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USERGUIDE
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D-20 Dehumidifying Dryer

⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

General Instructions

EQUIPMENT DESCRIPTION

Conair Franklin Dehumidifying Dryers provide hot, low dewpoint air, circulated in a closed system, for fast moisture pick-up from hygroscopic plastic materials.

Drying air is passed through a cartridge containing a molecular seive desiccant where moisture is absorbed. The dry air is then heated to a preset temperature so that air entering the drying hopper is always hot and "thirsty". Moisture picked up from the plastic material passes through a return hose from the drying hopper and once again passes through the molecular seive desiccant.

Regeneration is accomplished by passing room air, heated to a higher temperature, through the desiccant and purging the moisture out of the system.

THE DESICCANT ASSEMBLY (see Figure 1)

The "hollow core" desiccant cartridge design efficiently exposes the molecular seive desiccant to moist air returning from the drying hopper. Water molecules in the return air are trapped in the desiccant, while low dewpoint air leaves the cartridge and enters the dryer's air heater compartment. Flowing over the heating elements, the dry air is brought back up to the selected temperature and re-enters the drying hopper. There the heated, "thirsty" air again picks up moisture from the plastic pellets.

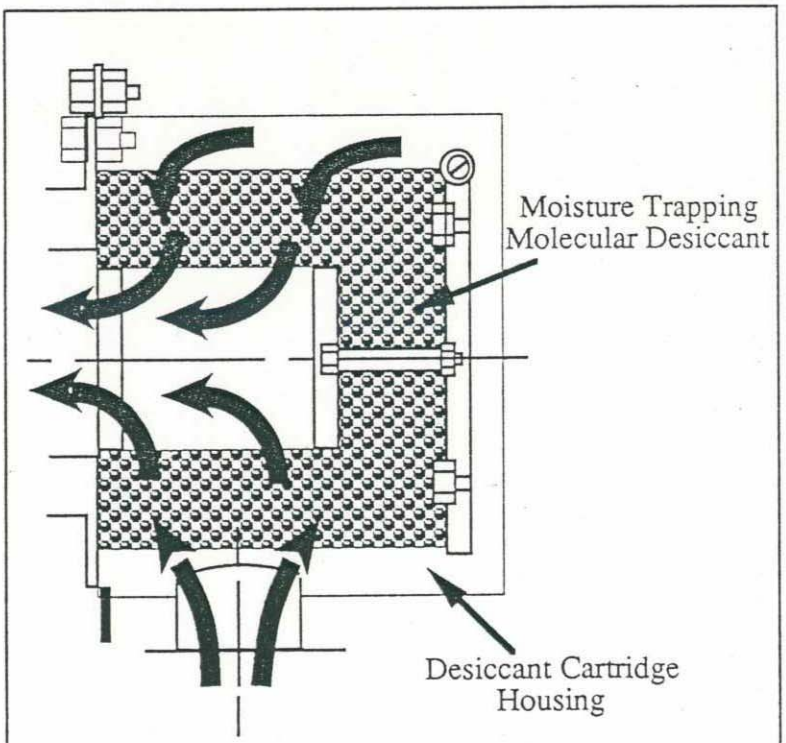


Figure 1

Before a desiccant cartridge can become completely saturated with trapped moisture, it switches "off-stream" to a high-

heat regeneration condition and is prepared for its next cycle through the process air stream. The core-type design and compact size enables the cartridge to regenerate quickly, using minimum power. The dryers have been designed with a time cycle capable of handling the worst conditions.

PROCESS CIRCUIT (see Figure 2 -- next page)

Return air is pulled through the (1) process filter by the (2) blower and delivered into the (3) desiccant cartridge where it is thoroughly dehumidified. Then it passes into the (5) process heater, where the air is heated to the temperature selected by the machine operator on the control panel. A (6) solid state temperature controller assures heating to the proper temperature at the inlet of the hopper.

The process flexible hose conducts the air into the (7) drying hopper where it is distributed evenly through the pellets, heating them and removing the moisture content. The moisture bearing air is then drawn into the flexible return hose and the entire cycle is repeated.

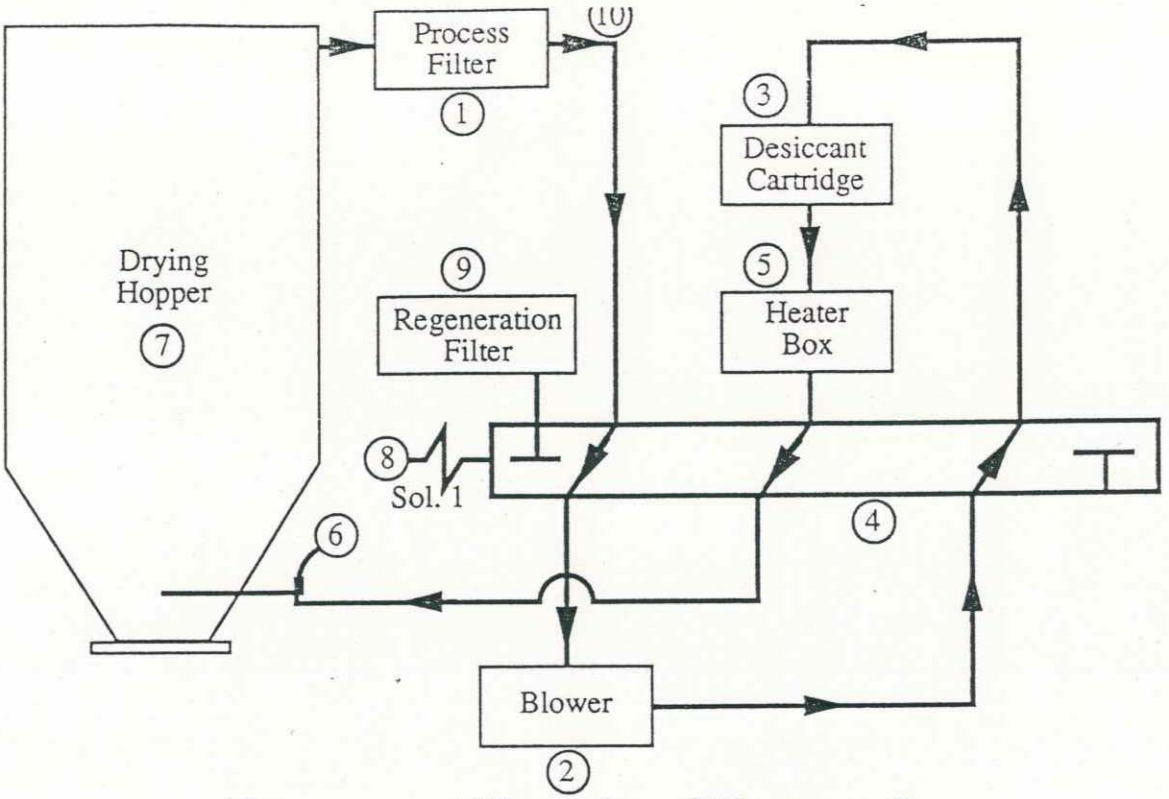
PROCESS TEMPERATURE

The process temperature is monitored and controlled at the inlet of the hopper. If it is necessary to remove the hopper from the dryer, note that the thermocouple assembly must be removed prior to hopper and dryer separation.

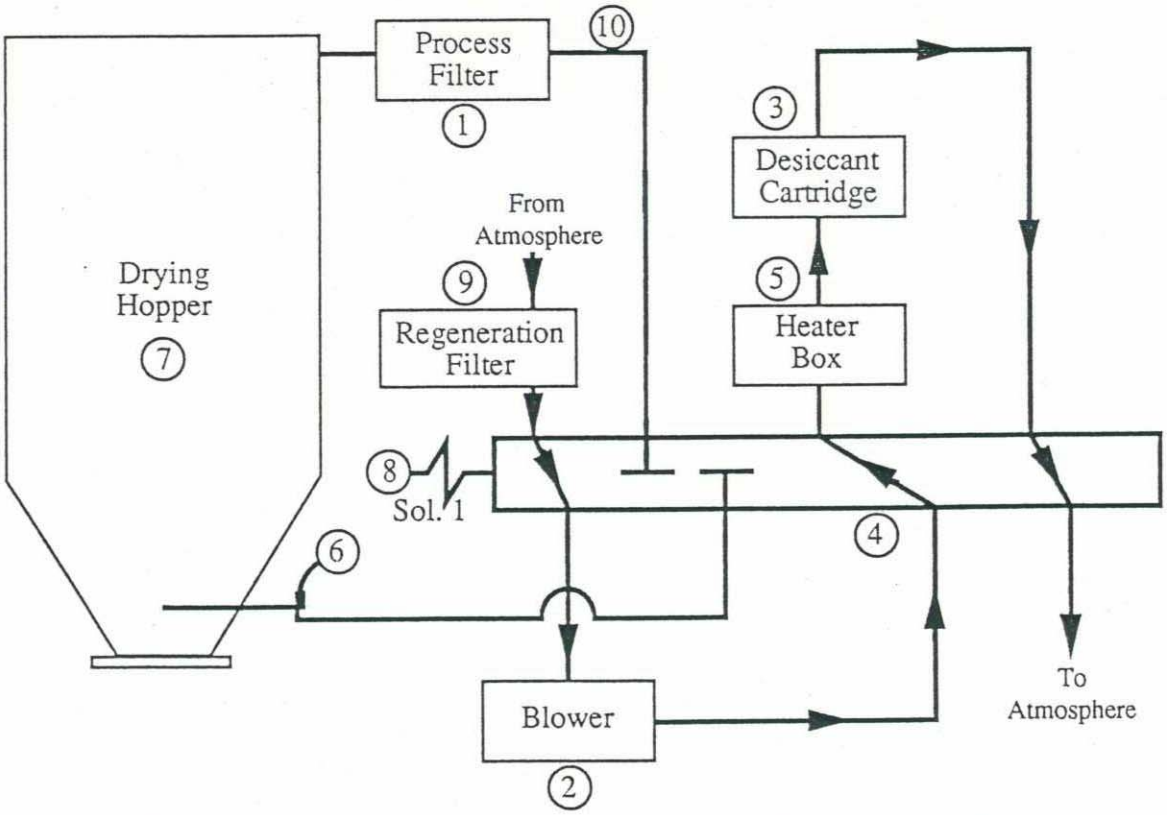
REGENERATION CIRCUIT (see Figure 3 -- next page)

After 55 minutes, the dryer switches from process cycle to regeneration cycle to purge the desiccant. At this time, the (4) valve will shift positions, initiating the regeneration cycle. The valve position is controlled by the (8) solenoid.

The (2) blower draws air through the (9) filter, and through the (5) heater box where it is brought to an elevated temperature. The heated air flows through the (3) "wet" cartridge and purges it of moisture. The moist air is then exhausted out of the system.



Process Circuit - Figure 2



Regeneration Circuit - Figure 3

COOLING CIRCUIT

Immediately following regeneration, the fresh cartridge must be cooled before switching to the process cycle. This is accomplished by de-energizing the heater and continuing to run the blower; drawing cool air through the (9) regeneration filter and reducing the temperature of the desiccant.

VERY IMPORTANT

The air filter assures that only clean air flows through the drying circuit. Fines carried in the return air stream may eventually clog the filter, which can decrease efficiency. Check filters frequently and clean as necessary. (See "Maintenance")

TIMING CYCLE

Although the timing cycle is preset at the factory, it may be necessary to readjust the timer cams if they are tampered with. The following instructions indicate the proper cam positioning.

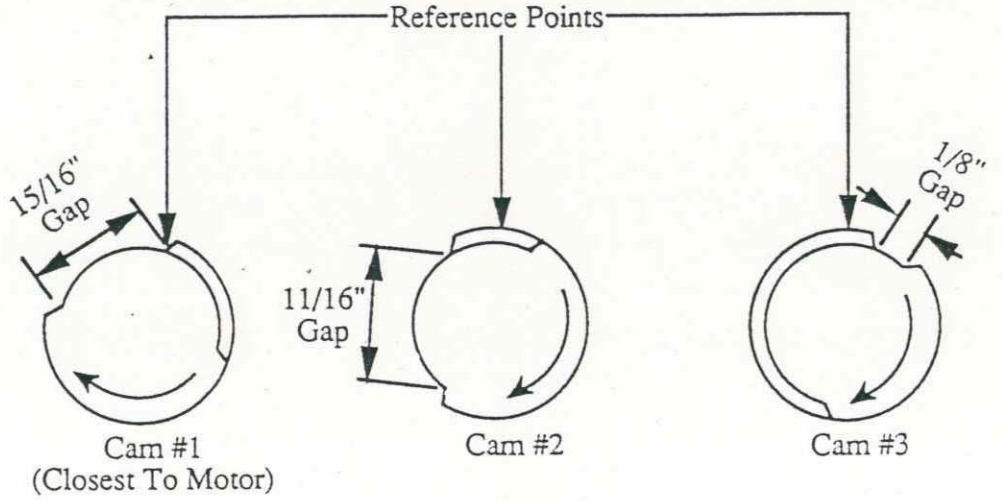
The dryer has a complete cycle of 72 minutes, which breaks down into three separate cycles as follows:

Process Cycle	56 minutes
Regeneration Cycle	5 minutes
Cooling Cycle	11 minutes

It is important that the timing of the different cycles is not tampered with, in order to insure proper regeneration and processing conditions.

Should it be necessary to re-adjust these cycles, the cams should be set as close as possible by following the instructions in Figure 4 (next page). After this, the dryer should be run through the complete regeneration and cooling cycles in order to insure the proper adjustments have been accomplished. Further adjustments can be made if necessary. It is not necessary to run through the process cycle. If the regeneration and cooling cycles have been properly adjusted, the process cycle will automatically be adjusted.

Timing Relationship of Three Cams



To calibrate cams, line up reference points.

Figure 4

ELECTRICAL CONNECTION:

Make sure your dryer is connected to the correct voltage, using the properly sized power cord. Use of plugs which comply with OSHA Lockout Regulations (#29 CFR Part 1910) is recommended. Verify voltage by checking the name plate on the side of the control box. All units are prewired at the factory for service on one voltage only. Check your wiring diagram to verify amperage.

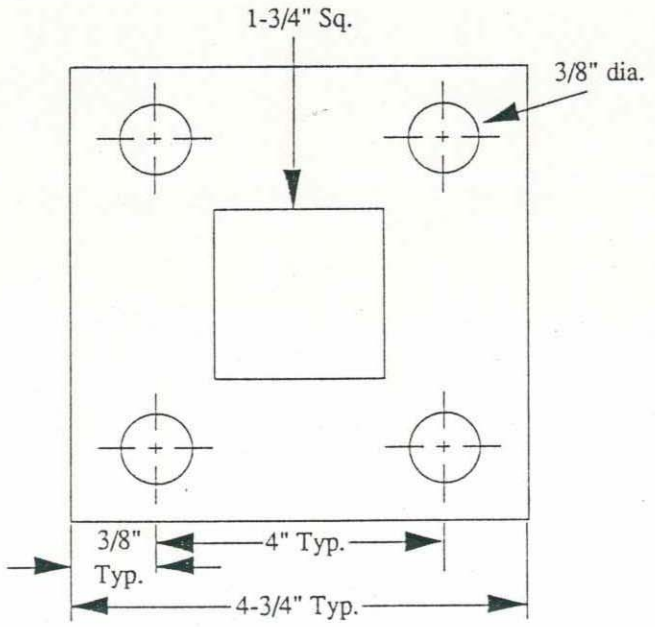
DO NOT ATTEMPT TO ALTER VOLTAGE CONNECTIONS!

INSTALLATION

The front of the control panel and the process filter should be easily accessible. In most cases, the dryer/hopper combination is mounted on the throat of the molding machine.

MOUNTING PLATE (see Figure 5)

Prior to installing the D-20 Dryer, an adaptor plate will probably be required to adapt to the throat of the process machine. (This plate may have been provided with the hopper if ordered that way.) Figure 5 shows the relative dimensions of the dryer base. If you cannot fabricate the adaptor plate yourself or have it done locally, send Conair Franklin a template of the throat and we will make the adaptor plate (price on request).



Dryer/Hopper Mounting Configuration

Figure 5

DRYER START-UP

1. Adjust temperature control on panel to the proper drying temperature for the material being processed.

2. Flip "Start" switch.

NOTE: A "cold" dryer may take up to 72 minutes to reach full operating capacity. If the unit has not been used in some time, allow sufficient time for warm-up.

Also, if the dryer has just been installed or has not been operated for a long period of time, the desiccant cartridge may have reached moisture equilibrium with the surrounding

air, in which case it is conceivable that you could actually add moisture to the resin which is being dried. In order to avoid this, the desiccant cartridge should be regenerated by turning the machine on while connected to the hopper (without any material in it) and allowing it to run "close-looped" for approximately 72 minutes. During this period, the process controller should be turned down to 100°F. At this point, load the hopper and start drying. Be sure to set the controller to the proper drying temperature.

DRYER SHUT DOWN

In order to take the "Heat Edge" off the heater box before shutting the dryer off, the controller should be turned to approximately 100°F for 5 minutes before flipping the stop switch.

There is a high temperature switch located in the heater box which, if exposed to an elevated temperature, will shut the dryer down. Should the dryer be shut down in the middle of a regeneration cycle or a high temperature process cycle, this switch may be activated. If this occurs, the dryer cannot be started again until the thermal switch has cooled down.

MAINTENANCE

Filters:

The process, regeneration and cooling filters serve to protect the desiccant from contamination by dirt, dust and fines. If contamination occurs, drying efficiency will be severely diminished. Therefore, it is very important that the filters be cleaned at regular intervals. Length of time between cleanings will depend on the type of granulate being processed and the working environment, but typical intervals range from three to fourteen days.

To Clean Filters:

First, shut down the dryer. This must be done so dirt and humidity are not drawn into the drying circuit. Next, remove the process filter from the filter housing (attached to the side of the drying hopper). The regeneration filter (located on the front of the dryer housing) may be removed from the O-ring coupling base by gripping the outer edge and pulling.

Use compressed air to blow the fines out.

NOTE: Contamination is the principal cause of desiccant failure. If the desiccant cartridge should become contaminated, drying efficiency will be reduced.

Desiccant Cartridge Replacement:

The desiccant cartridge is located above the blower and air flow manifold in the desiccant cartridge chamber. Remove the main cover and the desiccant chamber side panel to obtain access to desiccant cartridge. To remove the cartridge, loosen the screw which secures the cartridge. The desiccant cartridge will now slide out of its housing. Install the new cartridge and reverse above procedure to reassemble.

Heating Element:

The heating element in your Conair Franklin Dryer requires no routine maintenance. After a very long term of service, however, the element may eventually require replacement. Should the elements need to be replaced, care should be taken in rewiring the new element in the same manner as the defective ones.

CAUTION:
BEFORE SERVICING YOUR DRYER, BE SURE TO DISCONNECT THE MAIN POWER SOURCE.

TROUBLESHOOTING

Difficulty	Probable Cause	Corrective Action
Process air temperature too low.	Process heating elements failure.	Check electrical connections; replace elements if necessary.
	Supply voltage different from dryer voltage.	Check supply voltage against name plate voltage.
	Dryer in Regeneration Cycle.	This is typical of this dryer. Not a malfunction.
Process air temperature too high.	Temperature Controller not located properly.	Check to make sure temperature controller is mounted to inlet of hopper.
	Incorrect temperature selected on control panel.	Dial in correct temperature.
	Controller malfunction.	Check electrical connections.
Material not drying.	Process filter clogged.	Clean filter.
	Heating elements inoperative.	Check electrical connections; replace elements if necessary.
	Elevated return temperature.	Check return temperature. Should be 125°F - 130°F (see High Temp. Dryer Instructions).
	Material residence time in hopper too short.	Thruput rate too high for dryer. Contact Conair Franklin.
	Moist room air leaking into dry process air.	Check all hose connections and tighten as required. Check hoses for cracks; replace as necessary.
	Desiccant contaminated.	Replace desiccant cartridge. (see "Maintenance")
Premature blower failure.	High return temperature.	Use aftercooler.

MAINTENANCE CHECK LIST FOR DRYERS

This check list is a general guideline for servicing the automatic dehumidifying dryers manufactured by Conair Franklin. Understanding the following basic points should make the troubleshooting and maintenance of the dryer easier.

Air Circuits:

1. Are the hoses in good condition?
2. Do all the hoses have a proper fit on the dryer and hopper?
3. Are all the gaskets in place and in good condition?

It is important to maintain a "closed-loop" system in order to avoid high moisture laden ambient air from entering the system and prematurely loading the desiccant cartridge. Under operating conditions, normally the return dewpoints will be between 0°F and 20°F with a closed system. Under these same conditions, the ambient dewpoint may be 65°F.

Filter Condition:

(Dryer must be shut off prior to removal of filters to avoid drawing fines and/or dust into the blower and desiccant tank.)

1. Is the process filter clean?
2. Is the regeneration filter clean?

In order to have the amount of air flow necessary for proper regeneration and processing, the filters must be relatively clean. Cleaning of the filter should be done quite frequently when first installed until some logical cleaning schedule can be determined, depending on such variables as rates of material being processed, fines in the material, and amount of regrind material being used with virgin.

Regeneration Temperature:

In order to get the proper temperature profile across the desiccant tank, an inlet temperature of 425°F.is required. This, in conjunction with the proper air flow, are the two main points for adequate regeneration. Check the heater element amperage (check electrical diagram for specifications on your particular model).

Desiccant Cartridge:

Cartridges must be packed properly using the correct procedure and desiccant. Proper drying may be negated by using incorrect packing procedure or desiccant. Conair Franklin has an exchange program for routine replacement of cartridges. Call the Conair Franklin Parts Department toll free at 800-458-1960 for details.

Return Air Line Temperature:
What is the return air line temperature from the top of the drying hopper to the dryer? This temperature should not exceed 125°F - 130°F. It may be necessary to use a return air line cooler (consult Conair Franklin).

HIGH TEMPERATURE D-20 DRYER

General:
Essentially, the high temperature dryer is the same as the standard dryer with the exception of additional parts necessary to properly handle the higher temperature.

The high temperature dryer is intended to be used in applications where the drying temperatures range from 250°F - 300°F. Higher temperature ranges can be achieved. To do this, consult Conair Franklin for proper sizing.

Auxiliary Equipment:
The auxiliary equipment necessary for high temperature drying include:

Aftercooler:
Utilizing tap or tower water in the range of 55°F - 70°F, the return air from the hopper is cooled to an acceptable level before introducing it back into the desiccant tank where moisture is removed from the cool air. In a few cases where material rates are low, it may be necessary to use 40°F coolant temperatures supplied by a chiller in order to lower the high return air temperature. In any case, the flow rates of the cooling agent will range from one to two GPM. The dryer will operate most efficiently with return air temperature in the area of 125°F - 130°F.

All other components necessary for high temperature drying are built into the dryer.

Operation:
Because of the higher temperature, prolonged periods of residence time in the drying hopper should be avoided. If it is necessary to stop the operation for some time, the temperature should be lowered in order to avoid bridging (material becoming soft and tacky and sticking together, not allowing an even flow in the hopper).

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.