

CalorMatic®

MULTI-PURPOSE HEAT PROCESSOR

INSTALLATION & OPERATING INSTRUCTION MANUAL

Manufactured in the U.S.A. by



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www.sweetmfg.com

THIS MANUAL IS THE PROPERTY OF:

MODEL: _____

SERIAL NUMBER: _____

DATE PURCHASED: _____

WARRANTY

All items manufactured by Sweet Manufacturing Company are warranted against defects in material and workmanship for one (1) year from the date of shipment (but not against damage caused by accident, abuse, or faulty installation). Sweet Manufacturing Company will repair or replace free of charge (F.O.B. point of supply) all such defective parts if returned to the factory, charges prepaid. No allowances will be made for repairs, alterations or changes unless specifically authorized by us. There are no other warranties expressed or implied other than title, freedom from liens, and against patent infringement. **Seller makes no warranty of merchantability or fitness for a particular purpose.**

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CHECK AND INSPECT YOUR ORDER

Each order or shipment is double-checked before leaving the factory. All parts, pieces and components are listed item by item on our packing list, which accompanies each order. The number of each item, package, container, skid, etc. is listed on the bill of lading. In signing the bill of lading, the carrier assumes full responsibility for the safe delivery of all goods to destination in the same order a carrier was tendered by the shipper. In the event of damage or shortage, have the transportation company note the same on the freight bill. You should then file claim against the carrier for such loss and/or damage.

You will find a packing list attached to one of the items in the shipment. Check each item against the list. Check by description, specification, quantity or count, etc. Should there be any discrepancies, notify us immediately. If an order or shipment includes more than one heat processor, the parts for each order will be keyed or marked on the packing list for easy identification.

IMPORTANT - In addition to checking items and count included in shipments, it is also important to inspect and check shafts, bearings, pulleys and sprockets having set screws. Movement, vibrations and handling in shipment may loosen set screws and bolts.

Small parts and items, such as bolts, washers, bushings, and keys are just as important to an installation as the larger parts. Make sure these are located and checked before disposing of any containers or packing. We cannot be responsible for the loss of items that are listed and included on our packing list.

Should there be some delay between the time an order is received and ensuing installation, store parts in a protected area so they may be easily located and identified. Retain packing lists for this reason, as well as for future parts reference.

GENERAL INSTALLATION

The installation guidelines mentioned, along with the drawings for the model you purchased, are intended to assist in planning your final installation procedures. Procedures will vary among installers. When unsure of the proper installation procedure, we recommend that you contact our office for assistance if you do not find a recommended procedure in this manual.

The best equipment, improperly installed, cannot be expected to provide the performance intended by the manufacturer. Therefore, a quality installation should be of prime concern to the customer and installing contractor. Sweet Manufacturing Company is NOT responsible for the installation of a heat processor. The suggestions and information contained herein are offered solely as a convenience. We assume no liability for poorly installed equipment, whether that liability is expressed or implied.

1. It is important that a firm and level foundation be provided on which to install a CalorMatic®. The footing should be ample to carry the load of the heat processor, and be free of water. The foundation can be at ground level or elevated on supports.
2. All electrical wiring should meet necessary code requirements.

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INTRODUCTION

The purpose of this manual is to assist owners and operators of heat processors in the installation, operation and maintenance of their equipment. You have purchased a quality designed product which has been manufactured with utmost care using fine materials and reflecting many years of engineering knowledge.

THE FOLLOWING INFORMATION IS INTENDED TO AID YOU IN THE INSTALLATION AND OPERATION OF YOUR NEW CALORMATIC®. TO ENSURE LONG LIFE AND TROUBLE-FREE OPERATION, WE RECOMMEND THAT YOU READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY AND PROVIDE REGULAR, PERIODIC MAINTENANCE.

IT IS THE INSTALLER'S RESPONSIBILITY TO BE AWARE OF AND TO COMPLY WITH ALL LOCAL CODE REQUIREMENTS, INCLUDING BUT NOT LIMITED TO GAS AND ELECTRICAL CODES.

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OPERATIONAL CONCEPT

The CalorMatic® heat processor utilizes a fluidized bed of hot air (up to 600 ° F) to roast, toast, condition, and/or remove moisture from many different products. The ‘processed’ air is collected by cyclones to provide for separation of particulates from the air stream. The product infeed and discharge are by rotary valves, providing environmental control.

The CalorMatic® offers several variable parameters to allow users to process materials to reach their optimum final condition. These variables include operating temperature, infeed rate, exposure time, and airflow rate. Adjustments allow maximum throughput and efficiency while obtaining the optimum physical properties desired.

A centrifugal fan supplies a high volume of air at minimal sound levels. The air is heated by a burner located just downstream of the fan, in an air plenum designed to prevent direct flame contact with the product. Heated air passes through the product at high velocities, fluidizing the product to provide thorough mixing for even processing.

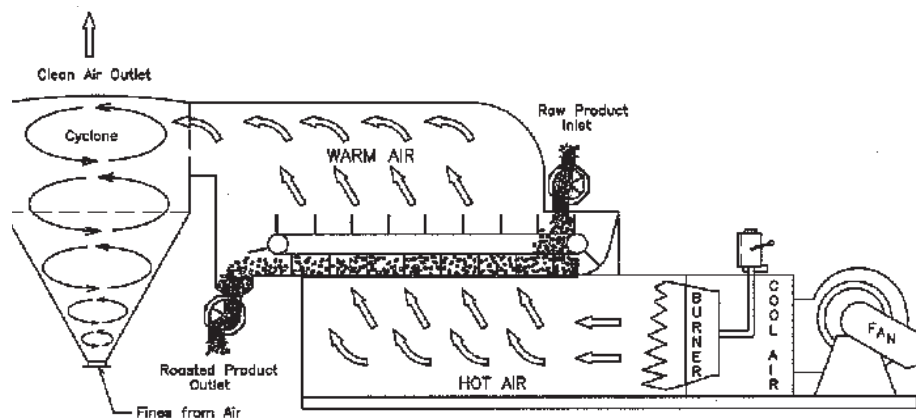
The desired air temperature is selected by the operator and controlled by a modulating gas valve. Sensors monitor the presence of air and flame, as well as the temperature of the heated air and processed product.

The product is fed into the processing chamber through a rotary valve, which has a variable speed drive. Adjusting the speed of the rotary valve allows the operator to determine the optimal depth of material as related to processing speed and amount of fluidization desired.

The product is moved through the processing chamber by a drag chain conveyor. The conveyor speed is adjustable, allowing the operator to control the time of product exposure. The product is discharged through another rotary valve.

Typical Operating Parameters

Product	Air Temperature	Product Temperature	Chimney Temperature	Gas Pressure	Product Depth
Soybeans	570 ° F	285 ° F	325 ° F	30" WC	4" - 5"
Egg Shells	600 ° F	300 ° F	350 ° F	30" WC	4" - 5"
Corn	425° - 470°	300 ° F	500 ° F	30" WC	4" - 5"



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SAFETY REQUIREMENTS

Operating and maintenance personnel should be thoroughly trained in safe operating procedures in order to recognize possible hazards, and to maintain a safe work area around the CalorMatic®.

The following safety guidelines should be followed:

1. Maintain a safety program for all operating personnel.
2. All operating personnel should be advised of the location of emergency controls and devices.
3. Good lighting, housekeeping and maintenance contribute to a safe work area.
4. Frequent inspections should be made of all equipment. All safety devices should be in proper working order.
5. Conduct a pre-start safety check of all equipment to determine the machinery and surrounding area are safe for operation and guards and warning devices are in place.
6. Equipment should not be operated unless all exposed moving parts are properly guarded. If the CalorMatic® cover or housing is to be opened, the motor and equipment must be locked out electrically in such a way that it cannot be restarted by anyone. Inspection doors should not be opened while the machine is operating.
7. * NEVER bypass or “jumper” any electrical safety circuits, except during troubleshooting while machine is shut down.

THESE ARE GUIDELINES ONLY AND COMPLIANCE WITH SAFETY STANDARDS, LOCAL, STATE AND FEDERAL, IS THE RESPONSIBILITY OF THE USER.

ELECTRICAL SAFETY EQUIPMENT

Emergency stop switches, safety shut-off switches, zero speed switches, overflow and overload devices, bin full and/or bin empty switches and other electrical controls may be required for a safe CalorMatic® installation. These auxiliary controls are to be furnished by the equipment user, as needed.

* Troubleshooting to be performed by qualified personnel only.

WARNING!



ROTATING FAN BLADE
COULD CAUSE
SEVERE INJURY
LOCKOUT POWER BEFORE
REMOVING COVER OR
INSPECTION DOOR

EMC 21 64

WARNING!



MOVING PART
CAN CAUSE
SEVERE INJURY
LOCK OUT ENERGY
SOURCE BEFORE
INSPECTION OR SERVICE

EMC 30 64

NOTICE

BEFORE ANY
MAINTENANCE OR
SERVICE IS
PERFORMED ON THIS
MACHINE IT MUST BE
LOCKED OUT IN
ACCORDANCE WITH
CURRENT OSHA
REQUIREMENTS

EMC 42 64

Your CalorMatic® is provided with safety decals to warn you of potential hazards. READ AND OBSERVE all of OSHA safety warnings. If decals become damaged or are removed, please contact Sweet Manufacturing Company for replacements at:

1-800-334-7254 (US & Canada)
or 937-325-1511
Please have your
serial number available.

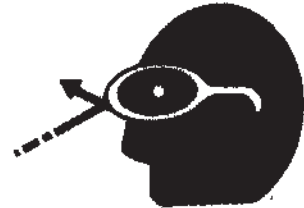
WARNING!



HOT SURFACES
CAN CAUSE
SEVERE BURNS
AVOID CONTACT LOCK
OUT ENERGY SOURCE
BEFORE SERVICING

EMC 34 43

WARNING



FLYING MATERIAL CAN
CAUSE SEVERE EYE
INJURY OR BLINDNESS
WEAR SAFETY
GLASSES AROUND
OPERATING EQUIPMENT

EMC 48 64

WARNING!



EXPOSED CONVEYORS
AND MOVING PARTS CAN
CAUSE SEVERE INJURY
LOCK OUT POWER BEFORE
REMOVING COVER OR
INSPECTION DOOR

EMC 57 64

2 DANGER



HAZARDOUS VOLTAGE
WILL CAUSE SEVERE
INJURY OR DEATH
TURN OFF POWER
AND LOCK OUT
BEFORE SERVICE

EMC 11 46

WARNING!



EXPOSED BELT CHAIN
& MOVING PARTS CAN
CAUSE SEVERE INJURY
LOCK OUT
POWER BEFORE
REMOVING GUARD

EMC 24 46

INITIAL SET-UP PROCEDURE

1. Before applying electrical power to machine, be sure transformer in control panel is wired to match incoming line voltage.
 2. Pilot line gauge should read 5 PSI nominal pressure. See gas train assembly drawing for pressure line reference.
 3. It is also recommended to remove electrical box cover on motor and recheck motor connections to ensure line voltage matches motor connections.
 4. Set low gas pressure switch to 10" W.C. (Hawk and Eagle)
 5. Set high gas pressure switch to 35" W.C. (Hawk and Eagle)
 6. With fan off, press Reset on "Plenum high limit" and verify that limit does not appear on display. If limit shows, see troubleshooting. With panel door open, turn ignition switch on and verify that indicator light is illuminated (flashes). If not, see troubleshooting.
 7. Check temperature readings on controllers for consistency.
 8. Press DISP button on High Limit - verify setting (600° F / 315° C MAX) - press reset.
 9. Thermostat Plenum Temperature
Press FUNC button on temperature controller so that the letter "R" does not show. Press DISP once to show "SP"; this setting should always be below ambient air temperature (e.g. 0-10 deg F.). Press DISP again to show "2SP". This will be the operating temperature of the plenum. Always set this set point to around 250° F before starting the machine. To set: press DISP until "2SP" shows, then press up or down arrow to reach desired temperature. The FUNC and DISP buttons are the only two needed to operate the machine.
 10. Pressure test all gas piping; use soapy water to test all connections for gas leaks.
WARNING: Never test for leaks with a match or open flame! Correct any leaks before proceeding.
 11. Make final check for any obstruction inside heat processor; material flow in, material flow out.
CAUTION: Never move product through the conveyor when the fan is off.
- *3 & 4 - Check that low and high gas gauge is set as indicated on gauge (refer to photo below).





Gas Train Assembly



Control Panel Assembly

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START UP PROCEDURE

1. Make sure the main electrical disconnect is set to the “ON” position and E-Stop is pulled out. Also check door switches and plug chute switch to make sure they will allow unit to run.
2. Open the valve that supplies gas to the gas train.
3. Press FUNC button on the thermostat until “R” does not show on display. (modulating model should close control valve). Low fire (0°-20° temperature setting).
4. Start the fan.
5. Turn ignition switch to “ON”. Allow 15 seconds purge time. Once pilot is proven, green “RUN” light will come on and main valve will be opened automatically.
6. Press FUNC button to show “R” on display. With temperature programmed for run, modulating motor will start to open. You may now begin to increase operating temperature by pressing DISP button until “2SP” on display. Then hold in “UP” arrow to increase temperatures. Set the thermostat to the desired temperature.
7. Start the drag conveyor and adjust chain speed.
8. Start the Rotary Feeder and adjust speed for desired product depth in drag conveyor. The heating chamber should normally never be set over 600° F. The recommended starting point temperature for most products is 400° F .

WARM UP PROCEDURES

Let the CalorMatic® operate with product, during this time the product should reach its normal set temperature for the burner temperature setting. Increase or decrease the drag conveyor chain speed to alter the initial product temperature.

SUGGESTED NORMAL OPERATING TEMPERATURES

The normal operating temperature of a CalorMatic® may vary according to the product and the process. This may need to be increased or decreased depending on the moisture content of the product. The most important temperature to monitor and control is the exiting product temperature. The plenum temperature, chain speed and amount of product fed by the rotary inlet must be adjusted to achieve desired product exit temperature. Take product temperature readings approximately every two (2) minutes until the desired product exit temperature and quality is achieved.

Once the product exit temperature is stable and at the desired level, a reading should be taken at least every hour. The product exit temperature readout instrument is located on the control panel for monitoring; however, actual product temperature should be measured after it has exited the machine.

After machine is operating, observe and record the burner plenum operating pressure. The magnehelic gauge displays a reading in inches of water column (WC). Record this reading with your machine at average operating temperature and product depth.

A pressure reading of the exhaust (chimney) compartment should also be recorded. This reading can be taken at the exhaust temperature probe port.

A good pressure relationship would place burner plenum pressure at plus 6" differential of that recorded in exhaust chimney.

EXAMPLE: Burner Plenum 7" WC

Chimney 1" WC

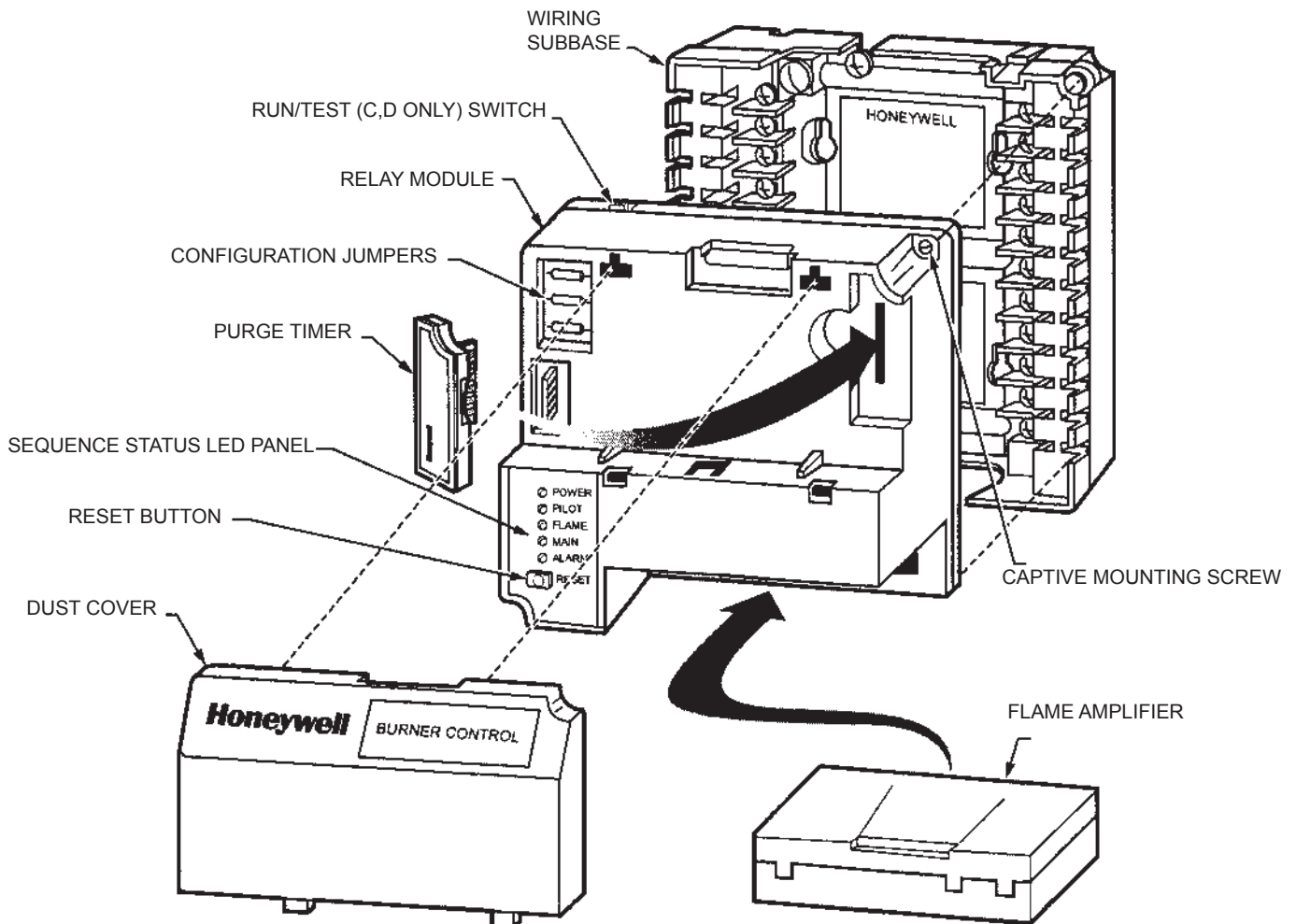
= 6" WC differential

SHUTDOWN

1. Press SP Select button on Plenum Therm controller to remove "R" from DISPLAY, until "L" is shown. The temperature should drop to No. 1 set point.
2. Stop inlet feeder to control - shut down.
3. When final product has exited machine, turn ignition "OFF".
4. Stop chain conveyor - chain drive "stop".
5. Allow fan to run until machine cools down and all temperature indicators read approximately 100° F / 38° C.
CAUTION: Never move product through conveyor when fan is off.
6. Stop fan.
7. Turn off gas supply.
8. Turn off electricity at panel box.
9. Inspect burner plenum and air bed for debris at the end of each day.

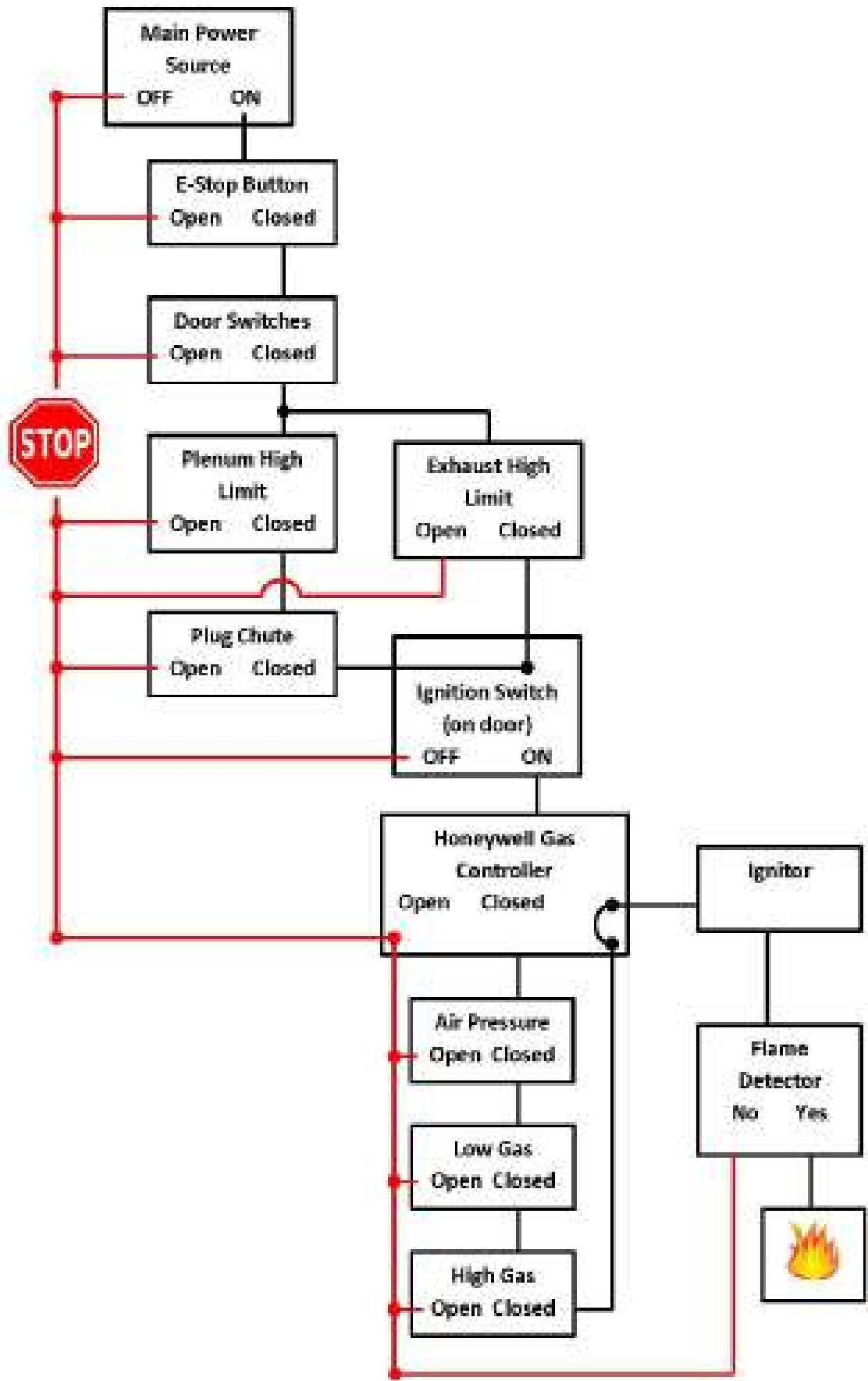
BURNER SYSTEM SEQUENCE OF OPERATION

1. Both High Limit- Exhaust and High Limit- Plenum contacts must be closed (displays should not show "limit").
2. Hi limit controller should be displayed as SP Low at low temperature of 0°-20° to place unit in low fire position.
3. Start fan.
4. Turn ignition switch to "ON". This provides power to the flame relay.
5. Flame relay "looks" for proof of airflow and correct gas pressure. Then it energizes the purge timer.
6. Purge timer waits 15 seconds, then opens the pilot valve and energizes the ignition transformer to light pilot.
7. Flame relay detects presence of flame and energizes main fuel valve and Run Light. The main valve will then be opened automatically.



MODEL RM 7895A-1014

SEQUENCE OF OPERATION



IMPORTANT INFORMATION ABOUT FLAME SENSING SYSTEMS

The 7800 series burner control relay module can accept different flame sensing systems. The CalorMatic® Heat Processors now in service are presently using one of the following systems:

1. Flame Rod

This is a rectification type flame system. It senses changes in electric current in the flame rod due to heat from the flame. The relay must sense at least 1.25V DC or shutdown will occur. Typical readings for a system working properly is 2V DC to 3V DC. This system can result in burner shutdown in error:

- a. Excessively wet conditions (short)
- b. Flame rod touching mixing plates (short)
- c. Flame relay over 15' from burner such as control panel mounted remotely. (weak signal)
- d. Foreign material on flame rod - this is usually caused by dirty air coming into fan (results in weak signal).

The components for this system:

Rectification style amplifier
Color code: green
7 1/2" flame rod
Connection: High tension spark cable

2. Ultraviolet System

This type of system senses the ultraviolet light which is given off by the burning fuel. This system has shown some advantages over the flame rod system:

- a. less sensitivity to wet conditions (won't short out)
- b. not affected by dust in burner area (sensor is mounted outside of burner)
- c. works well even for distances over 20 feet, signal typically 4V DC plus.

This system costs slightly more. Cleaning of sensor lens and mounting tube are required occasionally.

The components for this system:

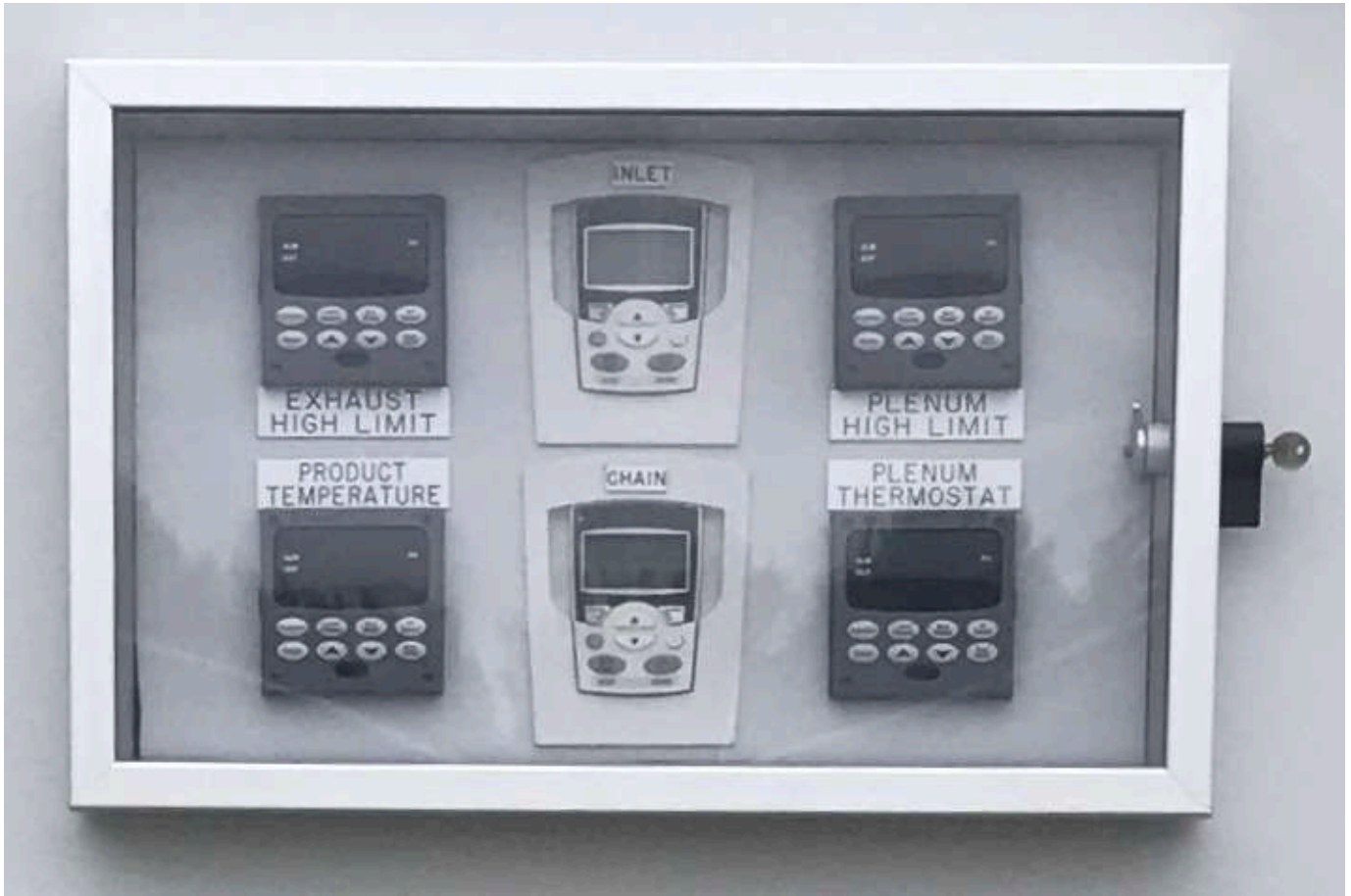
Ultraviolet signal amplifier, color code: purple
Ultraviolet flame sensor, unit has two leads:
Blue MUST go to F terminal on relay
White MUST go to EARTH ground

Standard stranded # 12 or 14' wire for connections (if leads need extended)
Length of 1/2" or 3/4" black pipe for mounting (length varies with application)

CONTROL PANEL



CONTROL PANEL



CONTROL PANEL (INSIDE)

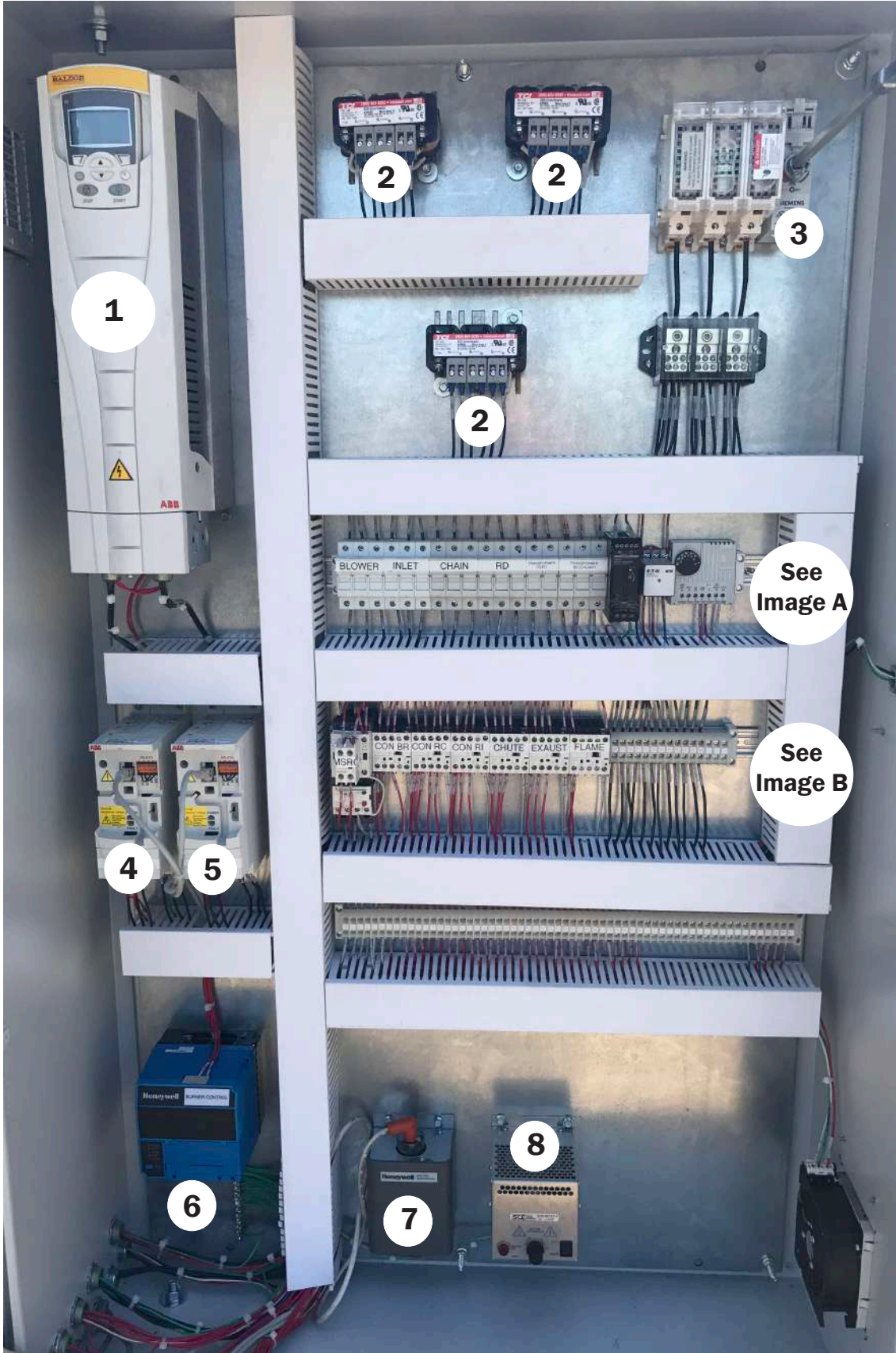
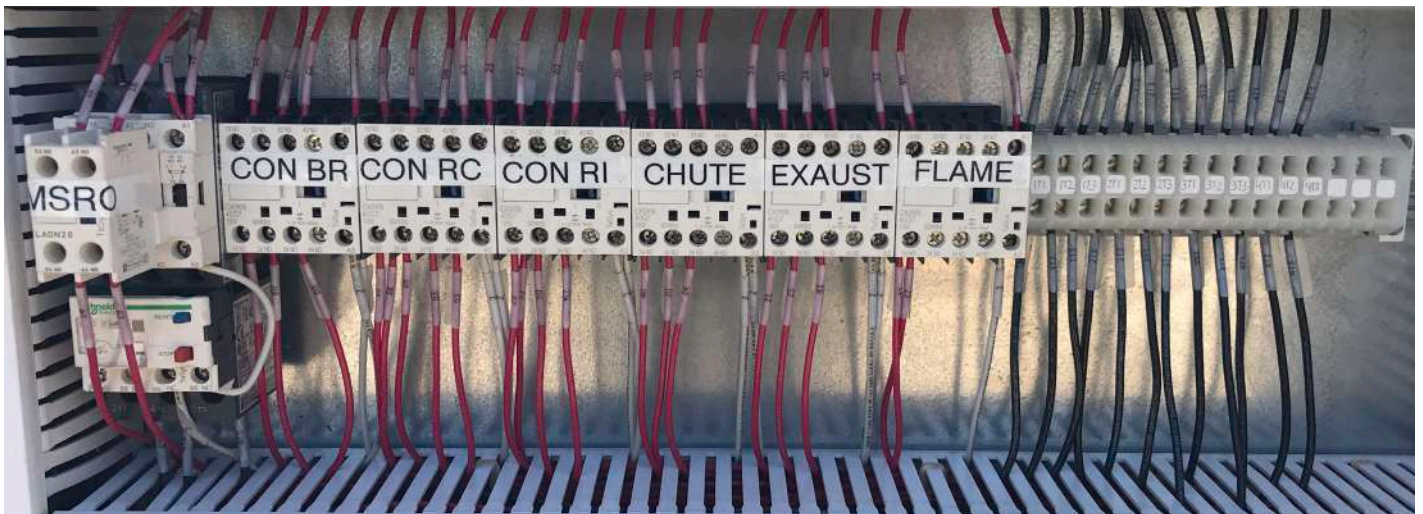


Image A



Image B



1 - Fan V.F.D.

5 - Chain V.F.D.

2 - Line Reactor

6 - Burner Controller

3 - Main Fuse Block

7 - Spark Ignitor

4 - Rotary Inlet V.F.D.

8 - Heater

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MAINTENANCE

After approximately ten (10) hours of operation, retighten all bearing set screws for the head and tail shafts, as well as the bushings on the sprockets and reducer. Check the chain slack in the conveyor and the tension in the drive. This should be repeated every fifty (50) hours of operation.

CAUTION: Make inspections when all operations are stopped and CalorMatic® is cool.

Here are some of the things which should be inspected and maintained regularly:

1. Check chain tension. Remove excess chain links if chain cannot be adjusted further.
2. Check fan V-belts for proper tension. Do not overtighten.
3. Check speed reducers regularly for sufficient oil and signs of leakage. Keep breather CLEAN.
4. Check bearings for sufficient lubrication and evidence of overheating.
5. Check all sheaves and drive attaching parts to make sure they are properly secured.
6. Check all hardware and tighten as required.

FAN MAINTENANCE

1. General Safety Notes:
 - A. Rotating parts including shaft and V-belt drives must be properly guarded to prevent personal injury.
 - B. Electrical wiring must be accomplished by a qualified electrician in accordance with all applicable codes.
 - C. Care should be taken:
 - Not to run fan above its safe speed.
 - Not to operate in dangerous environments.
 - Read all instructions carefully.
2. Fans shipped completely assembled have had V-belt drive aligned at the factory. Alignment should be rechecked before operation as a precaution due to handling during shipment. Start the fan. Check for proper rotation. Run fan at full speed. A slight bow should appear on slack side of belt. Disconnect power and adjust belt tension by adjusting motor on its sliding base. All belts must have some slack on one side. If belt squeals at start up, it may be too loose.

REDUCER AND GEAR MOTOR MAINTENANCE

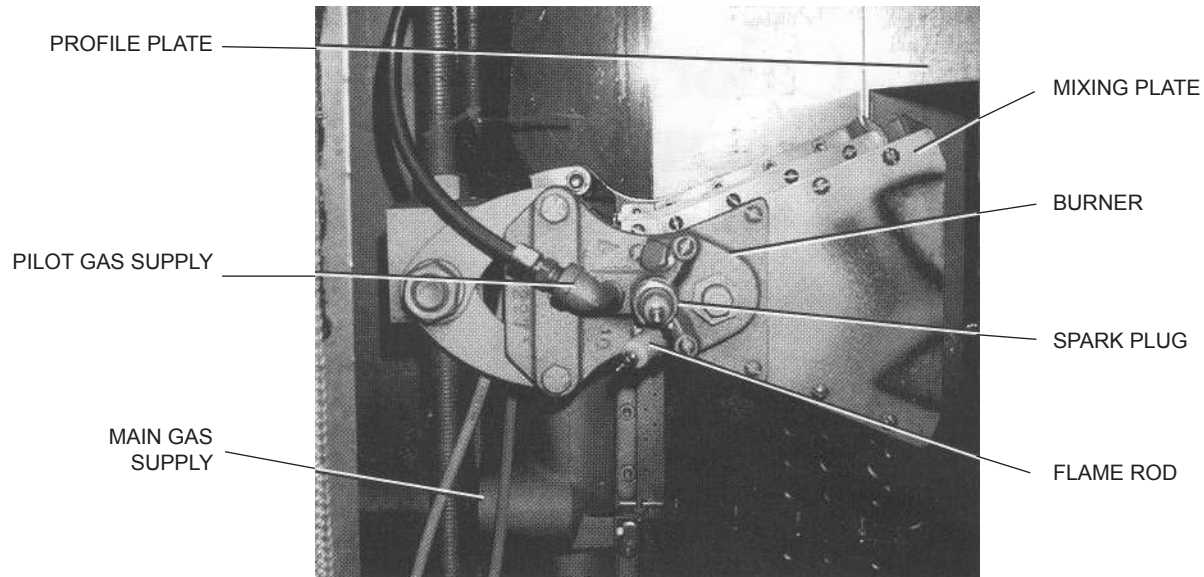
Refer to manuals sent with CalorMatic®.

TROUBLESHOOTING CHART

SYMPTOM	POSSIBLE CAUSE	PROCEDURE
1. Front panel has no display or partial display	No power to control panel / E-stop pressed	Procedure 1
	Blown fuse X1 or X4 / Door open	Replace
	Blown fuse transformer primaries	Replace
2. Fan will not start	Safety relay 2, controlled by Exhaust High Limit controller is OPEN. Rotary inlet and flame relay will also be de-energized.	Replace
	No power to control panel / E-stop pressed	Procedure 1
	Thermal overload tripped / Door open	Reset
	Blown fuse X1 or X4 or transformer primaries	Replace
3. a. High Limit Plenum b. High Limit Exhaust (flashes limited)	Temperature has exceeded high setting	Procedure 2
	Open thermocouple	Reset
	Temperature below range of instrument (0°F / -18°C)	Procedure 11
4. Flame relay indicated light does not flash when ignition switch is turned on. (fan can be off)	Blown fuse X1 or X4 or transformer primaries	Replace
	Flame relay overload tripped	Reset
	High limit controllers (one or both limited)	Reset
	Plug chute switched tripped	Reset
5. Display shows IN 1FAIL or OFL	Thermocouple open	Procedure 3
6. Pilot will not light	Fan not running	Start fan
	Flame relay overload tripped	Reset
	Safety circuit open - gas, air	Procedure 4
	No earth ground	Procedure 5
	Gas supply off	Turn on
	Pilot gas pressure too high or low	Procedure 6
	Flame relay not sensing flame rod or UV sensor	Procedure 7
	Loose, dirty or wet connections	Procedure 8
	Signal amplifier faulty or defective	Procedure 9
	One or both Hi Limit controllers is limited out	Check cause, then press Reset
No spark at ignitor	Procedure 10	
7. Display shows IN 1 RNG	Instrument out of its operating range limits	Procedure 11
8. Burner goes out intermittently	Flame rod or connections	Procedure 7, 8
	Fluctuating gas pressure	Procedure 12
9. AC drive will not turn in cold weather	Oil in gear case too thick	Procedure 13
10. Operating temperature is erratic & uncontrollable	Gas pressure too high	Procedure 14
11. Operating temperature is too low	Gas pressure is too low	Procedure 15
	Gas volume restricted	Procedure 16
12. Product temperature too low	Plenum temperature is too low	Procedure 17
	Chain speed too fast	Procedure 18
	Product too deep in conveyor	Procedure 19
13. Product temperature too high or burning	Plenum temperature too high	Procedure 20
	Chain speed too slow	Procedure 21
	Product depth too low in conveyor	Procedure 22

TROUBLESHOOTING PROCEDURES

1. Check main disconnect switch or circuit breaker to be sure that it is on. Check line fuses. Also check E-stop and that door is closed.
2. Determine cause of high temperature and correct. Press reset on high limit.
3. Check thermocouple connections on the back of the instrument (red <->, white <+>). If the connections are good, the thermocouple probably has an open short and must be replaced.
4. Check for continuity in air gas switch series terminals # 6 & 7. One lead must be removed from the circuit, the fan must be running and the gas must be on for this test. If the circuit is open, check each switch to determine which one is open.
5. A good earth ground is essential for proper operation of the CalorMatic® controls. Have a qualified electrician ground the machine and control panel according to national and local codes.
6. The CalorMatic® burner utilizes an adjustable pilot orifice instead of separate ones for each fuel type. This is easily adjusted with a hex key wrench. Start by closing the valve completely, then open it two (2) full turns. Try to light pilot in the normal manner. If unsuccessful, adjust orifice in or out until pilot lights. After pilot is established, turn valve in slowly until flame goes out, then open it back up 1/4 turn.
7. Remove flame rod from burner and inspect for dirt, moisture or cracks. Clean and dry the unit and reinstall firmly in burner casting. Also inspect for solid connection with wire and check connection in box.
8. Check all flame rod wire connections for dirt, moisture and corrosion. Also look for nicks or scratches in the wire. Pay close attention to the threaded contact knob on top of the flame rod. It can become loose and cause intermittent contact.
9. Remove signal amplifier by pulling unit straight out of flame relay. Inspect contacts for dirt or corrosion. If anything appears to have been hot or is burnt, contact dealer or factory (lightning likes this part). Reinstall amplifier.
10. Remove spark ignitor from burner and inspect for dirt, moisture or cracks. Also look for premature arcing along electrodes. All sparking should take place at the electrode tip. It may be necessary to spread the ground (bent) lead away from the center slightly. Make certain that the electrodes are at least parallel to each other. Reinstall clean, dry spark ignitor firmly in the burner casting. Be sure wire makes good contact with terminal.
11. Operating range limits for a type "J" low thermocouple are 0-900° F (-18-482° C). If the temperature goes out of this range (usually low), the instrument cannot recognize it. The thermocouple must be brought back into range before the message will go away. Unit may need cold start option installed. Wiring diagram at the back of manual.



12. Make certain gas supply lines, pressures, and volume are adequate for the burner size. Keep in mind any other gas fired appliances that might be sharing the same device. If the supply is marginal and another unit (i.e. drier or boiler) comes on or calls for gas, the sudden drop in pressure may cause the burner to go out.
13. Reduce gas pressure at main regulator.
14. Increase gas pressure at main regulator.
15. Gas supply piping undersized for volume required or regulator orifice too small. Have qualified gas person verify.
16. Increase plenum temperature (not to exceed 600° F / 315° C)
17. Decrease chain speed gradually (via the VFD on front of control panel using Honeywell marked Plenum Thermostat).
18. Decrease speed of rotary feeder (via the VFD on front of control panel using Honeywell marked Plenum Thermostat).
19. Decrease plenum temperature.
20. Increase chain speed gradually (via the VFD on front of control panel).
21. Increase speed of rotary feeder (via the VFD on front of control panel).
22. Consult dealer or factory.

CONTROL PARTS

P/N	DESCRIPTION	WEIGHT (LBS.)
0950967	Thermocouple assembly with 15' lead wire	4.00
0950942	Controller, Hi-Limit 230L	4.00
0950952	Controller, temperature, H/C 230B	4.00
0950974	Drive Board, DC 180 Volt	2.00
0951066	Pressure gauge, Magnehelic	2.00
0950901	Flame relay, RM7895A-1014	3.10
0950911	Subbase for flame relay, Q7800A-1005	1.10
0950921	Signal amplifier, R7847A-1033	0.10
0950931	Purge timer, 10 sec. ST7800A-1021	1.00
0001808	Thermocouple wire with PVC insulation, priced per ft.	0.02
0950903	Ultra Violet Flame Detector	
0950926	Keyboard Display Module	
0950968	Thermocouple Assembly - 30' Lead J	
0950953	Air pressure switch	3.70
0951052	High pressure switch	3.70
0950947	Low pressure switch	3.70

IGNITION PARTS

P/N	DESCRIPTION	WEIGHT (LBS.)
0951030	Spark igniter	0.12
0951035	Miniature flame rod	0.14
0950905	Ignition transformer	3.10
0001809	Ignition cable 35,000 V high temperature, priced per ft.	0.02
0951031	Spark plug terminal	0.01
0951032	Spark plug boot	0.01

MISCELLANEOUS PARTS

P/N	DESCRIPTION	WEIGHT (LBS.)
0001800	1-1/2" Fiberglass installation	
0770695	D88K Chain	28.5
0950190	Paddle - Hawk and Eagle I-IV	7.5
0951507	Paddle - Cardinal II and Blue Jay	3.2
0950292	Cord Sealant (1/4")	0.01/Ft.
0950044	3/8" Tempered Window	6.25
0452598	High Temperature Silicone (red)	0.5



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