User Guide

Compu-Dry

Gas-Heated Dehumidifying Dryer
Models CDG400 to CDG3200

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

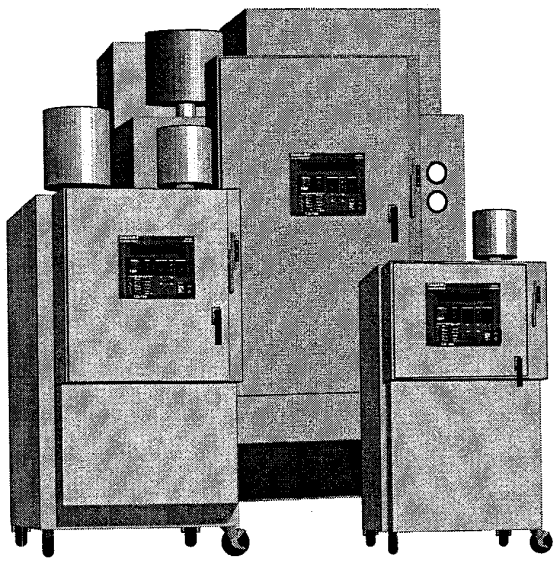
This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, 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containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

Installation

Operation

Maintenance

Troubleshooting



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UGD009/0296

GAS HEATED
DEHUMIDIFYING DRYER INSTRUCTIONS

For Models CDG400 Including A, H and
CDG600 Central Series
CDG800 equipped with Compu-
CDG1000 Dry Controls.
CDG1600
CDG2400

WARNING

Your CDG Series dryer is equipped with numerous safety devices. As with all safety devices, improper application and/or misadjustment can result in repeated and/or unscheduled shutdowns. Improper corrective action (bypassing, jumping-out, etc.) can lead to hazardous conditions and should never be attempted to sustain production.

If adjustable or motorized dampers are used in flue ducting which are capable of being moved to a position which might contribute to an unsafe condition, they must be equipped with mechanical stops, cut away dampers and/or limit switches interlocked to the safety circuitry of the dryer to assure that the dampers are in a proper operation position.

WARNING:
IF A GAS ODOR IS DETECTED:
—Open Doors/Windows
—Do Not Touch Electrical Switches
—Extinguish Any Open Flame
—Immediately Have Qualified Personnel Determine Source of Leakage and Repair.

FOR YOUR SAFETY – DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN VICINITY OF THIS EQUIPMENT.

EQUIPMENT DESCRIPTION:

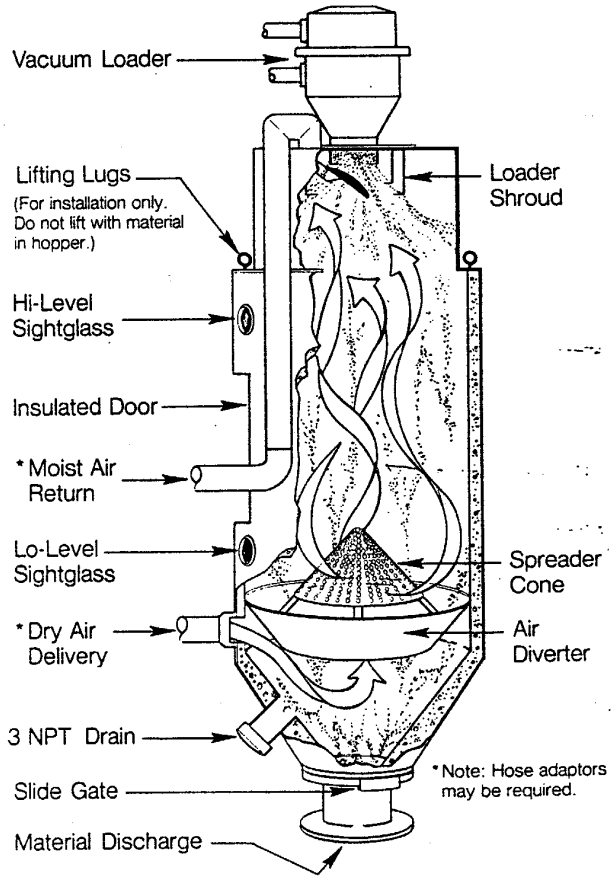
Conair Franklin "Closed Loop" Dehumidifying Dryers provide hot, low dewpoint air, to hygroscopic plastic material, loaded into a drying hopper, for fast moisture removal.

Drying air is passed through cartridges containing a molecular sieve desiccant where moisture is deposited. 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 sieve desiccant.

As the "on-stream" desiccant cartridges approach saturation, they are moved out of the process drying air mode and into the regeneration mode. Depending on the dryer model, at least one cartridge is always "on-stream", removing moisture from the process air, while one cartridge is regenerating. Regeneration air flow is completely isolated from process air flow. Regeneration is accomplished by passing filtered room air, heated to 425 degrees F. through the desiccant, purging it of moisture.

The maximum efficiency of automatic drying is fully achieved only when the hopper is automatically loaded and kept full. A CONAIR vacuum hopper loader is recommended.

FIGURE 1



INSTALLATION:

DRYING HOPPER INSTALLATION – (See Figure 1)

To install the drying hopper, the bottom flange of the slide gate assembly must be drilled in order to properly fit the bolting pattern on the throat of the process machine. If there are physical interferences with the slide gate assembly or you are installing a smaller "Challenger" Hopper with an aluminum slide gate, an adapter plate must be fitted to the throat of the process machine first.

Before installing the hopper, carefully check inside for parts which have been placed there for shipping. Certain hoppers are supplied with removable spreader cones and air diverters which must be installed as shown in Figure 1. Some hoppers require the installation of the return air drop tube which mounts to the opening at the top of the hopper and clamps to the hopper body.

Inspect and clean hopper thoroughly to remove any dirt which may have accumulated during shipping. Also clean the drying hopper internal surfaces with solvent to remove rust preventative coating.

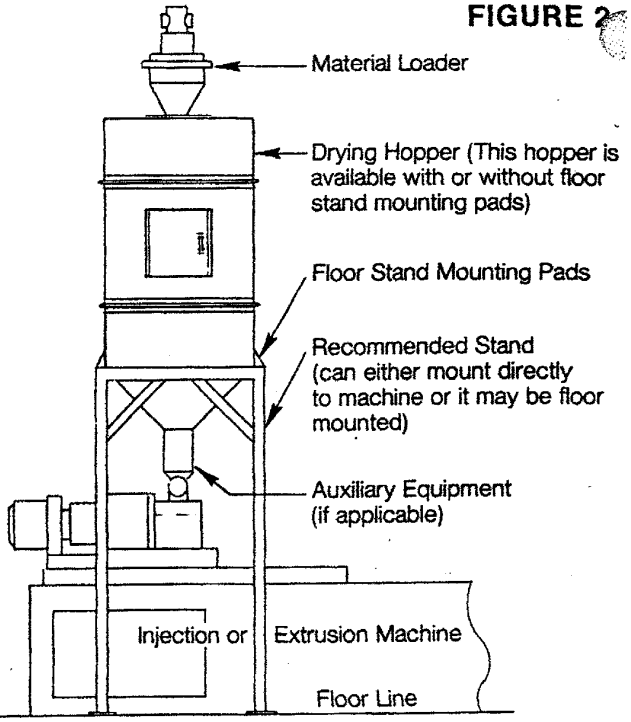
Bolt the adapter plate (if necessary) to the throat of the molding machine. Bolt the hopper slide gate assembly to the adapter plate. It is left to the discretion of the customer either to remove the slide gate and mount it to the throat of the molding machine first and then mount the drying hopper to the top of the slide gate, or to mount the entire slide gate/drying hopper assembly to the machine. As mentioned before, an automatic hopper loader is recommended for the top of the drying hopper to provide a constant supply of fresh material for dehumidifying. If such a loader is used, be sure to properly install the loader shroud in the top of the drying hopper. This shroud rests in the opening at the top of the hopper. Its purpose is to prevent ambient moisture from entering the drying hopper through the loader as material is discharged from the loader.

Install the vacuum loader to the top of the drying hopper, using the clamping lugs provided. It is not necessary, nor recommended, to drill holes in the top of the hopper.

Because of the many different processing

Drying Hopper Installation with Floor Stand

FIGURE 2

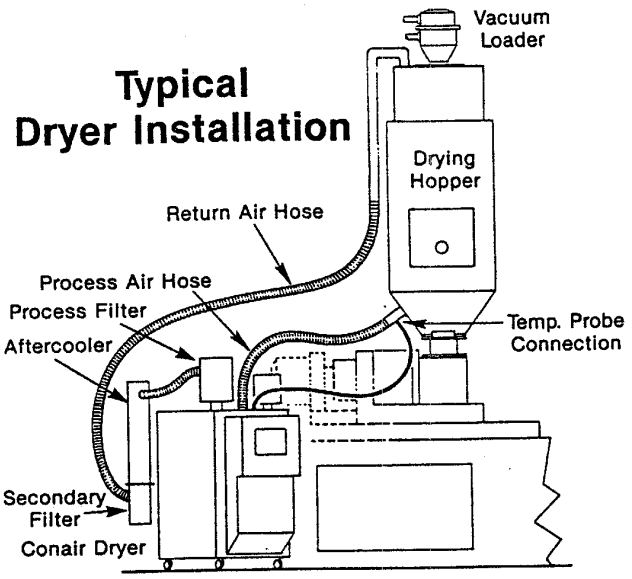


ment used in conjunction with drying hoppers, it is impossible for Conair Franklin to totally engineer each and every arrangement. For this reason, we can only recommend the arrangement shown in Figure 2, which we feel is best, from a safety standpoint. Notice the various components which may be used in a typical installation. If there is no auxiliary equipment between the drying hopper and the machine, it may not be necessary to use the stand, which transmits the load of the drying hopper to the machine (or floor) rather than depending on the auxiliary equipment to support it. The customer is responsible for insuring that the size and strength of the fasteners used to install the hopper are capable of supporting it.

CAUTION: BUYER IS RESPONSIBLE FOR STRUCTURAL INTEGRITY OF THE FINAL INSTALLATION.

The dryer should be located as close to the hopper as possible (no more than 10 feet away) to reduce heat loss. The front of the control panel and the filters should be easily accessible. The areas surrounding the front, rear and sides of the unit should be kept clear so the airflow necessary for good combustion is not obstructed. The dryer should be positioned for easy access to side panels

FIGURE 3



STANDARD GAS DRYER INSTALLATION

Clamp the flexible process air hose to the dry air outlet of the dryer. Clamp the other end of the hose to the dry air delivery inlet at the bottom of the drying hopper. Install the flexible return air hose between the moist air return outlet on the hopper and the return air inlet on the dryer.

Do not allow either of the flexible hoses to crimp or kink. If the hoses are too long, cut them to fit. Also, it is advisable to support long sections of hose wherever possible, by tying them to overhead structural members.

Standard gas dryers are equipped with internal coolers (20), Figure 6. The internal cooler should be supplied with tap or tower water in the range of 55 to 70 degrees F. through the pipe coupling provided. Provisions for discharge from the cooler must also be provided.

Approximate Flow Rates for Cooling Water:

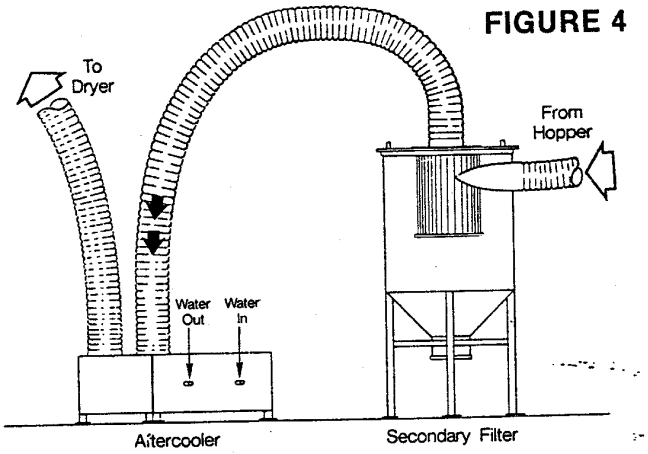
Dryer Model	GPM@ 60 PSI @ 55 to 70 degrees F
CDG400	2 to 3
CDG600	2½ to 3½
CDG800	3 to 4
CDG1000	3½ to 4½
CDG1600	4 to 5
CDG2400	6 to 8

Water pressure should not exceed 60 PSIG. Flexible water hoses are recommended with a length that permits easy removal of the internal cooler coils for cleaning.

HIGH HEAT GAS DRYERS: (See Figure 3)

High-heat gas dryers are equipped with increased BTU capabilities to handle drying temperatures ranging from 240 to 350 degrees F. As a result of the higher temperatures, an aftercooler is required to lower the return air temperature to a safe range before it enters the dryer. To prevent contamination of the aftercooler by fines drawn in from the drying hopper, a secondary filter is also employed at the inlet to the aftercooler. These two items must be installed on the dryer with hardware supplied for this purpose. See Figure 3 for correct placement of high heat components for model CDG400H. Figure 11 (from the maintenance section of this manual) shows the location for models CDG600H and CDG800H. Figure 4 shows the floor mounted aftercooler and secondary filter for models CDG1000H through CDG2400H.

FIGURE 4



An insulated process delivery hose is also supplied for high-heat models. It should be installed from the Dry Air Delivery port of the dryer to the inlet of the drying hopper. This insulated hose reduces the amount of heat lost to the surrounding atmosphere. The return hose from the drying hopper on high heat dryers must be clamped to the inlet of the secondary filter. On model CDG400 through CDG800, the secondary filter clamps directly to the aftercooler, but on models CDG1000 through CDG2400 a hose must be connected between the secondary filter and the aftercooler. The aftercooler in turn must be hosed to the process filter inlet of the dryer.

The aftercooler should be supplied with tap or tower water in the range of 55 to 70 degrees F. through the pipe couplings provided. Flow rates will be approximately the same as the flow rates for internal coolers. Water pressure should not exceed 60 PSI. Flexible water hoses are recommended with a length that permits easy removal of the aftercooler coils for cleaning.

PROCESS TEMPERATURE PROBE (All Models) See Figure 3:

Install the process drying air temperature probe (shipped inside the control cabinet) into the fitting on the inlet of the drying hopper. If your hopper is equipped with hose adapters, insert the temperature probe in the coupling provided in the air inlet adapter. This permits accurate temperature sensing. The coupling provided in the hopper should be plugged to prevent loss of air. Plug the other end of the probe into the jack located on top of the control panel.

Care should be taken while handling the temperature probe; IF DROPPED, severe damage may occur to it.

ELECTRICAL INSTALLATION:

MAKE SURE TO CONNECT YOUR DRYER TO THE CORRECT VOLTAGE. Verify voltage by checking the name plate on the side of the control box. All units are pre-wired at the factory for service on one voltage only:

DO NOT ATTEMPT TO ALTER VOLTAGE CONNECTIONS!

The appropriate wiring diagram for your model of dryer is included with this manual. It provides complete wiring details and an electrical parts list. In the event it is lost, the electrical print number for your dryer is listed inside the control cabinet door. Additional copies may be ordered for a nominal cost through the Conair Franklin Service Department.

A 3-phase disconnect switch is provided in the control for hook-up to your electrical supply. Be sure that the cable used for hook-up is of a sufficient rating, is grounded and equipped with a sufficient, shielding for physical protection. Strain relief bushings must be used at the cable entry point of the control cabinet.

Follow all appropriate local, state, national and

GAS INSTALLATION:

Conair Franklin gas dryers are manufactured fo use with either propane or natural gas. For prope installation procedures, refer to AN Z223.1.1984 National Fuel Gas Code. Copies ma be obtained from: The American Gas Association Inc., 1515 Wilson Blvd., Arlington, Virgini 22209. In Canada, refer to CAN. 1.B149.1.M8(NAT. Copies may be obtained from: The Canadia Gas Association, 55 Scarsdale Road, Don Mills Ontario, Canada M3B2R3.

In order to comply with the NFPA Code 86, a main gas shut off valve must be equipped in the gas supply line to the dryer. Also, if necessary, a regulator must be installed to insure the supply pressure to the dryer is in the range of 6-8" wate column. Both the shut off valve and the regulato to be supplied by customer. In addition to the main gas shut off valve, a secondary shut off valve is supplied within the gas dryer. Both valves must be in the open position prior to starting the dryer If the dryer is not being used, both valves should be closed.

Gas and air adjustments for each burner have been factory set. Further adjustment should n be required.

Prior to starting the gas dryer, gas piping connections should be checked for gas leaks. Use a soap solution or other preferred means.

CAUTION:

Many soaps used for leak testing are corrosive to certain metals. Piping must be rinsed thoroughly with clean water after leak check has been completed. DO NOT USE MATCHES, CANDLES, FLAME OR OTHER SOURCES OF IGNITION TO CHECK FOR GAS LEAKS.

Conair dryers operate at 7" (H2O) of gas pressure, therefore it is important that a regulator be equipped in the supply line if your pressures are greater than 7". Since the dryers are equipped with on-board high pressure switches, it is important that the regulators used have "ANSI Class 6 Positive Shut Off."

If improper regulators are used and a dryer is shut off for any length of time, gas pressure may bleed by these regulators and the dryer will not

monitoring. Also when specifying the regulators, it is important that they are capable of handling the pressure differential between the gas pressure in your supply line and the operating pressure of the dryers. Improperly sized regulators which are incapable of handling the differential for your application will result in unstable gas pressures to the dryer, causing premature shut downs.

If multiple pieces of equipment are on the same supply line, it is conceivable that as individual units are started up, the pressure to already running dryers may be reduced and low pressure switches on board may be activated, shutting the dryers down. In order to avoid this problem, it is recommended that individual gas lines be run to the various pieces of equipment and then utilize individual regulators at each dryer to reduce to the 7" of operating pressure. Under these conditions, the affect of startup of an invidual piece of equipment will not affect any other equipment already in operation.

These are only general recommendations. It is advisable that a qualified gas contractor or your local gas company be consulted for proper installation of the equipment.

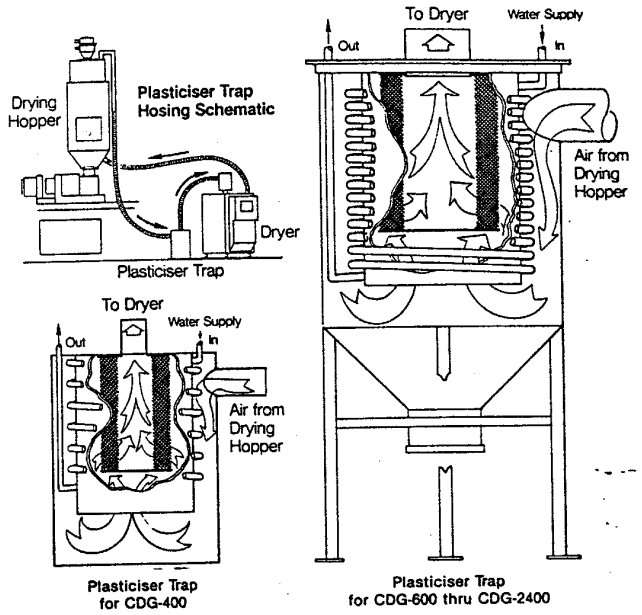
COMBUSTION FLUE INSTALLATION: (By Customer)

To properly vent the combustion air away from the dryer, a suitable exhaust duct must be installed. This should be done by qualified personnel, such as a HVAC contractor, familiar with local codes. The size of the ducting will depend on the length of run. To insure proper operation of the dryer, the back pressure (if present) caused by the use of ducting must not exceed 3" water column.

PLASTICIZER TRAP INSTALLATION (See Figure 5)

A problem encountered occasionally in drying plastic material is the release of volatiles, by the material, at the selected drying temperature. This condition exists commonly when processing cellulosics. (To minimize this problem, do not "overdry" the material. Extended residence time at elevated temperatures should be avoided.) The largest problem created by this condition is the acute and rapid clogging of the process filter on standard dryers, and the secondary filter of high-heat models.

Plasticiser Traps FIGURE 5



To avoid this problem, Conair Franklin offers Plasticizer Traps to provide a location where these volatiles can be collected. The traps are equipped with cooling coils, which require water in the 55 to 70 degrees F. range. The return air from the hopper, which carries the volatiles, contacts the plasticizer coils, the volatiles condense on the cool surface. The trap is equipped with a cartridge filter within the piping support shroud that provides additional filtering. Cleanout of the trap is accomplished by removing the cooling coil and filter through the lid assembly. On larger models, condensed volatiles can be removed through the bottom drain cap.

When installing a plasticizer trap, be sure to allow ample clearance on all sides for cleanout. Supply water should be connected using hose (to permit servicing) and supplied at a rate of 1 to 3 gpm. See Figure 5 for proper piping between the dryer and hopper.

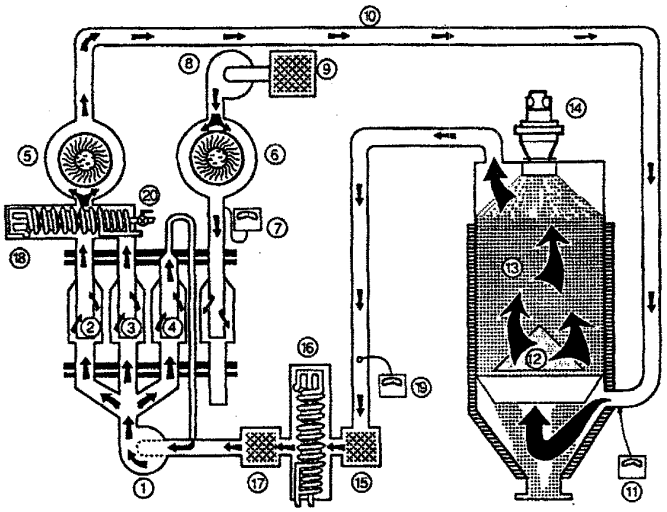
OPERATION SEQUENCE — (See Figure 6)

DRYING CIRCUIT

Return air is pulled through the process filter (17) by the process blower (1) and delivered into the on-stream desiccant cartridges (2), where it is thoroughly dehumidified. Then it passes into the process heat exchanger (5), where the air is heated to the temperature selected by the operator. The process temperature sensor (11) located at the hopper inlet assures heating to the proper temperature.

The flexible process hose (10) conducts the air into the drying hopper where it is distributed evenly through the pellets (13), heats them, and removes their moisture content. The moisture bearing air is then drawn into the return flexible hose, and the entire cycle is repeated. The spreader cone (12) insures even material flow through the hopper. The automatic vacuum loader (14) maintains a full drying hopper.

Air Flow Pattern FIGURE 6



REGENERATION CIRCUIT — (See Figure 6) A gear motor rotates the desiccant carousel so that moisture-bearing cartridges (2) move off-stream and into the regeneration mode (4). Independent of the process air circuit, the regeneration blower (8), draws air through a filter (9), over the regeneration heat exchanger (6) and heats it to 425 degrees F. The heated air flows through the "wet" cartridge (4) and purges it of moisture. The moist air is blown out the exhaust. (For summer operation, or operation in air conditioned rooms, the moist air may be exhausted outdoors; however, care should be taken that the vent is properly sized and does not restrict air flow.)

COOLING CIRCUIT — (See Figure 6)

Immediately following regeneration, the fresh cartridge must be cooled before being placed back on-stream. To accomplish this, a fraction of process air is bled through the cartridge (3). This allows the fresh cartridge to be properly cooled to the process temperature range.

In the case of the CDG2400, there are two carousels operating in parallel. All information

HIGH HEAT MODELS (See Figure 6)

With the increased BTU capability of high heat models, return air temperatures can exceed the 125 to 130 degrees Fahrenheit safe range. If this happens, dehumidifying can be greatly hampered because the desiccant cannot effectively remove moisture from high temperature air. To avoid this, an aftercooler (16) is installed which uses circulating water to reduce the return air temperature.

A secondary filter (15) is also provided on high heat models to trap fines returning from the material in the drying hopper, before they can coat the aftercooler coils, reducing the aftercooler's efficiency.

COMBUSTION CIRCUIT: (See Figure 7)

The combustion blower (2) draws air through a filter (1). There are two air flow paths through the air/fuel train; Process, and Regeneration. Each of these circuits is further broken down into two flow paths; High fire and Low fire. Based on the drying temperature selected, the flow will either be thru low fire only or thru the combination of high and low.

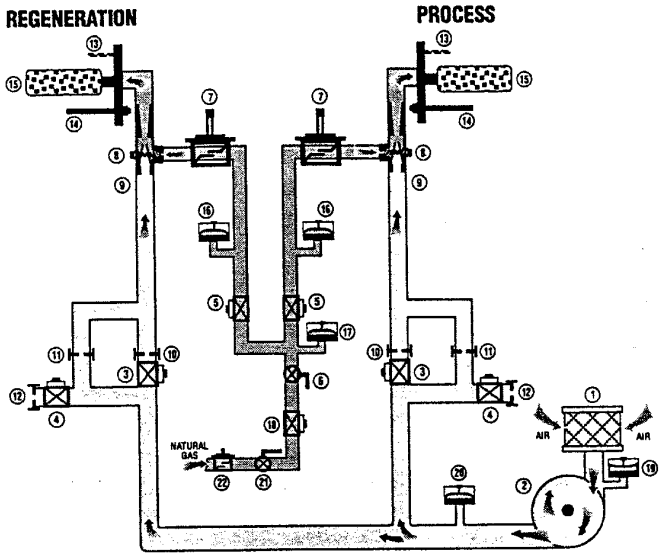
A. High Fire: Under this mode, valve (3) is open and bleeder valve (4) is closed. Air flows through both the low fire orifice (11) and the high fire orifice (10), then through the air jet (9). Airflow through the air jet creates a vacuum inside the mixer (8), drawing the natural gas through the gas pressure regulator (22), main gas valve (21), main gas solenoid valve (18), service valve (6), secondary gas valve (5), and finally the zero gas governor (7).

B. Low Fire: During this mode, valve (3) is closed and bleeder valve (4) is open. The volume of air which would normally flow through the valve (3) will bleed to atmosphere through the bleeder orifice (12). A fixed volume of air will flow through the low fire orifice (11) and through the air jet (9). The airflow through the air jet creates a vacuum inside the mixer (8) and draws natural gas as explained above in the high fire mode.

Once inside the mixer, the air and gas are thoroughly blended and proportioned; then delivered to the burner (15) where the mixture is ignited by the hot surface igniter (13). A flame

Piping Combustion Circuit

FIGURE 7



ignition sequence, the dryer will be de-energized to avoid any potential danger. The sensor will continue to monitor during operation and if, at any time combustion stops, due to any failure, the dryer will shut down immediately and the appropriate alarm messages will be displayed.

The air/fuel mixture will burn on the surface of the burner at approximately 1800 degrees F. From there, flue products are exhausted out of the heat exchanger to a satisfactory location (See Flue Installation).

Note:

The ratio of air and gas mixture can be adjusted by turning the needle valve on the mixer (8). The air adjustment for each burner has been factory set. Further adjustment should not be required unless the mixer, combustion blower, or the size of burner is changed. In case of one of the above changes, contact your local gas supplier or the Conair Franklin Service Department.

CONDENSATION TRAP

A condensation trap is supplied with the dryer. The function of the trap is to collect any moisture which may accumulate at the exit point of the process heat exchanger.

The moisture will be collected at the lowest point of the trap, where an "S" tube has been installed. A length of tubing is supplied to properly drain the condensation to a suitable drain. Any local codes pertaining to the discharge of such solutions are the responsibility of the customer. Consult a local HVAC contractor for assistance.

The trap also serves the purpose of directing the combustion air of both heat exchangers to a common duct point, where the appropriate connections can be made with flue ducting.

Any additional condensation traps required (due to long duct runs) are the responsibility of the customer to determine size and location.

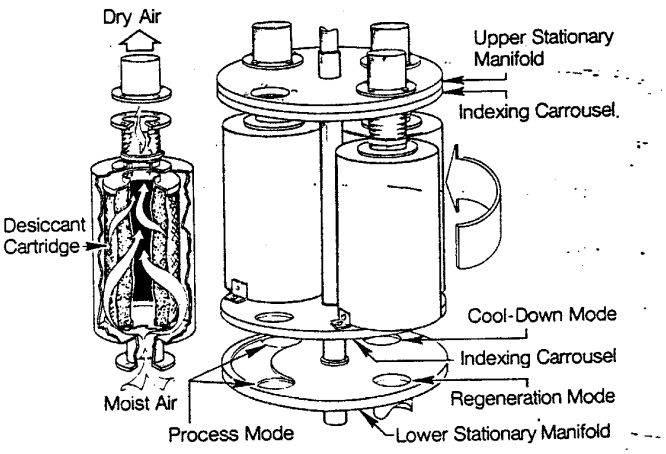
POWER MISER OPTION (See Figure 6)

In an effort to decrease the amount of energy consumed by your dehumidifying gas dryer when operated at less than full capacity, Conair Franklin offers a Power Miser option.

Power Miser 1 is designed to eliminate unnecessary use of regeneration heat by sensing the process air dewpoint and modifying the desiccant carousel indexing cycle to allow the on-stream cartridge(s) (2) to be fully depleted of their moisture absorbing capabilities before rotating into regeneration. During this period, the regeneration heat exchanger (6) is turned off, along with the regeneration blower (8) which saves energy.

Desiccant Carrousel

FIGURE 8



THE DESICCANT ASSEMBLY (See Figure 8)

The heart of your Conair Franklin Dehumidifying Dryer is the patented, indexing, multiple desiccant cartridge assembly.

The "hollow core" desiccant cartridge design efficiently exposes the molecular sieve desiccant to the moist air returning from the drying hopper. While cartridges are in the process air stream, water molecules in the return air are trapped in the desiccant, while low dewpoint air leaves the cartridges and enters the heat exchanger.

Before an "on-stream" desiccant cartridge can become completely saturated with moisture, it indexes "off-stream" to a high-temperature regeneration position over a separate air port in the bed plates. The core-type design and compact size of the cartridge enables it to regenerate quickly, using less energy. (Residual regeneration heat is retrieved and added to process drying heat, to further lower energy consumption.)

The dryers have been designed with a timed index cycle capable of handling the worst conditions.

The Timed Cycle for Indexing of all models is 15 minutes. With the Power Miser 1 option the indexing is lengthened. (See Power Miser 1 Option under Function Set-up). Note: The CDG2400 has two carousels. As soon as the first carousel stops indexing, the second one will index.

DRYER START-UP:

Your dehumidifying gas dryer is equipped with 3-phase electrical motors that must be checked for proper rotation of the blowers before being put into regular service. Confirm that: (1) 3-phase electrical power has been applied to the isolating disconnect switch within the control enclosure; (2) that the voltage is correct; (3) the amperage rating of the circuit is sufficient and (4) the cable is properly equipped with strain relief bushings to prevent cable abrasion or mechanical disconnection due to strain.

To check for proper rotation of the blowers:

A. Apply power to the dryer.

B. Close the disconnect switch by moving it to the "up" position. Note: the dryer door must be closed and locked with the lower locking lever, for the disconnect switch to operate.

C. Turn the on/off rocker switch of the Compu-Dry to the "on" position. The switch itself should light to indicate power to the control

D. Remove the "to process" hose from the top the dryer in order to check air flow directio

E. Press the dryer's "run" key to start all regul dryer functions, then press "stop" to stop dryer.

F. Immediately check the flow of air at the "t process" air outlet. Air flow should be *positiv* or blowing air *out*. Note: If the dryer has bee used recently and is hot, or if the "to process outlet is difficult to reach, use the "from pr cess" hose connection at the inlet to the pr cess air filter and verify that air flow i *negative* or pulling air *into the filter housin* For CDG600 thru CDG2400, use a mechanic mirror to monitor rotation of the blower moto

G. If blower rotation is incorrect, disconnec power at the *dryer cable source*, then switc any two of the 3-phase leads at the disconnec switch.

Do not attempt to alter the direction c individual motors. All motors are properl phased together at the factory.

NOTE: If the dryer is moved frequently, an op tional "Improper Blower Direction Alert" ma be installed to inform the operator of impr air flow, resulting from out-of-phase wiring

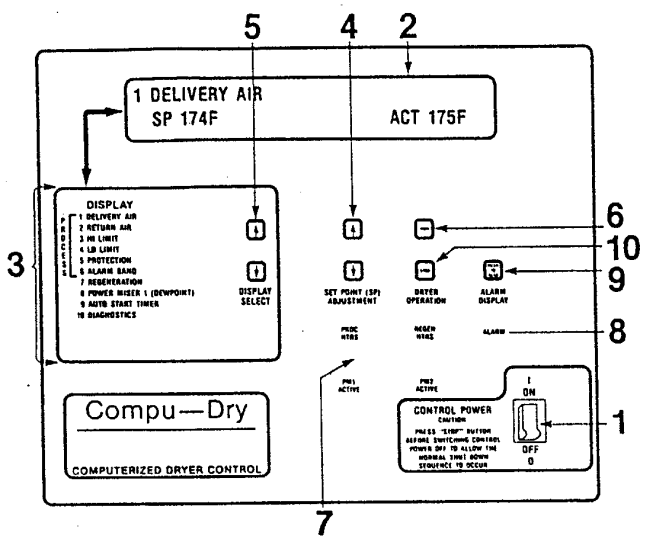
H. Check for proper rotation of the desiccan carousel. Rotation of the carousel should b *counterclockwise* when viewed from the to Note: Direction of desiccant tank assembl rotation is *independent* of 3-phase power con nection. If desiccant tank assembly is index ing in the wrong direction, contact the Conai Franklin Service Department.

To test carousel indexing:

With dryer power switch "off", activate an hold the desiccant carousel limit switch located on the perimeter of the carousel be plates, while turning on the power switch an pressing the "run" key. Then release the limi switch. The display should indicate the drye is in the indexing mode. On all models excep the CDG2400, the carousel may not inde immediately because of automatic cool dow of the heater boxes. Within 30 seconds, th carousel should index. The limit sw follower should come to rest in the bed plat valley, once rotation is complete.

Compu-Dry Label

FIGURE 9



FUNCTION SET-UP (See Figure 9)

By switching the "on/off" switch (Item #1) to the "on" position, the Display (Item #2) will be energized as "Diagnostic Check—Please Wait" for 90 seconds. The display has been designed to give the operator an indication as to what function is being monitored at any given time, as well as the setpoint and actual temperature of those functions. The two-line display shows the display number and description of the function on the first line and the setpoint (SP) temperature and actual (ACT) temperature on the second. The display possibilities are listed in the parameter list (Item #3). The first seven functions relate to the actual plastic material drying or "process" circuit of the dryer. The remaining parameters relate to other functions of the dryer which can be monitored on the display. With function #1 (Process Delivery Air), we may increase or decrease the setpoint by using the up and down keys labeled "Setting Adjustments" (Item #4). As you press the up or down key, you will see the setpoint on the display change or "scroll" accordingly. There are two scrolling speeds designed into the control. When first pressed, the slower scrolling rate is evoked. After five seconds, the faster rate is evoked. When you have properly adjusted #1 (Process Delivery Air) to the desired processing temperature, move on to the next function for proper adjustment. This is done by utilizing the up and down keys labeled "Display Select" (Item #5). By pressing the down key, the display will change from function #1 to function #2 (Return Air). If this function has not been installed in the dryer, the display will indicate so. In this case, move on to the next function by pressing the down key.

Continue to step through each function and key in the appropriate setpoint for each one of these functions as it pertains to your application. Once all functions have been adjusted properly, the dryer may be started by pressing the key labeled "RUN" (Item #6). If any malfunctions occur, an alarm light (Item #8) will be energized, alerting the operator. By pressing the alarm display key (Item #9), the nature of the malfunction will be described on the display and the audible alarm, if equipped, will be silenced.

Initially when an alarm occurs, the alarm light will flash on and off alerting the operator. After the operator has pressed the Alarm Display key, the alarm light will stop flashing but will remain lit until the alarm has been cleared. If it is inconvenient to correct the nature of the alarm and the dryer is permitted to run, it is conceivable that a more serious alarm could occur subsequent to the first alarm. In order to alert the operator of any additional alarms, the alarm light will start to flash again and the audible alarm (if supplied) will be sounded, alerting the operator that some other malfunction has occurred.

While the dryer is running, there are indicating lights (Item #7) which advise the operator which heat exchanger or optional functions may be energized. Note that the indicating lights for the heat exchangers or optional functions are not visible unless energized.

In order to shut the dryer down, the stop key (Item #10) should be used rather than the on/off switch (Item #1).

The stop key starts a programmed shutdown mode which shuts down both process and regeneration heat exchangers for ten minutes, prior to de-energizing the blowers. Once the dryer has shut down (blowers stopped), the on/off switch (Item #1) may be turned to the off position.

The following is a list of all display functions, along with a brief description of each. For those functions which relate to options which are not installed, the Display will read "Option Not Installed".

1. Process Delivery Air Temperature — Should be set for the material being processed (eg: for ABS, SP = 180°F). This temperature is

monitored and controlled at the inlet to the drying hopper. Depending on the temperature selected, the display will appear in one of 2 ways. First, if the selected temperature is less than 70% of the dryer temperature range, the display will show what the setpoint and actual temperatures are immediately. If, however, a temperature setpoint is selected that is above 70% of the dryer temperature range, a message will appear on the display indicating the dryer is in a "Preheat mode". This message will remain on the display until the dryer has heated up properly. Once the dryer is up to operating temperature conditions, the display will revert to "process delivery air" displaying the setpoint and actual temperatures.

2. Return Air Temperature — This function is used as a temperature monitor. The display will indicate actual return air temperature on the first line of the display.

*3. Process Hi-Limit — This function safeguards against unauthorized personnel raising the process delivery temperature above an acceptable level for a given material. The process temperature setting cannot exceed the hi-limit setting; therefore, it is impossible to accidentally raise the process temperature above the hi-limit. This setting may be any temperature greater than or equal to the process delivery air temperature. A safe setting would normally be ten degrees above the process temperature setting.

*4. Process Low Limit — This is similar to the Hi-Limit. The setting may be any temperature less than or equal to the process delivery air temperature. A safe setting would normally be ten degrees below the process temperature setting.

*5 Process Protection — (Optional) This parameter provides an adjustable hi-limit safety setpoint for the process circuit of the dryer, by utilizing an independent temperature probe located at the outlet of the process heat exchanger. Because of the difference in location between the standard "To Process" probe at the hopper and the Process Protection probe, a difference in temperatures between these two probes is common and must be anticipated before setting the process protection setpoint. (At the time of shipment, the SP temperature is set to maximum). First, to stabilize and register the temperature at that location. Then set the process protection setpoint (SP) to 10 degrees above the actual (ACT). This provides a 10 degree safety margin to protect the process temperature from climbing out of control and possibly melting material in the drying hopper. The most common reason for such a malfunction is the improper installation of the "To-Process" probe in the air inlet of the drying hopper. In such a circumstance, the dryer's heaters react to an erroneous temperature reading (usually ambient temperature) and continue to provide heat to the material in an attempt to reach setpoint.

*This parameter requires an access code in order to change the setpoint. With the access code set at "54", it is possible to raise or lower the setpoint.

The dryer must be stopped to enter the access code. Press the "down" arrow key (DISPLAY SELECT) until "ACCESS CODE" appears on display 10. Press the "up" arrow key (SETPOINT ADJUSTMENT) until "54" appears on the display. With the access code set, go back and change the setpoint of the desired parameter. Once the dryer has been started, the access code will reset, locking out any further setpoint adjustments.

6. Process Alarm Band — This parameter is adjustable from 5°F to 20°F above and below the Process Delivery Setpoint. Should the actual process temperature fall outside this band width, an alarm condition will be evoked. See Troubleshooting section for more detail.

7. Regeneration — This function indicates the actual regeneration temperature. If this temperature falls below the setpoint, an alarm condition will alert the operator. (See Troubleshooting Section).

The regeneration temperature refers to the temperature of an independent flow of air which is used to purge moisture from the desiccant after it becomes laden with moisture removed from the plastic in the drying hopper. This function occurs simultaneously with the "process" func-

8. Power Miser 1 — (This adjustment relates to the option Power Miser 1 "Deluxe") Adjust the setpoint to the desired dewpoint for processing. If this option has been factory installed, it has been pre-adjusted to -3°F. This is an acceptable setpoint for most materials, but you may readjust the setpoint should your application require a different setpoint (adjustable from -80°F to +32°F).

9. Auto Start Timer — This function permits automatic start-up at a predetermined time. It is adjustable from 0 to 100 hours. If you wish to start-up in 24 hours, set the timer at 24 and the dryer will automatically start at that time.

CAUTION: Make sure temperature parameters are properly set for the material to be dried upon automatic start-up, before using this feature. Failure to do so could result in severe damage to your material.

Once the time setting has been set, press the "RUN" key to start timing cycle. The display will count down to 0 and the dryer will start. The timer must be reset each time you wish to use this feature. On power interruptions the microprocessor retains where the time left off, and will resume the countdown once power is available.

10. Diagnostics — This function is reserved for entering access codes and setup codes for various functions. These codes are referred to throughout the manual as required.

Once you have checked all setpoints and are satisfied, the dryer may be started by pressing the "RUN" key.

A "cold" dryer may take up to 45 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 tanks 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. To properly dry out the desiccant tanks under these conditions the use of the purge cycle may be required. The purge cycle must be activated while the dryer is not running. In order to activate the "Purge Cycle", move to one window past the "Diagnostics" by the use of the function select keys.

PURGE CYCLE OFF

Use "Setpoint Adjustment" UP key to turn the Purge Cycle "ON".

PURGE CYCLE ON

Then press "RUN" to activate the cycle. During the cycle, the dryer will function as follows:

1. Other functions can be observed by pressing the function UP and DOWN arrow keys. The display will automatically default back to the "Purge Cycle" window, one minute after the use of the Function Select keys.

2. The process burner will remain off while the dryer is being purged of moisture. The Regeneration Burner will be ignited and maintain 425 degrees F. throughout the Purge Cycle.

3. The "Purge Cycle" continues for 60 minutes, then it will change to:

PURGE CYCLE COMPLETE

The dryer will continue to operate in this mode until the "RUN" button is pressed. The process burner will ignite if necessary and maintain temperature. At this point, the Purge Cycle is automatically turned "OFF".

The "Purge Cycle" will be shortened if the dryer is equipped with Power Miser 1 Deluxe option and the dewpoint becomes less than the setpoint.

DISPLAY INTENSITY (VACUUM FLUORESCENT ONLY):

Dryers that are equipped with vacuum fluorescent displays are capable of having the intensity increased or decreased. The unit is shipped with a display intensity which should suit most customer applications. However if you find it necessary to change the intensity, perform the following procedure:

While the dryer is stopped, press the Display Select "DOWN" arrow to "Diagnostics". By

entering one of the following access codes, the intensity of the display will change accordingly:

Access Code	Display Intensity
20	100%
21	75%
22	50% (Default Value)
23	25%

After you have entered your selected intensity level, press the "Stop" key. At that point you should observe the display intensity increase or decrease, depending on your selection. The dryer will maintain the new intensity level until it is altered again by following the same procedure.

Keep in mind that the life of the vacuum fluorescent display is directly proportional to the intensity which it is operated at. By increasing the intensity of the display, the life of the unit will be somewhat decreased. This, however, should still fall within a satisfactory life span of such a component.

P. C. BOARD TROUBLESHOOTING:

The Microprocessor has been designed with a modular concept. (Individual printed circuit boards for various functions) The following list describes each printed circuit board and what function it serves.

CPU Board:

There are three LED's on the board which serve as troubleshooting aids.

—Status Light: (normally flashing)
This LED will flash if the microprocessor is working properly. If the LED is not flashing, there is a malfunction with the board or there is an inadequate supply of power.

—"Halt"/Run Light: (normally on)
This LED will light if the 12 volt power supply falls below an acceptable level. The microprocessor (U3) is automatically reset, which will shut the dryer off.

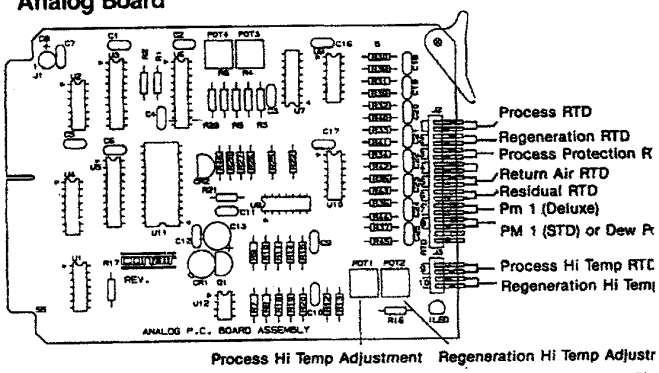
—Reset Light: (normally off)
If the microprocessor detects an internal error, this LED will be energized and the dryer

Analog Board:

The analog board contains 10 channels which ar used for taking an input signal from either RTI temperature sensors or pressure transducers then translating it to a signal which the CP capable of manipulating. Two special channels o the board are used to monitor the temperatur in the heat exchangers. Inputs to these channel are identified on the analog board as terminal 1&2, 3&4 (J3). In conjunction with the input there are two potentiometers (1 POT, 2 POT which have been factory adjusted and sealed These pots set the temperature hi-limit in th respective heat exchangers. Should th

FIGURE 1(

Analog Board



temperature in the heat exchanger exceed t hi-limit, the dryer will automatically shut dow and the display will indicate the nature of th malfunction.

The pots should not be re-adjusted except by a qualified Conair Franklin serviceman.

1LED on the board will be de-energized should ar overtemp condition occur. In order to determin which heat exchanger has overheated, first plac a jumper between terminals 1&2 (J3). If 1LE is energized, the problem has occurred in the pro cess heat exchanger. If 1LED does not light, plac the jumper between terminals 3&4 (J3). If 1LE is energized, the problem has occurred in th regeneration heat exchanger. Do not leave th jumper on the terminals. This would override th hi-limit shutdown. Severe damage could occur a a result.

See Figure 10 for the proper input channel fo each temperature (or other input signals) being monitored or controlled.

The I/O board(s) of your Compu-Dry is the inter

switches, push buttons, overloads, motors, heaters and various other devices through this board.

Your Compu-Dry control may be equipped with up to two kinds of I/O boards; Standard and General Purpose (GP).

Standard I/O Board:

The Standard I/O board is equipped with a bank of LED's which illuminate in coordination with all input/output channels.

1 LED—"Watch Dog Timer": (normally off)
This LED will be energized if a malfunction is detected in the microprocessor hardware. When it is illuminated, all outputs are de-energized.

2 LED through 10 LED:
See the wiring diagram supplied with your dryer for the specific functions associated with each LED.

11 LED—Power Supply: (normally on)
This LED indicates the 12 volt power supply to this board is satisfactory.

In addition to the "Standard" I/O Board, the "General Purpose" I/O is supplied on Dryers equipped with certain options. This GP I/O (like the Standard I/O) is equipped with LED's that illuminate in coordination with the I/O channels.

1 LED through 18 LED:
See the wiring diagram supplied with your dryer for the specific functions associated with each LED.

19 LED: (normally on)
This LED indicates the 12 volt power supply to the GP I/O is satisfactory.

MAINTENANCE:

Filters

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

When the plastic material being processed contains a large proportion of dust and fines, an optional auxiliary filter is recommended.

VERY IMPORTANT:

The process 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 filter frequently and clean as necessary.

TO CLEAN FILTERS:

Process Filters — See Figure 11

First, shut down dryer. This must be done so that dirt and humidity are not drawn into the drying circuit. Then, remove the filter from its housing and clean the cartridge filter. Use a vacuum cleaner on the outside of the cartridge to remove dirt and fines. If you are using compressed air to *blow* out dirt and fines, always blow from the inside - out. When replacing the filter, *make sure it is properly seated.*

During cleaning, check carefully for holes or tears in filter paper. If defects are found, replace old filter(s) with new one(s) before placing dryer back into operation. New filter cartridges may be ordered from Conair Franklin.

NOTE:

Contamination is the principal cause of desiccant failure; if a desiccant cartridge should become contaminated, drying efficiency will be severely reduced.

Regeneration and Combustion Filters — (See Figure 11)

Regeneration and combustion filters should be cleaned in a similar manner as the process filters.

WARNING:

Contamination, if permitted to collect in the heat exchangers, presents a possible fire hazard. This contamination can collect if the filters are not properly seated, or if the dryer is not shut down during cleaning.

In addition to the fire hazard, contamination of the combustion filter will cause improper combustion of the burners, lowering the efficiency of the heat exchanger.

SECONDARY FILTERS (High Heat Dryers) See Figure 11

Shut down the dryer and remove the secondary filter from its housing. The filter is a cloth bag type designed to prevent material dust from clogging the Aftercooler coils and process filter. Clean the filter thoroughly with a vacuum cleaner or compressed air. Replace the filter if it shows signs of extreme wear, holes, separating or an inability to pass air any longer. Reinstall the filter in its housing and clamp securely.

AFTERCOOLER CLEANING (High Heat Dryers) See Figure 11

The coils of the Aftercooler circulate water that causes a reduction in temperature of the drying circuit's return air. Dust carried over from the hopper accumulates on the copper coils of the Aftercooler and as a result, reduces the Aftercooler's ability to lower the return air temperature. The coils must be cleaned periodically to remove the accumulated dirt.

Turn the dryer off, using the stop key and allow the Aftercooler's water to bring down the temperature of the Aftercooler chamber to a safe level. Then, expose the coils by releasing the clamps and *removing* the coils on Models CDG400 through CDG800, or by removing the lid on the CDG1000 through CDG2400 models. Clean the coils and housing thoroughly by steam cleaning or by applying an industrial solvent. This will provide optimum heat transfer. Be sure to thoroughly vacuum or blow all particles of dirt from the Aftercooler chamber before replacing the coils and/or securing the Aftercooler cover.

This procedure should be carried out on a regular basis to provide optimum performance of the Aftercooler, but the need for continuous cleaning may indicate the need for a plasticizer trap preceding the secondary filter/Aftercooler combination. (Consult Conair Franklin).

PLASTICIZER TRAP CLEANING — See Figure 5 (from "Installation" Section)

The Plasticizer trap provides a specific condensation point for volatiles given off during drying and returning to the dryer in the return air stream. The trap provides a collection chamber for these volatiles. Three areas of the trap require maintenance:

1. The Collection Chamber — The accumulate volatiles collect in this chamber which mu be emptied periodically and cleaned. Yo trap may be one of two types which provid access to the collection chamber by releas the lid clamp, removing the coil assembly a allowing the trap "barrel" to be emptied an cleaned (CDG400); or, removing the acce cover at the base of the trap to permit drai ing of the volatiles from the collectio chamber (CDG600 through CDG2400).
2. The Trap Coils — These coils within th plasticizer provide a suitable temperatur with cool water for the volatiles to condens out. The coils should be cleaned periodicall to provide optimum heat transfer for the co lection of the volatiles. Release the lid clamp of the trap, pull out the coils and clean ther by steam cleaning or by applying a industrial solvent. It is advisable to clean th collection chamber at this time ("1." above as well as the trap's cartridge filter ("3. below).
3. The Trap Cartridge Filter — As a final guar against the passing of volatiles back into th dryer's process air circuit, a cartridge filte is included in the trap in a metal shr within the trap's coils. Remove the t thumb screws on top. Pull the filter out an clean thoroughly with a vacuum or compress ed air as described in "process filte maintenance" above. Replace the filter if i is torn or clogged. Be sure to reinstall i carefully.

LUBRICATION

All motors are lubricated for life and require n lubrication.

IMPORTANT: Sealing surfaces between desiccan carousel plates should *never* be lubricated. If, fo some reason, it becomes necessary to disassembl the dryer, care should be taken during reassembl to insure that all sealing surfaces are clean an free of dirt and grease.

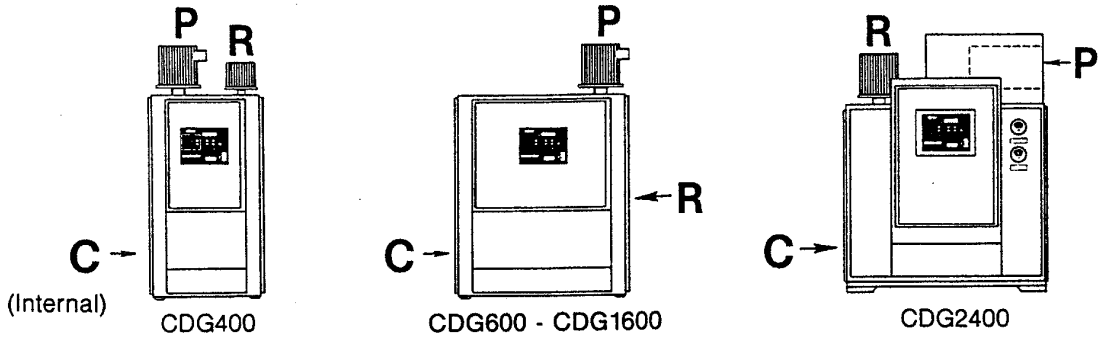
OTHER MAINTENANCE AREAS

In addition to filter and auxiliary componen cleaning, these other areas should be chec periodically.

Filter Locations:

P = Process Filter
R = Regeneration Filter
C = Combustion Filter

FIGURE 11



1. Hoses: Both inside the dryer and out. Check to be sure they are not cracked, torn or have holes that could allow ambient air to leak in or dry air to leak out. Be sure all hoses are fitted correctly to the dryer and hopper. Be sure all adaptors (if required) are in place and are clamped tightly.

2. Gaskets: During any routine service, gaskets throughout the dryer should be checked to be sure if they are intact and in place: Heat exchangers, filter gaskets, hopper door, loader flange.

3. Desiccant Tank "O" Rings: Each tank is fitted with an "O" ring on the bottom to prevent air leaks. Be sure it is in place and in good condition, especially when replacing the tanks.

SERVICING:

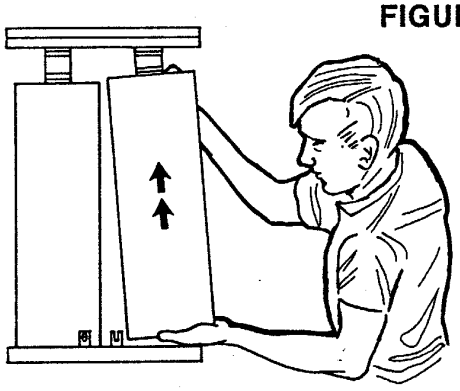
A. **DESICCANT CARTRIDGE REPLACEMENT** — See Figure 12

> Note: Desiccant cartridges have an almost unlimited life as long as they are not contaminated by material fines, volatiles, or dust. Be sure your cartridges are actually contaminated before attempting replacement.

The desiccant cartridges are fitted between two sets of rotating plates within the carousel assembly. Turn off the dryer and release at least one hose clamp at the top of the cartridge. Loosen or remove the bolts at the base of the cartridge. Lift the cartridge straight up to clear the protruding tube at the bottom, pull the bottom out and lower the cartridge away from the hose connection at the top. When reinstalling the replacement cartridge be sure to include the "O" ring on the base tube and hose securely at the top. The mounting bolts at the base of the cartridge should hold the tank firmly in place against the "O" ring seal. Be sure to tighten the bolt in the bedplate *before* tightening the bolt in the desiccant cartridge.

Desiccant Cartridge Replacement

FIGURE 12



B. **BURNER REPLACEMENT OR INSPECTION:**
(Figure 13)

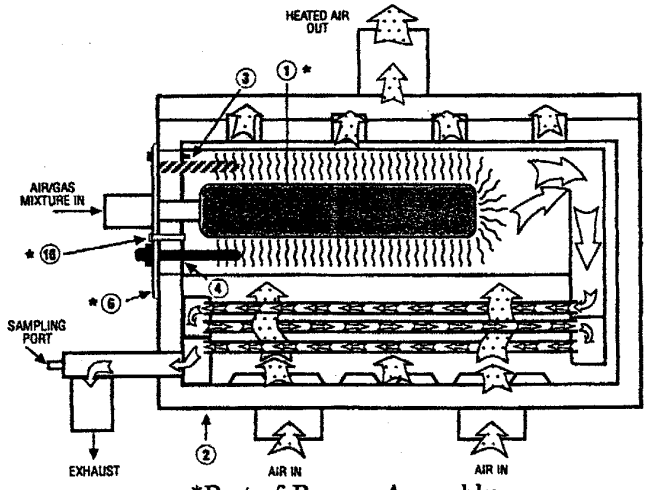
Under normal operating conditions, the burners will have a fluorescent orange glow as viewed thru the inspection sight glass (10). If a flame appears to be "jumping" off the burner surface, some adjustments may be required to modify the air/fuel mixture. Consult technical support bulletin number IMD-064A.

If dark areas appear on the surface of the burner, this is likely to be a damaged area caused by poor handling of burner during installation, or age. Replacement of burner may be required.

NOTE: The burner element of your CDG Series Gas-Heated dryer presents no hazard under normal conditions of use, storage, or transport. However, refractory ceramic fiber (a type of manmade vitreous fiber, or MMVF) is one of the elements of the burner's composition. Any scraping, severe abrasion or damage resulting in the generation of air borne particles which could be inhaled may present a health hazard. Further information concerning ceramic fibers and their health hazards may be obtained from Conair Franklin upon request.

Heat Exchanger

FIGURE 13



*Part of Burner Assembly

The burner (1) is located in the heat exchanger housing (2) mounted in or on the dryer housing. Disconnect power to the dryer and be sure the main gas valve and service valves are closed. Disconnect the electrical leads to the hot surface ignitor (3) and the flame sensor (4). Unbolt flange (6) from the heat exchanger housing. Do not touch, brush, or bump the burner surface (mantle). The mantle is made of a porous ceramic fiber material which is easily damaged. The burner mantle's fiber coating is one-quarter inch thick. If you accidentally bump or scrape the mantle, it is important to check the depth of coating which must be at least one-eighth inch thick for safe operation. Measure this by estimating, not by measuring devices, the depth of scrape as compared to the undamaged surface nearby. Measuring devices may cause more damage. If deeper abrasions have been inflicted, or if the screen beneath the fibers becomes visible, replace the burner.

NOTE: Do not attempt to disassemble tl burner from the flange. An exchange progra permits you to return your defective assemb to Conair Franklin for partial credit tov a new assembly.

Return all items which are indicated in Figu 13 as part of the burner assembly. Oth items, such as Hot Surface Igniter and Flan Sensor, must be ordered separately if they a returned. They are not considered part of tl burner assembly.

During installation of the burner, take tl same precautions as taken during the remov process. Make sure it is the proper size burne Reconnect all the wires to the flame sens and hot surface igniter.

C. **FLAME SENSOR REPLACEMEN INSPECTION** (See Figure 13)

If the sensor (4) does not conduct the prop signal (consult Technical Support Bulleti IMD-064), replace the sensor by disconnectin the wire lead, then unscrew the flame senso

D. **HOT SURFACE IGNITER (HSI) INSP TION/REPLACEMENT** (See Figure 13)

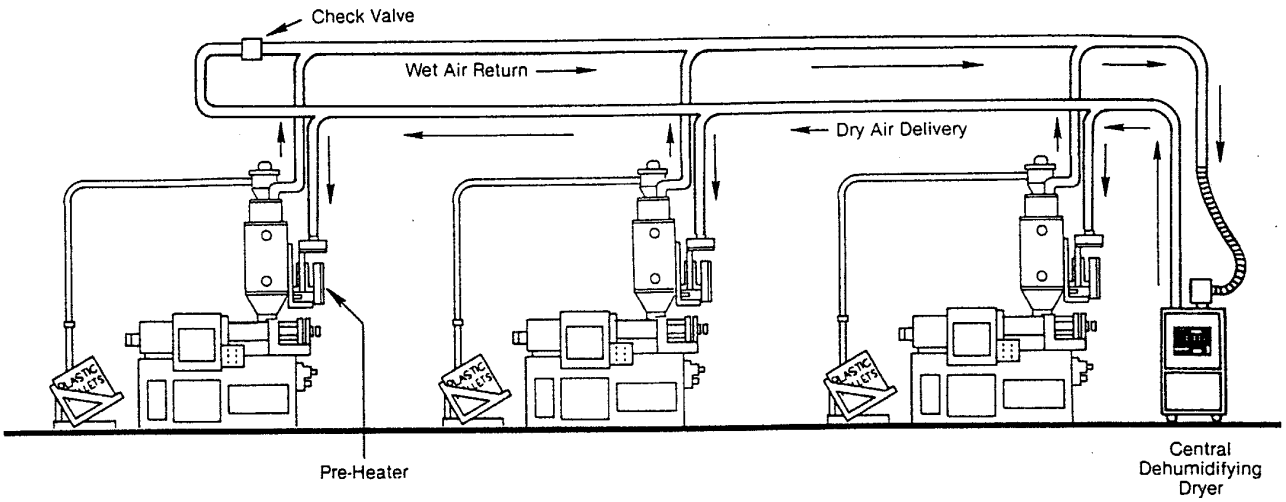
On initial firing of the Heat Exchanger, a orange glow should appear through the sigl glass, indicating proper operation of the HS (3). If, upon visual inspection no glow detected, the HSI has malfunctioned. T remove it, unfasten the holddown bracket an simply pull the HSI out by the electrical lead until the body of the HSI is exposed. At tha point, grip the body and continue removin it from flange. Use care not to damage th ceramic body while removing.

CENTRAL DRY AIR SYSTEM:

A Conair Franklin Central Dry Air System is a alternative arrangement for simultaneous dryin and heating of materials at several processin machines. The goal of centralized drying is to offe individual pre-heat temperatures to eac machine in the system, while spreading the of the dehumidified air supply across the num of machines serviced.

Central Dry Air System

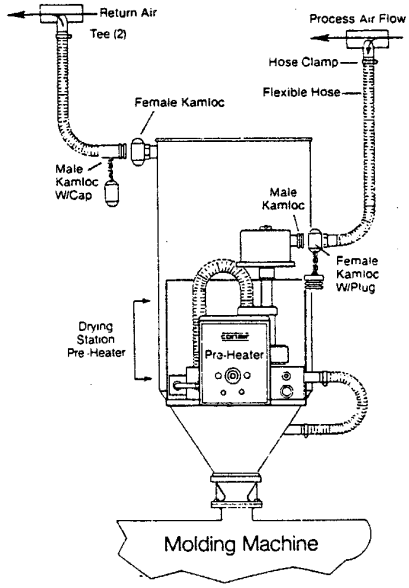
FIGURE 14



Small pre-heaters are mounted on or near each drying hopper to provide individual process temperatures to each station, so that each machine can run a different material. A central dehumidifying dryer, (without a process heat exchanger) provides low dewpoint air to each station through a common dry air delivery line. The moist air coming from each station returns to the dehumidifying dryer through a separate, wet air return line. (See Figure 14).

Typical Central Dry Air System Station

FIGURE 15



Typical Central Dry Air System Station

The equipment used in Central Dry Air Systems (Dryer and Pre-heaters) is very similar to conventional Conair Franklin Drying units and the instructions for these units can easily be adapted to supply information regarding installation, maintenance and servicing. See the earlier parts of this manual for information regarding the Central Dehumidifying Dryer and information for the pre-heaters can be found in the Conair Franklin "C-50 Dryer" instructions.

Two important considerations in Central Dry Air Systems are: (1) the need for maintaining a dehumidifying closed-loop when stations within the system are taken out of service and disconnected and (2) balancing the air flow of the system when only one or two of the stations are in operation.

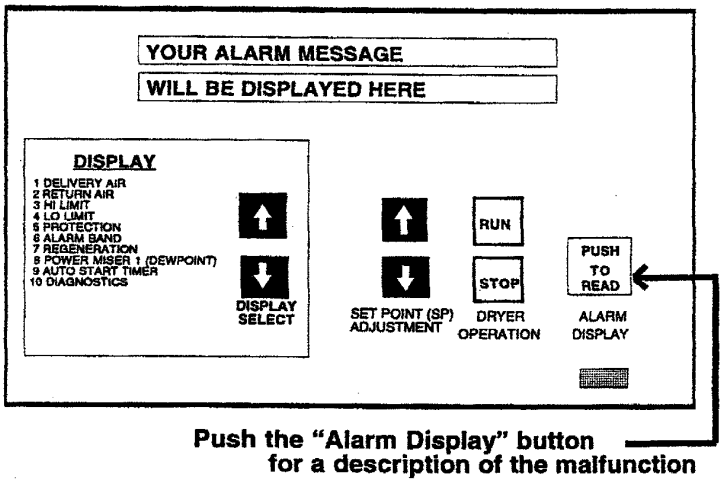
Air balancing problems are resolved with the use of a check valve (See Figure 14), located in the trunk line at the furthest point from the dehumidifying dryer. This check valve permits the full circulation of air through the system when only one or two stations are in operation. Be sure this valve is located properly in the trunk line for correct air flow through it.

To properly maintain a closed-loop, yet allow for removal of a station from service, "Kamlock" connectors with plugs are provided at each station (See Figure 15). These connectors permit secure connection to each pre-heater and drying hopper for normal operation but permit easy disconnection and plugging of the line if the station needs to be removed from the processing machine. In this way, dehumidified air will not be lost to atmosphere and wet plant air will not be drawn into the trunk line of the Central system.

TROUBLE SHOOTING

WHEN SOMETHING GOES WRONG...

Your gas dryer will activate an alarm and tell you where to look for the source of the problem. Its microprocessor control will shut down the dryer, if it detects an equipment malfunction or other problem that could damage your materials or facility. If the malfunction presents no danger, you will see a "passive" alarm telling you that a problem exists, but the dryer will continue operating.



Push the "Alarm Display" button for a description of the malfunction

To determine what caused an alarm, press the Alarm Display button on the dryer control panel. The panel display will describe the malfunction. Each alarm may be caused by one or more maintenance or equipment problems in the dryer.

The following pages will help you interpret the Alarm Displays and determine how to fix the problem.

BEFORE BEGINNING...

You'll want to find the wiring and equipment diagrams shipped with your dryer. The diagrams are the best reference for locating possible problems. If you're reading this, you've already found the dryer's operating and maintenance manual. A diagram of the Analog Board can be found on Page 12. A diagram of the gas combustion piping circuit is on Page 7.

If you need service or parts, call **CONAIR Instant Access at:** **800-458-1960.**
From outside the United States call: **814-437-6861.**

A FEW WORDS OF CAUTION

Gas and electrical problems should be examined and corrected only by qualified service personnel. Your Compu-Dry gas dryer is equipped with numerous safety devices. As with all safety devices, improper application and/or maladjustment can result in repeated and/or unscheduled shutdowns. Improper corrective action (bypassing, jumping-out, etc.) can lead to hazardous conditions and should never be attempted to sustain production.

GAS SUPPLY — SHUT DOWN ALARMS

The following alarm messages describe gas supply problems that could damage your plant or materials. When one of these malfunctions occurs, the microprocessor immediately:

1) Shuts off the dryer.
2) Turns on the alarm light.

When the Alarm Display says:

MAIN GAS VALVE MALFUNCTION

Pressure switches have detected gas leaking through the main gas valve.

Possible cause...	Solution:
Is the main gas solenoid valve stuck open or leaking?	Rebuild or replace the valve. The Conair Parts Department offers rebuilding kits.
Is Pressure Switch 4 installed properly?	If the switch is installed properly and still not working, replace it.

When the Alarm Display says:

PROCESS SEC GAS VALVE MALFUNCTION

Pressure switches have detected gas leaking through the secondary gas solenoid valve in the process line.

Possible cause...	Solution:
Has someone turned the dryer power on and off two or three times without actually operating the dryer?	Each time the dryer is turned on, the automatic diagnostics check releases a small amount of gas into the line. This gas is now stuck in the line, and the pressure switch thinks it means there is a leak. First, turn off the main gas valve. Then turn on the dryer and run the diagnostics check to vent the gas. You may need to run the diagnostics check twice. When the gas is vented, turn off the dryer. Turn on the main gas valve. Turn the dryer back on, and run it.
Is the secondary process gas solenoid valve stuck open or leaking?	Rebuild or replace the valve. The Conair Parts Department offers rebuilding kits.
Is Pressure Switch 4 installed properly?	If the switch is installed properly and still not working, replace it.

GAS SUPPLY — SHUT DOWN ALARMS (continued)

When the Alarm Display says:

REGEN SEC GAS VALVE MALFUNCTION

Pressure switches have detected gas leaking through the secondary gas solenoid valve in the regeneration line.

Possible cause...	Solution:
Is the secondary regeneration gas solenoid valve stuck open or leaking?	Rebuild or replace the valve. The Conair Parts Department offers rebuilding kits.
Is Pressure Switch 3 installed properly?	If the switch is installed properly and still not working, replace it.

When the Alarm Display says:

HIGH GAS PRESSURE

Gas pressure to the dryer exceeds the pressure created by a 15-inch column of water, the limit for safety.

Possible cause...	Solution:
Does the gas regulator need adjusting?	Incoming gas pressure should equal a 6- to 8-inch water column. Check the pressure at the gas regulator and adjust, if necessary.
Is Pressure Switch 5 installed properly?	If the switch is installed properly and still not working, replace it.

When the Alarm Display says:

LOW PROCESS GAS PRESSURE

Gas pressure is too low for the dryer to run a normal process cycle.

Possible cause...	Solution:
Is gas pressure at Pressure Switch 4 lower than a 3-inch water column?	Incoming gas pressure should equal a 6- to 8-inch water column, while pressure at the switch should equal a 5-inch water column. Check the gas pressure at the regulator, and adjust if necessary. If pressure at the regulator is OK, check for gas leaks in pipes or valves.
Is Pressure Switch 4 is working?	The switch should turn on within 45 seconds of the process burner igniting. Check the window on the side of the pressure switch. If the switch is on, installed properly and still not working, replace it.
Does the general purpose input/output board have a steady power supply?	If LED 19 flickers with the power switch on, check for loose connections between the input/output board and power supply.

GAS SUPPLY — SHUT DOWN ALARMS (continued)

When the Alarm Display says:

LOW REGEN GAS PRESSURE	Gas pressure is too low for the dryer to run a normal regeneration cycle.

Possible cause...	Solution:
Is gas pressure at Pressure Switch 3 lower than a 3-inch water column?	Incoming gas pressure should equal a 6- to 8-inch water column, while pressure at the switch should equal a 5-inch water column. Check the gas pressure at the regulator, and adjust if necessary. If pressure at the regulator is OK, check for gas leaks in pipes or valves.
Is Pressure Switch 3 working?	The switch should turn on within 45 seconds of the regeneration burner igniting. Check the window on the side of the pressure switch. If the switch is on, installed properly and still not working, replace it.
Does the general purpose input/output board have a steady power supply?	If LED 19 flickers with power on, check for loose connections between the input/output board and power supply.

INDEX CYCLE — SHUT DOWN ALARM

The following alarm message describes a bed plate indexing problem that could damage your materials. When this malfunction occurs:

1) The indexing timer times out.
2) The alarm light turns on.
3) The burners shut off.
4) The process and combustion blowers shut off after 10 minutes.
5) The regeneration blower shuts off when regeneration temperature is less than 280° F.

When the Alarm Display says:

INDEX CYCLE TOO LONG CHECK L S AND MOTOR	The rotating bed plate that holds the desiccant cartridges has not turned or has turned too far while indexing for the next process/regeneration cycle.

Possible cause...	Solution:
Is the limit switch along the outside of the rotating bed plate adjusted properly?	Adjust the switch so that its small roller drops into the valley on the side of the moving bed plate, tripping the switch and halting rotation.
Is the limit switch sticking?	Replace the limit switch?
Is the drive motor turning the bed plate?	Check for blown fuses or other power interruptions in the motor control circuit. If the power supply is OK, inspect the gear motor, spur gears and motor bracket for damage.

COMBUSTION CIRCUIT — SHUT DOWN ALARMS

The following alarm messages describe combustion air flow or burner problems that could damage your plant or materials. When one of these malfunctions occurs, the microprocessor:

1) Shuts off the dryer.
2) Turns on the alarm light.

When the Alarm Display says:

LOW COMBUSTION AIR FLOW

Air pressure from the combustion blower has dropped below the pressure setting.

Possible cause...	Solution:
Is the combustion air filter clogged?	Clean the filter.
Has air flow reversed?	Make sure the combustion blower is rotating in the same direction as the arrows stamped on the blower housing.
Is there an air leak?	Repair any air leaks in pipes or connections.
Is Pressure Switch 2 installed properly?	If the switch is installed properly and still not working, replace it.

When the Alarm Display says:

PROCESS BURNER LOCKOUT

The process burner did not ignite.

Possible cause...	Solution:
Is the process pressure switch open?	The pressure switch should be closed. If the hose remains attached to the switch, continue through this list to find cause.
Is a process blower fuse bad?	Check the fuses, and replace if necessary.
Is air trapped in the gas line?	This can occur after installation. Before starting the dryer for the first time, you need to purge air from incoming gas lines.
Is the manual gas cock closed?	Make sure the manual gas cock inside the dryer is open.
Is gas pressure low or fluctuating?	When gas pressure is so low that the burner won't ignite, this alarm will display before the Low Gas Pressure alarm.
Is there a problem with the air/fuel train?	Check all main and secondary valves in the air/fuel train to make sure they are wired and working properly
Did the flame igniter glow bright orange before gas valve opened?	If not, replace the igniter. A defective igniter will not open the gas valve, and it will not try to light the burner.
Are there dark areas on the burner's surface?	You may need to replace the burner. Dark areas generally indicate damage or age. Call the Conair Service Department.
Is the flame sensor installed properly?	The flame sensor should be positioned close to, but not touching, the burner surface. There should be no loose wires.
Is the air/gas mixture correct?	Ask qualified gas service personnel to check the mixture.

COMBUSTION CIRCUIT — SHUT DOWN ALARMS (continued)

When the Alarm Display says:

REGEN BURNER LOCKOUT

The regeneration burner did not ignite.

Possible cause...	Solution:
Is the regeneration pressure switch open?	The pressure switch should be closed. If the hose remains attached to the switch, continue through this list to find cause.
Is a regeneration blower fuse bad?	Check the fuses, and replace if necessary.
Is air trapped in the gas line?	This can occur after installation. Before starting the dryer for the first time, you need to purge air from incoming gas lines.
Is the manual gas cock closed?	Make sure the manual gas cock inside the dryer is open.
Is gas pressure low or fluctuating?	When gas pressure is so low that the burner won't ignite, this alarm will display before the Low Gas Pressure alarm.
Is there a problem with the air/fuel train?	Check all main and secondary valves in the air/fuel train to make sure they are wired and working properly
Did the flame igniter glow bright orange before gas valves opened?	If not, replace the igniter. A defective igniter will not open the gas valves, and it will not try to light the burner.
Are there dark areas on the burner's surface?	You may need to replace the burner. Dark areas generally indicate damage or age. Call the Conair Service Department.
Is the flame sensor installed properly?	The flame sensor should be positioned close to, but not touching, the burner surface. There should be no loose wires.
Is the air/gas mixture correct?	Ask qualified gas service personnel to check the mixture.

COMBUSTION CIRCUIT — PASSIVE ALARM

The microprocessor detected a combustion circuit problem that does not endanger your materials, and:

1) Turned on the alarm light.
2) Allowed regeneration and process cycles to operate normally.

When the Alarm Display says:

SERVICE COMBUSTION AIR FILTER

The combustion air filter is clogged, or a pressure switch has malfunctioned.

Possible cause...	Solution:
Is the combustion filter clogged?	Clean or replace the filter.
Is Pressure Switch 1 working?	If the switch is not working properly, repair or replace it.

ELECTRICAL — SHUT DOWN ALARMS

The following alarm messages describe electrical problems that could damage your plant or materials. When one of the malfunctions occurs, the microprocessor automatically:

1) Turns on the alarm light.
2) Shuts off the process and regeneration burners.
3) Shuts off the process and combustion blowers.
5) Shuts off the regeneration blower, if the regeneration air temperature is less than 280 F

When the Alarm Display says:

PROC / COMB BLOWER O L OR NO 12+ POWER

Something has tripped the electrical overload on the process or combustion blower. Or the input/output board is not receiving 12 volts of electricity.

Possible cause...	Solution:
Is the motor drawing more current than its nameplate rating allows?	Check for loose wiring or fuses between the motor and the control panel. If you don't find any, call the Conair Service Department. The motor might need to be replaced.
Are the settings for overloads 1 and 3 different from the settings indicated on the External Power Wiring Diagram / Electrical Parts List?	For Compu-Dry 400 and 600 series gas dryers, find the overload adjustment screw inside the control panel and adjust the overloads to the proper settings. For all other dryers, contact the Conair Service department.
Is LED 11 on the input/output board off when power is on?	The input/output board is not receiving 12 volts from the filter board. Check the filter board and power supply.
Is the LED on the filter board off when the power is on?	Check the power supply.

When the Alarm Display says:

O L REGEN BLOWER

Something tripped the electrical overload on the regeneration blower. Regeneration cycle shuts down, but process cycle will run normally.

Possible cause...	Solution:
Is the motor drawing more current than its nameplate rating allows?	Check for loose wiring or fuses between the motor and the control panel. If you don't find any, call the Conair Service Department. The motor might need to be replaced.
Is the setting for overload 2 different from the proper settings indicated on the External Power Wiring Diagram / Electrical Parts List?	For Compu-Dry 400 and 600 series gas dryers, find the overload adjustment screw inside the control panel and adjust the overloads to the proper settings. For all other dryers, contact the Conair Service department.

ELECTRICAL — SHUT DOWN ALARMS (continued)

When the Alarm Display says:

DIAGNOSTICS TDR MALFUNCTION	The timer used in the dryer's startup diagnostics check malfunctioned.

Possible cause...	Solution:
Is the timer bad?	The timer is called a TDR on the wiring diagram for the control box. Make sure it's plugged in. If the timer is plugged in but still not working, replace it..

ELECTRONIC — PASSIVE ALARM

A problem with the dryer's electronic systems has caused an error that can be corrected while the dryer is operating. The microprocessor has:

1) Turned on the alarm light.
2) Allowed the process and regeneration cycles to continue operating.

When the Alarm Display says:

CHECKSUM ERROR CHECK ALL SETPOINTS	Electronic interference may have erased all temperature setpoints from the dryer's memory.

Possible cause...	Solution:
Did electronic "noise" cause a one-time memory lapse?	Reset all setpoints for process and regeneration cycles, and continue running the dryer.
Did the battery supplying power to the computer's memory die?	If the checksum error continues to show up after setpoints have been reset, replace the dryer's CPU board. The battery that holds the setpoints in memory no longer functions.

TEMPERATURE — SHUT DOWN ALARMS

The following alarm messages describe temperature problems that could damage your materials. When one of these malfunctions occurs, the microprocessor:

1) Turns on the alarm light.
2) Shuts off the process and regeneration burners.
3) Shuts off the process and combustion blowers.
4) Shuts off the regeneration blower when regeneration temperature is less than 280° F, unless noted otherwise.

TEMPERATURE — SHUT DOWN ALARMS (continued)

When the Alarm Display says:

PROCESS TEMPERATURE UNSATISFACTORY - HIGH

The process temperature is too hot. It has exceeded the setpoint temperature by an unacceptable level.

Possible cause...	Solution:
Are the filters clogged?	Clean the filters. Dirty filters reduce air flow and increase heat.
Is the process temperature setpoint too low for the burner firing rate.	Adjust the setpoint. Gas dryers cannot be set to operate above or below a particular temperature range. Typical ranges are: H series 240° F to 350° F, and A series 120° F to 275° F.
Is the burner firing properly?	The burner should have an even, orange glow that is brighter during high fire. If the burner doesn't appear to be operating properly, make sure incoming gas pressure is more than a 7-inch water column. If gas pressure is OK, contact the Conair Service Department.
Is the dryer locked in high-fire mode?	Check solenoid valves (SV) 2 and 3 for malfunctions. If a valve is stuck open, contact Conair Service Department.
Is the intercooler water temperature too high? (A Series dryers only)	Make sure the intercooler has a sufficient flow of water.
Is the air/gas mixture correct?	Ask qualified gas service personnel to check the mixture.

When the Alarm Display says:

PROCESS TEMPERATURE UNSATISFACTORY - LOW

The process temperature is too cool. It has fallen below the setpoint temperature by an unacceptable level.

Possible cause...	Solution:
Is the process setpoint too high?	Adjust the setpoint. Gas dryers cannot be set to operate above or below a particular temperature range. Typical ranges are: H series 240° F to 350° F, and A series 120° F to 275° F.
Are you losing too much heat between the dryer and hopper?	Move the dryer and hopper closer together, or further insulate the process air hose.
Is the burner firing properly?	If the burner does't appear to be operating properly, make sure incoming gas pressure is more than a 7-inch water column. If gas pressure is OK, contact the Conair Service Department.
Is the dryer locked in low-fire mode?	Check solenoid valves (SV) 2 and 3 for malfunctions. If a valve is stuck open, contact Conair Service Department.
Is air flow reversed?	Make sure all blowers are rotating in the same direction as the arrows stamped or applied to the blower housings.
Is the process air temperature sensor installed properly?	The sensor must be centered inside the hopper air inlet. If the sensor is to close to the tube wall, inaccurate readings result.

TEMPERATURE — SHUT DOWN ALARMS (continued)

When the Alarm Display says:

RETURN AIR TEMP ABOVE LIMIT

The return air temperature has exceeded 180 F.

Possible cause...	Solution:
Is the throughput low?	Make sure the hopper is full and the appropriate throughput is established.
Does the aftercooler have enough water?	Make sure the water to the aftercooler is turned on and providing an adequate supply. If an aftercooler was not purchased with the dryer, you may need one. Consult your Conair salesman.
Has dust and dirt accumulated on the aftercooler coils?	Clean aftercooler coils regularly. Dust on the coils reduces the aftercooler's ability to lower the return air temperature. If you need to clean the coils continuously, you may need a plasticizer trap. Consult your Conair salesman.

When the Alarm Display says:

HI TEMPERATURE LIMIT REGEN / PROCESS

The temperature in the heat exchangers got too hot, exceeding the regeneration or process high-temperature limit.

Possible cause...	Solution:
Has a filter clog, damaged hose or blower problem reduced air flow?	Check process and regeneration filters and hoses for leaks, clogs, crimps or other problems that decrease air flow through the heat exchanger. If no air restrictions or leaks are found, check the process blower for proper rotation. (See Page 8 for details on checking blower rotation)
Are the RTD temperature sensors wired properly?	The process high temperature RTD should be wired to terminals 1 and 2 (channel 9) on J3 of the analog board. The regeneration high-temperature RTD should be wired to terminals 3 and 4 on J3 of the analog board.
Do the two potentiometers on the analog board need readjusting?	If you suspect this problem, don't try to fix it. **The potentiometers should be adjusted only by qualified Conair service personnel.** The potentiometers (1 POT and 2 POT) were factory adjusted and sealed.

When the Alarm Display says:

PROCESS PROTECTION SETPOINT EXCEEDED

The process air temperature has become hotter than your safety margin allows.

Possible cause...	Solution:
Is the process protection setpoint too low?	You may be losing more heat between the hopper and process heat exchanger than was anticipated. Increase the process protection setpoint to 10 ° F above the actual air temperature.

TEMPERATURE — PASSIVE ALARMS

The following alarm messages indicate air temperature problems that have not yet become serious enough to damage materials. The microprocessor has:

1) Turned on the alarm light.
2) Allowed the process and regeneration cycles to continue operating.

When the Alarm Display says:

RETURN AIR UNSATISFACTORY - HIGH

The return air temperature has exceeded 150 F.

Possible cause...	Solution:
Is the throughput low?	Make sure the hopper is full and the appropriate throughput is established.
Does the aftercooler have enough water?	Make sure the water to the aftercooler is turned on and providing an adequate supply. If an aftercooler was not purchased with the dryer, you may need one. Consult your Conair salesman.
Has dust and dirt accumulated on the aftercooler coils?	Clean aftercooler coils regularly. Dust on the coils reduces the aftercooler's ability to lower the return air temperature. If you need to clean the coils continuously, you may need a plasticizer trap. Consult your Conair salesman.

When the Alarm Display says:

REGEN TEMPERATURE BELOW SETPOINT

The regeneration temperature is below an acceptable level.

Possible cause...	Solution:
Is air being pulled into the regeneration moisture exhaust?	You should feel air coming out of the regenerating moisture exhaust. If you don't, call the Conair Service Department.
Is the burner working properly?	If the burner does not have an even, orange glow that is brighter on high fire, call the Conair Service Department.
Is the regeneration temperature sensor installed properly?	Position the sensor at the center of the regeneration heat exchanger outlet.
Is the dryer locked in low-fire mode?	Examine solenoid valve (SV) 6, the regeneration high-fire valve. If it's stuck open, call the Conair Service Department.

TEMPERATURE — PASSIVE ALARMS (continued)

When the Alarm Display says:

ALARM BAND EXCEEDED

The actual process air temperature is hotter or colder than the range allowed by the process delivery setpoint.

Possible cause...	Solution:
Is the alarm band too narrow?	Increase the alarm band setting. The recommended setting is 10 degrees above and below the setpoint. However, the band adjustment allows for actual temperatures ranging from 5 to 20 degrees above and below the setpoint.
Is the process burner locked in high- or low-fire mode?	Check the solenoid valves in the combustion air train. If they have malfunctioned, call the Conair Service Department.

When the Alarm Display says:

DELIVERY AIR LESS THAN ALARM BAND

The actual process air temperature is colder than the range allowed by the alarm band.

Possible cause...	Solution:
Is the alarm band range too narrow?	Increase the alarm band setting. The recommended setting is 10 degrees above and below the setpoint. However, the band adjustment allows for actual temperatures ranging from 5 to 20 degrees above and below the setpoint.
Is the process setpoint too high?	Adjust the setpoint. All gas dryers have a particular temperature range, and cannot be set to operate below those ranges. Typical ranges are: H series 240° F to 350° F, and A series 120° F to 275° F.
Is the delivery air sensor installed properly?	Center the probe inside the hopper inlet. Inaccurate temperature readings result from the sensor being too close to the wall of the inlet tube.
Is the burner functioning properly?	If the burner does not have an even, orange glow that is brighter during high-fire mode, call the Conair Service Department.
Is the dryer locked in low-fire mode?	Check the solenoid valves controlling high- and low-fire modes. If they have malfunctioned, call the Conair Service Department.

PROBE MALFUNCTIONS — SHUT DOWN ALARMS

The following alarm messages indicate a problem that could damage your materials. The microprocessor:

1) Turns on the alarm light.
2) Shuts off the burners.
3) Shuts off the process and combustion blowers after 10 minutes.
4) Shuts off the regeneration blower if the regeneration air temperature is less than 280° F.

When the Alarm Display says:

DEL AIR PROBE MALFUNCTION

The delivery air temperature probe is not working.

Possible cause...	Solution:
Is the probe properly connected to the control box?	Make sure the probe is plugged into the top of the control box. The process RTD should be wired to terminals 1 and 2 (channel 1) on J2 of the analog board.
Is the probe cut or damaged?	Call the Conair Parts Department for a replacement.

When the Alarm Display says:

REGEN PROBE MALFUNCTION

The regeneration temperature probe is not working. The shut down alarm activates only if the dryer is in purge mode.

Possible cause...	Solution:
Is the probe properly connected to the analog board?	The Process RTD should be wired to terminals 3 and 4 (channel 2) on J2 of the analog board.
Is the probe cut or damaged?	Call the Conair Parts Department for a replacement.

PROBE MALFUNCTIONS — PASSIVE ALARMS

These alarms indicate a problem not yet serious enough to damage your materials. The microprocessor:

1) Turns on the alarm light.
2) Allows the process and regeneration cycles to continue operating.

When the Alarm Display says:

PROCESS PROTECTION PROBE MALFUNCTION

The process protection probe is not working.

Possible cause...	Solution:
Is the probe properly connected to the analog board?	The Process Protection RTD should be wired to terminals 5 and 6 (channel 3) on J2 of the analog board.
Is the probe cut or damaged?	Call the Conair Parts Department for a replacement.

PROBE MALFUNCTIONS — PASSIVE ALARMS (continued)

When the Alarm Display says:

RESIDUAL PROBE MALFUNCTION

The residual probe is not working

Possible cause...	Solution:
Is the probe properly connected to the analog board?	The Residual RTD should be wired to terminals 11 and 12 (channel 6) on J2 of the analog board.
Is the probe cut or damaged?	Call the Conair Parts Department for a replacement.

When the Alarm Display says:

RETURN AIR PROBE MALFUNCTION

The return air probe is not working.

Possible cause...	Solution:
Is the probe properly connected to the analog board?	The Return Air RTD should be wired to terminals 9 and 10 (channel 5) on J2 of the analog board.
Is the probe cut or damaged?	Call the Conair Parts Department for a replacement.

DEWPOINT — PASSIVE ALARM

The microprocessor detected a dewpoint problem that will not harm your material. It has:

1) Turned on the alarm light.
2) Allowed process and regeneration cycles to continue operating.

When the Alarm Display says:

DEWPOINT UNSATISFACTORY

The dryer is not producing the proper dewpoint.

Possible cause...	Solution:
Are there any air leaks in the system?	Check all hoses for holes, crimps or other sources of air leaks. Make sure devices connecting the dryer with a loader or other equipment are installed properly.
Is the regeneration filter clean?	Clean it. A clogged filter reduces desiccant air flow.
Is the desiccant contaminated?	Using a dewpoint monitor, test the air entering and leaving the desiccant tank. If the dewpoint doesn't change, replace the desiccant or desiccant tank.
Is the dewpoint sensor or board damaged or out of calibration?	Call the Conair Service Department