



## *Operation and Set-Up Manual*

Three Twins Ice Cream

Sheboygan, WI

MSA-26SS

Serial Number: 590

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### **WARNING!**

**Safe operation of this machine goes beyond good design practice and fabrication. Management must provide effective safety procedures, including, but not limited to:**

- Proper Installation
- Proper Maintenance Procedures
- Enforced Safety Rules
- Proper Safety and Maintenance Equipment
- Encouraging a "Safety First" attitude

**Safety information is available from OSHA and other sources.**

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# Basic Steps to Operate System

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## **STEPS FOR THE OPERATOR TO PERFORM BEFORE THE AUTOMATIC OPERATION OF THE APM EQUIPMENT:**

1. *The operator should make a visual inspection to ensure the machine is clear of all obstructions.*
2. *Depress all “Emergency Stop” buttons and ensure that the upstream is enabled.*
3. *Ensure that the safety doors are completely closed. If the doors are not closed, the machine will not start.*
4. *Press the “Control Power Off/On” button located on the HMI, which turns on the master air valve and power to the drives.*
5. *Set the proper temperature for the seal bar and tunnel oven.*
6. *Ensure that the machine is physically configured correctly for the desired product and film is threaded properly.*
7. *Once all temperatures are met, press the “Clear Alarms” button or the “Cycle Stop” button to clear all alarms.*
8. *After verifying all settings, press the “Cycle Start” button on the main panel.*
9. *The machine will beep for 3 seconds and then automatic operation commences.*

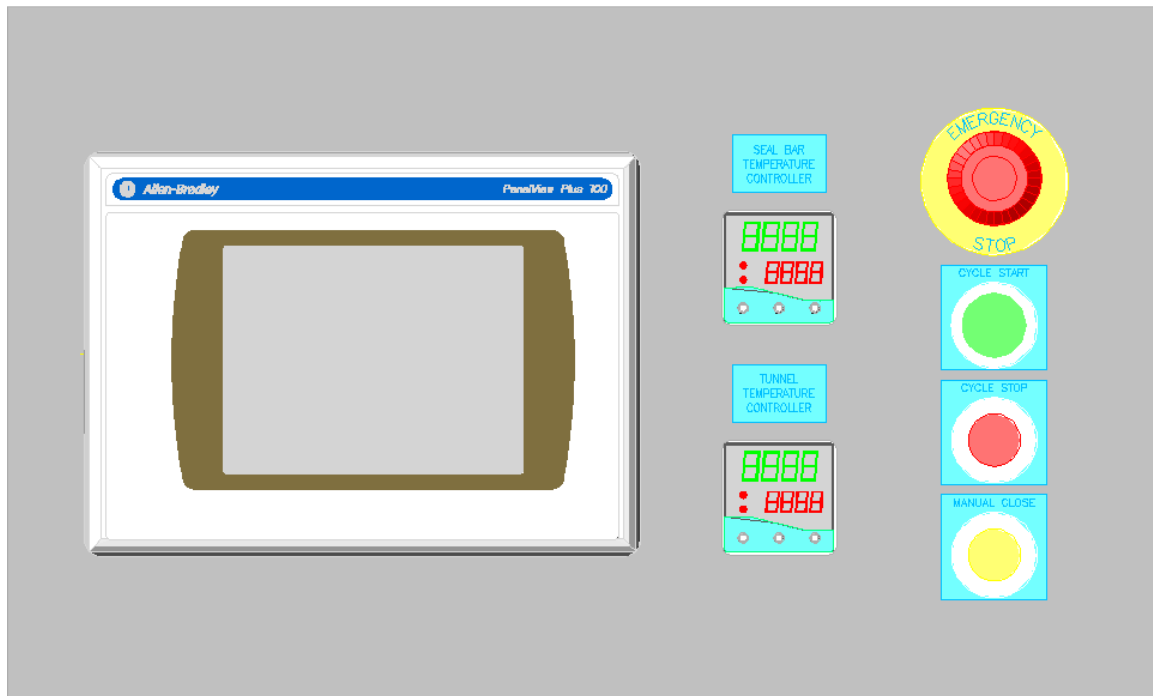
## **STEPS FOR THE OPERATOR TO PERFORM TO STOP THE APM EQUIPMENT:**

- *In the event of an emergency, press any “Emergency Stop” button.*
- *In the event of a non-emergency, press the “Cycle Stop” button.*

## **STEPS FOR MACHINE OPERATOR TO PERFORM IF A FAULT OCCURS:**

- *If any alarms show on the Panel View, check and correct.*
- *Press the “Clear Alarms” button, or “Cycle Stop” Button to clear the alarm.*
- *Start the cycle by pressing the “Cycle Start” button.*

# Operator Station #1 (OS1)



**Operator Station #1**

## Emergency Stop Push/Pull Button

In an Emergency, press any of the “Emergency Stop” buttons to stop all motion immediately and dump all hazardous energy from the system. To resume normal machine function, all Emergency Stop buttons must be depressed.

## Cycle Start Illuminated Push Button

The “Cycle Start” button is used to start the automatic operation of the system. When the machine is ready with no alarms and temperature is met, the green light will flash informing the operator that the system is now ready for automatic operation. Pressing the Cycle Start button will start the warning buzzer for three seconds, and then the system will begin automatic operation.

## Cycle Stop Push Button

In a non-Emergency, press the “Cycle Stop” button to automatically stop the system.

## Manual Close Push Button

The “Manual Close” button when pressed will perform a manual cut with the Seal Bar only when not in automatic mode.

## Seal Bar Temperature Controller

Press and hold the “**STAR**” button and press the “▲” or “▼” button to adjust the Seal Bar’s temperature set point in degrees Fahrenheit. \*\*

## Tunnel Temperature Controller

Press and hold the “**STAR**” button and press the “▲” or “▼” button to adjust the tunnel oven’s temperature set point in degrees Fahrenheit. \*\*

**\*\*For more information on setting up a temperature controller, please see the “Temperature Controller CAL9400 Set Up” section of this manual.**

# Palm Operation/Cycle Engagement

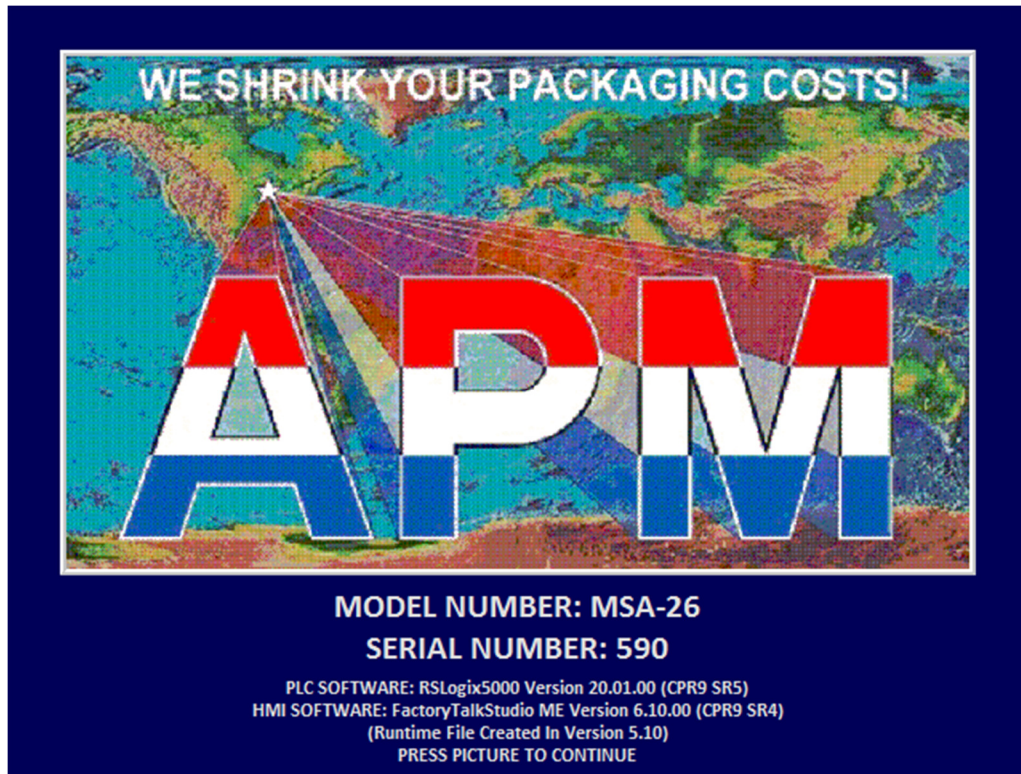
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## Palm Button Operation

The MSA system is a manual cycle engagement system offered by American Packaging Machinery, Inc. When the machine is in auto, the operator must place product in front of the manual pusher and use the handle to slide the product through the seal frame. Once the product is transferred fully, the operator must retract the manual pusher. If the manual pusher is not fully retracted, the palm buttons will not illuminate and will not allow the sealing process to occur. Once the manual pusher is fully retracted, the blue lights will illuminate informing the operator that the manual seal operation may now take place. The operator must use both hands and press both palm buttons within a half second or the blue lights will turn off and a manual seal will not occur. Release both buttons to retry. If both buttons are pressed within a half second, the Hold Down will engage and stabilize the product and start the “Seal Bar Start Delay” timer. Once the timer expires, the Sealing Bar will close to cut and seal the film. If the operator lets go of either palm button before the Seal Bar closes, the sealing process will immediately cancel. If the operator continuously holds either palm button in, the sealing process will not be allowed again until both buttons were released. This sequence is designed to assure the safety of the operator during the film sealing function of the machine.

# Initial Screen

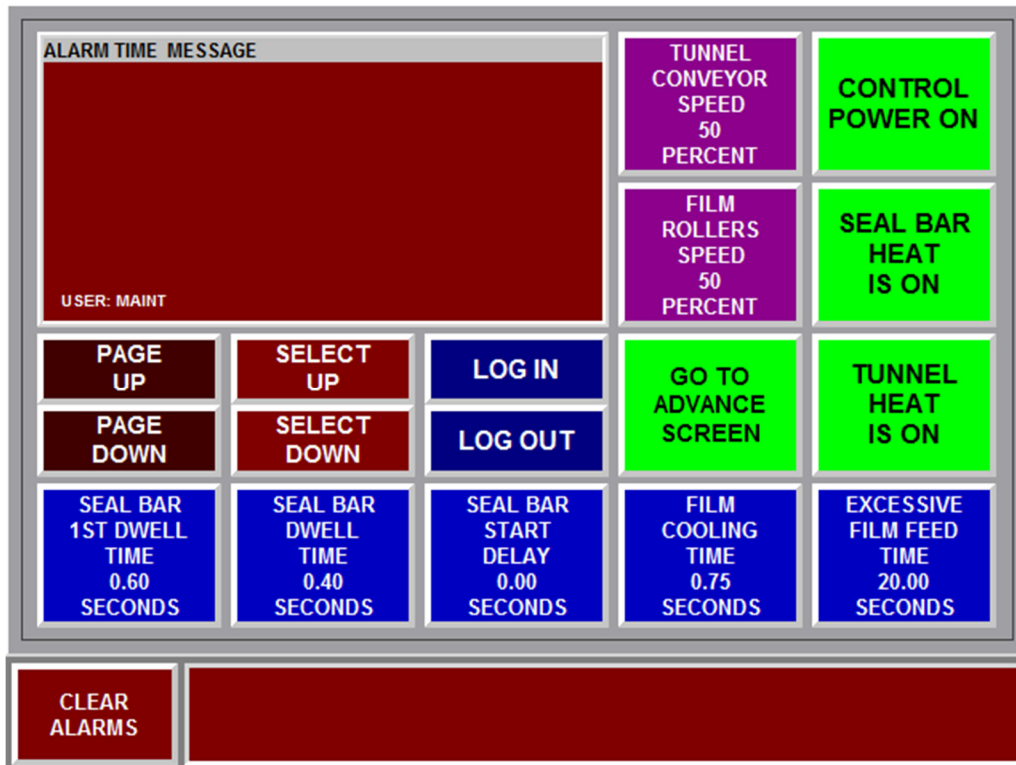
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*Initial Screen (Help Screen)*

The “Initial Screen” is used mainly for descriptive purposes only. When power is applied to the machine, this will be the first screen shown. The model number(s) and serial number(s) are shown here for each piece of equipment. Press the picture to continue.

# Main Screen



*Main Screen*

## Screen Footer

The screen's footer (bottom of screen) will have the "Clear Alarms" button on the left side and the alarm banner to the right of the "Clear Alarms" button.

The alarm banner will display the most recent active, unacknowledged alarm which must be corrected and cleared before automatic operation may resume.

## Alarm History

The "Alarm History" banner is where all alarms which occurred on the system are stored for reference only. Use the "Select Up/Down" buttons to move through the alarm list one alarm at a time. Use the "Page Up/Down" buttons to move through the alarm list one page at a time.

## Log In Button

The "Log In" button when pressed will open up an alpha-numeric keypad allowing the operator to enter their user name and password to allow access to secured screens and settings.

## Log Out Button

The "Log Out" button when pressed is used to log out the current user to the "Default" user locking all secured screens and settings.

## Control Power Off/On Button

The “Control Power Off/On” button is used to turn on the control power to the system after an E-Stop.

## Seal Bar Heat Off/On

The "Seal Bar Heat Is Off/On" button turns power off or on to the heating element for the seal bar.

## Tunnel Oven Heat Off/On

The "Tunnel Oven Heat Is Off/On" button turns power off or on to the heating elements for the tunnel oven.

## Tunnel Conveyor Speed

Press the “Tunnel Conveyor Speed” button to enter the speed of the tunnel conveyor as a percentage up to 100%.

## Film Rollers Speed

Press the “Film Rollers Speed” button to enter the speed of the film rollers as a percentage up to 100%.

## Go To Advanced Screen

To access the advanced features of your MSA-26SS machine, log in and then press the “Go to Advanced Screen” to open the advanced screen.

### Seal Bar 1st Dwell Time

Press the “Seal Bar 1<sup>st</sup> Dwell Time” button to enter the desired seal time for the Seal Bar’s first seal after being idle for at least 15 seconds.

### Seal Bar Dwell Time

Press the “Seal Bar Dwell Time” button to enter the desired seal time for the Seal Bar when the seal bar has performed the initial seal and has not been idle for 15 seconds or more.

### Seal Bar Start Delay

Press the “Seal Bar Start Delay” button to enter the desired time in seconds from when the hold down clamps the product to when the seal bar starts closing.

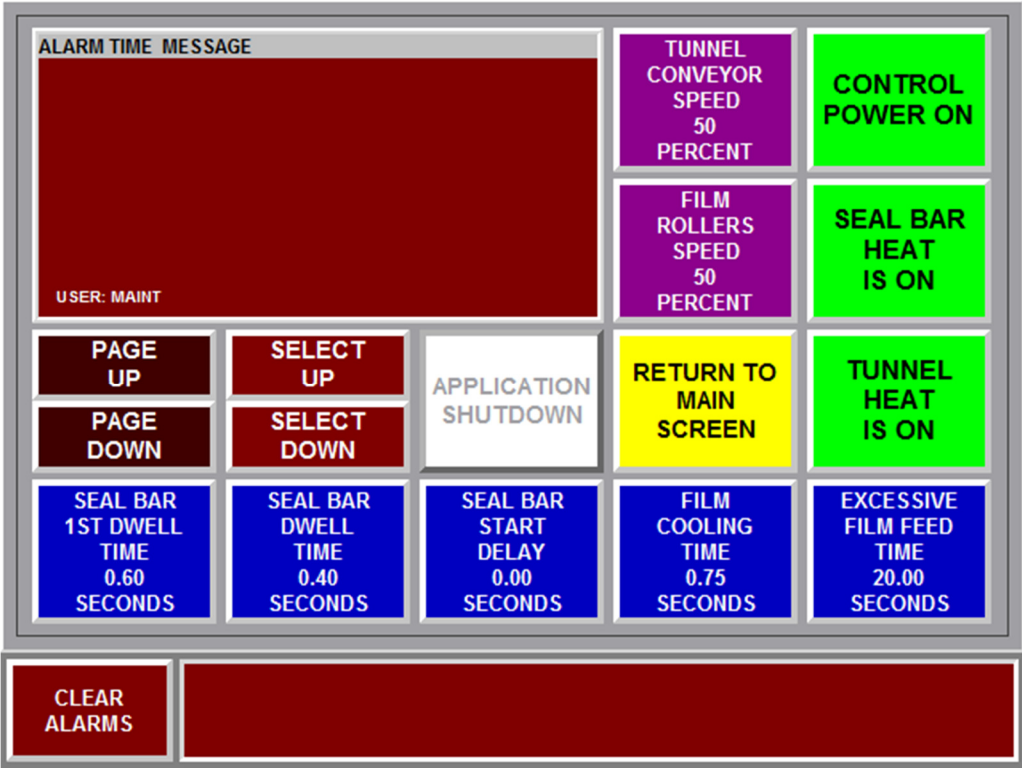
### Film Cooling Time

Press the “Film Cooling Time” button to enter the desired amount of time the film cooling jets will apply air after the seal bar has cut and sealed the film to cool the film and avoid film separation.

### Excessive Film Feed Time

Press the “Excessive Film Feed Time” button to enter the amount of time in seconds to limit the film rollers from running continuously before shutting down the system with an alarm. Ideally the time value should allow 1 package to reach the exit side of the tunnel oven before creating the alarm.

# Advanced Screen



Advanced Screen

## Screen Footer

The screen’s footer (bottom of screen) will have the “Clear Alarms” button on the left side and the alarm banner to the right of the “Clear Alarms” button.

The alarm banner will display the most recent active, unacknowledged alarm which must be corrected and cleared before automatic operation may resume.

## Alarm History

The “Alarm History” banner is where all alarms which occurred on the system are stored for reference only. Use the “Select Up/Down” buttons to move through the alarm list one alarm at a time. Use the “Page Up/Down” buttons to move through the alarm list one page at a time.

## Application Shutdown

Press the “Application Shutdown” button to close the PanelView’s runtime application to access the configuration settings. **Only qualified personnel should press this button as the program may be deleted, or communications may be altered rendering the PanelView useless.**

## Control Power Off/On Button

The "Control Power Off/On" button is used to turn on the control power to the system after an E-Stop.

## Seal Bar Heat Off/On

The "Seal Bar Heat Is Off/On" button turns power off or on to the heating element for the seal bar.

## Tunnel Oven Heat Off/On

The "Tunnel Oven Heat Is Off/On" button turns power off or on to the heating elements for the tunnel oven.

## Tunnel Conveyor Speed

Press the "Tunnel Conveyor Speed" button to enter the speed of the tunnel conveyor as a percentage up to 100%.

## Film Rollers Speed

Press the "Film Rollers Speed" button to enter the speed of the film rollers as a percentage up to 100%.

## Return To Main Screen

Press the "Return To Main Screen" button to go back to the main screen. Use the "Log Out" button to lock out the Advanced Screen.

### Seal Bar 1st Dwell Time

Press the “Seal Bar 1<sup>st</sup> Dwell Time” button to enter the desired seal time for the Seal Bar’s first seal after being idle for at least 15 seconds.

### Seal Bar Dwell Time

Press the “Seal Bar Dwell Time” button to enter the desired seal time for the Seal Bar when the seal bar has performed the initial seal and has not been idle for 15 seconds or more.

### Seal Bar Start Delay

Press the “Seal Bar Start Delay” button to enter the desired time in seconds from when the hold down clamps the product to when the seal bar starts closing.

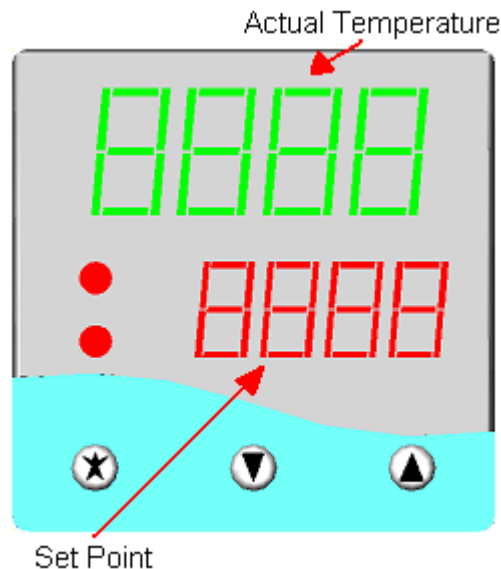
### Film Cooling Time

Press the “Film Cooling Time” button to enter the desired amount of time the film cooling jets will apply air after the seal bar has cut and sealed the film to cool the film and avoid film separation.

### Excessive Film Feed Time

Press the “Excessive Film Feed Time” button to enter the amount of time in seconds to limit the film rollers from running continuously before shutting down the system with an alarm. Ideally the time value should allow 1 package to reach the exit side of the tunnel oven before creating the alarm.

# Temperature Controller CAL9400 Set Up



Screen 11.2

## After Initial Power Up

1. Press and hold the “**STAR**” button and press the arrow up “▲” button to select “**tC J**”.
2. Release the “**STAR**” button and press the arrow up “▲” button to select “**unit**”.
3. Press and hold the “**STAR**” button and press the arrow up “▲” button to select “**o F**”.
4. Release the “**STAR**” button and press the arrow down “▼” button to select “**Level**”.
5. Press and hold the “**STAR**” button and press the arrow up “▲” button or arrow down “▼” button to select “**2**”.
6. Release the “**STAR**” button and press the arrow up “▲” button to select “**SP2.A**”.
7. Press and hold the “**STAR**” button and press the arrow up “▲” button to select “**bAnd**”.
8. Release the “**STAR**” button and press the arrow up “▲” button to select “**SP2.b**”.
9. Press and hold the “**STAR**” button and press the arrow up “▲” button to select “**hold**”.
10. Release the “**STAR**” button and press the arrow up “▲” button to select “**hi.SC**”.
11. Press and hold the “**STAR**” button and press the arrow down “▼” button to select “**450**”.
12. Release the “**STAR**” button and press the arrow up “▲” button to select “**Level**”.

13. Press and hold the “**STAR**” button and press the arrow up “▲” button or arrow down “▼” button to select “**1**”.
14. Release the “**STAR**” button and press the arrow up “▲” button to select “**CYC.t**”.
15. Press and hold the “**STAR**” button and press the arrow down “▼” button to select the cycle time:
  - a. Seal Bar = “**2.0**”
  - b. Tunnel Oven = “**20**”
16. Release the “**STAR**” button and press the arrow up “▲” button to select “**SEt.2**”.
17. Press and hold the “**STAR**” button and press the arrow up “▲” button to select “**50**”.
18. To exit the program mode, press and hold the arrow up “▲” and the arrow down “▼” buttons for at least 3 seconds.
19. Now the temperature controller will display “**Par Y**” which means no temperature was preset for the controller.
20. Press and hold the “**STAR**” button and press the arrow up “▲” button or arrow down “▼” button to set the desired temperature.

## Auto Tune at Set Point

1. Make sure power is on and the controller to be tuned is at the normal operating set point temperature.
2. Enter the programming mode by pressing and holding the arrow up “▲” button and arrow down “▼” button together for more than 3 seconds until “**tunE Off**” is shown.
3. Release both the arrow up “▲” button and the arrow down “▼” button.
4. Press and hold the “**STAR**” button and press the arrow up “▲” button and select “**tunE At.SP**”.
5. To exit the program mode and begin the tuning process, press and hold the arrow up “▲” and the arrow down “▼” buttons for at least 3 seconds.
6. Do not shut power off until the controller has completed the tuning process (tuning will no longer flash on the controller). If power is lost during the tuning process, the procedure must be restarted.

# AC Drives Set Up Parameters

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<b>AB POWERFLEX 4 SET-UP PARAMETERS</b>			
<b>FILM ROLLERS</b>		<b>TUNNEL CONVEYOR</b>	
<i>Parameter</i>	<i>Value</i>	<i>Parameter</i>	<i>Value</i>
P031	240	P031	240
P032	60	P032	60
P033	2.3	P033	2.3
P034	0	P034	0
P035	60	P035	60
P036	2	P036	2
P037	4	P037	4
P038	2	P038	2
P039	1.0	P039	3.0
P040	1.0	P040	3.0
A051	7	A051	7

# Alarm Messages

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## Emergency Stop button is pressed – please release

One of the Emergency Stop buttons is pressed. Releasing all of the E-Stop buttons will remove this message. If it doesn't, the particular E-Stop may have failed and needs to be replaced.

## A guard door is opened...

The particular guard door is opened. Close so control power may be restored. If all of the doors are closed and the message is still present, that particular safety switch is miss-aligned or has failed and must be replaced.

## (Axis Name) AC drive has faulted

The specific AC drive has faulted and requires troubleshooting by maintenance. Opening the electrical cabinet is the recommended way to get the specific fault for the particular axis by recording the two or three digit error code that is displayed on the front of the drive. Then see the AC Drive Troubleshooting Section of this manual for further help.

## The Tunnel's Left / Right Blower Motor has faulted

An overcurrent has occurred for the left / right blower motor. Check for overloaded motor or loose wiring for the motor's 3-phase circuit.

## Seal Bar temperature is out of range

This is normal when the Seal Bar is heating up or the temperature set point was adjusted at least 50 degrees Fahrenheit below current temperature. If actual temperature is above 500 degrees Fahrenheit, then there is a problem and maintenance must be contacted.

## Tunnel Oven temperature is out of range

This is normal when the Tunnel Oven is heating up or the temperature set point was adjusted at least 50 degrees Fahrenheit below current temperature. If actual temperature is above 500 degrees Fahrenheit, then there is a problem and maintenance must be contacted.

## Seal Bar Blocked Alarm

The Seal Bar Blocked alarm will occur when the Seal Bar is attempting to close and the photo eye looking across the seal frame detects an object. The Seal Bar will abort the seal and return to the open position.

## Seal Bar Jammed Alarm

The Seal Bar Jammed alarm will occur when the Seal Bar is attempting to close and the proximity switch above the seal frame detects an object. The Seal Bar will abort the seal and return to the open position.

## Seal Bar Obstruction Alarm

The Seal Bar Obstruction alarm will occur when the Seal Bar is attempting to close and the proximity switch for the close position is not triggered after three seconds and neither the Seal Bar Blocked nor Seal Bar Jammed alarms occur. The Seal Bar will abort the seal and return to the open position.

## Film Web Break

The Film Web Break alarm occurs when a successful seal is made and the film web break proximity switch on the upper dancer arm is still on. If the film has not separated, then counter weights on one or both of the film dancer arms may not be set properly, or the film pre-feed time set in the Film Settings screen may be too high.

## Excessive Film Feed Alarm

The Excessive Film Feed alarm occurs when one or both film roller clutches remains on for the time set in the Film Settings screen. This will occur when the film does not separate after a completed seal and the package which is transferring into the tunnel continues to pull the film from the seal frame.

# AC Drive Troubleshooting Section

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## PowerFlex 4 Error Code Chart

\*From Rockwell publication: Rockwell Automation Publication 22A-UM001F-EN-E – October 2005

### F2 Auxiliary Input

Auxiliary input interlock is open.

1. Check remote wiring.
2. Verify communications programming for intentional fault.

### F3 Power Loss

DC bus voltage remained below 85% of nominal.

1. Monitor the incoming AC line for low voltage or line power interruption.
2. Check input fuses.

### F4 UnderVoltage

DC bus voltage fell below the minimum value. Monitor the incoming AC line for low voltage or line power interruption.

### F5 OverVoltage

DC bus voltage exceeded maximum value. Monitor the AC line for high line voltage or transient conditions. Bus overvoltage can also be caused by motor regeneration. Extend the decel time or install dynamic brake option.

### F6 Motor Stalled

Drive is unable to accelerate motor. Increase [P039 - A067](#) [Accel Time x] or reduce load so drive output current does not exceed the current set by parameter [A089](#) [Current Limit 1].

### F7 Motor Overload

Internal electronic overload trip.

1. An excessive motor load exists. Reduce load so drive output current does not exceed the current set by parameter [P033](#) [Motor OL Current].
2. Verify [A084](#) [Boost Select] setting

### F8 Heatsink OvrTmp

Heatsink temperature exceeds a predefined value.

1. Check for blocked or dirty heat sink fins. Verify that ambient temperature has not exceeded 40° C (104 ° F) for IP 30/NEMA 1/UL Type 1 installations or 50°C (122°F) for IP20/Open type installations.
2. Check fan.

### F12 HW OverCurrent

The drive output current has exceeded the hardware current limit. Check programming. Check for excess load, improper [A084](#) [Boost Select] setting, DC brake volts set too high or other causes of excess current.

### F13 Ground Fault

A current path to earth ground has been detected at one or more of the drive output terminals. Check the motor and external wiring to the drive output terminals for a grounded condition.

### F33 Auto Rstrt Tries

Drive unsuccessfully attempted to reset a fault and resume running for the programmed number of [A092](#) [Auto Rstrt Tries]. Correct the cause of the fault and manually clear.

### F38 Phase U to Gnd

A phase to ground fault has been detected between the drive and motor in this phase.

1. Check the wiring between the drive and motor.
2. Check motor for grounded phase.
3. Replace drive if fault cannot be cleared.

### F39 Phase V to Gnd

### F40 Phase W to Gnd

### F41 Phase UV Short

Excessive current has been detected between these two output terminals.

1. Check the motor and drive output terminal wiring for a shorted condition.
2. Replace drive if fault cannot be cleared.

### F42 Phase UW Short

### F43 Phase VW Short

### F48 Params Defaulted

The drive was commanded to write default values to EEPROM.

1. Clear the fault or cycle power to the drive.
2. Program the drive parameters as needed.

### F63 SW OverCurrent

Programmed [A098](#) [SW Current Trip] has been exceeded. Check load requirements and [A098](#) [SW Current Trip] setting.

### F64 Drive Overload

Drive rating of 150% for 1 minute or 200% for 3 seconds has been exceeded. Reduce load or extend Accel Time.

### F70 Power Unit

Failure has been detected in the drive power section.

1. Cycle power.
2. Replace drive if fault cannot be cleared.

### F71 Net Loss The communication network has faulted.

1. Cycle power.
2. Check communications cabling.
3. Check network adapter setting.
4. Check external network status.

### F81 Comm Loss

RS485 (DSI) port stopped communicating.

1. If adapter was not intentionally disconnected, check wiring to the port. Replace wiring, port expander, adapters or complete drive as required.
2. Check connection.
3. An adapter was intentionally disconnected.
4. Turn off using [A105](#) [Comm Loss Action].

### F100 Parameter Checksum

The checksum read from the board does not match the checksum calculated. Set [P041](#) [Reset To Defaults] to option

- 1 "Reset Defaults".

### F122 I/O Board Fail

Failure has been detected in the drive control and I/O section.

1. Cycle power.
2. Replace drive if fault cannot be cleared.