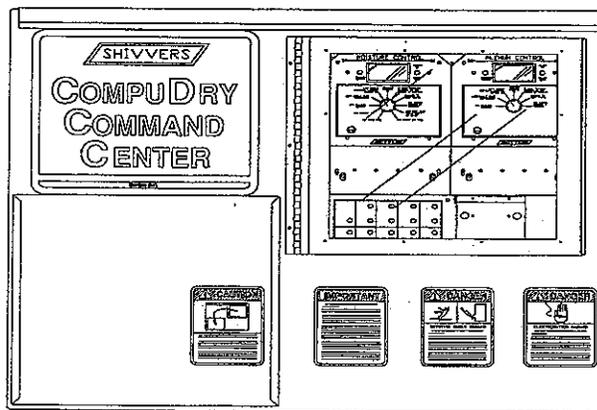


CompuDry Command Center



Operating Instructions For Model 641A-001A



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Corydon, IA 50060
(641) 872-1005
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3-18-08

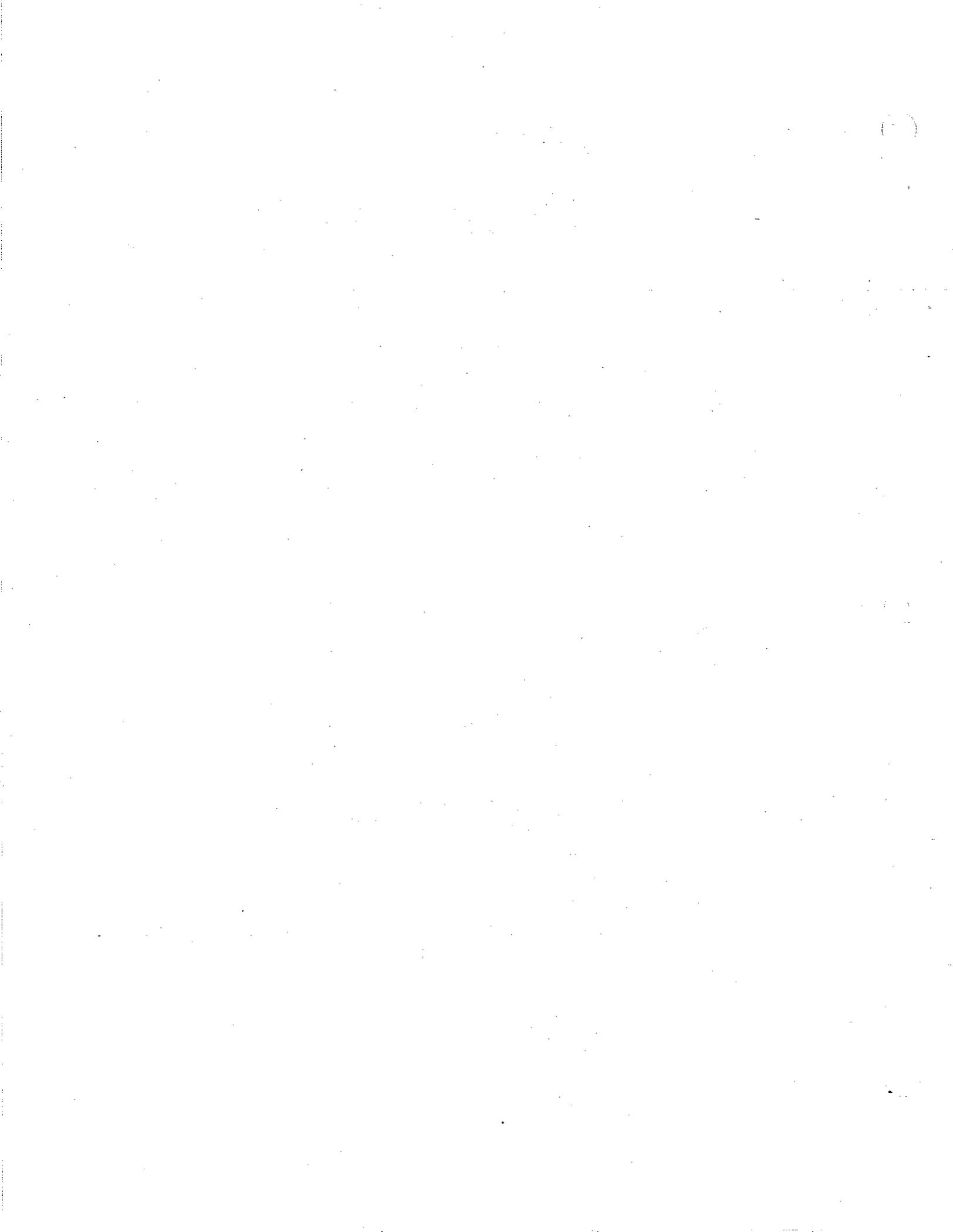


TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	2
SAFETY INFORMATION	3-4
LOCATION OF SAFETY DECALS	5-7
OTHER DECAL LOCATIONS	8-9
IDENTIFICATION OF PARTS	10-11
SWITCH/RELAY PANEL EXPLANATION	12
MOISTURE CONTROL MODULE EXPLANATION	13-15
PLENUM CONTROL MODULE EXPLANATION	16-17
COMMAND CENTER OPERATION	18-35
FAN CONTROL	18
SETTING SWEEP AUGER(S)	19
PLENUM CONTROL OPERATION	20-24
MOISTURE CONTROL OPERATION	25-30
LOW GRAIN SHUT OFF OPERATION	31-32
COMMAND CENTER SHUTDOWN	33
COMMAND CENTER QUICK START	34-35
MAINTENANCE	36
ERROR CODES	37-39
TROUBLE SHOOTING TIPS	40-41
CONFIGURE MACHINE TYPE	42

INTRODUCTION

READ OPERATING INSTRUCTIONS AND OPERATOR'S SAFETY MANUAL COMPLETELY BEFORE STARTING THE COMPUDRY COMMAND CENTER.

The 641 series CompuDry Command Center is designed as a complete, automatic in-bin dryer control. It will test actual grain moisture with its computerized sensor and Moisture Control module. It will adjust the plenum heat, within operator set parameters, to give the desired grain moisture, while minimizing the amount of over-dried grain, with its Plenum Control module.

The standard configuration will control the removal machine and one continuous flow auger and spreader. It can control up to three fan and heater units, and has a low grain shut off to turn the system off when the grain depth gets low.

Available options include; motor starters for up to three additional transfer augers, a printer to record each grain sample, a sequential timer control for transfer auger clean out, and power transformers to convert available power to 115 volt control power. A main power disconnect switch or breaker with lockout capability is required but not included.

The Moisture Control module works as an electronic moisture tester in place of the grain thermostat. Instead of controlling by grain temperature, it controls the machine (sweep augers) by reading a sample of the grain and then determining if the grain is dry enough to transfer. The Moisture Control module turns on the machine, waits for 60 seconds, then takes a moisture reading of the grain. If the moisture reading is higher than the operator entered set point, the module shuts the machine off. It will then wait for the grain to dry before sampling again. If the grain sample is dry enough, the module keeps the machine on and turns on the transfer augers to transfer the grain to the cooling bin. Once the machine is running, the Moisture module samples every 5 minutes to test the transferring grain. If a wet sample is encountered it looks at the averages of the last 2 - 9 samples (set by operator) to determine when to shut the machine off. Using averages to shut the machine off allows the control to go through isolated wet spots. This prevents over drying of grain in other areas of the bin. Once the average becomes too wet, the Moisture module shuts the machine off and cleans out the transfer augers.

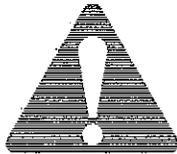
The Plenum Control module receives data from the Moisture Control Module. It will adjust the target temperature between the minimum and maximum temperature settings based on the moisture readings received. If the grain is too dry, the target temperature will go down to prevent over-dry. If the grain is too wet, the target temperature will go up to maximize capacity. The Plenum module also monitors the low grain shut off, and will shut the system down when the bin runs low on grain.

SAFETY INFORMATION

The operator of this machinery must assume the responsibility for their own safety, and that of those who are working with them. They must also make sure the equipment was installed properly. Factors that contribute to the overall safety of operation are: proper use, maintenance, and frequent inspection of the equipment. All of these are the operator's responsibility.

If any items covered in this manual are not completely understood, or there is a concern with the safety of the product, contact SHIVVERS at the address shown on the front page.

SHIVVERS is genuinely interested in providing the safest practical equipment to our customers. If you have a suggestion which you believe will enhance the safety of this product, please contact us and let us know.



**TAKE NOTE ANYTIME THIS SAFETY ALERT
SYMBOL APPEARS.
YOUR SAFETY, AND THAT OF PERSONS AROUND
YOU IS AT STAKE.**

The safety alert symbol will be accompanied by one of three signal words whose definitions are given as:

DANGER: Red and white. Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING: Orange and black. Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

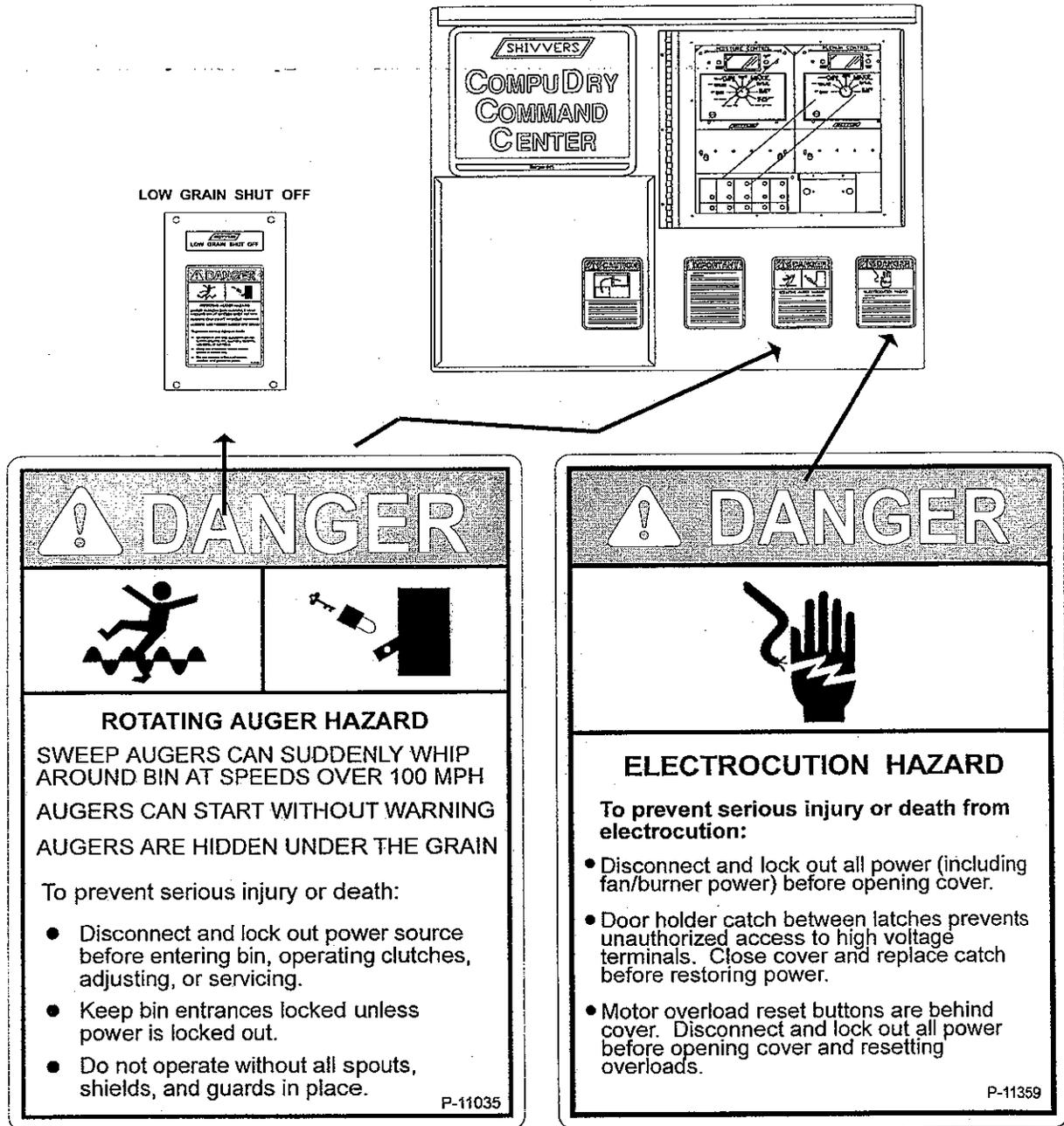
CAUTION: Yellow and black. Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Be sure to observe these common sense rules when working with the dryer equipment:

- 1). All units must be equipped with a main power disconnect switch. This disconnect switch must shut power off to the complete drying system. It must have the capability of being locked into the OFF or OUT position. Disconnect and **LOCK OUT** this main power disconnect switch before conducting any inspection, maintenance, repair, adjustment, or cleaning of the drying system. When you must have the electrical power on to troubleshoot equipment, do it from a safe distance, and always from outside the bin.
- 2). Keep the bin entrances locked at all times. To unlock the bin, first lower the Level-Dry (if so equipped), then shut the main power disconnect off. Take the safety lock off the bin entrance and place it on the main power disconnect before opening the bin entrance. **Never enter the drying bin unless the Level-Dry (if so equipped), is completely lowered, and all power is disconnected and locked out.**
- 3). Always keep all shields and guards in place. If shields or guards must be removed for inspection or maintenance, replace them before unlocking and turning the power back on.
- 4). Be sure everyone is clear of all the drying and transferring equipment, and outside of all bins, before unlocking and turning the power on. Some equipment may run upon re-application of power.
- 5). Make sure that all decals are in place and are easy to read. Do not operate the equipment with missing or illegible decals. If replacements are needed, contact SHIVERS Incorporated or your dealer.
- 6). Prior to use, inspect all equipment to insure that it is in good operating condition. Do not operate with missing, damaged, or worn parts. Use only SHIVERS approved replacement parts.
- 7). Metal edges can be sharp. Wear protective clothing and handle equipment and parts with care.
- 8). Keep children and bystanders away from drying and transferring equipment at all times.
- 9). If going up the bin ladder and/or performing maintenance on the top of the bin, take precautions to prevent accidental falls. When on top of the bin, wear a safety harness or other safety device.
- 10). At least annually, review all operating and safety manuals with any personnel working with this equipment. Always train new employees before they operate the drying equipment. Insist that they read and understand the operating and safety manuals.

LOCATION OF SAFETY DECALS

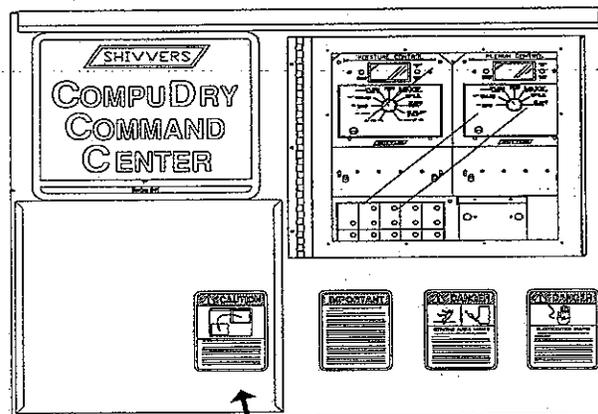
This manual shows the location of safety decals that apply to the CompuDry Command Center. For complete instructions on where to find safety decals for other installed equipment consult your Operator's Safety Manual (P-10001).



P-11035

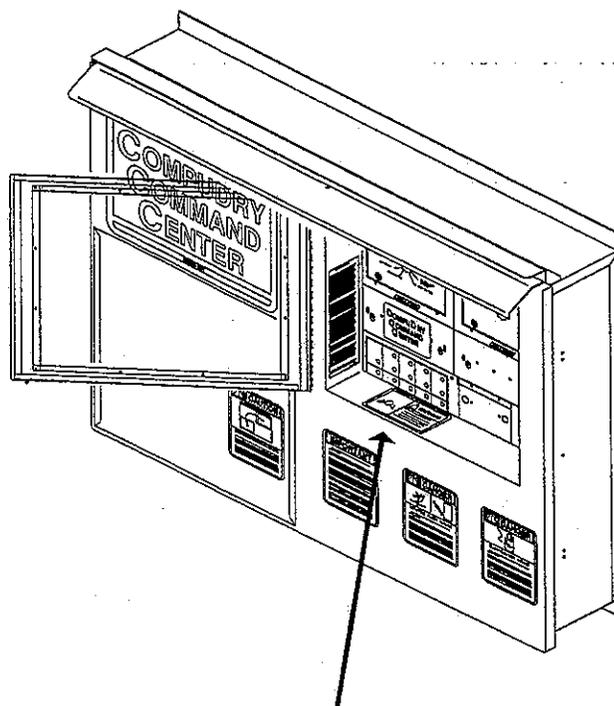
P-11359

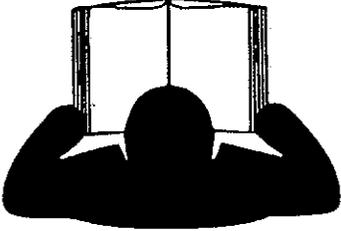
Location of safety decals, cont'd:



P-11360

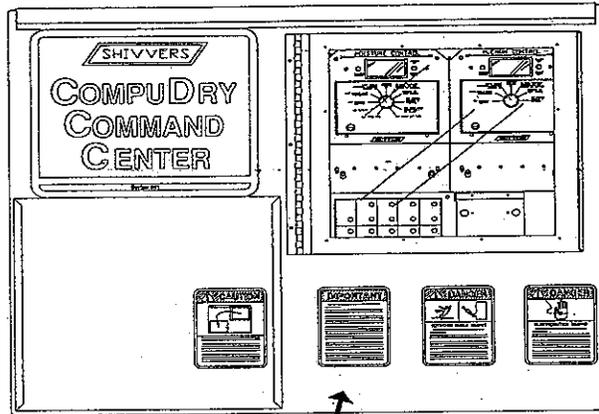
Location of safety decals, cont'd:



 <p>P-10367</p>	<p>! WARNING</p> <p>To prevent Serious Injury or Death:</p> <ul style="list-style-type: none">• Avoid unsafe operation or maintenance.• Do not operate or work on equipment without reading and understanding the operator's manual.• If manuals or decals are missing or difficult to read, contact Shivers, Inc. Corydon, IA 50060 for replacements.
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P-10367

OTHER DECAL LOCATIONS



IMPORTANT

START-UP

Keep drying bin depth under 2 feet until Circu-Lator or Dri-Flo has been "polished" with several hours of operation. Tapered sweep augers should not operate in grain over 20% moisture content. Dry the bottom layer first with fan and heater before operating sweep augers.

LOW GRAIN SHUT OFF

Put Low Grain Shut Off switch in BYPASS position and fill bin until grain level is above Low Grain Shut Off box. Dry as normal until a tapered sweep auger has passed under box at least twice (approximately 1 hour of "ON" time). Put Low Grain Shut Off switch into AUTO position. Switch it quickly to prevent Moisture Control from shutting down. The red indicator light should remain lit. When grain level falls below Low Grain Shut Off box, dryer will automatically begin shut down process. Turn transfer augers on after a low grain shut down to clean them out.

KEEP BELTS TIGHT

New belts especially will stretch during the first two weeks of operation.

BASKET SLIDE GATE

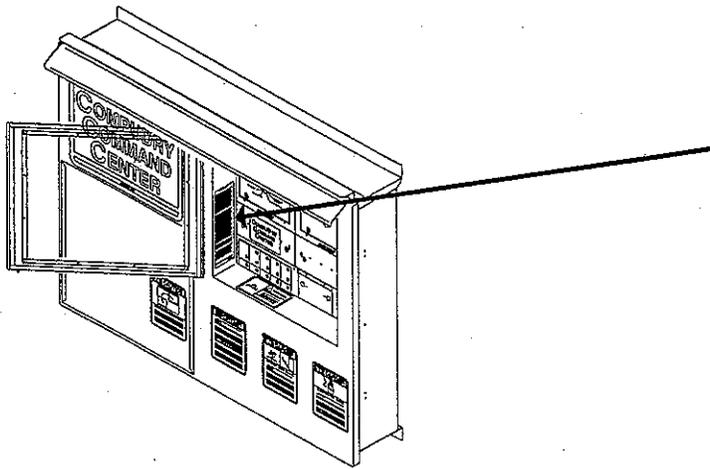
Always keep basket slide gate closed during Circu-Lator or Dri-Flo operation.

LUBRICATION

Lubricate equipment at least annually as per instructions in operating manuals.

P-11350

P-11350



OPERATING NOTES

MOISTURE CONTROL

This moisture meter is adjustable. You can calibrate it if necessary to be consistent with a certified moisture meter or other meter you consider accurate. Periodically check meter accuracy and your dryers output grain moisture throughout the drying season. When drying is complete, proper grain management is required to maintain quality and proper moisture content of the stored grain.

Control Panel and Low Grain Shut Off indicator lights must be on, and Machine switch in AUTO, before Moisture Control will have power.

Hold Adjust Up or Down on Moisture Control to start both modules. Meter calibration can be done with knob at Last Sample or Moisture Average. Meter or grain temp. cannot be calibrated, and display update may be slow, when Moisture Control is reading sensor. Hold Adjust Down for 2 seconds to restart 12 hour transfer average.

MOISTURE ERROR (M-ERR) CODES

- E03 Readings not changing. Grain is not moving past sensor.
- E04 Readings out of range. Grain is too wet, dry, or not on sensor.
- E05 Moisture cable/sensor problem.
- E06 Bad grain temp. reading.

PLENUM CONTROL

Plenum control will automatically start if Moisture control is started. Display flashes when in fan shutdown mode. Adjust Fan Shutdown Time to max. (—) to bypass fan shutdown.

PLENUM ERROR (P-ERR) CODES

- E03 Data transmission error.
- E04 Plenum hot. Fan not shut off.
- E06 Bad plenum temp. reading.

M-ERR OR P-ERR CODES

- *Px.x Program version #. Power was off or grain type was changed.
- *E02 Watchdog timer reset. A malfunction shut system off.
- *E07 Drying parameter read error. Defaults are set.
- E08 No rotary switch input. Stops sampling. Shut power off.

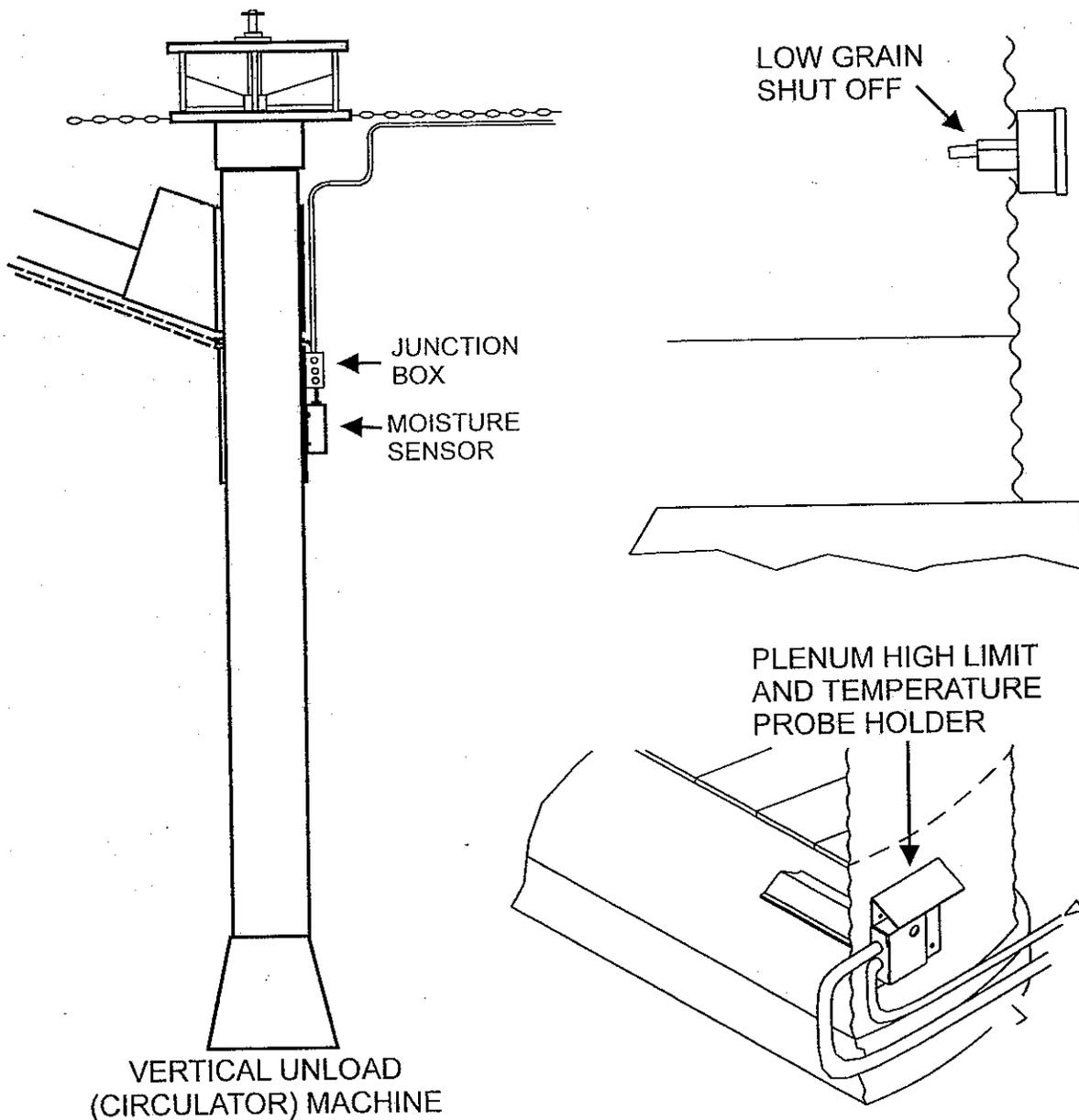
*Stops sampling, press Adjust Up or Down to start drying program.

P-11361

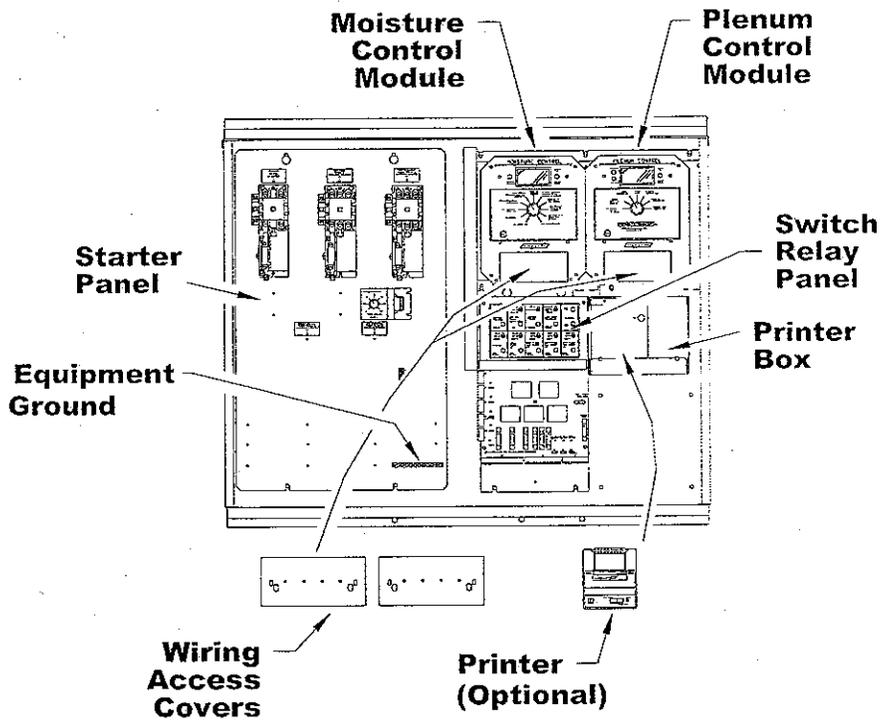
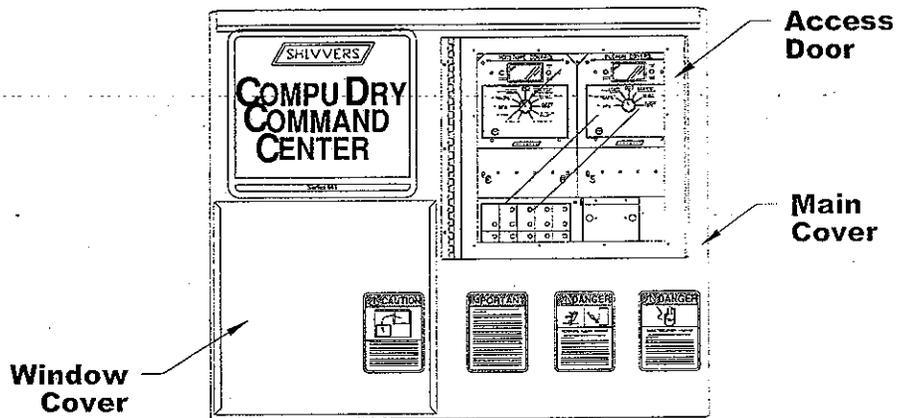
P-11361

IDENTIFICATION OF PARTS

See the installation manual (P-11337) for an overview of Command Center features and equipment terminology. Also see the Operator's Safety Manual (P-10001) for definitions, proper use of safety locks and disconnects, and proper bin unloading procedures. Refer to other installed equipment manuals for a complete understanding of the total drying and grain handling system. The CompuDry Command Center will usually be referred to as a Circu-trol in other manuals, as that is the control which the Command Center replaces.



Identification of parts, cont'd:



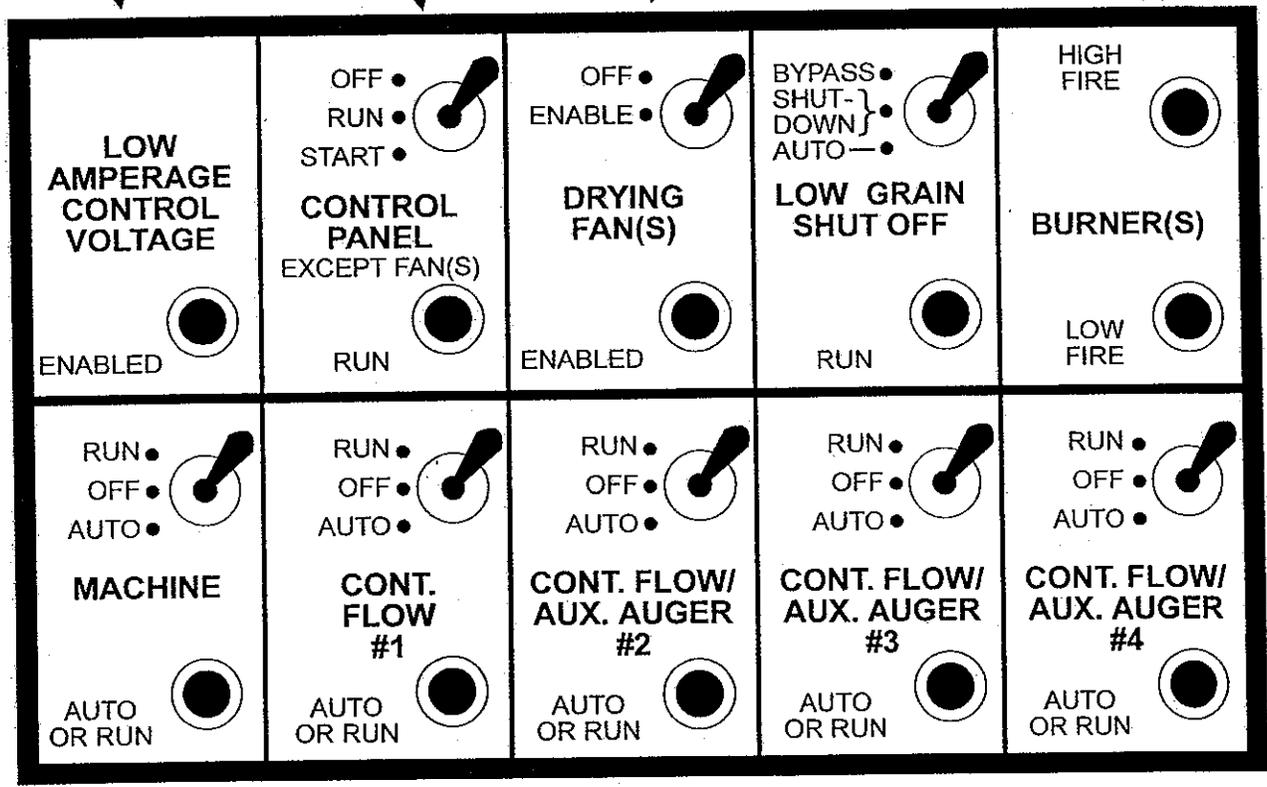
Bottom view shown with main cover removed.

! DANGER

Disconnect and lock out all power (including fan/burner power) before opening main cover.

SWITCH/RELAY PANEL EXPLANATION

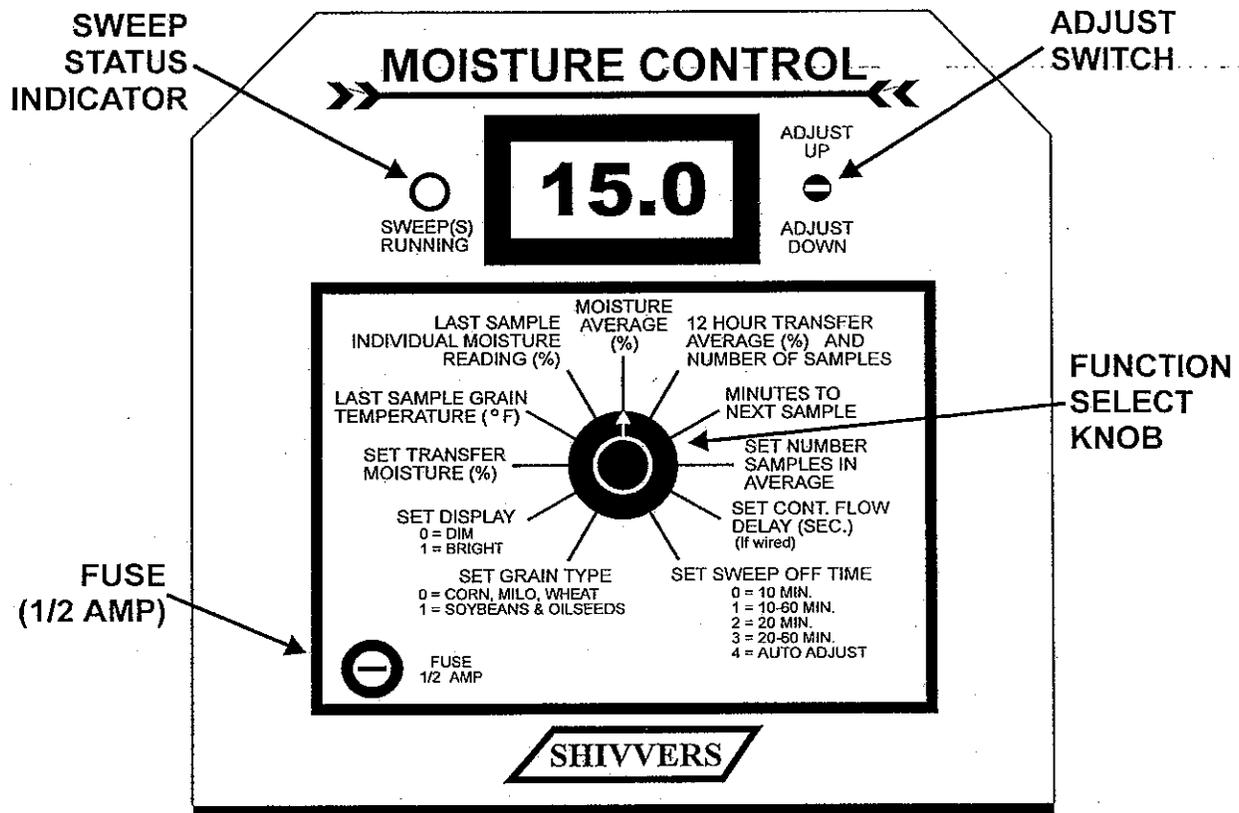
<p>Light is on when control power breaker is on. Shutting breaker off shuts down fan(s) and control circuit.</p>	<p>In up position, control panel power is off. Burners and augers are off. Center is run position. Push switch down to momentary start position to turn on panel control power. When light is on, Plenum Control and Printer, have power.</p>	<p>In up position fans cannot be started. In middle position, if all safeties are OK, light will be on and fan(s) can be started. Bottom momentary position is not used.</p>	<p>In BYPASS position LGSO is out of circuit or bypassed. In SHUT-DOWN position, burners cannot run. In AUTO, Moisture Control and burners will shut off when bin is out of grain. Light must be on for Moisture Control to have power.</p>	<p>High and Low Fire indicators.</p>
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In RUN position Machine will run, even if LGSO is off. In AUTO, power is applied to Moisture Control. Moisture Control then turns machine on and off. Light is on whenever switch is in RUN or AUTO even if machine is not running.

In RUN position auger will run, even if LGSO is off. In AUTO, Moisture Control controls auger on and off. Lights are on whenever switch is in RUN or AUTO even if auger is not running.

MOISTURE CONTROL MODULE EXPLANATION



SWEEP STATUS INDICATOR - The sweep status indicator lets the operator know when the sweep(s) are running.

ADJUST SWITCH - The adjust switch is a spring loaded toggle switch that allows the operator to adjust or calibrate the selection being viewed on the display.

FUNCTION SELECT KNOB - The function select knob allows the operator to choose the data to be displayed.

Moisture Control module explanation, cont'd:

FUNCTION SELECT KNOB SETTINGS

SET GRAIN TYPE: In this position the type of grain to be dried is selected. 0 = CORN, MILO, WHEAT. 1 = SOYBEANS, OILSEEDS. By holding the Adjust switch up or down 0 or 1 can be selected. When the grain type is changed the Moisture Control will restart from the beginning of the program with new averages and the meter calibration for that grain type.
Default = 0.

SET DISPLAY: When the knob is in this position it will allow the operator to toggle the display brightness between DIM and BRIGHT. 0 = DIM 1 = BRIGHT

SET TRANSFER MOISTURE: This position sets the hot grain moisture content that is to be transferred. Allow for cooling based on your own experience. For example: set at 16.5, if 1.5 points of moisture is lost in cooling, final moisture level would be 15.0%. The Moisture Control will start transferring when the individual moisture reading is below the setpoint, but will not shut off until the moisture average is above the setpoint. This allows the sweep auger(s) to go through isolated wet spots, thereby preventing overdrying of the rest of the bin. Default = 14.0%.

LAST SAMPLE GRAIN TEMPERATURE: This displays the grain temperature of the last sample that was taken. The temperature can be calibrated $\pm 20^\circ$ by holding the Adjust switch up or down until the temperature reading is correct. Default = 0.

LAST SAMPLE INDIVIDUAL MOISTURE READING: This displays the moisture content of the last grain sample. The sensor can be calibrated $\pm 7.9\%$ in this position. See CALIBRATING MOISTURE SENSOR section for details. Default = 0.

MOISTURE AVERAGE: Displays a rolling average of the last 2-9 grain samples. This is what the Moisture Control looks at to shut the sweep(s) off. If the average is below setpoint, the sweep(s) remain on. If the average is above the setpoint, the sweep(s) will be shut off. If off 2 or more times in a row, the moisture average will be the same as the individual moisture reading. The moisture average will restart with the next on cycle. Sensor calibration can be performed in this position also.

12 HOUR TRANSFER AVE. AND NUMBER OF SAMPLES: This position shows the average of up to 12 hours of readings when the sweep(s) were on. It will also show the number of samples included in the average. (Display will occasionally flash the number of samples in the average.) The average can be reset at any time by holding the Adjust switch down for 2 seconds when knob is in this position. This average will automatically start over after 144 "ON" samples.

Moisture Control module explanation, cont'd:

MINUTES TO NEXT SAMPLE: This position shows how long before the next sample is taken. When the program is first started, the first sample will be in 10 minutes. During "OFF" cycles, the time to the next sample depends on the off time mode selected. It can range from 10 to 60 minutes depending on moisture. When the control is in an "ON" cycle, the time between samples is 5 minutes. The time can be adjusted down to 0 to start the sample process by using the Adjust switch. The time can also be adjusted up in the same manner if desired.

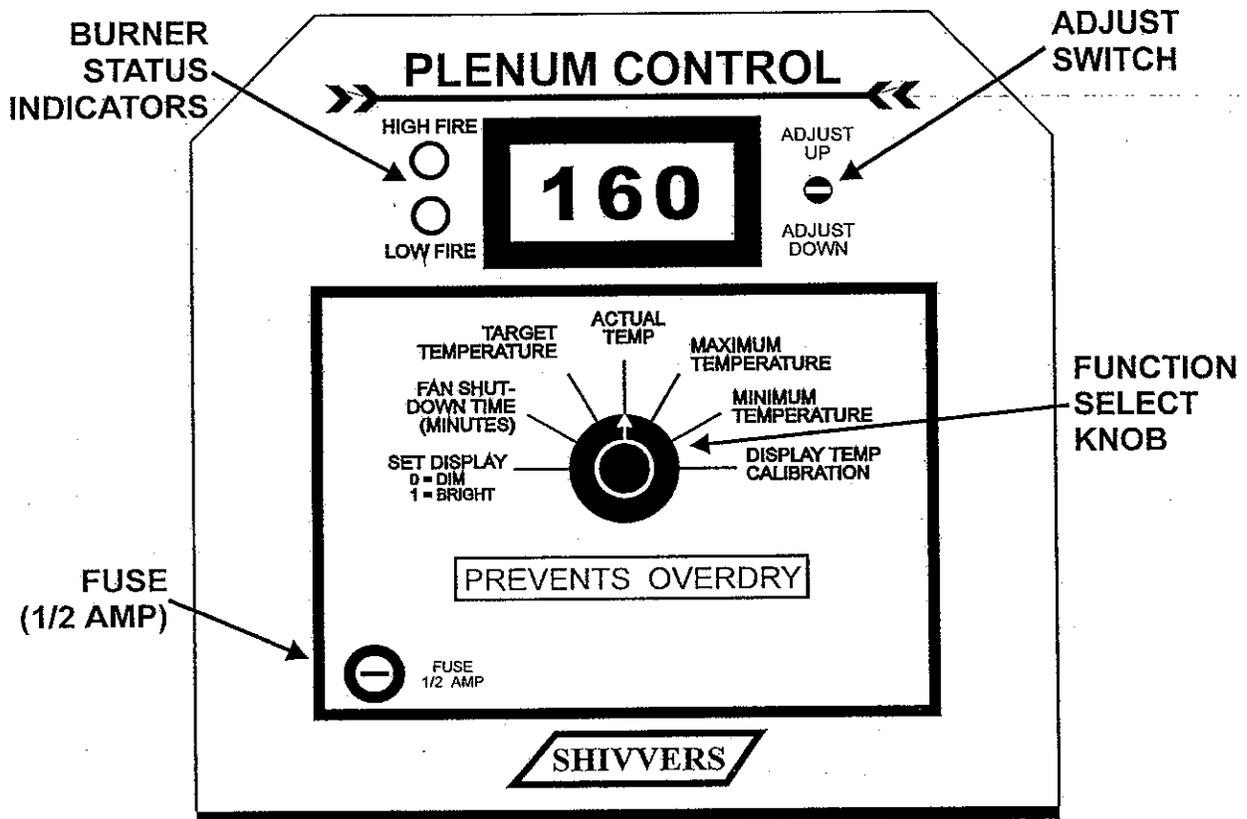
SET NUMBER OF SAMPLES IN AVERAGE: This is where the number of samples is set for the rolling moisture average and can be set from 2-9. For the initial setting take the time that it takes for the sweep(s) to go completely around the bin and divide that by five. For example: if it takes the sweep 35 minutes to go around the bin, the setting should be 7. Most dual sweeps systems can be set at 4. Default = 4

SET CONT FLOW DELAY: This position allows the operator to set the number of seconds the transfer augers will clean out after the sweeps have shut off. The time can be adjusted from 10 - 127 seconds. Default = 30.

SET SWEEP OFF TIME: The sweep off time can be set to match your drying system. If the Moisture Control is off more than 5 times in a row, the next slowest off time should be chosen. 0 = 10 minutes fixed, which is the fastest mode. 1 = 10-60 adjustable. This mode calculates the time between off cycles according to the moisture content (the wetter the grain the longer the off time). It is for dryers that are slower. 2 = 20 minutes fixed, the time between off cycles is 20 minutes. It is the next slowest drying mode. 3 = 20-60 adjustable is the slowest drying time. It is set up like the 10-60 adjustable except the minimum time between off cycles is 20 minutes. 4 = Auto Adjust. The Moisture Control will automatically adjust between the 0 - 3 off modes. If off 5 times in a row it will go to a slower mode. If off only once, then on 10 times in a row, the Moisture Control will go to a faster mode. Hold Adjust switch up or down to set initial auto adjust mode.

HLP: This position is not labeled on the Moisture Control. This selection is when the pointer is straight down. This position is reserved for manufacturing, testing, and configuring purposes and is not used under normal operating circumstances.

PLENUM CONTROL MODULE EXPLANATION



BURNER STATUS INDICATORS - These indicator lights show when the plenum control module is calling for heat.

ADJUST SWITCH - The adjust switch is a spring loaded toggle switch that allows the operator to adjust or calibrate the selection being viewed on the display.

FUNCTION SELECT KNOB - The function select knob allows the operator to choose the data to be displayed.

Plenum Control module explanation, cont'd:

FUNCTION SELECT KNOB SETTINGS

SET DISPLAY: When the knob is in this position it will allow the operator to toggle the display brightness between DIM and BRIGHT. 0 = DIM 1 = BRIGHT.

FAN SHUTDOWN TIME: This position sets the number of minutes the Plenum Control will wait to shut the fan(s) off after a Low Grain Shut Off. Range is from 1 to 120 minutes. It can also be set to not shut the fan(s) off by setting it above 120 (the display will show "---"). The adjustment increments from 1, 2, 3, 4, 5, 10, 15, ..., 110, 120, ---. After the Plenum Control goes into fan shutdown mode (blinking display), the fan shutdown time can be adjusted down to 0 to immediately shut the fan(s) off. It can also be adjusted up to "---" to get out of fan shutdown mode without shutting the fan(s) off. When fan shutdown time is adjusted while the Plenum Control is in fan shutdown mode, the time settings are not stored in memory. Default = 60 minutes.

TARGET TEMPERATURE: This displays the Plenum Control's desired temperature setting. It can be adjusted from the Minimum Temperature setting to the Maximum Temperature setting. The target temperature will change based on the moisture data received from the Moisture Control. Default = 140 degrees.

ACTUAL TEMP: This displays the actual plenum temperature as read by the Plenum Control's temperature sensing probe. The temperature can be calibrated $\pm 20^\circ$ by holding the Adjust switch up or down until the temperature reading is correct. Default = 0.

MAXIMUM TEMPERATURE: This displays the Plenum Control's maximum temperature setting. It can be adjusted from the Minimum Temperature setting to 180 degrees. The target temperature cannot be adjusted above the maximum temperature. Default = 140 degrees.

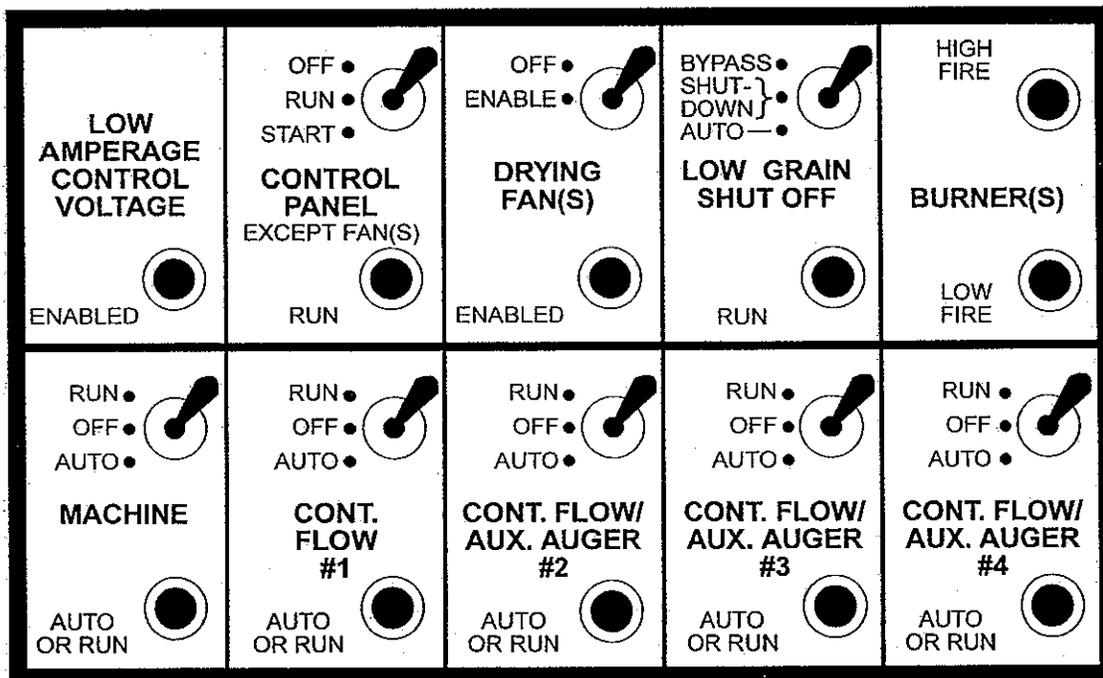
MINIMUM TEMPERATURE: This displays the Plenum Control's minimum temperature setting. It can be adjusted from 55 degrees to the Maximum Temperature. The target temperature cannot be adjusted below the minimum temperature. Use caution when setting a minimum temperature above 100 degrees. If there is a malfunction, the plenum control cannot adjust the target temperature below the minimum temperature setting. Set the minimum temperature to 55, or below ambient conditions, to prevent overdrying grain. Default = 55 degrees.

DISPLAY TEMP CALIBRATION: This position shows the plenum temperature calibration setting. It can also be adjusted here from +/- 20 degrees. Default = 0.

COMMAND CENTER OPERATION

Remove the off season window cover from the access door of the Command Center and place it over lower left corner of the main cover. Keep it in this position until all grain is dried for the season. This will make the indicating lights and displays visible through the access door window during operation.

Make sure all Command Center switches are in the OFF position, the drying bin entrances are locked shut, and everyone is clear of all grain drying equipment before turning on the power to the Command Center. The **LOW AMPERAGE CONTROL VOLTAGE** indicator light must be on before the Command Center functions will operate. Anytime the **LOW AMPERAGE CONTROL VOLTAGE** indicator is ENABLED, assume the drying equipment can start at any time.



Command Center Switch/Relay Panel

FAN CONTROL

Move the **DRYING FAN(S)** switch from the OFF position to the ENABLE position. If the grain high limit(s), gearbox high limit, and Plenum Control module, are good, the ENABLED indicator should come on. The drying fan(s) can now be started at the fan(s). Use caution if the bin is empty. Too much airflow from fan(s) may lift the drying floor or knock over floor supports. If the **DRYING FAN(S)** switch is put in the OFF position, the fan(s) will stop. If the burner(s) are running, it is recommended to shut them off for a minute or two before shutting off the fan(s). See the section on Command Center Shut-Down for more details.

SETTING SWEEP AUGER(S)

It is important to "set" the sweep augers when first filling an empty bin. With power disconnected and locked off, the Jaw Clutch and Unloading Pin should be set for drying operation (see Circulator or Dri-Flo Operating Instructions for more details). When there is 6"-12" of grain in the bin, move the Command Center **CONTROL PANEL** switch from the OFF position to the momentary START position, then release it to the RUN position. The RUN indicator light should now be on.

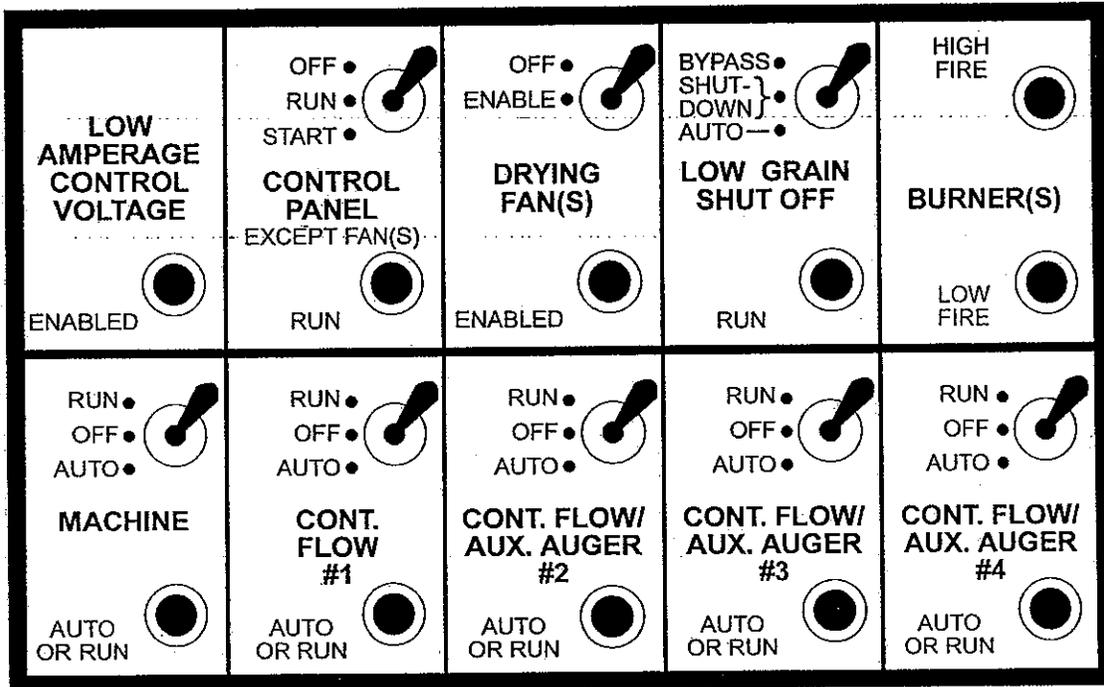
For center vertical systems only: Center vertical systems will recirculate the grain in a drying bin, so only the machine motor has to run. Move the **MACHINE** switch from the OFF position to the RUN position. The machine motor should now turn on and run the tapered sweep augers in the drying bin. After about 5 seconds move the **MACHINE** switch back to the OFF position.

For bottom unloading systems only: Bottom unloading systems require another auger to run which will take the grain away from the drying bin. This is usually wired to one or more of the Continuous Flow switches. Depending on how the system is wired, (consult your dealer or electrician if you have questions), move the appropriate **CONT. FLOW/AUX. AUGER** switches to the RUN position, starting with the auger that is the furthest away. With these take away augers running, move the **MACHINE** switch from the OFF position to the RUN position. The machine motor should turn on and run the tapered sweep augers in the drying bin. After about 5 seconds, move the **MACHINE** switch back to the OFF position. Grain may not come out of the horizontal auger, but it is better to be safe and not risk plugging the system. The appropriate **CONT. FLOW/AUX. AUGER** switches can now be moved to the OFF position, when the augers are empty, starting with the closest auger first.

For both systems: Move the **CONTROL PANEL** switch to the OFF position to shut off the Command Center. The tapered sweep augers in the drying bin are now "set". They will be aligned with the gearbox and will have grain underneath them to remove any bow. They will be a lot easier to start when the grain gets deeper.

When the grain depth gets to 2-3 feet deep, the bottom layer should be predried, and the sweep augers polished (if new or at the start of the drying season), before getting the grain any deeper. See the following sections for instructions on predrying and operating the system. Do not operate the tapered sweep augers in grain over 20% moisture (other than for a few seconds to set the sweeps). Run the fan(s) and burner(s) for a period long enough to dry the bottom 6-12" of grain. Center vertical type systems can normally have the **MACHINE** switch set to RUN and the grain recirculated on top of itself to speed the break-in period. Bottom unloading type systems will require removing a layer of grain, then waiting until the next layer is dried. Several hours of auger operation will normally polish the system enough to fill the bin further. Each installation will have slightly different procedures so consult your dealer for answers to any questions.

PLENUM CONTROL OPERATION



Command Center Switch/Relay Panel

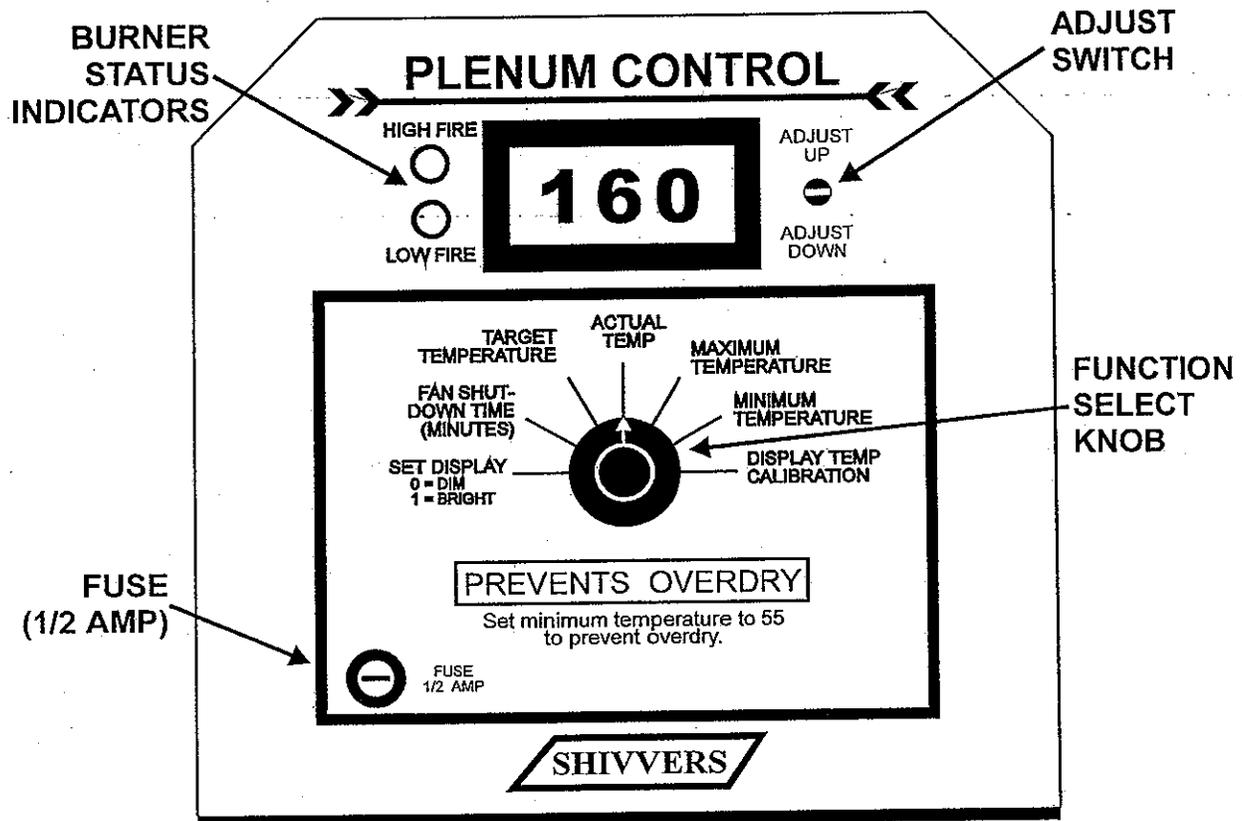
With the Machine and all Cont. Flow switches set to the OFF position, and with the Low Amperage Control Voltage Enabled, move the **CONTROL PANEL** switch to the momentary START position and release it to the RUN position. The Plenum Control Module display will light up, show 8.8.8., then start flashing the program version number such as P1.1 (or Px.x, where x could be any number). If it shows Hx.x, it has inadvertently been set for DEMO mode. Consult the factory for instructions on how to get the module out of DEMO mode.

For the Plenum Control Module to attempt to turn the burners on, the DRYING FAN(S) ENABLED light must be on. Move the switch to the ENABLE position now, if it isn't already. The fan(s) can now be started at the fan. If there is a Burner Power switch on the burner, it will also have to be turned on. See the burner operator's manual for more details. The burner(s) should never turn on the fuel unless the fan is actually running.

The LOW GRAIN SHUTOFF (LGSO) RUN indicator light must also be on before the burners will fire. See instructions later on proper operation of the LGSO switch. For now, it can be placed in the BYPASS position.

The Plenum Control Module should now be on with its display flashing the program number, the fan(s) should be running, the LGSO RUN indicator will be on, and the burner power switch at the burner should also be on.

PLENUM CONTROL OPERATION, Cont'd:



Press the Adjust Switch up or down on the Plenum Control Module to start the control program. The display will show 8.8.8 briefly, then show the data associated with the function select knob setting.

Turn the knob to **SET DISPLAY** and the display will show either "0" for a dim display, or "1" for a bright display. Hold the Adjust Switch up or down to set the desired display brightness.

Turn the knob to **MAXIMUM TEMPERATURE** and hold the Adjust Switch up or down to set the desired maximum plenum temperature. It can be adjusted from the minimum temperature setting up to 180 degrees Fahrenheit. Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed. Brand new systems should start out with the maximum temperature lower than desired until it is determined that the temperature sensing probe for the Command Center is not in a cold spot of the plenum. Temperatures under the drying floor may vary by 50 degrees or more depending on the burner and floor support structure.

PLENUM CONTROL OPERATION, Cont'd:

Turn the knob to **MINIMUM TEMPERATURE** and hold the Adjust Switch up or down to set the desired minimum plenum temperature. It can be adjusted from 55 degrees up to the maximum temperature setting. Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed. To prevent overdrying of the grain and to give the Command Center more control of the system, it is usually best to leave this setting at the default of 55 degrees.

Turn the knob to **TARGET TEMPERATURE** and the display will show the current temperature the Plenum Control Module is trying to maintain in the plenum. It can range in value from the minimum temperature setting to the maximum temperature setting. Hold the Adjust Switch up or down to set the desired starting target temperature. If the grain is known to be wet, set the target temperature to the maximum. If the grain is known to be dry, set the target temperature to the minimum. Once the system is running, the Command Center will automatically adjust the target temperature up and down (within the operator set limits) to give the maximum dryer capacity while minimizing the over-dried grain.

Turn the knob to **ACTUAL TEMPERATURE** and the display will show the current plenum temperature. The Adjust Switch may be held up or down to calibrate the temperature reading plus or minus 20 degrees. Take a temperature reading with an accurate thermometer at the Temperature Probe Holder mounted on the bin. Compare this reading to the actual temperature reading and adjust it until they match. Once this setting is calibrated it will stay in effect until it is changed by the operator, even if power is removed.

If the target temperature is more than about 5 degrees above the actual temperature, the HIGH FIRE and LOW FIRE indicator lights should both be on. High Fire is defined as having both indicators on. The burner should be firing. Once the target temperature is reached, the HIGH FIRE indicator will shut off. When this happens on high-low style burners, there will be less fuel pressure and a smaller flame. If the target temperature is exceeded by more than about 5 degrees, the LOW FIRE indicator will also shut off. The burner will not have any flame when this happens. Once the actual temperature falls below the target temperature, the indicators will come back on and the burner will re-ignite.

Set fuel pressure high enough to maintain desired plenum temperature. High-low style burners should normally cycle from high to low and seldom go completely off. Modulating valve style burners should have the modulating valve set 10 to 20 degrees below the target/maximum temperature to minimize shutting completely off. They may need to be manually adjusted as the Command Center adjusts the target temperature. When adjusting fuel pressure, the vaporizer on LP burners may also need adjustment. See the burner operating manual for more details.

PLENUM CONTROL OPERATION, Cont'd:

Turn the knob to **DISPLAY TEMP CALIBRATION** and the display will show the currently entered temperature calibration. The Adjust Switch may be held up or down to change the calibration setting. This is the same calibration as is done with the knob set at **ACTUAL TEMPERATURE**. This position just lets the operator know what the calibration offset is.

Turn the knob to **FAN SHUT-DOWN TIME (MINUTES)** and the display will show how long the fan will run after the Plenum Control Module gets a signal that the bin is out of grain. Hold the Adjust Switch up or down to set the desired time delay. It can range from 1 minute to 120 minutes. Above 120 minutes the display will show "---" and this indicates the fan will not shutdown (it will continue to run). Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed. However, if the Plenum Control is already in fan shut-down mode (indicated by a flashing display), if the setting is adjusted, it will not be stored in memory. This allows the operator to shut the fan off immediately (adjust down to zero), or never (adjust up to "---"), without changing the normal setting.

If the actual plenum temperature is above 128 degrees when it is time to turn off the fan(s), the Command Center will not normally shut them off. It assumes it does not have control of the burner fuel for some reason and will keep the fan(s) enabled. The exception to this is if the fan shut-down time is set for 10 minutes or less. Under this situation, the fan may not have enough time to cool the plenum below 128 degrees, so the Command Center will go ahead and shut the fan(s) off.

OTHER PLENUM CONTROL FEATURES:

If the Plenum Control module doesn't get a signal from the Moisture Control module within 1 hour, it will reduce the target temperature 12 degrees. It will reduce it 12 degrees every 30 minutes after that until it gets to the minimum temperature setting. This is to keep from severely over-drying grain if there isn't any grain being removed by the Moisture Control module. The Plenum Control module will also lower the target temperature if it gets error readings from the Moisture Control. The amount depends upon the severity of the error.

The plenum control module will send data to the printer whenever it gets a moisture reading from the Moisture Control Module. If it doesn't get a reading from the Moisture module within 30 minutes, the plenum module will go ahead and send data to the printer anyway. There will just be dashed lines for the unknown grain moisture and temperature.

PLENUM CONTROL OPERATION, Cont'd:

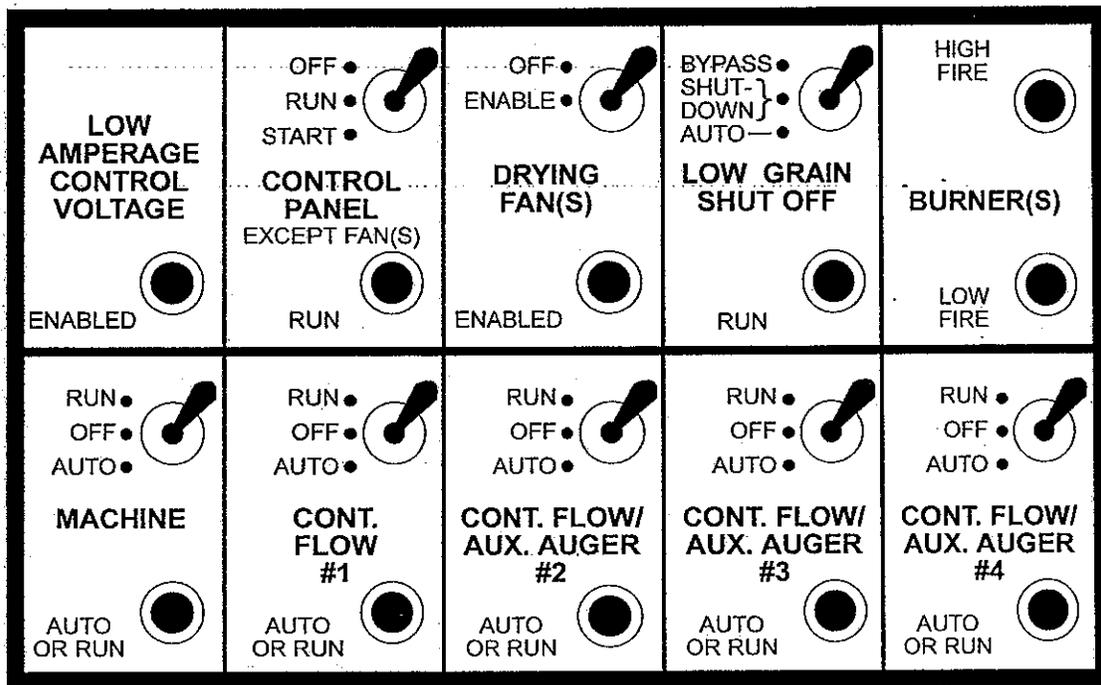
When adjusting settings on the Plenum Control module or when it is receiving data from the Moisture Control, the HIGH FIRE indicator will go off. It will come back on when the adjustment is completed or the data is received.

Once initial settings are made and the initial grain is pre-dried, the Plenum Control is normally automatically started by the Moisture Control.

When the Low Grain Shut Off (LGSO) RUN indicator is off, (or if the Drying Fan(s) Enabled indicator is off), the HIGH and LOW FIRE indicators on the Switch/Relay panel will immediately go out. After about 5 seconds, the HIGH and LOW FIRE indicators on the Plenum Control will also go out. The display will then start flashing or blinking whatever data is on the display. This indicates that it has gone into fan shut-down mode. If the knob is set at FAN SHUT-DOWN TIME, the time shown will decrement every minute. To get out of fan shut-down mode either adjust the time to zero (and shut the fans off), or adjust the time to "—" (and the fans will not shut off). The display will then go back to showing the program version number (Px.x). The Control Panel switch can also be moved to the OFF position, then restarted, and the fans will not shut off.

If the Plenum Control is in fan shut-down mode (display blinking) and it gets a signal from the Moisture Control it will go out of fan shut-down mode without shutting the fan(s) off. It will then go into reset (flashing the program version number). If it gets another signal from the Moisture Control, it will automatically start the drying program.

MOISTURE CONTROL OPERATION



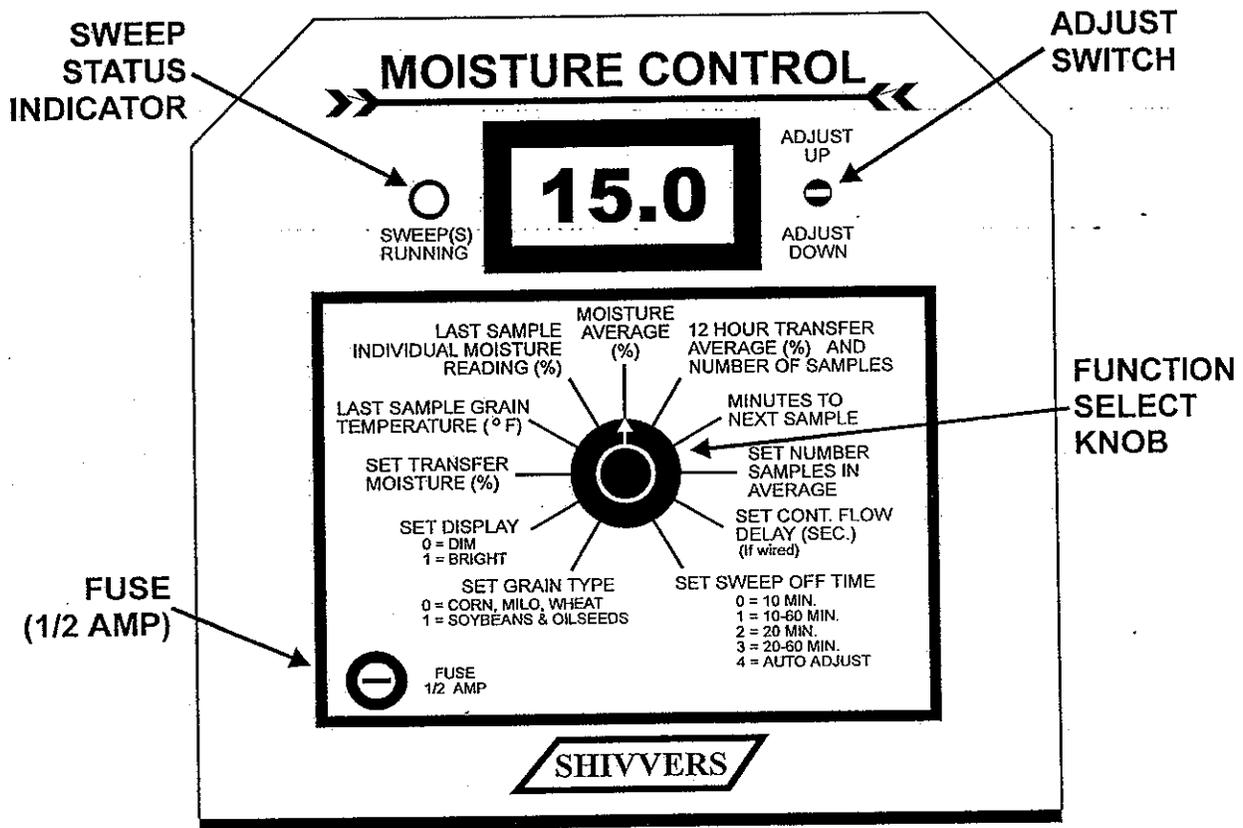
Command Center Switch/Relay Panel

To turn on the Moisture Control module, move the **CONTROL PANEL** switch on the switch/relay panel to the momentary **START** position and release it to the **RUN** position. The **RUN** indicator should light and stay on. Move the **LOW GRAIN SHUT OFF** switch to the **AUTO** position. If the **RUN** indicator doesn't come on, either there isn't enough grain in the bin or the sweep augers haven't removed grain from under the Low Grain Shut Off (LGSO) arm allowing it to be pulled down. In this case, put the **LOW GRAIN SHUT OFF** switch in the **BYPASS** position. The **LGSO RUN** indicator must be on.

If the drying system hasn't been running for a day or more, move the **MACHINE** switch to the **RUN** position to make sure the sweep augers will run. Remember not to run the sweep augers for more than a few seconds if the grain on the floor is above 20% moisture. Note that bottom unloading (DRI-FLO) type machines will need to have the appropriate **CONT. FLOW/AUX. AUGER** switches set to **RUN** first to give a place for the discharged grain to go. Center vertical (Circulator) type machines do not require this as they will re-circulate the grain back on top.

Move the desired **CONT. FLOW/AUX. AUGER** switches to the **AUTO** position. The augers should be numbered and will correspond to the switch numbers. Center vertical type machines do not have to have these switches set to **AUTO**. The grain will re-circulate if they are not.

MOISTURE CONTROL OPERATION, Cont'd:



Move the **MACHINE** switch to the AUTO position and the Moisture Control Module display will come on. The display will show 8.8.8 briefly, then start flashing the program version number Px.x, where x can be any number. If there is a problem, it will flash the appropriate error code. Hold the Adjust Switch up or down until the display shows 8.8.8 again, then release it. The Moisture Module is now in its drying program and the display will show whatever data is available as determined by the function select knob setting. The Plenum Control module will automatically start after a few seconds. If a printer is installed, the current system settings will be printed out.

The first sample upon power up or restart will always be in 10 minutes unless it is manually adjusted up or down. If the grain is estimated to take less than 60 minutes to pre-dry, move the function select knob to the **MINUTES TO NEXT SAMPLE** setting. Hold the Adjust Switch up or down until the display shows the desired setting. If it will take more than 60 minutes to pre-dry the grain, shut the **MACHINE** switch OFF and let the Plenum Control dry the grain. If the grain on the floor is already known to be dry and the moisture control settings are already adjusted, make sure the appropriate **CONT. FLOW/AUX. AUGER** switches are in AUTO. Then adjust the time down to zero and the Moisture Control Module will turn on the machine and take a sample.

MOISTURE CONTROL OPERATION, Cont'd:

To configure the Moisture Control module, turn the function select knob to **SET GRAIN TYPE**. Change the display by holding the Adjust Switch up or down to set the grain type that is going to be dried; 0 for corn, wheat, or milo; or 1 for soybeans, or other oilseeds. Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed. When the grain type is changed, the program will reset itself and go back to start up (flashing the program version number). Hold the Adjust Switch up or down to re-start the drying program.

Turn the knob to **SET TRANSFER MOISTURE %** and hold the Adjust Switch up or down until the display shows the moisture level where grain will be removed from the drying bin. When setting this be sure to allow for points of moisture lost during cooling. For example; if the setting transfers 16.5% moisture to the cooling bin and if an additional 1.5% is lost during cooling, final product will be 15.0%. There are many variables that affect this so go by your own experience when setting this value. Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed. If the printer option is installed, every time the transfer moisture setting is changed, the printer will print out all drying parameters.

Turn the knob to **SET NUMBER SAMPLES IN AVERAGE** and hold the Adjust Switch up or down to set the number of samples to be included in the rolling moisture average. Normally this is set to reflect one complete pass (of the sweep(s)) around the bin. This is determined by finding out how long the sweep(s) take to make one complete revolution around the bin, and dividing that number by 5 (The number of minutes between "ON" samples). For example; if there is one sweep auger and it takes 35 minutes to go around the bin, set to $35 \div 5 = 7$. Dual sweep machines can normally be set at 4 because they pull grain from both sides of the bin. This gives the operator a rolling average of the bottom layer of grain that was removed from the bin floor and the machine won't shut off on an individual wet sample. Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed.

Turn the knob to **SET CONT. FLOW DELAY (SEC)** and hold the Adjust Switch up or down to set the number of seconds the continuous flow/auxiliary augers will run to clean themselves out after the Machine shuts off. The time can be adjusted from 10 to 127 seconds and may need to be adjusted during the season if different combinations of continuous flow/auxiliary augers are used. As a starting point, set the time to 1/2 second for every foot of auger and fine tune from there. Additional time delays can be achieved by the addition of an optional auxiliary auger sequence timer kit. Once this setting is adjusted it will stay in effect until it is changed by the operator, even if power is removed.

MOISTURE CONTROL OPERATION, Cont'd:

Turn the knob to **SET SWEEP OFF TIME** to configure the Moisture Control to match the speed of your drying system. There are 5 different off time modes available.

- | | |
|---|-----------------------|
| 0 = 10 minutes fixed | Fastest dryers |
| 1 = 10-60 minutes adjustable (1 min/.1%) | ↓ |
| 2 = 20 minutes fixed | |
| 3 = 20-60 minutes adjustable (2 min/.1%) | Slowest dryers |
| 4 = auto adjust | |

When enough wet samples are encountered to cause an off cycle, the Moisture Control will shut off the Machine and wait to take another sample. The period of time it waits depends upon the off mode selected. Mode 0 (10 minutes fixed) is the fastest, while mode 3 (20-60 adjustable) is the slowest. Experiment to find the mode that best suits your dryer. This is fairly easy to accomplish if the optional printer is installed. If the printer isn't installed, watch the Moisture Control and look for the following scenarios. If the Moisture Control is constantly off for more than 5 cycles in a row, the next slowest off mode should be considered. This will help prevent slower dryers from sampling (running the sweeps) more than is necessary, and from transferring grain that is too wet (bottom unload systems). If the Moisture Control is off only once or twice, and then the grain that is discharged is over-dried, consider going to a faster off mode.

An auto adjust mode is provided to automatically adjust between off modes 0 through 3. Selection 4 will put the Moisture Control into auto adjust mode. When 4 is selected the display will show 4-0 indicating it is in auto adjust mode with a 10 minute fixed off delay. If the adjust switch is held up, the number on the right will increment up. If the mode is set to 4-1, the Moisture Control will start in the 10-60 minutes adjustable mode. If off for more than 5 times in a row, it will automatically adjust up to the next slowest drying time, which would be 4-2. This would be the 20 minutes fixed off time mode. If off only once, and then on for 10 times in a row (indicating a possible over-dry situation), it will automatically adjust down to the next fastest mode. Normally after some experience is had with the drying system, the mode can be changed from auto adjust to the appropriate unchanging off time mode.

MOISTURE CONTROL OPERATION, Cont'd:

Drying parameters are now set and when the minutes to next sample adjusts down to zero, there are two possible modes of operation concerning the machine start-up sequence. For bottom unloading (Dri-Flo) systems, the Cont. Flow/Aux. Auger(s) which are set to AUTO will start and run for 5 seconds. The Machine will then start. For center vertical (circulator) systems, the Machine will start and grain will recirculate in the bin until it is determined to be dry enough, even if the Cont. Flow/Aux. Auger(s) are set to AUTO. The proper mode should have been set by the installer. If not, refer to the installation manual for instructions on setting the machine type. They are located in the final configuration section. In either case, the machine will run for 60 seconds then the Moisture Control display will blink every three seconds for ten times. The actual moisture reading of the grain is taken during these 30 seconds.

Turn the function select knob to **LAST SAMPLE INDIVIDUAL MOISTURE READING (%)** and if a sample hasn't been taken yet, the display will show the current moisture meter calibration. After the first sample (ten blinks), the display will show the last moisture reading. If this reading is at or below the Set Transfer Moisture, the machine will stay on, and the next sample will be taken in 5 minutes. If the first sample reading is above the Set Transfer Moisture, the machine will shut off and wait for 10 to 60 minutes as determined by the Sweep Off Time setting. After one or more samples are taken, if the reading is above the Set Transfer Moisture, the Moisture Control will look at the Moisture Average to determine if the Machine should continue to run or not.

Turn the knob to **LAST SAMPLE GRAIN TEMPERATURE** and the display will show the grain temperature of the last sample. If a sample hasn't been taken yet, it will show the current grain temperature calibration. Hold the Adjust Switch up or down to calibrate the grain temperature plus or minus 20 degrees. Use caution when calibrating the grain temperature because the flat plate moisture sensor used by the Command Center is inherently a little slower to react to temperature swings. Also be aware that changing the grain temperature calibration may also affect the moisture calibration. Always check several samples before changing the calibration.

CALIBRATING THE SENSOR

When calibrating the moisture sensor be sure to take a manual grain sample when the Moisture Control is sampling. Look at the minutes to next sample to find out how long before the next sample. This can be adjusted down to zero to start the sample process immediately. If the Machine was off, it will start a 60 second purge cycle (to get fresh grain to the sensor). If the Machine was on, there will not be a purge cycle. The display will blink 10 times (approximately every 3 seconds). This is when the manual sample should be captured. For Center Vertical type systems, the appropriate Cont. Flow/Aux. Auger switch(es) can be set to the RUN position to get grain to discharge from the dryer. Place them back to AUTO after the manual sample has been taken. Let them clean out first if the Machine has shut off.

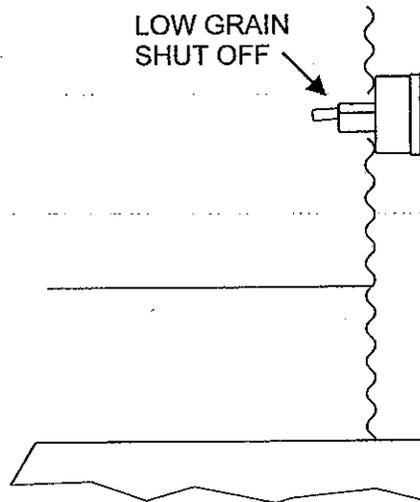
MOISTURE CONTROL OPERATION, Cont'd:

Measure the manually obtained sample with your reference moisture tester and record the reading and the grain temperature. Turn the function select knob to Last Sample Individual Moisture Reading and Last Sample Grain Temperature and record the readings. Do this several times when the discharged grain is close to the desired transfer moisture. First calibrate the grain temperature if required. Take several more samples and record the readings. Turn the knob to **LAST SAMPLE INDIVIDUAL MOISTURE READING** and hold the Adjust Switch up or down to match the display to the reference meter readings. Once calibration is close, any additional calibration amounts should only be about half of what it needs to be changed (to prevent overshooting back and forth). It is almost impossible to get the exact same readings every time. Some readings will be high and some will be low. Calibration should be checked periodically throughout the season, especially if temperatures, grain varieties, or test weights change significantly.

Turn the knob to **MOISTURE AVERAGE** and the display will show the rolling average of the last 2-9 (as set by Number of Samples in Average), "on" cycles. This is what the Moisture Control looks at to shut the Machine off. If the average is below the transfer setting, the Machine will continue to run, even if the individual moisture reading is above the setpoint. If the Machine is off 2 or more times in a row, the display will show the same as the individual reading. The Moisture Control also looks at this display to determine the off time (if an adjustable off time mode is selected). Once the individual reading gets dry enough to transfer, the rolling average will start over. Moisture meter calibration can also be performed at this selection by holding the Adjust Switch up or down.

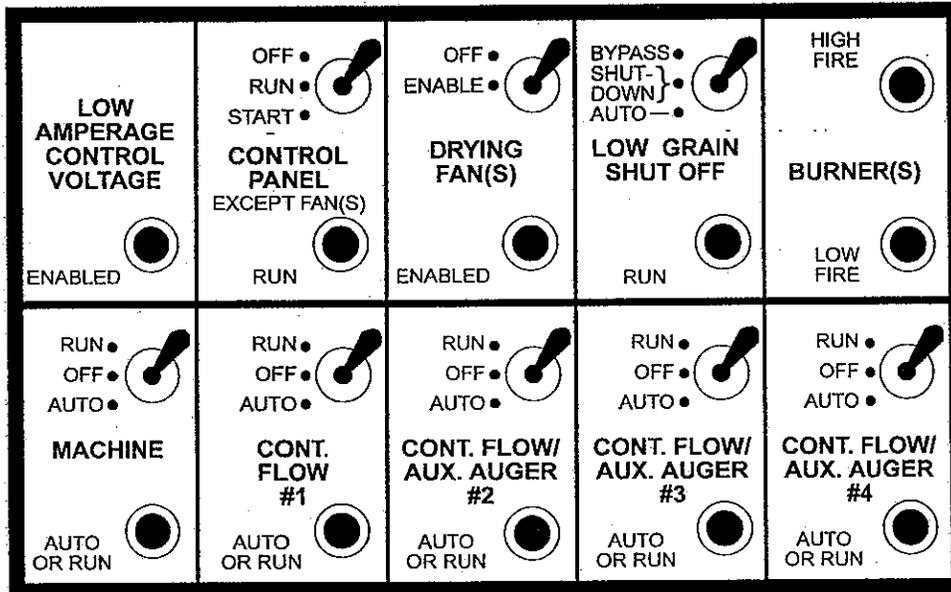
Turn the knob to **12 HOUR TRANSFER AVERAGE AND NUMBER OF SAMPLES** and the display will show an average moisture content of all transferred samples. It will also occasionally flash the number of "on" samples in this average. This allows the operator to keep track of the moisture content of the grain that is transferred while the system is unattended, especially if the printer option isn't installed. The Moisture Control can store up to 12 hours of "on" samples (samples taken when the grain was being transferred). When the Moisture Control is on (transferring), it samples every 5 minutes. Accumulating 144 "on" samples times 5 minutes per sample = 12 hours of transferred grain. If power is lost, the accumulated average is lost. The average will automatically reset after 144 samples, losing all previous information. The average can be reset by holding the Adjust Switch down for 2 seconds while in this setting. Reset the average when the bin is last checked in the evening to insure that the number of samples doesn't go over 144 before the next bin check.

LOW GRAIN SHUT OFF OPERATION



The Low Grain Shut Off (LGSO) mounts on the drying bin sidewall above the perforated floor. It is designed to shut off the burner(s) and the Moisture Control when the grain level in the bin gets below it. It can only do this if the **LOW GRAIN SHUT OFF** switch on the switch/relay panel is set to the AUTO position. When the bin is first filled, the arm on the LGSO will normally stay in the horizontal (empty bin) position, even after the grain level gets above it. The **LOW GRAIN SHUT OFF** switch will need to be put in the BYPASS position until the sweep auger(s) have made at least one or two passes under the arm (approximately 1 hour of "ON" time). Removal of grain from under the arm will allow it to be pulled down into the run position. The **LOW GRAIN SHUT OFF** switch can now be placed into the AUTO position. Switch it from BYPASS to AUTO very quickly to prevent the Moisture Control from shutting off. It is best to make the switch during an "OFF" cycle if possible. If the RUN indicator doesn't stay lit, put the switch back to BYPASS until more grain is removed from under the arm. If the Moisture Control does shut off or reset while switching, simply hold the Adjust Switch up or down to restart the drying program.

LOW GRAIN SHUT OFF OPERATION Cont'd:



Command Center Switch/Relay Panel

Once the **LOW GRAIN SHUT OFF** switch is in the AUTO position and the RUN indicator is lit, the system will automatically shut down when the grain level in the bin falls below the LGSO box. When the LGSO arm rises back to the horizontal position, the RUN indicator will go off. The Moisture Control will lose power which shuts off the Machine and Cont. Flow/Aux. Augers. The burner(s) will shut off. After about 5 seconds, the Plenum Control display will start blinking indicating that it is in fan shutdown mode. After the time delay set for fan shut-down expires, the fan(s) will be shut off. The Plenum Control will then go to the start of its program (flashing the program version number). As soon as possible after a low grain shut down, the appropriate Cont. Flow/Aux. Augers switches should be placed in the RUN position to clean them out. It is also a good idea to put the Machine switch in the RUN position for about 30 seconds to make sure there is cool grain in the center vertical (or horizontal auger if a bottom unloading system). Move the switches back to the AUTO position.

To restart the system, put the **LOW GRAIN SHUT OFF** switch in the BYPASS position. The Moisture Control display will come back on and start flashing the program number. Hold the Adjust Switch up or down to restart the Moisture Control. After a few seconds, the Plenum Control will automatically start. If grain is above the LGSO and the sweep(s) have removed about 1 hours worth of grain, quickly put the **LOW GRAIN SHUT OFF** switch back to the AUTO position (preferably during an off cycle).

Put the **LOW GRAIN SHUT OFF** switch in the OFF position to simulate a low grain shut off situation even if the grain level in the bin is above the LGSO box. This could be used for an aeration or cool down cycle which will automatically shut the fan(s) off after the programmed time delay.

COMMAND CENTER SHUT-DOWN

If the Command Center needs to be shut down quickly, because of a plugged auger or whatever, simply move the **CONTROL PANEL** switch to the OFF position. This will shut off all augers, the burners, the Moisture Control, and the Plenum Control. The drying fan(s) will not shut off. If the burners have been running, allow them to cool for a minute or two. Move the **DRYING FAN(S)** switch to the OFF position to shut the fan(s) off. If the Cont. Flow/Aux. Augers were running, remember to manually run them to clean them out.

To shut the Command Center down during an "off" cycle, move the **MACHINE** switch to the OFF position. This will shut the Moisture Control off. Move all **CONT. FLOW/AUX. AUGER** switches to the OFF position. They should already be cleaned out (if the proper delay is programmed into the Moisture Control). Move the **CONTROL PANEL** switch to the OFF position. This will shut off the burners and the Plenum Control. To shut the fan(s) off (after they've cooled), move the **DRYING FAN(S)** switch to the OFF position.

To shut the Command Center down during an "on" cycle, move the **CONT. FLOW/AUX. AUGER** switches that are in AUTO to the RUN position. This will keep them running. Move the **MACHINE** switch to the OFF position. Allow the Cont. Flow/Aux. Augers to clean out, then move the switches to OFF. Move the **CONTROL PANEL** switch to the OFF position. This will shut off the burners and the Plenum Control. To shut the fan(s) off (after they've cooled), move the **DRYING FAN(S)** switch to the OFF position.

END OF SEASON SHUT-DOWN:

To shut the Command Center down for the season, make sure all Cont. Flow/Aux. Augers are completely empty. For bottom unloading (Dri-Flo) systems, disengage the sweeps and make sure the horizontal auger is empty also. For center vertical (Circulator) systems, it is recommended to take a load of grain from the center of the bin (through the slide gate and horizontal auger with sweeps disengaged) to remove grain from the center vertical auger. This also helps remove a lot of the fines that accumulate in the center of the bin. See the system operators manual for proper procedures. Shut the fuel supply off at its source, start the fan(s) and burners and allow all fuel to burn from the lines. If a printer is installed, remove it and store in a clean, dry place, or at least remove the paper so it doesn't draw moisture. Put all Command Center switches in the off position. Shut off all power to the complete drying system. If the Command Center is outside, put the off season window cover over the access door window to protect the plastic and components from sunlight.

COMMAND CENTER QUICK START

These instructions assume all drying parameters have already been set, the system augers are polished, and the bottom layer of grain has already been dried.

1. Make sure the Low Amperage Control Voltage indicator light is on, which shows that power is available to the Command Center.
2. Move the Drying Fan(s) switch to the ENABLED position. The enabled indicator should be on. Fan(s) can now be started (at the fans).
3. Move the Control Panel switch to the START position and release. The run indicator light should come on and stay on. The Plenum Control module will also power up and flash the program version number (Px.x).
4. Put the Low Grain Shut Off switch in the BYPASS position. The switch may be put in the AUTO position if the RUN indicator will stay on.
5. Put the Continuous Flow and Machine switches in the RUN position to verify they will all start. Shut the Machine switch OFF, then shut OFF the Continuous Flow switches. Place the Machine switch in the AUTO position and the Moisture Control module will power up and flash the program version number (Px.x). To transfer grain, place desired Continuous Flow/Aux. Auger switches into the AUTO position. NOTE: Bottom unload machines must always have proper Continuous Flow/Aux. Auger switches set into the AUTO position. Otherwise damage to the unloader may result.
6. Press the Adjust switch on the Moisture Control module up or down to start the drying program. The Plenum Control module will automatically start in about 5 seconds. Check all operating parameters on both the Moisture and Plenum Control Modules. Turn the Function Select Knob on the Moisture Control module to Minutes to Next Sample. Adjust the display from 0 (take a sample immediately) to 60 (take a sample 60 minutes from now). Otherwise, the first sample will be in 10 minutes.
7. For center vertical machines, the machine motor should start, and re-circulate grain in the bin for 60 seconds. For bottom unload machines, the Continuous Flow auger(s) will start and run for 5 seconds, then the machine motor will start and run for 60 seconds. The Moisture Control module will then blink for about 30 seconds while it is taking a moisture reading. If the moisture reading is below the set transfer moisture, the machine will stay on. If the reading is wet, the machine will shut off.

COMMAND CENTER QUICK START Cont'd:

8. After the sweep auger(s) have made 2 or 3 passes under the low grain shutoff box (about 1 hour of transfer time), quickly switch the Low Grain Shut Off switch from BYPASS to AUTO. The indicator light should stay on. If switched too slowly, or if the light goes off, the Moisture Control will go off and reset. If this happens, just press the Adjust switch on the Moisture Control module up or down to restart it. If the Low Grain Shut Off indicator light is off more than 5 seconds, the Plenum Control will go into fan shutdown mode. This is indicated by a blinking display (and the burner high and low fire lights will be off). To get out of fan shutdown mode without shutting the fans off, turn Control Panel Switch OFF, then restart. When both displays are blinking the program version number, press the Adjust switch on the Moisture Control module up or down. The Moisture Control module will start and the Plenum Control module will automatically start in about 5 seconds.

MAINTENANCE



Never work on equipment or enter the drying bin unless main power is disconnected and locked off.

INDICATOR LIGHTS AND DISPLAYS: Make sure the window in the Access-Door remains clear so the indicator lights and displays are visible through it. Replace it if it becomes damaged. Make sure all indicator lights and displays are functioning properly. Replace them if they are not working properly.

LOW GRAIN SHUT OFF: There is a rubber seal that allows the arm on the Low Grain Shut Off (LGSO) to move freely up and down while keeping grain from getting inside the box. Before the drying season, check the LGSO seal and make sure the arm moves freely. It should go to the “up” position when there isn’t any grain.

PLENUM HIGH LIMIT AND TEMPERATURE PROBE HOLDER: It is important that there is air flow past the plenum temperature probe to insure accurate readings. Before the drying season, check to make sure the holder is not clogged up. Clean it out as required. Be sure all power is disconnected and locked off before removing the cover.

DOOR LATCHES AND CATCH: The door latches are adjustable. The foam seal around the Main Cover will compress over time and the door latches will need to be adjusted to keep a tight seal. If the latches are adjusted too tight, the Access Door will not seal properly. Make sure the door holder catch between the latches is properly installed. This prevents unauthorized access to high voltage terminals by requiring a tool to open the Main Cover.

CHECKING SETTINGS: Once calibration and settings are entered, unless they are automatically adjusted by the control, they will stay in memory even when power is lost. It is good practice to write the settings down in case they accidentally get changed, or in case of malfunction. Also recheck the settings periodically throughout the drying season.

CHECKING FOR EVEN HEAT: Temperatures around the bin can vary by 50 degrees or more. The more even that the temperatures are, the better the system will operate. Even heat will help the moisture consistency, the levelness in the bin, and the efficiency and capacity of the system. Four to six thermometers placed around the bin can be used to check the temperatures. Consult the burner manufacturer or dealer for adjustments which will help even the temperatures.

ERROR CODES

MOISTURE CONTROL ERROR CODES		
Display shows	Error definition	Possible cause/remedy
* Px.x	Program version number	Power was off or grain type was changed. Move adjust up/down to restart program.
* E02	Watch dog timer reset	Computer malfunction. Shut system off to clear error and try again.
E03	Readings not changing	Grain not moving past sensor. Sweeps not running, bin out of grain.
E04	Reading out of range	Grain is too wet, too dry, or not on sensor. Take manual sample and check calibration.
* E05	Moisture sensor or cable problem	Check moisture cable at sensor and at Moisture Control. Replace sensor.
E06	Bad grain temperature	Check grain temp. Check temp calibration. Check plenum temperature.
* E07	Drying parameter read error	Can't read stored drying settings. Will revert to default. Reenter settings and calibration if needed.
* E08	No rotary switch input	Shut power off to clear. Rotate switch around to clean contacts .
<p>* Will stop sampling if this error occurs. Press Adjust Up or Down to restart drying program.</p>		

ERROR CODES Cont'd:

PLENUM CONTROL ERROR CODES		
Display shows	Error definition	Possible cause/remedy
* Px.x	Program version number	Power was off or unit has completed fan shut down mode. Move adjust up/down to restart program.
* E02	Watch dog timer reset	Computer malfunction. Shut system off to clear error and try again.
E03	Data transmission error	Plenum control did not get good data from Moisture Control. Check data cable.
E04	Plenum hot. Fan(s) not shut off.	Plenum temp. too hot to allow fan shut off. Check burner for proper operation. Check plenum probe.
E05	not used	
E06	Bad plenum temperature reading	Check plenum temperature probe.
* E07	Drying parameter read error	Can't read stored drying settings. Will revert to default. Reenter settings and calibration if needed.
* E08	No rotary switch input	Shut power off to clear. Rotate switch around to clean contacts .
<p>* Will stop control if this error occurs. Data from Moisture Control will attempt to start program back up. Press Adjust Up or Down to restart drying program.</p>		

ERROR CODES Cont'd:

More than one error can occur at a time. These will show on the display as "E46", for example, indicating an error 4 and an error 6. Error codes will be sent to the printer if one is installed with the unit. Moisture Control error codes will be preceded with M-ERR. Plenum Control error codes will be preceded with P-ERR. If an error occurs, it is usually best to shut the system off, then restart it, while watching it closely to see what is happening when the error occurs. Contact your dealer if further assistance is needed.

TROUBLE SHOOTING TIPS



Trouble shooting should be done by trained personnel only. Never work on equipment unless main power is disconnected and locked off.

Symptom	Possible Cause	Remedy
LOW AMPERAGE CONTROL VOLTAGE ENABLED indicator not on.	Breaker not on. Blown Control Power fuse.	Make sure proper breakers are on. Lock out power and replace Control Power fuse located on Switch/Relay panel.
DRYING FAN(S) ENABLED indicator won't come on.	Grain Hi-limit(s) or Gearbox Hi-Limit may be tripped. They auto reset upon cooling. Bad Plenum Control Module.	Allow Hi-limits to cool. Observe closely for indications of a fire. Replace Plenum Control Module.
CONTROL PANEL RUN indicator comes on in START position but won't stay on in RUN position.	Machine or Cont. Flow/ Aux. Auger motor starter overload tripped.	Lock out power. Open main cover. Press reset buttons on overloads. Have electrician check motor running current and proper heater size.
Plenum Control goes into fan shut down mode even if DRYING FAN(S) is enabled and LOW GRAIN SHUT OFF RUN indicator is on.	Plenum Hi-Limit may be open. It is a manual reset device.	Use non-conductive stick to reset Plenum Hi-Limit. Lock out power and replace Plenum Hi-Limit.

TROUBLE SHOOTING TIPS Cont'd:

Symptom	Possible Cause	Remedy
Fan will not run even though DRYING FAN(S) ENABLED indicator is on.	<p>No power to the fan motor circuit.</p> <p>Blown fuse in fan.</p> <p>Blown Fan fuse on Switch/Relay panel.</p>	<p>Make sure proper breakers are on.</p> <p>Lock out power and replace control fuse in fan or, Fan #x fuse located on Switch/Relay panel.</p>
Burner will not run even though BURNER HIGH and LOW FIRE indicators are on.	<p>Burner malfunction or blown fuse.</p> <p>Blown Burner fuse on Switch/Relay panel.</p>	<p>Lock out power and trouble shoot burner or, replace Burner #x fuse located on Switch/Relay panel.</p>
Plenum Control module display will not light up even if CONTROL PANEL RUN indicator is on.	<p>Blown fuse on Plenum Control Module.</p>	<p>Lock out power. Replace fuse on Plenum Control module.</p>
Moisture Control module display will not light up even if LOW GRAIN SHUT OFF and MACHINE RUN indicators are on.	<p>Blown fuse on Moisture Control Module.</p>	<p>Lock out power. Replace fuse on Moisture Control module.</p>
Machine or Cont. Flow/ Aux. Auger will not run in RUN position even though AUTO OR RUN indicator is on.	<p>No power to the motor circuit.</p>	<p>Make sure proper breakers are on.</p> <p>Motor may have a thermal overload switch built into it which needs to be reset.</p>

CONFIGURE MACHINE TYPE

After the Command Center has been wired, the Moisture Control must be configured for the type of machine it is going to run. The default setting is for Bottom Unloading Machines such as Shivers DRI-FLO.

FOR CENTER VERTICAL MACHINES: If the machine type is set to 0, the Moisture Control will not energize the Transfer Augers (CR2) until the moisture readings are below the set point. Grain will recirculate in the drying bin while sampling.

FOR BOTTOM UNLOAD MACHINES: If machine type is set to 1, the Moisture Control will energize the Transfer Augers (CR2) 4 seconds before energizing the Machine (CR1). This will allow pneumatic transfer systems to come up to speed before grain is discharged.

TO CHANGE THE MACHINE TYPE:

- 1.) Turn Control Panel power to Command Center OFF.
- 2.) Turn function select knob on Moisture Control clockwise until pointed straight down.
- 3.) Turn control power to Command Center ON. Set LGSO Switch to "BYPASS" & Machine Switch to "AUTO". Moisture Control display will show HLP.
- 4.) Within 30 seconds of "power on", hold the Adjust Switch on the Moisture Control to "ADJUST UP" for 5 seconds. Display will start blinking showing the machine type setting.

0 = CENTER VERTICAL (CIRCU-LATOR)

1 = BOTTOM UNLOADER (DRI-FLO)

- 5.) When display stops blinking, release Adjust switch. Machine type setting is shown. Press Adjust switch up or down to change setting. After about 10 seconds the display will show HLP and programming machine type is complete. Turn function select knob to desired setting.

