

## Selecting a Dehumidifier

# Housing Fact Sheets

When condensation of moisture is the main cause of dampness inside a house, rather than seepage or leakage of moisture, a dehumidifier is the most effective means for removing it--especially from below-grade or partly below-grade areas- but also from major living areas of the house. Its primary function is to remove excessive moisture; it should not be confused with the function of an air conditioner which, in cooling air, also dehumidifies it. In fact, a dehumidifier slightly raises the air temperature as it dehumidifies the air.

Because a dehumidifier does not cool the air, it is used in situations where the temperature does not need correcting but the air is too damp. It is appropriate for use during hot, humid summer months or throughout the year in warm, damp winter climates. To prevent additional moisture from entering the room, windows and doors to the area being dehumidified should be kept closed.

### **How a Dehumidifier Works** *(See diagram on page 4)*

Essential parts of a dehumidifier are a refrigerating system (motor, compressor, cold coil, and warm coil) to cool the air and condense the excess moisture, a fan to move air over the cold coil, and a condensate container to catch the condensed water. A dehumidifier may have a humidistat to turn off the unit when the air has been dried sufficiently, a switch to turn off the dehumidifier when the container is full, and a signal light to indicate that the container should be emptied.

When a dehumidifier is operating, air passes over the cold coil and is cooled to the point that moisture condenses. The air then passes over the warm coil and is circulated back into the room. The condensed water drips off from the cold coil and is collected in the container.

Alternate means of disposing of the water may be provided. The container may be emptied manually or it can be removed and the water disposed of to a floor drain either directly or through a hose connected to the dehumidifier.

If there is a humidistat<sup>1</sup>, it can be set for relative humidity levels between 30 and 80 percent. Set it at a level that provides the personal comfort or the protection of household goods desired. The lower the humidity setting, the greater will be the portion of time during which the dehumidifier is in operation. If the air temperature is too low and the humidistat is set low, moisture may freeze on the cooling coil, reducing the efficiency of the dehumidifier.

The operating cost of a dehumidifier is fairly expensive. The United States Department of Energy estimates the average energy consumption of a dehumidifier to be between 200 and 1,000 kilowatt hours per year (kWh/yr). If the cost of electricity is \$0.14/kWh, that translates into a dollar amount between \$28 and \$140 per year<sup>2</sup>. But this expense may be justified when balanced against the possible moisture damage to the house and furnishings as well as personal discomfort which otherwise might occur without a dehumidifier. Maintenance is minimal, consisting of removal of dust and dirt from the various parts of the unit. Other servicing should be left to an experienced maintenance person.

### **What to Look For When Selecting a Dehumidifier**

When selecting a dehumidifier, you will find that prices vary depending upon capacity, appearance, and the various features available. Any model being considered should carry the Underwriters Laboratories (UL) label.

#### *Capacity*

Climate is an important determinant of the amount of dehumidification required: the hotter and more humid the day, the faster is the rate of moisture condensation. Infiltration of damp air from outdoors and evaporation of moisture from basement walls and floors also affect the rate at which moisture can be collected.

The capacity of a dehumidifier is measured by the number of pints of water removed in a 24-hour period from the air at 60 percent relative humidity and 80°F. Most home dehumidifiers remove between 10 to 50 pints per day. The table below will help you to determine the correct capacity for your needs.

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<sup>1</sup> A humidistat is an automatic and adjustable switch that can be set to turn a dehumidifier on when relative humidity reaches a certain level.

<sup>2</sup> This assumes a medium sized dehumidifier that operates between 400 and 4,400 hours per year. Larger dehumidifiers requiring more energy and operating more hours would cost more.

**Table 1: AHAM Dehumidification Selection Guide<sup>3</sup>**

Condition of space without dehumidification (During warm & humid outdoor conditions)	Area of Space in Square Feet (sf)				
	500 sf	1,000 sf	1,500 sf	2,000 sf	2,500 sf
Moderately damp: space feels damp and has musty odor in humid weather	10 pints*	14 pints	18 pints	22 pints	26 pints
Very damp: space always feels damp and has musty odor. Damp spots on walls and floors	12 pints	17 pints	22 pints	27 pints	32 pints
Wet: space feels and smells wet. Walls or floor sweat seepage is present.	14 pints	20 pints	26 pints	32 pints	38 pints
Extremely wet: wet floor, laundry drying takes place.	16 pints	23 pints	30 pints	37 pints	44 pints

\* For example, a moderately damp space of about 500 square feet would require that 10 pints of water be removed in each 24 hour period to eliminate the level of dampness.

\*\* If the dehumidifier has the Association of Home Appliance Manufacturers (AHAM) certification seal, its capacity has been tested according to a standardized procedure. The capacity ratings of certified dehumidifiers can be compared when you are shopping. If a model does not have the AHAM seal, its capacity may have been measured by a different procedure and should not be compared with the capacity of dehumidifiers carrying the AHAM seal.

### *Coils*

Dehumidifiers have two sets of coils. These may be arranged horizontally or vertically, or in a spiral. The location or arrangement of the coils should provide good exposure of the coils to the air passing over them to enable the dehumidifier to operate efficiently. The coils should be held firmly in place to eliminate the possibility of vibration and rattling. As air enters the dehumidifier, it blows across the cold air-drying coil, is cooled off, and deposits the excess moisture on the cold coil. The condensed moisture runs down the coils and drips into the condensate container. The cooled air then passes over the warm coil to heat the air to room temperature and to cool the refrigerant in the warm coil. The fan that moves the air is likely to be located between the cold and the warm coils.

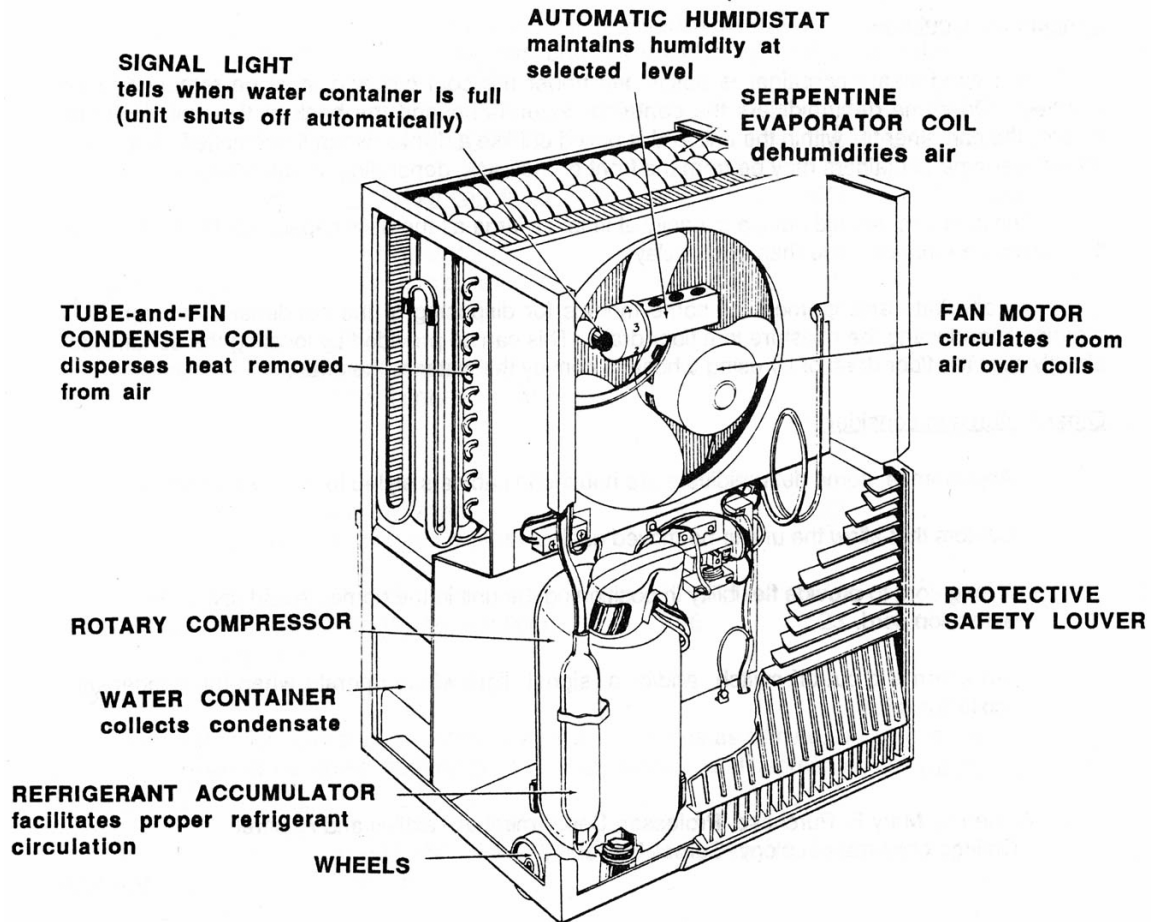
### *Condensate Container*

The condensate container is positioned under the cold coil and must be removed to be emptied. On some dehumidifiers the container extends beyond the back of the unit. In other models the container fits within the unit and is pulled out like a drawer when it is emptied. Access to the drawer-type containers may be from the front or the back, depending on the design of the unit. The container should have a capacity at least as large as the daily capacity of the unit, so that it need not be emptied more than once a day. An alternate arrangement on some models for disposing of the condensed moisture is a means of conducting the moisture to a floor drain. This can be provided by locating the dehumidifier directly over the floor drain or by using a hose to convey the water to the drain.

<sup>3</sup> 2005 Directory of Certified Dehumidifiers, published by the Association of Home Appliance Manufacturers(AHAM), Washington, DC. For more information about AHAM and to obtain a list of certified Dehumidifiers go to <http://www.aham.org> and click on "consumer section".

*Other features to consider:*

- Appearance; some dehumidifiers are housed in cabinets styled to look like furniture.
- Castors that allow the unit to be moved easily.
- A long cord to provide flexibility in positioning the unit in the home. Avoid use of an extension cord.
- An automatic cut-off switch and/or a signal light which operate when the condensate collector is full<sup>4</sup>.



**DEHUMIDIFIER**

*diagram courtesy of  
Fedders Corporation*

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<sup>4</sup> Written by Mary E. Purchase, Professor, Department of Textiles and Apparel, College of Human Ecology, Cornell University, May 1986. Revised March, 2005 by Mark Pierce, Extension Associate, Department of Design and Environmental Analysis, College of Human Ecology, Cornell University.