cylinder, it will also cause machine damage;
4. Moisture in the air is very corrosive, making compression equipment and pneumatic machinery prone to rust and shortening their service life;
5. The moisture in the gas mixes with the lubricating oil during the compression process, which will reduce the lubrication efficiency and increase the abrasion of the machine parts. In the packing for rubber circulation lubrication, it will not only cause poor sealing but also cause the air compressor lubricating oil to deteriorate;
6. One cubic meter of moist air (that is, the density of air molecules) is less than the weight of dry air of the same volume. At the same time, when the compressed air passes through the air

compressor accessories, cooler gas tank and pipeline, most of the water vapor is condensed, so the production capacity for weight calculation will be reduced;

7. The air supply system contains moisture. When the temperature is below 0 degrees, the moisture will freeze on the inner wall of the air duct. Similarly, reducing the diameter of pipes can sometimes even cause individual pipes to completely freeze, hindering work in individual sections. Therefore, the quality of compressed air is determined not only by its pressure, but also by its humidity.

The above is the impact of air humidity on air compressors compiled by Wuxi Youteng Machinery. If your [air compressor](#) fails, please contact us in time.

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Atlas Air Compressor Supplier and Manufacturer - Youteng Machinery

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