



HUMIDITY CONTROL

Total Home Comfort planning series . . . Book 3

To help you plan for Total Home Comfort

Today, within the four walls of your home, you can be pretty much in charge of your own indoor climate. You can have a system installed that will let you control *heating, air conditioning, humidity, air cleaning and odor.*

The control of these basic comfort factors makes it possible for you to have ideal indoor climate all year, even though you may live in an area with seasonal problems of heat, cold, humidity, pollen or dust.

Such complete indoor control is now commonly called **TOTAL HOME COMFORT.**

Capabilities for **TOTAL HOME COMFORT** have advanced more in the last few years than in generations before. Today, most home planners agree that within a very short time, the majority of better new homes will include provisions for all five important factors: *Heating* . . . for whole house comfort; *Cooling* . . . automatically controlled throughout; *Humidity Control* . . . with moisture removal or addition as needed; *Electronic Air Cleaning* . . . with efficiencies of 95%; and *Odor Control* . . . with odor neutralization and fragrance addition as desired.

The trend to Total Home Comfort calls for a new look at comfort possibilities for existing homes as well. Most homes have the potential for **TOTAL HOME COMFORT** and require only minor changes and equipment additions to make them truly modern.

In reviewing comfort plans for your home, remember that the comfort refinements you will be able to enjoy in the years ahead will depend to a large extent on you — your knowledge of the new product features available, and your insistence on having the benefit of these modern comfort developments right now. Why wait?



Humidity Control...

An overlooked element in many residential comfort systems

This booklet offers you information on humidity control as an important part of modern Total Home Comfort. Here you will find a discussion of the effects of humidity in the home, causes of humidity problems, methods of moisture addition and removal, and how you can have automatic humidity control. You'll likely find this information very helpful as a reference for system planning and equipment selection.

To help with your total system planning, Honeywell has prepared similar booklets on heating, air conditioning, and air cleaning. Copies may be available from your heating-cooling contractor, fuel supplier or utility. Or write directly to Honeywell, Merchandising Department, 740 Ellesmere Road, Scarborough, Ontario. Specify the books you want.



*Too dry . . . too damp . . .
or just right*

*If you are going to be really comfortable,
the moisture in the air must be controlled to
avoid extremes at any time.*

Most people are well aware of the pleasant, exhilarating effect of breathing moist, spring air. Most people are also well aware of the discomforts of a damp, muggy room or the parched, irritated feeling of sleeping in an extremely dry room. We have long recognized the important role of humidity on our comfort, yet until recent years, true control of humidity in the home has not always received proper attention.

Unbelievable as it may seem, the air in the average home in winter is often drier than the middle of a desert. For example, the Sahara has an average humidity of 20%, while many homes in cold weather have humidities of only 10 to 15%.

In other homes, the walls and windows may be dripping with moisture at times. Even in homes not plagued by these extremes, everyday comfort may be shortchanged because of either too much or too little humidity.

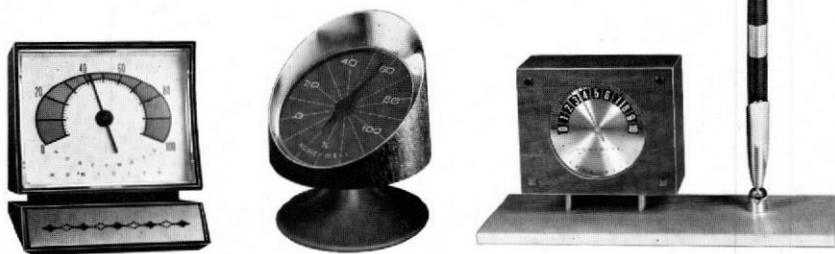
EFFECTS OF LOW HUMIDITY. If there is too little moisture in the air of your home, you may suffer from itchy skin or dry irritated nasal and throat passages. Many medical authorities relate low humidity to increased susceptibility to colds and respiratory infections.

Low humidity can cause woodwork to dry and shrink, furniture joints to loosen and leather goods and furnishings to become brittle. At humidities under 30%, static electricity may cause irritating shocks and room dust may increase.

When the air is too dry, you feel colder because of excess moisture evaporation from your body. As a result, you need a higher room temperature to feel comfortable. Studies show that for a drop of 30% in humidity, the room temperature must be raised five degrees to maintain the same body comfort balance as before. Such an increase in your home's indoor temperature could result in a 10 to 15% increase in your fuel bill. Heating costs usually increase 2 to 3% for each degree the room temperature is raised above seventy degrees. In addition, a dry house often shrinks. This tends to open cracks around the doors and windows of your home allowing even more heat loss.

EFFECTS OF HIGH HUMIDITY. If there is too much moisture in the air, as often occurs in summer, it reduces the evaporation rate of your body so you feel hot and sticky, clothing gets damp and wrinkled. Woodwork swells and drawers stick. Mold and mildew may form.

In cold weather, if the indoor humidity is too high, moisture collects on windows and walls. And it may drip down and stain and damage sills, draperies or furniture. Sometimes the moisture may form inside the walls and freeze as it collects, and later drip out to blister or stain the outside paint. Such damage can be very costly to you over the years.



There are various models of household hygrometers to help you check humidity conditions in your home. Shown here are typical table-top models. They give a direct reading of percent of relative humidity in the surrounding air. Some models include a thermometer and may include a barometer, as well.



Dry air in winter is a common but solvable problem in most homes

As cold outdoor air flows into a house and is warmed, it becomes very dry

Very few homes have adequate humidity in winter unless they are extremely tight in construction and have an unusually steady source of evaporating moisture. The dryness of most homes is due to the basic physical principle that cold air holds very little moisture, yet the same air when heated can drink up large amounts of moisture.

For example, the air in an average one-story house may contain up to 16 pints of water at 70°. Yet, the same amount of outdoor air can hold less than 4 pints of water at 32°, and only ½ pint at 0°F. This means that the air coming into a home from the outdoors in cold weather contains very little moisture. Most homes have at least two complete air changes through infiltration from the outdoors each hour. No wonder most homes get so uncomfortably dry in winter! Outdoor air on a zero-degree day may be at 100% humidity, and yet contain so little water that when brought into the house and heated to 70°, the relative humidity will be only 5%.

Many factors affect the amount of replacement moisture available from hour to hour. A partial replacement of the moisture lost to the outdoors is made through moisture evaporation as a result of normal living. Each person in the home adds 3 to 4 pints of water to the air each day through breathing and perspiring. A shower bath yields about one-half pint of water to the air. Washing and rinsing an average kitchen floor releases about 2 pints. Ten pounds of laundry, spun dry and hung on a line in the house may release over five quarts. Food preparation for a family of four releases about 5 pints of water a day. These and the many other sources of moisture evaporation in the home may vary greatly throughout the day and from day to day. As a result, comfort conditions vary as well. In most homes, however, the air remains too dry for comfort during most of the winter.

Additional humidification is the answer . . . but it must be properly controlled. The amount of moisture generated in the home is usually only enough to keep the indoor humidity at 10 to 15% during cold weather. Often up to 4 quarts of additional moisture per room should be supplied each day for health, comfort and economy.

However, because of the continually changing amounts of moisture released by living activities and because of continually changing weather effects, the amount of supplementary moisture required cannot be uniform. To provide comfort and to avoid the bad effects of overly damp or too dry air, the humidity should generally be kept between 30 and 60% depending on outdoor temperature and house construction.

The following pages cover common methods of adding moisture and removing moisture to maintain such desired humidity levels. In the past, humidification systems were provided merely to relieve extreme conditions, but today's better humidifiers can be controlled accurately to maintain the moisture level you wish.

Moisture-adding humidifiers can help you match comfort needs

*In selecting a humidifier, make sure it offers
the capacity and controllability you want*

Non-motorized evaporative humidifiers. Over the years, many types of simple evaporative humidifiers have been developed. Most are helpful in relieving air dryness but do not have the capacity for complete control. One common type for air circulating systems uses an evaporating pan inside the furnace unit. Another type uses a series of absorbent plates. The lower surfaces of the plates are immersed in a water pan. The upper surfaces are exposed to the circulating air stream inside the furnace. The pan is kept filled with water through the operation of an automatic valve. For improved accuracy of control the valve can be operated by a humidity control.

For hydronic systems, water pans are hung on the sides of the radiators, or evaporating plate humidifiers can be concealed within hot water convectors. The heat from the radiator or convector and the circulating air causes the water to evaporate. Another way of adding humidity is through use of power humidifiers.

Power humidifiers. Power humidifiers have opened new opportunity for accuracy in home humidity control, both for hydronic heating and for warm air systems. Whereas most other humidifiers tend to be only partially effective in meeting extreme conditions, today's power humidifiers can offer the full capacity to add moisture to the air as needed. In addition, power humidifiers have the advantage of quick response to control.

However, because of their large capacity, power humidifiers must be accurately controlled to meet changing needs without over-humidifying.

Many types of power humidifiers are available. One type has an evaporating pan with an electric heating element in it. Another uses a revolving evaporating pad in the warm air stream. Another passes the air through a water spray. Still another introduces an atomized water mist directly into the air stream of the furnace. Power humidifiers are available in models designed for installation directly on the heating plant or system ductwork and also as free-standing units for room use.



WALL MOUNTED



AUTOMATIC RESET



DUCT MOUNTED

Modern Honeywell Controls can put accurate control of humidity at your fingertips

Honeywell offers a complete line of both humidification and dehumidification controls. Models are available for mounting in room-type humidifier units; or on the wall of a room to sense humidity conditions; or on the heating or cooling system ductwork so as to be exposed to a combined sampling of the return air from all rooms. With a flick of your finger you can select the humidity setting you want for comfort in your home. The results are limited only by the ability of your humidification system to carry out the demands of your humidity control.

How high should the humidity be? Most people feel most comfortable at a humidity level of 40 to 50%. However, even if your humidifier has the capacity to maintain this setting, you may find a reduced setting necessary in colder weather to avoid window and wall condensation.

As the air along the outer edge of a room comes in contact with the cold windows and walls, its temperature drops and it loses its ability to hold moisture. Undesirable condensation and dripping may result. Storm windows and good insulation help keep these outer areas warm and thus make higher humidity settings possible. Experience with your home's response will help you determine how much to lower and raise the humidity setting with weather changes for best results.

New auto-reset humidity control automatically shifts its setting to fit the weather. Honeywell's latest development in humidifier controls is an automatic reset model. It consists of two units that work together to adjust the setting automatically to compensate for changes in weather. The one unit mounts on the return air duct where it measures humidity of the air coming from the rooms. The second unit mounts on the furnace and gages the outdoor temperature by the amount the furnace operates. It shifts the control setting accordingly to keep indoor humidity in step with the outdoor weather.



Air conditioning and dehumidifiers can help you meet high-humidity problems

If you live in an area with high outdoor humidity you can get relief through mechanical systems.

AIR CONDITIONING. Air conditioning cooling units are designed to chill the air as it passes over the cooling coil and thus condense out excess moisture. Then, when this air is delivered to the room and mixes with room air, it is warmed and can absorb considerable humidity. So along with providing cooling, a properly-sized air conditioning system will give you excellent control of humidity as well.

POWER DEHUMIDIFIER. There are many types and sizes of power dehumidifiers available. Most are simply small refrigeration units which remove the moisture by chilling the air temporarily as it passes through the unit. Most models allow you a choice of a pan (which requires emptying) to catch the water, or a drain connection to carry the condensed water away.

Most dehumidifiers include a built-in automatic control. Those that do not can be provided with a plug-in control. Automatic control gives you the advantage of starting your unit automatically before humidity conditions get out of control. In addition, it automatically shuts down the unit to save power costs and wear when operation is no longer required.

Knowing the causes of excess moisture can help you in finding preventive solutions

Moisture from living activities. A large family in a small tightly-constructed home can often create moisture problems. Showers, wet towels, drying diapers and lingerie, cooking, baking, floor washing and other sources of moisture can combine to cause unusual dampness and steaming of windows. An unvented clothes dryer may also be the culprit. The answer is in cutting down on the sources of moisture or drawing in fresh, dry, outdoor air to carry it away. In high humidity climates, a mechanical dehumidifier or air conditioning often is the answer.

Moisture from new home construction. Large amounts of water are used in home building, so most new homes take about a year to dry out fully. Unless you have extreme problems, you likely can rely on slightly open windows to help speed up the drying process. Also check the drainage around the walls of your home for surface potholes from settling ground.

Moisture from under the house. If you have a crawl space or concrete floor, moisture may be coming up from the ground. Test for moisture by placing a fairly large piece of rubber matting or plastic over the floor for a couple days. If you find moisture on the mat and floor when you remove it, you've found your moisture source. Your next job is to install a moisture barrier against it. In a crawl space, this can be done with heavy 55-pound roofing or with heavy-duty plastic. Be sure to use at least a 4-inch overlap. On a concrete floor, you'll need a new floor over the old one with a moisture barrier between. Improving the drainage around your house may also help.

Moisture from basement walls. If your basement walls are damp or leaky in wet weather, try one of the new paints for sealing out water. Also check the drainage completely around your walls. Make sure there are no hollows to catch run-off water from your roof or yard. If you are in a particularly humid area and your basement is quite cold, you'll get condensation from the air. A small heater or operating the pilot light on the furnace may help. Otherwise, a power dehumidifier is your best answer.

The Next Step Is Yours

How soon can the achievement of modern HUMIDITY CONTROL fit into your Total Home Comfort plans? If you are like most people you'll want cost figures to help you decide. Just call your local heating-cooling contractor, your fuel supplier, or utility. Through such sources you can easily obtain the prices you need, and without obligation.

In considering costs, remember—this type of home improvement usually adds to the resale value of your home as much or more than the system's cost. It's like money in the bank! So why wait? Why not call for an estimate right away!

Honeywell