

# Manual DehuKing Twenty Ton Dehumidifier remote/internal

## DU20T29CK696-x, DU25T36CK864-x

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## **PLEASE READ THIS MANUAL BEFORE POWER UP**

**THANK YOU FOR YOUR PURCHASE.** DehuKing<sup>®</sup> Warranty info is on the last page. Dehumidifiers are very similar to air conditioning units except on free standing self-contained units the same air is carried across the condenser and the evaporator. This process removes moisture from the atmosphere that is collected in a stainless steel pan. The water is then routed to a collection point of your choosing. The air leaves the evaporator much drier then passes through the condenser unless you own a remote model or combination model.

# Choosing a location for your DehuKing Dehumidifier

## Clearance

It's important, if possible, to locate the dehumidifier in the most humid area of the structure. Open space is the next most important thing when choosing a location. This stainless steel cabinet can be mounted flush against the wall of the structure without harm. It is important that the front, one side and top are exposed to free air. Intake needs 6' of clearance and discharge needs 6' of clearance above the unit. Intake is on the front near the bottom inside the grill. Discharge is atop the dehumidifier. One side can be flush against a wall however the other side must open.

## Remote Condenser Clearance

If you have purchased the remote dehumidifier or the combination unit you must locate your condensers outside on a pad. We prefer concrete pads that are 4' x 4' x 4" thick. You can purchase pre-built pads also. Locate where there is no pooling of water. Air is important and accessibility is important for repairs. You need 2' clearance on three sides and six feet on one. Most remote condensers are 3' x 3' x 42"H and discharge hot air straight up. The refrigeration lines are normally pre-charged and are worry free. If you use weld in place copper lines the technician must have a state refrigeration license. All wiring must be installed by a licensed electrician. In some states a licensed refrigeration technician is permitted to wire high voltage wires for HVAC and refrigeration.

## Air Intake & Discharge

The main air intake side has a filter over the intake and the discharge side has the large fan or fans with grills mounted atop the unit. This unit intakes humid air on one side that is then filtered before crossing through the evaporator/moisture removal Heat Exchanger (HX or HEX or HeX). The dry cooled air is then drawn across the condenser before being discharged out the top. When it goes through the condenser it is heated the same amount the temperature was reduced. If a unit is 20 tons then one half is 10 tons or 120,000 BTU. That means it cools the air 120,000 BTU while removing humidity then to cool the condenser(s) the exact 120,000 BTU is used to cool 120,000 BTU of condenser(s).

A 20 ton has two 10 ton compressors, two 10 ton condensers, and two 10 ton evaporators/moisture removal coil. 240,000 BTU of heat exchangers for the condenser and 240,000 BTU for the moisture removal evaporator.

This unit operates similar to an air conditioner that uses a compressor. Because of this, there will be a slight temperature increase in the area of the DehuKing Dehumidifier. Room temperature air is drawn through the filter and across the refrigerant chilled evaporator/moisture removal HX\*. Dry cool air is then blown across the condenser before discharging out the top of the dehumidifier.

\*Heat exchanger

## Remote Dehumidifier

Remote Dehumidifiers have an advantage over a standard dehumidifier. They make cold air while they dehumidify and it will cool the greenhouse or warehouse space. When a remote dehumidifier goes below 65F the evaporator is in the “danger zone” because it means that you are close to making ice on the evaporator. When your environment temperature gets down to 55F you’re in the danger zone.

Number one is that your refrigerant dehumidifier will need the refrigerant to be 20F colder than the environment. The evaporator or dehumidifier HX will be 20F to 30F colder than the environment. This could put your evaporator at 25F or making ice. Your dewpoint will drop to below the room temperature, this means you’re in a critical danger zone of non-dehumidification. Since your evaporator needs to be ten degrees colder at minimum, the refrigerant will be even colder than that. Evaporators must absorb heat to remove and collect the moisture. We need an evaporator to be 10F to 20F colder than dewpoint to do a good job collecting condensate. ***What is the answer?*** Add heat, raise the environment temperature to 70F or more, then everything falls in line and you remove humidity.

Remember, “***THE BEST DEHUMIDIFICATION TAKES PLACE ABOVE 75F.***”

## Legs or Options

There are a number of options that can be chosen to replace the legs that are standard capped stainless steel square tube. Optional casters of many sizes can be chosen. Most are sold with steel casters. Some with sand floors will use skids or large balloon wheel casters. If floors are made of concrete we recommend steel casters. Always lock the wheels when placing the dehumidifier in a permanent location.



## Securing to a Wall

This dehumidifier can also be secured to the wall using an optional mounting package. Please contact our manufacturing facility at 512-303-1529. Ask for the plant manager.

## Drain Removal of Condensed Water

The water that has been removed is very similar to distilled water. Water vapors are collected by cooling to bring about condensation. The condensed water runs down the evaporator/moisture removal HX and drips or runs into a pan. It is then routed out the end of the dehumidifier through the drain outlet.

Use Backing Tool



## Plumbing the Drain

It is important to collect the condensed water and route it to either a collection point or drain to waste. The outlet from the DehuKing Dehumidifier is 3/4" female pipe thread. You must use a 3/4" male fitting with pipe compound or Teflon tape to begin your drain route. Use a backing tool when tightening the male fitting into the female fitting of the dehumidifier. We recommend PEX because long rolls can be purchased and used in long lengths. A male 3/4" PEX fitting is made to join to the dehumidifier. We prefer the PEX crimp rings as shown. PEX pipe is easily bent without any need for additional fittings. The water can be routed drain to waste or drain to collect. A P-trap should be installed on the outlet of the dehumidifier.



## Drain Pan and Electrical

The electrical pass through is located just beneath the spec sticker on the back of the DehuKing Dehumidifier. It passes out the bottom of the dehumidifier near the specification sticker located on the rear lower left of the machine.

The drain lines are located on the exterior bottom pan. One drain is the primary pan and it is marked as such. The other drain is an overflow; it is also marked as such.

## Electrical

**Electrical Knockout:** Due to the U.L. Codes and restrictions, electrical panels cannot have pre-drilled holes for electrical connections. Those must be drilled or punched by your local licensed electrician. The hole should be located near the electrical service bar inside the dehumidifier. The spec sheet by model designates where the electrical service panel is.

These commercial/industrial dehumidifiers come in 3 phase 208v-230v or 3 phase 460v-480v. Only the models beginning with DU05TA come in single phase plus 3 phase 208v-230v and 3 phase 460v-480v. We recommend hard wiring these industrial dehumidifiers; however, they can be installed using a power cord that is not included.

These dehumidifiers must be installed according to local electrical codes by a licensed electrician or a licensed technician connecting unit to an electrician-supplied service disconnect. This unit should be connected to a ground fault interrupted service disconnect or an outlet with a ground fault breaker.



## Air Filtration

This DehuKing Dehumidifier is also an industrial air purifier to the level of chosen options. This unit moves a large volume of air. In addition, there are different options for filtration such as carbon filters. Depending on type of filter used, the filters should either be replaced or cleaned once a month. An inexpensive traditional air conditioning filter is satisfactory and better than no filter or no filter change.

This 20 ton dehumidifier moves more air than most industrial air cleaners. This unit moves 9,000 cfm. This gives you an opportunity to clean a large volume of air. Your unit is shipped with pleated filters. You may use any ETL or UL listed filter. If in Europe you may use any EU CE listed filter.



## Dehumidifier Controls

The controls are very simple to operate. Simply set the controller for the desired humidity in the area of the dehumidifier. The manual for the controller on your dehumidifier is supplied with your purchase documents.

## Control Options WiFi

Contact Biotherm Solutions™ for solutions on networking a number of dehumidifiers. Biotherm Solutions will also have options for WiFi and apps that give you additional options. Check progress or change settings from the comfort of your home.

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# RECOVERED WATER

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## Add Nutrients & Minerals as Needed

Contact Biotherm Solutions for storage solutions. If the condensed water is collected and stored, we highly recommend plastic storage or stainless steel containers. Since the water has similar characteristics to distilled water, it is very low in minerals and metals. For that reason it can cause corrosion of the metals used in storage. If this water is used to water plants or for production, please mix minerals and nutrients into the water to match your crop or production needs.

This unit will remove a tremendous amount of water from the air. The performance numbers are: 14 gallons per hour @ 80F and 60% Relative Humidity. Projected maximum performance at saturation is 31 GPH at 90F.

## Technician Needed

Hire a refrigeration technician to start your commercial dehumidifier. Units that are 5 tons and over have compressors that can start and run backwards on startup. The 3 phase circuit could be wired incorrectly and cause the compressor to run backwards. The sound will be harsh plus the pressures will be the opposite when using a manifold gauge set. Switch two three phase wires at the contractors to reverse rotation.

This DehuKing dehumidifier has four compressors. There's one each in the two remote condensers and then there's two inside the unit. The technician should start all four compressors. The outside remote compressors should never run when the inside compressors are operating or vice versa.

## Warranty Information

The warranty for the DehuKing dehumidifiers is 1 year on all parts, 3 years on refrigeration circuit. The refrigeration circuit includes compressor or compressors, the evaporator/moisture collector, the condenser, and the copper tubing that carries the refrigerant liquids or gases. Three months for labor. Warranty begins three days after purchase date from Biotherm.

3 years-Refrigeration circuit, compressor, condenser, evaporator, misc.

1 year-All parts

3 months-Labor

### **Controller PDF with below information.**

H46 Humidity Controller

Humidity Controllers

Provide automatic control of a humidifier

# Parts List

1. Compressor (Copeland Scroll)  
(The combination remote free-standing dehumidifier has four compressors but only two operate at any one time.)
2. 410a refrigerant
3. Humidity controller
4. Refrigerant liquid line filter
5. Refrigerant suction filter
6. Evaporator/moisture collector
7. Condenser
8. Fan & motor
9. Air filter chassis
10. Air filter
11. Power block with lugs
12. Stainless steel cabinet
13. Stainless steel base
14. Stainless steel pan/with drain piece 3/4" female
15. Single phase only start capacitor
  1. Remote condenser
  2. Remote compressor
  3. Remote condenser fan
  4. Remote king valve