CONAIR

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USERGUIDE

UGD003/1095

Carousel Dehumidifying Dryer

(Electric Series)

TABLE OF CONTENTS

WARNING: This dryer may utilize contactors which contain mercury. As of January 1, 1990, mercury was considered to be a hazardous substance and dealt with accordingly.

In the rare event that a relay should be vaporized, the levels of the mercury vapor in the air would be below public safe levels within one hour. During that hour there is no practical hazard; a person would have to inhale concentrated fumes continuously for weeks before an opportunity existed to experience noticeable symptoms.

Standard procedure in the case of a spill is nearly as simple as cleaning up any spill:

A. Sweep the mercury and parts into a "Ziplock" type of bag or air-tight container.

B. Dispose of mercury in normal fashion as done with scrap metals.

Also included with your instruction packet is an MSDS sheet (#7439-97-6) for your use.

WARNING: For your safety, DO NOT store or use flammable or explosive materials in the vicinity of this equipment.

INTRODUCTION

Equipment Description:

For Models

CS-101	CS-151
CS-201	CS-301
CS-401	CS-601

Including A, H & Central Series equipped with Micro-processor controls.

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 desiccant cartridges which are in the process cycle, or on-stream, 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 and is accomplished by passing filtered room air, heated to 425°F through the desiccant and 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.

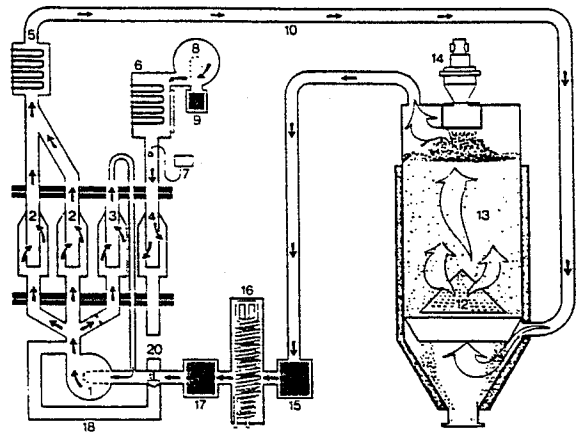
How It Works: (See Figure 1)

Process 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 heater (5), where the air is heated to the temperature selected by the operator.

The flexible process hose (10) conducts the air into the drying hopper where it is distributed evenly through the pellets (13), heats them, and removed 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 1



Regeneration Circuit: (See Figure 1)
A gear motor rotates the desiccant carousel to 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 heater elements (6) and heats it to 425°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 1)
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.

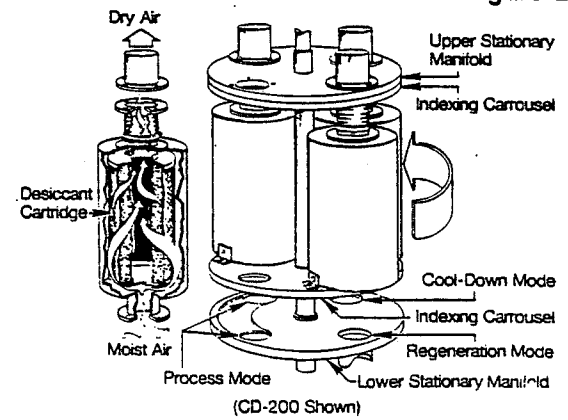
High Heat Models: (See Figure 1)
With the increased KW capability of high heat models, return air temperature can exceed the 125 to 130°F safe range. If this happens, dehumidifying can be greatly hampered because the desiccant cannot effectively remove moisture from high temperature air. To avoid this, an after-cooler (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.

Power Miser Option: (See Figure 1)
In an effort to decrease the amount of energy consumed by your dehumidifying 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 the regeneration heaters (6) by sensing the process air dewpoint and modifying the desiccant carousel indexing cycle (see "Time Cycle", page 2) 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 heaters (6) are turned off, along with the regeneration blower (8) which saves energy.

DESICCANT CAROUSEL **Figure 2**



The Desiccant Assembly: (See Figure 2)
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 dryer's air heater compartment.

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 power consumption.)

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

Time Cycle for Indexing

Dryer	Time between indexes (min.)*
CS101	30
CS151-CS601	15

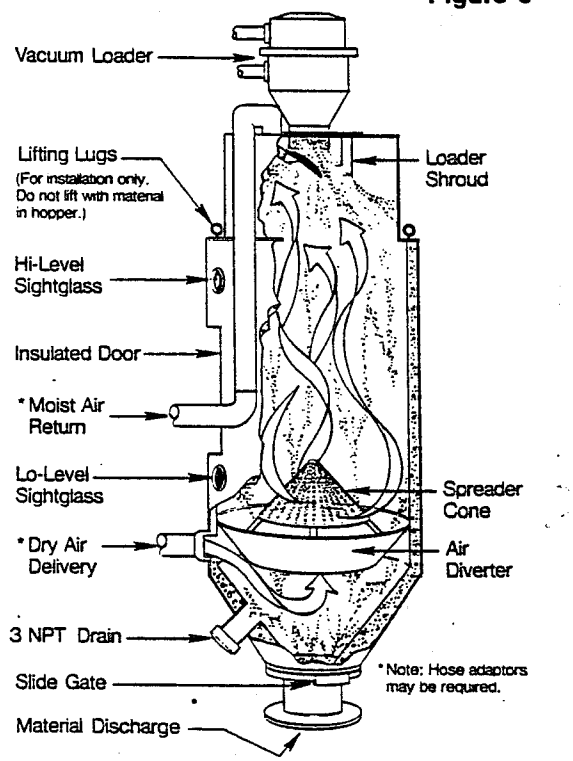
*with Power Miser 1 option **not** active.

MECHANICAL INSTALLATION:

Drying Hopper: (See Figure 3)
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 3. Some hoppers require the installation of the return air down tube which mounts to the opening at the top of the hopper and clamps to the hopper body.

Figure 3



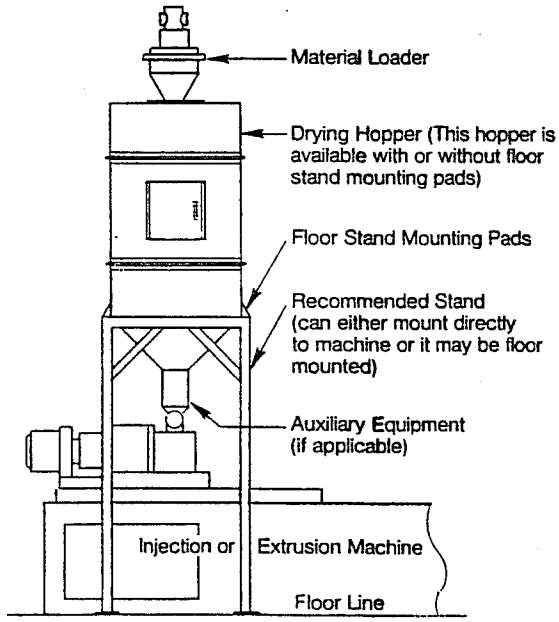
Inspect and clean the hopper thoroughly to remove any dirt which may have accumulated during shipping. Also clean the drying hopper internal surfaces with solvent to remove rust preventative coating.

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 if it is easier 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 without disassembly. 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 hole at the top of the hopper and acts as a cylindrical diverter for the material as it is discharged from the loader to prevent ambient moisture from entering the drying hopper through 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.

DRYING HOPPER INSTALLATION WITH FLOOR STAND **Figure 4**



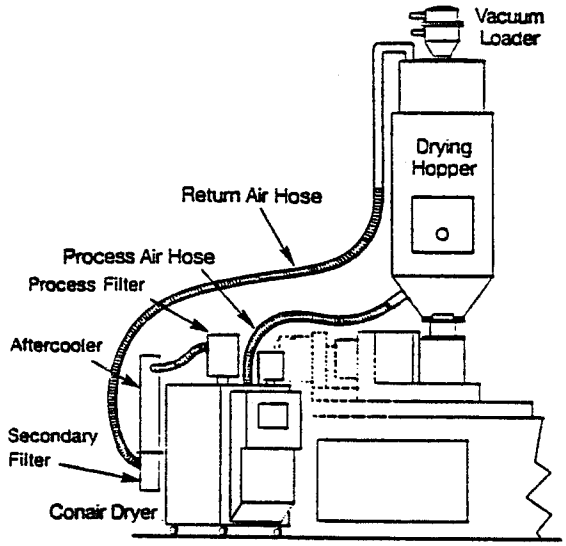
Because of the many different processing machines and combinations of auxiliary equipment used in conjunction with drying hoppers, it is impossible to totally engineer each and every arrangement. For this reason, we can only recommend the arrangement shown in Figure 4, which we feel is best from a safety 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 places the load of the drying hopper on the machine, or floor, rather than on the auxiliary equipment). The customer is responsible for insuring that the size and strength of the fasteners used to install the hopper are capable of supporting it.

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.

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

TYPICAL DRYER INSTALLATION

Figure 5



Standard Dryers:
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 moisture 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.

High Heat Dryers: (See Figure 5)
High-heat dryers are equipped with increased kw capabilities to handle drying temperatures ranging from 150 to 350°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 11 for correct placement of high heat components. An insulated process delivery hose is also supplied for these 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 models CS-101 through CS-401, the secondary filter clamps directly to the aftercooler, but on model CS-601 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°F through the pipe couplings provided. Flow rates will be approximately one to three GPM for dryer models CS-101 through CS-601. 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.

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 prewired at the factory

for service on one voltage only:

DO NOT ATTEMPT TO ALTER VOLTAGE CONNECTIONS!

The appropriate wiring diagrams for your model of dryer are included with this manual. They provide complete wiring details and an electrical parts list. In the event of loss, the electrical print numbers for your dryer are listed inside the control cabinet door. Additional copies may be ordered for a nominal cost through the Conair 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 is 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 industrial electrical codes.

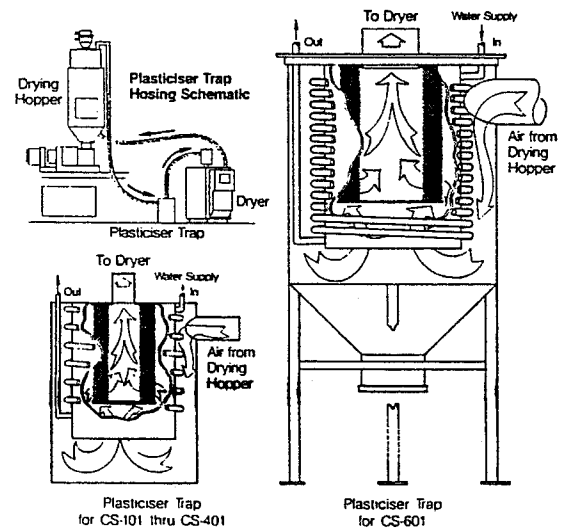
Plasticizer Trap Installation:
(See Figure 7)

A problem encountered occasionally in drying plastic material is the giving off 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.

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°F range. The return air from the hopper, which carries the volatiles, contacts the plasticizer coils causing condensation of the volatiles 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 dump 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 7 for proper piping between the dryer and hopper.

PLASTICISER TRAPS **Figure 7**



Start-Up:
Your dehumidifying dryer is a 3-phase electrical device 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:

1. Turn the on/off rocker switch to the "on" position. The switch itself should light to indicate power to the control.

2. Remove the "to process" hose from the top of the dryer in order to check air flow direction.

3. Press the dryer's "RUN" key to start all regular dryer functions, then press "STOP" to stop the dryer.

4. On Conair Models CS-101 through CS-601, check the flow of air at the "to process" air outlet. Air flow should be positive, or blowing air out. NOTE: If the dryer has been used recently and is hot, or if the "to process" outlet is difficult to reach, use the "from process" hose connection at the inlet to the process air filter and verify that air flow is negative or pulling air into the filter housing.

If blower rotation is incorrect, disconnect power at the dryer cable source, then switch any two of the 3-phase leads at the disconnect switch. Do not attempt to alter the direction of individual motors. All motors are properly phased together at the factory.

5. Check for proper rotation of the desiccant carousel. Rotation of the carousel should be counterclockwise when viewed from the top (EXCEPT for the CS-101 and CS-151, which index in a clockwise direction.) NOTE: Direction of desiccant tank assembly rotation is independent of 3-phase power connection. If desiccant tank assembly is indexing in the wrong direction, contact the Conair Franklin Service Department.

To test carousel indexing: with the dryer power switch "OFF", press in and hold the desiccant carousel limit switch, located on the perimeter of the carousel bed plates, while turning on the power switch and pressing the "RUN" key. Then release the limit switch. The carousel will not index immediately because of automatic cool down of the heater boxes. Within 30 seconds, the carousel should index. The limit switch follower should come to rest in the bed plate valley, once rotation is complete.

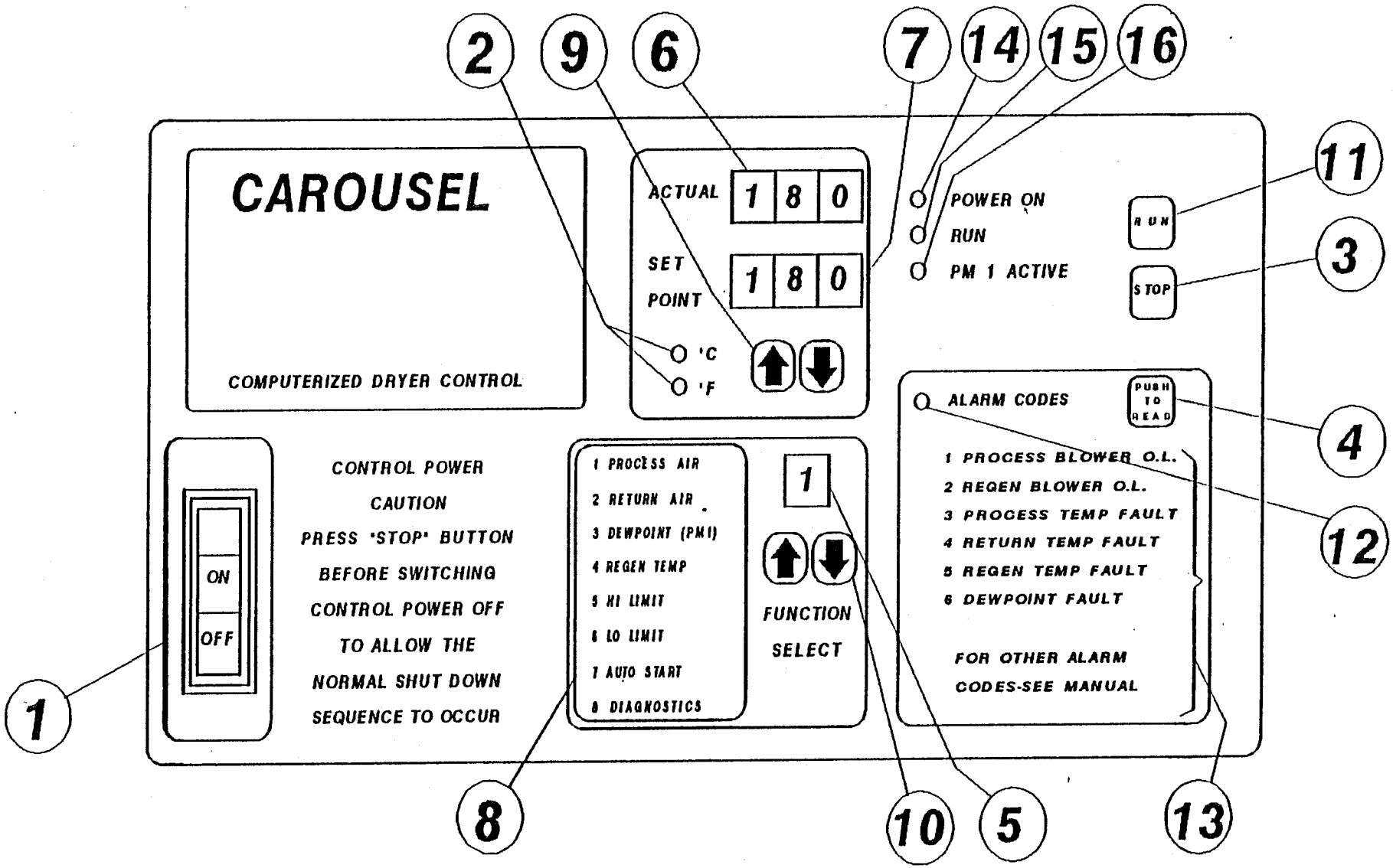
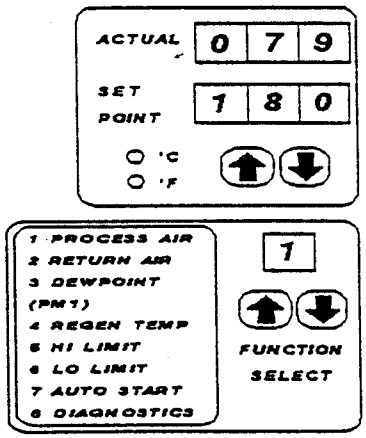

2
9
6
7
14
15
16
11
3
4
12
10
5
13
8
1
CAROUSEL
COMPUTERIZED DRYER CONTROL
ACTUAL
1 8 0
SET POINT
1 8 0
°C
°F
POWER ON
RUN
PM 1 ACTIVE
RUN
STOP
ALARM CODES
PUSH TO READ
1 PROCESS BLOWER O.L.
2 REGEN BLOWER O.L.
3 PROCESS TEMP FAULT
4 RETURN TEMP FAULT
5 REGEN TEMP FAULT
6 DEWPOINT FAULT
FOR OTHER ALARM CODES-SEE MANUAL
ON
OFF
CONTROL POWER
CAUTION
PRESS 'STOP' BUTTON
BEFORE SWITCHING
CONTROL POWER OFF
TO ALLOW THE
NORMAL SHUT DOWN
SEQUENCE TO OCCUR
1 PROCESS AIR
2 RETURN AIR
3 DEWPOINT (PM1)
4 REGEN TEMP
5 HI LIMIT
6 LO LIMIT
7 AUTO START
8 DIAGNOSTICS
1
FUNCTION SELECT

Figure 8

Control:

Function Set-Up: (See Figure 8)
By switching the "ON/OFF" or the reset switch (1) to the ON position, the power on light (14) and LED displays (5,6&7) will be energized as follows:



Depending on how your unit was set up, either the °C or the °F LED (2) will be on. The function display (5) has been designed to give the operator an indication as to what function is being monitored or displayed at any time.

The word "Function" refers to the parameters listed in Item #8, of which the first three relate to the process circuit of the dryer. The remaining five parameters relate to other functions of the dryer. With the Function display (5) indicating Function #1 "Process Air", we may increase or decrease the setpoint by using the setpoint up and down keys (9). As you press the setpoint up and down keys, you will see the "Setpoint" display (7) scroll accordingly.

There are two scrolling speeds designed into the control. When the setpoint up and down keys (9) are pressed, the first scrolling speed is invoked. After 5 seconds, the faster speed is invoked.

The following is a list of all functions, along with a brief description and setup procedure for each one.

Functions:

1. Process Air - Process delivery air temperature should be set for the material being processed (eg. ABS at 180°F). As before with the function display (5) indicating Function #1, use the setpoint up and down keys (9) to adjust the setpoint to the desired process air temperature. The actual display (6) displays the actual process temperature as seen by the process RTD.

2. Return Air - This function is not adjustable and is for monitoring the temperature of the return air from the drying hopper. Your dryer has been equipped with this feature to prevent and protect your dryer from high return air temperatures, which could damage the dryer's blower. Also to alert the operator to the possible need for a return air after-cooler (See "High-Heat Dryers" section of this manual).

3. Dewpoint (PM1) - Setpoint display will read noP if not installed. This function relates to Power Miser 1 "Deluxe". This option is for extending the process cycle time of your dryer by measuring the process dewpoint. 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 adjust the setpoint should your application require a different setpoint. With the function display (5) indicating Function #3, use the setpoint up and down keys (9) to adjust to the desired setpoint. It is adjustable from -40°F to 0°F.

4. Regen Temp - This function indicates the actual regeneration temperature. The regeneration temperature refers to the temperature of an independent air flow which is used to purge moisture from the desiccant after it becomes laden with moisture, removed from the plastic in the drying hopper. This occurs simultaneously with the process cycle, but on desiccant tanks indexed out of the process circuit. (see Figure #1) The regeneration setpoint of 425°F is fixed, and has been determined to be the optimum temperature for regenerating the moisture laden desiccant.

*5. Hi-Limit - This function safeguards against someone raising the process air setpoint above an acceptable level for a given material. The process air setpoint cannot exceed the "Hi-Limit" setting. Therefore it is impossible to accidentally raise the process setpoint above the "Hi-Limit". This number may be any number greater than or equal to the "Process Air" setpoint (400°F maximum). A safe setting normally would be 10° above the "Process Air" setpoint.

*6. Lo-Limit - This function is similar to the "Hi-Limit". The setting may be any umber less than or equal to the "Process Air" setpoint (100°F minimum). A safe setting normally would be 10° below the "Process air" setpoint.

* These functions require an access code in order to change the setpoint. With an access code of 54, it is possible to raise or lower the setpoint.

The access code can be entered at any time. Press the function down key (10) until the function display (5) indicates #8. While in diagnostics (Function #8), use the setpoint up key (9) until the setpoint display reads 054. Then scroll up to the desired function to be adjusted by pressing the function up key (10). Once you have adjusted both Hi and Lo Limits to the desired settings, you can reset the access code to read 000 or the unit will automatically reset after a two minute timer counts down.

7. AutoStart - This function permits automatic startup at the predetermined time. It is adjustable from 0 to 150 hours. With the function display (5) indicating #7, enter the number of hours before the dryer is to start by using the setpoint up and down keys (9). Then by pressing the "RUN" key (11), the timing cycle will start. The actual display (6) will read "ON" and the run LED (15) will flash on and off to give operator the indication of "Auto Start" in process.

> CAUTION: Make sure the parameters are properly adjusted before using this function. Failure to do so could result in severe damage to your material.

The timer must be reset each time you wish to use this feature. On power interruptions, the microprocessor retains

where the timer left off and will resume the countdown once power is restored.

To de-activate the Auto Start timer, press the "STOP" key (3). Then with function display (5) indicating #7, set the timer to zero by using the setpoint down key (9).

8. 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.

Secondary Functions:

These functions are not listed on the control label but may be needed by the operator for certain applications. To access these functions, with the function display (5) indicating #8, use the setpoint up key (9) to enter access code of 064. Then by pressing the function down key (10), you can scroll through each function you wish to view. The following is a list of all secondary functions, along with a brief description and setup procedure for each one.

1. Software Version - This function simply displays the software version number shown in the setpoint display (7). This function may be needed when contacting Conair Franklin Service Department for information on your dryer and will be helpful to know what software version is installed in your dryer without having to open the control box to check the software version on the actual chip.

2. Access Code - This function is for access code of 054, which is needed to adjust the Hi and Lo Limit functions of your dryer. If you do not want to have to enter an access code of 054 each time to adjust the Hi and Lo Limit, you can turn this function off. This can be done with the actual display (6) indicating "Acc". Press the setpoint down key (9) so that the setpoint display (7) reads "off". After doing this, it will no longer be necessary to enter an access code of 054 to adjust the Hi and Lo Limit.

3. SPI Interface (optional) - If this option is installed, the setpoint display (7) will read "noP". This is the display if you communicate with RS232.

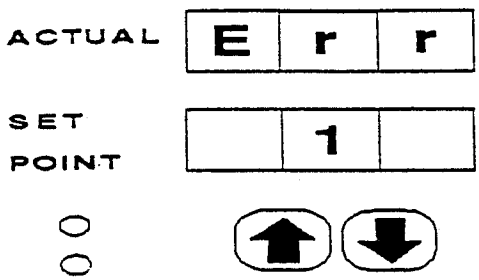
If this option has been installed, the setpoint display (7) will read 3.01. This is the SPI version installed in your unit. If you use RS485 to communicate with, this is what should be displayed.

4. Baud Rate - This function is for adjusting the Baud Rate for your communication needs. For RS232 it is adjustable from 3 to 96, which indicates 300 to 9600. For RS485, the adjustment is from 12 to 96, which indicates 1200 to 9600. To adjust the Baud Rate with the actual display (6) indicating bAu", use the setpoint up and down keys (9) to adjust to the desired Baud Rate.

5. Node Address - This function is also for communication purposes. It is adjustable from 032 to 064. This allows you to give 32 separate unit addresses for communication. To adjust the node address with the actual display (6) indicating "nod", use the setpoint up and down keys (9) to adjust to the desired node address.

Once all functions have been adjusted properly, the dryer may be started by

pressing the "RUN" key (11). Upon starting the dryer, the "RUN" LED (15) will be energized. If any malfunction occurs, the "Alarm" LED (12) will be energized, alerting the operator. By pressing the "Push to Read" key (4), the nature of the malfunction will be indicated in the setpoint display (7). For example:



This indicates error message #1, which Alarm #1 is Process Blower O.L.

NOTE: The display will stay energized for three seconds after the "Push to Read" key (4) is pressed.

The first six alarms are listed in Item #13 on the control label. For seven and above, refer to the Troubleshooting section of this manual.

NOTE: Some of the alarms are passive, while others are shut down alarms (see troubleshooting at end of manual).

To shut the dryer down, the "STOP" key (3) should be used rather than the "ON/OFF" switch (1). This is done to utilize the programmed shutdown mode which de-energizes the heaters and looks at the process and regeneration temperatures to insure that the unit has cooled down prior to de-energizing the blowers. Once the dryer is shut down, the "ON/OFF" switch (1) can be turned to the "OFF" position.

Preventative Maintenance:

Filter Cleaning:
Both the process filter and the regeneration filter serve to protect the desiccant 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.

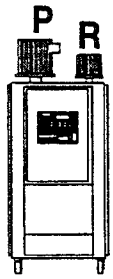
VERY IMPORTANT
The process air filter assures that only clean air flows through the drying circuit. Fines carried in the return air stream may eventually clog the filter, which can decrease efficiency. Check filter frequently and clean as necessary.

FILTER LOCATIONS

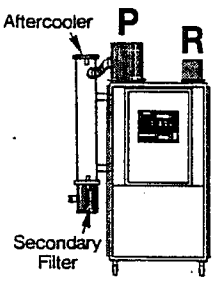
P = Process Filter
R = Regeneration Filter

Figure 11

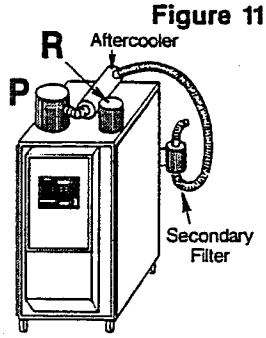
CS101/CS151



CS201 thru CS601



CS101 thru CS401 High Heat Models



CS601 High Heat Models

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.

Regeneration Filters: (see Figure 11)
Regeneration filters should be cleaned in a similar manner as the process filters.

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

WARNING:
Contamination, if it is permitted to collect in heater boxes, 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.

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.

Shut down the dryer 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. 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 out 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 7 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:

a. The Collection Chamber - The accumulated volatiles collect in this chamber which must be emptied periodically and cleaned. Your trap may be one of two types which provide access to the collection chamber by releasing the lid clamp, removing the coil assembly and allowing the trap "barrel" to be emptied and cleaned (CS-101 through CS-401); or, removing the access cover at the base of the trap to permit draining of the volatiles from the collection chamber (CS-601).

b. The Trap Coils - These coils within the plasticizer provide a suitable temperature with cool water for the volatiles to condense out. The coils should be cleaned periodically to provide optimum heat transfer for the collection of the volatiles. Release the lid clamps of the trap, pull out the coils and clean them with steam cleaning or by applying an industrial solvent. It is advisable to clean the collection chamber at this time ("a" above) as well as the trap's cartridge filter ("c" below).

c. The Trap Cartridge Filter - As a final guard against the passing of volatiles back into the dryer's process air circuit, a cartridge filter is included in the trap in a metal shroud within the trap's coils. Remove the four thumb screws on top. Pull out the filter and clean thoroughly with a vacuum or compressed air as described in "process filter maintenance" above. Replace the filter if it is torn or clogged. Be sure to reinstall it carefully.

Lubrication:
All motors are lubricated for life and require no lubrication.

Important: Sealing surfaces between desiccant carousel plates should never be lubricated. If, for some reason, it becomes necessary to disassemble the dryer, care should be taken during reassembly to insure that all sealing surfaces are clean and free of dirt and grease.

Other Maintenance Areas:
In addition to filter and auxiliary component cleaning, these other areas should be checked periodically.

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 adapters (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: heater box, 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.

4. Check Heater Amperages - The wiring diagram for your dryer specifies the proper amperage for each heater bank. Verify these amperages periodically with an amprobe to check for burned out heaters.

Servicing:

1. Desiccant Cartridge Replacement (see Figure 12)

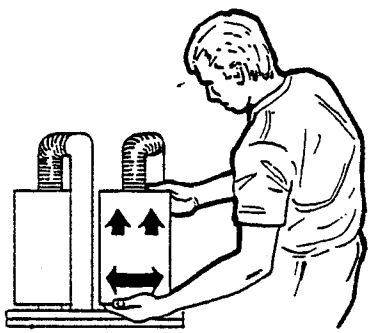
NOTE: Desiccant cartridges have an almost unlimited life as long as they are not contaminated by material fines or dust. Be sure your cartridges are actually contaminated before attempting replacement.

a. Model CS101/CS151: The three desiccant cartridges are friction fitted to a single, rotating bed plate. Turnoff the dryer, unclamp the hose at the top of the cartridge, and work it out of place. Be sure to firmly reinstall the replacement cartridge with an "O" ring on its base. Re-hose tightly.

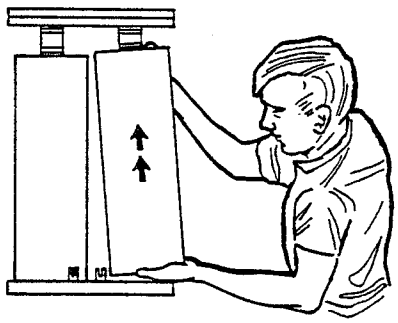
b. Model CS201 through CS-601: The desiccant cartridges for these models are fitted between two sets of rotating plates within the carousel assembly. Turn off the dryer and release at least one hose clamp at the top of the cartridge. Loosen or remove the bolts at the base of the cartridge. Lift the cartridge 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 TANK REMOVAL **Figure 12**



CS101/CS151



CS201 thru CS601

2. Heating Element Replacement - The elements are located in "heater boxes" mounted in or on the dryer housing. Check Figure 1 to be sure which heater box contains the heating elements that need to be replaced by following the air flow path. Disconnect power to the dryer and be sure to refer to the wiring diagram and parts list to assure use of the proper replacement part. Use care in unbolting the heater box covers to be sure that the gasket seal is not damaged. the elements are bolted to an internal mounting plate beneath the access covers of the heater box. On models CS-101 and CS-151, the mounting plate may be pried away from the heater box flange to expose the heaters once the access cover is removed. On models CS-201 through CS-601, however, the mounting plate is recessed within the heater box opening. For these models, screw two of the mounting plate fastening bolts into the threaded holes of the mounting plate to break the seal between the plate and the flange. The plate can then be removed to expose the heaters.

Replace the elements carefully and be sure to reinstall all jumper wires and bars identical to original installation. Test all electrical connections for strength. Replace the heater box covers carefully and bolt firmly. Verify proper operation immediately by measuring heater amperage. See the wiring diagram for proper amperages.

3. Electrical Contactor Replacement: As with any mechanical device, there is a maximum life cycle to these components. Periodic inspection of the heater contactors is recommended and, if necessary, replaced.

CENTRAL DRY AIR SYSTEM:

A Conair Franklin Central Dry Air System is an alternative arrangement for simultaneous drying and heating of materials at several processing machines. The goal of **centralized drying is to offer individual** preheat temperatures to each machine in the system, while spreading the cost of the dehumidified air supply across the number

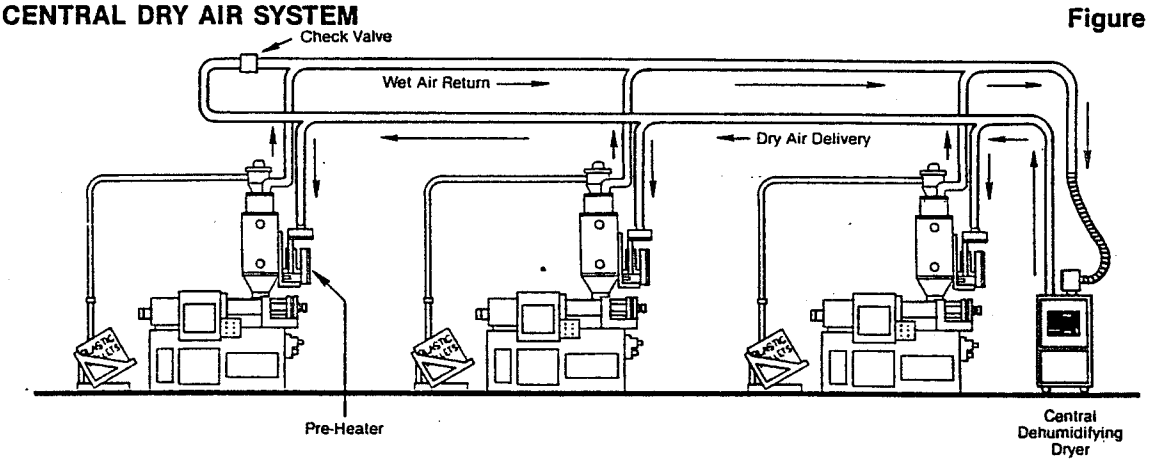
of machines serviced.

Small preheaters 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 heater) provides low dewpoint air to each station through a common dry air delivery line. The moisture bearing air coming from each station returns to the dehumidifying dryer through a separate, wet air return line. (see Figure 13)

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 13), located in the trunk line at the furthest point from the dehumidifying dryer. This check valve permits the full circulation of

CENTRAL DRY AIR SYSTEM **Figure 13**



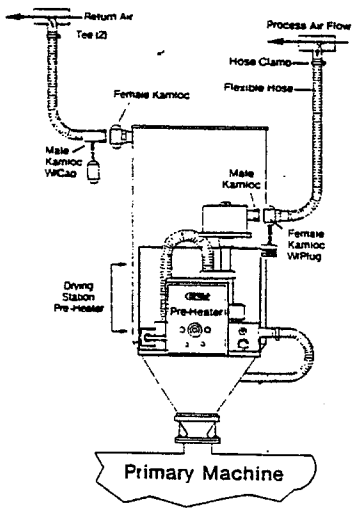
The equipment used in Central Dry Air Systems (Dryer and Preheaters) are very similar to conventional Conair Drying units and the instructions for these units can easily be adapted to supply information regarding installation, maintenance and servicing. See the earlier parts of this manual for information regarding the Central Dehumidifying Dryer and information for the preheaters can be found in the Conair "C-50 Dryer" or P20 Preheater instructions.

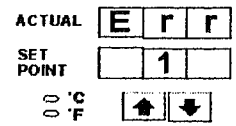
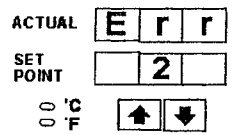
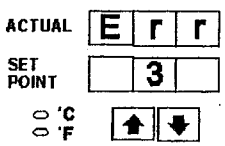
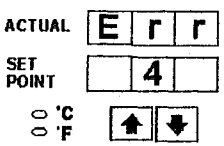
air through the system when only one or two stations are in operation. Be sure this valve is located properly in the trunk line for correct air flow through it.

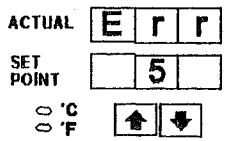
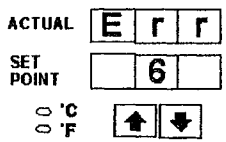
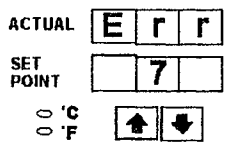
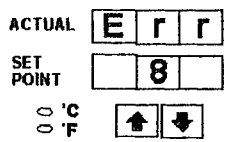
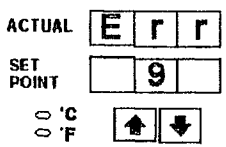
To properly maintain a closed-loop, yet allow for removal of a station from service "Kamlok" connectors with plugs are provided at each station (see Figure 14). **These connectors permit secure** connection to each preheater and drying hopper for normal operation but permit easy disconnection and plugging of the

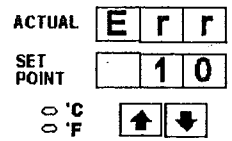
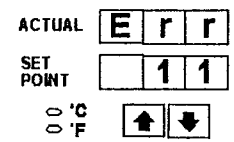
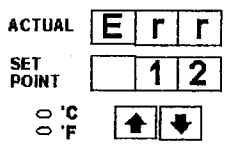
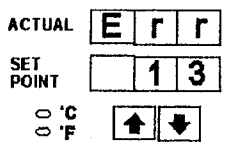
line if the station needs to be removed from the processing machine. In this way, dehumidified air will not be lost to atmosphere and wet plant air will not be drawn into the trunk line of the Central System.

TYPICAL CENTRAL DRY AIR SYSTEM STATION **Figure 14**



ALARM DISPLAY	MALFUNCTION	SOLUTION	AUTOMATIC SEQUENCE IF MALFUNCTION OCCURS
	*** PROCESS BLOWER OVERLOAD** - The overload on the process blower has tripped. This could be caused by not having the overload properly adjusted or the motor may be drawing excessive current.	- Check the overload setting and adjust if necessary. Reset the overload. - Check the motor current against the current on the name plate to insure the motor is not drawing excessive amperage.	- Dryer shuts down and alarm light is energized.
	**REGEN BLOWER OVERLOAD** - The overload on the regeneration blower has tripped. The motor may be drawing excessive current, or the overload may not be set correctly.	- Reset the overload. - Check the motor current against the current on the name plate to insure the motor is not drawing excessive amperage.	- Regeneration heaters and blower are de-energized and the alarm light is energized.
	*** PROCESS TEMP FAULT** - The process temperature is above or below an acceptable level. - The process temperature setting is too high for the dryer to maintain the temperature set point. - Dryer may be too far from the dryer hopper. - Air flow may be reversed. - Heaters may be defective. - Process temperature sensor not positioned properly at inlet of drying hopper. - Supply voltage different from nameplate voltage. - Heater contact may have failed.	- Check heater amperage for defective heaters. - Check air flow direction. - Check location of process temperature sensor. - Check supply voltage against name plate voltage. - Check heater contact for damage. - Consult Conair for additional assistance.	- Dryer shuts down and alarm light is energized.
	**A - RETURN AIR TEMP UNSATISFACTORY** - Return air temperature is above 150° F. *** B - RETURN AIR TEMP ABOVE LIMIT** - Return air temperature is above 180° F.	- Insure hopper is full of material. - Add aftercooler if it's not already part of the system. - If aftercooler exists, check the coils and clean if necessary.	- Above 150° F, dryer alarm is energized. - Above 180° F, dryer shuts down and alarm light is energized.

ALARM DISPLAY	MALFUNCTION	SOLUTION	AUTOMATIC SEQUENCE IF MALFUNCTION OCCURS
	**REGEN TEMP FAULT** The regeneration temperature is below an acceptable level or above 450° F. - Air flow may be reversed. - Heaters may be defective. - The regeneration temperature sensor not positioned at the heater box outlet.	- Check heater amperage for defective heaters. Replace heater if necessary. - Check air flow. - Make sure the regeneration temperature sensor is positioned at the heater box outlet.	- Alarm light is energized.
	**DEWPOINT FAULT** - Dryer is not producing the proper dewpoint. - Desiccant may be contaminated. - System may be improperly installed.	- Consult Conair.	- Alarm light is energized.
	*** CALIBRATION ERROR**	- Press PUSH TO READ to clear the error message. Press STOP, then turn the power off and back on. Press RUN to resume normal operation. - If you can't clear the error message after pressing PUSH TO READ, consult Conair.	- Dryer shuts down and alarm light is energized.
	*** PROCESS PROBE FAULT** - Either the temperature sensor has not been properly connected or the sensor is defective.	- Check the connection. - Check the probe for obvious damage and replace if necessary.	- Dryer shuts down and alarm light is energized.
	**RETURN AIR PROBE FAULT** - Either the temperature sensor has not been properly connected, or the sensor is defective.	- Check the connection. - Check the probe for obvious damage and replace if necessary.	- Alarm light is energized.

ALARM DISPLAY	MALFUNCTION	SOLUTION	AUTOMATIC SEQUENCE IF MALFUNCTION OCCURS
	**REGEN PROBE FAULT** - Either the temperature sensor has not been properly connected or the sensor is defective.	- Check connection. - Check probe for obvious damage and replace if necessary.	- Regeneration heaters and blower are de-energized, and the alarm light is energized.
	*** INDEX CYCLE TOO LONG** - The desiccant tank carousel has rotated too far during indexing. - The desiccant tank carousel did not rotate due to drive motor malfunction or a defective gear drive.	- Check the position of the limit switch relative to the bed plate. The switch should be adjusted so that it drops into the groove along the bed plate edge and stops the plate rotation. - Test the motor for proper operation (See dryer start up instructions). - Check the motor control circuit.	- Dryer shuts down and alarm light is energized.
	*** HI TEMP LIMIT** - The regeneration hi-temp limit has been exceeded because of an abnormally high temperature in the heater box. - Faulty high temperature probe.	- Clear any restricted hoses. - Check for proper air flow in the circuit. - Check heater box for signs of excessive heat. - Check probe for obvious damage and replace of necessary.	- Dryer shuts down and the alarm light is energized. See NOTE 1.
	**MATERIAL LEVEL TOO LOW** - The conveying filter may be clogged. - The conveying blower maybe phased incorrectly. - The conveying blower overload tripped. - Improper insert inside the distribution box. - Improper hose connections or air leaks in the hoses. - Demand senor may need readjusted, or sensor may be faulty.	- Check and clean the conveying filter. Replace the filter if it is torn or hopelessly clogged. - Check the blower rotation. If it is rotating in the opposite direction of the arrow stamped on the blower, reverse any two leads at the conveying motor starter. - Make sure the proper material insert is inside the distribution box. - Check the conveying hoses for proper connections, or any damage. Replace if necessary. - Check the demand sensor and replace if necessary.	- Alarm light is energized.

ALARM DISPLAY	MALFUNCTION	SOLUTION	AUTOMATIC SEQUENCE IF MALFUNCTION OCCURS
ACTUAL E r r SET POINT 1 4 ○ °C ○ °F ▲ ▼	**✱ CHECKSUM ERROR** - Electronic noise - Calibration error	- Press PUSH TO READ to clear the error message, then press PUSH TO READ a second time to clear error message 7. Press STOP, then turn power off and back on. Press RUN to resume operation.	- Dryer shuts down and alarm light is energized.
ACTUAL E r r SET POINT 1 5 ○ °C ○ °F ▲ ▼	**IMPROPER SHUT DOWN** One of the following situations removed power to the dryer before it completed its cool-down cycle. - Someone stopped the dryer incorrectly by pressing the power ON/OFF switch instead of the STOP key. - A shut down alarm. - A power outage.	- Always use the STOP key to shut down the dryer. - Press PUSH TO READ to clear the error message, then press RUN to resume normal operation. - Press PUSH TO READ. If another error message appears, refer to the alarm code in this section to determine what shut down the dryer. - Check the dryer power supply.	- Alarm light is energized.

① **By pressing the "PUSH TO READ" key, the nature of the malfunction will be shown on the display.**

✱ When this alarm condition exists, you will need to switch the dryer OFF to reset the unit. If the malfunction has been corrected, the it will exhibit normal conditions when restarted. If, however, the malfunction is not corrected, the unit will go into an alarm condition.

NOTE 1: For safety reasons, error #12 bypasses the microprocessor. If the error occurs, ERR 12 will flash in the top display.

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.