



[Desiccant Dehumidification Troubleshooting Guide](#)

There are a number of things when dealing with desiccant dehumidifiers that have to be present so dry air can be achieved. They are:

1. Desiccant must be present. Either in wheel or bed form. (silica gel, activated alumina, molecular sieve, etc.)
2. Two airstreams (Process and Reactivation. Process is the dry air side and the React is the moisture air discharge side)
3. Rotating desiccant wheel
4. Seals. The Airstreams mentioned above must be sealed properly so no leakage is present. There are 6 total seals within the desiccant wheel cassette. 3 on each side. (on the Compact Series dehumidifiers there are only 5 seals.)
5. Heat source. Normally >200F and <325. The heat source can be either electric, gas, or steam.

These are the 5 main variables that have to be present. There are other variables that can be included such as pre cooling coils, purge designs, bypass dampers, etc. However, they are only present to supplement the main dehumidifier's operation. Below is a more detailed list of troubleshooting techniques on both the Rotor Series and Compact Series dehumidifiers.

Rotor Series (vertical wheel):

- **Is the desiccant wheel turning?**
 - If not:
 - It could be a bad gearmotor or
 - The VFD speed control isn't adjusted properly or
 - Somehow there is no power supplied to the gearmotor. Check wiring/voltage.
- **Is the desiccant wheel turning at the right speed? Normal speed is 14-24 RPH.**
 - If not:
 - Adjust using the VFD Speed control or
 - Install new sprocket/gearmotor arrangement to achieve speed.
- **Are the seals in good working order?**
 - Check the perimeter seal, the vertical seal, and the horizontal seal. Ensure to check both sides of the wheel. Total, there are 6 seals. 3 on each side (1 perimeter seal that follows the

shape of the desiccant wheel and 2 straight seals that divide the react section from the process section.

- To ensure there is not leakage between the react inlet and process outlet, use a standard business card or credit card and see if you can slide it between the seals and the desiccant wheel. If the card freely slides between the wheel and the seal, the seals need to be replaced or adjusted. The card should have some resistance against it when it is slid between the two.
- **Are the two airstreams balanced?**
 - Get a profile across the filters to be completely sure. Sometimes the Magnahelic isn't the best way to tell. $CFM \text{ required} \div \text{Filter square footage} = \text{Velocity}$.
 - In addition to the velocities across the filters, make sure the process outlet is not stealing air (leaking) from the react inlet. This is very difficult to obtain by just velocity readings on the inlet filters. Most likely you will have to run a profile on the wheel which requires crawling into the process outlet section and measuring dewpoint at the top portion of the process outlet as well as other points along the seals of the desiccant wheel. Look for spikes in dewpoint as you run the profile. If the dewpoint is higher than normal, leakage is occurring. Normally the driest part of the wheel is the portion just leaving the react section near the 11 o'clock area, as it rotates counterclockwise. As it makes its way towards the last part of the process section (3 o'clock) the moisture level begins to rise and you almost achieve "break-through" right before the wheel enters the react section at 3 o'clock. Normally three moisture profiles are taken. One in the upper left portion of the wheel, one in the lower left, and one in the lower right portion of the wheel. Take the average and most likely that is your overall leaving dewpoint.
 - To remedy this leakage problem:
 - The seals need to be adjusted/replaced or
 - The reactivation airflow needs to be increased so it overpowers the process airstream.
- **Is the reactivation heater temperature operating at the design temperature?**
 - Normal ranges are 250-300F. There is normally a controller inside the control box that will indicate this temperature via either a digital readout or analog dial.
 - If heaters are not operating temperature correctly:
 - Are the heaters burned out/bad?
 - Check amperage on each leg while the power is on. They should be the same unless there is an unbalanced load by design.
 - Check the ohms when the power is off. Check between legs 1 & 2, 2 & 3, and 1 & 3. They should be the same unless there is an unbalanced load by design.
 - Is the temperature controller bad/not operating correctly?
 - Is it calling for heat on the controller?
 - Is the Circuit Breaker on?
 - Is the Definite purpose contactor on? Check voltage.
 - Is the thermocouple bad or located in a bad location so it isn't reading the proper temperature? Sometimes the sensor can fall and give false readings.

If you can verify the above items, then you should be getting dry air. The only other variable is the desiccant. It might be contaminated or it's reached its lifecycle and is no longer able to dry air. However, under most circumstances, if the above are achieved, dry air is as well.

Compact Series (Horizontal bed):

- Is the desiccant bed turning?
 - If not:
 - It could be a bad gearmotor or
 - The bed timer controller (normally 1TC) isn't adjusted correctly or
 - Somehow there is no power supplied to the gearmotor. Check wiring/voltage.
- Is the desiccant bed turning at the right speed?
 - If not:
 - Adjust the bed timer controller (normally 1TC). Normal operation is 8 seconds on, 45 seconds off.
- Are the seals in good working order?
 - Check the perimeter seal, the two vertical seals (one on the right side of the bed that is shaped like a reverse capital letter "D" and one on the back side of the dehumidifier that can be felt by hand but not seen easily with the desiccant bed installed (use a mirror)), and the two horizontal seals (one on the bottom of the bed and one on the top of the bed). Ensure to check both sides of the bed. Total, there are 5 seals. 1 perimeter seal on the desiccant bed, 2 vertical seals, and 2 horizontal seals.
- Are the two airstreams balanced?
 - Get a profile across the filters to be completely sure. Sometimes the Magnahelic isn't the best way to tell. $CFM \text{ required} \div \text{Filter square footage} = \text{Velocity}$. On the Compact Series, please refer to the Air Balancing Page located in the front of the IOM that came with the unit. It will detail the air balancing procedures in a easy to follow manner.
- Is the reactivation heater temperature operating at the design temperature?
 - Normal ranges are 250-300F.
 - If heaters are not operating temperature correctly:
 - Are the heaters burned out/bad?
 - Check amperage on each leg while the power is on. They should be the same unless there is an unbalanced load by design.
 - Check the ohms when the power is off. Check between legs 1 & 2, 2 & 3, and 1& 3. They should be the same unless there is an unbalanced load by design.
 - Is the Circuit Breaker on?
 - Is the Definite purpose contactor on? Check voltage.

If you can verify the above items, then you should be getting dry air. The only other variable is the desiccant. It might be contaminated or it's reached its lifecycle and is no longer able to dry air. However, under most circumstances, if the above are achieved, dry air is obtained.

If all of these items have been achieved and dehumidification is still not happening, please contact the factory for assistance.