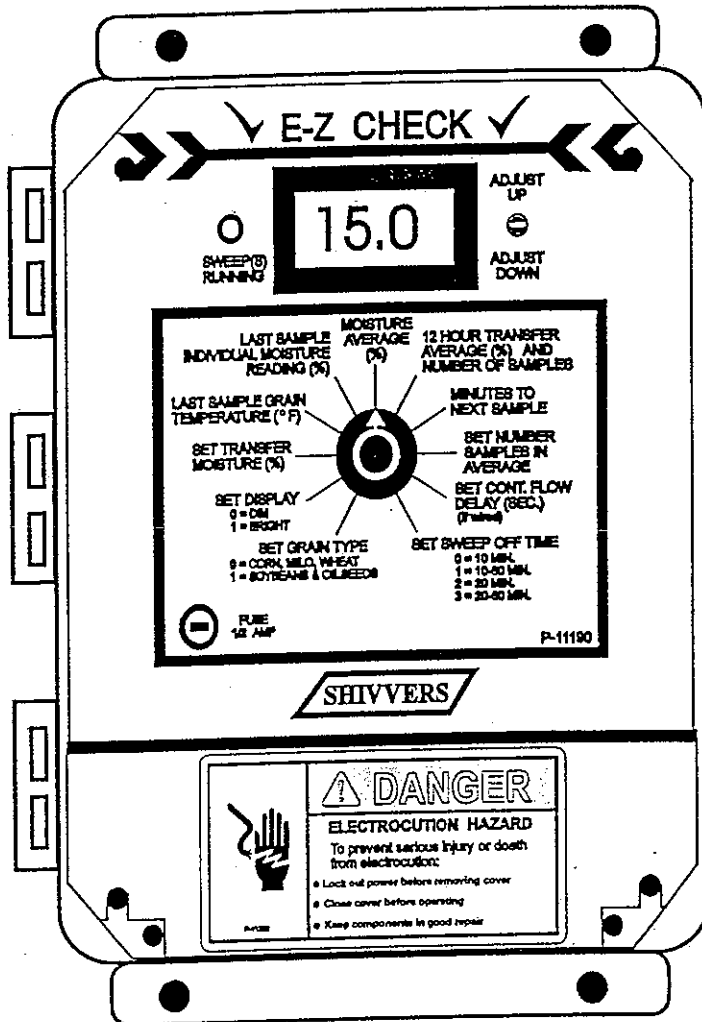


✓ E-Z CHECK ✓



OPERATING INSTRUCTIONS For Model 597Y-001A



SHIVERS INCORPORATED
614 WEST ENGLISH
CORYDON, IOWA 50060
515/872-1005

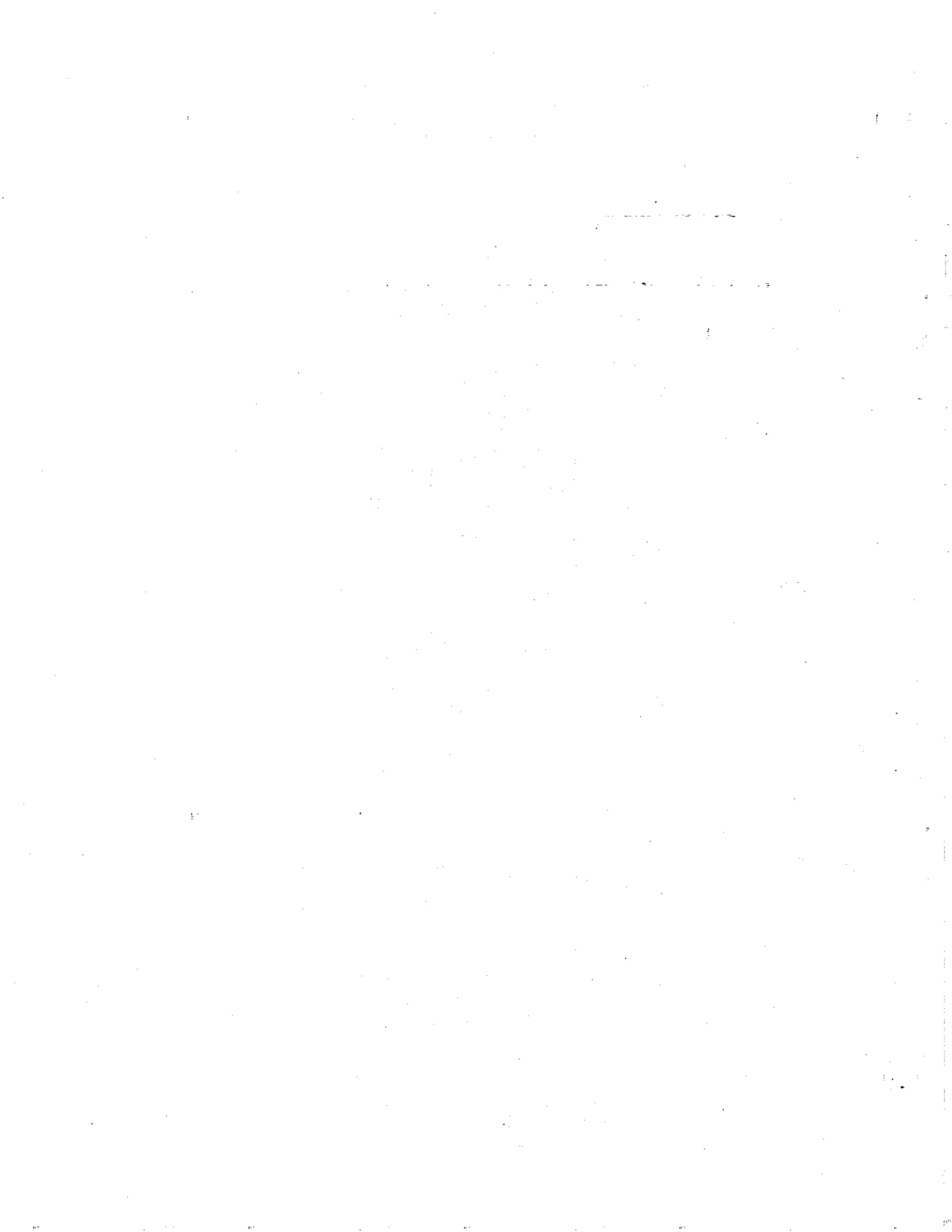
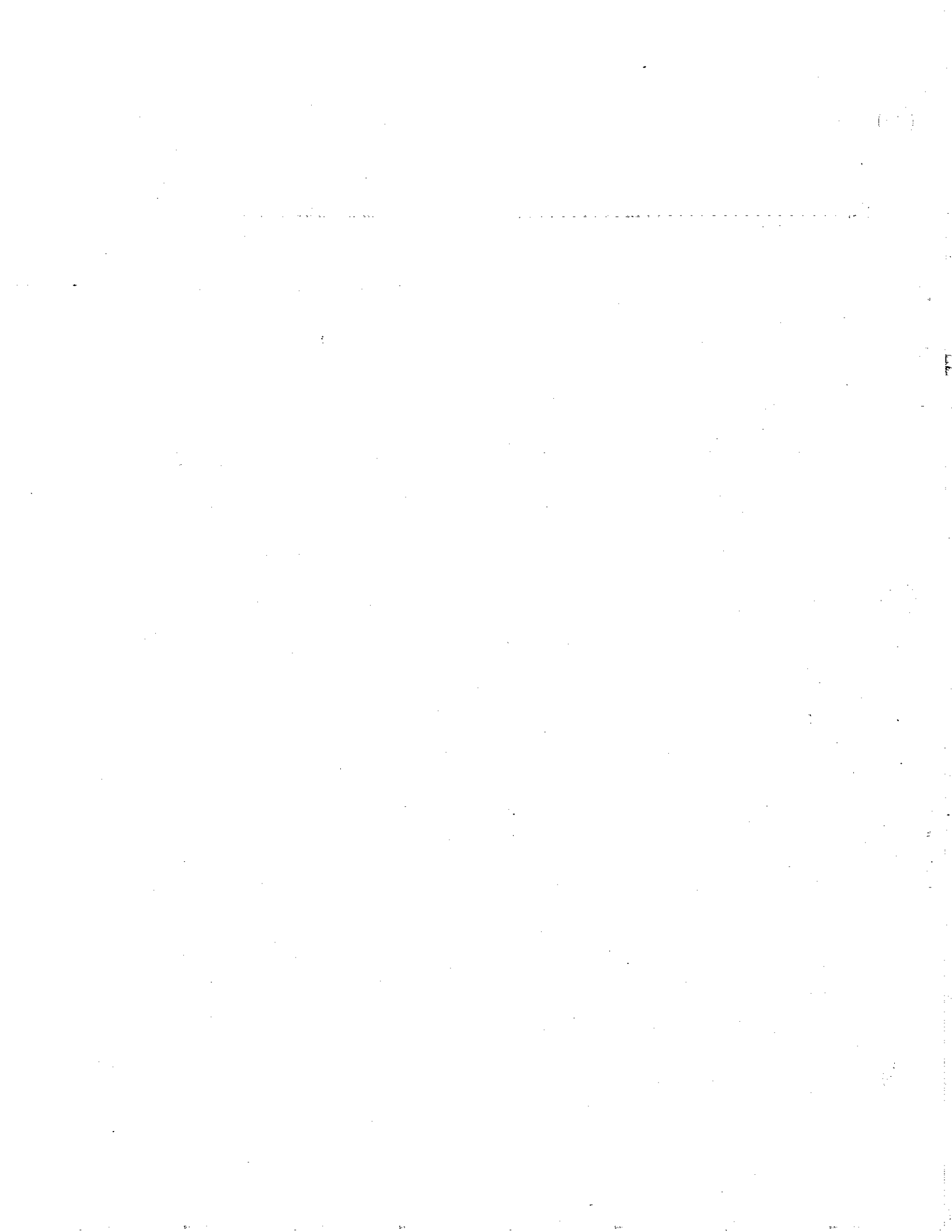


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INTRODUCTION

READ OPERATING INSTRUCTIONS COMPLETELY BEFORE STARTING E-Z CHECK

The E-Z Check controller works as an electronic moisture tester in place of the grain thermostat. Instead of controlling by temperature, the E-Z Check controls the machine (sweep augers) by reading a moisture sample of the grain and then determining if the grain is dry enough to transfer.

The E-Z Check 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 E-Z Check shuts the machine off. It will then wait for grain to dry before sampling again.

If the grain sample is dry enough, the E-Z Check keeps the machine on and turns on the transfer augers (if so wired) to transfer the grain to the cooling bin. Once the machine is running, the E-Z check samples every 5 minutes to test the transferring grain. If a wet sample is encountered the E-Z Check 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 E-Z Check shuts the machine off and cleans out the transfer augers (if wired).

A printer can also be added to the E-Z Check. It has its own enclosure that can be mounted next to the E-Z Check control. The printer will allow the operator to have a hard copy of the data produced by the E-Z Check.

SAFETY

The operator of this machinery must assume the responsibility for his own safety, and that of those who are working with him. He 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 SHIVERS Incorporated at the address shown on the front page.

SHIVERS 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 write 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.

Anytime you are working with your drying unit, be sure to observe these common sense rules:

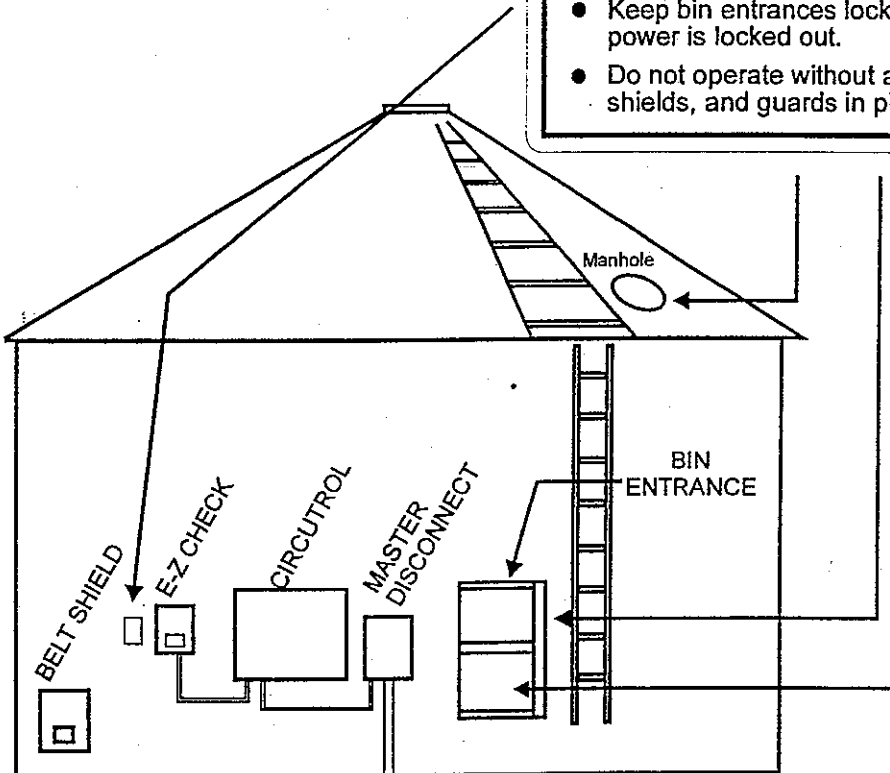
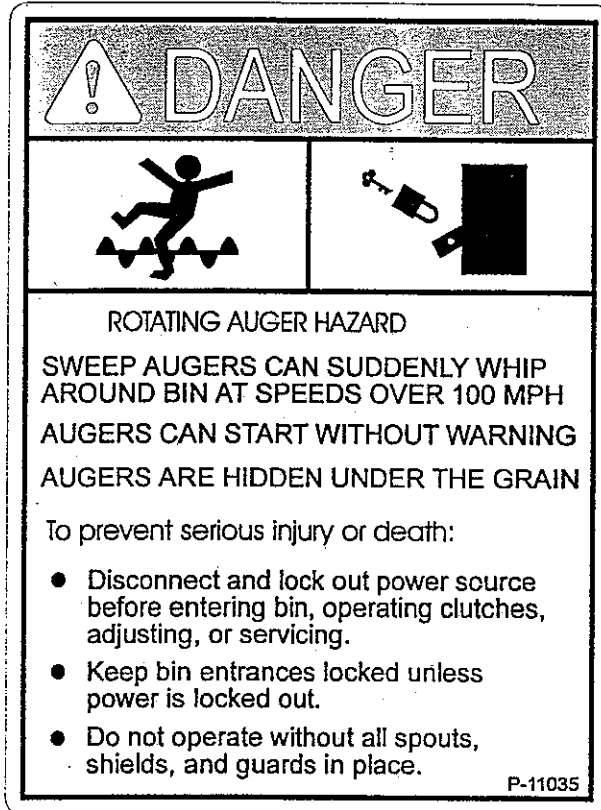
- 1). All units must be equipped with a main power disconnect switch. This disconnect switch must shut power off to the complete drying system. It must have the capability of being locked into the OFF or OUT position. Disconnect and **LOCK OUT** this main power disconnect switch before conducting any 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 SHIVVERS 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 SHIVVERS 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 E-Z Check. For complete instructions on where to find safety decals for other installed equipment consult your Operators Safety Manual (P-10001).

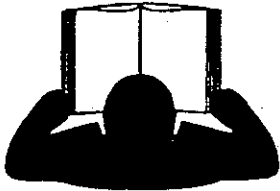
P-11035 (field installed)

1. Next to E-Z Check
2. Man hole entrance
3. Bin outside entrance
4. Bin inside entrance



P-10367

1. On outside of door of E-Z Check



P-10367

! WARNING

To prevent Serious Injury or Death

- 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.

E-Z CHECK

ADJUST UPADJUST DOWN

15.0

SWITCH RELEASEADJUST UPADJUST DOWN

LAST SAMPLE INDIVIDUAL MOISTURE (C)

LAST SAMPLE DRYAN TEMPERATURE (°F)

SET TRANSFER MOISTURE (C)

SET DISPLAY 1 = ON 2 = OFF

SET SPAN TYPE 1 = CORAL BED OFFER 2 = REDUCED SPAN

SET 12 HOUR TRANSFER AVERAGE (C) AND NUMBER OF SAMPLES

SELECTED TO NEXT SAMPLE

SET NUMBER SAMPLES IN AVERAGE

SET CORRELATION DELAY (MIN) 1 = 0 2 = 1 3 = 2 4 = 3 5 = 4

SET SWEEP OFF TIME 1 = 0 2 = 1 3 = 2 4 = 3 5 = 4

! WARNING


To prevent Serious Injury or Death

- Avoid unsafe operation or maintenance.
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- If manuals or decals are missing or difficult to read, contact Shivers, Inc. Corydon, IA 50060 for replacements.

P-10367

P-11232

1. On wiring access cover behind door



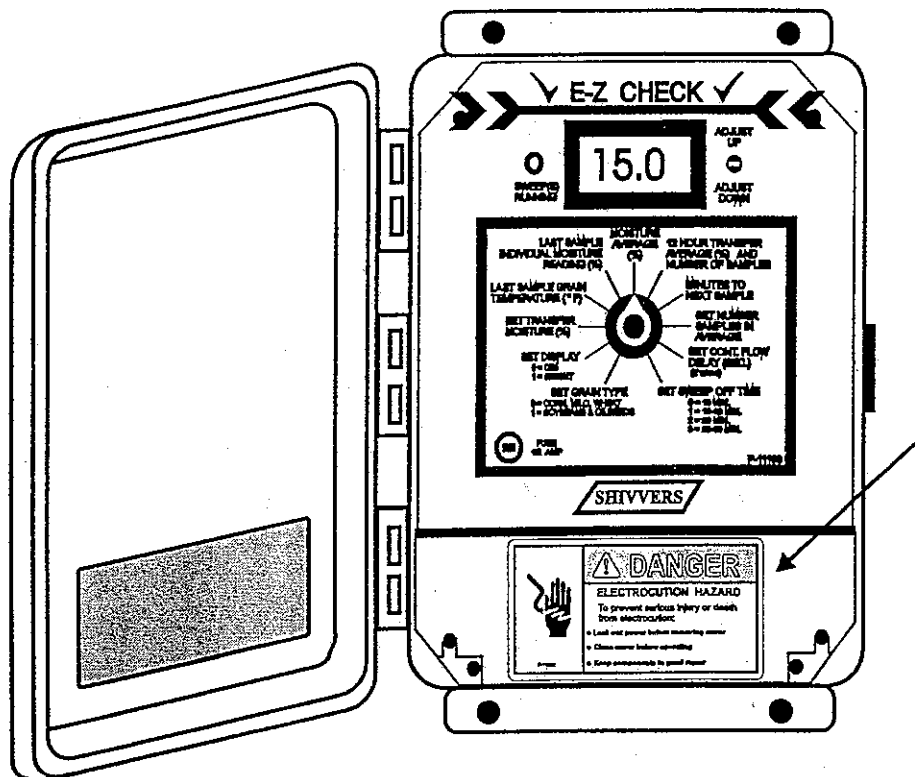
P-11232

⚠ DANGER

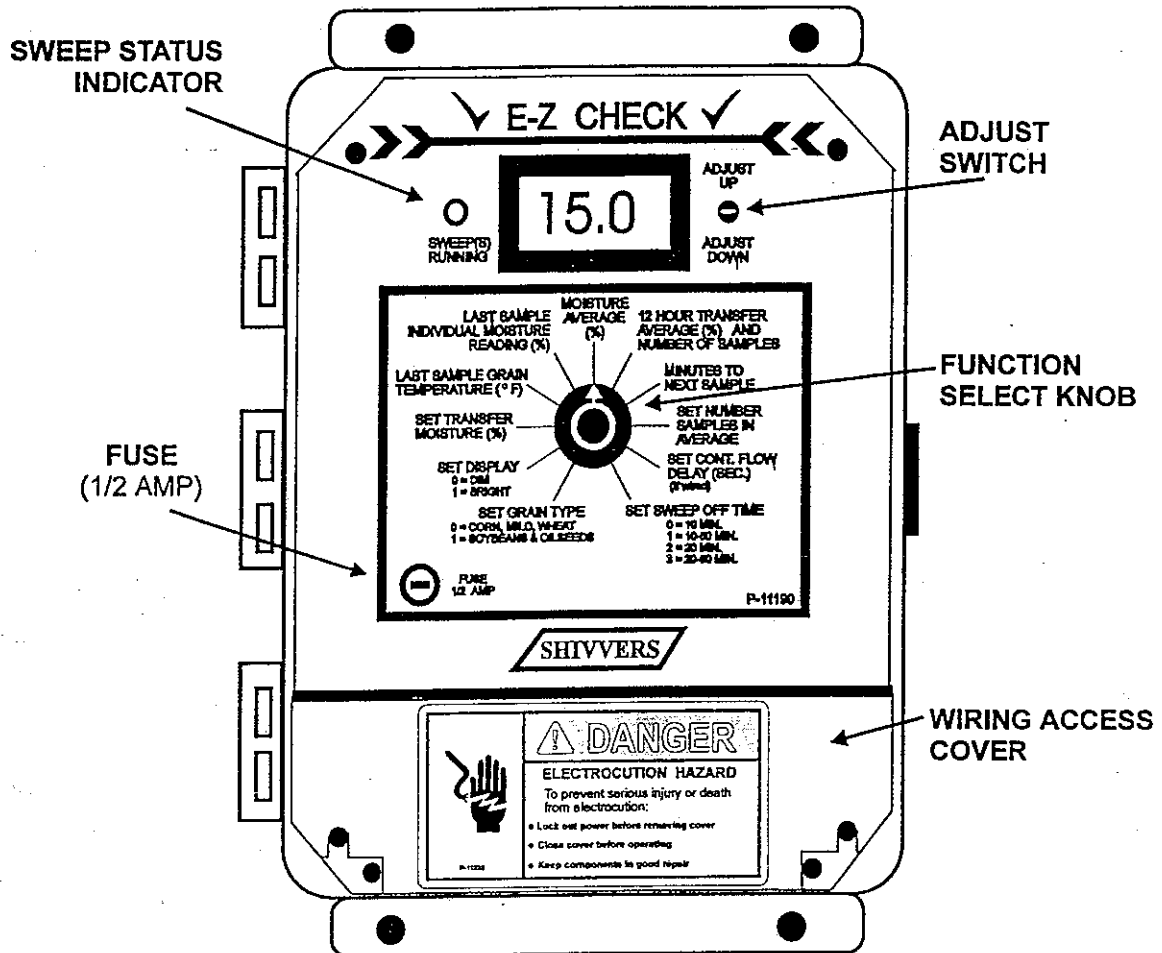
ELECTROCUTION HAZARD

To prevent serious injury or death from electrocution:

- Lock out power before removing cover
- Close cover before operating
- Keep components in good repair



IDENTIFICATION OF PARTS



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.

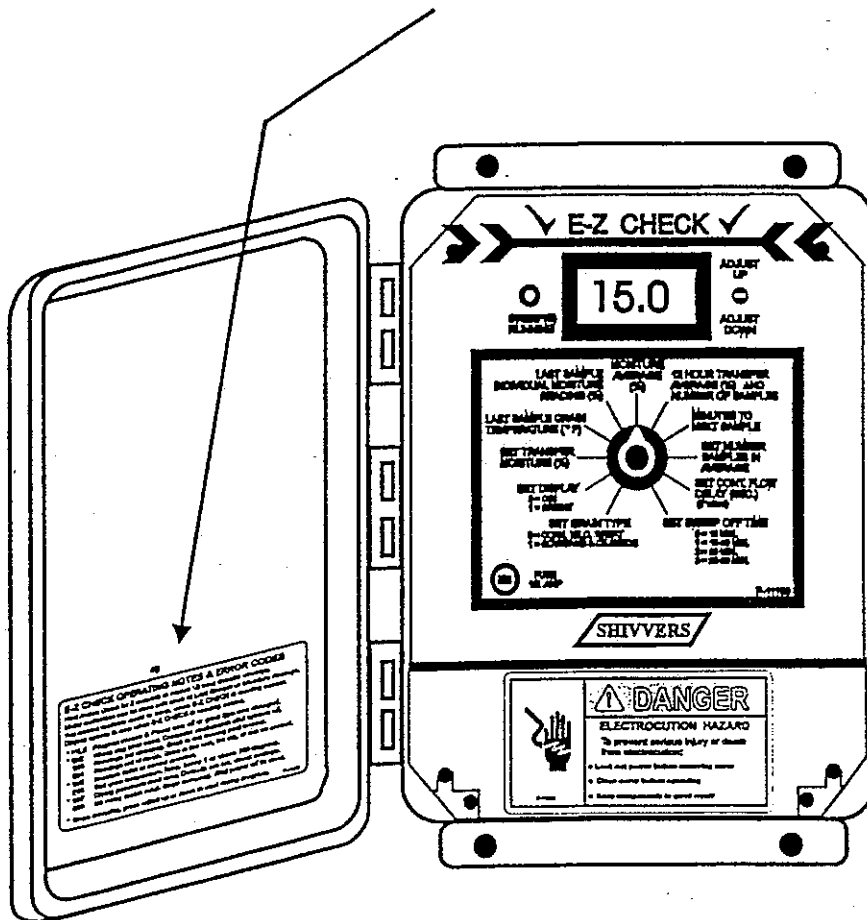
FUNCTION SELECT KNOB The function select knob allows the operator to choose the data to be displayed.

E-Z CHECK OPERATING NOTES & ERROR CODES

Hold Adjust Down for 2 seconds to restart 12 hour transfer average.
Meter calibration can be done with knob at Last Sample or Moisture Average.
You cannot calibrate meter or temp. when E-Z CHECK is reading sensor.
Display update may be slow when E-Z CHECK is reading sensor.

- * PX.X Program version #. Power was off or grain type was changed.
 - * E02 Watchdog timer reset. Computer malfunction shut system off.
 - E03 Readings not changing. Grain is not moving past sensor.
 - E04 Readings out of range. Grain is too wet, too dry, or not on sensor.
 - * E05 Moisture cable or sensor problem.
 - E06 Bad grain temperature. Temp. below 1 or above 160 degrees.
 - * E07 Drying parameter read error. Defaults are set, check settings.
 - E08 No rotary switch input. Stops sampling. Shut power off to clear.
- * Stops sampling, press adjust up or down to start drying program.

P-11235



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 E-Z check 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 E-Z Check 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 E-Z Check to go through isolated wet spots, 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 E-Z Check 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 more than 2 or more times in a row, the moisture average will be the same as the individual moisture reading. The average will restart on 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. The average will start over after 144 samples.

MINUTES TO NEXT SAMPLE This position shows how long before the next sample is going to be taken. When the program is first started, the first sample will be in 10 minutes. After the first sample, the time to the next sample depends on the off time mode selected. 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 (if wired) This position allows the operator to set the number of seconds that 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 E-Z Check is off for 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 E-Z Check 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 E-Z Check 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 E-Z Check. 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 procedures.

OPERATING THE E-Z CHECK

START UP

When the E-Z Check is turned on the display will show 8.8.8., then will flash the program version P1.X. The program version will flash on the display until the Adjust switch is moved up or down. The drying program will then start.

Once the drying program is started, the display will show the selection that the Function Knob is set to. The first sample will always be in 10 minutes unless you adjust the minutes to next sample up or down.

SET GRAIN TYPE

To start drying, first select the grain type that is going to be dried by selecting either 0 for corn, wheat, or milo; or 1 for soybeans, or other oilseeds. When grain type is changed, the program will go back to start up.

SET TRANSFER MOISTURE %

After selecting the type of grain to be dried, the transfer moisture level should be set. Default setting is 14.0%. Set Function Knob at this position and hold the Adjust switch up or down until the display shows the moisture level that you want to transfer grain at. When setting this be sure to allow for points of moisture lost during cooling. For example: 15.5% moisture transferred to cooling bin and if an additional 1.5% is lost during cooling, final product would be 14.0%. Go by your own experience when setting this value.

SET NUMBER SAMPLES IN AVERAGE

The next item to be set is the number of samples in the average. This will determine the number of samples to be included in the rolling average. Normally you would want this to reflect one complete pass (of the sweeps) around the bin. This is determined by finding out how long the sweep takes to make one complete revolution around the bin, and dividing that number by 5. (The number of minutes between samples during on times.) For example: if it takes 35 minutes for the sweep to go around, set to $35 \div 5 = 7$. Dual sweeps can use a 1/2 revolution for this number. This procedure will give the operator a rolling average of the bottom layer of grain that was removed from the bin floor. The default value is 4, and most dual sweep systems can use the default setting.

SET CONT. FLOW DELAY (SEC) (if wired)

If the transfer augers have been wired to the E-Z Check, then the clean out time should be set. The default time is 30 seconds. Determine how much time is needed for the transfer auger to clean out, then simply hold the adjust switch up or down until the number of seconds needed is displayed. This time can be adjusted from 10 seconds up to 127 seconds.

SETTING SWEEP OFF TIMES

Once the E-Z Check is operating it can be tailored to match the speed of your drying system. There are 5 different modes that can be chosen.

- 0 = 10 minutes fixed
- 1 = 10-60 minutes adjustable
- 2 = 20 minutes fixed
- 3 = 20-60 minutes adjustable
- 4 = auto adjust

Fastest dryers



Slowest dryers

When a wet sample is encountered after an off cycle, the E-Z Check shuts off the sweeps and waits to take another sample according to the off mode selected. If the E-Z Check shuts off after a sample more than 5 times 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 transferring grain that is too wet (if so wired). 0 or the 10 minutes fixed mode is the fastest, while 3 or 20-60 adjustable is the slowest. Experiment to find the mode that best suits your dryer. The auto adjust mode will automatically adjust between off modes 0 through 3. Selection 4 will put the E-Z Check in auto adjust mode. When 4 is selected the display will show 4-0. If the adjust switch is held up, the number on the right will increment up. The auto adjust mode can be set. For example: if the mode is set to 4 - 1 the E-Z Check will start in the 10-60 minutes adjustable mode. If the E-Z Check is off for more than 5 times in a row, the E-Z Check will automatically go to the next slowest drying time, which would be 4 - 2. This would be the 20 minutes fixed mode. If the E-Z Check is off only once and then on for 10 times in a row the E-Z Check will choose the next fastest mode.

CALIBRATING LAST SAMPLE GRAIN TEMPERATURE

The grain temperature can also be calibrated. It is done similar to the moisture calibration. While in the Last Sample Grain Temperature setting, take a manual sample while the E-Z Check is sampling. Compare the temperature of your manual sample to the E-Z Check sample. If they differ more than desired, hold the adjust switch up or down until the readings match. **Note:** this can also affect the meter calibration.

CALIBRATING THE SENSOR

When calibrating the sensor be sure you are taking a manual sample when the E-Z Check is sampling. Look at the minutes to next sample to find out how long before next sample. This can be adjusted down to zero to start the sample process immediately. If the E-Z Check was off, it will start its 60 second purge cycle (to get fresh grain to the sensor) then the display will flash 10 times(approximately every 3 seconds). This is when the E-Z Check is taking a sample and when your manual sample should be taken.

CALIBRATING THE SENSOR (continued)

Compare the manual sample to the E-Z Check by looking at the Last Sample Individual Moisture Reading. If the two readings differ by more than what is desired, adjust the reading up or down until the display matches the manual sample. Once calibration is close, any additional calibration amounts should be about half of what needs to be changed (to prevent overshooting back and forth).

When calibrating the moisture sensor, the manual sample reading should be an average of 4 or 5 readings due to variances in moisture readings and moisture levels. Calibration should be checked periodically throughout the season, especially if temperatures, grain varieties, or test weights change significantly. For the most accurate setting, calibration of the sensor should be done when the grain is close to the moisture level that it is to be transferred at.

12 HOUR TRANSFER AVERAGE

This average allows the operator to keep track of the moisture content of the grain that was transferred while the operator was away. The E-Z Check keeps an average of the transferred samples. The display will show the average and occasionally flash the number of samples in the average. The E-Z Check can store up to 12 hours of "ON" samples (samples taken when the grain was being transferred). When the E-Z Check is on (transferring) it samples every 5 minutes. $144 \text{ "ON" samples} \times 5 \text{ minutes per sample} = 12 \text{ hours of transferred grain}$. If power is lost the accumulated average is lost. The average will reset after 144 samples losing all previous information. It can also reset by holding the adjust switch down for 2 seconds while in this setting. Clear out the average when you last check the bin in the evening to ensure that the number of samples doesn't go over 144 before you next check the bin.

CHECKING SETTINGS

Once calibration and settings are entered they will stay in the E-Z Check 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 whenever power is restored to the E-Z Check.

TROUBLE SHOOTING TIPS



DANGER

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
No power to E-Z Check.	Machine switch not in auto. Grain tstat backup switch not in E-Z Check mode. 1/2 amp fuse blown in E-Z Check. Control fuse blown in Circu-trol.	Put machine switch to auto. Put switch in E-Z Check mode. Replace fuse .
E-Z Check not operating.	Drying program not started. Power may have flashed off. Error in drying program occurred.	Move adjust switch up or down to start program. See error codes to determine fault(s).
E-Z Check sampling but not transferring grain.	Cont Flow switch not in auto. Grain not reaching setpoint.	Put switch in auto. Check sensor calibration. Check dryer (temp, static pressure, etc.). Check off time (slower mode may be needed).
Machine running but E-Z Check sweep(s) running light is off.	System may be wired in parallel with grain T-STAT. System may be wired with low current draw relay coil.	Turn grain T-STAT to highest (driest) setting. Have electrician make sure relay coil requires at least 20 mA.

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.
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, not on sensor. Take manual sample and check calibration.
* E05	Moisture sensor or cable problem	Check moisture cable at sensor and E-Z Check. Replace sensor.
E06	Bad grain temperature	Check grain temp. Check temp calibration. Check drying 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. Adjust up or down to restart drying program.</p>		

Error codes will be sent to the printer if one is installed with the unit. Contact your dealer if further assistance is needed.