Airstream Grain Conditioning Systems

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DRYER OPERATION

AND SERVICE MANUAL

PNEG-341CE
1200 & 1200S SERIES
TWO FAN PORTABLE
DRYER MODELS

CE

AIRSTREAM
a division of
THE GSI GROUP

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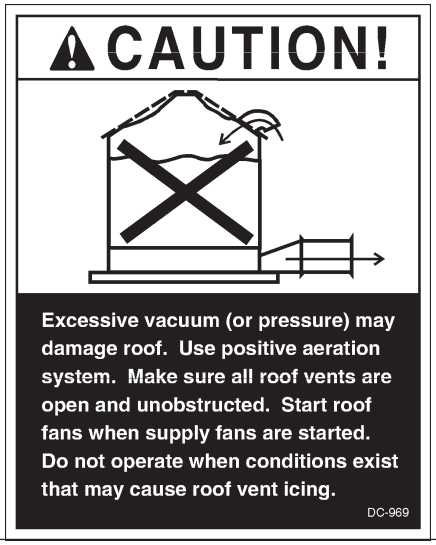
ROOF WARNING, OPERATION & SAFETY

ROOF DAMAGE WARNING AND DISCLAIMER



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DRYER OPERATION

Thank you for choosing a GSI/ Airstream product. It is designed to give excellent performance and service for many years.

This manual describes the operation and service for all standard 1200 Series two fan grain dryers. These models are available for liquid propane or natural gas fuel supply, with either single phase 230 volt, three phase 220, 380, or 440 volt electrical power.

The principal concern of the GSI Group, Inc. ("GSI") is your safety and the safety of others associated with grain handling equipment. This manual is written to help you understand safe operating procedures, and some of the problems that may be encountered by the operator or other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment, or who are in the dryer area. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

This dryer is designed solely for the purpose of drying agricultural corn, grain, and seeds. Use of this dryer in any ways or under configurations other than those indicated in this manual is a misuse of the machine, will invalidate the warranty, and may lead to serious injury or death. If in any doubt, contact GSI or your dealer.

SAFETY ALERT SYMBOL

The symbol shown is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions. It means "ATTENTION", "WARNING", "CAUTION", and "DANGER". Read the message and be cautious to the possibility of personal injury or death.

WARNING! BE ALERT!

Personnel operating or working around this equipment should read this manual. This manual must be delivered with the equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

SAFETY ALERT DECALS

Three decals displayed on all Airstream Dryers. Belt drives, chain driven meter rolls and combustible fuels must be treated with caution.

SAFETY PRECAUTIONS

1. Read and understand the operating manual before trying to operate the dryer. This manual contains important guidelines and sequence of events to help you install and operate your dryer safely and successfully. Follow the guide lines closely.
2. After towing the dryer, ensure it is parked on a level surface and that suitable precautions have been taken to prevent it from rolling, i.e. block the wheels in both directions.
3. Never operate the dryer while the guards are removed.
4. BEFORE any maintenance switch the dryer OFF at the mains electrici ty and lock off. This should include all associated conveyors, augers and other associated equipment. Maintenance requiring the power to be ON, such as testing electrical circuits, must be done by a suitable qualified electrician.
5. Check for gas leaks at all gas pipe connections. If any leaks are de tected, do not operate dryer. Shut down and repair before further opera tion.
6. Never attempt to operate the dryer by jumping or otherwise bypassing any safety devices on the unit.
7. Set pressure regulator to avoid excessive gas pressure applied to burner during ignition and when burner is in operation. Do not exceed maximum recommended drying temperature.
8. Keep the dryer clean. Do not allow fine material to accumulate in the plenum chamber.
9. Keep auger drive belts tight enough to prevent slippage.
10. Never work in or on the dryer whilst it is on or when the electrical supply is on as the fans, augers and burners may start automatically.
11. Keep the air inlet to the fan clear of any obstructions and free from combustible materials.
12. Before attempting to remove and reinstall any propeller, make certain to read the recommended procedure listed within the servicing section of the manual.
13. Be certain that capacities of auxiliary conveyors are matched to dryer auger capacities.
14. Clean grain is easier to dry. Fine material increases resistance to airflow and requires removal of extra moisture.
15. Never enter the dryer plenum chamber unless:
    a) The electrical power is locked off and the key is in your possession.
    b) The gas is shut off from the gas supply.
    c) The dryer has stopped operating and is cool.
16. Dust and noise are inherent hazards with this type of machine, which can be harmful to your health. To reduce risks:
    a) Avoid working around the dryer.
    b) When around the dryer, wear suitable ear defenders and a dust mask suited to protection against grain dust.

READ THESE INSTRUCTIONS BEFORE OPERATION AND SERVICE SAVE FOR FUTURE REFERENCE

USE CAUTION IN THE OPERATION OF THIS EQUIPMENT

The design and manufacture of this dryer is directed toward operator safety. However, the very nature of a grain dryer having a gas burner, high voltage electrical equipment and high speed rotating parts, does present a hazard to personnel which can not be completely safeguarded against, without interfering with efficient operation and reasonable access to components.

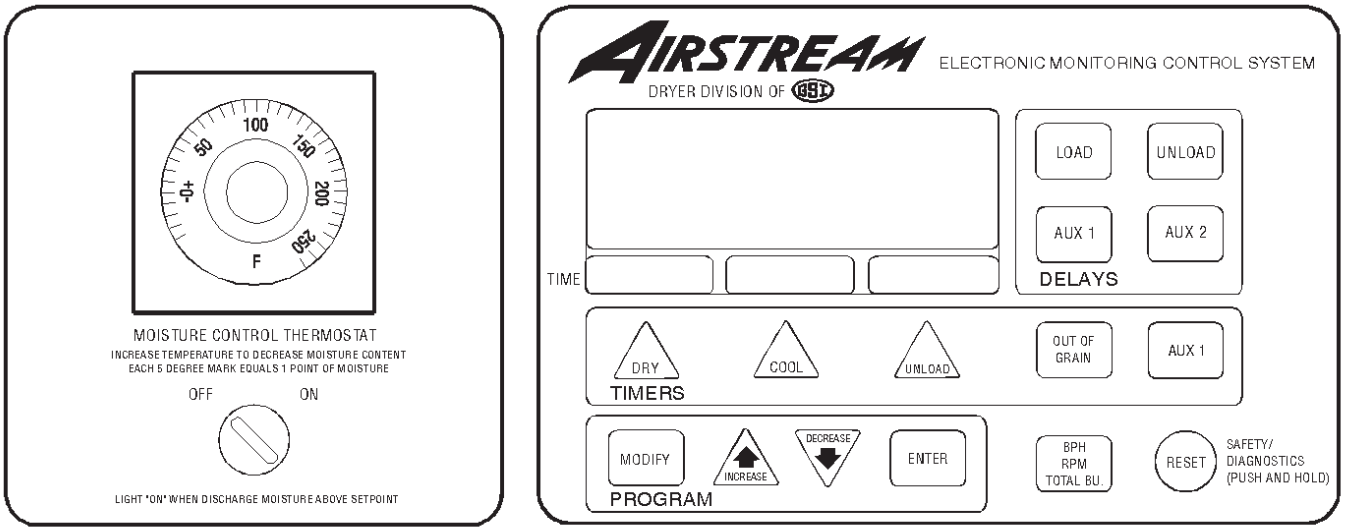
Use extreme caution in working around high speed fans, gas fired heaters, augers and auxiliary conveyors, which may start without warning when the dryer is operating on automatic control.

KEEP THE DRYER CLEAN
DO NOT ALLOW FINE
MATERIAL TO ACCUMULATE
IN THE PLENUM CHAMBER
OR SURROUNDING THE
OUTSIDE OF THE DRYER

Continued safe, dependable operation of automatic equipment depends, to a great degree, upon the owner. For a safe and dependable drying system, follow the recommendations within this manual, and make it a practice to regularly inspect the operation of the unit for any developing problems or unsafe conditions.

Take special note of the safety precautions listed above before attempting to operate the dryer.

DRYER CONTROL PANEL



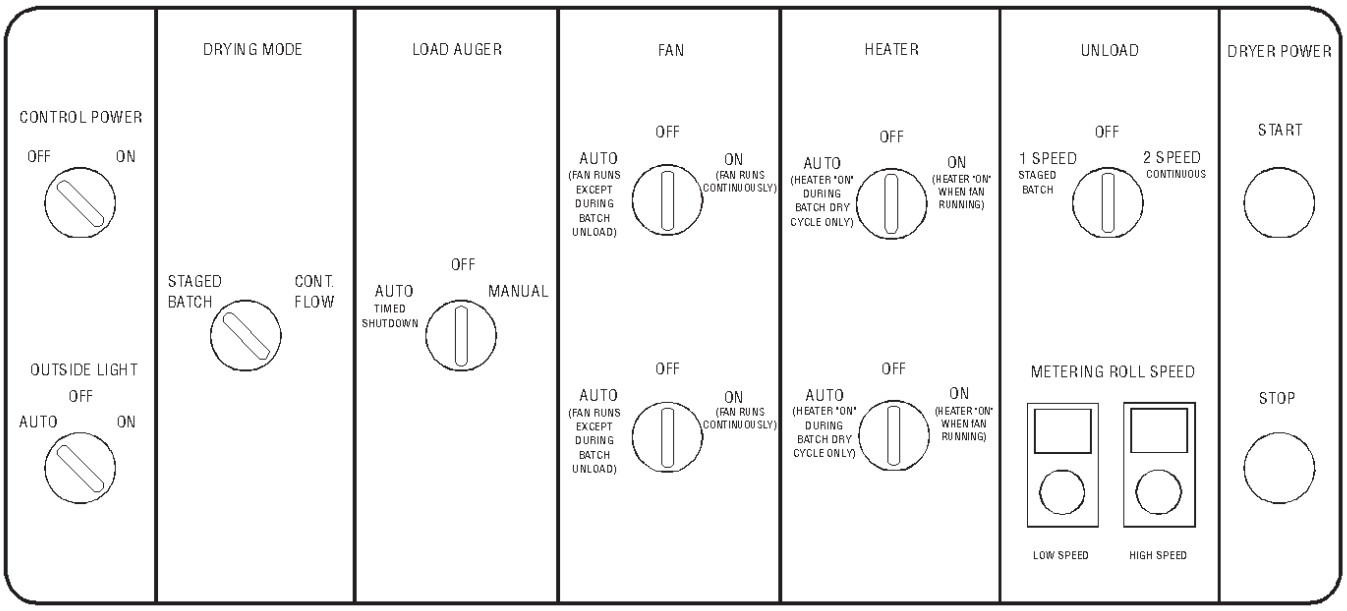


Figure 1: The grain dryer control panel with the Electronic Monitoring Control System in the upper right panel.

DRYER CONTROL PANEL FEATURING THE ELECTRONIC MONITORING CONTROL SYSTEM

The control panel provides easy access to gauges and controls, and the illuminated switches provide a quick reference for every operating function. The patent pending Electronic Monitoring Control System is a computerized control system that gives instant information regarding dryer operation.

MOISTURE CONTROL THERMOSTAT

This electronic thermostat controls the moisture level of discharged grain by sensing grain column temperature.

MOISTURE CONTROL SWITCH

This switch turns the power on or off to the moisture control thermostat. It lights up when the grain column temperature is below the thermostat set point.

DRYER CONTROL PANEL

CONTROL POWER SWITCH

The power to the Electronic Monitoring Control System is turned on or off with this switch.

OUTSIDE LIGHT

The dryer service light is turned on or off here. It also may be set on auto, which turns the light on while the dryer is running and off if a shutdown occurs.

DRYING MODE SWITCH

This is used to select staged batch or continuous flow drying. The switch will light only after the Electronic Monitoring Control System has been turned on, the safety circuit is okay and the reset button on the control panel has been pressed.

LOAD AUGER SWITCH

This is used to select the operation of the fill auger. In both the auto and manual position the load auger will operate if the dryer is low on grain and will automatically shut off when the dryer is full. In the auto position only, the dryer will shut down after a preset period of time set on the out of grain timer, or if grain flow is interrupted to the dryer. The switch will light whenever the load auger is operating.

(Note: If the load auxiliary motor overload relay is being utilized in the dryer control panel, this switch will also control the operation of the auxiliary equipment).

FAN SWITCHES

Each fan is turned on or off with this switch. The on position operates the fan continuously during staged batch and continuous flow modes. The auto position operates the fan in staged batch during the dry and cool cycle. The switch will light up whenever the airflow switch is sensing airflow and the dryer is full of grain.

HEATER SWITCHES

Each burner is turned on or off with this switch. The auto position operates the burner in staged batch during the dry cycle. The on position will operate the burner only when the fan is running. The switch will light up only when the flame sensor detects the flame.

UNLOAD SWITCH

The unload switch turns the metering rolls and discharge auger on or off, and selects the operation of the metering rolls.

- In the 2 speed position if the moisture control switch is on, and the drying mode switch is turned to cont. flow, the metering roll speed will alternate between the high speed metering roll potentiometer setting and the low speed metering roll potentiometer setting depending on the control signal from the moisture control thermostat. The discharge auger will operate continuously.

- In the 1 speed position, if the moisture control switch is on, and the drying mode switch is turned to cont. flow, the metering roll speed will operate at the high speed metering roll potentiometer setting or turn off depending on the control signal from the moisture control thermostat. The discharge auger will operate whenever the metering rolls are operating.

- In both the 1 speed or the 2 speed position, if the moisture control switch is off, and the drying mode switch is turned to cont. flow, the metering roll speed can be manually controlled by adjusting the high speed metering roll potentiometer. The discharge auger will operate continuously.

- If the drying mode switch is turned to staged batch, the unload switch should be set to the 1 speed position. The discharge auger and metering rolls will only operate during the unload cycle of the staged batch operation, and the speed of the metering rolls is adjusted using the high speed metering roll potentiometer.

(Note: If the unload auxiliary motor overload relay is being utilized in the dryer control panel, this switch will also control the operation of the auxiliary equipment.)

LOW SPEED METERING ROLL POTENTIOMETER

This is used to adjust the low speed of the metering roll when the 2 speed automatic moisture control feature of the dryer is in use.

DRYER CONTROL PANEL

HIGH SPEED METERING ROLL POTENTIOMETER

This is used to:

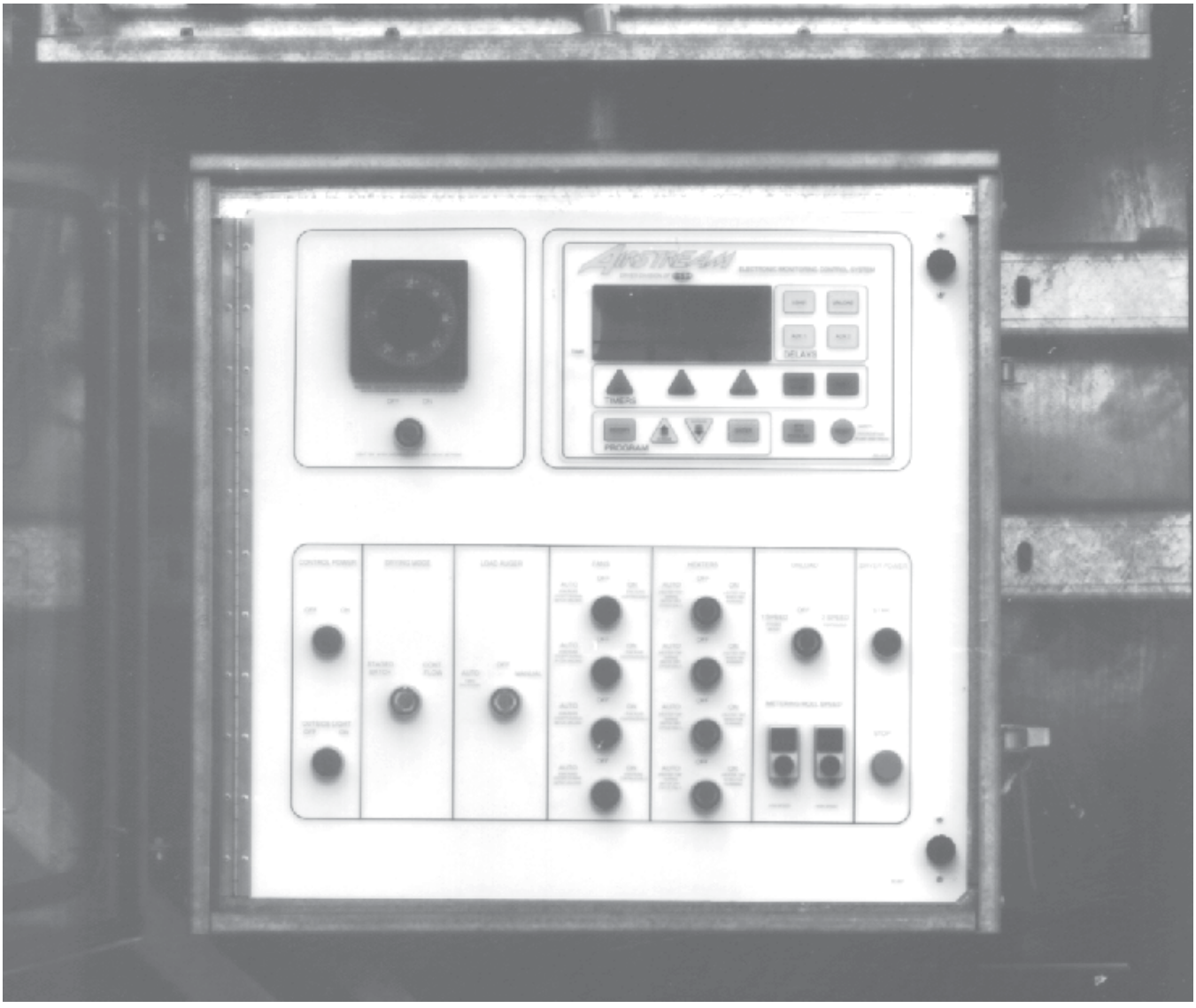
- Set the high speed of the metering roll when the two speed automatic moisture control feature of the dryer is utilized.
- Set the speed of the metering rolls when the one speed automatic moisture control feature of the dryer is utilized.
- Set the speed of the metering rolls during continuous flow operation when the moisture control is not used.
- Set the rate of grain discharge from the dryer during the unload cycle of staged batch dryer operation.

DRYER POWER START SWITCH

This switch starts and operates the dryer based on switch settings. If other switch settings are in the off position, individual dryer components can be operated by turning the drying mode switch to continuous flow, pressing the dryer power start button and then turning on the desired dryer component.

DRYER POWER STOP SWITCH

This switch stops all dryer functions. If an automatic dryer shutdown occurs, first determine and correct the cause of the shutdown. Then, press the dryer power stop button to reset the dryer before restarting.



An Airstream Dryer Control Panel (four fan model) mounted on the dryer.

DRYER CONTROL PANEL

ELECTRONIC MONITORING CONTROL SYSTEM

The Electronic Monitoring Control System (Figure 2) controls all timing functions and safety circuit checks. It is designed to simplify dryer operation by providing printed messages and warnings on its liquid crystal display (LCD).

TURNING ON THE ELECTRONIC MONITORING CONTROL SYSTEM

Turn the control power switch to on. The monitor will display a copyright message and model number, total running time in hours and minutes and the current time and date. To activate the controller press the reset button.

SETTING THE DRY, COOL, BATCH AND UNLOAD TIMERS

These switches are used to set the cycle times in the staged batch drying mode only. The drying mode switch must be in the staged batch position. The current setting on these three timers is displayed directly above each timer button. To change the setting of these timers follow these instructions:

1. Press the dry, cool or unload timer button.
2. Press the modify button.
3. Press the increase or decrease button to adjust the settings.
4. Press the enter button.

During operation the remaining time on each timer is displayed on the screen. If the power goes out or if the dryer is stopped, these times are saved by the controller. When the dryer is restarted the timers will continue timing down. The timers will return to their initial setting if the reset button is pushed.

SETTING THE OUT OF GRAIN TIMER

If the dryer runs out of grain while the load auger switch is in the auto position, the out of grain timer automatically shuts off the dryer after the period of time preset on the timer. When pressed, the display will show the amount of time left on the timer and the percentage of time used by the last load. A second screen will appear with the timer's setting, and may be modified as described in the batch timer section.

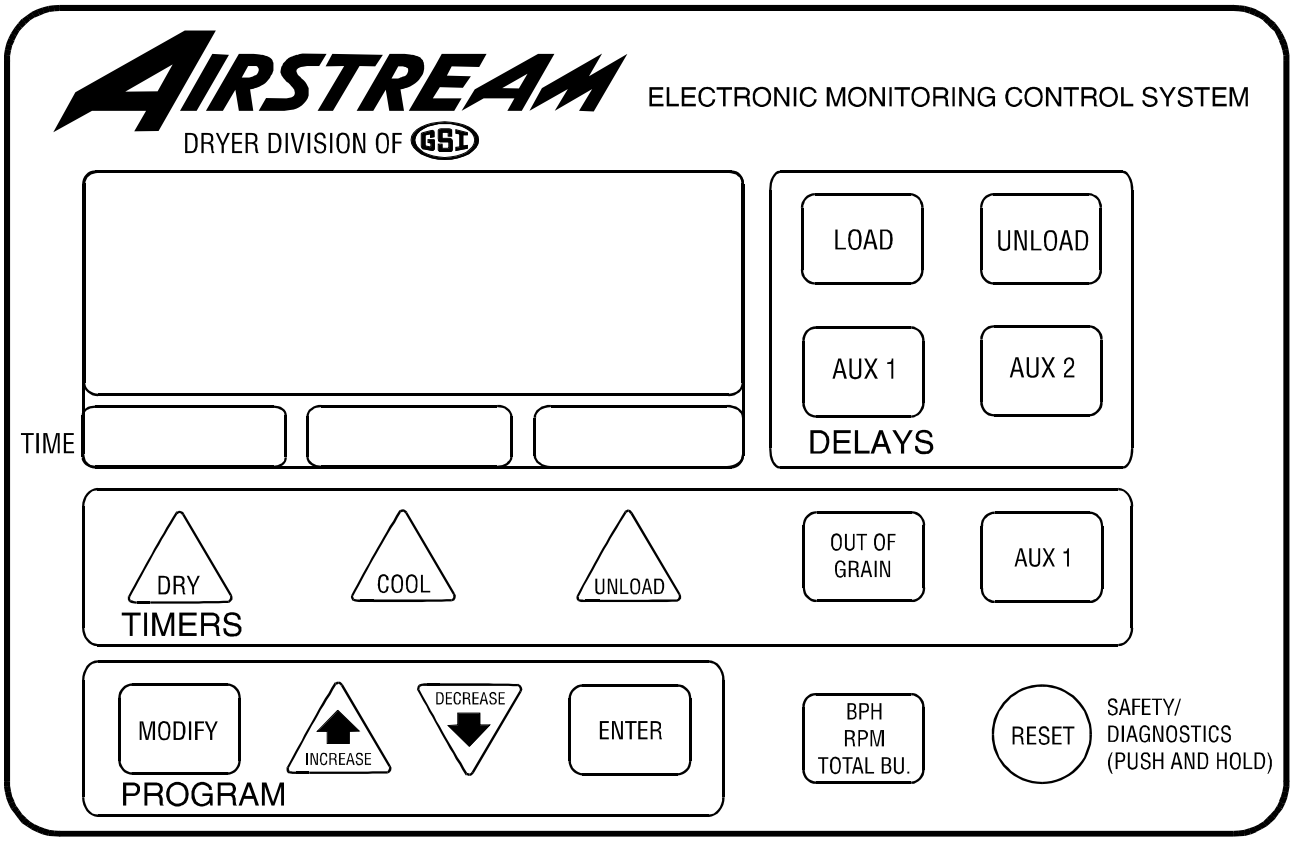
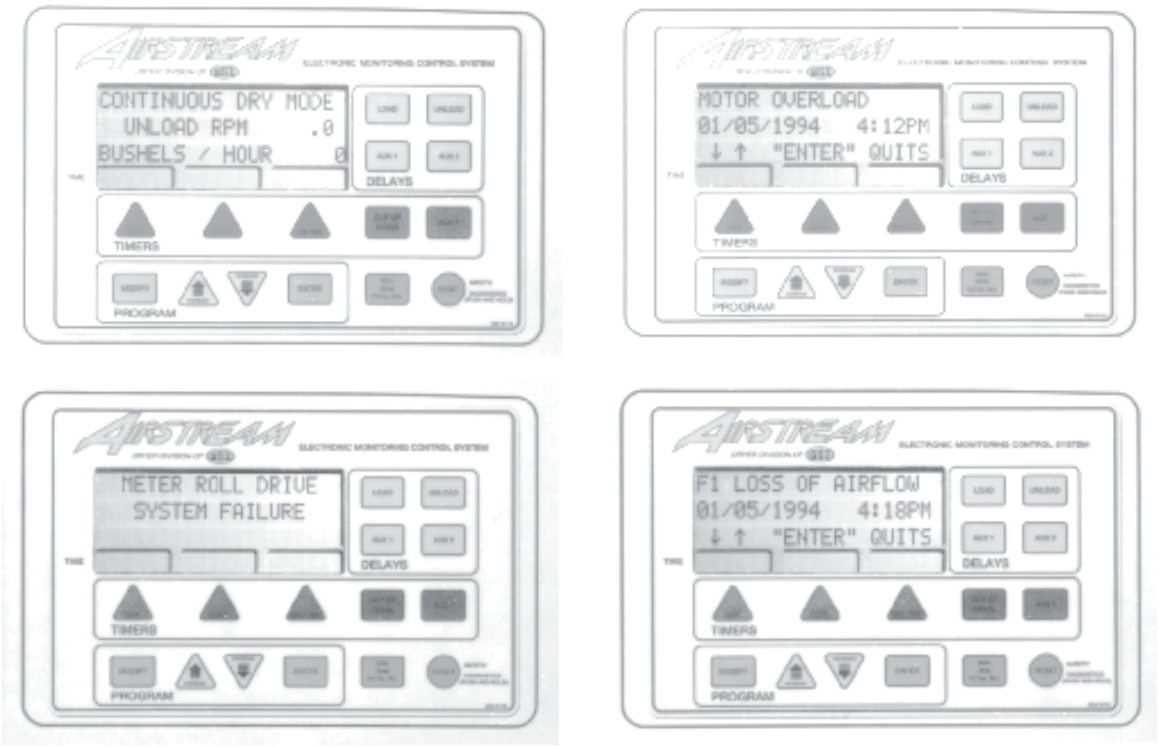


Figure 2: The Airstream Electronic Monitoring Control System

DRYER CONTROL PANEL



The Airstream Electronic Monitoring Control System showing several different LCD displays.

SETTING THE LOAD AND UNLOAD DELAYS

The load delay is used to delay the starting of the load auger when the dryer is unloading to prevent the load auger from starting and stopping. The unload delay is used to control the amount of time the unload auger runs after the metering rolls stop to allow for auger cleanout. Both the load and unload delays are set using the same procedure as the timers. The aux 1 and aux 2 delays are presently not being used.

UTILIZING THE BUSHEL COUNTER

When operating the dryer the LCD display will show the dryer mode of operation on the first line, the bushels per hour or the metering roll rpm on the second line and the total bushels dried on the third line. By pressing the bph/rpm/total bu button the second line will alternate between the metering roll rpm's or the bushel per hour rate. The total bushels dried reading is the total since the bushel counter was last reset. To reset the bushel counter, press and hold the reset button for five seconds. Press the enter button through the date and time settings, and follow the instructions displayed on the LCD for resetting the counter.

In the batch mode, the first line of the LCD display tells which timer is being used, and the second line switches between total batches, unload rpm or total bushels. The third line indicates total dry time, and the fourth line is time remaining on the timers.

DRYER SAFETY CIRCUIT

The Electronic Monitoring Control System continuously checks all safety circuits on the dryer, and will automatically shut the dryer down should a problem occur. The cause of the dryer shutdown will be displayed on the LCD display, and a beeper will sound on the controller. To restart the dryer after a safety shutdown, first correct the reason for the shutdown, and then press the dryer power stop button to reset the circuit. Press the start button.

The Electronic Monitoring Control System stores in its memory the time, date and cause for the last 25 dryer safety shutdowns. To review this information, hold the reset button in for five seconds. The procedure for reviewing the safety circuit shutdown log will be displayed on the LCD display.

SAFETY CIRCUIT SHUTDOWN MESSAGES

BURNER 1 OR 2 VAPOR HIGH TEMPERATURE

The LP gas vapor temperature sensor located in the gas pipe train downstream from the vaporizer, has opened indicating that the vaporizor is running too hot and must be readjusted. This sensor is set at 93°C and automatically resets itself when cool. The message will distinguish between burner 1 and 2.

BURNER 1 OR 2 WARNING FLAME NOT DETECTED

The flame sensor has failed to detect a burner flame indicating that the burner has failed to light, there is a problem with the flame sensing circuitry or the dryer is not getting burner fuel. The message will distinguish between burner 1 and 2.

FAN 1 OR 2 HOUSING HIGH TEMPERATURE

The temperature high limit located on the fan/burner housing has opened, indicating an over temperature condition has occurred towards the rear of the fan/heater housing. This control is set at 93°C and must be manually reset. The message will distinguish between fan 1 and 2.

BURNER 1 OR 2 SHUT-DOWN LOSS OF AIRFLOW

The contacts in the air switch have opened due to insufficient airflow for the burner to operate. The message will distinguish between burner 1 and 2.

GRAIN DISCHARGE WARNING

The lid on the grain discharge box has opened, indicating that grain is not being taken away fast enough at the discharge box.

LOWER ADJUSTABLE GRAIN HIGH TEMPERATURE

An over temperature condition has occurred in the right side (left and right as viewed from behind the dryer) grain column causing the control to shut down the dryer. This control is adjustable from 27° to 104°C, and automatically resets itself when cool.

LOWER FIXED GRAIN HIGH TEMPERATURE

An over temperature condition has occurred in the left side (left and right as viewed from behind the dryer) grain column causing the control to shutdown the dryer. This control is set at 99°C and automatically resets itself when cool.

MOTOR OVERLOAD

One of the thermal overloads on either the fan, load, unload or auxiliary motors has opened, indicating an overcurrent condition. The overloads must be manually reset.

OUT OF GRAIN WARNING/ UNLOAD CLEANOUT

The dryer has run low on grain, and the out of grain timer has timed out, shutting the dryer down. The unload auger will clean out the dryer if it is in continuous flow operation.

12 VOLT POWER SUPPLY WARNING

The right circuit breaker on the input/ output board has tripped.

L1 VOLTAGE LOST

The left circuit breaker located on the input/output board of the Electronic Monitoring Control System has tripped, or one of the hardware timers has shut down the dryer.

METERING ROLL DRIVE SYSTEM FAILURE

The metering roll drive system has failed to turn. A broken chain or jammed metering roll is a possibility.

RIGHT METERING ROLL FAILURE

The right (as viewed from behind the dryer) metering roll has stopped turning, or the sensor has been damaged.

LEFT METERING ROLL FAILURE

The left (as viewed from behind the dryer) metering roll has stopped turning, or the sensor has been damaged.

PLENUM 1 OR 2 HIGH TEMPERATURE

An over temperature condition has occurred inside the dryer plenum. This control is a 149°C limit and automatically resets itself when cool. The message will distinguish between plenum 1 and 2.

AUXILIARY SAFETY SHUTDOWN

A shutdown has occurred due to an auxiliary installed safety feature.

FAN 1 OR 2 FAILURE NO AIRFLOW

Contacts in the air switch have opened due to the fan not turning, or the air switch may need adjustment. The message will distinguish between fan 1 and 2.

FAN 1 OR 2 CANNOT START CHECK AIR SWITCH

The air switch contacts have closed prior to the fan starting, indicating a freewheeling blade or improper setting of the air switch. The message will distinguish between fan 1 and 2.

DRYER PRE START CHECKS

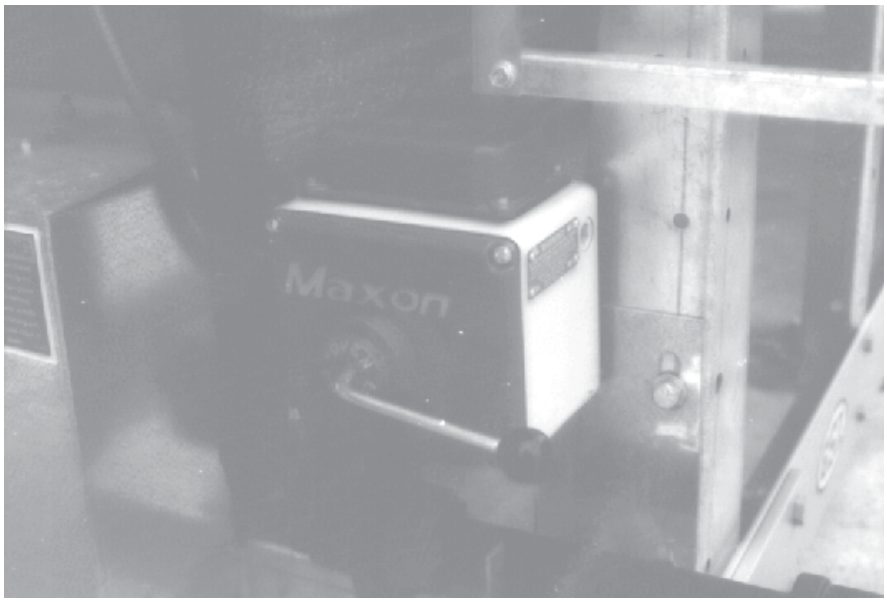
PRE SEASON INSPECTION

This section gives a series of checks to be carried out on the dryer before starting. If any of the checks fail to produce the stated result, you should consult GSI or your dealer to assess what the problem is. YOU SHOULD NOT ATTEMPT TO USE THE DRYER UNLESS ALL THE PRE-START CHECKS HAVE BEEN SUCCESSFULLY COMPLETED.

INSPECT THE METERING ROLLS

Open all metering roll access doors and inspect each compartment for any bolts, nuts or other foreign material, that may cause possible jamming of the metering rolls.

BEFORE ATTEMPTING TO OPERATE THE DRYER MAKE SURE ALL SAFETY SHIELDS ARE IN PLACE, ALL BOTTOM CLEANOUT AND REAR ACCESS DOORS ARE CLOSED AND ALL PERSONNEL ARE CLEAR OF THE DRYER



The Maxon safety shut off valve.

SET CONTROL SWITCHES

Moisture Control Switch-ON
Moisture Control Thermostat-MAXIMUM TEMPERATURE
Load Switch-OFF
Unload Switch-OFF
Fan Switches-OFF
Burner Switches-OFF
Out of Grain Timer-8 MINUTE
Load Delay-30 SECONDS
Unload Delay-30 SECONDS
Metering Roll Speed-LOW AND HIGH SPEED SETTINGS PUT ON ZERO
Dry Timer-60 MINUTE
Cool timer-20 MINUTE
Unload timer-10 SECONDS
Mode Switch-CONTINUOUS FLOW

ELECTRICAL POWER

Turn on the electrical power supply to the dryer; set all circuit breakers to on, including the safety disconnect handle mounted on front of the dryer power panel.

CONTROL POWER SWITCH

Turn the control power switch to on. The switch will light up. A copyright message, model number, total running time in hours and minutes, current date and time will appear. At this point the controller will lock out all other dryer functions. Once the date and time appear, press reset and the dryer will perform its safety circuit check. If a fault is found, the cause will be displayed on the LCD. If all are found safe, the controller will supply power to the electronic fuel shut-off valve, if so equipped, and the drying mode switch will light up, indicating that the dryer is ready to be started.

POWER START BUTTON

Push the dryer start button, and all the selector switches on the control panel will be activated.

DRYER PRE START CHECKS

FUEL CHECK

If using LP gas, make sure the tank has plenty of fuel and that the tank does not have a regulator mounted to it. If using natural gas, make sure an adequate supply is available.

If using LP gas, slowly open the main fuel supply valve at the tank. If using natural gas, turn on the valve along the supply line. Then, open the electronic shut off valve (Maxon valve), if so equipped, or open the manual shut off valve on the dryer to allow fuel flow to the dryer. Inspect all gas lines and connections for possible leaks.

Any gas leaks must be fixed immediately!

LOAD AUGER

With the grain supply shut off, quickly bump the load auger switch to manual, and see if the load auger rotates clockwise as viewed from the drive end, or counterclockwise if the dryer is a front load model. If the wet grain supply auxiliary is wired to the dryer it should also rotate in the correct direction at this time. Turn the load auger switch to the auto position. The top auger and wet grain supply auxiliary should run for one minute, and then the dryer will shutdown leaving the safety shutdown message (out of grain warning) displayed. Press the dryer power stop button to reset the panel, then press the start button.

ONE SPEED OPERATION

To check one speed operation place the unload switch in the one speed setting. Turn up the high speed metering roll dial until the metering rolls start rotating. The bottom auger should rotate counterclockwise as viewed from the drive end. The metering roll drive motor should rotate clockwise as viewed from the drive end of the gear box. If the dry grain take away auxiliary is wired to the dryer, it should start and rotate in the proper direction.

MOISTURE CONTROL THERMOSTAT

To check the moisture control thermostat leave the unloading switch on one speed, and slowly turn down the moisture control thermostat. As the setting is decreased, the indicator light should come on and the metering rolls should stop operating. The bottom auger will stop after the 30 second clean out delay, providing that the dryer is still being held by the moisture control thermostat. Rotate the moisture control thermostat up to its maximum setting. The light should go off, and the metering rolls should restart along with the bottom auger if it has stopped.

TWO SPEED OPERATION

To check two speed operation move the switch to the two speed position, set low speed on 200 and high speed on 600. Slowly turn the thermostat until the moisture control switch light comes on. The metering roll speed is now controlled by the low speed dial. Turning the thermostat the other way until the light goes out leaves the metering rolls controlled by the high speed dial.

METERING ROLL OPERATION

To check the metering roll operation turn either the low speed or high speed knob clockwise, and the metering roll speed should increase. Turning either knob counterclockwise will de-

crease the speed. Make sure the drive chain tension is properly adjusted and all sections of the metering rolls rotate. Turn the unload switch off after these checks are complete. The bottom auger will continue to run for 30 seconds after the switch is turned off to allow for cleanout.

FAN SWITCHES

Bump each fan switch and observe the fan rotation. The fan should run counterclockwise. Sometimes on three phase models all motors will run backwards. They can easily be reversed by interchanging two of the three power supply wires. All power should be switched and locked off before attempting to reverse the connections. Reverse the two outside wires, L1 and L3, and leave the middle one in the same position.

Note: If the dryer is empty, the fans or burners will not operate. The fans cannot create enough static pressure to engage the air switch. You will receive a loss of airflow message.

BURNER SAFETY

To check the burner safety function, first make sure the main gas valve is off. Turn the fan switch on and allow the fan to start. Then, turn the heater switch on for that fan. The dryer will shut down after 20 seconds. The safety message, "Burner 1 warning flame not detected" will appear. Restart dryer and repeat for the second fan/heater.

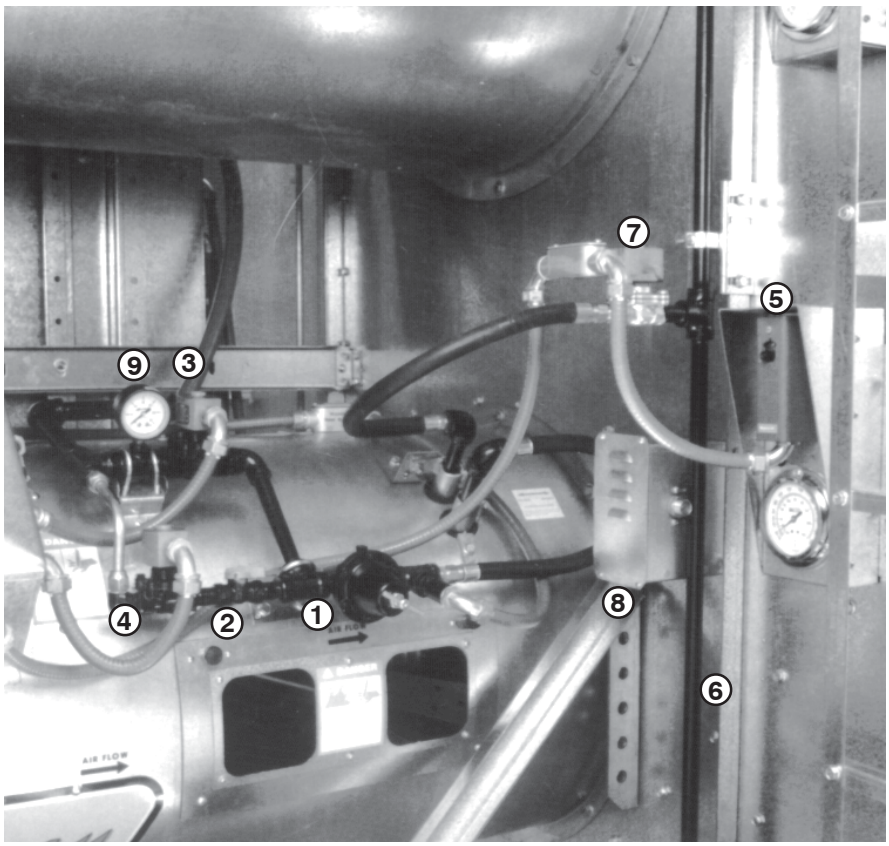
BURNER TEST FIRE

Test fire each burner by starting the fan. Then, turn the burner switch to on. Turn on the fuel supply, and the burner should ignite after a short purge delay of approximately 10 seconds. Gas pressure should be shown on the gauge. At this time adjust the burner hi-lo fire thermostat to 93°C, causing the burner to operate on hi-fire. This thermostat is located on the front left side of the dryer. Observe the gas pressure on gauge, and turn the thermostat to its minimum setting, causing the burner to cycle into lo-fire. As the burner thermostat is turned down the gas pressure should also show a noticeable drop, indicating that the hi-fire solenoid is closed and the burner is being supplied with less gas through the low fire control valve. At this time set the hi-fire and lo-fire pressure settings. Use the pressure regulator for hi-fire and the ball valve for lo-fire. The thermostat should cycle between high and low, approximately 4 to 5 times per minute.

Approximate settings should be:

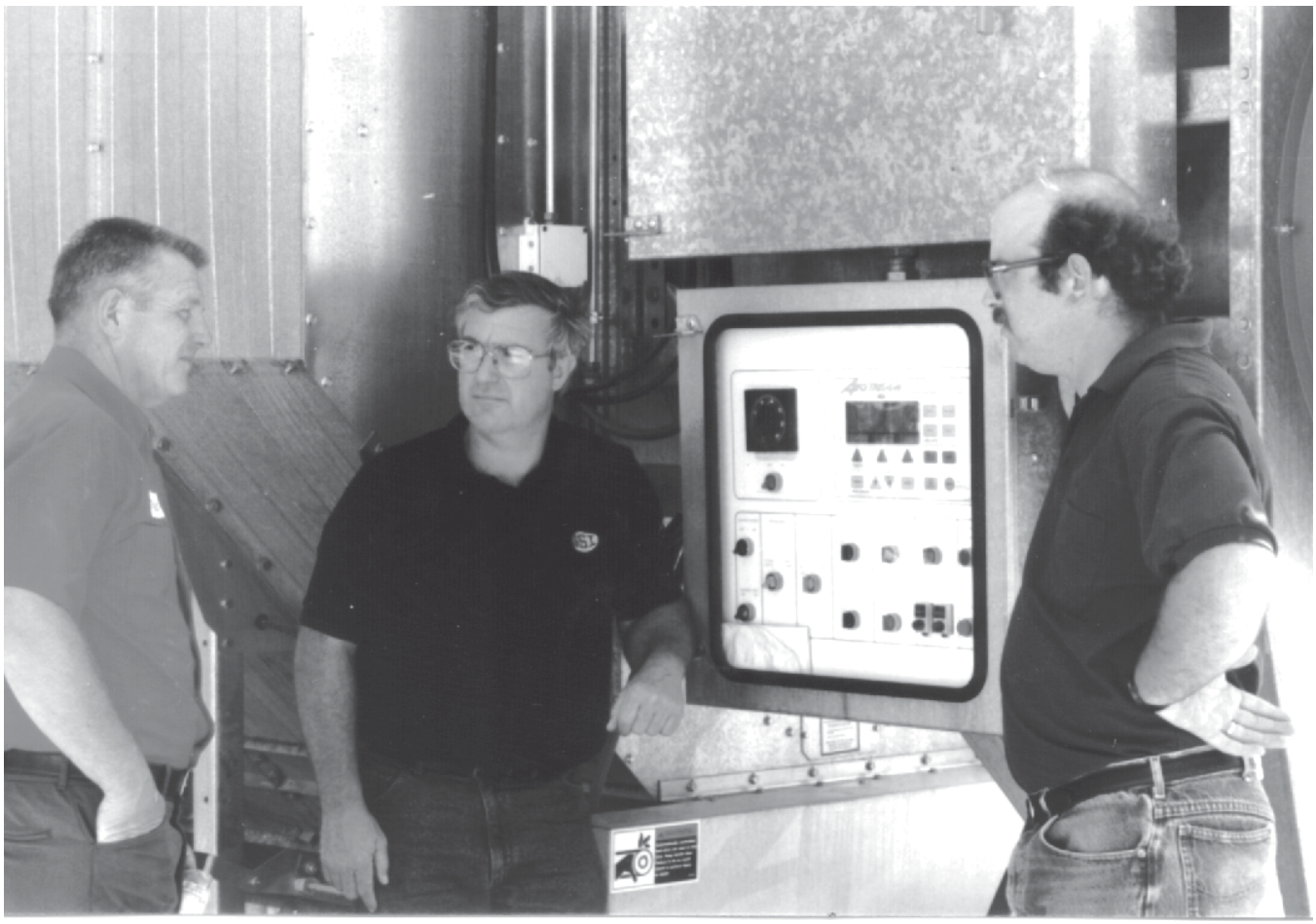
LP Gas	Hi-Fire 41-102 kPa
	Lo-Fire 14-41 kPa
Natural Gas	Hi-Fire 41-69 kPa
	Lo-Fire 7-20 kPa

If the burner remains on hi-fire and does not cycle, increase the regulator setting on the propane models, or the supply valve on the natural gas models in order to reach the thermostat setting. If the burner remains in lo-fire and does not cycle,



The dryer fan and heater controls featuring: 1-pressure regulator, 2-lo-fire control valve, 3-high pressure solenoid, 4-low pressure solenoid, 5-hi-lo fire thermostat, 6-fuel supply line, 7-LP solenoid or supply ball valve(NG), 8-air pressure switch and 9-liquid filled gauge.

DRYER PRE START CHECKS



All dryer functions should be checked before operation each season.

slightly decease gas pressure with the lo-fire control valve. If the gas pressure is decreased too much a popping or fluttering sound will be heard. Also, anytime the high pressure side is adjusted, the low pressure side needs to be checked. Repeat the test for each fan/heater unit.

STAGED BATCH CHECK

To check the staged batch operation, turn the control power switch to the on position. Turn the drying mode switch to the staged batch position. Press the reset button, open the main fuel supply valve at the tank on an LP dryer, or valve in the fuel supply line on a natural gas dryer. Turn on the electric shut off valve to allow fuel flow to the dryer, if so equipped. Turn the load switch to auto and unload switch to one speed. Push the dryer power start button, and the controller will sequentially start all dryer components in their proper order. If any switches are not in their correct position for staged batch operation, the dryer will indicate improper switch position, and will not start until the switches are in the proper position. After starting, all batch timers will time down in sequence. When the unload cycle is complete the timers will automatically reset to their original settings, and start the dry timer again.

DRYER SHUTDOWN

To shut down the dryer, first close the fuel supply valve at the tank or valve along the fuel line. If the burner is operating, let the dryer run out of fuel, and it will shut down automatically due to loss of flame. Close the fuel valve at the dryer, and press the dryer power stop button. Turn off the safety disconnect handle on the front of the power box, and turn off the main power to the dryer.

EMERGENCY

In case of emergency push the dryer power stop button. The fan, burner and all augers will stop immediately.

CONTINUOUS FLOW AND CONTINUOUS BATCH START UP PROCEDURE

At the beginning of each harvest and before filling the dryer with grain make sure to inspect the dryer for rodent damage, proper belt and chain tension and missing or damaged safety shields. Test operate the dryer using the pre start check procedures located on pages 14-17.

1. Before attempting to operate the dryer make sure that all safety shields are in place, all plenum bottom closure panel doors are closed, all rear access doors are closed and all personnel are clear of the grain dryer and grain handling machinery.

2. Turn all selector switches on the control panel to the off position.

3. Turn on the electrical power supply to the dryer, and move the safety disconnect handle mounted on the dryer's upper power box to on.

4. Turn the control power switch to on. The switch will light up. A copyright message, model number, total running time in hours and minutes, current date and time will appear. At this point the controller will lock out all other dryer functions. Once the date and time appear, press reset, and the dryer will perform its safety circuit checks. If a fault is found the cause will be displayed on the LCD. If all safeties do not detect a problem the controller will allow the electronic fuel shutoff valve to be manually opened, if so equipped, and the drying mode switch will light up,indicating that the dryer is ready to be started.

5. Move the load auger switch to manual, and push the dryer power start switch. The top auger will immediately start, and the load auger switch will light up. If additional loading equipment is wired to the dryer it will also start immediately.

6. When the dryer is full of grain the top auger will stop automatically, and any auxiliary loading equipment wired to the dryer will also stop.

CONTINUOUS FLOW OPERATION

1. Turn the control power switch to on.

2. After the date and time appear on screen, press the reset button.

3. Push the dryer power start switch.

4. Open the main fuel supply valve on the tank if using LP gas, or open the fuel supply line if using natural gas. Turn on the Maxon electric shut off valve, if so equipped, or open the manual shut off valve to allow fuel flow to the dryer.

5. Turn the drying mode switch to continuous flow.

6. The dryer should already be filled with grain. Turn the load auger switch to the auto position. In both the auto and manual positions, the dryer grain level switch will auto matically keep the dryer full of grain. In the auto position the dryer will shut down after a pre set time period on the out of grain timer.

7. Turn each fan switch to on. The fan will start, and the switch will light up when airflow is detected.

8. Start each burner by turning the heater switch to on. After purging for approximately 10 seconds the burner will fire, and the heater switch will light up. This indicates that the flame sensing circuit is sensing burner flame. For information concerning burner adjustment see the pre start section of this manual.

9. Operate the heaters to dry grain for 6-7 minutes per point of moisture to be removed with the plenum temperature set at 82° C. Example: Shelled corn starts with 25% moisture and the final mois ture content is to be 15% (10% removal). Using the all heat dryeration process, the estimated drying time is 60 minutes (10 x 6).

10. While operating the dryer adjust the metering roll dials to the recommended settings. See the charts on pages 19 through 22.

1200 SERIES CONTINUOUS FLOW METERING ROLL SETTINGS

		Full Heat			
Initial Moisture	Moisture Removed	Approx. Dry Time	1 Speed	2 Speed Low	2 Speed High
17%	2 pts.	16 min.	625	317	875
18%	3 pts.	21 min.	476	270	775
19%	4 pts.	26 min	385	241	675
20%	5 pts.	31.5 min.	317	213	575
21%	6 pts.	37 min.	270	196	476
22%	7 pts.	41.5 min.	241	185	385
23%	8 pts.	47 min.	213	172	317
24%	9 pts.	51 min.	196	161	270
25%	10 pts.	54 min.	185	150	241
26%	11 pts.	58 min.	172	140	213
27%	12 pts.	62 min.	161	132	196
28%	13 pts.	66.5 min.	150	123	185
29%	14 pts.	71.5 min.	140	116	172
30%	15 pts.	76 min.	132	110	161
31%	16 pts.	81 min.	123	104	150
32%	17 pts.	86 min.	116	100	140
33%	18 pts.	91 min.	110	096	132
34%	19 pts.	96 min.	104	087	123
35%	20 pts.	100 min.	100	082	116

These are approximate starting points.

1200 SERIES CONTINUOUS FLOW METERING ROLL SETTINGS

		Dry & Cool			
Initial Moisture	Moisture Removed	Approx. Dry Time	1 Speed	2 Speed Low	2 Speed High
17%	2 pts.	18 min.	363	187	650
18%	3 pts.	24 min.	272	163	550
19%	4 pts.	30 min	218	145	450
20%	5 pts.	35 min.	187	131	363
21%	6 pts.	40 min.	163	119	272
22%	7 pts.	45 min.	145	109	218
23%	8 pts.	50 min.	131	101	187
24%	9 pts.	55 min.	119	093	163
25%	10 pts.	60 min.	109	087	145
26%	11 pts.	65 min.	101	082	131
27%	12 pts.	70 min.	093	077	119
28%	13 pts.	75 min.	087	073	109
29%	14 pts.	80 min.	082	069	101
30%	15 pts.	85 min.	077	065	093
31%	16 pts.	90 min.	073	061	087
32%	17 pts.	95 min.	069	057	082
33%	18 pts.	100 min.	065	053	077
34%	19 pts.	105 min.	062	049	073
35%	20 pts.	110 min.	059	045	069

These are approximate starting points.

1200S SERIES CONTINUOUS FLOW METERING ROLL SETTINGS

		Full Heat			
Initial Moisture	Moisture Removed	Approx. Dry Time	1 Speed	2 Speed Low	2 Speed High
17%	2 pts.	16 min.	655	333	850
18%	3 pts.	21 min.	499	283	760
19%	4 pts.	26 min	403	252	670
20%	5 pts.	31.5 min.	333	223	580
21%	6 pts.	37 min.	283	205	499
22%	7 pts.	41.5 min.	252	194	403
23%	8 pts.	47 min.	223	181	333
24%	9 pts.	51 min.	205	170	283
25%	10 pts.	54 min.	194	158	252
26%	11 pts.	58 min.	181	147	223
27%	12 pts.	62 min.	170	138	205
28%	13 pts.	66.5 min.	158	129	194
29%	14 pts.	71.5 min.	147	122	181
30%	15 pts.	76 min.	138	115	170
31%	16 pts.	81 min.	129	109	158
32%	17 pts.	86 min.	122	105	147
33%	18 pts.	91 min.	115	099	138
34%	19 pts.	96 min.	109	093	129
35%	20 pts.	100 min.	105	087	122

These are approximate starting points.

1200S SERIES CONTINUOUS FLOW METERING ROLL SETTINGS

		Dry & Cool			
Initial Moisture	Moisture Removed	Approx. Dry Time	1 Speed	2 Speed Low	2 Speed High
17%	2 pts.	18 min.	293	151	420
18%	3 pts.	24 min.	220	132	370
19%	4 pts.	30 min	176	117	320
20%	5 pts.	35 min.	151	106	270
21%	6 pts.	40 min.	132	096	220
22%	7 pts.	45 min.	117	088	176
23%	8 pts.	50 min.	106	081	151
24%	9 pts.	55 min.	096	075	132
25%	10 pts.	60 min.	088	070	117
26%	11 pts.	65 min.	081	066	106
27%	12 pts.	70 min.	075	062	096
28%	13 pts.	75 min.	070	059	088
29%	14 pts.	80 min.	066	056	081
30%	15 pts.	85 min.	062	053	075
31%	16 pts.	90 min.	059	050	070
32%	17 pts.	95 min.	056	048	066
33%	18 pts.	100 min.	053	045	062
34%	19 pts.	105 min.	050	042	059
35%	20 pts.	110 min.	048	039	056

These are approximate starting points.

11. To move grain through the dryer turn the moisture control switch to on. The switch will light up.

Note: When the unload switch is in the 2 speed position, and the moisture control thermostat switch is off, the speed of the metering rolls can be manually adjusted by turning the high speed metering roll dial. Turning the dial clockwise will increase the grain discharge rate, counterclockwise will decrease the discharge rate. (The numbers on the speed dials indicate the percentage of full speed.)

12. At the end of the startup period, start the flow of grain out of the dryer. Turn the unload switch to the two speed position. The bottom auger and metering roll will immediately start, and the unload switch will light. If additional unloading equipment is utilizing the unload auxiliary overload supplied with the dryer, this equipment will also immediately start.

13. To shut the dryer down,close the fuel supply valve at the fuel tank or fuel source. Let the dryer run until the fuel supply lines drain, and the dryer automatically shuts down due to loss of flame. Close the fuel valve at the dryer. Press the dryer power stop button. Turn off the dryer's safety disconnect handle. Turn off the main power supply to the dryer.

14. In case of emergency push the dryer stop button. The fans, burners and all augers will stop immediately.

Note: The Electronic Monitoring Control System can be used to automatically start the dryer. Place all the control panel selector switches in the proper position. Open the electric fuel shut off valve before pressing the dryer power start button. The controller will start all dryer components in their proper order.

CONTINUOUS BATCH (STAGED BATCH) OPERATION

1. Turn the control power switch to on.

2. Make sure the drying mode switch is turned to staged batch.

3. After the date and time appear, press the reset button.

4. Open the main fuel supply valve on the tank if using LP gas, or the valve in the fuel supply line if using natural gas. Turn on the Maxon electric shut off valve, if so equipped, or open the manual shut off valve to allow fuel flow to the dryer.

5. The dryer should already be filled with grain. Turn the load auger switch to auto. In both the auto and manual position, the grain level switch will automatically keep the dryer full of grain. In the auto position the dryer will shut down after the preset time period on the out of grain timer, or if the grain flow to the dryer is interrupted.

6. Turn each fan switch to auto. The fan will start, and the switch will light up when airflow is detected.

7. Start each burner by turning the heater switch to auto. After purging for approximately 10 seconds the burner will fire, and the heater switch will light up indicating that the flame sensing circuit is sensing burner flame. For information concerning burner adjustment see the pre start section of this manual.

8. To properly set the correct dry, cool and unload time for various moisture content grains. See the charts on pages 25 through 28.

9. If the dryer is being operated in all heat, turn each fan switch to on. In this position the fan will run continuously during both the dry and unload stages of the staged batch operation. If the dryer is being operated in the dry and cool mode, the preferred position for the fan switch is the on position, so the fan will run continuously. If desired, the fan can be turned off during the unload cycle of the dry-cool-unload sequence by turning the fan switch to auto.

10. If the dryer is being operated in all heat, turn each heater switch to on. The burner will operate whenever the fan is operating. If the dryer is being used in dry and cool, turn the heater switches to auto and the burner will automatically shut down

during the cooling and unloading cycles.

11. Turn the unload switch to the one speed position. The bottom auger and metering rolls will start automatically during the unload cycle of the dry-cool-unload mode, along with any grain handling equipment that is wired to the dryer. The speed at which the metering rolls operate during the unload cycle is adjusted by using the high speed metering roll knob. Turning the dial clockwise will increase the grain discharge rate, and counterclockwise will decrease the discharge rate.

12. To control the length of the dry cycle using only the dry time setting programmed into the system, turn the moisture control setting to off. To use the automatic moisture control so that the dry time is determined, not only by the dry time setting, but also by the moisture content of the drying grain, turn the moisture control switch to on, and set dial to a beginning setting of 135°F.

13. To start the drying operation push the dryer power start button. The controller will start all the dryer components in their proper order. If any of the selected switches are improperly positioned for staged batch drying, the display will indicate the proper switch position, and will not allow the dryer to operate until the position of the switch is corrected.

14. To shutdown the dryer, close the fuel supply valve at the fuel tank or fuel source. If the burners are operating, let the dryer run out of fuel causing an automatic shutdown due to a loss of flame. Close the fuel valve at the dryer, and press the dryer power stop button. Turn off the dryer's main circuit breaker located on the front of the power panel. Turn off the main power supply to the dryer.

15. In case of an emergency, press the dryer power stop button. The burners, fans and all augers will stop immediately.

FAN & HEATER SWITCH SETTINGS

Fan Setting	Heater Setting	Fan Function	Heater Function
Auto	Auto	Fans stay on during dry and cool cycle only	Burners stay on during dry timer cycle only
Auto	On	Fans stay on during dry and cool cycle only	Burners stay on during dry and cool
On	On	Fans are on continuously	Burners are on continuously
On	Auto	Fans are on continuously	Burners shut down at the end of the dry cycle

At the end of the dry cycle in staged batch, the fans and heaters will continue running if in the Auto-Auto setting, until the preset temperature on the moisture control thermostat is reached.

1200 SERIES BATCH TIMER SETTINGS

		Full Heat Fan & Burner Switches on Manual				Dry & Cool Fans on Manual Burners on Auto			
Initial Moisture	Moisture Removed	Approx. Dry Time	Dry	Cool	Unload*	Approx. Dry Time	Dry	Cool	Unload*
17%	2 pts.	16 min.	6 min.	0	10 min.	18 min.	18 min.	18 min.	10 min.
18%	3 pts.	21 min.	11 min.	0	10 min.	24 min.	24 min.	18 min.	10 min.
19%	4 pts.	26 min	16 min	0	10 min.	30 min	30 min	18 min	10 min.
20%	5 pts.	31.5 min.	21.5 min.	0	10 min.	35 min.	35 min.	18 min.	10 min.
21%	6 pts.	37 min.	27 min.	0	10 min.	40 min.	40 min.	18 min.	10 min.
22%	7 pts.	41.5 min.	31.5 min.	0	10 min.	45 min.	45 min.	18 min.	10 min.
23%	8 pts.	47 min.	37 min.	0	10 min.	50 min.	50 min.	18 min.	10 min.
24%	9 pts.	51 min.	47 min.	0	10 min.	55 min.	55 min.	18 min.	10 min.
25%	10 pts.	54 min.	44 min.	0	10 min.	60 min.	60 min.	18 min.	10 min.
26%	11 pts.	58 min.	48 min.	0	10 min.	65 min.	65 min.	18 min.	10 min.
27%	12 pts.	62 min.	52 min.	0	10 min.	70 min.	70 min.	18 min.	10 min.
28%	13 pts.	66.5 min.	56.5 min.	0	10 min.	75 min.	75 min.	18 min.	10 min.
29%	14 pts.	71.5 min.	61.5 min.	0	10 min.	80 min.	80 min.	18 min.	10 min.
30%	15 pts.	76 min.	66 min.	0	10 min.	85 min.	85 min.	18 min.	10 min.
31%	16 pts.	81 min.	71 min.	0	10 min.	90 min.	90 min.	18 min.	10 min.
32%	17 pts.	86 min.	76 min.	0	10 min.	95 min.	95 min.	18 min.	10 min.
33%	18 pts.	91 min.	81 min.	0	10 min.	100 min.	100 min.	18 min.	10 min.
34%	19 pts.	96 min.	86 min.	0	10 min.	105 min.	105 min.	18 min.	10 min.
35%	20 pts.	100 min.	90 min.	0	10 min.	110 min.	110 min.	18 min.	10 min.

These are approximate starting points.

*Set unload meter roll high speed setting to 999. If unload equipment cannot adequately keep up, lower the speed setting and add time to the unload timer setting to completely unload the batch. In full heat mode, the time added to the unload timer will need to be substracted from the dry timer. If fan is on auto and does not run during unload, set cool timer to 25 minutes.

New unload time calculation = present unload time $\frac{\text{new dial setting}}{1000}$

Example

$$13.75 = 11 \div \frac{800}{1000}$$

1200 SERIES STAGED BATCH TIMER SETTINGS

		Full Heat Fan & Burner Switches on Manual				Dry & Cool #2 Fan on Manual #2 Burner on Auto #1 Fan on Manual #1 Burner on Off			
Initial Moisture	Moisture Removed	Approx. Dry Time	Dry	Cool	Unload*	Approx. Dry Time	Dry	Cool	Unload*
17%	2 pts.	16 min.	2 min.	0	3.5 min.	18 min.	9 min.	3 min.	3.5 min.
18%	3 pts.	21 min.	3.5 min.	0	3.5 min.	24 min.	12 min.	3 min.	3.5 min.
19%	4 pts.	26 min	5.5 min	0	3.5 min.	30 min	15 min.	3 min	3.5 min.
20%	5 pts.	31.5 min.	7 min.	0	3.5 min.	35 min.	17.5 min.	3 min.	3.5 min.
21%	6 pts.	37 min.	9 min.	0	3.5 min.	40 min.	20 min.	3 min.	3.5 min.
		same				#2 Fan on Manual #2 Burner on Manual #1 Fan on Auto #1 Burner on Auto			
22%	7 pts.	41.5 min.	10.5 min.	0	3.5 min.	45 min.	.5 min.	18 min.	3.5 min.
23%	8 pts.	47 min.	12.5 min.	0	3.5 min.	50 min.	2.5 min.	18 min.	3.5 min.
24%	9 pts.	51 min.	13.5 min.	0	3.5 min.	55 min.	4 min.	18 min.	3.5 min.
25%	10 pts.	54 min.	14.5 min.	0	3.5 min.	60 min.	5.5 min.	18 min.	3.5 min.
26%	11 pts.	58 min.	16 min.	0	3.5 min.	65 min.	7.5 min.	18 min.	3.5 min.
27%	12 pts.	62 min.	17.5 min.	0	3.5 min.	70 min.	9 min.	18 min.	3.5 min.
28%	13 pts.	66.5 min.	18.5 min.	0	3.5 min.	75 min.	10.5 min.	18 min.	3.5 min.
29%	14 pts.	71.5 min.	20.5 min.	0	3.5 min.	80 min.	12.5 min.	18 min.	3.5 min.
30%	15 pts.	76 min.	22 min.	0	3.5 min.	85 min.	14 min.	18 min.	3.5 min.
31%	16 pts.	81 min.	23.5 min.	0	3.5 min.	90 min.	15.5 min.	18 min.	3.5 min.
32%	17 pts.	86 min.	25.5 min.	0	3.5 min.	95 min.	17.5 min.	18 min.	3.5 min.
33%	18 pts.	91 min.	27 min.	0	3.5 min.	100 min.	19 min.	18 min.	3.5 min.
34%	19 pts.	96 min.	28.5 min.	0	3.5 min.	105 min.	20.5 min.	18 min.	3.5 min.
35%	20 pts.	100 min.	30 min.	0	3.5 min.	110 min.	22.5 min.	18 min.	3.5 min.

These are approximate starting points.
*Set unload meter roll high speed setting to 999. If unload equipment cannot adequately keep up, lower the speed setting and add time to the unload timer setting to completely unload the batch. In full heat mode, the time added to the unload timer will need to be substracted from the dry timer. For additional cooling, set #1 fan switch on manual. If you need more time between dumps use batch mode.

New unload time calculation = present unload time $\frac{\text{new dial setting}}{1000}$

Example

$$13.75 = 11 \div \frac{800}{1000}$$

1200S SERIES BATCH TIMER SETTINGS

		Full Heat Fan & Burner Switches on Manual				Dry & Cool Fans on Manual		Burners on Auto	
Initial Moisture	Moisture Removed	Approx. Dry Time	Dry	Cool	Unload*	Approx. Dry Time	Dry	Cool	Unload*
17%	2 pts.	16 min.	6 min.	0	10 min.	18 min.	18 min.	18 min.	10 min.
18%	3 pts.	21 min.	11 min.	0	10 min.	24 min.	24 min.	18 min.	10 min.
19%	4 pts.	26 min	16 min	0	10 min.	30 min	30 min	18 min	10 min.
20%	5 pts.	31.5 min.	21.5 min.	0	10 min.	35 min.	35 min.	18 min.	10 min.
21%	6 pts.	37 min.	27 min.	0	10 min.	40 min.	40 min.	18 min.	10 min.
22%	7 pts.	41.5 min.	31.5 min.	0	10 min.	45 min.	45 min.	18 min.	10 min.
23%	8 pts.	47 min.	37 min.	0	10 min.	50 min.	50 min.	18 min.	10 min.
24%	9 pts.	51 min.	47 min.	0	10 min.	55 min.	55 min.	18 min.	10 min.
25%	10 pts.	54 min.	44 min.	0	10 min.	60 min.	60 min.	18 min.	10 min.
26%	11 pts.	58 min.	48 min.	0	10 min.	65 min.	65 min.	18 min.	10 min.
27%	12 pts.	62 min.	52 min.	0	10 min.	70 min.	70 min.	18 min.	10 min.
28%	13 pts.	66.5 min.	56.5 min.	0	10 min.	75 min.	75 min.	18 min.	10 min.
29%	14 pts.	71.5 min.	61.5 min.	0	10 min.	80 min.	80 min.	18 min.	10 min.
30%	15 pts.	76 min.	66 min.	0	10 min.	85 min.	85 min.	18 min.	10 min.
31%	16 pts.	81 min.	71 min.	0	10 min.	90 min.	90 min.	18 min.	10 min.
32%	17 pts.	86 min.	76 min.	0	10 min.	95 min.	95 min.	18 min.	10 min.
33%	18 pts.	91 min.	81 min.	0	10 min.	100 min.	100 min.	18 min.	10 min.
34%	19 pts.	96 min.	86 min.	0	10 min.	105 min.	105 min.	18 min.	10 min.
35%	20 pts.	100 min.	90 min.	0	10 min.	110 min.	110 min.	18 min.	10 min.

These are approximate starting points.

*Set unload meter roll high speed setting to 999. If unload equipment cannot adequately keep up, lower the speed setting and add time to the unload timer setting to completely unload the batch. In full heat mode, the time added to the unload timer will need to be substracted from the dry timer. If fan is on auto and does not run during unload, set cool timer to 25 minutes.

New unload time calculation = present unload time $\div \frac{\text{new dial setting}}{1000}$

Example

$$13.75 = 11 \div \frac{800}{1000}$$

1200S SERIES STAGED BATCH TIMER SETTINGS

		Full Heat Fan & Burner Switches on Manual				Dry & Cool #2 Fan & Burner Switches on Manual #1 Fan & Burner Switches on Auto			
Initial Moisture	Moisture Removed	Approx. Dry Time	Dry	Cool	Unload*	Approx. Dry Time	Dry	Cool	Unload*
17%	2 pts.	16 min.	3 min.	0	5 min.	18 min.	0 min.	13 min.	5 min.
18%	3 pts.	21 min.	5.5 min.	0	5 min.	24 min.	.5 min.	18 min.	5 min.
19%	4 pts.	26 min.	8 min	0	5 min.	30 min	3.5 min.	18 min	5 min.
20%	5 pts.	31.5 min.	11 min.	0	5 min.	35 min.	6 min.	18 min.	5 min.
21%	6 pts.	37 min.	13.5 min.	0	5 min.	40 min.	8.5 min.	18 min.	5 min.
22%	7 pts.	41.5 min.	16 min.	0	5 min.	45 min.	11 min.	18 min.	5 min.
23%	8 pts.	47 min.	18.5 min.	0	5 min.	50 min.	13.5 min.	18 min.	5 min.
24%	9 pts.	51 min.	20.5 min.	0	5 min.	55 min.	16 min.	18 min.	5 min.
25%	10 pts.	54 min.	22 min.	0	5 min.	60 min.	18.5 min.	18 min.	5 min.
26%	11 pts.	58 min.	24 min.	0	5 min.	65 min.	20.5 min.	18 min.	5 min.
27%	12 pts.	62 min.	26 min.	0	5 min.	70 min.	23.5 min.	18 min.	5 min.
28%	13 pts.	66.5 min.	28 min.	0	5 min.	75 min.	26 min.	18 min.	5 min.
29%	14 pts.	71.5 min.	31 min.	0	5 min.	80 min.	28.5 min.	18 min.	5 min.
30%	15 pts.	76 min.	33 min.	0	5 min.	85 min.	31 min.	18 min.	5 min.
31%	16 pts.	81 min.	35.5 min.	0	5 min.	90 min.	33.5 min.	18 min.	5 min.
32%	17 pts.	86 min.	38 min.	0	5 min.	95 min.	36 min.	18 min.	5 min.
33%	18 pts.	91 min.	40.5 min.	0	5 min.	100 min.	38.5 min.	18 min.	5 min.
34%	19 pts.	96 min.	43 min.	0	5 min.	105 min.	41 min.	18 min.	5 min.
35%	20 pts.	100 min.	45 min.	0	5 min.	110 min.	43.5 min.	18 min.	5 min.

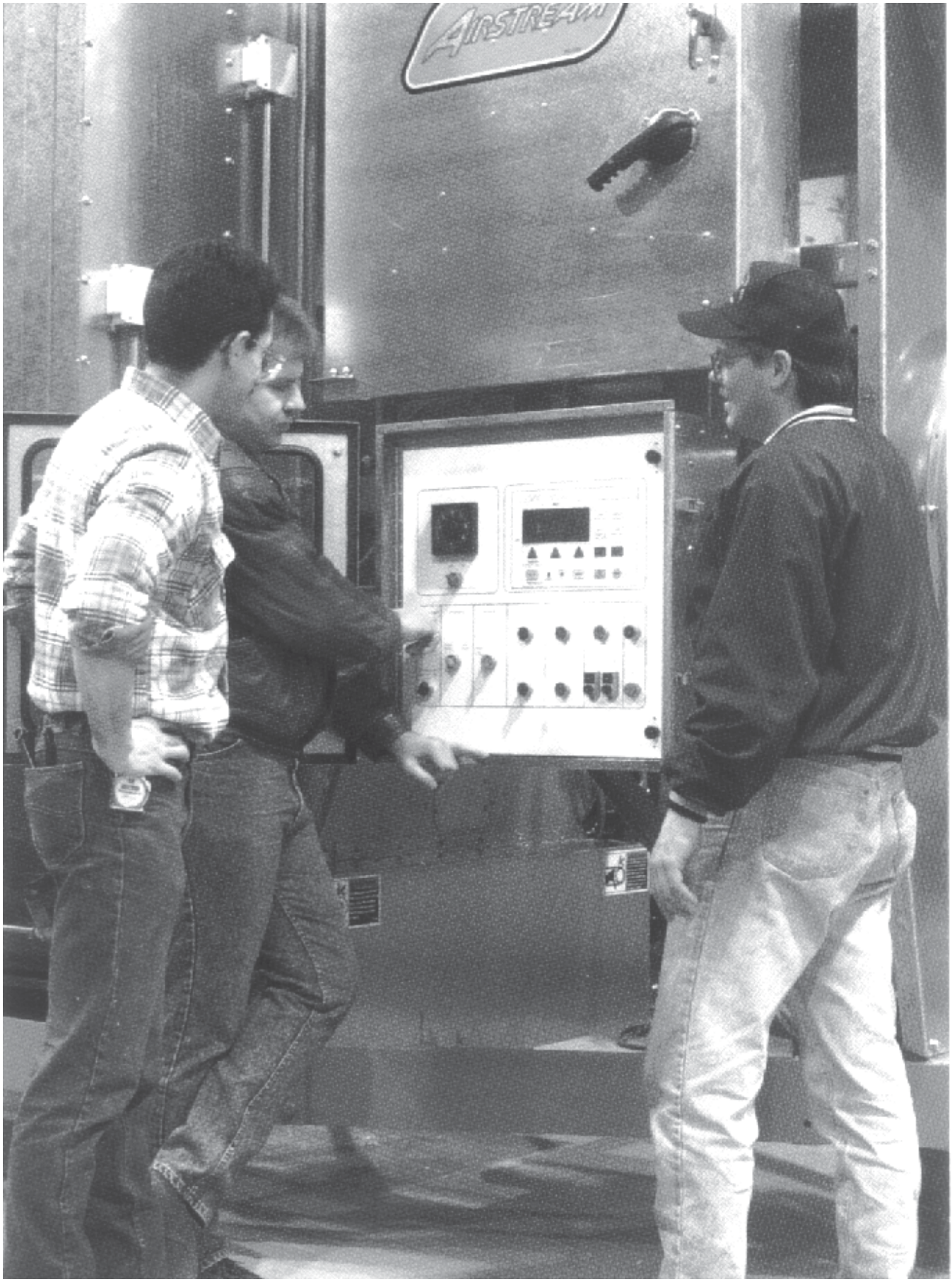
These are approximate starting points.

*Set unload meter roll high speed setting to 999. If unload equipment cannot adequately keep up, lower the speed setting and add time to the unload timer setting to completely unload the batch. In full heat mode, the time added to the unload timer will need to be substracted from the dry timer. For additional cooling, set #1 fan switch on manual.

New unload time calculation = present unload time $\frac{\text{new dial setting}}{1000}$

Example

$$13.75 = 11 \div \frac{800}{1000}$$


AIRSTREAM

SERVICE

SEASONAL INSPECTION AND SERVICE

Before starting any repairs or maintenance on your dryer, observe the following safety steps:

1. Isolate the whole system from the electrical supply by switching off the power isolator and locking it.
2. Isolate the dryer from the gas supply by shutting off the main gas valve (if necessary lock the valve).
3. Keep the keys in your possesion.
4. Augers and drives to augers may be under some degree of tension. Avoid touching these parts with your hands until you are sure that they are free.
5. Do not reconnect the power supply until all work is completed and all guards are cor rectly refitted.

The dryer is made of weather resistant material, and is designed to require a minimum of service. However, each season we recommend the following items be checked before the unit is used, and any damaged or questionable parts replaced. These checks will help eliminate possible failures, and assure dependable operation of the equipment.

1. Shut off electrical power. Open power box and control box, and inspect for moisture, rodent damage or accumulated foreign material. Remove any foreign material present. Inspect and tighten any loose terminal connections. Replace any damaged or deteriorated wiring.

2. Check each propellor for freedom of rotation and uniform tip clearance. They should also be inspected for dirt and grain dust, especially inside the hub. Any additional weight can seriously effect the balance, and result in harmful vibrations and a short bearing life.

3. Check each propellor for free play. Any side play is an indication of defective motor bearings, which should be replaced to prevent a complete motor failure. Make sure motor mount bolts are tight.

4. Motor bearings should be lubricated periodically, depending on operating conditions. Under normal usage it is desirable to have the motor cleaned, checked and bearings repacked by an authorized service station every two to three seasons. If the unit is operated continuously through most of the year, this service should be performed each year.

Note: If on site bearing relubrication is to be performed, see lubrication instructions for ball bearing motors. To keep motor bearings properly lubricated, and dispel any accumulation of moisture within the windings, the fan and auger motors should be operated for 15 to 30 minutes each month.

LUBE PROCEDURES

If the motors are equipped with an alemite fitting, clean the tip of the fitting and grease with a grease gun. Use 1 or 2 full strokes on motors in NEMA 215 frame and smaller. Use 2 to 3 strokes on NEMA 254 through NEMA 365 frame. Use 3 to 4 strokes on NEMA 404 frames and larger. On motors having drain plugs, remove drain plug and operate motor for 20 minutes before replacing drain plug. On motors equipped with slotted head grease screw, remove screw and apply grease tube to hole. Insert 5 to 8 cm length of grease string into each hole on motors in NEMA frame and smaller. Insert 8 to 13 cm length on larger motors. On motors having grease drain plugs, remove plug and operate motor for 20 minutes before replacing drain plug.

SUGGESTED LUBRICANTS AND SCHEDULES*

Hours of Service per Year	kW Range	Suggested Lube Interval
5000	.1 to 5.6 7.5 to 29.8 37.3 to 111.9	5 years 3 years 1 year
Continuous Normal Applications	.1 to 5.6 7.5 to 29.8 37.3 to 111.9	1 year 3 years 9 months
Seasonal Service (motor is idle for 6 months or more)	All	1 year-beginning of season
Continuous high ambient temperatures, dirty or moist locations, high vibrations or when shaft end gets hot	.1 to 29.8 37.3 to 111.9	6 months 3 months

* The bearings have been lubricated at the factory, thus no lubrication should be added before start up.

Insulation Class	Consistency	Type	Grease	Frame Type
A & B	Medium	Polyurea	Shell Dolium R	215T & Smaller
A & B	Medium	Polyurea	Shell Dolium R	254 & Larger
F & H	Medium	Polyurea	Shell Dolium R	All

Note: All of the auger and metering roll bearings are lifetime lubricated and do not require service relubrication.

1. Remove and clean the gas line strainers. Make certain gas valves are closed and that gas is purged from the system before attempting disassembly.

2. Inspect the collector plate at the top of the burner casting and the burner cup for any accumulation of foreign material. Clean if required. Foreign material in the burner cup or casting will not burn out and will impair burner operation.

3. If required, inspect ignitor plug and clean the electrodes. Use an ignition point file to remove carbon and rust between the electrode surfaces. Ignitor gap should be about 3 mm.

4. Inspect flame sensors for possible damage or poor connections. Flame sensor wires must be in good condition.

5. Inspect and manually rotate the top auger paddle assembly. The paddle unit must rotate freely without any indication of sticking or binding.

6. Inspect the top auger and bottom auger drive lines for proper adjustment and condition. Readjust line tension as required.

Note: All of the auger and metering roll bearings are lifetime lubricated and do not require service relubrication.

7. Operate dryer clean out levers, and check cleanout hatch mechanism for proper operation. With hatch open, inspect and remove any accumulation of dirt, fines and foreign material from the bottom auger trough area.

Note: Do not allow high moisture material to collect within the trough area. It may adversely affect metal parts.

8. Inspect entire dryer for loose, worn or damaged parts. Include check of auger flighting, metering rolls and other internal parts. Check that temperature sensors within air plenum chamber are secured within insulated clamps, and do not chafe on other metal parts.

9. Make sure all dryer guards and warning decals are securely installed. Make certain guards do not interfere with moving parts. If guards or warning decals are missing, contact your dealer for a free replacement.

10. Test fire the dryer several weeks ahead of the drying season. Check for possible gas leaks. See page 16 for burner test fire.

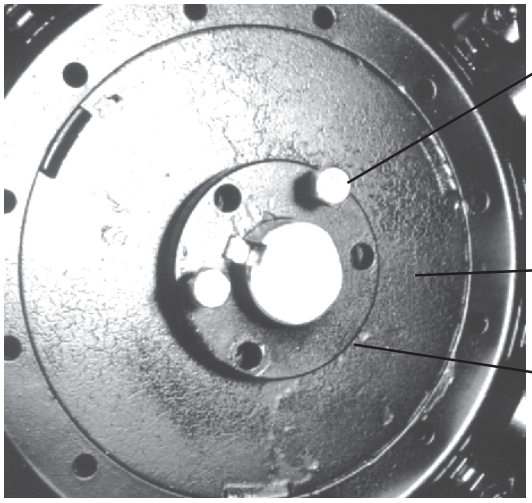
FAN PROPELLOR REMOVAL AND INSTALLATION

When working on or around the fan propeller, be aware that it may free wheel, and could cause serious injury. It may helpful to gently wedge the propeller to prevent this from occuring. However, do remember to remove the wedge before restarting the fan.

If at any stage the propeller has become damaged, it is important that the blades are repaired and that the propeller is in balance. Failure to do this could result in the propeller running out of balance, and potentially exploding. Balancing the propeller is a specialists job, if in doubt contact GSI or your dealer.

The fan propellor is secured to the motor shaft by the use of a taper-lock bushing, motor shaft key and three cap screws.

CAUTION: Although the taper-lock method of retaining the propellor onto the motor shaft is simple, it is essential that the following points be read carefully and fully understood. Improper installation can cause a loose flying propellor, and result in serious injury or death.



Fan blade removal

THREADED BUSHING HOLES

The threaded holes within the bushing are provided for disassembly purposes only. Do not attempt to use these holes for reassembly. They will not allow the parts to lock onto the shaft thereby causing a hazardous operating condition.

CLEARANCE HOLES

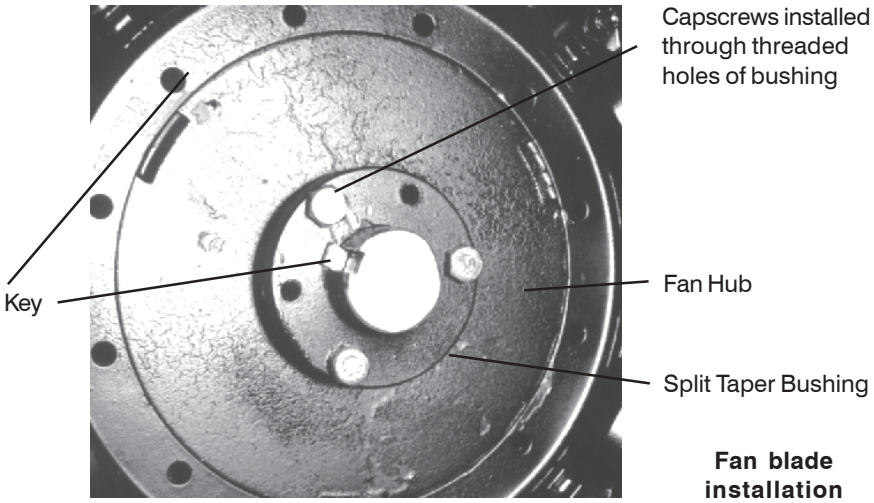
When reassembling parts, the cap screws must be installed through the untapped clearance holes as shown. This will cause the propellor to be pulled forward onto the tapered bushing, thus locking the parts securely onto the motor shaft.

When fan servicing requires removal and installation of the propellor, make sure the propellor is removed and reinstalled properly.

1. Lock out the fan power supply, and remove the fan guard and the venturi, as required on some models.
2. Remove the three cap screws from the clearance holes in the taper-lock bushing.
3. Install two grade 5 cap screws into the threaded holes in bushing, and turn them by hand until they bottom against the front surface of the propellor.
4. Block propellor to prevent it from turning, and gradually turn the cap screws (up to 1/4 turn at a time) until the propellor breaks loose from the bushing and motor shaft. Care fully remove bushing and propellor. With the propellor free from the bushing,a wheel can be used to pull the bushing off of the motor shaft. Re-attach bushing onto propellor to prevent the loss of parts.

Note: During manufacture the propellor and bushing are balanced together and are marked with two small dots to identify their original alignment position. Check the bushing and propeller to make sure they have alignment marks. Mark the alignment of the propeller and bushing, if necessary.

FAN MOTOR REMOVAL AND INSTALLATION



Fan blade installation

In the event of motor failure, remove the motor as described, and take it to the nearest service station. An authorized service station is the only place that can provide possible motor warranty. Motor service and repair at other places will be at owners expense.

If the service station determines motor failure is caused by faulty material or workmanship within the warranty period, repair will be covered under the warranty. Motor failure caused by external sources will result in a charge to the owner for repair.

1. Make certain power is shut off and locked out. Remove fan guard and propellor.

2. Remove cover from fan/heater control box, and disconnect the motor lead wires from within the box.

   Note: Tag or otherwise identify wires for ease of reassembly.

3. Remove motor mount bolts. If there are shims between the motor and its base, note their location so they can be properly installed during reassembly.

4. Disconnect the upper end of the motor conduit, then carefully pull the wires through the hole in the fan/heater housing. Remove motor from the fan/heater unit with the conduit still attached. If motor requires service, take it to an authorized service station.

5. To reinstall motor, slide onto motor base plate and replace shims (if required) between motor base and plate. Reinstall motor mount bolts and washer, but do not fully tighten at this time.

6. Reinstall conduit and wires through hole in fan/heater housing and carefully connect all electrical wiring.

7. Adjust position of motor by temporarily mounting fan blade on motor shaft. Rotate fan blade by hand, making the necessary adjustments, so the tip clearance between blade and housing is uniform. If required, remove the fan blade and fully tighten all four motor mount bolts.

   Note: Make sure to install and tighten the propellor in accordance with previous instructions.

HEATER PARTS REMOVAL AND INSTALLATION

Most of the heater parts can be removed by simply identifying any attached wiring, and then disconnecting the obvious mounting parts.

1. **Flame sensor**: Disconnect the wire connector, and unscrew the flame sensor out of its mounting bracket.

2. **Gas Solenoid valve coil(s)**: Unsnap either the plastic cap, or the metal clip on the gas valve, and slide the housing and coil off the valve stem and body. Do not energize the coil when it is removed, as the coil may be come damaged due to excessive current flow.

3. **Regulator and gas solenoid valve(s)**: The gas regulator and solenoid valve(s) are directional and must be connected as indicated by the markings near the port openings. Make sure gas is shut off and purged from the system before removing parts.

   Note: When installing a liquid gas solenoid valve on LP models, do not over tighten the connection into the inlet side, as the inlet orifice may become partially blocked.

4. **Main Gas Orifice:** With fuel shut off and gas purged from system, proceed as follows:

   a. Disconnect the plumbing support brackets from the pipe train.

   b. Disconnect gas solenoid valve coils. Be sure to mark which one goes where.

   c. Lift pipe (with orifice, solenoid valve and other parts attached), straight up and remove from fan/heater housing. Orifice and other parts can now be removed from pipe train, if desired.

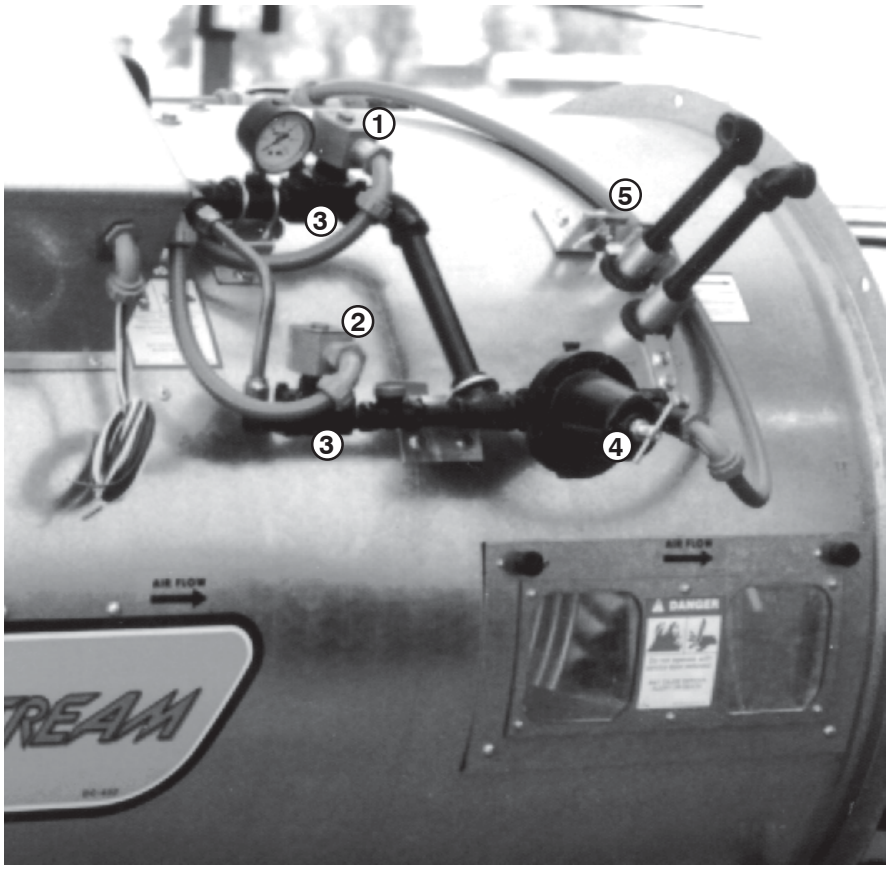
5. **Reassemble**: To reassemble parts, reverse the disassembly procedure and check the following:

   a. Make sure all parts are thoroughly cleaned and open.

   b. Use a dependable brand of high temperature pipe caulking compound when assembling gas connections. Apply only a light coating onto male threaded end of fittings.

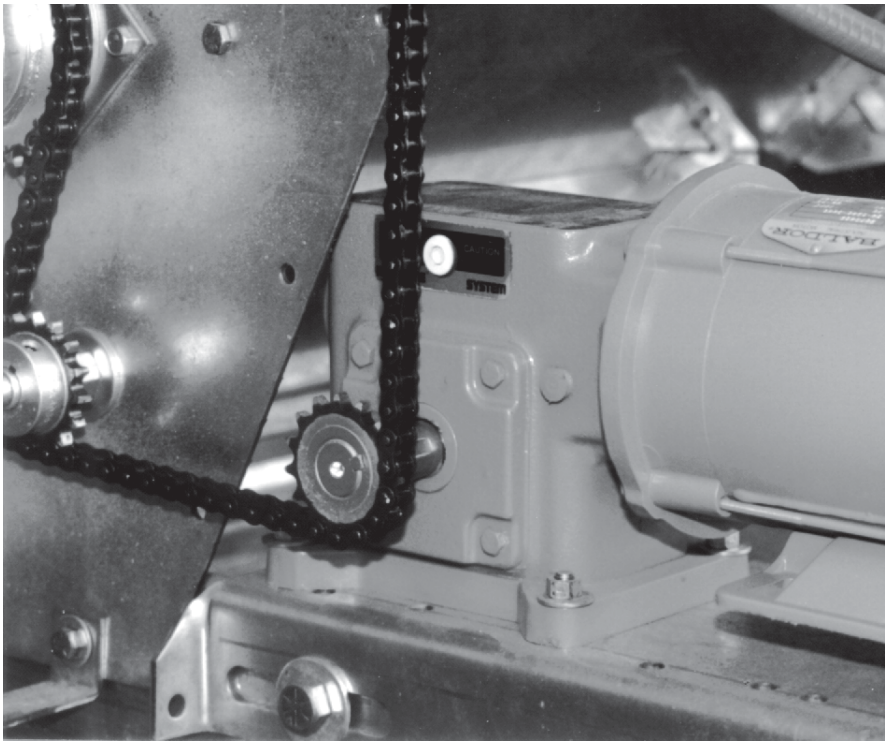
   c. Solenoid valves and gas regulators are directional and must be properly installed. Do not attempt to connect gas solenoid valve by applying force to the valve core stem as it may ruin the unit.

   d. Make sure all electrical wires are properly connected. Refer to wiring diagrams.



This view of the dryer heater shows 1-high pressure gas solenoid, 2-low pressure gas solenoid, 3-gas solenoid valves, 4-gas regulator and 5-vaporizer adjustment bracket

METERING ROLL SERVICING



The speed reducer gear box.

This dryer is equipped with SCR metering roll drive assembly. The metering rolls are driven by a separate DC type electric motor. The speed of the motor is variable, and is controlled by an electric SCR (silicon controlled rectifier) control within the main control box.

MAIN CONTROLS

1. **SCR speed control**: The metering roll speed pots on the front of the control box regulate the speed of the DC motor which drives the metering rolls.

The markings on the scale from 0 to 999 represent the flow of grain past the metering rolls as a percent of the maximum grain discharge rate for the dryer. The maximum setting of 999 provides a maximum 100% discharge of 50 MT / hr for 1214, 57 MT / hr for 1216, 64 MT / hr BPH for 1218, 71 MT / hr for 1220, 78 MT / hr for 1222, 92 MT / hr for 1226 model dryers.

Note: When the control is set to the maximum discharge rate (999), the metering roll speed should be 17.5 RPM for 20 cm discharge auger.

2. **DC electric motor**: The direct current (DC) motor provides the drive for the metering roll, and is located on the front left hand side of standard model dryers. The output shaft of the motor is connected directlyto the gear box assembly.The DC motor requires no operational adjustment as it is completely controlled from the control box.

3. **Speed reducer gear box**: The direct drive gear box provides the required speed reduction, and transmits power to the metering rolls through a drive chain arrangement. The gear box does not require adjustment. The drive chain should also be periodically lubricated and retensioned as necessary.

4. **Unload auger time delay**: The delay controls the bottom auger system and causes the unload auger (and any connected auxiliary unloading conveyors) to continue operating for the programmed amount of time, even after the metering rolls stop. This feature permits the cleanout of grain within the unloading equipment at the end of all discharge cycles.

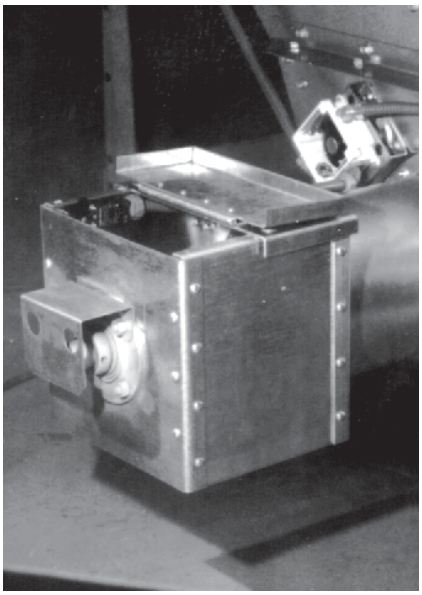
5. If a foreign object becomes lodged in the metering rolls and jams the system, the unloading auger will stay in motion. However, the metering roll drive will stop and the DC motor should stall out. The Electronic Monitoring Control System will shut down the dryer after a two minute period. If any one metering roll or sensor should malfunction the control will display a left or right metering roll failure warning.

HOW TO DETERMINE A METERING ROLL PROBLEM

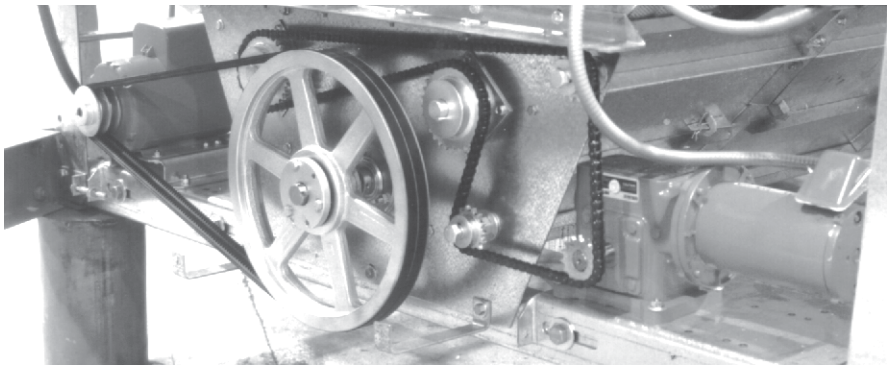
To determine if the metering problem is from blockage, perform the following test with the power off.

Remove the drive chain by loosening the motor mounting bolts. Refer to photo, and place a pipe wrench on the hub of the roller chain sprocket, on the left hand metering roll at the drive end of the dryer. Apply up to 136 N-m of force, and attempt to rotate the roll toward the inside of the dryer. If the metering roll will turn, then repeat for right hand side. If the metering roll will turn, it can be assumed that no blockage exists, and the problem is from some other cause. Check for a break in the power train, chain, drive key, pin, etc.

CAUTION: Keep hands away from sprocket teeth to avoid injury from chain backlash, as a result of torsion build up in the system caused by the jam.



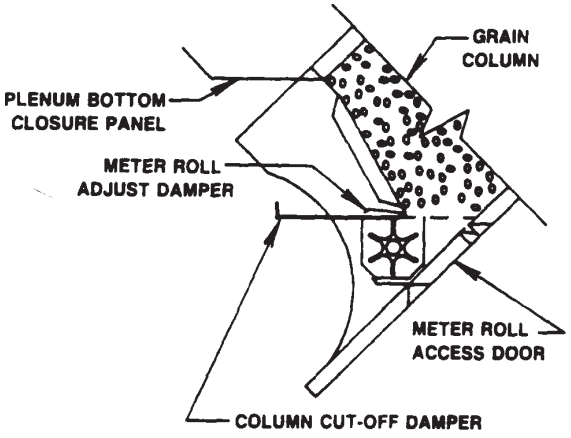
The auger discharge switch.



The metering roll drive.

HOW TO CLEAR A JAMMED METERING ROLL

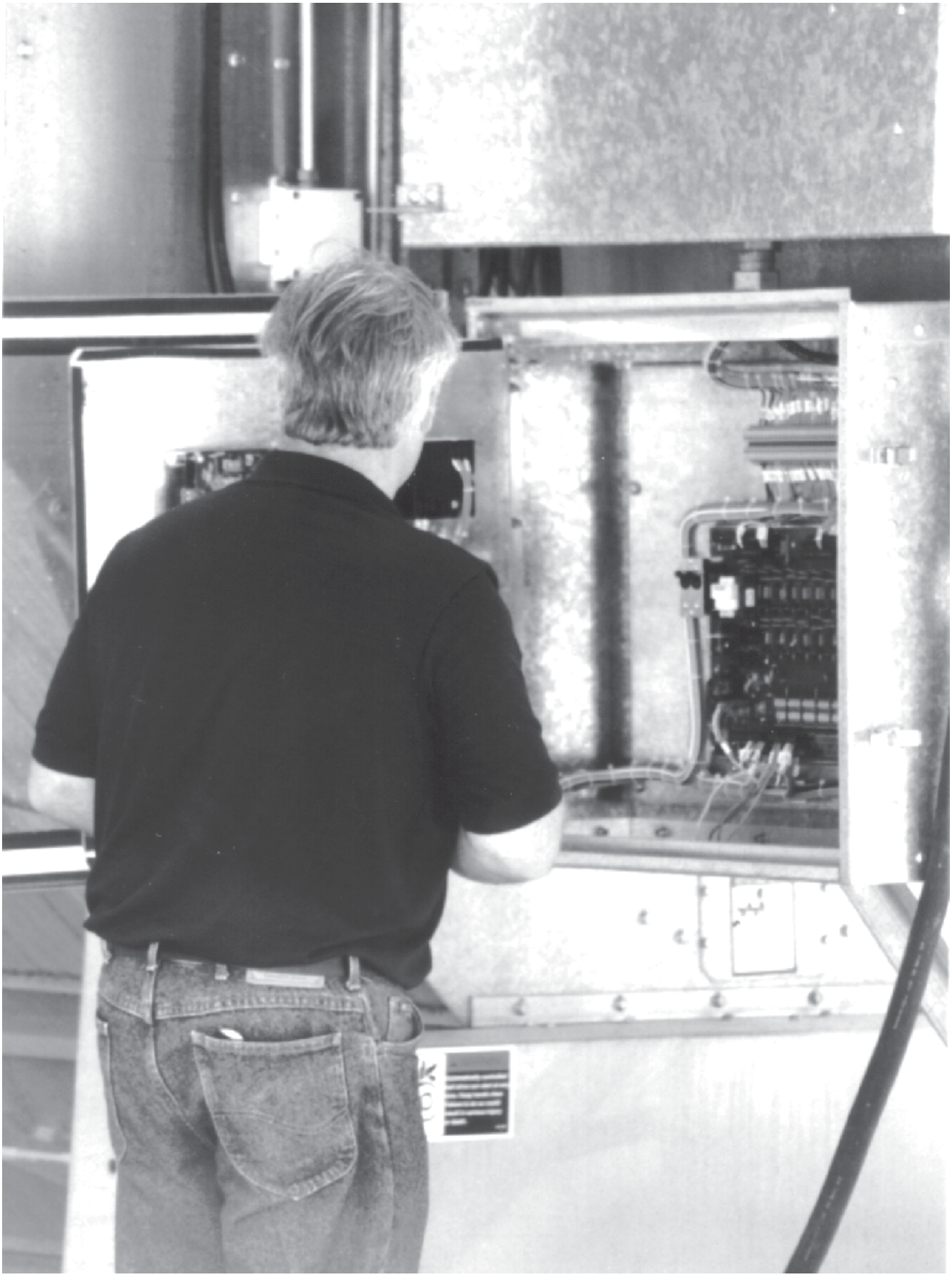
Place a pipe wrench on the hub of the sprocket of the jammed metering roll and turn the roll. First, backward, and then, forward several times in an attempt to dislodge the object, and clear it through the roll. If this is not successful, have an assistant turn the metering roll, and attempt to locate the jam by sound. Shut down the fan/heater, and eliminate any other noise when making this check. Once the location is determined, the roll can be reached from the outside by opening the access door to remove the foreign object causing the jam (before opening doors see below). The service tool must be inserted before opening doors. First, swing open the plenum bottom closure panel. Insert the service tool above the metering roll.



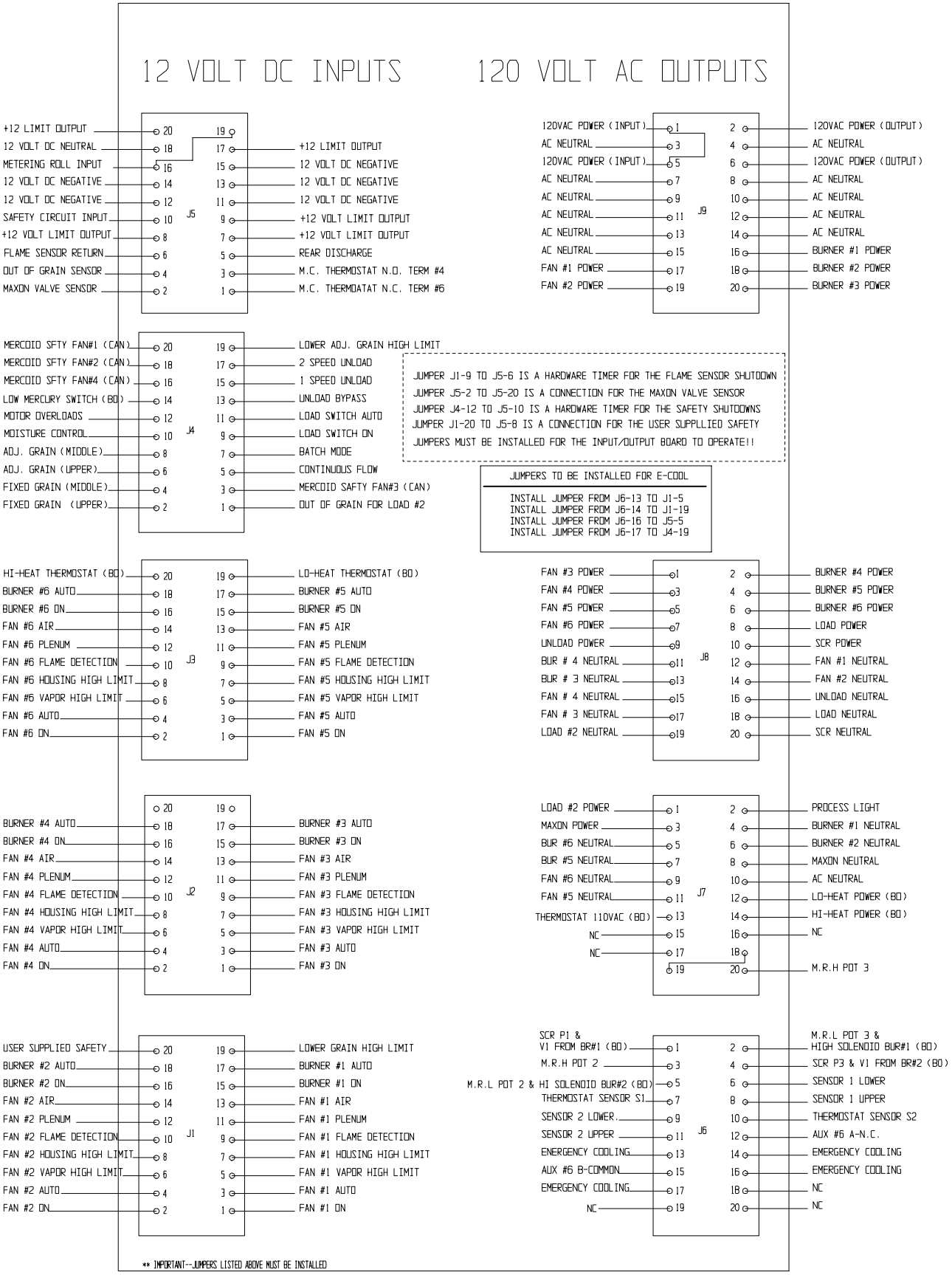
SERVICE TOOL

This column cutoff damper is designed to insert through the grain column (from the inside of the dryer) immediately above the metering roll. This permits opening of the metering roll access door. For service or inspection without unloading the dryer, the plenum bottom closure panel and metering roll adjust damper must be removed prior to using service tool.

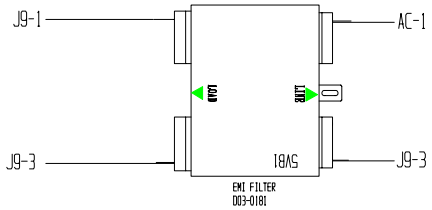
1200 & 1200S SERIES WIRING DIAGRAMS



INPUT/OUTPUT BOARD TERMINAL IDENTIFICATION



LOWER CONTROL BOX TERMINAL STRIP

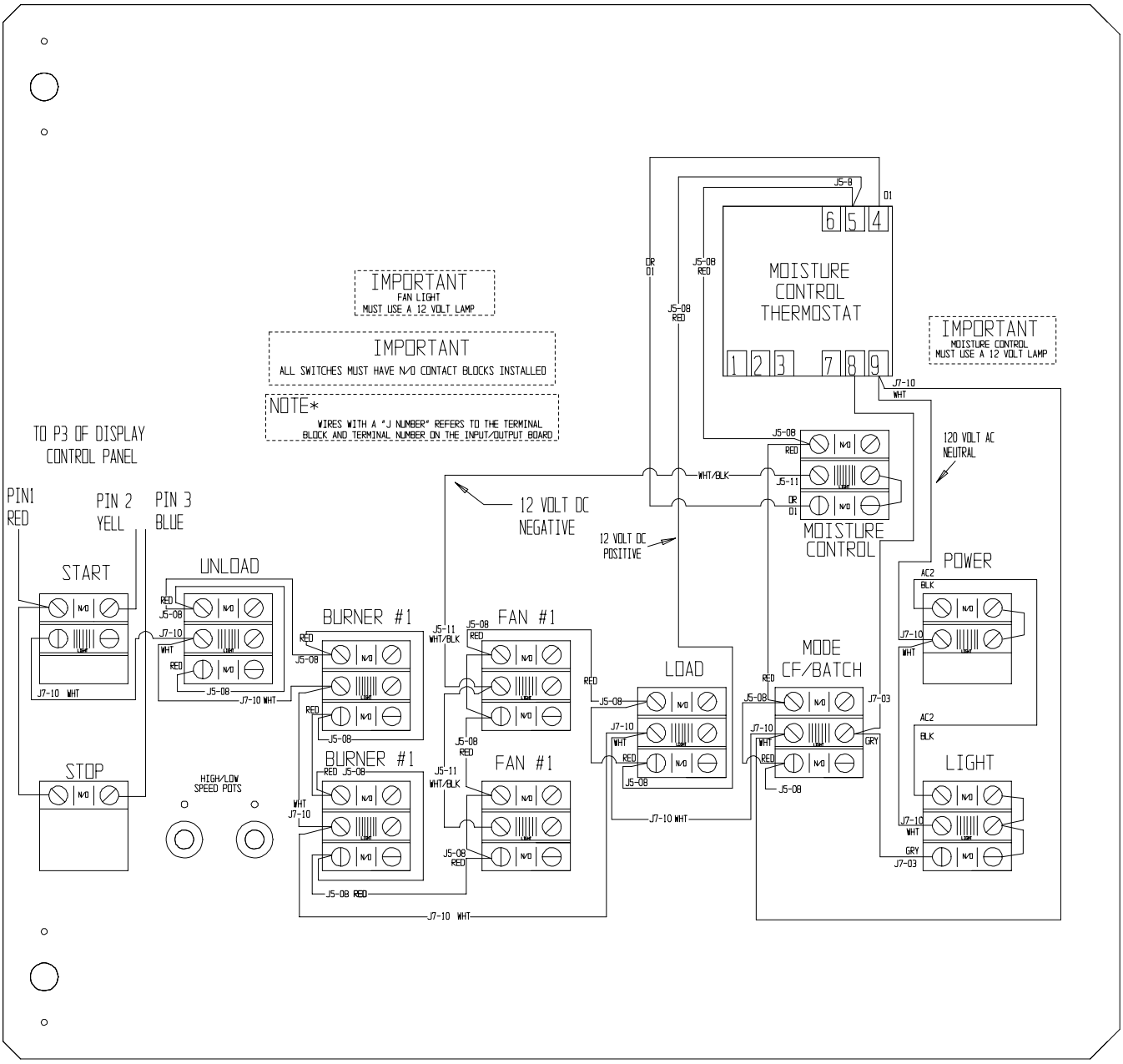


EMERGENCY COOLING JUMPERS
INSTALL J6-13 TO J1-5
INSTALL J6-14 TO J1-19
INSTALL J6-16 TO J5-5
INSTALL J6-17 TO J4-19

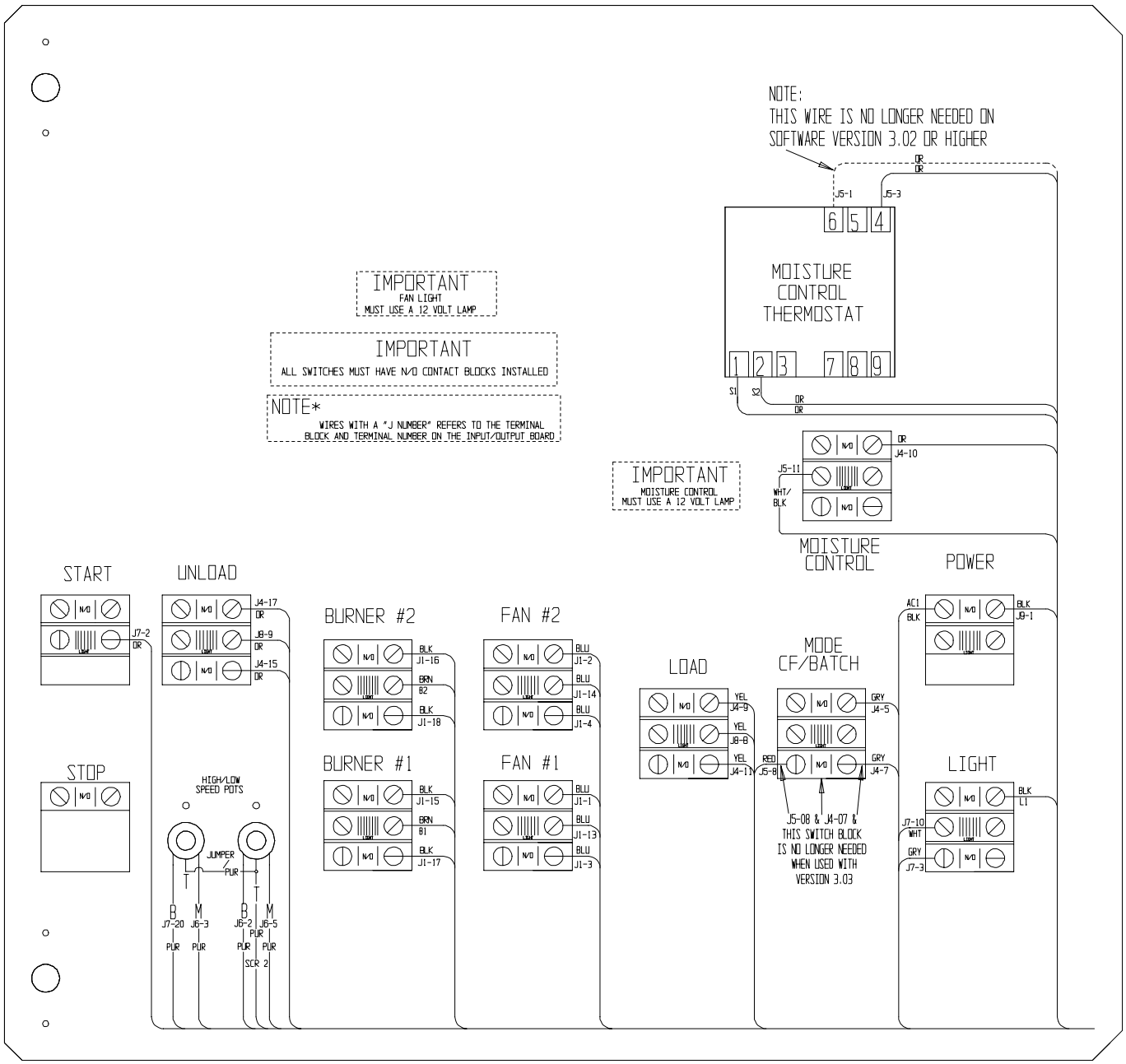
I/O BOARD JUMPERS
INSTALL J1-9 TO J5-6
INSTALL J5-2 TO J5-20
INSTALL J4-12 TO J5-10
INSTALL J9-1 TO J9-5

L1	BLACK - 120 VAC - OUTSIDE LIGHT
B1	BROWN - 120 VAC - BURNER #1 LIGHT
B2	BROWN - 120 VAC - BURNER #2 LIGHT
S1	ORANGE - TEMPERATURE SENSOR
S2	ORANGE - TEMPERATURE SENSOR
SCR2	PURPLE - CONTROL POT P2
J1-5	RED - 12 VDC - FAN #1 VAPOR HIGH LIMIT
J1-6	RED - 12 VDC - FAN #2 VAPOR HIGH LIMIT
J1-7	RED - 12 VDC - FAN #1 HOUSING HIGH LIMIT
J1-8	RED - 12 VDC - FAN #2 HOUSING HIGH LIMIT
J1-9	RED - 12 VDC - FAN #1 FLAME DETECTION
J1-10	RED - 12 VDC - FAN #2 FLAME DETECTION
J1-11	RED - 12 VDC - FAN #1 PLENUM HIGHT LIMIT
J1-12	RED - 12 VDC - FAN #2 PLENUM HIGHT LIMIT
J1-13	BLUE - 12 VDC - FAN #1 AIR SWITCH
J1-14	BLUE - 12 VDC - FAN #2 AIR SWITCH
J1-19	RED - 12 VDC - LOWER FIXED GRAIN LIMIT
J1-20	RED - 12 VDC - USER SUPPLIED SAFETY
J4-12	RED - 12 VDC - MOTOR OVERLOADS
J4-19	RED - 12 VDC - LOWER ADJUSTABLE GRAIN HIGH LIMIT
J5-4	YELLOW - 12 VDC - OUT OF GRAIN SENSOR
J5-5	RED - 12 VDC - REAR DISCHARGE SWITCH
J5-8	RED - 12 VDC - 12 VOLT SUPPLY
J5-9	RED - 12 VDC - 12 VOLT SUPPLY
J5-12	WHITE - 12 VDC NEG - 12 VOLT SUPPLY NEGATIVE
J5-16	PURPLE -TIMING PULSE- LEFT METERING ROLL PULSE
J5-19	PURPLE -TIMING PULSE- RIGHT METERING ROLL PULSE
J6-1	PURPLE - CONTROL POT P1
J6-4	PURPLE - CONTROL POT P3
J7-3	BLACK - 120 VAC - MAXON POWER
J7-4	WHITE - AC NEUTRAL - BURNER #1 NEUTRAL
J7-6	WHITE - AC NEUTRAL - BURNER #2 NEUTRAL
J7-8	WHITE - AC NEUTRAL - MAXON NEUTRAL
J8-8	YELLOW - 120 VAC - LOAD POWER
J8-9	ORANGE - 120 VAC - UNLOAD POWER
J8-10	ORANGE - 120 VAC - SCR POWER
J8-12	WHITE - AC NEUTRAL - FAN #1 NEUTRAL
J8-14	WHITE - AC NEUTRAL - FAN #2 NEUTRAL
J8-16	WHITE - AC NEUTRAL - UNLOAD NEUTRAL
J8-18	WHITE - AC NEUTRAL - LOAD NEUTRAL
J8-20	WHITE - AC NEUTRAL - SCR NEUTRAL
J9-04	WHITE - MOISTURE CONTROL NEUTRAL
J9-05	BLACK - MOISTURE CONTROL POWER
J9-16	BLACK - 120 VAC - BURNER #1 POWER
J9-17	BLUE - 120 VAC - FAN #1 POWER
J9-18	BLACK - 120 VAC - BURNER #2 POWER
J9-19	BLUE - 120 VAC - FAN #2 POWER

1200 & 1200S SERIES FRONT PANEL INTERNAL WIRING



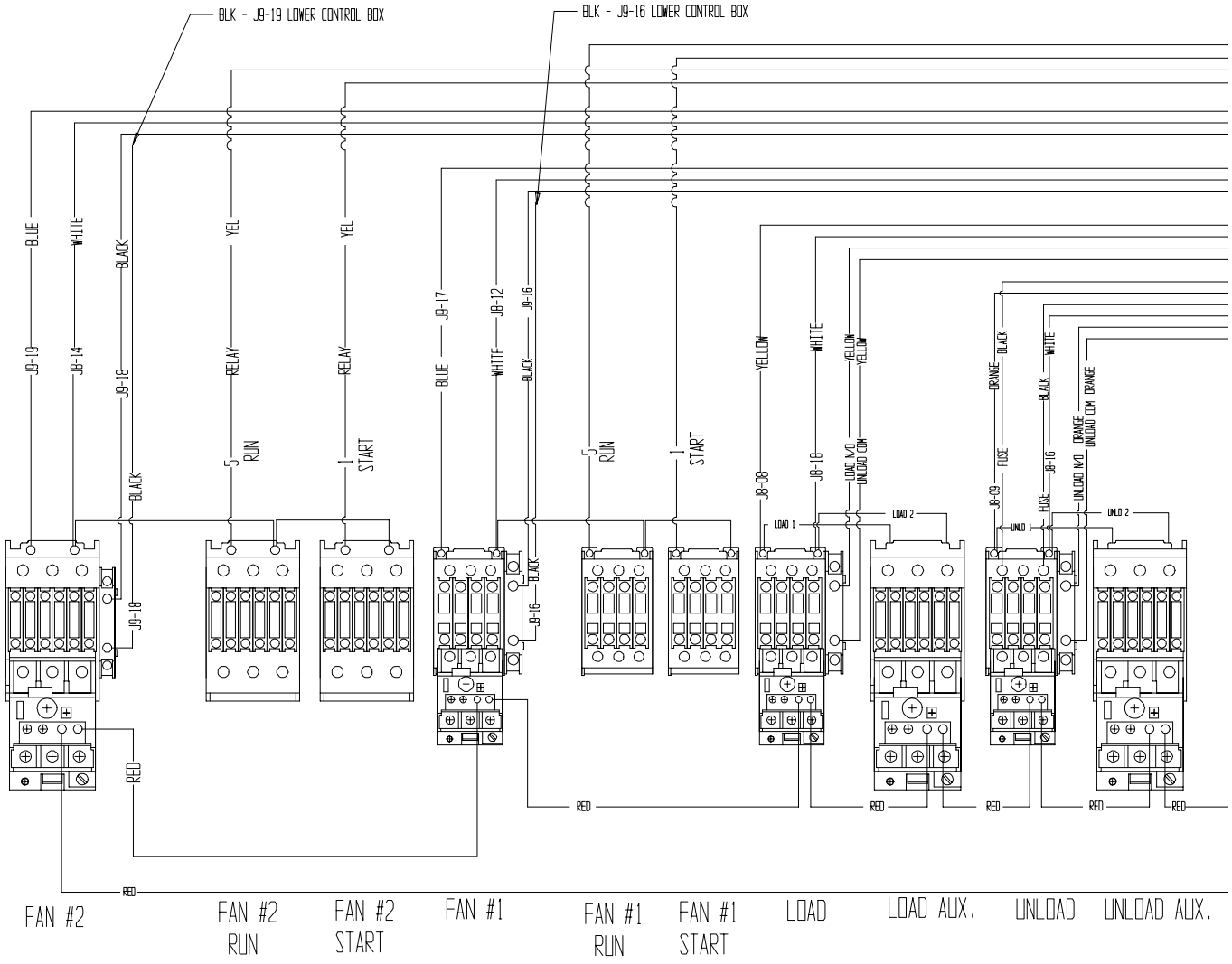
1200 & 1200S SERIES FRONT PANEL EXTERNAL WIRING



1200 & 1200S SERIES WIRING DIAGRAMS

1200 & 1200S SERIES 380V THREE PHASE WYE-DELTA

CONTROL WIRING



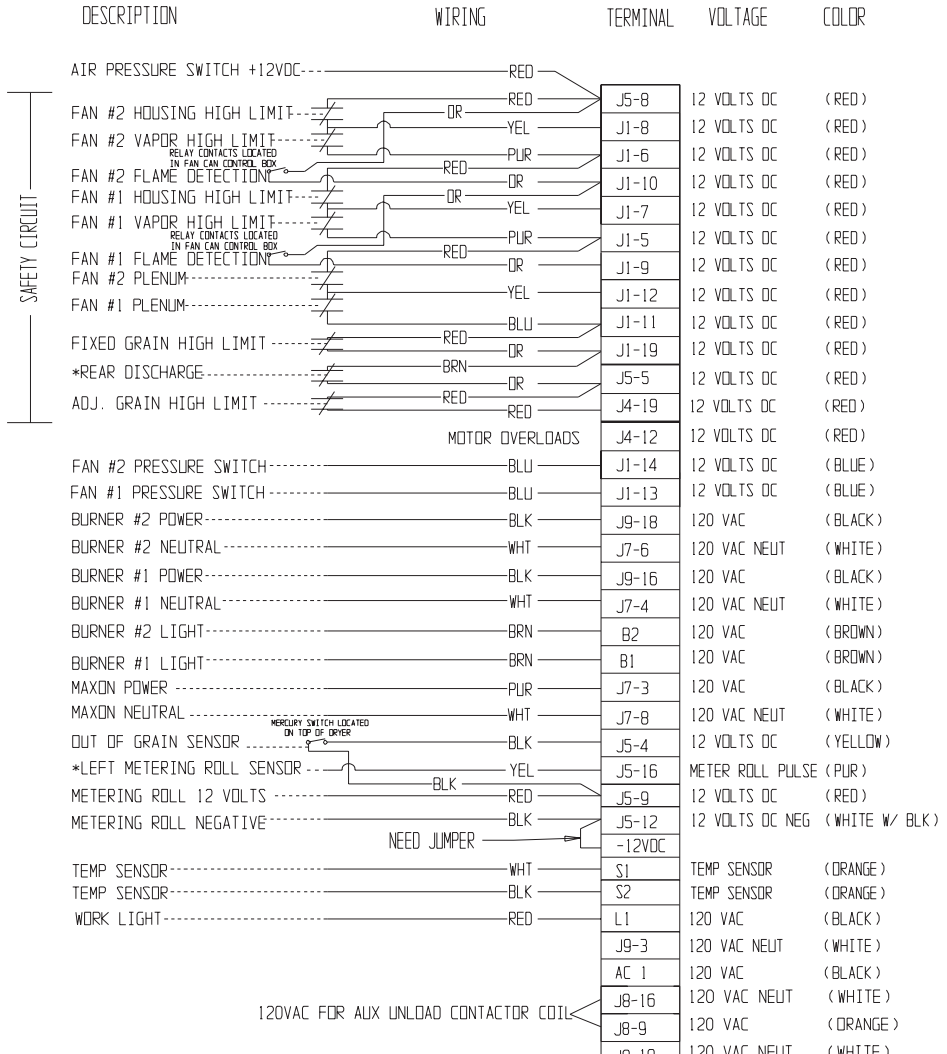
1200 & 1200S SERIES 380V THREE PHASE WYE-DELTA

CONTROL WIRING

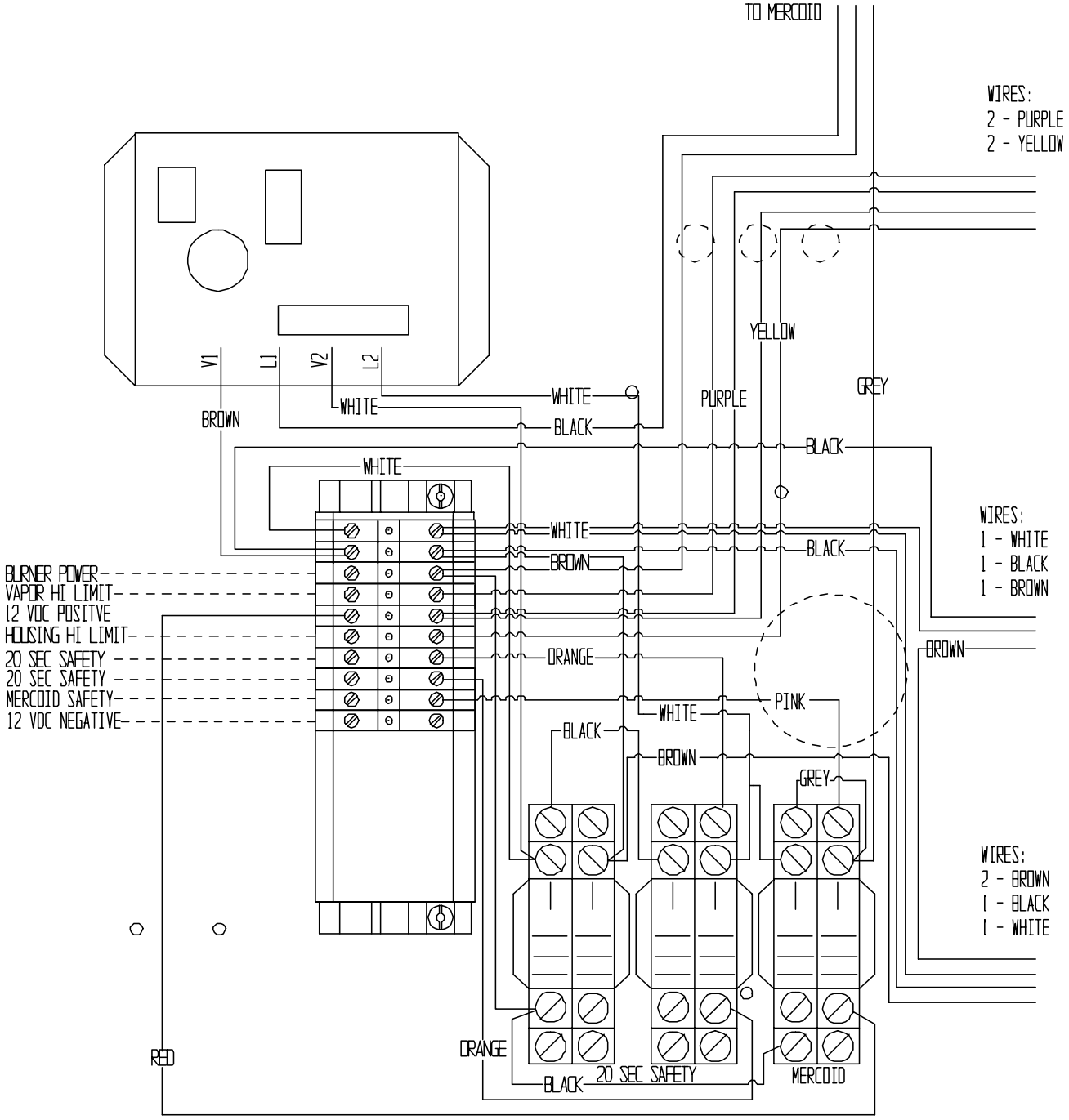
1200 & 1200S SERIES 380V THREE PHASE WYE-DELTA

POWER WIRING

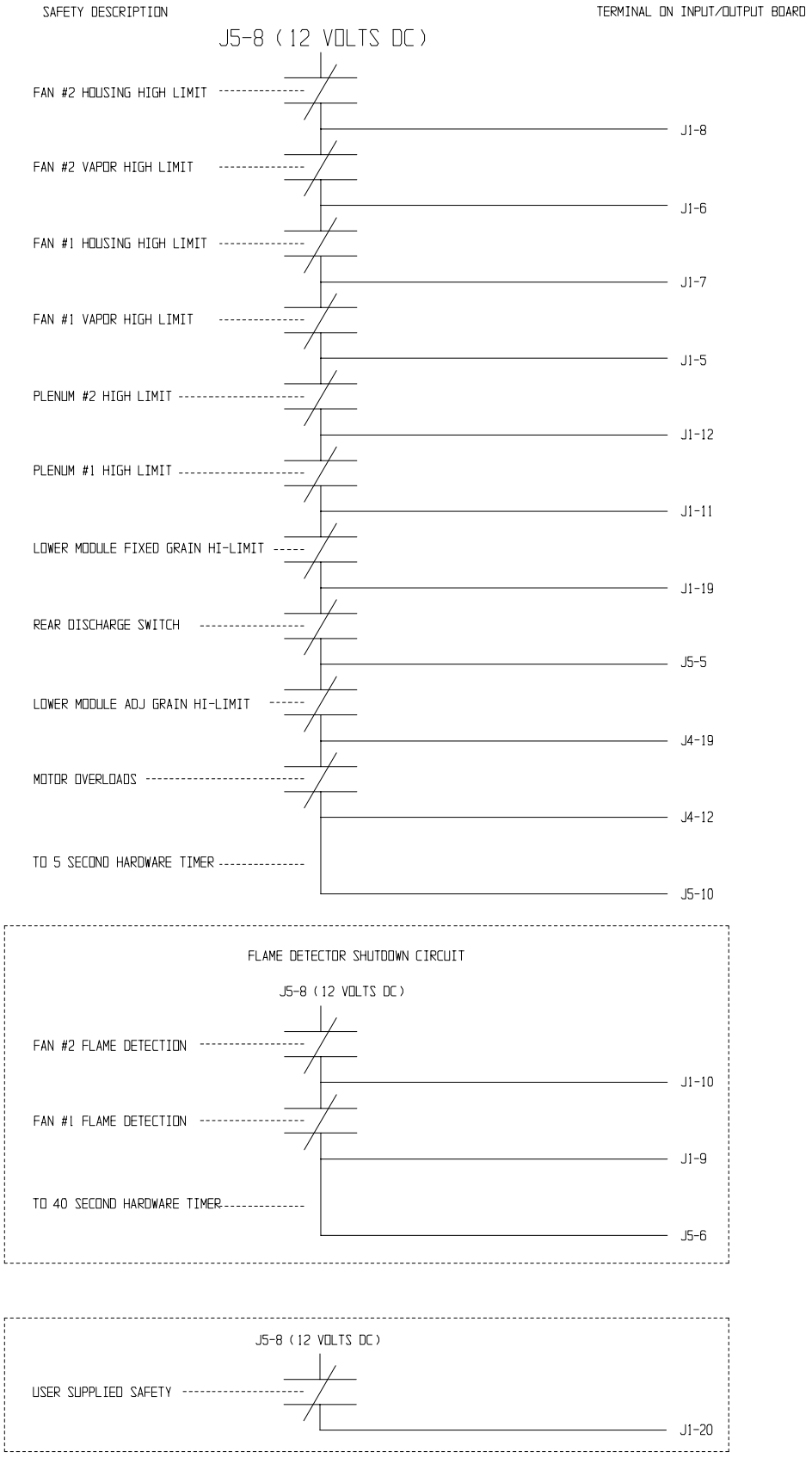
1200 & 1200S SERIES TWO FAN WIRING TO CONTROL BOX



DRYER FAN CAN CONTROL WIRING



1200 & 1200S SERIES SAFETY WIRING DIAGRAM



TROUBLE ANALYSIS PROCEDURE

A multimeter is required for some of the following checkout procedures. Before performing any tests, check if the dryer power supply is 1 phase, 230 volt, or 3 phase, 230, 380, or 460 volt.

- The burner circuit is 120 volts AC on all standard U. S. production models.
- The control circuit to the motor starters is 120 AC volts.
- The safety circuit is 12 volts DC
- When checking these circuits, measure voltage between the cir cuit test location and to ground.
- DC circuits should be measured between the test location and its respective DC ground.

Refer to wiring diagrams and the parts list for identification of parts and the electrical terminals.

CAUTION: When making high voltage tests with "live" circuits, be extremely careful. Follow established safety practices. Turn power on for testing only. Do not attempt to make the dryer operate by using a jumper wire to bypass a defective safety component.

Problem	Possible Cause
Control power switch light off.	1. Check that main power and circuit breakers are turned on. Check for tripped breaker. 2. Check for blown 5 amp fuses. 3. Monitor relay is defective. 4. Defective transformer or wiring. 5. Check for a defective power switch. 6. Check wiring between fuses and input/output board. Refer to wiring diagram for test locations.
Control power light is on, reset button has been pressed, drying mode light off. This indicates control power is present at input/output board, but no power is being transferred through the I/O board.	1. **Power interruption:** Incoming power to the dryer has been interrupted. The display screen will show the date and time if this has occured, once power has returned. 2. **Display not finished initial setup:** The monitor will display a copyright message and model number, total running time in hours and minutes and then the current date and time. To activate the controller press the reset button. 3. **Input/output board:** The input/output board has developed a problem that requires its replacement.
No display on LCD screen.	1. Check for a defective power switch. 2. Check wiring between fuses and input/output board. 3. Check for 120 volts AC between points J9-3 and AC-1. 4. The display may have a malfunction requiring its replacement.
Control power light is on, drying mode light is on--load auger, fan, heater, unload auger will not operate.	1. **Press the dryer power** start button. 2. Refer to the problem listed for load auger, fan heater and unload auger in the following sections.
Display shows "**L1 VOLTAGE LOST**" message.	The left circuit breaker located on the input/output board of the Electronic Monitoring Control System has tripped, or one of the hardware timers on the Electronic Monitoring Control System has shut down the dryer.
Display shows "**12 VOLT POWER SUPPLY WARNING**" message.	The right circuit breaker located on the input/output board of the Electronic Monitoring Control System has tripped.
Display shows "**MOTOR OVERLOAD**" message.	The thermal overload on the fan motor, load motor, unload motor or an auxiliary motor has opened indicating an overloaded motor. (The overloads must be manually reset).

TROUBLE ANALYSIS PROCEDURE

Problem	Possible Cause
Display shows "**BURNER 1 OR 2 VAPOR HIGH TEMPERATURE**" message.*	The LP gas vapor temperature sensor located in the gas train downstream from the vaporizor has opened, indicating that the vaporizer is running too hot and must be readjusted. (This control is a 93°C limit which automatically resets when it cools).
Display shows "**BURNER 1 OR 2 WARNING FLAME NOT DETECTED**" message.*	The flame sensor has failed to detect a burner flame, indicating that the burner has failed to light, there is a problem with the flame sensing circuitry or the dryer is not getting burner fuel.
Display shows "**FAN 1 OR 2 HOUSING HIGH TEMPERATURE**" message.*	The temperature high limit located on the fan/burner housing has opened, indicating an over temperature condition has occurred towards the rear of the fan/heater housing. (This control is a 92°C limit control that must be manually reset).
Display shows "**GRAIN DISCHARGE WARNING**" message.	The cover on the grain discharge box has opened, indicating that grain is backing up into the discharge box.
Display shows "**LOWER ADJ. GRAIN HIGH TEMPERATURE**" message.	An over temperature condition has occurred inside the left side grain column. (This control is a 99°C limit which automatically resets when it cools).
Display shows "**LOWER FIXED GRAIN HIGH TEMPERATURE**" message.	An over temperature condition has occurred inside the right side grain column. (This control is a 99°C limit which automatically resets when it cools).
Display shows "**OUT OF GRAIN**" message. Display shows "**OUT OF GRAIN-UNLOAD CLEANOUT..**" message.	The dryer has run low on grain, and the out of grain timer has timed out shutting the dryer down. The unload auger will then clean out the dryer, if the unload switch is on during continuous flow operation. Check the out of grain timer setting, and if necessary adjust. Also, before restarting, inspect load equipment for possible damage or adjustment.
Display shows "**PLENUM 1 OR 2 HIGH TEMPERATURE**" message.*	An over temperature condition has occurred inside the dryer plenum. (This control is a 149°C limit which automatically resets when it cools).
Display shows "**METER ROLL DRIVE SYSTEM FAILURE**" message.	The metering roll drive system has failed to turn within two minutes. A faulty D. C. motor, broken chain or jammed roll is a possible cause of this message.
Display shows "**RIGHT METERING ROLL FAILURE**" message.	The right metering roll has stopped rotating, or the sensor has been damaged.
Display shows "**LEFT METERING ROLL FAILURE**" message.	The left metering roll has stopped rotating, or the sensor has been damaged.
Display shows "**AUXILIARY SAFETY SHUTDOWN**" message.	A shutdown has occurred due to a user installed safety feature. This circuit is located between J5-8 and J1-20 terminals on the input/output board.
Display shows "**BURNER 1 OR 2 SHUTDOWN LOSS OF AIRFLOW**" message.*	The air switch contacts have opened, indicating insufficient airflow for burner to operate.

* The number in the warning message designates the fan, burner or plenum where the problem is located. All areas are numbered from the bottom up. For example, the bottom fan is number 1, and the top fan is number 2.

TROUBLE ANALYSIS PROCEDURE

Problem	Possible Cause
Display shows "**FAN 1 OR 2 FAILURE-NO AIRFLOW**" message.*	The air switch contacts have opened, indicating the fan may not be turning. The air switch may need adjustment.
Display shows "**FAN 1 OR 2 CANNOT START-CHECK AIR SWITCH**" message.*	The air switch contacts have closed prior to the fan starting, indicating a freewheeling blade or improper setting of air switch.
Fan motor will not start.	1. Check that the fan circuit breaker and the fan switch are on. Also, check for defective switch or bad wiring connections. 2. If lighted switch does not light, the air switch needs adjustment, or the bulb may be burned out. 3. Verify closing of fan motor contactor. Check voltage on load side of contactor. See appropriate power wiring circuit diagram for terminal numbers. Inspect contactor for defective points or a burned out coil. 4. Inspect connections, and check voltage applied to the motor leads in the fan heater box to determine if the motor is defective. 5. Check capacitors on single phase motors, and replace if defective. If motor starts slowly, check for low voltage during starting due to excessive voltage drop in power supply wiring.
Top auger will not start.	1. Check that the top auger circuit breaker and the load auger switch are turned on. 2. If lighted switch does not light, the output power to the contactor is missing. Check connections, or if the bulb is burned out. 3. Check position of the upper auger paddle switch. It must be down to start auger. 4. Inspect for secure mounting and wiring of mercury switch in the terminal box on the top auger paddle switch shaft. Include check for a defective mercury switch. 5. Verify closing of the top auger contactor. Check voltage on load side of contactor. Inspect contactor for defective points, or a burned out coil. 6. Inspect connections, and check voltage applied to motor leads in motor junction box to determine if motor is defective. 7. Check that the mercury switch box is in the proper position.
Bottom auger will not start.	1. Check that the bottom auger circuit breaker is on. 2. If the lighted switch does not light, the output power to the contractor is missing. Check connections, and check to see if the bulb is burned out. 3. Check that the unload switch is on (1 or 2 speed). 4. Verify closing of bottom auger contactor; check voltage on load side of contactor. 5. If using the moisture control, check for proper setting, or defective operation of the control. 6. Check for any loose wire connections in unload auger and moisture control thermostat circuits.
Grain not moving through columns.	1. Check the dryer for fine material buildup inside the columns. 2. Avoid leaving the dryer columns full for long periods at a time (2-3 days) while not operating the dryer, or during rainy weather.

* The number in the warning message designates the fan, burner or plenum where the problem is located. All areas are numbered from the bottom up. For example, the bottom fan is number 1, and the top fan is number 2.

TROUBLE ANALYSIS PROCEDURE

Problem	Possible Cause
Grain not moving through columns.	1. Check the dryer for fine material buildup inside the columns. 2. Avoid leaving the dryer columns full for long periods at a time (2-3 days) while not operating the dryer or during rainy weather. 3. Empty the dryer. Keep the dryer clean! Do not allow fine material to gather in the plenum chamber. 4. It may be necessary to open the strike off plates in the affected columns in half inch intervals.
Uneven drying-Some kernels appear brown while others are under dried. Uneven heat exiting from dryer columns.	1. Check plenum thermostat temperature setting. Some varieties of grain are more sensitive to higher operating temperatures. It may be necessary to lower the plenum operating temperature to accommodate this. 2. Check for proper burner alignment (side to side). Vibration during shipment may have caused misalignment.
Burner will not fire with fan operating.	1. Burner switch must be on. 2. Check for power to ignition board.
Heater switch light and gas solenoids go on and off erratically-The light blinks on and off while the solenoids "chatter".	1. The blinking light indicates the flame sensor is not detecting flame. 2. The "chattering" solenoids are caused by the loss of flame detection, and the thermostat and Fenwal ignition board trying to reestablish a flame. Check for loose wires on flame sensor; replace or repair wires or sensor.
Burner will not fire-No gas pressure with fan operating at least 15 seconds (gas supply or fan heater malfunction).	1. Check gas supply. Also, check gas filter and gas line for possible obstruction or closed valves. Refill tank; replace or repair parts, as required. 2. Inspect gas solenoid valves (including liquid valve on LP units) for defective coils or improper wiring. Replace valve or coil if valve will not open with proper voltage applied (120 volts). 3. Check for proper voltage. 120 volts across L1 and L2 incoming voltage to the Fenwal Ignition Board, and 115 volts outgoing across V1 and V2 to the solenoids.
Burner will not fire-But gauge shows gas pressure.	1. Fenwal Ignition Board: Check board for spark by removing ignition wire from board, and holding aninsulated screwdriver against the output terminal and 1/4" away from the control box casing. There should be a strong spark. Check board wire connections. Replace the Fenwal board, if necessary. 2. Ignitor: Check that the ignitor is properly gapped to 1/8" and that it has a strong spark. Inspect the porcelain and electrodes for damage or cracking. Replace or clean if necessary.
Burner maintains desired drying temperature-but cycles from hi-fire to off (without going to lo-fire).	1. Make sure the low flow control valve is not completely closed. Valve must be adjusted open to provide the proper lo-fire gas pressure listed in this manual. 2. Check lo-fire solenoid valve for proper operation.

TROUBLE ANALYSIS PROCEDURE

Problem	Possible Cause
Burner operates-But will not cycle from hi-fire to lo-fire.	1. Check the gas pressure reading on the gauge. Problem may be due to insufficient gas regulator setting. Temporarily decrease the hi-lo fire thermostat setting to verify that the thermostat will function and cause the burner to cycle. If burner will cycle at the reduced thermostat setting, it indicates that the problem was due to insufficient heat to satisfy the original setting. Increase the gas regulator setting for additional heat output. Do not exceed the maximum pressure listed in this manual. 2. Hi-lo fire thermostat control may be defective. If the burner still will not cycle to lo-fire after decreasing the thermostat, the problem may be due to a broken or kinked thermostat sensor tube. Observe reading on the thermometer. Replace control assembly if it cannot be set to cause its switch to go to the open circuit position with normally hot air plenum temperatures. 3. If the burner continues to operate on hi-fire, check the hi-fire gas solenoid valve for a stuck or blocked open condition, or for reversed gas pipe connections. The solenoid valve must not allow gas flow when its coil is not energized.
Burner operates-But will not cycle from lo-fire to hi-fire.	1. Check for an excessive lo-fire gas pressure setting. Observe pressure setting shown on gauge, and compare reading with recommended low pressure settings listed in this manual. Readjust lo-fire setting on flow control valve, if necessary. 2. Check for improperly adjusted or defective hi-lo fire thermostat control. Temporarily increase the temperature setting. If the heater will still not cycle, check for problem in the control wire connections. The control wires should be connected to terminals R and B of the thermostat, so the switch will open upon temperature rise. If the burner will cycle with these two wires connected together, the thermostat is faulty. 3. Check for improperly connected or faulty hi-fire gas vapor solenoid valve. Correct any poor connections or defective wiring. If wiring appears proper, problem may be caused by a burned out valve coil or defective valve. Replace hi-fire solenoid valve, or its coil, if defective.

ELECTRONIC MONITORING CONTROL SYSTEM

Important! To activate the controller after turning on the control power, press the reset button.

Setting the dry, cool, unload and out of grain timers:

- Press the **dry, cool, unload** or **out of grain** button
- Press the **modify** button
- Press the **increase** or **decrease** button to get desired setting
- Press the **enter** button when desired setting is reached

Setting the load and unload delays:

- Press the **load** or **unload** button
- Press the **modify** button
- Press **increase** or **decrease** button to get desired setting
- Press the **enter** button when desired setting is reached

Pressing the **increase** and **decrease** buttons simultaneously will access the following programming features:

- Safety circuit shutdown log
- Dryer model number
- Fan delay
- BPH factor
- Metering roll monitor disabling feature
- Air switch disabling feature

These features are accessed sequentially as listed above. Press the **increase** or **decrease** buttons to change a setting. Press the **enter** button to move from feature to feature.

Pressing and holding the **reset** button for five seconds will access the following programming features:

- Calendar year setting
- Calendar month setting
- Calendar day setting
- Clock hour setting
- Clock minute setting
- Bushel counter reset
- Batch counter reset

These features are accessed sequentially as listed above. Press the **increase** or **decrease** buttons to change a setting. Press the **enter** button to move from feature to feature.

Change the marquee on the LCD display:

- Press and hold the modify button while turning on the control power
- To change a character press the increase or decrease button
- To move the cursor to the right press the unload button
- To move the cursor to the left press the dry button
- To delete a character press the cool button.
- Press enter when the desired marquee is displayed

To reset the computer to the original default setting, turn off the computer, press and hold the **green AUX 1 button** and turn on the computer. NOVRAM will appear on the LCD display. The year, date, time and minutes may be changed now, and the shutdown history may also be cleared.

Note: If the history is cleared the dryer model number must be reset or only the bottom fan will operate.

Dryer owner and Airstream associates check the Electronic Monitoring Control System.

NOTES

AIRSTREAM
a division of
THE GSI GROUP

1004 E. Illinois St., Box 20
Assumption, IL 62510-0020
phone: 217-226-4421
fax: 217-226-4498