

OWNER'S MANUAL



Calc-u-DRYER

MODEL 25

DAVID MANUFACTURING COMPANY

1600 12th Street NE, Mason City, Iowa 50401 641-424-7010

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DMC Calc-u-DRYER

***You have chosen the newest technology in automated grain drying.
This unit will provide many years of efficient and dependable service.
Thank you for choosing a DMC Calc-u-DRYER.***

**READ THESE INSTRUCTIONS BEFORE INSTALLATION AND OPERATION.
SAVE FOR FUTURE REFERENCE**

WARRANTY

DMC has a standard 12 month limited warranty on Calc-u-DRYERS. The warranty is limited to defects in material and workmanship. The only obligation to DMC is to repair or replace components which have been submitted and found to be defective. DMC's liability shall not include consequential damages or special costs or exceed the selling price of the product.

This warranty does not cover damage caused by negligent use, misuse, alterations to the dryer or accident. DMC reserves the right to make design or specification changes at any time, without any contingent obligations to purchasers of products already sold.

OPERATING PRECAUTIONS

- € Read and understand the operation manual before operating this unit.
- € Keep untrained people away from the dryer at all times.
- € All guards, safety decals, and shields must be kept in place for safe operation.
- € Do not jump or bypass any safety devices on the dryer.
- € Always lock out the main power supply before performing any maintenance work.
- € Never operate the dryer if any gas leak is detected.
- € Use caution in working around the dryer because automatic equipment may start.

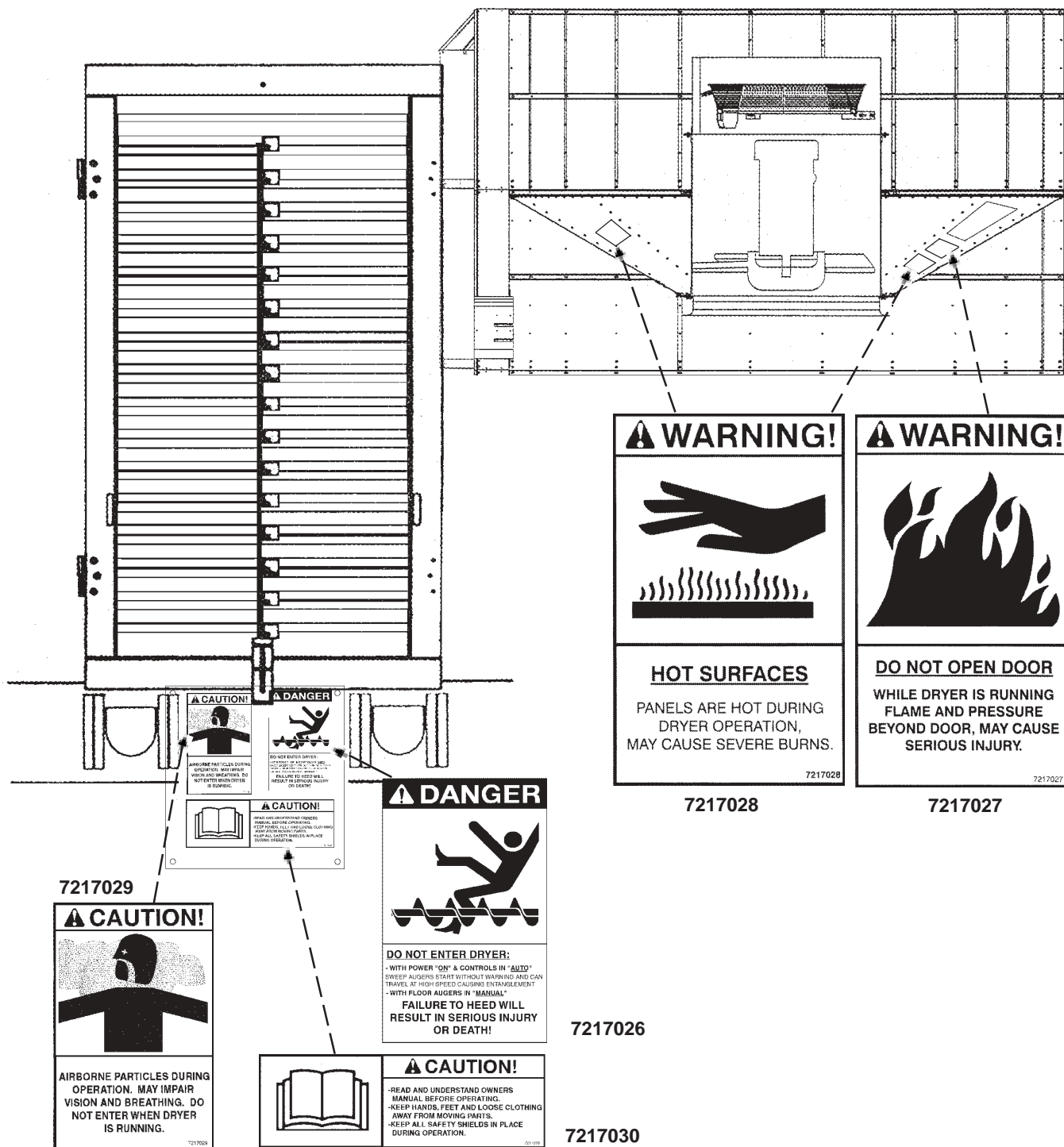
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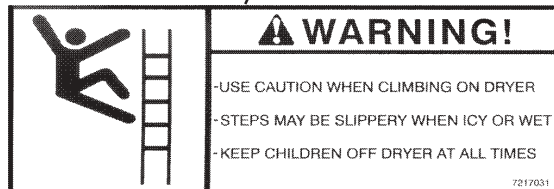
REPLACEMENTS ARE AVAILABLE UPON REQUEST

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1600 12th Street NE
Mason City, IA 50401

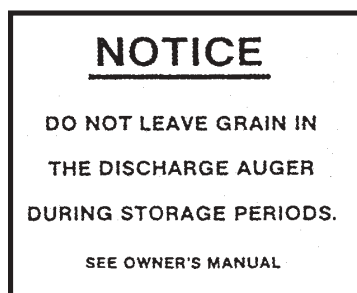
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 2. Keep decals clean at all times.
 3. All decals must be replaced if they are destroyed, missing, painted over, or can no longer be read.

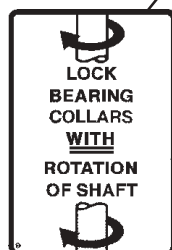
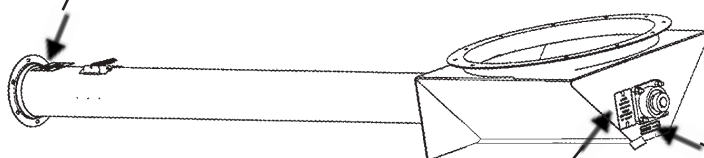




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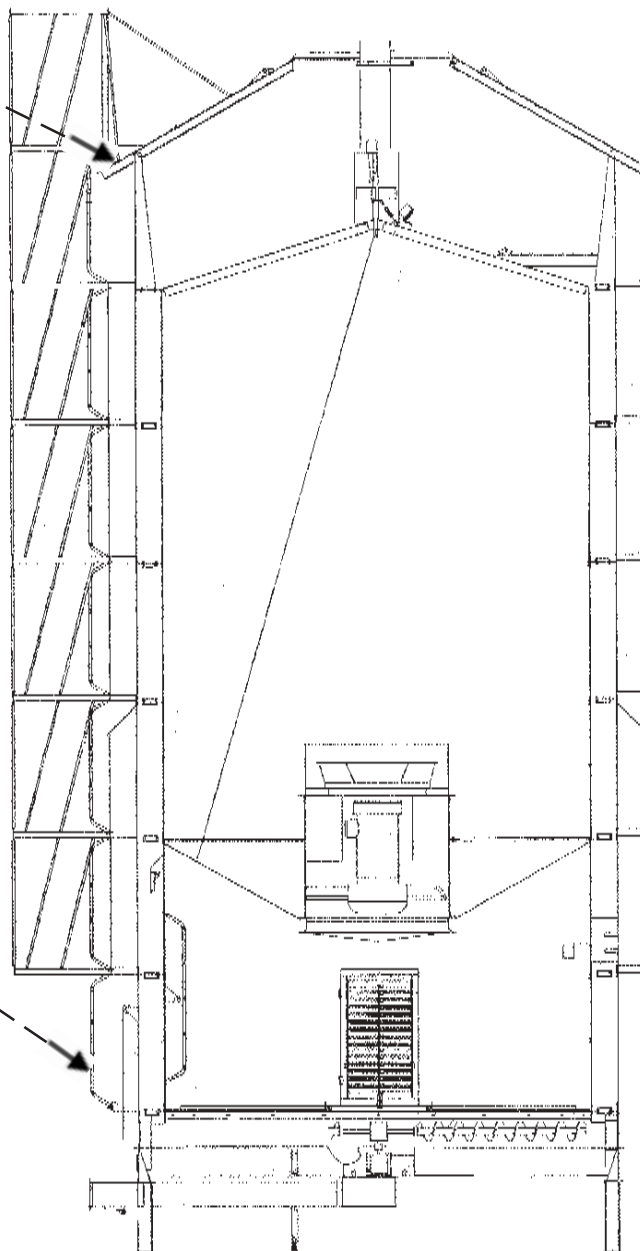
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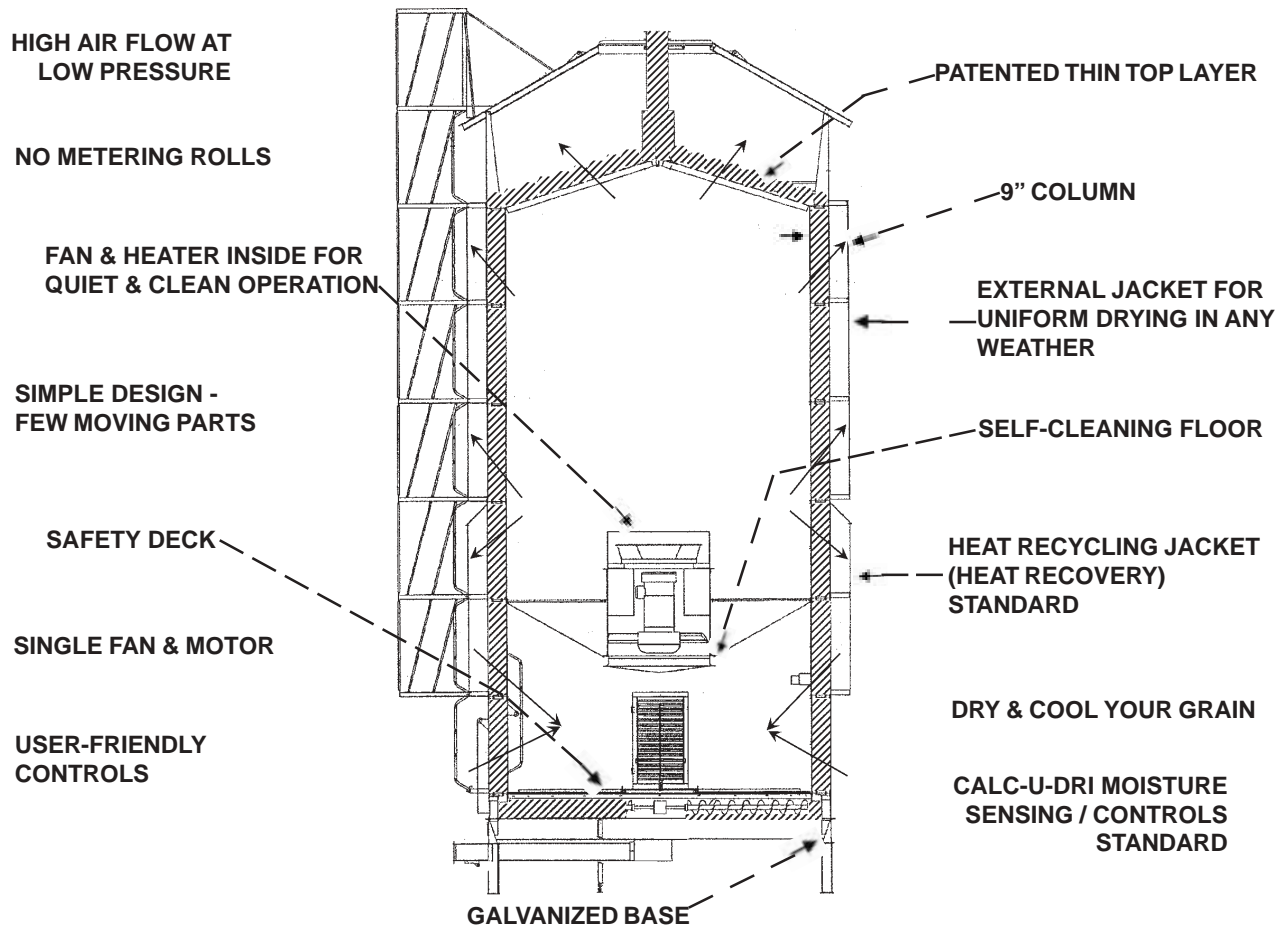
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FUNDAMENTALS OF CONTINUOUS FLOW DRYER OPERATION



In the DMC Calc-u-DRYER, grain enters at the top center peak of the perforated cone and flows across the perforated roof cone. The grain depth on the roof is adjustable and easily adaptable to the varying conditions from one year to another. The heated air passes easily through this grain, taking away surface moisture quickly and easily because of the thinner layer and the fact that there is no second screen to pass through. This process also uses the initial heat to warm the grain entering the columns, thereby reducing the chance of condensation forming on the outside of the dryer.

The drying procedure is also protected from the wind by an outer weather shield, allowing a more uniform drying process to take place. The grain continues down the column, drying as it goes. The transition from heat area to cooling allows steeping and then cooling. The grain is then pulled across the floor and out of the dryer by the sweep augers. These augers control the amount and the rate at which the grain is removed from the dryer.

The unloading system is controlled by the Calc-U-Dri Commander, which measures the moisture level of the grain being discharged to control the unloading rate. The grain column throughout the dryer column is only 9" thick, which enables the dryer to maintain a low static pressure with a high air flow. Air in the dryer is drawn through the lower section, cooling the grain as it passes through. This cooling effect is regulated by adjusting the louvers on the doors. The air then passes through the burner, picking up the heat which is then pushed through the upper section of the grain column. The air that passes through the lower portion of the heating chamber is then directed back through the grain in the lower section by the use of a recycling jacket. By doing this the cooling process is started with warm air reducing the stress on the grain. The fan and burner are located inside the dryer and thus the noise level outside the dryer is very low. The air leaks at the base of the plenum cone control the build up of fines above the floor by allowing them to blow through the leaks.

Calc-u-DRYER SPECIFICATIONS - *MODEL 25*

CAPACITY CHART

Moisture Removed	100 Heat Rise	125 Heat Rise	150 Heat Rise	175 Heat Rise	200 Heat Rise
5 pts.	340	425	510	595	680
7 pts.	250	313	375	438	500
10 pts.	218	272	326	381	435
13 pts.	155	193	232	271	309

All above capacities are calculated in wet bushels per hour for shelled corn at 65% ambient relative humidity. Your actual capacities may vary with humidity, corn variety, and other factors.

Number of Rings

Heating	3
Cooling	2

Fan Electrical Requirements

230 Volt, 3 Phase, 66 Amps
460 Volt, 3 Phase, 33 Amp

Concrete Pad

Diameter 13' 6"
Pour in compliance with DMC specifications

Sweep Auger

Motor 1-1/2 HP DC
Augers 7 inch

Discharge Auger: 6 inches

Approximate Weight: 11,000 pounds

Holding Capacity Bushels

Heat	272
Cool	160
Total	432

Dryer Dimensions

Inside Diameter	10 ft.
Outside Diameter	12.5 ft.
Column Width	9 in.
Column Height	20 ft.
Dryer Height w/Roof	29 ft.

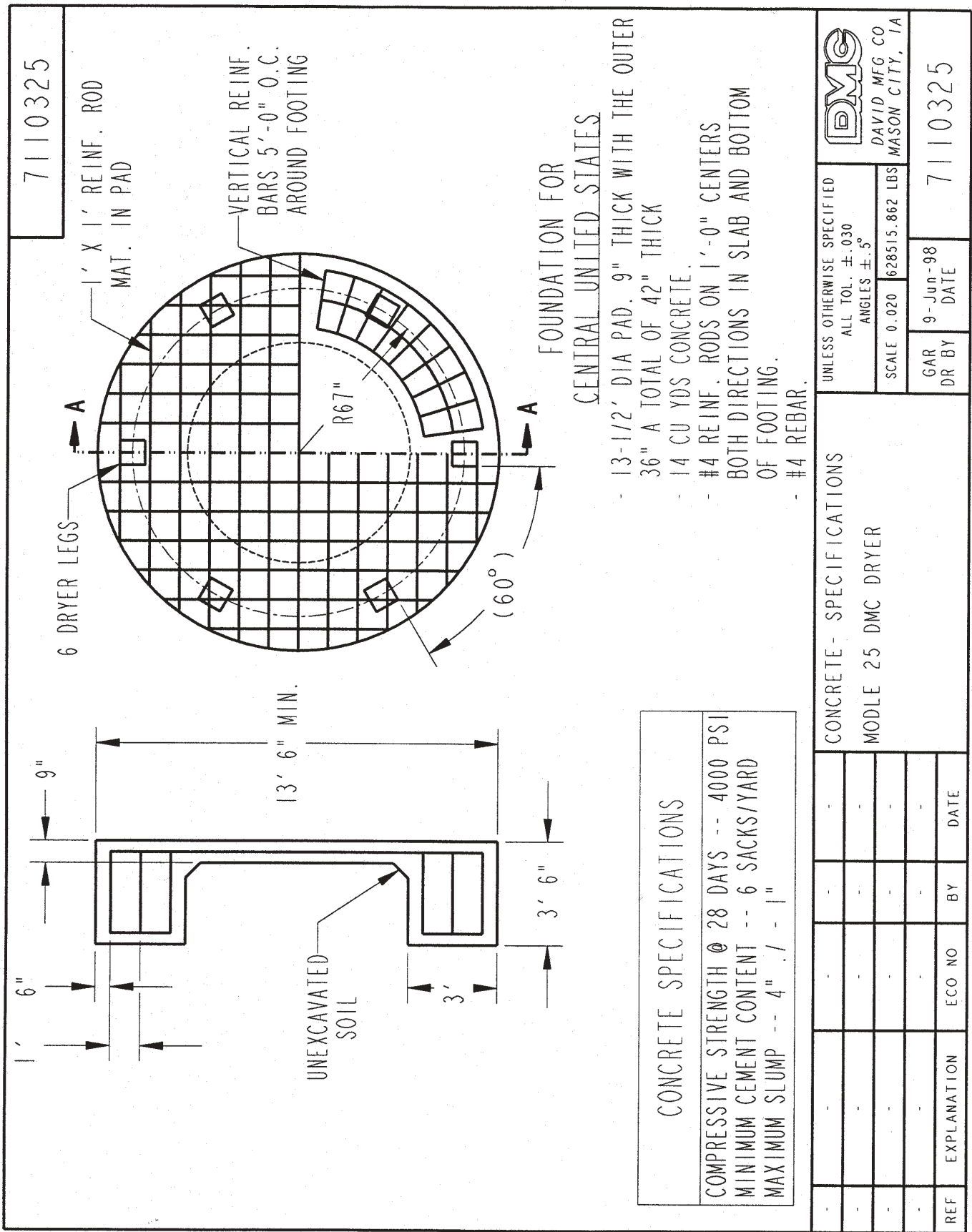
Fan

Diameter	38"
Horsepower	25
RPM	1750
CFM	38,000

Fuel Line Size

Liquid Propane:	1/2 in.
Vaporizer Size:	3/4 in.
Orifice Size (Std.): LP	11/32 in.
BTU per Hour:	9 million
Natural Gas Line Size:	1-1/4" @ 15 PSI

- TYPE:** Energy efficient, continuous flow, automatic grain dryer.
- FAN:** Heavy-duty axial, internally mounted, with adjustable pitch blades.
- HEATER:** Octagon style burner with transformer ignition and flame sensing.
- TEMPERATURE:** Controlled by a Honeywell Controller with a Maxon valve.
- MOISTURE CONTROL:** DMC Calc-U-Dri Commander with moisture sensing and SCR drive for the sweep augers.
- ROOF:** Optional and requires a leg with over flow so dryer can be continuously fed grain.
- GARNER BIN:** Standard without optional roof and holds 15 Bu. of grain and can be fed with an auger.
- DRY GRAIN:** Make sure your unloading system has the capacity to handle 1000 bu./hr.
- WET GRAIN:** Your wet fill system should have at least 1000 bu./hr. capacity.



INSTALLATION CHECKLIST

After your dryer has been installed the operator should verify that everything has been installed properly and quality workmanship has been maintained. This should be done mainly to ensure that the dryer will operate properly.

1. Do a general walk-around check, observing general appearance of the dryer. (look for damaged sheets, loose bolts, etc.)
2. Ensure that the filling and take-away components will be adequate to handle the needs of the dryer.
3. Make sure the ladder and safety cage sections are properly and firmly attached.
4. Verify all safety shields and protective devices are present and properly installed.
5. Ensure that the proper electrical wiring has been installed to provide adequate power to the dryer.
6. Verify that the dryer has been properly anchored down, according to the specifications.
7. Check the fuel system supply lines to the dryer for proper sizing and check the system for leaks.
8. Check the fluid levels in all gear boxes and lubrication points, verifying that proper lubricants are present. Refer to the maintenance section if necessary.

START-UP PROCEDURES

General Practices

Before attempting to fill the dryer for the first time, it is recommended that the dryer be inspected for cleanliness and/or damage. Before starting the dryer the second or subsequent day, the plenum chamber area should be inspected for foreign material, and this material removed. Be sure to close the doors to the plenum before starting fan.

When filling the dryer for the initial fill, it is recommended that dry grain be used whenever possible. Using this process eliminates recycling grain back through the dryer, which would have to be done if wet grain were used. Also, whenever wet grain is used to start the dryer, deposits of wet grain will always be present on the floor and in the bottom outside of the grain column throughout the season. Over time these deposits will accelerate the deterioration of the dryer components.



!WARNING! - BEFORE TURNING ON MAIN POWER TO THE DRYER, MAKE SURE THAT ALL SWITCHES ARE IN THE “OFF” POSITION OR UNWANTED START-UP OF EQUIPMENT MAY OCCUR. BE SURE EVERYONE IS CLEAR OF THE EQUIPMENT AND THAT ALL DOORS ON THE DRYER ARE CLOSED!

1. Switch main breaker, in the dryer control box, to the “ON” position.
2. Place the control power switch down in the “MANUAL” position.
3. Place the fan switch down in the “MANUAL” position, at which time the fan will start.

NOTE: The fan must be running in order for the grain to flow over the 18 degree perforated roof of the dryer.

4. If filling equipment is being run out of the dryer control box, place the wet fill and wet bin switches down in the “MANUAL” position. If not, start appropriate equipment at this time.
5. When the dryer is full, place **ALL** switches in the “OFF” position and turn off any other equipment being used.

Before starting dryer, remove and reinstall all drain plugs in gas train to release moisture and other foreign material from the line. Be sure there is adequate wet grain available to avoid unnecessary shut down occurring. Turn on the main fuel supply valve at the tank and make sure the dryer gas hand valve is open, and turn on any necessary breakers for auxiliary augers.

1. Verify dryer is completely full of grain and the wet fill auger has grain available to keep the perforated roof covered with grain, and the take-away auger is ready.
2. Place all switches up in the “AUTO” position, except the Commander Box, which should be set in the “MANUAL” position.

Set the temperature control to “MANUAL” and have the valve about 30% open (P30). Leave the control in “MANUAL” position until the plenum is warmed up close to the desired plenum temperature, then switch it to “AUTOMATIC”. Check the “AUTO” set point and have it at the desired temperature (see definitions for operation instructions on Pg.16). If 30% open does not reach desired temperature, adjust as needed.



!WARNING! BE SURE EVERYONE IS CLEAR OF THE EQUIPMENT AND THAT ALL DOORS ON THE DRYER ARE CLOSED.

Check the operating temperature setting if you are drying with low temperature or grain other than corn (see Pg. 16).

Initial Starting (cont'd)

NOTE: At this point nothing will start until the start switch is pushed.



!WARNING! WHEN THE START SWITCH IS PUSHED, EQUIPMENT WILL START AUTOMATICALLY. CARE SHOULD BE TAKEN TO AVOID CONTACT WITH ANY OF THIS EQUIPMENT.

3. At this time push the "START" button.
4. After approximately 10 seconds the gas solenoids will open and the spark plug will spark. Check the pressure gauges to see if they are increasing.
5. When ignition occurs, check the fuel pressure gauge. The pressure should be no higher than 20 PSI. If the reading is higher, the regulator should be turned down (counter-clockwise) to lower the pressure.
6. When the operating temperature has been reached in the plenum chamber, the unload system of the dryer will start.
7. Continue to monitor the dryer until dryer temperature has been stabilized to the desired temperature.
8. Calibrate the wet and dry grain sensors while the dryer is stabilizing. Calibration is accomplished by:
 - a) Push down on the "DISPLAY SWITCH" and observe the calibration being displayed.
 - b) Turn the calibration adjustment knob until the value is zero.
 - c) Compare the moisture value displayed with the moisture content determined by averaging several samples tested with a reliable tester (See Chart I).
 - d) Subtract the average of the displayed moisture readings from the average of the tested samples. This value is the calibration needed for the Commander to make the displayed moisture match the actual moisture content. (NOTE: The calibration can either be a positive or negative number.)
 - e) Push the "DISPLAY SWITCH" down and turn the calibration adjustment knob until the value being displayed matches the calibration determined in step "d".
 - f) This completes the calibration. Record the calibrations for the wet and dry grain sensors in the back of this manual for future reference.
9. Grain samples should be taken on a daily basis to ensure that the electronic equipment is functioning correctly. Use a quality moisture tester that will provide repeatable accuracy.
10. Use the following guidelines for safe and reliable sampling:



!CAUTION! USE A SAFE SAMPLING PROCEDURE. DO NOT SAMPLE FROM A HOPPER WITH AN UNGUARDED AUGER. KEEP HANDS, FEET AND CLOTHING AWAY FROM ROTATING PARTS.

- a) Take the samples when the displayed moisture is not changing rapidly.
- b) Take several samples and record the moisture being displayed when each sample was taken as well as the tested moisture content of each sample.
- c) Take several samples as close to the moisture sensor as possible to ensure that the sensor is displaying the moisture from the same batch of grain that you are sampling.

CHART I

Example of Grain Moisture Sampling

This chart shows grain moisture readings of samples as they should be taken to obtain reliable averages of moisture values.

Time	Calc-U-Dri		Dole		Elevator
	Temp.	Moisture	Temp.	Moisture	Moisture
9:33 a.m.	112	14.4%	109	14.7%	
9:36 a.m.	112	14.4%	111	14.4%	
9:38 a.m.	108	16.0%	107	17.5%	
9:40 a.m.	110	14.6%	109	14.7%	
9:43 a.m.	108	15.9%	104	17.3%	
9:50 a.m.	111	14.5%	107	15.0%	
TOTAL		89.8%		93.6%	
AVERAGE		15.0%		15.6%	15.3
QUESTION: Where would you set the moisture offset, +0.3 or +0.6? ANSWER: Most would want to set it to +0.3 which would make it match the point of sale's reading.					

- A. The Commander uses the comparison between the control moisture being displayed and the control set point to vary the speed of the sweep augers. This displayed control moisture can be the average of: 1) wet, dry and column sensors; 2) wet and dry sensors; 3) dry and column sensors, or 4) just the dry grain sensor. The toggle switches used to select the sensor combination are inside the box on the left-hand side of the back panel.

Adjust the main speed until the discharged grain is at the desired moisture. The control mode should be in "MANUAL". This is best done while the incoming wet grain is at a consistent moisture level. Remember to allow enough time for the wet grain to flow through the dryer between any speed changes.

You have found the proper main speed when the dryer has stabilized and the discharge moisture is at or very close to the desired moisture. At this time look at the control moisture displayed. This is the average moisture of all three sensors. Adjust the control set point to this value.

- B. Switch the control mode switch to "AUTO" and the Commander will start to control the speed of the dryer metering rolls. The dryer will run in "HIGH SPEED" when the control moisture is .3% or more drier than the set point. It will run in "MAIN SPEED" when it is within + (plus) or - (minus) .3%. It will run in "LOW SPEED" when the control moisture is .3% or more wetter than the set point.
- C. The amount of speed change from "MAIN SPEED" to either "HIGH SPEED" or "LOW SPEED" can be varied by turning the high and low speed adjustment screws found on the front panel. A speed change of approximately 15% should give good performance under most conditions. However, some adjustments may be required for different drying situations. For example, a wider speed range may be required to accommodate wet grain with inconsistent moisture content.

- D. **NOTE:** if the main speed is changed, some readjustment of the low and high speeds may be required to maintain the 15% speed change.

STARTING AFTER A SHUT-DOWN PERIOD

When starting the dryer after it has been shut down, the same basic procedures are listed on the preceding pages. However, the reason for an automatic shut down should be investigated.

OPERATING PROCEDURES

Getting Desired Plenum Temperature - (See page 16 for additional instructions)

Plenum temperature is controlled by the Honeywell Temperature Controller. The temperature controller signals the Honeywell Modutrol Motor which drives the Maxon Control Valve. The temperature sensor is located at the top of the dryer inside the plenum chamber.

The temperature controller works in either "MANUAL" or "AUTOMATIC" mode. Change to the "MANUAL" mode by pushing the "MAN/AUTO" key. The top display reads temperature and the lower display reads percentage open. For example: "P 60" means that the control valve is 60% open.

Change to "AUTOMATIC" mode by again pushing the "MAN/AUTO" key. The top display reads temperature and the lower display reads set point. The controller will automatically change the control valve to maintain the temperature at the set point. To change set point, press the "SETUP" key and then the up arrow or down arrow until the desired set point is displayed. Press the "SETUP" key again. The controller will maintain this new set point.

The plenum temperature should be set to the grain type, quality and moisture. To get the maximum capacity out of the dryer, a higher temperature can be used, but the susceptibility to cracks (quality) will also increase. The orifice can be reduced if low temperature drying is desired. For more information contact DMC.

The supply pressure to the modulating valve should never exceed 30 PSI or damage to the valve may result. The pressure regulator on the dryer has been preset to 20 PSI and should not be altered. It is recommended that the orifice be changed instead, to change the operating temperature range, if necessary.

Other Dryer Adjustments

GRAIN DEPTH

The grain depth on the perforated roof of the dryer is adjusted through the use of a chain and hook assembly for garner bins. The depth is adjustable in order to fine-tune the dryer's performance through a wide variety of conditions. The depth to start with is 6 inches. If the roof option was installed, the skirt can be adjusted from the ground with the adjusting lever. When the incoming grain is above 25% moisture, reduce the grain depth on the perforated roof. The grain entering the column should be about 100 degrees F, but not above 140 degrees F. This will minimize the amount of condensation on the outer perforated sheet.

SKIRT ADJUSTMENT is directly related to the amount of moisture needed to be removed. The following tips will serve as a skirt adjustment guide to assist you in obtaining the maximum performance from your DMC Calc-u-DRYER: **Moisture Points To Be Removed-**

(Refer to Drawing Point A. Measure at skirt).:

0-5 pts: Fully open or 8 to 10 inches.

5-8 pts: Skirt should be half open or 4 to 6 inches.

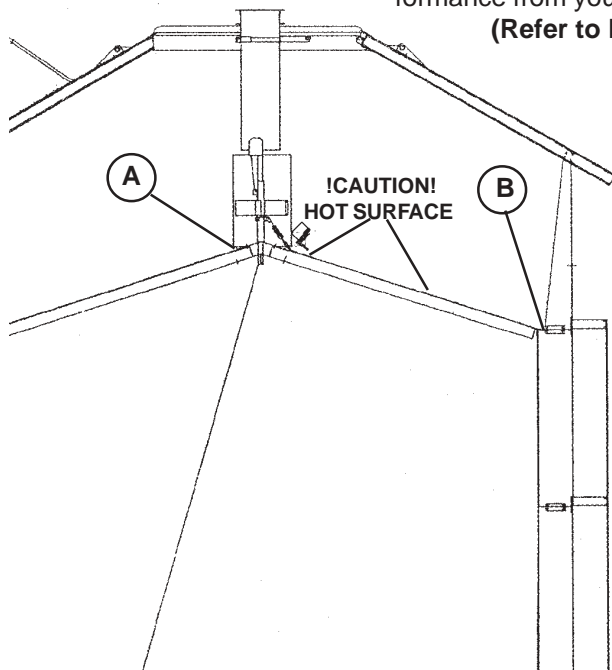
8-12pts: 3 to 5 inches open at skirt.

12 pts and up: 2 to 3 inches open without bubbling. If grain dances or bubbles directly below skirt, thicken grain by opening skirt one inch.

(Refer to Drawing Point B. Check temperature of grain).:

The grain entering the column should be warm, just above 100 degrees F, but should never exceed 140 degrees F. This will minimize the amount of condensation on the outer perforated sheet.

The principle behind the perforated cone on the Calc-u-DRYER is to preheat the grain and remove the surface moisture before entering the columns. When grain is *25% or wetter*, a thinner layer of grain will aid the drying process. When grain is *drier than 25%*, a thicker layer will help the drying process.



OPERATING PROCEDURES (cont'd.)

Louvers On Doors

The louvers on the doors are used to regulate the amount of air pulled through the grain in the cooling section. Increasing the amount of air through the column increases the cooling effect on the grain. When the louvers are closed to increase cooling you will notice a reduction in performance, due to the fact that less air is flowing through the dryer. When the louvers are fully opened maximum air flow through the dryer can be obtained, but this will reduce the amount of cooling of the grain before being discharged. To adjust, loosen louver assembly, adjust to desired setting, and tighten securely.

Sweep Augers

The sweep augers can be moved closer or further away from the outside wall of the dryer. This is done to adjust to the differences in incoming grain qualities, moisture and types. Adjustments are intended to enable the operator to maximize the efficiency of the unloading system. After the dryer's sweep system has been adjusted upon installation future adjustments may not be necessary. To adjust, remove bolt holding flighting tube to the gear box, adjust in or out, and replace bolt back in appropriate hole and tighten. A nominal distance from the support channel is 1-1/2 inch. If the sweep augers are running in "HIGH" speed the majority of the time, and if speed adjustment on Commander is not possible, move the auger closer to the column. If the sweep augers are running in "LOW" speed the majority of the time, and if speed adjustment on Commander is not possible, move the auger away from the wall.

Shut-Down Procedures

Temporary or Overnight Shut-Down

When shutting down temporarily, (service) push the "STOP" button and allow the dryer to shut down automatically. After the flame goes out shut off the hand valve which supplies fuel to the dryer.



!CAUTION! IF YOU ARE GOING TO ENTER THE DRYER, MAKE SURE THAT THE PLENUM TEMPERATURE IS COOL ENOUGH TO ENTER THE DRYER SAFELY, AND ALSO LOCK OUT THE MAIN POWER TO THE DRYER.

To shut down the dryer overnight, follow the instructions above. It is also recommended that main power switches and breakers on the dryer be shut off. It is not necessary to cool the grain in the dryer down completely unless it will be idle for several days.

MAINTENANCE

LUBRICATION

ITEM	LUBRICANT	INTERVAL
SWEEP GEAR BOXES	80 - 90 GEAR OIL	*CHECK EVERY 200 HOURS AND / OR EACH SEASON
SPEED REDUCER	SYNTHETIC GEAR LUBE	*CHECK EVERY 200 HOURS AND / OR EACH SEASON *CHANGE EVERY 800 HOURS
FAN	ELECTRIC MOTOR GREASE	*1-2 PUMPS PER BEARING MAX AT BEGINNING OF SEASON

PRE-SEASON MAINTENANCE

1. ***Be sure the main breaker is shut off in the dryer control box.***
2. Visually inspect dryer for any noticeable damage which may have occurred in the off season.
3. Inspect and clean plenum chamber and cooling chamber, ensuring leak area around fan barrel is free from debris.
4. Clear out gearbox sump and auger.
5. Inspect moisture sensors for cleanliness and / or damage.
6. Check fluid levels in gear boxes and speed reducer. The fluid should reach to the bottom of the side hole in the boxes.
7. Grease motors and other devices, using the lubrication chart above as a reference.
8. Tighten all large lugs on the starters, distribution block, and circuit breaker. Make sure supply power is turned off.



DAILY MAINTENANCE

SHUT DOWN DRYER AND LOCK OUT ELECTRICAL BOX BEFORE ENTERING THE DRYER!

The primary daily maintenance required is to check and clean out the plenum chamber. When cleaning the plenum, pay special attention to the leak area, ensuring that there are no plugged openings. Also, during operation, pay attention to any irregular sights or sounds around the dryer which could indicate a problem occurring or about to occur.

END OF SEASON MAINTENANCE

After the dryer has been cleaned out at the end of the year the following procedures should be followed:

1. Lightly grease the sweep auger flight to prevent rusting in the off season.
2. Support ends of sweep auger to prevent bowing during off season.
3. Ensure fuel supply is shut off and the line is drained off.
4. Remove the filter plug from the fuel line strainer and clean, then re-install, using pipe sealant.
5. Remove cap from moisture trap, drain as necessary, then re-install, using pipe sealant.
6. Cover the burner.
7. Clean sensors and remove discharge sensor, if necessary.

End of Season Operation

Options for Final Grain Drying

To finish drying the final wet grain in the dryer, do either of the following:

1. Add dry corn to the dryer until the wet corn has passed through the heating section of the dryer.
2. The dryer may be shut off hot, allowed to steep for a short time and then turn on the fan to finish the cooling.

Unloading Dryer and Final Cleanup

1. Ensure that all switches are in the “OFF” position and main power switch is in the “MANUAL” position.
2. Place the fan switch in the “MANUAL” position - this will start the fan. It is necessary to run the fan to aid in the grain flowing off the roof and to avoid sweeping.
3. Start the take-away components at this time. If running out of the dryer control box, place the appropriate switches in the “MANUAL” position.
4. Place the discharge switch and the sweep auger switch in the “MANUAL” position and set speed to the system at a reasonable rate.
5. When the roof has cleared, the fan switch may be placed in the “OFF” position.
6. Continue running the sweep system until all the grain, that can be, is removed.
7. When sweeps have removed all possible grain, place the sweep auger in the “OFF” position and run only the discharge.

NOTE: If the discharge system is not used, shut off the main breaker in the dryer control box.

8. Place the discharge switch in the “MANUAL” position.



!CAUTION! Make sure the sweep system is not operating before entering the dryer. |

9. Before cleaning the floor of the dryer it is recommended that the perforated cone, plenum chamber, and walls of the dryer be cleaned first. It is also suggested that the upper moisture sensors be checked for foreign material. By doing the cleaning in this order, a second cleaning of the floor can be prevented.
10. Run the discharge system until all material, that can be, is emptied from the auger.
11. When finished, place the discharge switch and main power switch in the “OFF” position.
12. Shut off the main breaker in the dryer control box.
13. Clean out discharge hopper by opening slide gate underneath.
14. Remove moisture sensor from discharge tube, clean off sensor and clean out tube. Mount sensor back in the discharge tube.



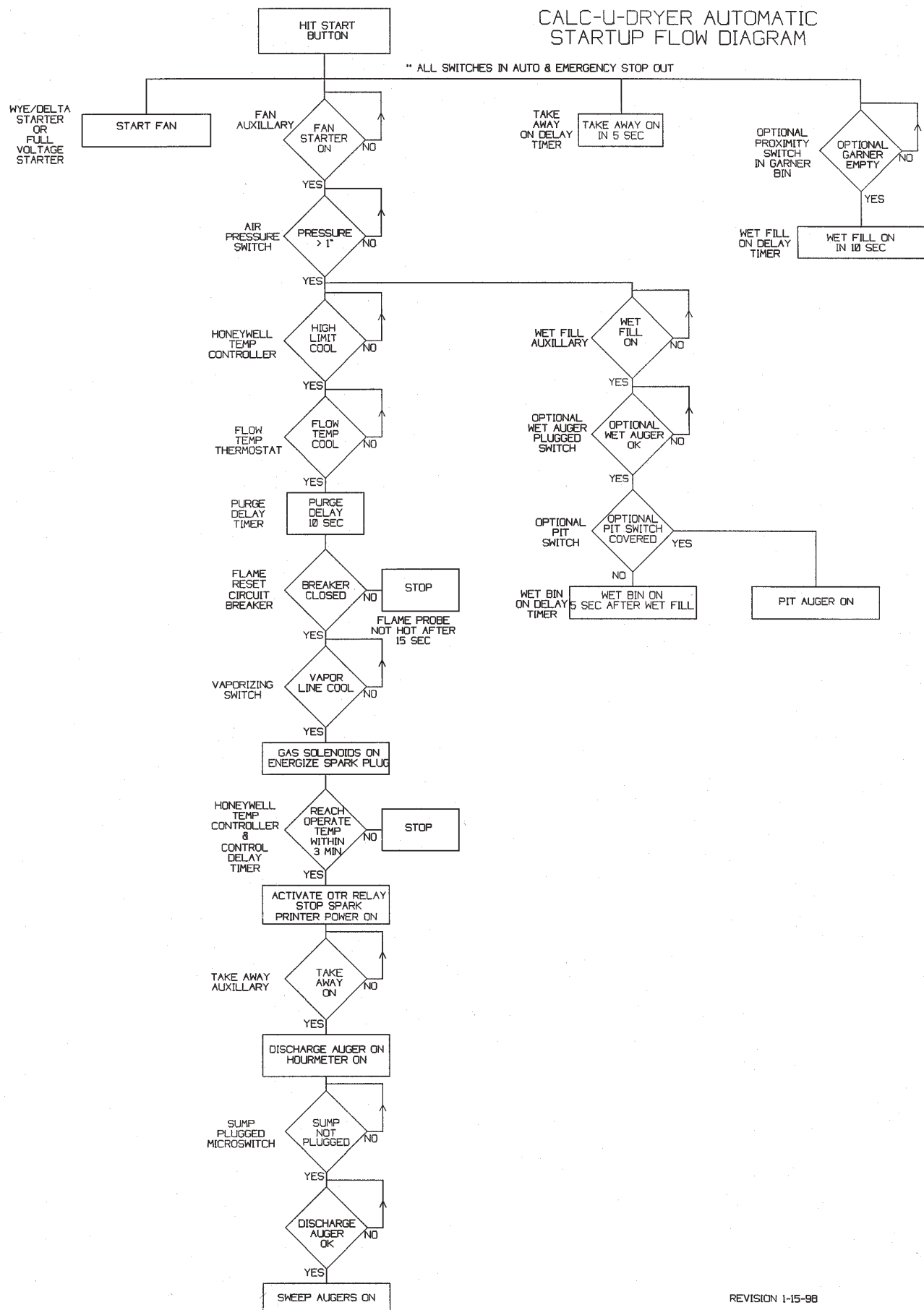
!CAUTION! SHUT OFF THE MAIN BREAKER IN THE CONTROL BOX BEFORE CLEANING THE INSIDE OF THE BOX.

When the main breaker in the control box has been shut off, clean out foreign material both inside and outside box.

Final Shut Down

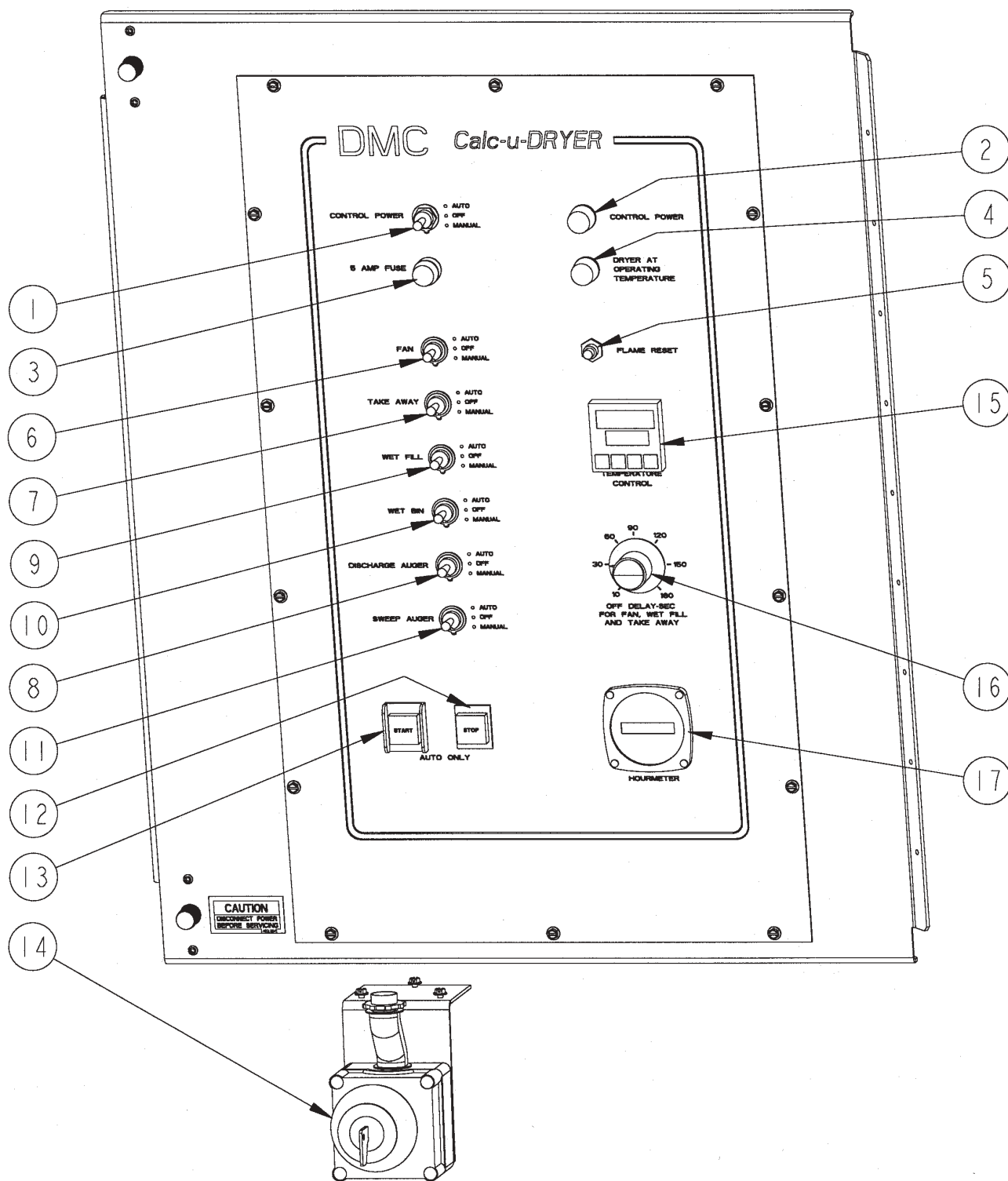
When shutting down the dryer in the off season, it is recommended that the main disconnect for the dryer be shut off. It is suggested that the control box be locked to prevent unauthorized entry. All fuel supply lines should be shut off at the source, as well as on the dryer.

CALC-U-DRYER AUTOMATIC STARTUP FLOW DIAGRAM



REVISION 1-15-98

Calc-u-DRYER CONTROL MODULE



Calc-u-DRYER CONTROL DEFINITIONS

1. CONTROL POWER SWITCH: This switch controls the 115 volts AC power that is required for the Calc-u-DRYER control. The switch must be in the **“MANUAL”** mode to enable any of the other functions to run in the **“MANUAL”** mode. The **“AUTOMATIC”** mode provides power for normal drying operations. **NOTE:** Turning this switch **“OFF”** will immediately shut down all functions.
2. CONTROL POWER INDICATOR: This lamp will be **“ON”** whenever the power switch is in **“AUTO”** or **“MANUAL”** and there is 115 volts AC present.
3. FIVE AMP FUSE: Use only AGC 5A fuses. **DO NOT OVERSIZE!**
4. OPERATING TEMPERATURE INDICATOR: This lamp will be **“ON”** when the plenum chamber has reached operating temperature. The operating temperature is factory-set at 120°.
5. FLAME RESET: This button will pop out when the dryer no longer is sensing a flame during operation, and will shut down the system. (See page 16).
6. FAN SWITCH: This switch allows the fan to run in **“AUTOMATIC”** or **“MANUAL”** mode. Turning the switch **“OFF”** will immediately stop the fan.
7. TAKE-AWAY SWITCH: This switch allows the take-away equipment to run in **“AUTOMATIC”** or **“MANUAL”** mode. Turning the switch **“OFF”** will immediately stop the take-away equipment.
8. DISCHARGE AUGER SWITCH: This switch allows the discharge auger to run in **“AUTOMATIC”** or **“MANUAL”** mode. Turning this switch **“OFF”** will immediately stop the discharge auger.
9. WET FILL SWITCH: This switch allows the equipment filling the dryer to run in **“AUTOMATIC”** or **“MANUAL”** mode. Turning this switch **“OFF”** will immediately stop the wet fill equipment.
10. WET BIN SWITCH: This switch allows the equipment feeding the wet fill system to run in **“AUTOMATIC”** or **“MANUAL”** mode. Turning this switch **“OFF”** will immediately stop the wet fill equipment.
11. SWEEP AUGERS SWITCH: This switch allows the sweep augers to run in **“AUTOMATIC”** or **“MANUAL”** mode. Turning this switch **“OFF”** will immediately stop the sweep augers.
12. STOP SWITCH: This switch will stop the dryer and allow the fan, take-away, and wet fill equipment to run for the **“OFF DELAY”** period before shutting down completely.
13. START SWITCH: This switch starts the dryer in the **“AUTOMATIC”** mode when the power switch is in the **“AUTO”** position and will need to be reactivated to restart the dryer after any shutdown. **NOTE:** This switch does not need to be activated for components to run in the **“MANUAL”** mode.
14. EMERGENCY STOP: This switch is located externally and will immediately stop the dryer and all connected equipment when the **“STOP”** button is pushed in. **NOTE:** The dryer can not be restarted until the button is unlocked with the switch key and pulled back out to its original position.
15. TEMPERATURE CONTROL: This module controls the plenum temperature by regulating the modulating valve that provides gas to the burner. The controller will automatically regulate the modulating valve to maintain a desired plenum temperature in the **“AUTO”** mode. The plenum temperature is displayed in the top window of this module and the desired plenum temperature is set in the lower window. The modulating valve can be manually regulated with this controller in the **“MANUAL”** mode. The top window will display the plenum temperature and the lower window will show the percent that the valve is open.
 - To adjust the temperature in **“AUTO”** press the ‘setup’ key and then the ↑ or ↓ keys to adjust the set point. Then push ‘setup’ again.
 - To adjust the temperature in **“MANUAL”** mode, simply push the ↑ or ↓ keys.
16. OFF DELAY/ADJUSTMENT: This adjustment varies the off-delay period (the time that equipment will run after an automatic shutdown) for 10 to 180 seconds.
17. HOURMETER: The hourmeter displays accumulated time that the discharge auger has discharged grain.

CONTROL BOX OPERATION

CONTROL ON DELAY TIMER:

The purpose of the on delay timer is to give the dryer enough time during startup to reach operating temperature. This is typically factory set at about two (2) minutes. The timer basically bypasses all of the sensors that would normally shut the dryer down during operation. Once this time has elapsed, the dryer may automatically shut down at any time. This can be lengthened if more time is required to reach operating temperature by simply turning the knob clockwise.

ON-DELAY TIMERS, AUXILIARY EQUIPMENT

The Wet Bin, Wet Fill and Take-Away equipment have individual on-delay timers. This allows you to stagger start all of the equipment to reduce the peak amperage draw. Each is adjustable from zero (0) to twenty (20) seconds.

FLOW TEMP THERMOSTAT

The purpose of the flow thermostat and thermocouple is to detect when there is no longer grain being fed into the dryer. The thermocouple is placed just above the grain on the perforated cone. When the thermocouple is cool, the dryer will be allowed to run. If the grain entering the dryer has stopped, an opening will occur through the perforated roof. This will allow more hot air to escape at the top and will heat the thermocouple. Once the thermocouple temperature has risen above the thermostat setting, the dryer will shut down.

The flow temp setting needs to be above ambient temperature and the operating temperature and yet below the plenum temperature. Plenum temperature is displayed on the temperature controller. Thermostat is factory set at 170 °.

TYPICAL DRYING SITUATIONS

GRAIN	PLENUM TEMPERATURE	OPERATING TEMPERATURE	FLOW TEMPERATURE	AMBIENT TEMPERATURE
CORN	250°	120°	170°	50°
RICE	105°	95°	100°	85°
WHEAT	150°	110°	130°	70°

It is recommended to test the setting by shutting off the incoming grain. The dryer should shut down automatically and the FLOW TEMP light on the shutdown indicator should be on.

PURGE DELAY TIMER

The purge delay timer will allow the fan to run for ten (10) seconds during startup before the gas solenoids open and ignition occurs.

OFF DELAY TIMER

The off delay timer will keep the fan, wet fill and take-away equipment on for the set time after the dryer has been signaled to stop. This will occur after the stop button on the control panel has been pushed or during an automatic shutdown. When the emergency stop button has been pushed, the off delay timer is not used, and all equipment will shut down immediately.

DISCHARGE STARTER

The discharge starter consists of a circuit breaker, contactor and overload protection all housed in one unit. The overload setting is made by way of the adjusting screw on the starter's front panel. This setting should equal the discharge motor's full load rating. The control switch should be in the AUTO position. If the breaker or overload should trip, then this switch will rotate to the OFF position. The dryer will shut down and the shut down indicator's discharge light will be on. To reset, first rotate the switch to RESET then to AUTO.

CONTROL BOX OPERATION (cont'd)

FAN STARTER

The fan starter consists of a definite purpose contactor and an overload relay. If the overload should trip, allow the three thermal units a minute to cool down before pushing the red reset handle down.

SCR DRIVE

The SCR drive is an electronic device that controls the sweep auger DC motor. It receives a speed signal from the Commander control box based upon grain moisture. The 230 VAC input power is protected by way of the two SCR fuses located above the SCR. The output is protected by way of the armature fuse located on the right-hand side of the SCR. The output varies from 0 to 180 VDC and is displayed on the Commander's DC VOLTMETER.

SHUTDOWN INDICATOR

The shutdown indicator will help to determine why the dryer automatically shut down. During startup it is common for a light to turn on such as the air sail light. All lights will reset when the dryer reaches operating temperature. Only after the operating temperature has been reached is the shutdown indicator ready to sense a shutdown. If the dryer shuts down before this due to the control on delay expiring, the proper light may not be lit!

FLAME RESET SWITCH

The flame reset switch is a circuit breaker that is connected directly to the normally closed flame probe above the burner. If the flame probe is closed due to being cold, the flame reset switch would take roughly 20 seconds to trip. This would cause the black pin to pop out. The switch must have time to cool down before resetting. Reset by simply pushing the pin back in place.

TEMPERATURE CONTROLLER

The temperature controller maintains the plenum temperature, provides a signal when the operating temperature has been reached and provides the high limit signal. It receives a temperature signal from the RTD sensor located at the top of the plenum. This is the hottest area in the plenum and the best place for stable control. The controller outputs a 4 to 20 mA signal to the modulating gas valve to maintain the plenum temperature near the set point.

While in automatic mode the top number displayed is the plenum temperature and the lower number is the set point. The set point can be changed by pushing the Set Up key and then push the ↓ or ↑ arrow keys as required. Press the Set Up key again once or twice to get back to the original display.

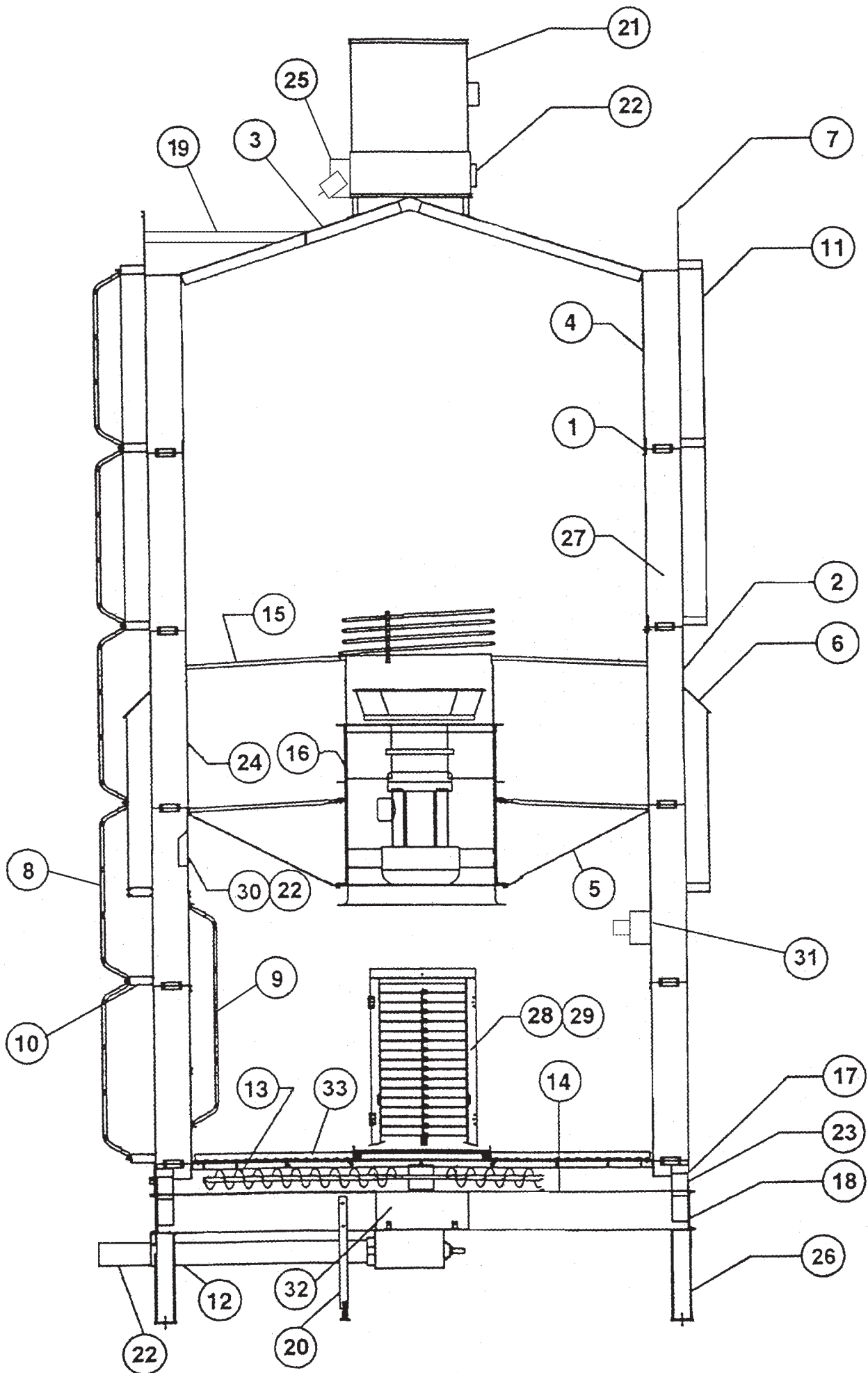
Press the Manual/Auto key to switch from auto to manual and vice versa. While in manual the SET light will blink and the lower number is the percentage open of the modulating valve. For example: "P 30" means that the modulating valve is 30% open. This opening can be manually adjusted by pressing the ↑ or ↓ arrow keys. The purpose of the operating temperature is to allow the dryer time to warm up before discharging grain. The operating temperature is preset at 120°. See the Honeywell Temperature Controller Programming section on page 32 for changing this value if necessary. This value must be lower than the set point for proper operation. If the set point is lowered below 125°, then the operating temperature should be lowered accordingly. It is okay to have the operating temperature lower than the ambient air temperature, however, there will be no warm-up time after startup.

When the operating temperature has been reached, the following events occur:

- 1) Discharge auger turns on
- 2) Sweep augers turn on
- 3) OPERATING TEMPERATURE light turns on
- 4) ALM light on temperature controller blinks
- 5) Spark plug stops sparking
- 6) Shutdown indicator lights are reset
- 7) Optional printer or chart recorder turns on

If the plenum temperature dips below operating temperature, the dryer will shut down.

The high limit is preset at 300°. If the plenum temperature exceeds the high limit, the dryer will shut down.



DMC Calc-u-DRYER MODEL 25 PARTS LIST

1	7110001 7210121	CHANNEL-RING SUPP. SUPPORT RING-SLICE	12	7110295 7110028 7210280 7110026 7110318 104B2056 1FH0738 1FH0997 601B0003 2FH0486 2FH0983 2FH5335 602B018 601C0082 601C0081 PT0116 7110310 7210531 7210353	DISCHARGE HOPPER & FLIGHT ASSY TUBE-DISCHARGE 6" WLDMNT HOPPER-DISCHARGE - ZINC PLT AUGER-DISCHARGE, 5" WLDMNT STUB SHFT - DISCHG, 1-1/4 DIAM SPRG-EXT. W/LOOPS .50 OD x 4.50L NUT-LK, 1/2-13, 2-WAY, GRD. 2 NUT-LK, FLG, 3/8-16 WHIZ LOCK CLAMP-BND, 6" 11GVx2"COILx11.12" SCREW-S/DRILL #10-16 x 3/4 SCREW-FLG, WHIZ LK,3/8-16 BOLT-HEX, 1/2-13 x1-1/2 PLATE-SUMP CLAMP-6" WLDMNT SAMPLER COVER- 6" SAMPLER SLIDE GATE- 6" BEARING-W/HSNG,1-1/4" ECC LK CHANNEL-DISCHARGE SUPP. CLIP- HOPPER MOUNT COVER-SLIDE CLEANOUT
2	7110004 7110232	OUTSD. PERF. PANEL-.078 GALV OUTSD. PERF. PANEL-.078 STNLSS			
3	7110192 7110216 7120006 7220010 4FH0827	CONE PERF.PANEL-.094 CONE PERF.PANEL-.078 TOP/BOTTOM CNTR CONE CNTR CONE PIPE ASSY 1-1/4 PIPE PLUG			
4	7110007 7110214	INSIDE PERF. PANEL-.094 INSIDE PERF. PANEL-.078			
5	7110217 7210296 7110242 7110247 7110278 7110254 7110270	CONE FAN SUPP. PANEL SUPPORT FAN CONE CONE FAN PANEL W/SLOT CONE FAN PANEL I/S CONE FAN PANEL O/S DOOR ACCESS-RT DOOR ACCESS-LT	13	3EL5086 7110022 7210440 7210510 7210549 1FH0735 1FH0767 2FH0511 2FH5270 2FH5787 7110317 7310212 1FH0736 2FH5297	1-1/2 HP DC MOTOR WORM GEAR REDUCER GEARBOX-SINGLE 1.5-1 SUPP.GEARBOX DRIVE HUB-WORMGEAR REDUCER NUT-LK,5/16-18 NUT-HEX,1/2-13 FINISHED SCREW-SET-SOCKET HEAD BOLT-HEX,5/16-18 x 1-1/4" GRD 5 BOLT-HEX,1/2-13 x 3 GRD 5 AUGER-SWEEP 7" WLDMNT SHAFT-SWEEP AUGER,STUB NUT-LK-3/8-16 BOLT-HEX, 3/8-16x2-1/4" GRD 5
6	7110019 7110016	VISOR RECYCLING SEAL VISOR - STANDOFF			
7	7110015 7110240	CHANNEL SIDE BOARD SUPP. PANEL SIDE BOARD	14	7110034 7110044	FLOOR PANEL RADIAL
8	7210156	LADDER-4 STEP	15	7110049 7210064	TUBE BURNER SUPPORT BRACE END BURNER SUPPORT WLDMNT
9	7210166	LADDER-5 STEP	16	7120013 3EL5157	FAN/BARREL 25 HP 3 PH ASSY MOTOR 25 HP 3 PHASE
10	7110030	STANDOFF JACKET/LAD-	17	7210109	Z-BAR SUPPORT
11	7210256 7110025	JACKET-EXTERNAL JACKET STANDOFF	18	7110084	CHANNEL - BASE

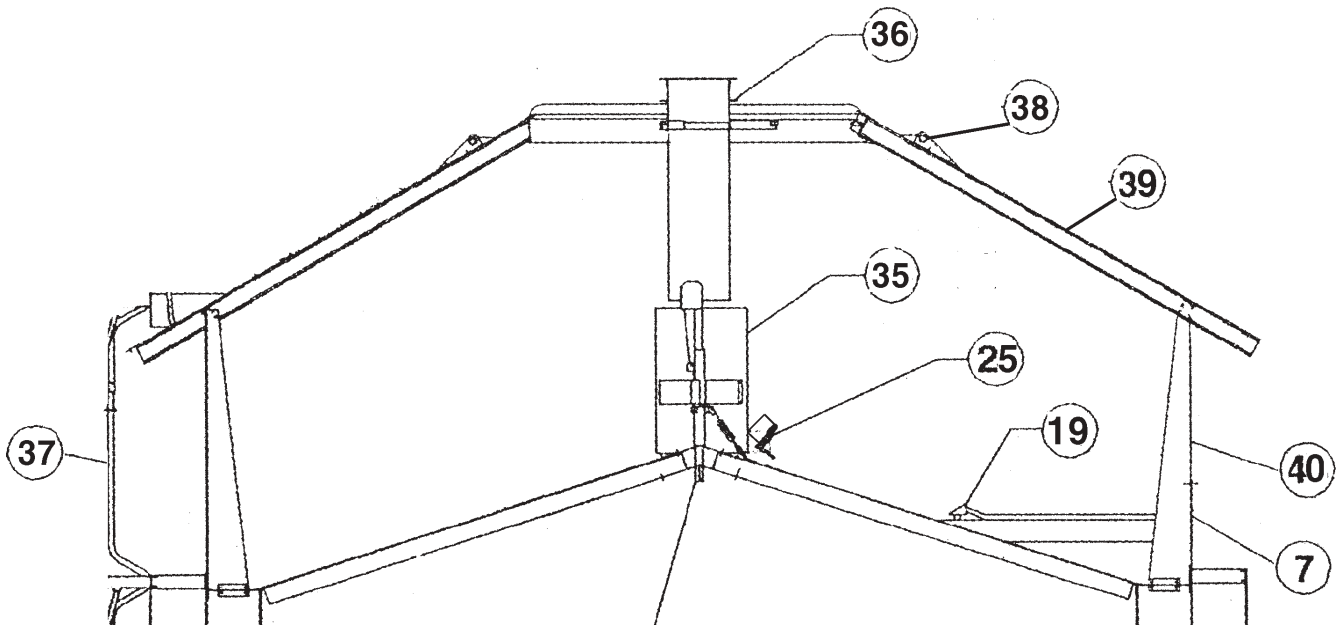
DMC Calc-u-DRYER MODEL 25 PARTS LIST (cont'd.)

19	2EL0221 7210404	RTD SENSOR BRACKET - RTD	28	7210313 MS5382	DOOR FRAME - ASSY HINGE
20	7210101 7210351	LEG - INSIDE 32" PAD - LEG ADJUSTABLE	29	7210311 7210039 7210129 7210327	DOOR ASSY LOUVER W/O ADJUST BRACKET SHAFT - LOUVER PIVOT DOOR FRAME
21	A 7110067 B 7110087 C 7110139 D 7110140 E 7110180 F 7110190 G 7110191 H 7110200 I 7110201 J 7110204 K 1FH0570 L 7110144 M 7110149	CHAIN - SUPPORT LEG - GARNER BIN ZINC PLT CHANNEL - GRNR BIN CHANNEL - SKIRT ZINC PLT BRACE - SENSOR, FLAT GUIDE - GARNER BIN ASSY HOOK - CHAIN GRNR BIN GARNER BIN-16GVx28"x96" SKIRT-GRNR BN 16GVx20"x99.57" PROX. SWITCH / BOX ASSY NUT-WING, 1/4-20 BOX-ELEC. PROX. SWITCH PROXIMITY SWITCH	30	602E287	COLUMN SENSOR BRACKET
22	602E020	SENSOR STANDARD	31	7210474 A 774695 B 851790 C 7210357 D 7210439 E 1EL0324 F 1EL0433 G 1EL0459 H 1FH0725 I 1FH0995 J 2FH0772 K 2FH0981 L 4FH0576 M 4FH0973 N D03-0167 O MS0801	TRANS. & JUNCT.ASSY AIR SWITCH SCREEN IGNITION-TRANSFORMER BRKT-TRANSFORMER JUNCTION BOX, DRILLED COVER, OUTLT BX, 4X2, FS CONNCT.-EMT, COMPRES.,1/2" NIPPLE-3/4"OFFSET1/2"D.CAST NUT-LK.#8-32, NYLON LK. NUT-LK.FLG.1/4-20UNC WZ.LK. SCREW,MACH,#8-32 x 1/2 SCREW,MF FLG WZ.LK.,1/4-20 x 3/4 FIT-COUPLER,AUTO-LK 1/4" TUBE FIT-NIPPLE HEX (BRASS)1/8x1/8 SWITCH-PRESSURE TUBE 1/4" - BLACK
23	7110238 7210072 7110312	PANEL - DUMP SLIDE - DUMP PANEL- DUMP - DOOR	32	7110320	SUMP-WLDMNT HOT DIP GALV
24	7110116 7110224	PANEL-PERF. INSD STEEP. .094 PANEL-PERF. INSD STEEP. .078	33	7110276 7110259 7110262 7110263 7110260 7210346 7210345	CORR. SAFETY DECK-OUTSIDE SUPPORT-ROLLED ANG.- GALV DECK-ANGLE, SHORT DECK-ANGLE, LONG CORR.SAFETY DECK OUTSIDE CORR.SAFETY DECK END CORR.SAFETY DECK CENTER
25	A 7210378 B 7210390 C 1EL0324 D 1FH0995 E 2EL0230 F 2EL0231 G 2FH0981 601E0044	PROBE FLOW TEMP - A/C BRKT-THERMOCOUPLE COVER-OUTLET BX NUT-LK. FLG. 1/4-20 WZ.LK. THERMOCOUPLE TUBE/WIRE THERMOCOUPLE MOUNTING SCRW- FLG WZ LK 1/4-20X3/4 BOX-OUTLET DRILLED	34	A 7210415 B 7210366 C 2EL0343 D 2EL0344 E 2EL0345	MOUNT-MOTOR, DC DR WLDMNT ROD-ARM LIMIT SWITCH SWITCH-LIMIT TYPE C-PLUG IN UNIT SWITCH-LIMIT TYPE C-PLUG IN RECP SWITCH-LIMIT TYPE C-HEAD ONLY
26	7210104 7210542	LEG - DRYER 24" PAD - LEG			
27	7210177 7210175 7210178	Z-BAR STANDARD Z-BAR SCAB PLATE 3 HOLE NUT			

DMC Calc-u-DRYER MODEL 25 PARTS LIST (cont'd.)

35	7220075 7220007 A 3FH1240 B 3FH0712 C 7220054 D 5FH0088 E 7220050 F 6FH0005 G 7220053 H 7220056 I 722010 J 5FH0117	SKIRT FEED IN ASSY SKIRT FEED IN CLEVIS PIN 5/16X1-3/8 COTTER PIN 1/8 X 3/4 CENTER PIPE W/C CABLE(CLAMP)U-BOLT HUB SKIRT TURNBUCKLE 5/16 X 4-1/2 SKIRT ALIGNMENT BRKT-SKIRT TURNBUCKLE CENTER CONE A/C SHEAVE DELRIN
43	A 7210375 B PT1406 C 4FH0592 D 2EL0208 E 2EL0222 F 2EL0232 G PT1309 H PT1521 I 7210391 J PT1514 K PT1519 L MS0802 M PT1310	GAS TRAIN MODULATING - LP BRACKET - PLUMBING REGULATOR (0-30 PSI) W/ 3/16 ORF. FIT - UNION 3/4 MODUTROL MOTOR- HONEYWELL CRANK ARM - MOTOR THERMOSTAT - VAPOR GAUGE - PRESSURE (0-200 PSI) VALVE COIL - 115 V ORIFICE NIPPLE VALVE - SOLENOID 3/4 VALVE - CONTROL 3/4 COPPER - TUBE - 1/4" GAUGE - PRESSURE (0-30 PSI)
36	A 7110269 B 7210339 C 7210419 D 7220080 E 6FH0005	COVER-ROOF, FEED IN ASSY ANGLE-MNTG, TAB ZINC PLT ANGLE-ROLLED, 8-1/8" ID TUBE-FEED IN, 8" WLDMNT TURNBUCKLE-5/16"x4-1/2"
44	A 7210374 B 4FH0591 C 4FH0685 D PT1319 E PT1504 PT1513	GAS TRAIN - INLET LP FIT-UNION 1/2 FPT, (SCH 80) FIT-STRAINER,(7P-1/2) VALVE-(RELIEF) 1/2 NPT VALVE-BALL,FULL PRT 1/2 MPT VALVE-SOLENOID 2 WAY
37	7210452	LADDER - 3 STEP
38	CRP-4710	SAFETY RING - 12'
39	CRP-4695 7110268	ROOF - 12' RING - ROOF SUPPORT
40	7210422	ROOF Z-BAR
41	PT0558	HOT HOUSE PULLEY
42	A 7210511 B 7210517 C MS5411 D 1FH0765 E 5FH0088 F 5FH0092	BRACKET - CABLE ADJ. EYEBOLT - CABLE BRACKET - CABLE ADJ HANDLE NUT-HEX 3/8 x 16 CLAMP - CABLE CABLE - 3/16
45	A 7210375 B 7210395 C MS0802 D 2EL0208 E 2EL0222 F 2FH0401 G 4FH0564 H 4FH0593 I 4FH0660 J PT1309 K PT1520 L PT1524 M PT1310	BRKT-PLUMB.,LG 12GVx6.75"x48.25" ORIFICE-GAS LINE, 2" WLDMNT COPPER-TUBE 1/4" SOFT MODUTROL MOTOR CRANK ARM FOR MOD. MOTOR BOLT-5/16x1.75x2.68-U W/PLT & 2 NTS FIT-CONNECT.,MALE 1/4"x1/2" NPT FIT-UNION, 1-1/4 FPT FIT-COUPLER,RDCR-2 FPT x 1-1/4 GAUGE-(PRESS.)-2-1/2" 0-200 PSI VALVE-CONT. 1-1/4 CV SERIES SOLENOID-GAS,1-1/4 GAUGE (PRESS.) - 4-1/2 -(0-30 PSI)
46	A 556605 B 749812 C *7210124 D *7210127 E *7110003 F 7110209 G 7210292 H 7210299 I 7110261 J 1FH0751 K 1FH0995 L 2FH0980	SPARK PLUG(IGNITION) FLAME PROBE-NORM CLOSE BRKT-VAPORIZER SHORT BRKT-VAPORIZER SUPP. VAPORIZER-38" BARREL BURNER-OCTAGON 38" ASSY BRKT-BURNER BRKT-FLAME PROBE BARREL-BURN.EXT. WLDMT NUT-JAM, 3/8-24 NUT-LK, FLG, 1/4-20 SCREW- WZ.LK. 1/4-20x1/2" * LP ONLY

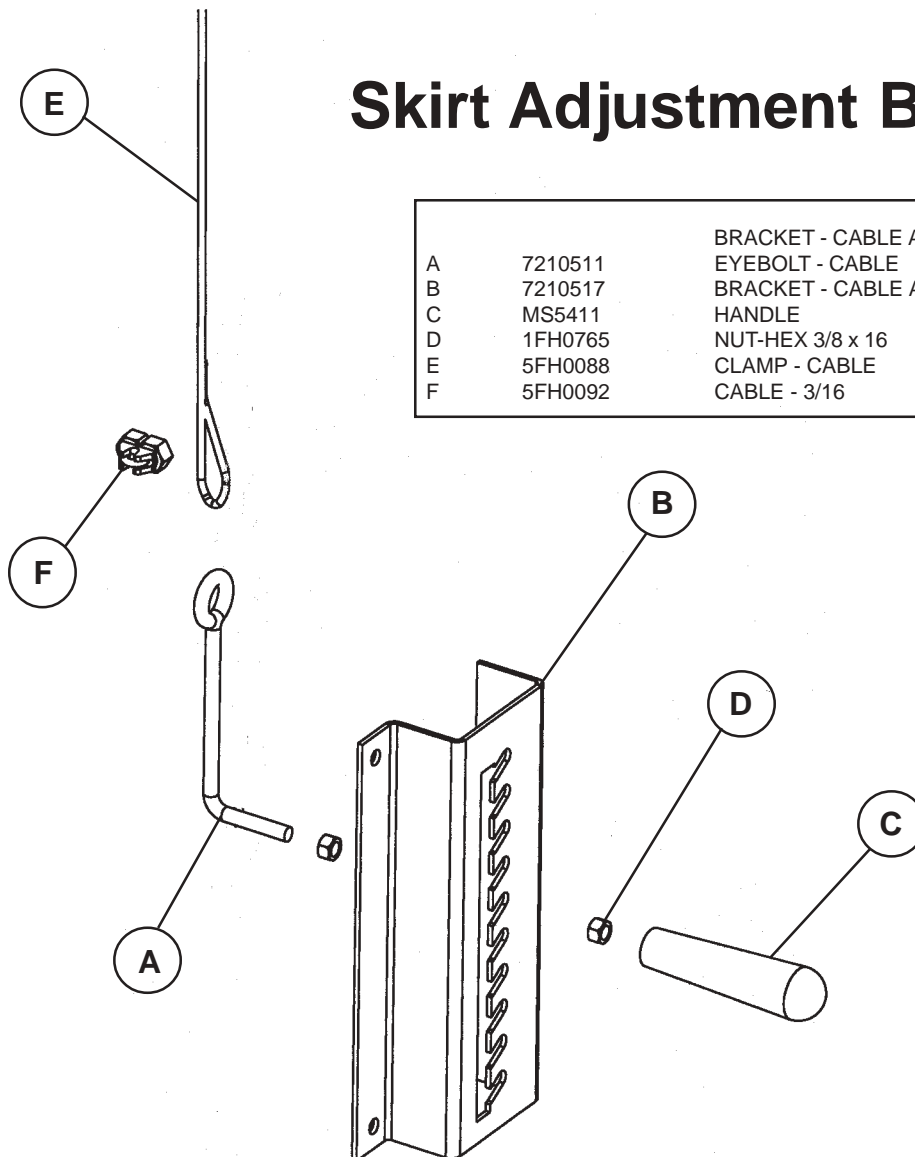
Calc-u-DRYER Model 25 ROOF OPTION

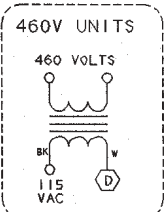


Skirt Adjustment Bracket

A	7210511
B	7210517
C	MS5411
D	1FH0765
E	5FH0088
F	5FH0092

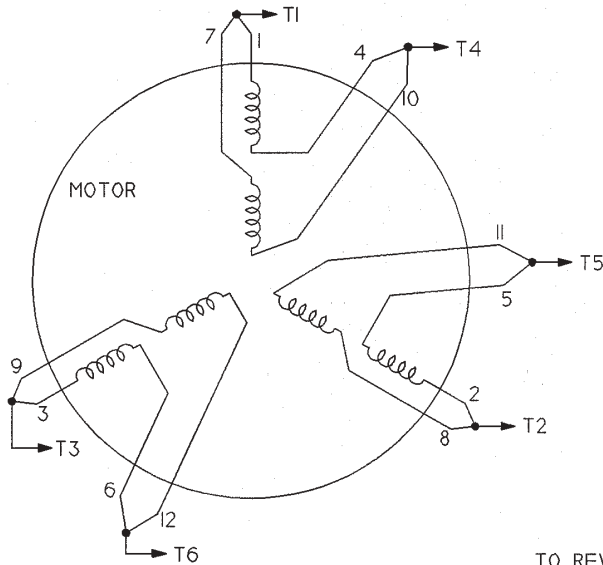
BRACKET - CABLE ADJ.
EYEBOLT - CABLE
BRACKET - CABLE ADJ
HANDLE
NUT-HEX 3/8 x 16
CLAMP - CABLE
CABLE - 3/16



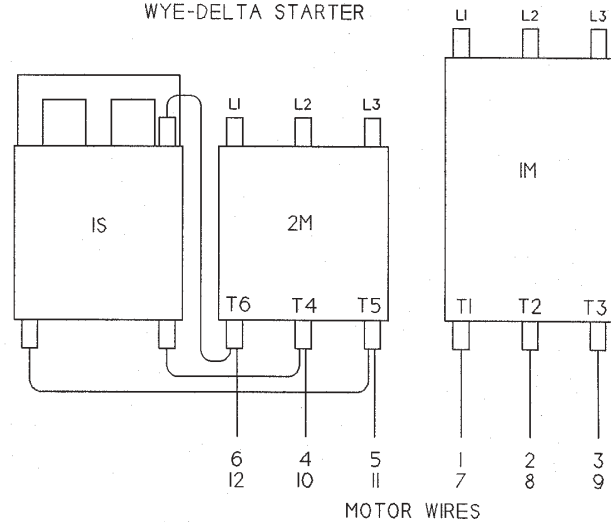


FAN MOTOR AND WYE-DELTA STARTER WIRING DIAGRAMS 40 HP AND LARGER

230 VAC



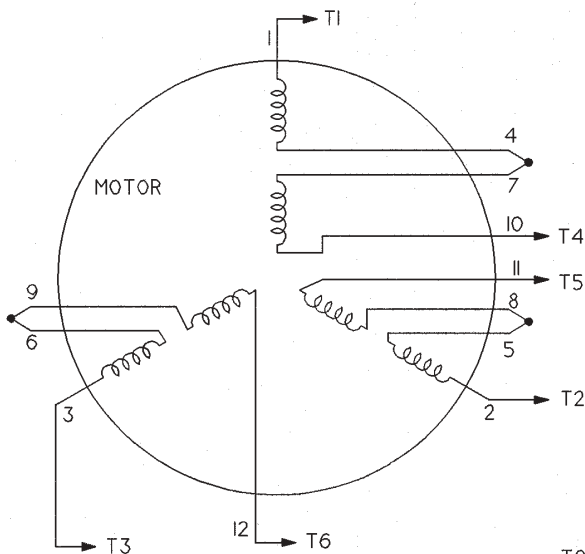
WYE-DELTA STARTER



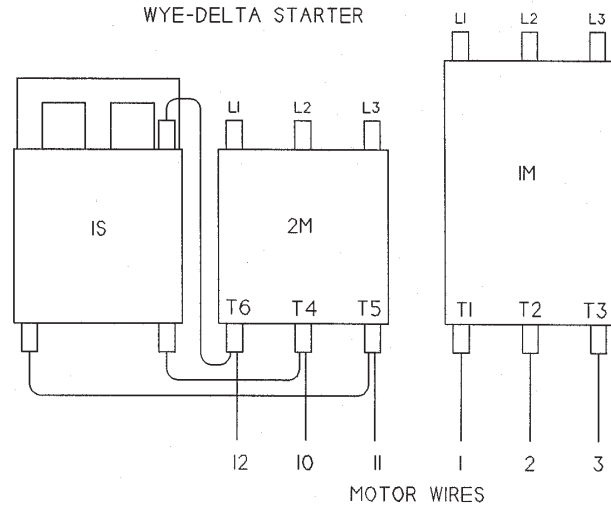
TO REVERSE DIRECTION
INTERCHANGE LEADS
BETWEEN T1 & T2
AND BETWEEN T4 & T6

LOW VOLTAGE

460 VAC



WYE-DELTA STARTER



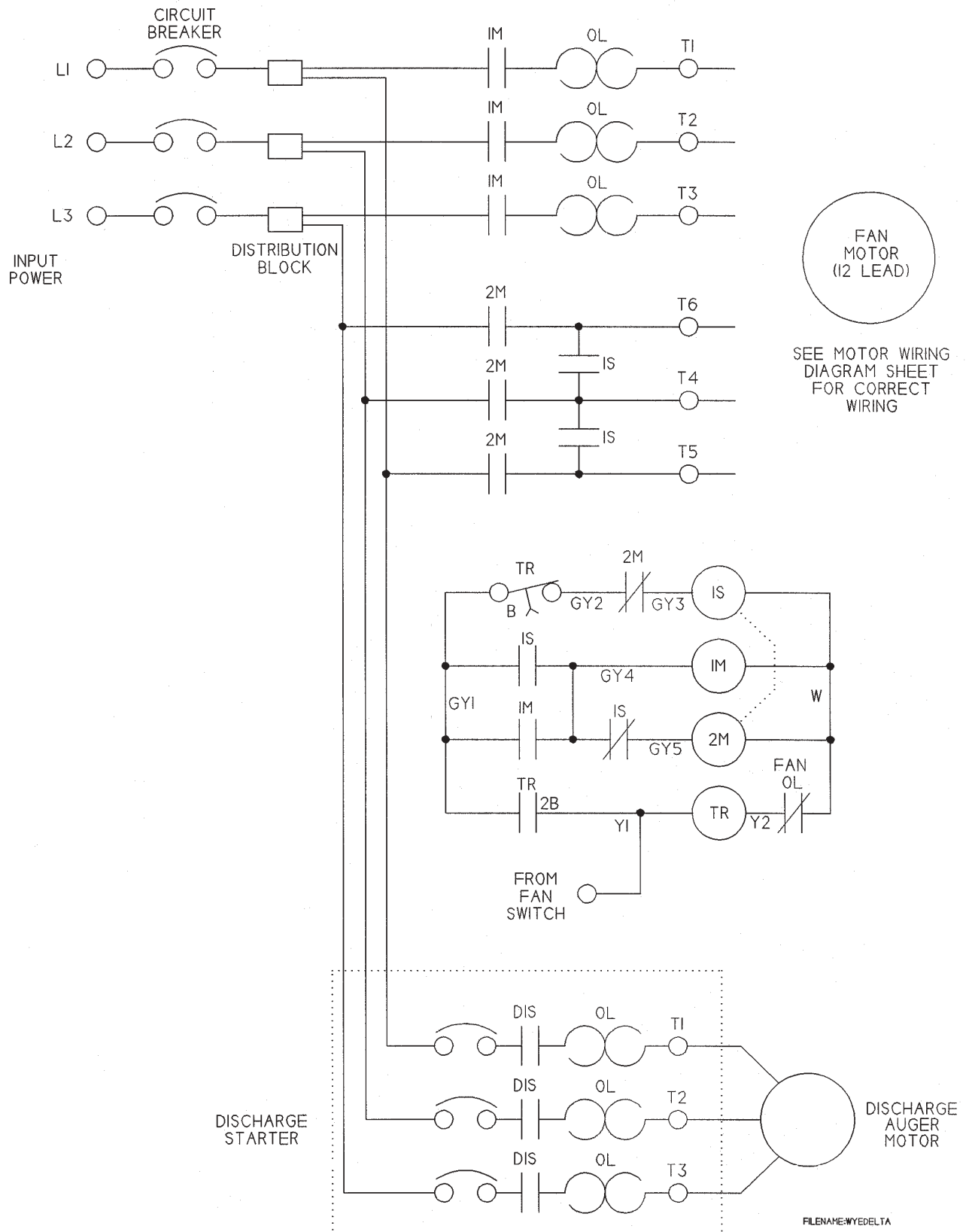
TO REVERSE DIRECTION
INTERCHANGE LEADS
BETWEEN T1 & T2
AND BETWEEN T4 & T6

4 5 6
7 8 9 JOIN MOTOR LEADS

HIGH VOLTAGE

FILENAME:WD40

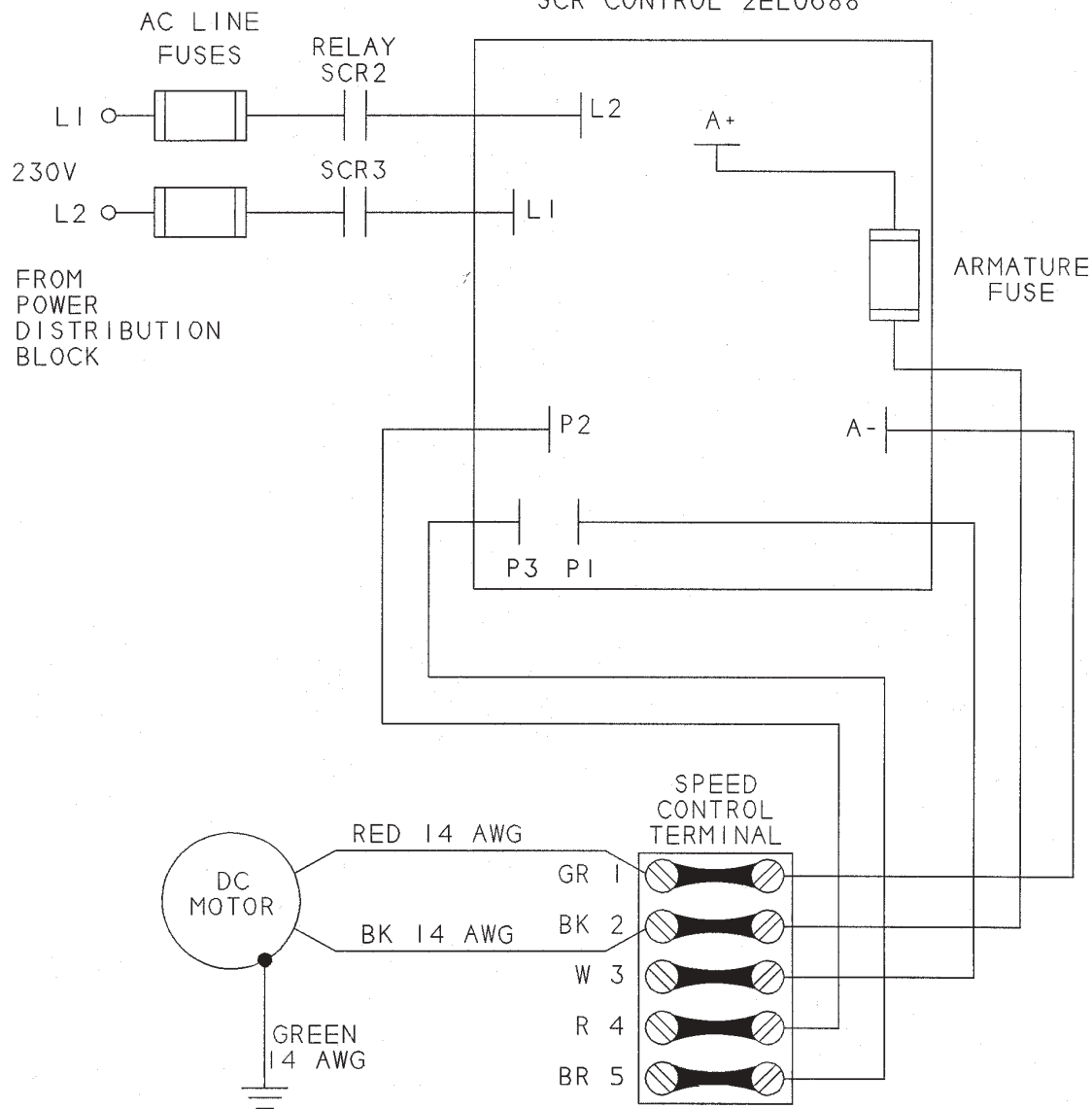
WYE-DELTA STARTER WIRING DIAGRAM 230 OR 460 VOLT



SCR MOTOR CONTROL WIRING DIAGRAM

230 VAC

SCR CONTROL 2EL0688



DRYER SIZE	25	40	60	75	100
DC MOTOR (HP)	1.5	1.5	1.5	2	2
AC LINE FUSES (A)	12	12	12	20	20
ARMATURE FUSE (A)	12	12	12	15	15

460 VAC SCR MOTOR CONTROL WIRING

1. USE A 230 VAC 20A TAP IF AVAILABLE
2. IF 230 VAC IS NOT AVAILABLE INSTALL A 5 KVA TRANSFORMER TO SUPPLY THE SCR CONTROL
3. HOOK THE 230 VAC DIRECTLY TO THE FUSE BLOCK. L1 AND L2

HONEYWELL TEMPERATURE CONTROLLER PROGRAMMING

OPERATING TEMPERATURE ADJUSTMENT

The operating temperature can be adjusted.

- 1) Enter Set Up mode by pressing the Raise and Set Up keys at the same time.
- 2) Change the "Uloc" to the proper code. The factory default code is 10.
- 3) Press the Set Up key. The "filt" parameter will be displayed. If the display returned to the original temperature display then you have entered the wrong code. To find out the correct code, follow the unlock code instructions below.
- 4) Press the Set Up key until the "h_A1" parameter is displayed.
- 5) Use the ↑ or ↓ key to adjust operating temperature.
- 6) Press the Raise and Set Up keys at the same time to return to the original temperature display.

DETERMINING THE UNLOCK CODE

- 1) Switch power on and within 30 seconds of power-up, hold down the Raise and Set Up keys simultaneously for approximately five seconds.
- 2) Press the Set Up key until the lower display reads Loc. The upper display will indicate the current Loc value. Record for future use.
- 3) Press the Raise and Set Up keys simultaneously to return to the original temperature display.

The following controller parameters are programmed by DMC for use in your Calc-u-DRYER:

CONFIGURATION MODE:

InPt = 2298
ALA2 = P_hi

SET UP MODE:

PB1 = 7.0
rSEt = 0.20
rAtE = 0.05
h_A1 = 120
h_A2 = 300
PoEn = 1

SHUTDOWN INDICATOR TROUBLESHOOTING GUIDE FOR CALC-U-DRYER

The shutdown indicator will help determine what has shut the dryer down. During the dryer start up procedure, some of the lights will turn on. Once the dryer has exceeded operating temperature, the shut down indicator will automatically reset, turning off all lights. At this point it will be ready to determine one of eight possible shut downs. The chart below will help explain why a particular light may be on.

INDICATOR		POSSIBLE PROBLEM	SOLUTION
1	AIR PRESSURE SWITCH	BAD PRESSURE SWITCH FAN FAILED	REPLACE PRESSURE SWITCH CHECK CONDITION OF FAN BLADE
2	HIGH LIMIT	TOO MUCH GAS THROUGH BURNER INCORRECT TEMP READINGS	CHECK OPERATION OF MODULATION VALVE AND PRESSURE REGULATOR VERIFY ACCURACY OF TEMPERATURE CONTROLLER & RTD SENSOR
3	FLOW TEMP	OUT OF GRAIN GRAIN INLET RATE TOO LOW SWEEP AUGERS STOPPED INCORRECT TEMP READING OF FLOW TEMP THERMOCOUPLE	LOAD GRAIN AND RESTART DRYER INCREASE INLET RATE TO KEEP UP WITH HIGH SPEED FLOW OR REDUCE PLENUM TEMP. CHECK SCR LINE FUSES & SCR ARMATURE FUSE. CHECK SWEEP AUGER DRIVE. MAKE SURE GRAIN IS BEING DRAWN TO THE CENTER OF DRYER. REPLACE THERMOCOUPLE
4	FLAME SENSING & VAPORIZING	FLAME QUIT BAD FLAME PROBE FLAME PROBE NOT HOT ENOUGH VAPORIZING LINE TOO WARM	CHECK GAS SUPPLY REPLACE FLAME PROBE RELOCATE FLAME PROBE INSPECT VAPORIZING SWITCH AND GAS LINE
5	OPERATING TEMP	NOT ENOUGH GAS FLOW TO HEAT PLENUM INCORRECT TEMPERATURE READING	CHECK GAS SUPPLY AND MODULATING VALVE OPERATION VERIFY ACCURACY OF TEMPERATURE CONTROLLER & RTD SENSOR.
6	TAKE AWAY	TAKE AWAY SYSTEM SHUT DOWN	CHECK OPERATION OF TAKE AWAY SYSTEM
7	SUMP PLUGGED	DISCHARGE AUGER STOPPED	CHECK DISCHARGE MOTOR AND DISCHARGE AUGER DRIVE CHECK CHAIN DRIVE ON DISCHARGE
8	DISCHARGE	DISCHARGE AUGER DOOR OPENED BECAUSE TAKE AWAY BACKED UP	CHECK DISCHARGE AUGER MOTOR AND OPERATION OF TAKE AWAY SYSTEM. RESET DISCHARGE STARTER.

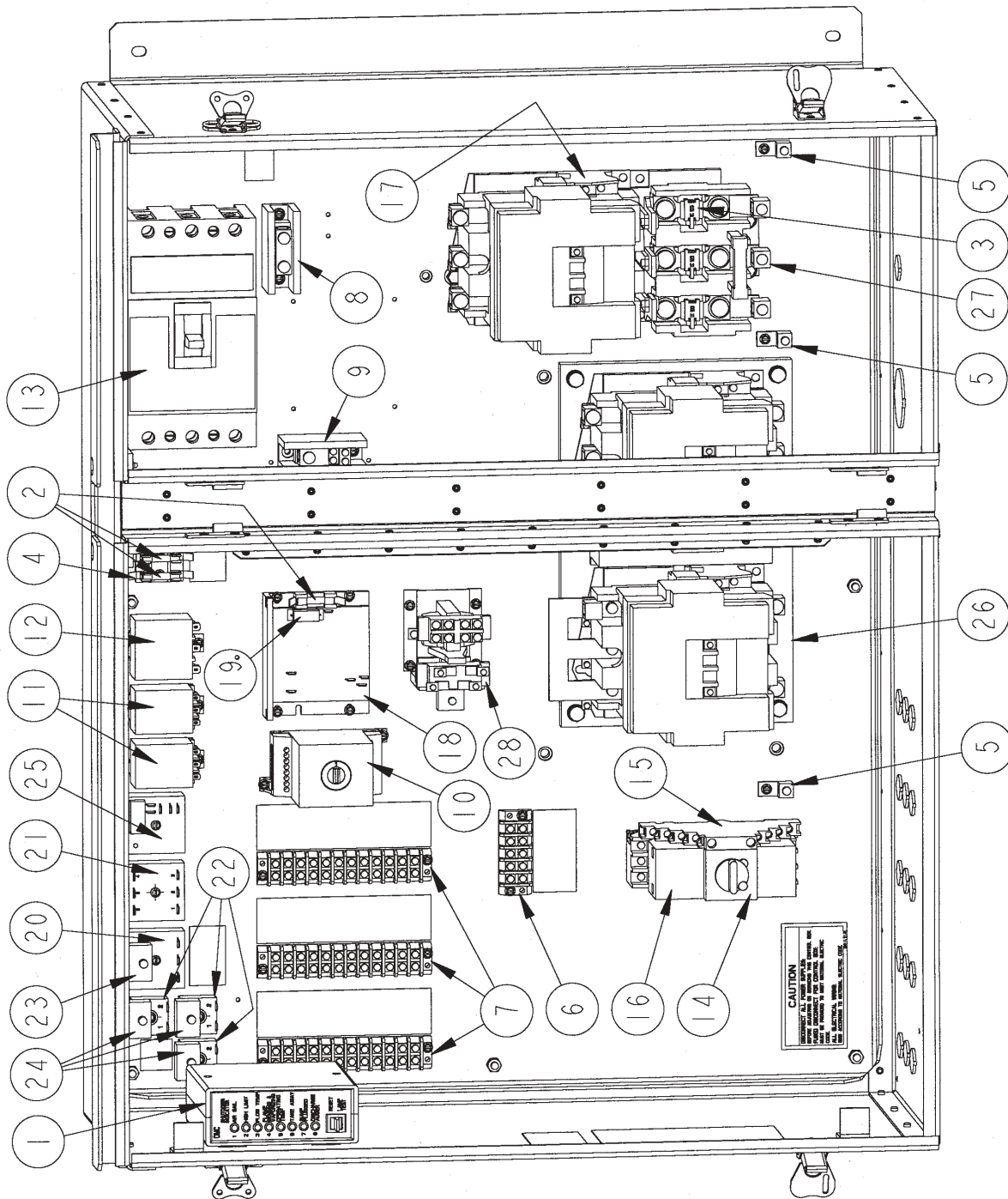


!CAUTION!
DO NOT SERVICE OR ENTER DRYER WITH POWER “ON”



PROBLEMS	ITEMS TO CHECK FOR SOLUTION
Power light does not light	<ul style="list-style-type: none">* Main circuit breaker tripped* Main power “OFF”* Control fuse blown (5A 250V AGC fuse)* Control switch turned “OFF”* Emergency button pushed in (need key to unlock before pulling out)
Fan does not start	<ul style="list-style-type: none">* Tripped thermal overloads
Dryer shuts down before the start-up is complete	<ul style="list-style-type: none">* On delay timer set too short of time* Burner not producing enough heat to reach operating temperature* Operating temperature set too high or defective
Burner will not light	<ul style="list-style-type: none">* Gas tank empty or turned “OFF”* Bad spark plug* Bad transformer* Gas solenoids (two) must be open* Mod valve not adjusted properly* Ignition wire shorting out to ground* Manual valve not open
Burner shuts off	<ul style="list-style-type: none">* High limit tripping due to:<ul style="list-style-type: none">a) High temperatureb) Out of adjustmentc) Defective temp controller* Grain flow temperature tripping due to:<ul style="list-style-type: none">a) Out of grainb) Temperature set too lowc) Positioned too close to the roof* Flame probe is not positioned correctly to sense flame* The spark plug ground may be loose or broken* Regulated gas pressure set too low* Modulating valve not adjusted correctly
Plenum will not reach set temperature	<ul style="list-style-type: none">* One of the gas valves not completely open* Regulator not adjusted correctly* Orifice too small for temperature setting* Gas line plugged or screens dirty or LP tank too cold to hold pressure.* Modulator not opening completely due to linkage adjustment* RTD sensor faulty
Dryer shuts down and shutdown indicator has no lights on	<ul style="list-style-type: none">* Momentary loss of AC power.

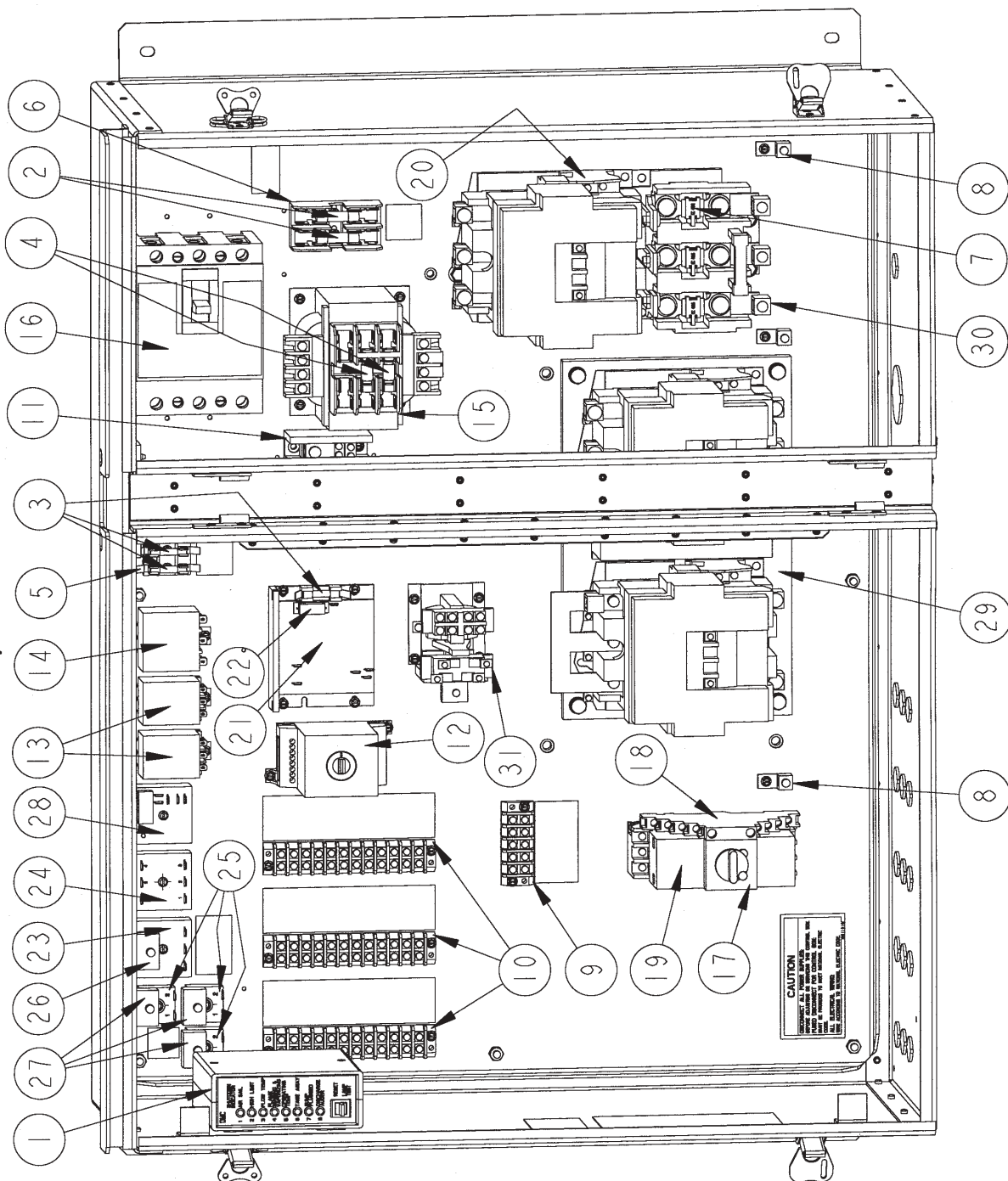
Calc-u-DRYER CONTROL BOX 230V, MODEL 40



Calc-u-DRYER CONTROL BOX 230 Volt, MODEL 40

1	5041218	SHUTDOWN INDICATOR ASSY
2	1EL0702	FUSE-ABC, CART. 12A, 250V
3	1EL0800	THERM.UNIT-TYPE CC, #CC 103
4	1EL0831	FUSEHOLDER- 2 POLE, 1/4
5	1EL0891	LUG-GRND,#TA-2(CSA), 600V, #2-14 WIRE
6	1EL0898	TERM. BLK-DBL(CSA), 5 TERM, 30A, 250V
7	1EL0900	TERM.BLK-DBL(CSA), 12 TERM, 30A,250V
8	1EL0909	PWR DIST. BLK(CSA) 1 CIRCUIT, 600V
9	1EL0911	PWR DIST. BLK(CSA) 3 CIRCUIT, 600 V
10	2EL0228	TEMP LIMIT CONTROLLER
11	2EL0273	RELAY-GEN. PURP.(CSA) 3PDT, 5A, 120V
12	2EL0279	RELAY-3 POLE, 30A (375 SERIES)
13	2EL0382	CIRCUIT BREAKER
14	2EL0397	OVRLD PROTEC.MOD W/6-10A OVRLD
15	2EL0398	STARTER AUXILIARY CONTACT
16	2EL0400	STARTER-W/O ORLD, 120V COIL
17	2EL0667	CONTACT - AUXILIARY
18	2EL0688	SCR CONTROL, 1-1/2 & 2HP
19	2EL0693	SCR CONTROL RESISTOR(0.015 OHM)
20	2EL1219	TIMER-.1 TO 10 MIN.
21	2EL1220	TIMER-10 TO 1000 SEC.
22	2EL1221	TIMER-.5 TO 60 SEC.(CSA)
23	2EL1222	TIMER-MODULE, .1-10 MIN.
24	2EL1223	TIMER-MODULE, .5-20 SEC.
25	2EL1224	TIMER-ON DEL, .5-10 SEC.
26	2EL0390A	STARTER- TWO CONTACTORS
27	2EL0390B	STARTER- CONTACTOR & RELAY
28	2EL0390C	STARTER- TIMING RELAY

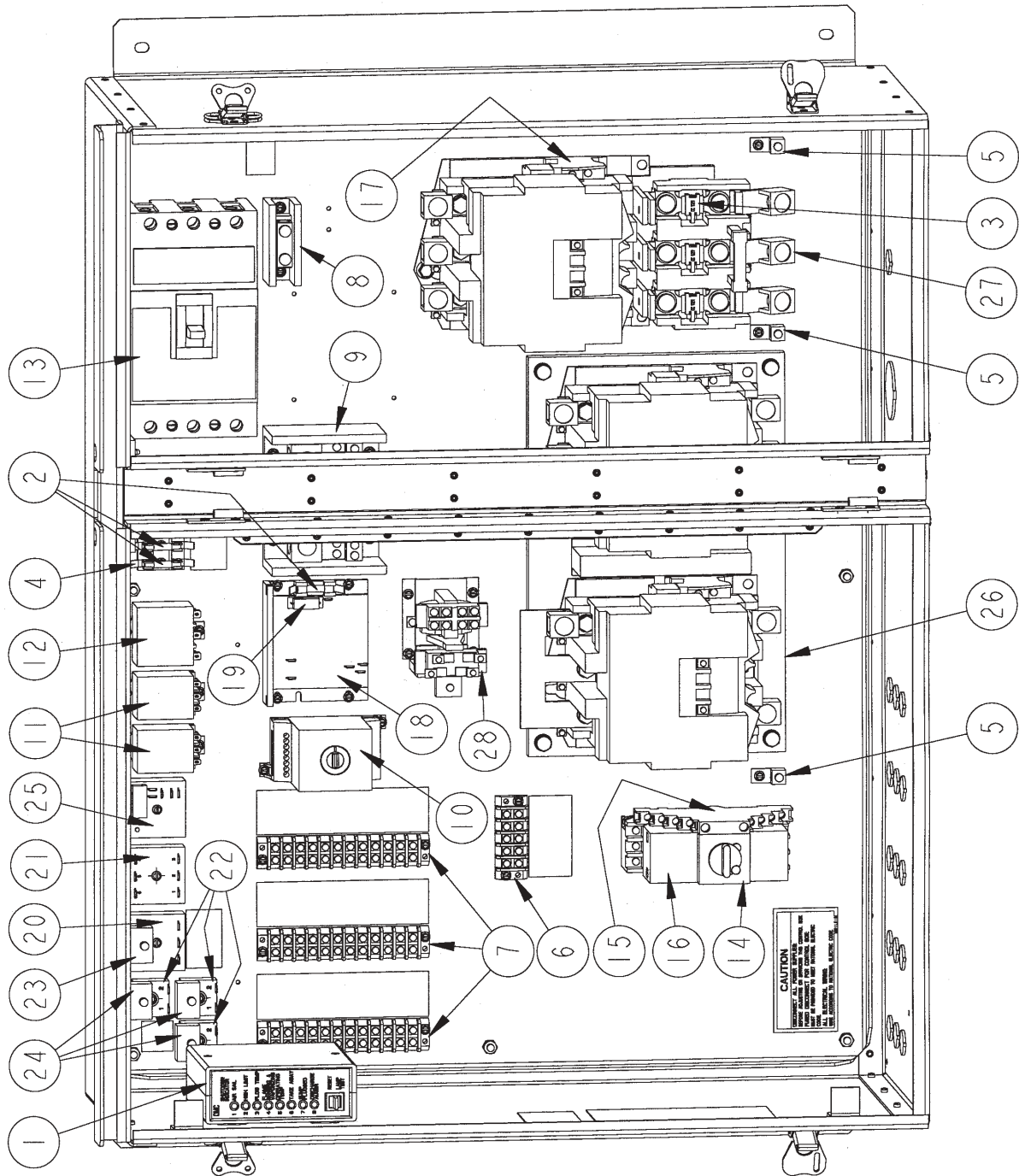
Calc-u-DRYER CONTROL BOX 460V, MODEL 40



Calc-u-DRYER CONTROL BOX 460Volt, MODEL 40

1	5041218	SHUTDOWN INDICATOR ASSY
2	1EL0701	FUSE-FLQ, CART. 15A, 500V
3	1EL0702	FUSE-ABC,CART. 12A, 250V
4	1EL0752	FUSE-CLASS CC TIME DELAY1.5A, REJ. TYP.
5	1EL0831	FUSEHOLDER-2 POLE, 1/4
6	1EL0839	FUSEHOLDER-BLK, 2-POLE, 30A, 600V
7	1EL0862	THERM. UNIT - TYPE CC, #CC 46.6
8	1EL0891	LUG-GRND(CSA)600V,#2-14WIRE
9	1EL0898	TERM.BLCK-DBL(CSA) 5 TERM. 30 A, 250V
10	1EL0900	TERM.BLCK-DBL(CSA) 12 TERM. 30A, 250V
11	1EL0911	PWR DIST BLK(CSA) 3 CIRCUIT, 600V
12	2EL0228	TEMP. LIMIT CONTROLLER
13	2EL0273	RELAY-GEN.(CSA)3PDT,5A,120V
14	2EL0279	RELAY-3 POLE,30A,375 SERIES
15	2EL0367	TRANSFORMER-CLSS 9070, 240/480-120V
16	2EL0381	CIRCUIT BREAKER
17	2EL0395	OVRLD PROTEC. MOD. W/ 2.5-4A OVRLD
18	2EL0398	STARTER AUX CONTACT
19	2EL0400	STARTER W/O OVRLD 120V COIL
20	2EL0667	CONTACT- AUXILIARY
21	2EL0688	SCR CONT.,1-1/2 & 2HP
22	2EL0693	SCR CONT.RESIST.(0.015 OHMS)
23	2EL1219	TIMER-.1-10 MIN.
24	2EL1220	TIMER-10-1000 SEC.
25	2EL1221	TIMER-.5-60 SEC. (CSA)
26	2EL1222	TIMER-MODULE, 1-10 MIN.
27	2EL1223	TIMER-MODULE, .5-20 SEC.
28	2EL1224	TIMER-ON DEL., .5-10 SEC.
29	2EL0391A	STARTER - TWO CONTACTORS
30	2EL0391B	STARTER - CONTACTOR & RELAY
31	2EL0391C	STARTER - TIMING RELAY

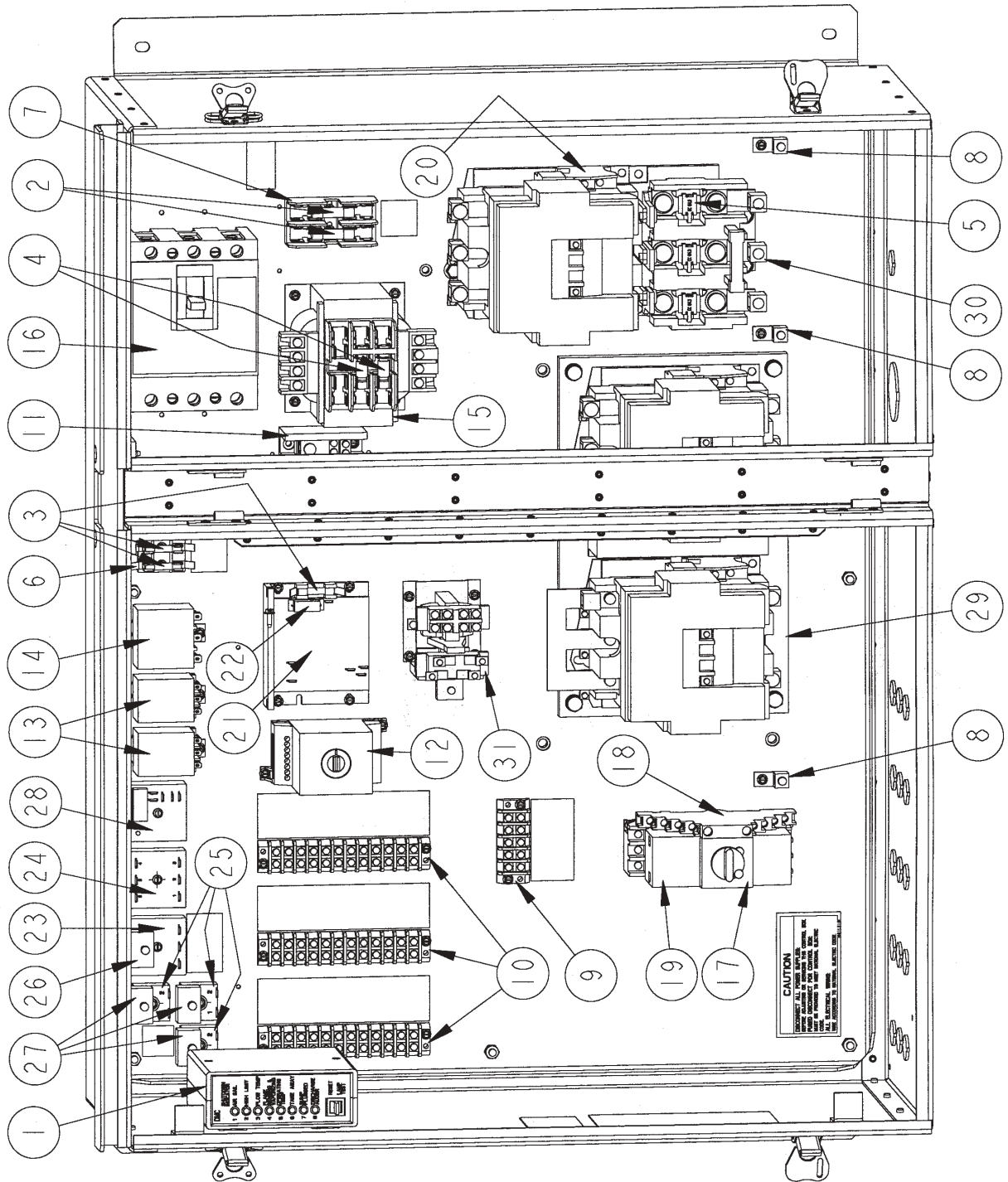
Calc-u-DRYER CONTROL BOX 230V, MODEL 60



Calc-u-DRYER CONTROL BOX 230Volt, MODEL 60

1	5041218	SHUTDOWN INDICATOR ASSY
2	1EL0702	FUSE-ABC,CART. 12A, 250V
3	1EL0806	THERM. UNIT-TYPE CC, #CC121
4	1EL0831	FUSEHOLDER-2 POLE, 1/4
5	1EL0891	LUG-GRND(CSA)600V,#2-14WIRE
6	1EL0898	TERM.BLCK-DBL(CSA) 5 TERM. 30 A, 250V
7	1EL0900	TERM.BLCK-DBL(CSA) 12 TERM. 30A, 250V
8	1EL0909	PWR DIST. BLK (CSA) 3 CIRCUIT, 600 V, 760 A
9	1EL0912	PWR DIST. BLK (CSA) 3 CIRCUIT, 600 V, 760 A
10	2EL0228	TEMP. LIMIT CONTROLLER
11	2EL0273	RELAY-GEN.(CSA)3PDT,5A,120V
12	2EL0279	RELAY-3 POLE,30A,375 SERIES
13	2EL0383	CIRCUIT BREAKER
14	2EL0397	OVRLD PROTEC. MOD. W/6-10A OVRLD
15	2EL0398	STARTER AUX CONTACT
16	2EL0400	STARTER W/O OVRLD 120V COIL
17	2EL0667	CONTACT- AUXILIARY
18	2EL0688	SCR CONT.,1-1/2 & 2HP
19	2EL0693	SCR CONT.RESIST.(0.015 OHMS)
20	2EL1219	TIMER-.1-10 MIN.
21	2EL1220	TIMER-10-1000 SEC.
22	2EL1221	TIMER-.5-60 SEC. (CSA)
23	2EL1222	TIMER-MODULE, 1-10 MIN.
24	2EL1223	TIMER-MODULE, .5-20 SEC.
25	2EL1224	TIMER-ON DEL., .5-10 SEC.
26	2EL0388A	STARTER - TWO CONTACTORS
27	2EL0388B	STARTER - CONTACTOR & RELAY
28	2EL0388C	STARTER - TIMING RELAY

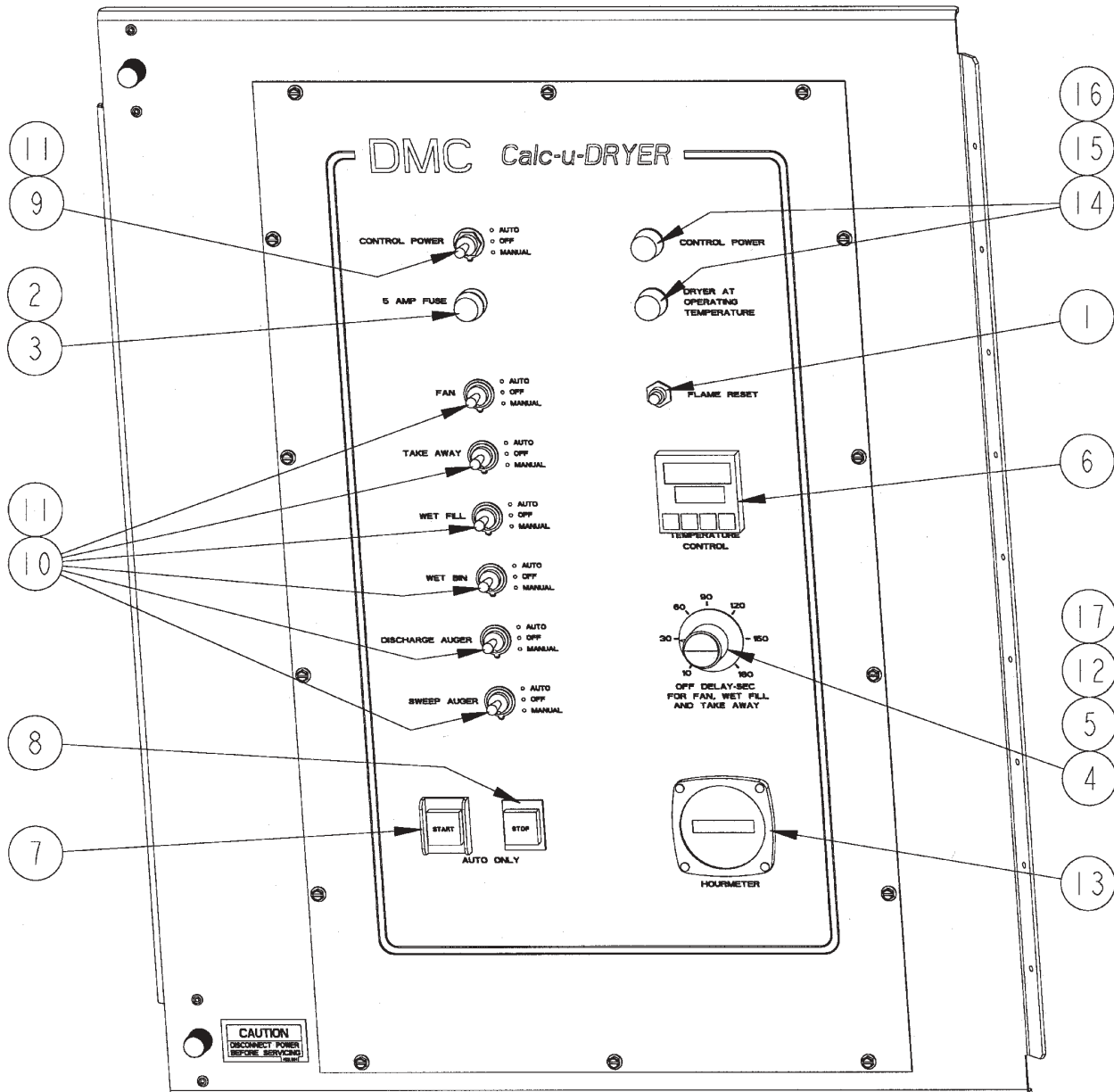
Calc-u-DRYER CONTROL BOX 460V, MODEL 60



Calc-u-DRYER CONTROL BOX 460Volt, MODEL 60

1	5041218	SHUTDOWN INDICATOR ASSY
2	1EL0701	FUSE-FLQ, CART. 15A, 500V
3	1EL0702	FUSE-ABC,CART. 12A, 250V
4	1EL0752	FUSE-CLASS CC TIME DELAY1.5A, REJ. TYP.
5	1EL0790	THERM UNIT - TYPE CC, #CC 64.3
6	1EL0831	FUSEHOLDER-2 POLE, 1/4
7	1EL0839	FUSEHOLDER-BLK, 2-POLE, 30A, 600V
8	1EL0891	LUG-GRND(CSA)600V,#2-14WIRE
9	1EL0898	TERM.BLCK-DBL(CSA) 5 TERM. 30 A, 250V
10	1EL0900	TERM.BLCK-DBL(CSA) 12 TERM. 30A, 250V
11	1EL0911	PWR DIST BLK(CSA) 3 CIRCUIT, 600V
12	2EL0228	TEMP. LIMIT CONTROLLER
13	2EL0273	RELAY-GEN.(CSA)3PDT,5A,120V
14	2EL0279	RELAY-3 POLE,30A,375 SERIES
15	2EL0367	TRANSFORMER-CLSS 9070, 240/480-120V
16	2EL0381	CIRCUIT BREAKER
17	2EL0395	OVRD PROTEC. MOD. W/ 2.5-4A OVRD
18	2EL0398	STARTER AUX CONTACT
19	2EL0400	STARTER W/O OVRD 120V COIL
20	2EL0667	CONTACT-AUXILIARY
21	2EL0688	SCR CONT., 1-1/2 & 2HP
22	2EL0693	SCR CONT.RESIST.(0.015 OHMS)
23	2EL1219	TIMER-.1-10 MIN.
24	2EL1220	TIMER-10-1000 SEC.
25	2EL1221	TIMER-.5-60 SEC. (CSA)
26	2EL1222	TIMER-MODULE, 1-10 MIN.
27	2EL1223	TIMER-MODULE, .5-20 SEC.
28	2EL1224	TIMER-ON DEL., .5-10 SEC.
29	2EL0387A	STARTER - TWO CONTACTORS
30	2EL0387B	STARTER - CONTACTOR & RELAY
31	2EL0387C	STARTER - TIMING RELAY

Calc-u-DRYER CONTROL MODULE



Calc-u-DRYER CONTROL MODULE

1	851808	SWITCH-TIME DELAY, E.T.A.
2	1EL0754	FUSE-AGC, CART.(CSA) 5A, 32V
3	1EL0826	FUSEHOLDER-PAN MNT(CSA)30A,250V
4	1EL0852	KNOB-CNTRL,BLACK 1 DIAM. FOR 1/4 SHFT
5	1EL2042	GROMMET-RUBBER .62OD x .38ID x .15T
6	2EL0207	TEMPERATURE CONTROL
7	2EL0618	SWITCH-PUSHB, SPST(CSA) GRN
8	2EL0619	SWITCH-PUSHB, SPST(CSA) RED
9	2EL0627	SWITCH-TOGGLE, DPDT, 15A, QUICK
10	2EL0632	SWITCH-TOGGLE, SPDT(CSA) TAB
11	2EL0643	SWITCH-LOCK. RING FOR .47" BUSH,.72"OD
12	2EL0677	POTENTIOMETER- 1M OHM
13	2EL0686	HOUR METER
14	2EL1258	SOCKET-MINIATURE LAMP
15	2EL1259	LAMP - 120V
16	2EL1260	LAMP CAP - RED
17	3FH0963	WASHER FLT.-.500 OD x .283 ID x .062



Calc-u-DRYER

MODELS 40 & 60

OWNER'S MANUAL

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