

**OPERATOR'S MANUAL
FRYMASTER BIEL14 SERIES MANUAL LOV™
ELECTRIC FRYER**



This equipment chapter is to be installed in the Fryer Section of the *Equipment Manual*.

FOR YOUR SAFETY
Do Not Store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.



**MANUFACTURED
BY**



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NOTICE

IF, DURING THE WARRANTY PERIOD, THE CUSTOMER USES A PART FOR THIS MANITOWOC FOOD SERVICE EQUIPMENT OTHER THAN AN UNMODIFIED NEW OR RECYCLED PART PURCHASED DIRECTLY FROM FRYMASTER DEAN, OR ANY OF ITS FACTORY AUTHORIZED SERVICERS, AND/OR THE PART BEING USED IS MODIFIED FROM ITS ORIGINAL CONFIGURATION, THIS WARRANTY WILL BE VOID. FURTHER, FRYMASTER DEAN AND ITS AFFILIATES WILL NOT BE LIABLE FOR ANY CLAIMS, DAMAGES OR EXPENSES INCURRED BY THE CUSTOMER WHICH ARISE DIRECTLY OR INDIRECTLY, IN WHOLE OR IN PART, DUE TO THE INSTALLATION OF ANY MODIFIED PART AND/OR PART RECEIVED FROM AN UNAUTHORIZED SERVICER.

NOTICE

This appliance is intended for professional use only and is to be operated by qualified personnel only. A Frymaster Authorized Servicer (FAS) or other qualified professional should perform installation, maintenance, and repairs. Installation, maintenance, or repairs by unqualified personnel may void the manufacturer's warranty. See Chapter 1 of this manual for definitions of qualified personnel.

NOTICE

This equipment must be installed in accordance with the appropriate national and local codes of the country and/or region in which the appliance is installed. See NATIONAL CODE REQUIREMENTS in Chapter 2 of this manual for specifics.

NOTICE TO U.S. CUSTOMERS

This equipment is to be installed in compliance with the basic plumbing code of the Building Officials and Code Administrators International, Inc. (BOCA) and the Food Service Sanitation Manual of the U.S. Food and Drug Administration.

NOTICE

Drawings and photos used in this manual are intended to illustrate operational, cleaning and technical procedures and may not conform to onsite management operational procedures.

NOTICE TO OWNERS OF UNITS EQUIPPED WITH COMPUTERS

U.S.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) This device must accept any interference received, including interference that may cause undesired operation. While this device is a verified Class A device, it has been shown to meet the Class B limits.

CANADA

This digital apparatus does not exceed the Class A or B limits for radio noise emissions as set out by the ICES-003 standard of the Canadian Department of Communications.

Cet appareil numérique n'émet pas de bruits radioélectriques dépassant les limites de classe A et B prescrites dans la norme NMB-003 édictée par le Ministre des Communications du Canada.

 DANGER

Improper installation, adjustment, maintenance or service, and unauthorized alterations or modifications can cause property damage, injury, or death. Read the installation, operating, and service instructions thoroughly before installing or servicing this equipment.

 DANGER

The front ledge of this appliance is not a step! Do not stand on the appliance. Serious injury can result from slips or contact with the hot oil.

⚠ DANGER

Do not store or use gasoline or other flammable liquids or vapors in the vicinity of this or any other appliance.

⚠ DANGER

The crumb tray in fryers equipped with a filter system must be emptied into a fireproof container at the end of frying operations each day. Some food particles can spontaneously combust if left soaking in certain shortening material.

⚠ WARNING

Do not bang fry baskets or other utensils on the fryer's joiner strip. The strip is present to seal the joint between the fry vessels. Banging fry baskets on the strip to dislodge shortening will distort the strip, adversely affecting its fit. It is designed for a tight fit and should only be removed for cleaning.

⚠ DANGER

Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit. A restraint kit is provided with the fryer. If the restraint kit is missing contact your local KES.

⚠ DANGER

This fryer has a power cord (three-phase) for each frypot and a single five-wire cord for the entire system. Prior to movement, testing, maintenance and any repair on your Frymaster fryer; disconnect ALL electrical power cords from the electrical power supply.

⚠ DANGER

Keep all items out of drains. Closing actuators may cause damage or injury.

NOTICE

The instructions in this manual for using a bulk oil system for filling and discarding oil are for an RTI system. These instructions may not be applicable to other bulk oil systems.

⚠ WARNING

This appliance is not intended for use by children under the age of 16 or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision concerning use of the appliance by a person responsible for their safety. Do not allow children to play with this appliance.

⚠ WARNING

If the electrical power supply cord is damaged, it must be replaced by a Frymaster Factory Authorized Servicer or a similarly qualified person in order to avoid a hazard.

MANUAL LOV™ ELECTRIC WARRANTY STATEMENT

Frymaster, L.L.C. makes the following limited warranties to the original purchaser only for this equipment and replacement parts:

A. WARRANTY PROVISIONS - FRYERS

1. Frymaster L.L.C. warrants all components against defects in material and workmanship for a period of two years.
2. All parts, with the exception of the frypot, O-rings and fuses, are warranted for two years after installation date of fryer.
3. If any parts, except fuses and filter O-rings, become defective during the first two years after installation date, Frymaster will also pay straight-time labor costs up to two hours to replace the part, plus up to 100 miles/160 km of travel (50 miles/80 km each way).

B. WARRANTY PROVISIONS - FRYPOTS

The frypot has a lifetime parts and labor warranty. If a frypot develops a leak after installation, Frymaster will replace the frypot, allowing up to the maximum time per the Frymaster time allowance chart hours of straight-time labor. Components attached to the frypot, such as the high-limit, probe, gaskets, seals, and related fasteners, are also covered by the lifetime warranty if replacement is necessitated by the frypot replacement. Leaks due to abuse or from threaded fittings such as probes, sensors, high-limits, drain valves or return piping are not included.

C. PARTS RETURN

All defective in-warranty parts must be returned to a Frymaster Authorized Servicer within 60 days for credit. After 60 days, no credit will be allowed.

D. WARRANTY EXCLUSIONS

This warranty does not cover equipment that has been damaged due to misuse, abuse, alteration, or accident such as:

- improper or unauthorized repair (including any frypot which is welded in the field);
- failure to follow proper installation instructions and/or scheduled maintenance procedures as prescribed in your MRC cards. Proof of scheduled maintenance is required to maintain the warranty;
- improper maintenance;
- damage in shipment;
- abnormal use;
- removal, alteration, or obliteration of either the rating plate or the date code on the heating elements;
- operating the frypot without shortening or other liquid in the frypot;

- no fryer will be warranted under the ten-year program for which a proper start-up form has not been received.

This warranty also does not cover:

- transportation or travel over 100 miles/160 km (50 miles/80 km each way), or travel over two hours;
- overtime or holiday charges;
- consequential damages (the cost of repairing or replacing other property which is damaged), loss of time, profits, use or any other incidental damages of any kind.

There are no implied warranties of merchantability or fitness for any particular use or purpose.

This warranty is applicable at the time of this printing and is subject to change.

BIEL14 SERIES MANUAL LOV™ ELECTRIC FRYER

CHAPTER 1: INTRODUCTION

NOTE: The Frymaster BIEL14 fryer requires a start-up, demonstration and training before normal restaurant operations can begin.

1.1 General

Read the instructions in this manual thoroughly before attempting to operate this equipment. This manual covers all configurations of McDonald's BIEL14 Manual LOV™ models. The fryers in this model family have most parts in common, and when discussed as a group, will be referred to as "Manual LOV™ fryers".

Although similar in appearance to the RE14 McDonald's electric fryers, the BIEL14 Manual LOV™ fryers feature a low oil volume frypot, automatic oil top off and an automatic intermittent filtration unit. The Euro-Look design incorporates a rounded topcap and a large round drain, which ensures that fries and other debris, will be washed into the filter pan. The BIEL14 Manual LOV™ fryers are controlled with an M3000 Manual LOV controller. Fryers in this series come in full- or split-vat arrangements, and can be purchased in batteries of up to five fryers.

1.2 Safety Information

Before attempting to operate your unit, read the instructions in this manual thoroughly.

Throughout this manual, you will find notations enclosed in double-bordered boxes similar to the one below.

⚠ DANGER

Hot oil causes severe burns. Never attempt to move a fryer containing hot oil or to transfer hot oil from one container to another.

⚠ CAUTION boxes contain information about actions or conditions that *may cause or result in a malfunction of your system.*

⚠ WARNING boxes contain information about actions or conditions that *may cause or result in damage to your system,* and which may cause your system to malfunction.

⚠ DANGER boxes contain information about actions or conditions that *may cause or result in injury to personnel,* and which may cause damage to your system and/or cause your system to malfunction.

Fryers in this series are equipped with the following automatic safety features:

1. Two high-temperature detection features shut off power to the elements should the temperature controls fail.
2. A safety switch built into the drain valve prevents the elements from heating with the drain valve even partially open.

1.3 Controller Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. While this device is a verified Class A device, it has been shown to meet the Class B limits. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

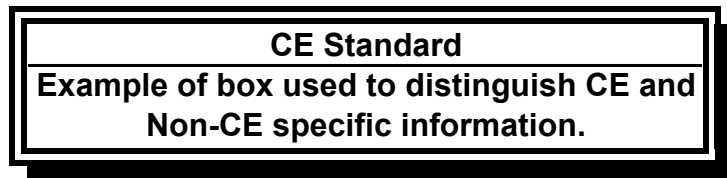
The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If necessary, the user should consult the dealer or an experienced radio and television technician for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

1.4 European Community (CE) Specific Information

The European Community (CE) has established certain specific standards regarding equipment of this type. Whenever a difference exists between CE and non-CE standards, the information or instructions concerned are identified by means of shadowed boxes similar to the one below.



1.5 Installation, Operating, and Service Personnel

Operating information for Frymaster equipment has been prepared for use by qualified and/or authorized personnel only, as defined in Section 1.6. **All installation and service on Frymaster equipment must be performed by qualified, certified, licensed, and/or authorized installation or service personnel, as defined in Section 1.6.**

1.6 Definitions

QUALIFIED AND/OR AUTHORIZED OPERATING PERSONNEL

Qualified/authorized operating personnel are those who have carefully read the information in this manual and have familiarized themselves with the equipment functions, or who have had previous experience with the operation of the equipment covered in this manual.

QUALIFIED INSTALLATION PERSONNEL

Qualified installation personnel are individuals, firms, corporations, and/or companies which, either in person or through a representative, are engaged in and are responsible for the installation of electrical appliances. Qualified personnel must be experienced in such work, be familiar with all electrical precautions involved, and have complied with all requirements of applicable national and local codes.

QUALIFIED SERVICE PERSONNEL

Qualified service personnel are those who are familiar with Frymaster equipment and who have been authorized by Frymaster, L.L.C. to perform service on the equipment. All authorized service personnel are required to be equipped with a complete set of service and parts manuals, and to stock a minimum amount of parts for Frymaster equipment. A list of Frymaster Factory Authorized Servicers (FAS's) is located on the Frymaster website at www.frymaster.com. ***Failure to use qualified service personnel will void the Frymaster warranty on your equipment***

1.7 Shipping Damage Claim Procedure

What to do if your equipment arrives damaged:

Please note that this equipment was carefully inspected and packed by skilled personnel before leaving the factory. The freight company assumes full responsibility for safe delivery upon acceptance of the equipment.

1. **File Claim for Damages Immediately** - regardless of extent of damage.
2. **Inspect For and Record All Visible Loss or Damage**, and ensure that this information is noted on the freight bill or express receipt and is signed by the person making the delivery.
3. **Concealed Loss or Damage**- If damage is unnoticed until equipment is unpacked, notify the freight company or carrier **immediately** upon discovery and file a concealed damage claim. This must be submitted within 15 days of date of delivery. Be sure to retain container for inspection.

<p><i>Frymaster</i> DOES NOT ASSUME RESPONSIBILITY FOR DAMAGE OR LOSS INCURRED IN TRANSIT.</p>

1.8 Service Information

For non-routine maintenance or repairs, or for service information, contact your local Frymaster Authorized Servicer (FAS). In order to assist you quickly, the Frymaster Authorized Servicer (FAS) or Service Department representative requires certain information about your equipment. Most of this information is printed on a data plate affixed to the inside of the fryer door. Part numbers are found in the Service and Parts Manual. Parts orders may be placed directly with your local FAS or distributor. A list of Frymaster Factory Authorized Servicers (FAS's) is located on the Frymaster website at www.frymaster.com. If you do not have access to this list, contact the Frymaster Service Department at 1-800-551-8633 or 1-318-865-1711 or by email at service@frymaster.com.

The following information will be needed in order to assist you efficiently:

Model Number _____

Serial Number _____

Voltage _____

Nature of the Problem _____

RETAIN AND STORE THIS MANUAL IN A SAFE PLACE FOR FUTURE USE.

BIEL14 SERIES MANUAL LOV™ ELECTRIC FRYER

CHAPTER 2: INSTALLATION INSTRUCTIONS

2.1 General Installation Requirements

Proper installation is essential for the safe, efficient, trouble-free operation of this appliance.

Qualified, licensed, and/or authorized installation or service personnel, as defined in Section 1.6 of this manual, should perform all installation and service on Frymaster equipment.

Failure to use qualified, licensed, and/or authorized installation or service personnel (as defined in Section 1.6 of this manual) to install or otherwise service this equipment will void the Frymaster warranty and may result in damage to the equipment or injury to personnel.

Where conflicts exist between instructions and information in this manual and local or national codes or regulations, installation and operation shall comply with the codes or regulations in force in the country in which the equipment is installed.

Service may be obtained by contacting your local Frymaster Authorized Servicer.

NOTICE

All fryers shipped without factory supplied cords and plug assemblies must be hardwired using flexible conduit to the terminal block located on the rear of the fryer. These fryers should be wired to NEC specifications. Hardwired units must include installation of restraint devices.

DANGER

Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit. A restraint kit is provided with the fryer. If the restraint kit is missing contact your local Frymaster Authorized Servicer (FAS).

NOTICE

If this equipment is wired directly into the electrical power supply, a means for disconnection from the supply having a contact separation of at least 3-mm in all poles must be incorporated in the fixed wiring.

NOTICE

This equipment must be positioned so that the plug is accessible unless other means for disconnection from the power supply (e.g., a circuit breaker) is provided.

NOTICE

If this appliance is permanently connected to fixed wiring, it must be connected by means of copper wires having a temperature rating of not less than 167°F (75°C).

NOTICE

If the electrical power supply cord is damaged, it must be replaced by a Frymaster Factory Authorized Servicer technician or a similarly qualified person in order to avoid a hazard.

⚠ DANGER

This appliance must be connected to a power supply having the same voltage and phase as specified on the rating plate located on the inside of the appliance door.

⚠ DANGER

All wiring connections for this appliance must be made in accordance with the wiring diagram(s) furnished with the appliance. Refer to the wiring diagram(s) affixed to the inside of the appliance door when installing or servicing this equipment.

⚠ DANGER

Do not attach an apron drainboard to a single fryer. The fryer may become unstable, tip over, and cause injury. The appliance area must be kept free and clear of combustible material at all times.

⚠ DANGER

Building codes prohibit a fryer with its open tank of hot oil being installed beside an open flame of any type, including those of broilers and ranges.

In the event of a power failure, the fryer(s) will automatically shut down. If this occurs, turn the power switch OFF. Do not attempt to start the fryer(s) until power is restored.

2.1.1 Clearance and Ventilation

This appliance must be kept free and clear of combustible material, except that it may be installed on combustible floors.

A clearance of 6 inches (15cm) must be provided at both sides and back adjacent to combustible construction. A minimum of 24 inches (61cm) should be provided at the front of the equipment for servicing and proper operation.

⚠ WARNING

Do not block the area around the base or under the fryers.

2.1.2 Electrical Grounding Requirements

All electrically operated appliances must be grounded in accordance with all applicable national and local codes, and, where applicable, CE codes. All units (cord connected or permanently connected) should be connected to a grounded power supply system. A wiring diagram is located on the inside of the fryer door. Refer to the rating plate on the inside of the fryer door for proper voltages.

⚠ WARNING

To ensure the safe and efficient operation of the fryer and hood, the electrical plug for the control power, which powers the hood, must be fully engaged and locked in its pin and sleeve socket.

2.1.3 Australian Requirements

To be installed in accordance with AS 5601 / AG 601, local authority, gas, electricity, and any other relevant statutory regulations.

2.2 Power Requirements

The three phase supply plug for the elements is rated at 60 amps, 250 VAC and is NEMA configuration L15-60P. The control and filter plug is rated at 20 amps, 120/208 VAC and is NEMA configuration L21-20P. Each fryer should have its cord for the element supply on an individual circuit as well as the control cord.

VOLTAGE	PHASE	WIRE SERVICE	MIN. SIZE	AWG (mm ²)	AMPS PER LEG		
					L1	L2	L3
208	3	3	6	(16)	39	39	39
240	3	3	6	(16)	34	34	34
480	3	3	8	(10)	17	17	17
220/380	3	4	6	(16)	21	21	21
240/415	3	4	6	(16)	20	20	21
230/400	3	4	6	(16)	21	21	21

NOTICE

If this appliance is permanently connected to fixed wiring, it must be connected by means of copper wires having a temperature rating of not less than 167°F (75°C).

DANGER

This appliance must be connected to a power supply having the same voltage and phase as specified on the rating plate located on the inside of the appliance door.

DANGER

All wiring connections for this appliance must be made in accordance with the wiring diagram(s) furnished with the appliance. Refer to the wiring diagram(s) affixed to the inside of the appliance door when installing or servicing this equipment.

2.3 After Fryers Are Positioned At the Frying Station

DANGER

No structural material on the fryer should be altered or removed to accommodate placement of the fryer under a hood. Questions? Call the Frymaster Service Hotline at 1-800-551-8633.

1. Once the fryer has been positioned at the frying station, use a carpenter's level placed across the top of the frypot to verify that the unit is level, both side-to-side and front-to-back.

To level fryers, adjust the casters being careful to ensure the fryer(s) are at the proper height in the frying station.

When the fryer is leveled in its final position, install the restraints provided by the KES to limit its movement so that it does not depend on or transmit stress to the electrical conduit or connection. Install the restraints in accordance with the provided instructions. If the restraints are disconnected for service or other reasons, they must be reconnected before the fryer is used.

⚠ DANGER

Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit. A restraint kit is provided with the fryer. If the restraint kit is missing contact your local Frymaster Authorized Servicer (FAS).

⚠ DANGER

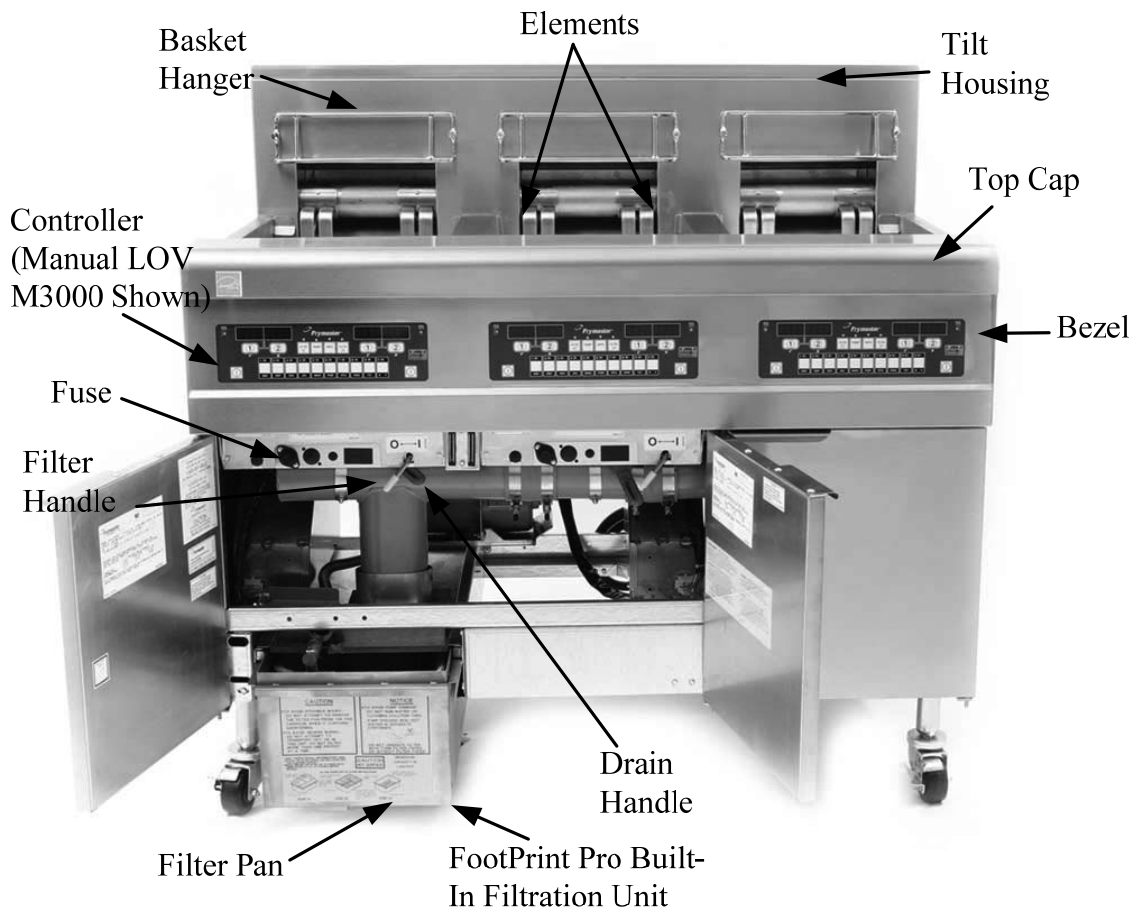
Hot oil can cause severe burns. Avoid contact. Under all circumstances, oil must be removed from the fryer before attempting to move it to avoid spills, falls, and severe burns. Fryers may tip and cause personal injury if not secured in a stationary position.

2. Clean and fill frypot(s) to the bottom oil level line with cooking oil. (See *Equipment Setup and Shutdown Procedures* in Chapter 3.)

BIEL14 SERIES MANUAL LOV™ ELECTRIC FRYER

CHAPTER 3: OPERATING INSTRUCTIONS

FINDING YOUR WAY AROUND THE BIEL30 MANUAL LOV™ SERIES ELECTRIC FRYER



TYPICAL CONFIGURATION (BIEL314 SHOWN)

NOTE: The appearance of your fryer may differ slightly from that shown depending upon configuration and date of manufacture.

3.1 Equipment Setup and Shutdown Procedures

Setup

⚠ DANGER

Never operate the appliance with an empty frypot. The frypot must be filled to the fill line with water or oil before energizing the elements. Failure to do so will result in irreparable damage to the elements and may cause a fire.

⚠ DANGER

Remove all drops of water from the frypot before filling with oil. Failure to do so will cause spattering of hot liquid when the oil is heated to cooking temperature.

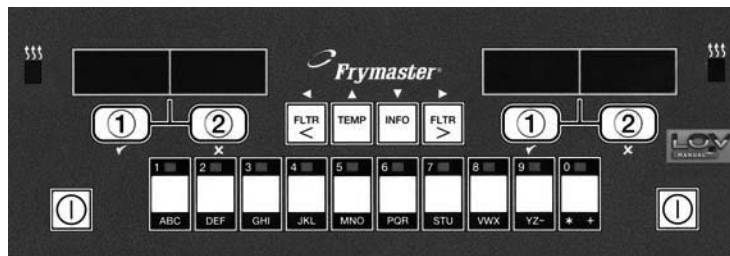
1. Fill the frypot with cooking oil to the bottom OIL LEVEL line located on the rear of the frypot. This will allow for oil expansion as heat is applied. Do not fill cold oil any higher than the bottom line; overflow may occur as heat expands the oil. For bulk oil systems see Section 4.11.4 on page 4-22 for instructions to fill the vat from bulk.
2. Ensure that the power cord(s) is/are plugged and locked (if applicable) into the appropriate receptacle(s). Verify that the face of the plug is flush with the outlet plate, with no portion of the prongs visible.
3. Ensure that the power is switched on. Some models are equipped with a master switch located behind the fryer door cabinet on the front panel of the component box, next to the fuse.
4. Ensure that the controller is switched ON. When the controller is switched on, the fryer will begin heating and will display *MLT-CYCL* alternating with *LOW TEMP* until the fryer temperature reaches 180°F (82°C). *LOW TEMP* is displayed until within 15° F of setpoint. Once the fryer reaches setpoint, the controller display changes to the product or dashed lines and the fryer is ready for use.
5. Ensure that the oil level is at the *top* OIL LEVEL line when the oil *is at its cooking temperature*.

Shutdown

1. Turn the fryer off.
2. Filter the oil and clean the fryers (See Chapters 4 and 5).
3. Place the frypot covers on the frypots.

3.2 Operation

This fryer is equipped with a Manual LOV™ M3000 controller (illustrated below). Fryers with Manual LOV™ M3000 controllers should refer to the Manual LOV™ M3000 Controller Manual 819-6964 for the controller programming and operating procedure.



MANUAL LOV™ M3000 CONTROLLER

Refer to Chapter 4 of this manual for operating instructions for the built-in filtration system.

BIEL14 SERIES MANUAL LOV™ ELECTRIC FRYER

CHAPTER 4: FILTRATION INSTRUCTIONS

⚠ WARNING

The on-site supervisor is responsible for ensuring that operators are made aware of the inherent hazards of operating a hot oil filtering system, particularly the aspects of oil filtration, draining and cleaning procedures.

4.1 Preparing the Built-In Filtration System for Use

The FootPrint Pro filtration system allows the oil in one frypot to be safely and efficiently filtered while the other frypots in a battery remain in operation.

Section 4.1.1 covers preparation of the Filter Paper and Filter Pad configurations for use.

4.1.1 Preparing the Built-In Filtration System for Use with Filter Paper or Filter Pad

The FootPrint Pro filtration system allows the oil in one frypot to be safely and efficiently filtered while the other frypots in a battery remain in operation. The FootPrint Pro filtration system uses a filter paper configuration which includes a crumb tray, large hold-down ring, and metal filter screen.

1. Pull the filter pan out from the cabinet and remove the crumb tray, hold-down ring, filter paper or pad and filter screen (see Figure1). Clean all components with a solution of detergent and hot water then dry thoroughly.

The pan cover must not be removed except for cleaning, interior access, or to allow a McDonald's Shortening Disposal Unit (MSDU) built before January 2004 to be positioned under the drain. Disposal instructions are on page 1-13 in the controller manual.

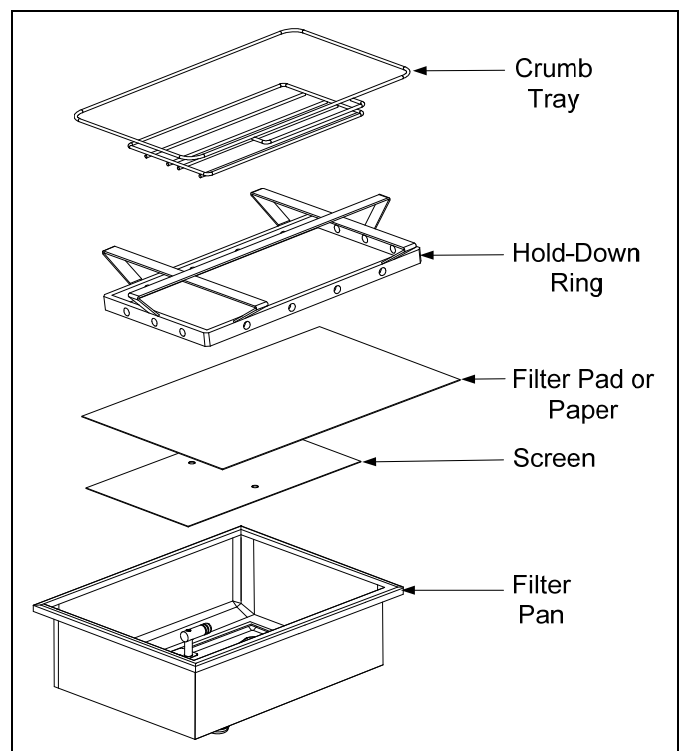


Figure 1

2. Inspect the filter pan connection fitting to ensure that both O-rings are in good condition (see Figure 2).
3. Then in reverse order, place the metal filter screen in the center of the bottom of the pan, then lay a sheet of filter paper or pad on top of the screen, overlapping on all sides (see Figure1). If using a filter pad, ensure the rough side of the pad is up and lay the pad over the screen, making sure that the pad is in between the embossed ridges of the filter pan.
4. Position the hold-down ring over the filter paper and lower the ring into the pan, allowing the paper to rest on the sides of the filter pan (see Figure 3).
5. When the hold-down ring is in position, if using filter paper, sprinkle one packet of filter powder evenly over the paper. (See Figure 4)

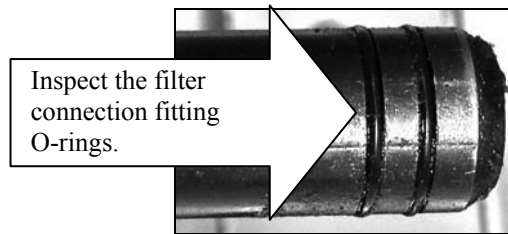


Figure 2



Figure 3

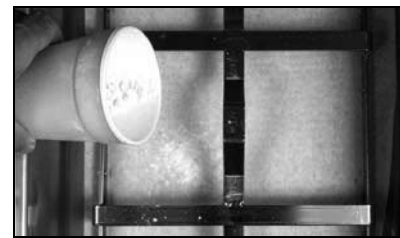


Figure 4

DO NOT use filter powder with the pad!

6. Replace the crumb tray in the filter pan, then push the filter pan back into the fryer, positioning it under the drain.

4.2 Filtration

An M 3000 controller prompts the user when to filter on the Manual LOV™ fryer if option is selected in setup. After a preset number of cook cycles the controller displays **FILTER NOW?** alternating with **YES NO**. Follow the instructions on page 2-15 in the controller manual. If NO is selected or a cook cycle is started, the controller will prompt again soon to filter the oil.

On demand filtration is used to manually start a filter. See page 2-14 of the controller manual for the filter menu.

The fryer **MUST** be at setpoint temperature for any filtration operation to start.

Note: Do NOT filter multiple vats simultaneously.

4.2.1 Operation of the Filter

⚠ DANGER

Draining and filtering of cooking oil must be accomplished with care to avoid the possibility of a serious burn caused by careless handling. The oil to be filtered is at or near 350°F (177°C). Ensure drain handles are in their proper position before operating any switches or valves. Wear all appropriate safety equipment when draining and filtering cooking oil.

⚠ DANGER

NEVER attempt to drain cooking oil from the fryer with the elements energized! Doing so will cause irreparable damage to the frypot and may cause a flash fire. Doing so will also void the Frymaster warranty.

1. Ensure that the filter is prepared. See Section. 4.1.
2. Make sure the oil is at operating temperature.
3. Drain the frypot into the filter pan by rotating the drain valve handle 90° (see Figure 5). If necessary, use the *Fryer's Friend* clean-out rod to clear the drain from **inside** the frypot.

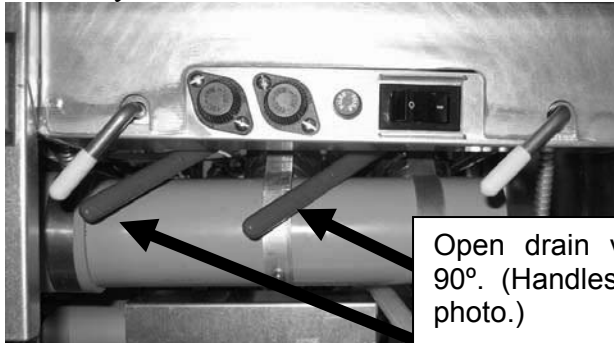


Figure 5

Open drain valve by rotating 90°. (Handles may differ from photo.)

⚠ DANGER

Do not drain more than one frypot at a time into the built-in filtration unit to avoid overflow and spillage of hot oil that may cause severe burns, slipping and falling.

⚠ DANGER

NEVER attempt to clear a clogged drain valve from the front of the valve! Hot oil will rush out creating the potential for severe burns.

⚠ DANGER

DO NOT hammer on the drain valve with the cleanout rod or other objects. Damage to the ball inside will result in leaks and will void the Frymaster warranty.

4. After the oil has drained from the frypot, rotate the filter handle towards the “I” to start the pump and begin the filtering process. There may be a slight delay before the pump activates (see Figure 6).

Rotate filter handle to the “I” to start the pump. (Position of handle may differ from photo.)

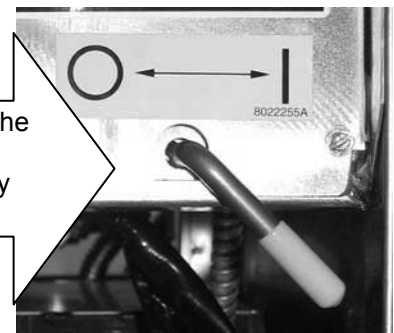


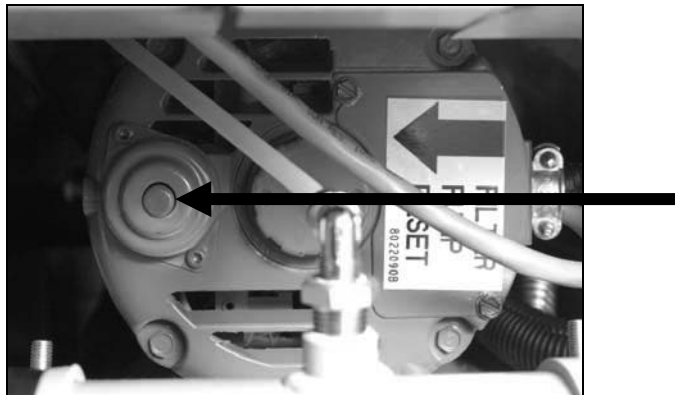
Figure 6

5. The filter pump draws the oil through the filter medium and circulates it back up to and through the frypot during a filter.
6. After the oil is filtered (about 5 minutes), close the drain valve and allow the fryer to refill. Let the filter pump run 15 to 30 seconds after the oil begins to bubble.
7. Ensure the drain valve is fully closed. (If the drain valve is not fully closed, the fryer will not heat.)

8. Turn the filter off by rotating the filter handle to original position.

⚠ WARNING

The filter pump is equipped with a manual reset switch in case the filter motor overheats or an electrical fault occurs. If this switch trips, turn off power to the filter system and allow the pump motor to cool 20 minutes before attempting to reset the switch (see photo below).



Filter Pump Reset Switch

⚠ WARNING

Use caution and wear appropriate safety equipment when resetting the filter pump reset switch. Resetting the switch must be accomplished with care to avoid the possibility of a serious burn caused by careless maneuvering around a drain tube and around a frypot.

⚠ DANGER

The crumb tray in fryers equipped with a filter system must be emptied into a fireproof container at the end of frying operations each day. Some food particles can spontaneously combust if left soaking in certain shortening material.

⚠ WARNING

Do not bang fry baskets or other utensils on the fryer's joiner strip. The strip is present to seal the joint between the fry vessels. Banging fry baskets on the strip to dislodge shortening will distort the strip, adversely affecting its fit. It is designed for a tight fit and should only be removed for cleaning.

4.4 Draining and Disposing of Waste Oil

When your oil has reached the end of its usable life, drain the oil into an appropriate **METAL** container for transport to the disposal container. Frymaster recommends the use of the McDonald's Shortening Disposal Unit (MSDU). **NOTE:** If using an MSDU built before January 2004, the filter pan cover must be removed to allow the unit to be positioned beneath the drain. To remove the lid, lift up on the front edge and pull it straight out of the cabinet. Refer to the documentation furnished

with your disposal unit for specific operating instructions. If a shortening disposal unit is not available, allow the oil to cool to 100°F (38°C), then drain the oil into a **METAL** stockpot or similar **METAL** container. When draining is finished, close the fryer drain valve securely.

 **DANGER**

Draining and filtering of cooking oil must be accomplished with care to avoid the possibility of a serious burn caused by careless handling. The oil to be filtered is at or near 350°F (177°C). Ensure all hoses are connected properly and drain handles are in their proper position before operating any switches or valves. Wear all appropriate safety equipment when draining and filtering oil.

 **DANGER**

Allow oil to cool to 100°F (38°C) before draining into an appropriate **METAL container for disposal.**

 **DANGER**

When draining oil into a disposal unit, do not fill above the maximum fill line located on the container.

1. Turn the computer power switch to the **OFF** position.
2. Position a **METAL** container with a sealable cover under the drainpipe. The **METAL** container must be able to withstand the heat of the oil and hold hot liquids.
3. Follow the instructions for disposing of oil on page 1-13 in the controller manual. Open the drain valve slowly to avoid splattering. If the drain valve becomes clogged with food particles, use the Fryer's Friend (poker-like tool) to clear the blockage.

 **DANGER**

NEVER attempt to clear a clogged drain valve from the front of the valve! Hot oil will rush out creating the potential for severe burns.

 **DANGER**

DO NOT hammer on the drain valve with the cleanout rod or other objects. Damage to the ball inside will result in leaks and will void the Frymaster warranty.

4. After draining the oil, clean all food particles and residual oil from the frypot. **BE CAREFUL**, this material may still cause severe burns if it comes in contact with bare skin.
5. Ensure the drain valve is closed securely and fill the frypot with clean, filtered or fresh cooking oil to the bottom **OIL-LEVEL** line.

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CHAPTER 5: PREVENTATIVE MAINTENANCE

5.1 Cleaning the Fryer

 **DANGER**

The crumb tray in fryers equipped with a filter system must be emptied into a fireproof container at the end of frying operations each day. Some food particles can spontaneously combust if left soaking in certain shortening material.

 **DANGER**

Never attempt to clean the fryer during the frying process or when the frypot is filled with hot oil. If water comes in contact with oil heated to frying temperature, it will cause spattering of the oil, which can result in severe burns to nearby personnel.

 **WARNING**

Use McDonald's All Purpose Concentrate to effectively clean and sanitize food-contact surfaces. Read the directions for use and precautionary statements before use. Particular attention must be paid to the concentration of cleaner and the length of time the cleaner remains on the food-contact surfaces.

5.2 DAILY CHECKS AND SERVICE

5.2.1 Inspect Fryer and Accessories for Damage- Daily

Look for loose or frayed wires and cords, leaks, foreign material in frypot or inside cabinet, and any other indications that the fryer and accessories are not ready and safe for operation.

5.2.2 Clean Inside and Outside of the Fryer Cabinet – Daily

Clean inside the fryer cabinet with a dry, clean cloth. Wipe all accessible metal surfaces and components to remove accumulated oil and dust.

Clean the outside of the fryer cabinet with a clean, damp cloth soaked with McDonald's All Purpose Concentrate. Wipe with a clean, damp cloth.

5.2.3 Clean the Built-in Filtration System Daily

 **WARNING**

Never operate the filter system without oil in the system.

 **WARNING**

Never use the filter pan to transport old oil to the disposal area.

 **WARNING**

Never drain water into the filter pan. Water will damage the filter pump.

There are no periodic preventive maintenance checks and services required for your FootPrint Pro Filtration System other than daily cleaning of the filter pan and associated components with a solution of hot water and McDonald's All Purpose Concentrate.

5.2.4 Clean Frypot, Heating Elements and Filter Pan Daily

Carbonized oil will accumulate on the filter pan and detachable parts and accessories such as baskets. See the Maintenance Filter procedure instructions on page 2-16 in the controller manual to clean the frypot.

Clean the filter pan and all detachable parts and accessories with a solution of hot water and McDonald's All Purpose Concentrate. Rinse and **thoroughly dry** each part. DO NOT use steel wool or abrasive pads to clean these parts. The scratches that result from such scrubbing make subsequent cleanings more difficult.

 **WARNING**

Use McDonald's All Purpose Concentrate. Read the directions for use and precautionary statements before use. Particular attention must be paid to the concentration of cleaner and the length of time the cleaner remains on the food-contact surfaces.

 **DANGER**

Never operate the appliance with an empty frypot. The frypot must be filled with water or oil before lighting the burners. Failure to do so will damage the frypot and may cause a fire.

If you notice that the system is pumping slowly or not at all, verify that the filter pan screen is on the bottom of the filter pan, with the filter paper or pad on top of the screen. Verify that the two O-ring(s) on the fitting at the right front of the filter pan are present and in good condition.

5.3 WEEKLY CHECKS AND SERVICE

5.3.1 Clean Behind Fryers – Weekly

Clean behind fryers in accordance with the procedure detailed in maintenance requirement card (MRC14A).

 **WARNING**

To ensure the safe and efficient operation of the fryer and hood, the electrical plug for the 120-volt line, which powers the hood, must be fully engaged and locked in its pin and sleeve socket.

5.3.2 Boiling Out the Frypot (Deep Clean)

After the fryer has been in use for a period of time, a hard film of caramelized oil will form on the inside of the frypot. This film should be periodically removed by following the boil-out procedure contained in maintenance requirement card. *Refer to the separate Manual LOV™ M3000 Controller Operating Instructions furnished with the fryer for specific details on setting up the computer for boil-out (Deep Clean) operation.*

 **DANGER**

Never leave the fryer unattended during the boil-out process. If the boil-out solution boils over, turn the fryer off immediately and let the solution cool for a few minutes before resuming the process.

⚠ WARNING

Do not drain boil-out solution into a McDonald's Shortening Disposal Unit (MSDU), a built-in filtration unit, or a portable filter unit. These units are not intended for this purpose, and will be damaged by the solution.

⚠ DANGER

Remove all drops of water from the frypot before filling with oil. Failure to do so will cause spattering of hot liquid when the oil is heated to cooking temperature.

5.3.3 Clean Detachable Parts and Accessories – Weekly



As with the frypot, a deposit of carbonized oil or shortening will accumulate on the detachable parts and accessories such as baskets, sediment trays, or fishplates.

Wipe the filter pan and all detachable parts and accessories with a clean dry cloth. Use a cloth dampened with a solution of McDonald's All Purpose Concentrate to remove accumulated carbonized oil. Rinse and thoroughly dry each part. DO NOT use steel wool or abrasive pads to clean these parts. The scratches that result from such scrubbing make subsequent cleanings more difficult.

5.4 MONTHLY CHECKS AND SERVICE

5.4.1 Check the Controller Set Point Accuracy

(This check applies only to units equipped with a Manual LOV™ M3000.)

1. Insert a good-grade thermometer or pyrometer probe into the oil, with the end touching the fryer temperature-sensing probe.
2. When the controller display shows a series of dashes “----” or a product name (indicating that the frypot contents are within the cooking range), press the  switch once to display the temperature and setpoint of the cooking oil as sensed by the temperature probe.
3. Press the  switch twice to display the set point. The setpoint is the temperature with a dot after it.
4. Note the temperature on the thermometer or pyrometer. All three readings should be within $\pm 5^{\circ}\text{F}$ (2°C) of each other. If not, contact a Factory Authorized Servicer for assistance.

5.5 Annual/Periodic System Inspection

This appliance should be inspected and adjusted periodically by qualified service personnel as part of a regular kitchen maintenance program.

Frymaster recommends that this appliance be inspected at least annually by a Factory Authorized Servicer as follows:

5.5.1 Fryer

- Inspect the cabinet inside and out, front and rear for excess oil.

- Verify that the heating element wires are in good condition and that leads have no visible fraying or insulation damage and that they are free of oil.
- Verify that heating elements are in good condition with no carbon/caramelized oil build-up. Inspect the elements for signs of extensive dry-firing.
- Verify that the tilt mechanism is working properly when lifting and lowering elements, and that the element wires are not binding and/or chafing.
- Verify the heating-element amp-draw is within the allowed range as indicated on the appliance's rating plate.
- Verify that the temperature and high-limit probes are properly connected, tightened and functioning properly, and that mounting hardware and probe guards are present and properly installed.
- Verify that component box and contactor box components (i.e. controller/controller, relays, interface boards, transformers, contactors, etc.) are in good condition and free from oil and other debris.
- Verify that component box and contactor box wiring connections are tight and that wiring is in good condition.
- Verify that all safety features (i.e. contactor shields, drain safety switches, reset switches, etc.) are present and functioning properly.
- Verify that the frypot is in good condition and free of leaks and that the frypot insulation is in serviceable condition.
- Verify that all wiring harnesses and connections are tight and in good condition.

5.5.2 Built-In Filtration System

- Inspect all oil-return and drain lines for leaks and verify that all connections are tight.
- Inspect the filter pan for leaks and cleanliness. If there is a large accumulation of crumbs in the crumb basket, advise the owner/operator that the crumb basket should be emptied into a fireproof container and cleaned daily.
- Verify that all O-rings and seals (including those on the quick-disconnect fittings) are present and in good condition. Replace O-rings and seals if worn or damaged.
- Check filtration system integrity as follows:
 - Verify that filter pan cover is present and properly installed.
 - With the filter pan empty, place each filter handle, one at a time, in the ON position. Verify that the pump activates and that bubbles appear in the oil of the associated frypot.
 - Close all oil return valves (i.e., place all filter handles in the OFF position). Verify proper functioning of each oil return valve by activating the filter pump using the lever on one of the oil return handle microswitches. No air bubbles should be visible in any frypot.

- Verify that the filter pan is properly prepared for filtering, then drain a frypot of oil heated to 350°F (177°C) into the filter pan and close the frypot drain valve. Place the filter handle in the ON position. Allow all oil to return to the frypot, indicated by bubbles in the oil. Return the filter handle to the OFF position. The frypot should have refilled in no more than 2 minutes and 30 seconds.

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CHAPTER 6: OPERATOR TROUBLESHOOTING

6.1 Introduction

This section provides an easy reference guide to some of the common problems that may occur during the operation of this equipment. The troubleshooting guides that follow are intended to help correct, or at least accurately diagnose, problems with this equipment. Although the chapter covers the most common problems reported, you may encounter problems that are not covered. In such instances, the Frymaster Technical Services staff will make every effort to help you identify and resolve the problem.

When troubleshooting a problem, always use a process of elimination starting with the simplest solution and working through to the most complex. Never overlook the obvious – anyone can forget to plug in a cord or fail to close a valve completely. Most importantly, always try to establish a clear idea of why a problem has occurred. Part of any corrective action involves taking steps to ensure that it doesn't happen again. If a controller malfunctions because of a poor connection, check all other connections, too. If a fuse continues to blow, find out why. Always keep in mind that failure of a small component may often be indicative of potential failure or incorrect functioning of a more important component or system.

Before calling a service agent or the Frymaster HOTLINE (1-800-24-FRYER):

- **Verify that electrical cords are plugged in and that circuit breakers are on.**
- **Verify that frypot drain valves are fully closed.**
- **Have your fryer's model and serial numbers ready to give to the technician assisting you.**

 DANGER

Hot oil will cause severe burns. Never attempt to move this appliance when filled with hot oil or to transfer hot oil from one container to another.

 DANGER

This equipment should be unplugged when servicing, except when electrical circuit tests are required. Use extreme care when performing such tests.

This appliance may have more than one electrical power supply connection point. Disconnect all power cords before servicing.

Inspection, testing, and repair of electrical components should be performed by an authorized servicer only.

6.2 Troubleshooting

6.2.1 Controller and Heating Problems

Problem	Probable Causes	Corrective Action
No Display on controller.	A. Controller not turned on. B. No power to the fryer. C. Failed controller or other component.	A. Press the ON/OFF switch to turn the controller on. B. Verify controller power cord is plugged in and that circuit breaker is not tripped. C. Call your FAS for assistance.
Controller displays IS VAT FULL? YES NO after a filtration.	A. Normal operation after a filtration. B. Oil may be in the filter pan.	A. Press ▲ (YES) if the vat is full, otherwise press ▼ (NO). B. Follow controller prompts to clear message. If problem persists, call your FAS for assistance.
Controller displays CHANGE FILTER PAD?	Daily filter pad change prompt has occurred.	Press ▲ (YES), follow prompts and change the filter pad or paper.
Fryer repeatedly cycles on and off when first started.	Fryer is in melt cycle.	This is normal operation. This will continue until the fryer temperature reaches 180°F (82°C).
Fryer does not heat.	A. Main power cord not plugged in. B. Drain is open. C. Controller has failed. D. One or more other components have failed.	A. Verify that all power cords are fully seated in the receptacles, locked into place and that a circuit breaker is not tripped B. Close drain. C. Call your FAS for assistance D. Call your FAS for assistance.
Fryer heats until high-limit trips with heat indicator ON.	Temperature probe or controller has failed.	Turn fryer off and call your FAS for assistance.
Fryer heats until high-limit trips without heat indicator ON.	Contact or controller has failed	Call your FAS for assistance.

6.2.2 Error Messages and Display Problems

Problem	Probable Causes	Corrective Action
Controller display is in wrong temperature scale (Fahrenheit or Celsius).	Incorrect display option programmed.	Toggle between F° to C° by pressing and holding ◀ and ▶ simultaneously until TECH MODE appears. Enter 1658 . The controller displays OFF . Turn the controller on to check temperature. If the desired scale is not displayed, repeat..
Controller displays HEATING FAILURE .	Failed controller, failed interface board, open high-limit thermostat.	Turn the fryer off and on again. If issue persists call your FAS for assistance.

Problem	Probable Causes	Corrective Action
Controller displays LOW TEMP.	Frypot temperature has dropped more than 30°F (17°C) lower than setpoint in idle mode or 45°F (25°C) in cook mode.	This display is normal for a short while if a large batch of frozen product is added to the frypot or if the fryer is not heating properly. If the issue persists call your FAS for assistance.
Controller displays HOT-HI-1.	Frypot temperature is more than 410°F (210°C) or, in CE countries, 395°F (202°C).	Shut the fryer down immediately and call your FAS for assistance.
Controller displays HI TEMP.	Frypot temperature is more than 40 °F (4°C).	Press the power button to turn off fryer and let cool before returning power to fryer. If issue continues call your FAS for assistance.
Controller displays HIGH LIMIT FAILURE DISCONNECT POWER.	A. Open drain valve B. Failed high limit	A. Close the drain valve. B. Shut the fryer down immediately and call your FAS for assistance.
Controller displays TEMP PROBE FAILURE.	Problem with the temperature measuring circuitry including the probe or damaged controller wiring harness or connector.	Shut the fryer down and call your FAS for assistance.
Heating indicator is on, but fryer is not heating.	Three phase power cord unplugged or circuit breaker is tripped.	Verify that both the main power cord and 120V is fully seated in its receptacle, locked into place and that circuit breaker is not tripped. If the problem continues call your FAS for assistance.
Controller displays RECOVERY FAULT/ YES and alarm sounds.	Recovery time exceeded maximum time limit.	Clear error and silence the alarm by pressing the ▲ (YES) button. Maximum recovery time for electric is 1:40. If this error continues call your FAS for assistance.
Controller displays SERVICE REQUIRED followed by an error message.	An error has occurred which requires a service technician.	Press the ▲ (YES) button if the issue is fixed or press the ▼ (NO) button to continue cooking and call your FAS for assistance. In some cases, cooking may not be available.

6.2.3 Filtration Problems

Problem	Probable Causes	Corrective Action
Fryer filter prompt is after each cook cycle.	Filter prompt setting incorrect.	Change the filter prompt setting.
Filter menu functions won't start.	Temperature too low or controller displays OFF.	Ensure fryer is at setpoint before starting; ensure the controller is ON.
Controller displays WAIT FOR FILTER.	Another function is still in process.	Wait until the previous function ends to start another filtration cycle.

Problem	Probable Causes	Corrective Action
Filter pump won't start or pump stops during filtering.	<p>A. Power cord is not plugged in or circuit breaker is tripped.</p> <p>B. Pump motor has overheated causing the thermal overload switch to trip.</p> <p>C. Blockage in filter pump.</p>	<p>A. Verify that the power cord is fully plugged in and the circuit breaker is not tripped.</p> <p>B. If the motor is too hot to touch for more than a few seconds, the thermal overload switch has probably tripped. Allow the motor to cool at least 45 minutes then press the Pump Reset Switch. (See page 5-4)</p> <p>C. Call your FAS for assistance.</p>
Filter Pump runs, but oil return is very slow.	Improperly installed or prepared filter pan components or cold oil.	<p>Remove the oil from the filter pan and replace the filter paper, ensuring that the filter screen is in place <i>under</i> the paper.</p> <p>Verify that O-rings are present and in good condition on filter pan connection fitting.</p>
Controller displays OIL IN DRAIN PAN / CONFIRM	Drain valve open or possibility that oil is in drain pan.	Press ▲ (CONFIRM) and follow directions for FILL VAT FROM DRAIN PAN.

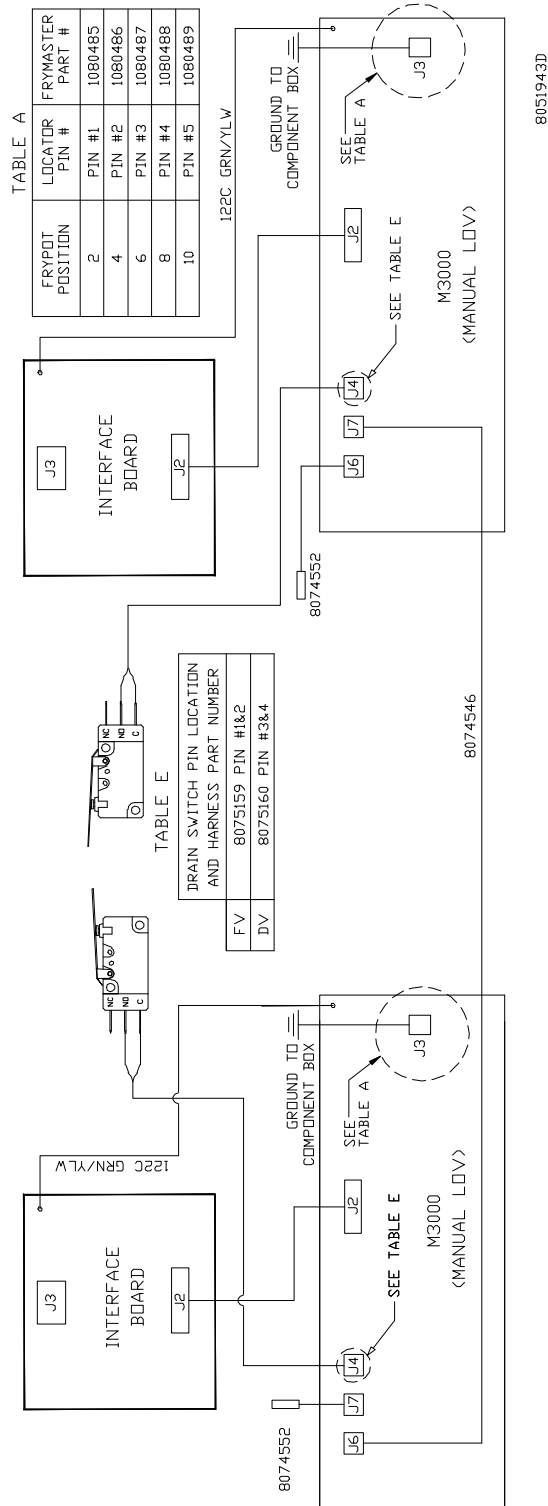
6.2.4 Error Log Codes (For M3000 Controller Only)

Code	ERROR MESSAGE	EXPLANATION
E03	ERROR TEMP PROBE FAILURE	TEMP Probe reading out of range
E04	HI 2 BAD	High limit reading is out of range.
E05	HOT HI 1	High limit temperature is past more than 410°F (210°C), or in CE countries, 395°F (202°C)
E06	HEATING FAILURE	A component has failed in the high limit circuit such as controller, interface board, contactor or open-high limit.
E20	INVALID CODE LOCATION	SD card removed during update
E21	CHANGE FILTER PAPER	25 hour timer has expired. Change filter paper and follow prompts.
E22	OIL IN PAN ERROR	Oil may be present in the filter pan.
E25	RECOVERY FAULT	Recovery time exceeded maximum time limit. Recovery time should not exceed 1:40 for electric.
E27	LOW TEMP ALARM	Oil temperature has dropped 30°F (17°C) lower than setpoint in idle mode or 45°F (25°C) in cook mode. (This message may appear if a product is dropped and the start cook button is not pressed immediately or if too large of cook loads are dropped.)

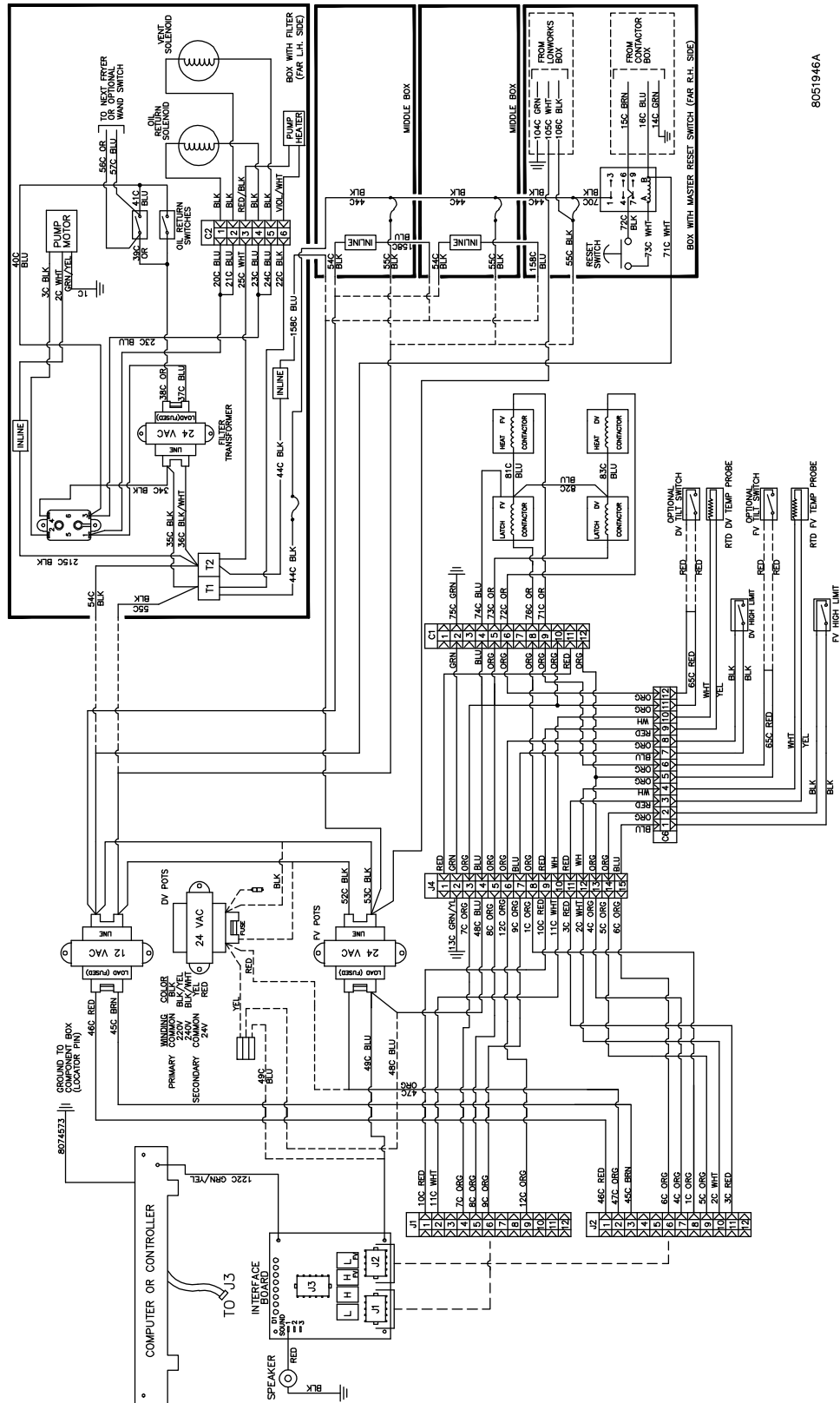
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CHAPTER 7: WIRING DIAGRAMS

7.1 BIEL14 Series Simplified Wiring with Manual LOV M3000 Controller

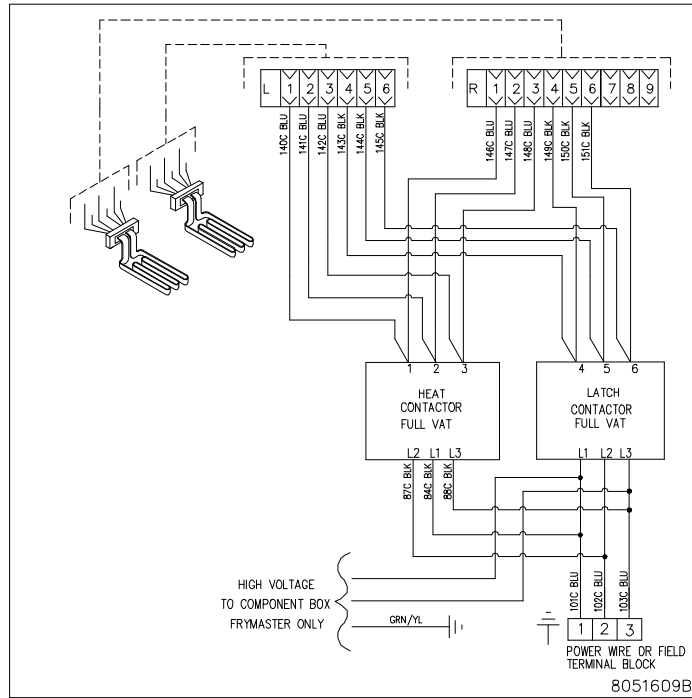


7.2 Component Wiring with Manual LOV M3000 controller

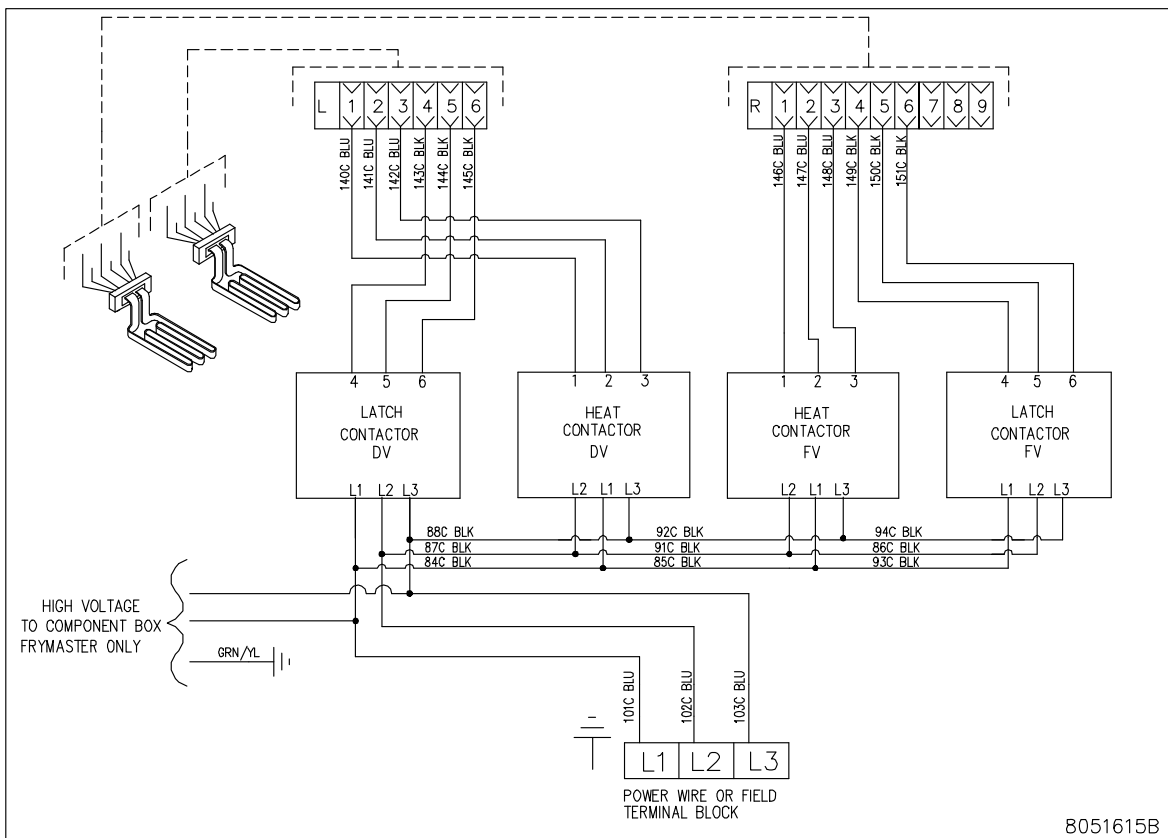


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7.3 Contactor Box – Delta Configuration

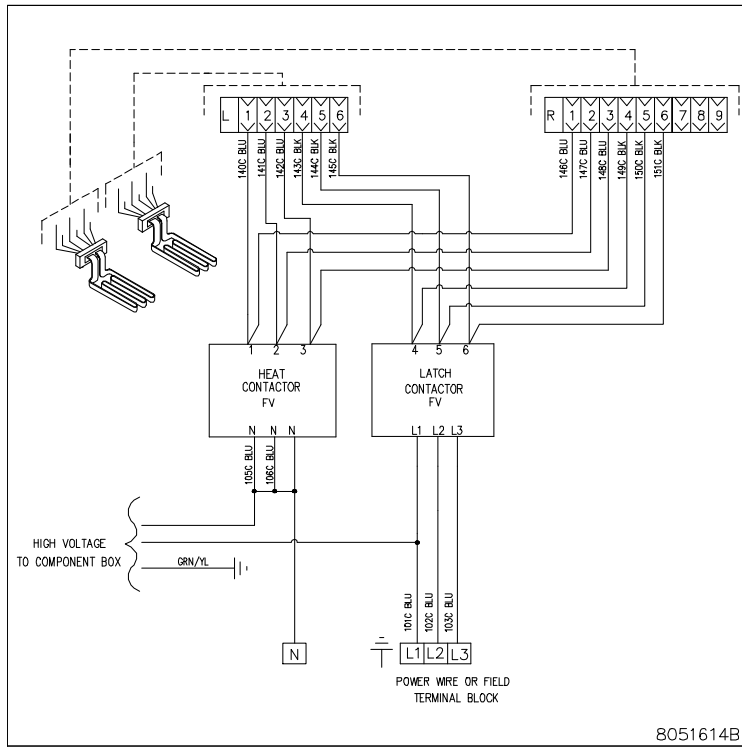


FULL VAT

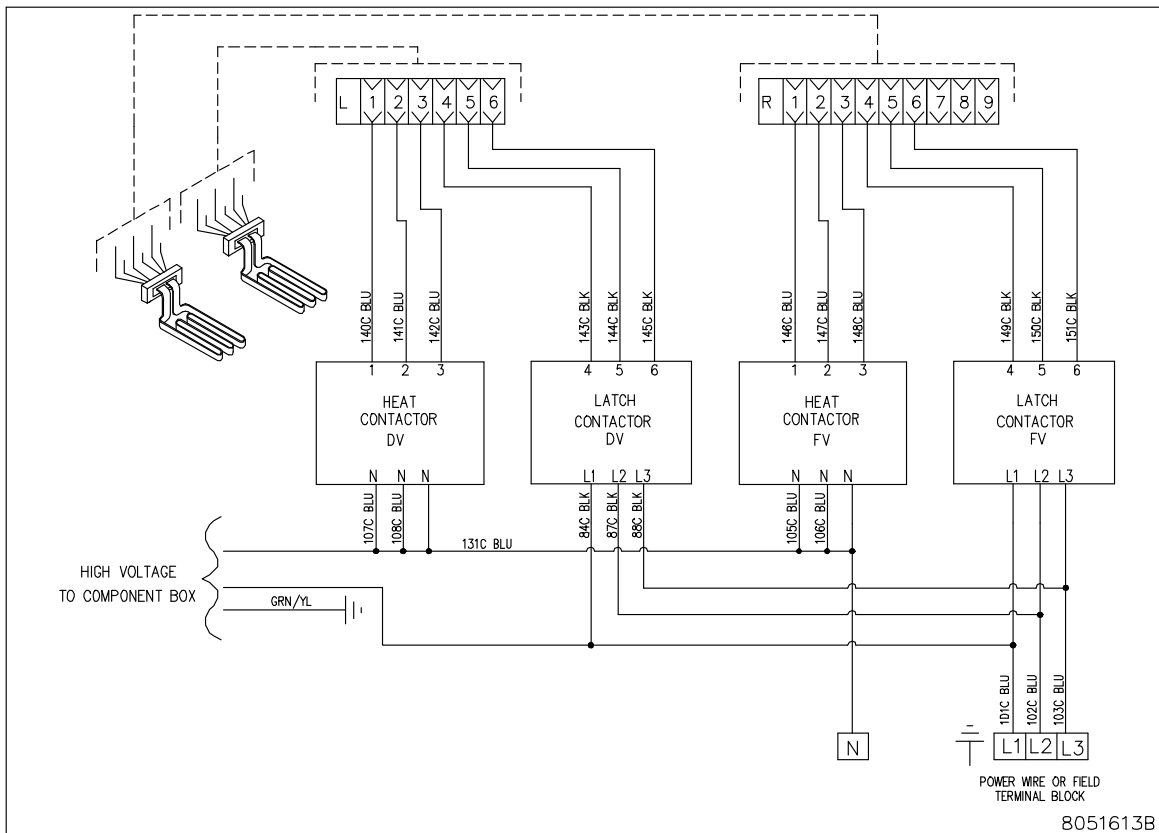


DUAL VAT

7.4 Contactor Box – WYE Configuration



FULL VAT



DUAL VAT



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