

TD-AFB123

Installation and user manual

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Warning Labels



Moving grain warning sticker.

Sticker to be placed on bin roof lid and top dryer bin door.

Figure 1



Danger moving parts can crush and cut.

Placed on cover of actuator and guards of loading stages.

Figure 2

DANGER

Danger 240v disconnect power before opening.

Placed on cover of TD-AFB123AB.

Component Identification

HMI Box (TD-AFB123HB)



- A) Mushroom E-stop button (ZB4BS844)
- B) Start button (ZB4BA3)
- C) HMI (HMIGTO5310)
- D) ¼ Turn latch

Inside HMI Box



- A) NC contact
- B) NO contact
- C) HMI (HMIGTO5310)
- D) Ethernet switch (TCSESU053FN0)
- E) PLC (TM221CE24T)
- F) (R1) Stage 1 relay (RPM11BD)
- G) (R2) Stage 2 relay (RPM11BD)

- H) (R3) Stage 3 relay (RPM11BD)
- I) (R4) Control power relay (RPM11BD)
- J) Terminal Block 1 (TB1)
- K) Ground Bar
- L) Ethernet plug (XB5PRJ45)
- M) 24vdc power female socket (5.5mmX2.1mm)

Terminal Block 1 (TB1)



Figure 6

- 1) To TD-AFB123TB TB2 #1(Blue)
- 2) Stage 1 (Relay 1) (Purple)
- 3) Stage 1 (Relay 1) (Purple)
- 4) Stage 2 (Relay 2) (Purple)
- 5) Stage 2 (Relay 2) (Purple)
- 6) Stage 3 (Relay 3) (Purple)
- 7) Stage 3 (Relay 3) (Purple)
- 8) Stage 1 Overload (Orange)
- 9) Stage 2 Overload (Orange)
- 10) Stage 3 Overload (Orange)
- 24) +24vdc (Blue) To TD-AFB123TB TB2 #24 (Blue)
- 24) +24vdc (Blue)
- 24) +24vdc (Blue)
- 24) +24vdc (Blue)
- 0) -0vdc (Blue and white) To TD-AFB123TB TB2 #90 (Blue and white)
- 0) -0vdc (Blue and white)
- 0) -0vdc (Blue and white)
- 0) -0vdc (Blue and white)
- 11) 24vdc input (Blue)



Figure 7

- A) Mushroom E-Stop (ZB4BS844)
- B) ¼ Turn latch



- A) NC contact
- B) PLC (TM221CE24T)
- C) Temperature input card (Temperature probes 1,2,3,4) (TM3TI4)
- D) Temperature input card (Plenum temperature probe) (TM3TI4)
- E) Terminal block 2 (TB2)
- F) Ground bar
- G) Ethernet plug (XB5PRJ45)
- H) (R5) Rotary relay (RPM11BD)

- I) (R6) Dryer fan relay (RPM11BD)
- J) (R7) Burner relay (RPM11BD)
- K) (R8) Hi/low relay (RPM11BD)
- L) (R11) Fuse monitor relay (RPM11F7)
- M) (R12) Switch monitor relay (RPM11F7)
- N) R13) Airflow monitor relay (RPM11F7)
- O) (R14) Vapor monitor relay (RPM11F7)
- P) (R15) Housing monitor relay (RPM11F7)
- Q) (R16) Transition monitor relay (RPM11F7)
- R) (R17) Thermostat monitor relay (RPM11F7)

Terminal Block 2 (TB2)



- 1) From TD-AFB123HB TB1 #1(Blue)
- 24) +24vdc (Blue)
- 60) From TD-AFB123ab TB3 #60 (Blue)
- 0) -0vdc (Blue and white)
- 0) -0vdc (Blue and white)
- 0) -0vdc (Blue and white)
- 13) To TB3 #13 (Grey)
- 14) To TB3 #14 (Grey)
- 16) To TB3 #16 (Grey)
- 19) To TB3 #19 (Grey)
- 21) Temperature probe 1+ (Red)
- 21) Temperature probe 1- (Pink)
- 21) Temperature probe 1- (Pink)
- 22) Temperature probe 2+ (Red)
- 22) Temperature probe 2- (Pink)
- 22) Temperature probe 2- (Pink)
- 23) Temperature probe 3+ (Red)
- 23) Temperature probe 3- (Pink)
- 23) Temperature probe 3- (Pink)
- 25) Temperature probe 4+ (Red)
- 25) Temperature probe 4- (Pink)
- 25) Temperature probe 4- (Pink)
- 26) Plenum temperature probe + (Red
- 26) Plenum temperature probe (Pink)
- 26) Plenum temperature probe (Pink)
- 27) Rotary power in (R5) (Purple)
- 28) Rotary power out (R5) (Purple)

- 28) Rotary power out (R5) (Purple)
- 29) Dryer 1 fan power in (R6) (Purple)
- 30) Dryer 1 fan power out (R6) (Purple)
- 31) Dryer 1 burner power in (R7) (Purple)
- 32) Dryer 1 burner power out (R7) (Purple)
- 33) Dryer 1 high/low power in (R8) (Purple)
- 34) Dryer 1 high/low power out (R8) (Purple)
- 35) +24vdc input from TB3 terminal #35 from TD-AFB123AB (Orange)
- 36) +24vdc input from bin top rotary (Orange)
- 37) +24vdc input from storage full rotary (Orange)
- 38) +24vdc input from TB3 terminal #38 from TD-AFB123AB (Orange)
- 39) +24vdc input from TB3 terminal #39 from TD-AFB123AB (Orange)
- 41) +24vdc input dryer fan 1 coil (Orange)
- 42) +24vdc input spare (Orange)
- N) Neutral from burner control
- N) Neutral from burner control
- N) Neutral from burner control
- 51) 120v in from burner fuse (R14) (Brown)
- 52) 120v in from burner switch (R15) (Brown)
- 53) 120v in from burner air switch (R16) (Brown)
- 54) 120v in from burner vapour high limit (R17) (Brown)
- 55) 120v in from burner housing high limit (R18) (Brown)
- 56) 120v in from burner transition high limit (R19(Brown))
- 57) 120v in from burner thermostat high limit (R20) (Brown)

Actuator box







- A) Motor brake
- B) Forward / reversing motor
- C) Gearbox
- D) Cover mounting
- E) Drip edge
- F) Gearbox mounting bracket
- G) Cable mounting hole
- H) Cable drum

- I) Beam clamp to activate limit switches
- J) Open limit switch
- K) Closed limit switch
- L) Actuator control box
- M) Chute leveling selector switch
- N) Cover
- O) Emergency stop

Actuator Control Box (TD-AFB123AB)



Figure 12

- A) (R10) chute control relay (RPM11BD)
- B) (R9) Aeration fan relay (RPM11BD)
- C) Overload switch

- D) Chute control selector switch
- E) Terminal block #3 (TB3)
- F) Chute contactor

Terminal Block 3 (TB3)



- L1) Line 1 240v (Red)
- L2) Line 2 240v (Black)
- 60) From TD-AFB123TB TB3 #60 (Blue)
- 24) +24vdc (Blue)
- 24) +24vdc (Blue)
- 24) +24vdc (Blue)
- 0) -0vdc (Blue and white)
- 0) -0vdc (Blue and white)
- 13) To TB2 #13 (Grey)
- 14) To TB2 #14 (Grey)
- 16) To TB2 #16 (Grey)

- 19) To TB2 #19 (Grey)
- 35) +24vdc output to TB2 terminal #35 (Orange)
- 38) +24vdc output to TB2 terminal #38 (Orange)
- 39) +24vdc output to TB2 terminal #39 (Orange)
- 49) Aeration Fan Relay Input (Relay 9) (Purple)
- 50) Aeration Fan Relay Output (Relay 9) (Purple)

Grain Temperature Probe



C) RTD - Lead

Rotaries not included (Bin Master BMRX)



Figure 14

Installation

Wiring Diagrams









Grain Temperature Probe Installation



- Equally space temperature probes E, F, G, H.
- Mount probe 8.5in off drying chamber floor.
- Use provided 1/2" 2-hole straps to attach the temperature probe conduit to bottom leveling band.
- Install so temperature probes are parallel with bands.
- Mount plenum temperature probe 4" under drying floor and 5'-10' away from burner inlet. Ex (Figure 23)





- Dryer storage full rotary paddle mounted 18in under and no more than 6ft from burner inlet. Ex (Figure 27)
- Drying chamber full rotary paddle mounted a minimum of 10in below the top of the top leveling band. Ex (Figure 25)



- A) 120v power in
- B) RelayC) Fail safe switch
- D) Ground

Bin Top Rotary

- Run wire from "+" to "TB2 #28" ٠
- Tie "-" to neutral •
- •
- Run wire from "1C" to "TB2 #24" Run wire from "1NO" to "TB2 #36" •

Bin Storage Rotary

- Run wire from "+" to "TB2 #28" •
- Tie "-" to neutral ٠
- ٠
- Run wire from "1C" to "TB2 #24" Run wire from "1NO" to "TB2 #36" •





- A) Cable B) Fairlead

- C) Actuator drumD) Bin wallE) Open limit switch

- F) Closed limit switch
 G) Beam clamp
 H) Crosby clamp
 I) Hole through actuator drum



- Mount actuator so fairlead is as close to directly under cable as possible. Run cable through fairlead. •
- •





- •
- Feed cable along the back of actuator drum and through hole in drum. Fold cable over after being fed through hole and install Crosby clamp on doubled over cable. Ex (Figure 31)





- Use a 5 mm allen key to remove the 2 plugs indicated above (Figure 32) Install the 2 provided breather plugs (Figure 33) in the openings that the plugs were removed from

Top Box (TD-AFB123TB)



- A) Knockout for 10 wire to TD-AFB123AB
 B) Knockout for rotary's
 C) Knockout for 4 wire to TD-AFB123HB
 D) Knockout for burner cables
 E) Ethernet plug in from TD-AFB123HB
 F) Knockout for temperature cables

- Mount box #1 on the bin wall so it is easily accessible from the top platform. •
- Tie temperature probe wires into TB2. •
- Run 9 wire cable between the TD-AFB123AB and TD-AFB123TB. •
- Tie 9 wire into TB2.
- Run 3 wire between TD-AFB123HB and TD-AFB123TB. •
- Run ethernet cable between TD-AFB123HB and TD-AFB123TB. •
- Plug ethernet cable into RJ45 plug on bottom of box. •

HMI Box (TD-AFB123HB)



- Mount Box 2 in a dry location. ٠
- Connect 3 wire from TD-AFB123HB to TD-AFB123TB. •
- Connect loading system control to Stage 1, Stage 2, Stage3 if necessary. •



- Stage 1 is initial loading system, stage 2 is secondary, stage 3 is tertiary. Ex. (Figure 36, • 37, 38)
- Plug ethernet cable into RJ45 plug on bottom of box. •
- Plug power supply into female adapter on bottom side of box. Plug power supply into AFCI protected outlet. •
- •

To tie into Sukup Burner



208 - 230 VOLT, SINGLE PHASE



FAN (with heater power block) ELECTRICAL DIAGRAMS

NOTES:

- Customer must provide means of disconnect, short circuit, and ground fault protection
- For motors without internal protection, correctly sized thermal units must be used in overload relay.
- Control circuit voltages are the same as that of the
- incoming power supply.
- Wire motor as per nameplate diagram.

KEY:

- M Motor MS Magnetic Starter C Magnetic Starter Coil OL Overload Relay PB1 Start Button (Green) PB2 Stop Button (Red) HPB Heater Power Block E Euso
- F Fuse
- N Neutral Terminal G Ground Terminal

- AUX Auxiliary Contact XFMR Control Transformer L1,L2,L3 Incoming Lines T1,T2,T3 Contactor Terminals J Motor Leads w/ Internal Protection

With internal motor protection (J leads) Without internal motor pr-2 30 HP8 2 30 HPG 6 6 1 1H S ME Ľ || " æ ΗH M м 12 41 ΗH ΗH 0-PB1 O____ PE2 . PB1

208 - 230 VOLT, THREE PHASE







Figure 40

L3







Figure 42





Disconnect wire #1 between "F" and "TS" in the burner control box. •



Figure 44

- Connect a wire between "F" in the burner control box and #31 of TB2 Connect a wire between "TS" in the burner control box and #32 of TB2 •
- •

3)



- ٠
- Disconnect wire between L1, AUX, and PB1. Disconnect wire between AUX, PB1 and PB2. •





- Run wire from "L1" to terminal "29" of TB2. Run wire from "PB2" to terminal "30" of TB2. •
- •

5)





- Run wire from the normally open "AUX" contact of the fan coil to terminal "24" of "TB2" •
- Run wire from the other side of the normally open "AUX" contact of the fan coil to terminal "41" of "TB2" ٠

4)

6) High/Low Burner Option*



Figure 48

- Disconnect wire #10 between the terminal block on the back of the burner control box and thermostat.
- Disconnect wire #13 between the terminal block on the back of the burner control box and thermostat.

7) High/Low Burner Option*



- Connect a wire between terminal #10 on the back of the burner control box and #33 of TB2.
- Connect a wire between terminal #13 on the back of the burner control box and #34 of TB2.

Sukup Safety Monitoring



Figure 50

- Connect wire from load side of fuse (wire #1 of burner) to terminal #51 of TB2.
- Connect wire from load side of toggle switch (wire #3 of burner) to terminal #52 of TB2.
- Connect wire from load side of air switch (wire #4 of burner) to terminal #53 of TB2.
- (Propane only) Remove jumper between #53 and #54 of TB2. Connect wire from load side of vapor high limit (wire #5 of burner) to terminal #54 of TB2.
- Connect wire from load side of housing high limit (wire #6 of burner) to terminal #55 of TB2.
- Connect wire from load side of transition high limit (wire #7 of burner) to terminal #56 of TB2.
- Connect wire from load side of to thermostat high limit (wire #8 of burner) to terminal #57 of TB2.





Figure 51





• Disconnect wire between the "STOP", "START", "AUX" and "STARTER COIL" in dryer #1 control box.







- Run wire from the normally open "AUX" contact of the fan coil in dryer control box #1 to terminal "24" of "TB2"
- Run wire from the other side of the normally open "AUX" contact of the fan coil in dryer control box #1 to terminal "41" of "TB2"





- Run wire from "STOP" push button of burner control box #1 to terminal "29" of TB2. Run wire from "STARTER COIL" of burner control box #1 to terminal "30" of TB2. •
- •

4)





Disconnect wire between terminal "4" and "5" of burner control box #1. ٠

3)



- Connect a wire between "F" in the burner control box #1 and #31 of TB2 Connect a wire between "TS" in the burner control box #1 and #32 of TB2 •
- •

6) High/Low Burner Option*





Disconnect wire "15" and "16" of burner control box #1 between thermostat and terminals "15" and "16". •

5)

7) High/Low Burner Option*



Figure 58

- Connect wire from terminal "15" of farm fans dryer panel #1 to terminal "33" of TB2 Connect wire from terminal "16" of farm fans dryer panel #1 to terminal "34" of TB2 •
- •

8)





Disconnect wire between the "STOP", "START", "AUX" and "STARTER COIL" in dryer • control box #2.





- Run wire from the normally open "AUX" contact of the fan coil in dryer control box #2 to terminal "24" of "TB2" •
- Run wire from the other side of the normally open "AUX" contact of the fan coil in dryer control box #2 to terminal "42" of "TB2" •





- •
- Run wire from "STOP" push button of burner control box #2 to terminal "52" of TB2. Run wire from "STARTER COIL" of burner control box #2 to terminal "53" of TB2.





Disconnect wire between terminal "4" and "5" of burner control box #2. •

12)



Figure 63

- Connect a wire between "F" in the burner control box #2 and #54 of TB2 Connect a wire between "TS" in the burner control box #2 and #55 of TB2 ٠
- •

11)

13) High/Low Burner Option*



Figure 64

Disconnect wire "15" and "16" of burner control box #2 between thermostat and terminals "15" and "16". •

14) High/Low Burner Option*



- Connect wire from terminal "15" of farm fans dryer panel #2 to terminal "59" of TB2 Connect wire from terminal "16" of farm fans dryer panel to terminal "60" of TB2 •
- •

Operation



- To level chutes select the "LEVEL CHUTES" button.
- When "LEVEL CHUTES" is selected the button will turn yellow and read "ON"



Figure 67

- When the "LEVEL CHUTES" option is selected the selector switch on the side of the actuator control box will light up green.
- Use the selector switch to raise or lower the chutes into the desired position.
- Once chutes are level install beam clamp so it is positioned against the "closed limit switch". Ex. (Figure 67)



Figure 68

- •
- The initial setting for large chutes should be 3.5sec and 45sec for smaller chutes. These times should only be used as a starting point. To set-up the proper chute time place a 1/4in dowel into the grain column see (Figure 68). Time how long it takes for the piece of dowel to travel from the top of the outer column to the chute while the grain is dumping. •



- Subtract 6 sec from the time and set "CHUTE DELAY". •
- "AUTO BATCH/FLOW" indicates how the loading and chutes will function.
- When set to "BATCH" the "CHUTYE DELAY" will automatically be set to 300sec. The loading will not run again until the chutes have lowered after the top has been filled • once.
- "BATCH" loading will not top up the bin top. Fills once and will not refill until chutes • have lowered and been brought back up. Sets "CHUTE DELAY" to 300 secs to allow enough time for drying floor to clear.
- When set to "FLOW" the chutes will follow the time set in "CHUTE DELAY" and the • loading will follow the parameters set in the "LOADING SETTINGS" page.
- "FLOW" chutes will not drop if bin top is not full. Dryer will call for grain as soon as • bin top rotary becomes free.
- "TEMPERATURE" indicates the temperature unit the dryer will function in. •
- "COUNTER RESET" resets the "DUMP COUNT" "BURNER ON/OFF WHEN OPEN" when in the "ON" position the burner will stay on when chutes are open. When in the "OFF" position the burner will shutoff when the chutes are ready to lower. The fan will run for the amount of time set in the "FAN OFF DELAY" section. After the fan shuts off the chutes will lower. The fan and burner will restart when the chutes are raised.
- "DUMP COUNT" keeps track of how many dumps there has been since the counter • was reset last.



Figure 70

- "ON/OFF" selects which stages will be used.
- "AUTO" indicates how the loading stage will run.
- When in the "AUTO" position the stage will start and stop according to the parameters set in the "DELAY START" and "DELAY STOP" selections.
- Set "DELAY START" to the amount of time after grain has cleared from the bin top sensor that the first stage will start.
- Set "DELAY OFF" to the minimum amount of time the stage takes to clean out.
- If loading is turning on frequently while dryer is running increase delay off time of last stage by increments of 5 sec until loading is topping up once or twice between dumps or until upper ring is full.
- Be careful not to run loading too long as it can lead to plugging of equipment.





- When "AUTO" is in the "MANUAL" position and "MANUAL" is set to "ON" the stage will run until "MANUAL" is switched to "OFF" or the overload trips.
- To set the "MAX LOADING TIMER" time how long it takes to fill the drying chamber from empty. Add %10 to the filling time and input it into "MAX LOADING TIMER". This will shut down the loading system if bin top rotary has not been reached within the time frame.

*Ignore if not controlling burner or aeration fan.



Figure 72

- "DRYER" only used if controlling burner.
- "RUN TIME" is the amount of time the burner will be on before shutting down.
- "COOL TIMER" is the amount of time the burner fan will run after the burner shuts off.
- "CONTROL" turns the dryer control on and off.
- "BURNER SAFETIES" only used if monitoring burner safeties.
- "MAX TEMP SAFTIES" should be set slightly higher than the plenum set point and the grain set point to prevent fires and damage to the burner and bin.
- In the "BURNER RUN SETTINGS" "TYPE" sets the stye of the burner and how it will be run.
- "MOD VALVE" setting the flame is controlled by a modulating valve built into the gas train.
- "HIGH/LOW" setting the flame is controlled by the "PLENUM SET" and "DIFF" settings. The burner will run at high flame until reaching the "PLENUM SET" temperature then switches to low flame until the plenum drops below the "PLENUM SET"- "DIFF". At which time the high flame starts again.
- "HIGH/LOW/OFF" setting the flame is controlled by the "CYCLE OFF", "PLENUM SET" and "DIFF" settings. The burner will run at high flame until reaching the "PLENUM SET" temperature then switches to low flame. If the plenum temperature continues to climb and reaches the "CYCLE OFF" set point it will shutoff the flame until the plenum drops below the "PLENUM SET"- "DIFF".
- "CYCLE OFF" is the set point at which the flame will shutoff then restart after dropping below the "PLENUM SET"- "DIFF" point
- The "PLENUM SET" is the temperature the plenum will reach before switching from high to low flame.
- The "DIFF" is the amount the temperature will drop after reaching the "PLENUM SET" point before the high flame will start again.
- "AERATION FAN" (only used if controlling aeration fan).
- "AUTO/MANUAL" controls how the aeration fan will be controlled. When in "AUTO" the fan will follow the parameters set in the "TIME START" and "TIMER" settings.
- "TIMER START" controls when the timer will start. "INSTANT" will start the timer as soon "CONTROL" is turned on. "AFTER DRY" will start the timer after the burner fan shuts down.
- "TIMER" is the amount of time until the aeration fan will shut down according to the parameters set in the "TIMER START" selection.
- "CONTROL" turns the aeration fan control on and off.

		DRY	TYPE		
	TIME AND TEMP DRY			TEMP DRY	
	TIME DRY			FINISH DR	Y
BACK	SETTINGS H	ISTORY	DRY TYP	E ALARMS	MAIN

- "DRY TYPE" selects the type of drying that will be used to control the chutes.
- "TIME AND TEMP DRY" the dryer must reach both time and temperature set points to lower the chutes.
- "TEMP" the dryer must reach the temperature set point to lower the chutes.
- "TIME" the dryer must reach the time set point to lower the chutes.
- "FINISH DRY" the chutes are controlled by the "UP" and "DOWN" buttons in the finish dry section.





- "TIME + TEMP DRY" when set to "ON" will allow the chutes to lower when the parameters set in the "DRY TIMER" and "SET TEMP" are met.
- "AUTO LOAD" allows the user to stop and start the auto loading from the drying page.
- "DRY TIMER" sets the minimum amount of time between dumps.
- "SET TEMP" sets the minimum the overall grain temperature must reach before the chutes will lower.
- "REMAINING" displays the amount of time left before the "DRY TIMER" parameter is reached.
- "DRYER CONTROL" allows control of the burner from the drying page.

TEMP DRY							
	DRY TYPE	RMATION CE OVERALL					
SETTINGS	OFF	106.2°	131.0°				
TEMP DRY	DUMP COUNT	TOP	STORAGE				
OFF	0	FULL	FULL				
	LOADING 6	AUTO LOAD	CHUTES				
AUTO LOAD	ØMIN	ON	OPEN				
ON	DRYER FAN	FLAME	AERATION				
SET TEMP	OFF	OFF	1484MIN				
0.0°							
	DRYER						
	CONTROL	START	STOP				
BACK SETTINGS	HISTORY DRY	TYPE ALA	ARMS MAIN				

Figure 75

- "TEMP DRY" when set to "ON" will allow the chutes to lower when the parameter set in the "SET TEMP" section is met.
- "AUTO LOAD" allows the user to stop and start the auto loading from the drying page.
- "SET TEMP" sets the point the overall grain temperature must reach before the chutes will lower.
- "DRYER CONTROL" allows control of the burner from the drying page.



Figure 76

- "TIME DRY" when set to "ON" will allow the chutes to lower when the parameter set in the "DRY TIMER" is met.
- "AUTO LOAD" allows the user to stop and start the auto loading from the drying page.
- "DRY TIMER" sets the minimum amount of time between dumps.
- "REMAINING" displays the amount of time left before the "DRY TIMER" parameter is reached.
- "DRYER CONTROL" allows control of the burner from the drying page.

FINISH DRY							
SETTINGS	DRY TYPE	RMATION CE	ENTER PLENUM				
FINISH DRY	OFF	106.2°	131.0°				
OFF	DUMP COUNT	TOP	STORAGE				
AUTO LOAD	0	FULL	FULL				
ON	LOADING	AUTO LOAD	CHUTES				
OPEN CHUTES	ØMIN	ON	OPEN				
OPEN	DRYER FAN	FLAME	AERATION				
	OFF	OFF	1483MIN				
CLOSE							
	DRYER	START	STOP				
	CONTROL						
BACK SETTINGS	HISTORY	TYPE AL	ARMS MAI	(N			

- "FINISH DRY" is generally used when clearing out the top of dryer.
- **When the dryer is set to "FLOW" and "FINISH DRY" it will allow the chutes to open even if the dryer storage rotary is covered. Caution should be used in this setting to ensure grain is not getting too close to the burner opening. ** When "FINISH DRY" is set to "ON" the chutes will open when the "OPEN" button is
- pressed and will remain open until the "CLOSED" button is pushed.
- "AUTO LOAD" allows the user to stop and start the auto loading from the drying page.
- "DRYER CONTROL" allows control of the burner from the drying page.

Date	Time	Message			
_yy/mm/dd	24:00				
yy/mm/dd	24:00				
_yy∕mm/dd	24:00				
					_
					_
					¥
3 3	:	BACK	FINISH	CLEAF	२

Figure 78

- Displays current and logged alarms.
- Red indicates alarm is active.
- Green indicates alarm is cleared.
- Clear button temporarily clears alarms. If alarm is still active will not clear.

BACK SETTINGS HISTORY DRY TYPE ALARMS MAIN

- "BACK" navigates to previous page.
- "SETTINGS" to settings page.
- "HISTORY" to history page.
- "DRY TYPE" to dry type selection page. If a dry type is running the "DRY TYPE" button will change to the dry type that is running and will navigate to the selected drying page.
- "ALARM" to alarm page. If an alarm is active the "ALARM" button will light up red.
- "MAIN" to main display page.



Figure 80

- "DELETE" allows deletion of individual sensors. Overall temperature will be taken by remaining sensors.
- "F°" or "C°" Displays current program temperature. Toggles between F° and C°.
- Current probe temperature is displayed at the bottom of each probe. Temperature will be displayed even if sensor is deleted.
- "OVERALL" displays current overall temperature of all active temperature probes.

	SETTINGS		
CHUTE SETTINGS	LOAD SETTINGS	BURNER	R GS
·	·		
DRY TYPE	GRAIN TEMP PROBES	ALARMS	5 - E
	·		
INPUTS	OUTPUTS	CONFIGU	IRE
LOGIN	CHANGE PASSWORD	ADD USE	ER
BACK SETTINGS	ISTORY TIME+TEMP	ALARMS	MAIN



- "CHUTE SETTINGS" directs to chute setup page.
- "LOAD SETTINGS" directs to load settings page.
- "BURNER SETTINGS" directs to burner setup page.
- "DRY TYPE" directs to dry type selection page.
- "GRAIN TEMP PROBE" directs to grain temperature probes settings page.
- "ALARM" directs to alarm history page.
- "INPUTS" directs to digital input display page.
- "OUTPUTS" directs to digital output display page.
- "CONFIGURE" to access configuration page user must be logged in. If user is not logged in "CONFIGURE" button will open user login page.
- "LOGIN" opens user login page.
- "CHANGE PASSWORD" opens change password page.
- "ADD USER" opens add user page.

	Date	Lic	e	Hessage	2		
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Ĩ				Back	RESET DUMP COUNT	SETTING	s

- Displays the dump date, time, number, plenum temperature and grain temperature.
- Displays burner off date and time. (If used)
- Displays burner fan off date and time. (If used)
- Displays aeration fan off date and time. (If used)
- Displays loading time. (Time from loading start until bin top rotary is activated)



Figure 83

- Main display page.
- Displays current statuses of dryer and loading equipment.

DOWN LIMIT SWITCH UP LIMIT SWITCH CHUTE OVERLOAD	ACTIVATED ACTIVATED TRIPPED
UP LIMIT SWITCH CHUTE OVERLOAD STACE 1 OVERLOAD	ACTIVATED TRIPPED
CHUTE OVERLOAD	TRIPPED
STAGE I OVERLOAD	TRIPPED
STAGE 2 OVERLOAD	TRIPPED
STAGE 3 OVERLOAD	TRIPPED
BIN TOP ROTARY SWITCH	NO GRAIN
BIN FULL ROTARY SWITCH	BIN NOT FULL
BURNER FAN COIL	OPEN
BURNER FUSE	TRIPPED
BURNER SWITCH	OPEN
AIR SWITCH	TRIPPED
VAPOR HIGH LIMIT	TRIPPED
HOUSING HIGH LIMIT	TRIPPED
TRANSITION HIGH LIMIT	TRIPPED
THERMOSTAT HIGH LIMIT	TRIPPED
BACK SETTINGS HISTORY TIME+TEMP	ALARMS MAIN

Figure 84

- Displays current digital input statuses.
- "DOWN LIMIT SWITCH" "ACTIVATED" when chutes are open and beam clamp is resting on the down limit switch.
- "UP LIMIT SWITCH" "ACTIVATED" when chutes are closed and beam clamp is resting on the up-limit switch.
- "CHUTE OVERLOAD" "TRIPPED" when overload is not in the on position.
- "STAGE 1 OVERLOAD" "TRIPPED" when stage 1 is being used and is tripped. (24VDC on TB1 #8)
- "STAGE 2 OVERLOAD" "TRIPPED" when stage 2 is being used and is tripped. (24VDC on TB1 #9)
- "STAGE 3 OVERLOAD" "TRIPPED" when stage 3 is being used and is tripped. (24VDC on TB1 #10)
- "BIN TOP ROTARY SWITCH" "GRAIN" when top rotary is not spinning.
- "BIN FULL ROTARY SWITCH" "FULL" when bin storage is not spinning.
- "BURNER FAN COIL" "CLOSED" when contactor controlling burner fan is powered.
- "BURNER FUSE" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON" and TB2 #51 is not powered. (120VAC)
- "BURNER SWITCH" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON", TB2 #51 is powered and TB2 #52 not powered. (120VAC)
- "AIR SWITCH" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON", TB2 #52 is powered and TB2 #53 not powered. (120VAC)
- "VAPOR HIGH LIMIT" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON", TB2 #53 is powered and TB2 #54 not powered. (120VAC)
- "HOUSING HIGH LIMIT" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON", TB2 #54 is powered and TB2 #55 not powered. (120VAC)
- "TRANSITION HIGH LIMIT" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON", TB2 #55 is powered and TB2 #56 not powered. (120VAC)
- "THERMOSTAT HIGH LIMIT" "TRIPPED" when burner is powered, "BURNER SAFETIES" is "ON", TB2 #56 is powered and TB2 #57 not powered. (120VAC)

OUTPUT STATUS	
CHUTE UP	OFF
CHUTE DOWN	OFF
STAGE 1 LOADING	OFF
STAGE 2 LOADING	OFF
STAGE 3 LOADING	OFF
BURNER FAN	OFF
BURNER	OFF
HIGH FLAME	OFF
MANUAL CHUTE CONTROL	OFF
AERATION FAN	OFF
BACK SETTINGS HISTORY TIME+TEMP	ALARMS MAIN



- "CHUTE UP" "RUNNING" when actuator motor closing.
- "CHUTE DOWN" "RUNNING" when actuator motor opening.
- "STAGE 1 LOADING" "RUNNING" when stage 1 is running.
- "STAGE 2 LOADING" "RUNNING" when stage 2 is running.
- "STAGE 3 LOADING" "RUNNING" when stage 3 is running.
- "BURNER FAN" "RUNNING" when burner fan is running. TB2 #30 is powered. (Voltage depends on coil voltage of burner fan contactor)
- "BURNER" "RUNNING" when burner flame is on. TB2 #32 is powered. (120VAC)
- "HIGH FLAME" "RUNNING" when high flame is on. TB2 #34 is powered. (120VAC)
- "MANUAL CHUTE CONTROL" "ON" when chute level is on. TB3 #19 is powered. (24VDC)
- "AERATION FAN" "RUNNING" when aeration fan is on. TB3 #46 is powered. (Voltage depends on coil voltage of aeration fan contactor)





- To login as a user. Enter user name, password and press the unlock button (button 3).
- Current users name is displayed under the "Password" section.
- Default Administrator: Name Admin. Default Password Admin
- Default User: Name User. Default password User
- Home button (button 1) directs to chute settings page.
- Back button (button 2) directs to previous page
- "BACK" directs to previous page.
- "CHANGE PASSWORD" directs to password change page. (Changes password of current logged in user)
- "MANAGE USERS" directs to manage users' page. (Add and delete users)





- Set button (button 1) sets the password input in the above sections.
- Exit button (button 2) directs to previous page.
- "BACK" directs to previous page.
- "CHANGE PASSWORD" directs to password change page. (Changes password of current logged in user)
- "MANAGE USERS" directs to manage users' page. (Add and delete users)

	Group			
	User		▼	
	0.0	CA		
	1 2	2		
		5 2	+)	
	_			
BACK		Change Password	MANA	AGE USERS

Figure 88

- "GROUP" indicates the security level that the user will be given.
- Group 1 has access to everything other than the "CONFIGURATION" page and the "MANAGE USER" page.
- Add user (button 1) adds user with the information set in the above sections and the password setting page.
- Change user (button 2) changes user with the information set in the above sections and password setting page.
- Delete user (button 3) deletes user selected in the above sections.
- Exit (button 4) exits user manager page.
- Password setting (button 5) navigates to password setting page.
- "BACK" directs to previous page.
- "CHANGE PASSWORD" directs to password change page. (Changes password of current logged in user)
- "MANAGE USERS" directs to manage users' page. (Add and delete users)



Figure 89

• The only changes that should be made in the configuration page is "Date/Time"



Figure 90

- This page indicates there is a connection issue between the indicated PLC and the HMI.
- Refer to trouble shooting guide.

Troubleshooting

Status LEDs

The following figure shows the status LEDs:



The following table describes the status LEDs:

Label Function Type Color Status Description						
				Controller States ⁽¹⁾	Prg Port Communication	Application Execution
PWR	Power	Green	On	Indicates that power	is applied.	
			Off	Indicates that power	is removed.	
RUN	Machine Status	Green	On	Indicates that the co application.	ntroller is running a	a valid
			Flashing	Indicates that the co is stopped.	ntroller has a valid a	application that
			Off	Indicates that the co	ntroller is not progr	ammed.
ERR	Error	Red	On*	EXCEPTION	Restricted	NO
			Flashing (with RUN status LED Off)	INTERNAL ERROR	Restricted	NO
			Slow flash	Minor error detected ⁽²⁾	Yes	Depends on the RUN status LED
			1 single flash	No application	Yes	Yes
SD	SD Card	Green	On	Indicates that the SI) card is being acc	essed.
	Access		Flashing	Indicates that an error was detected during the S card operation.		
			Off	Indicates no access	(idle) or no card is	present.
BAT	Battery	Red	On	Indicates that the ba	ttery needs to be r	eplaced.
			Flashing	Indicates that the ba	ttery charge is low.	
			Off	Indicates that the battery is OK.		
SL	Serial line 1	Green	On	Indicates the status	of Serial line 1.	
			Flashing	Indicates activity on	Serial line 1.	
Off Indicates no s				Indicates no serial c	ommunication.	

Figure 91

Alarm	Problem	Solution
RESET TOP PLC	-Connection issue between PLC in "TB-AFB122TB" and HMI	-Make sure "PWR" indicator on face of PLC in "TB-AFB122TB" is on.
		-If "PWR" indicator is off check for 24vdc on the power supply on the bottom of the PLC.
		-Check "RUN" indicator on face of PLC in "TB-AFB122TB" if blinking reset PLC (Figure 92). (Move switch to stop then back to run)
		-Check ethernet cable connection between HMI in "TB-AFB122HB" and ethernet switch.
		-Check ethernet cable connection between PLC in "TB-AFB122TB" and ethernet switch.
RESET BOTTOM PLC	-Connection issue between PLC in "TB-AFB122HB" and HMI	-Make sure "PWR" indicator on face of PLC in "TB-AFB122HB" is on.
		-If "PWR" indicator is off check for 24vdc on the power supply on the bottom of the PLC.
		-Check "RUN" indicator on face of PLC in "TB-AFB122HB" if blinking reset PLC (Figure 92). (Move switch to stop then back to run)
		-Check ethernet cable connection between HMI in "TB-AFB122HB" and ethernet switch.
		-Check ethernet cable connection between "TB-AFB122HB" and ethernet switch.
ALL TEMPERATURE PROBES DELETED	All temp probes deleted.	-Add temperature probes back in on "GRAIN TEMPERATURE PROBES" page.
TEMPERATURE DIFFERENTIAL TOO HIGH	Temperature differential between adjacent probes exceeds 30°.	-Check "GRAIN TEMPERATURE PROBES" page.
		-Check chutes for obstructions
		-Delete probes if necessary. This should only be done after grain temperature around probe has been checked. Overheated grain could cause damage or fire.

CHECK CHUTES	Beam clamp did not activate limit switch in time.	-Check power to "TB-AFB122HB".
		to be sure they're in the proper position.
CHUTE OL TRIPPED	Chute Overload tripped	-Reset chute overload switch. (Figure 93) Turn switch counter clockwise then clockwise.
FILLING TIMED OUT	Full rotary sensor was not covered before "MAX	-Check wet bin level.
	out.	-Be sure wet grain is getting into the dryer top when loading is running.
		-Check chutes for leaking or broken chains.
		-Make sure timer is set for the appropriate amount of time.
TOO HIGH	exceeded the maximum plenum temperature set in the "MAX TEMP SAFTIES"	temperature is set to an appropriate temperature.
	section of the "BURNER SETTINGS" page.	-Make sure the "PLENUM SET" in the "HIGH LOW TEMP SETTING" of the "BURNER SETTINGS" page is not set too close to the maximum plenum temperature. (If burner has a High/Low valve)
		-Make sure modulating valve is turned to an appropriate setting. (If burner has a modulating valve)
**GRAIN TEMP TOO HIGH	Grain temperature exceeded the maximum grain temperature set in	-Make sure maximum grain temperature is set to an appropriate temperature.
	the "MAX TEMP SAFTIES" section of the "BURNER SETTINGS" page.	-Check chutes for obstructions.
DRYER STORAGE FULL	Dryer storage rotary not spinning.	-Check bin storage level.
		-Check rotary for obstructions.
		-Make sure rotary is powered.
TRIPPED	Stage 1 overload tripped	-Reset tripped overload.
STAGE 2 OL TRIPPED	Stage 2 overload tripped	-Reset tripped overload.
STAGE 3 OL TRIPPED	Stage 3 overload tripped	-Reset tripped overload.
SET "MAX LOADING TIMER"	Max loading timer not set	-Set "MAX LOADING TIME" in "LOADING SETTINGS" page.
SET "CHUTE DELAY"	Chute delay not set	-Set "CHUTE DELAY" on "CHUTE SETTINGS" page.
SET "SET TEMP"	Drying temperature not set	-Set "SET TEMP" on "TEMP DRY" or "TIME AND TEMP DRY" page depending on which drying type is being used.

SET "DRY TIMER"	Drying time not set	-Set "SET TIME" on "TIME DRY" or "TIME AND TEMP DRY" page depending on which drying type is being used.
	Power from fuse not	-Check burner fuse.
DURINER FUSE		-Check relay #14
***CHECK BURNER SWITCH	Power from switch not reading to PLC	-Check burner power switch on burner.
		-Check relay #15
***BURNER HOUSING HIGH	Power from burner housing high limit not reading to	-Check burner housing high limit tripped.
LIMIT TRIPPED	PLC	-Check relay #18
***CHECK AIR FLOW SWITCH	Power from air flow switch not reading to PLC	-Check airflow switch.
		-Check relay #16
***BURNER THERMOSTAT	Power from thermostat not reading to PLC	-Check burner thermostat.
TRIPPED		-Check relay #20
***TRANSITION HIGH LIMIT	Power from transition high limit not reading to PLC	-Check transition high limit.
TRIPPED		-Check relay #19
***VAPOR HIGH LIMIT TRIPPED	Power from vapor high limit not reading to PLC	-Check vapor high limit.
(PROPANE ONLY)		-Check relay #17

** only applies when controlling the burner.

*** only applies when monitoring burner safeties.



Figure 92



<u>Notes</u>



Figure 94



Figure 95



Figure 96



Figure 97



Figure 98



Figure 99



Figure 100



Figure 101



Figure 102



Figure 103