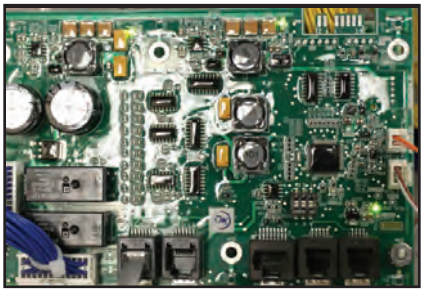
FRYMASTER

Technical Reference Manual



Student Name _____

Instructor Name _____

Date: ___/___/___

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2020 Edition

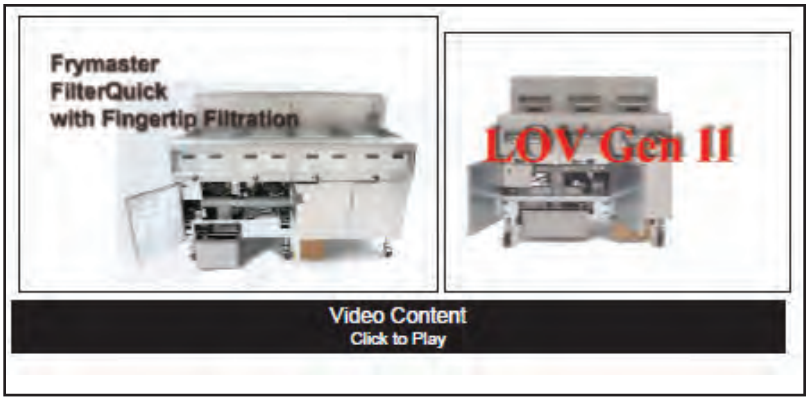
WELBILT

8 1 9 7 8 4 0

12/5/2019

Using the Interactive Features in this Manual

Interactive features are embedded throughout this manual. The function of the feature is based on the form of the book: electronic books have linked video and documents; paper copies have QR codes, linking to Web-posted material.

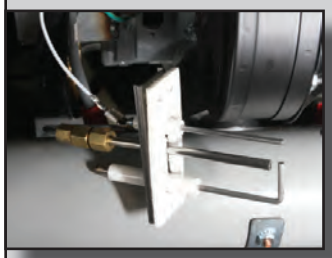


You will see images (like the non-linked examples above) labeled Video Content. Click on the desired image and the related video will play on your internet-connected device.

QR codes connect to Service and Parts manuals. The title next to the QR code is hyper linked. Click on the title while viewing the manual on a connected device and you will be taken to the desired technical manual.

The Technical Reference Manual and other service and parts manuals are published on the flash drive provided in the training class.

Scan the bar code at left to be taken to a service manual. Pictures labeled video content are linked to Web-based videos. Click on the image to see the video while viewing the manual on an internet-connected device.



Frymaster Tech Reference

Table of Contents

Chapter 1: Frymaster Support

Frymaster makes information available in a number of formats:

• Training classes held all over the country.

• Call Center service techs can be reached at 800-551-8633 or via email at frytechsupport@welbilt.com

Manuals

Number	Manual Type	Topic
819-5981	SP Manual	1721/18UE Service & Parts Manual
819-5680	IOSP Manual	17EC/EWBS/ESW
819-6887	IO Manual	1814E Series Electric Fryer
819-6911	SP Manual	1814E Series Electric Fryer
819-7317	IO Manual	1814E with FilterQuick
819-7319	Parts Manual	1814E with FilterQuick
819-7318	Service Manual	1814E with FilterQuick
819-7320	Wiring Diagram	1814E with FilterQuick Electric Wiring Diagrams
819-6883	IO Manual	1814G Series Gas Fryer
819-7371	IO Manual	1814G with FilterQuick
819-5758	IO Manual	24G (LJS) Series Flatbottom Gas Fryers
819-6000	IO Manual	24G Series Flatbottom Gas Fryers
819-6031	SP Manual	24G Series Flatbottom Gas Fryers (SCF/SCFC)
819-5727	IO Manual	24G Series Flatbottom Gas Fryers CE
819-6113	IO Manual	2836 Series Electric Fryers w/out Float Switch
819-6114	SP Manual	2836 Series Electric Fryers w/out Float Switch
819-6038	IO Manual	2836 Series Electric Fryers with Float Switch
819-6049	SP Manual	2836 Series Electric Fryers with Float Switch
819-6872	Operating Instructions	3000 Operational Manual 1.60 (Pre-March 2013)
819-6985	Operating Instructions	3000/3010 Operation Manual v3-7 (Mar 2013-Present)
819-5795	SP Manual	35 Series

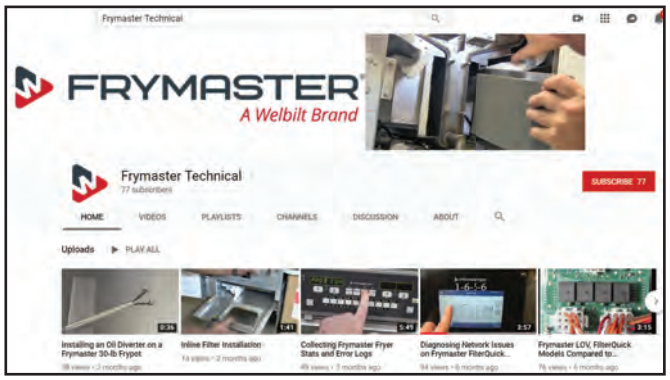
• Manuals, bulletins, forms and instructions are posted to the service literature page of Frymaster.com

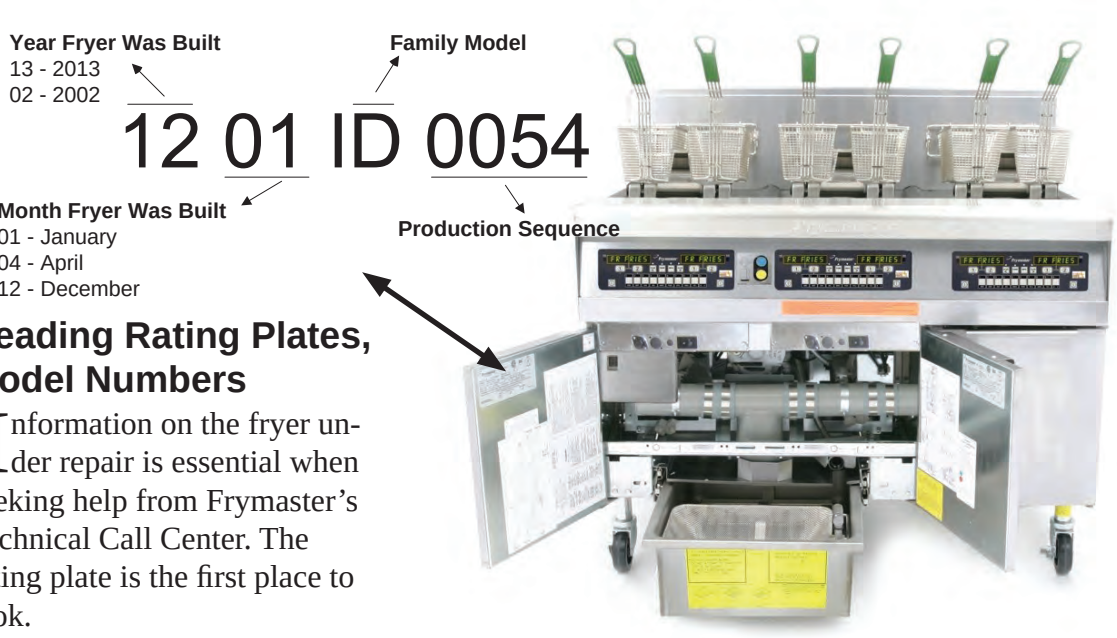
• Technical and operational videos are posted to Frymaster's YouTube channels.

• Interactive training modules are posted to Frymaster's Google Classroom.

• Throughout this manual, video links are identified and reachable by clicking when reading on an internet connected computer or tablet. Manuals are reachable by clicking titles or scanning QR codes.

Frymaster Call Center Techs: (Back row, from left) Bobby Boracz, Darryl Tucker, Josepher Brown, Larry Shephard. (Front row, from left) Terry Loux, Robert Hammond, Thomas Mitchell, Lyn Sealy, Dan Griffith, Brad Rowe, Dave Glassy



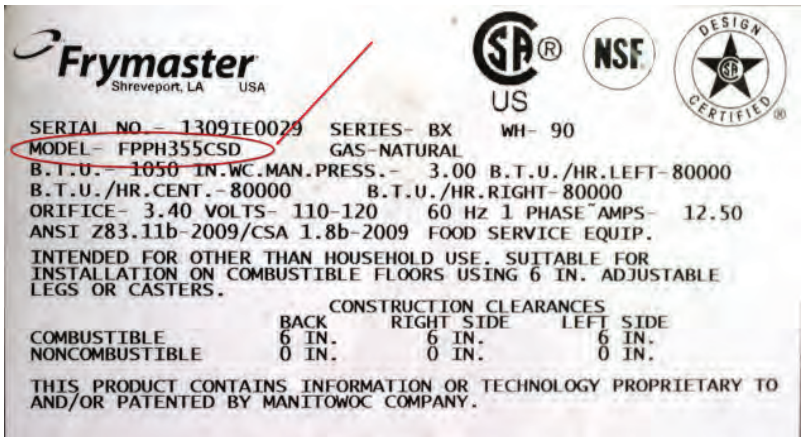


Reading Rating Plates, Model Numbers

Information on the fryer under repair is essential when seeking help from Frymaster's Technical Call Center. The rating plate is the first place to look.

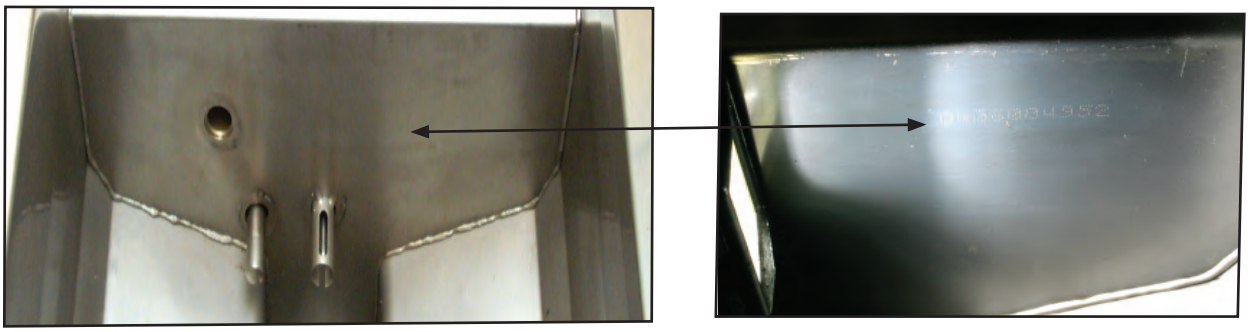
The serial number, annotated above, provides the fryer's model year and the month it was built, often vital information when dealing with individual components or software.

The rating plate, shown at right, also includes the model number, which reveals the fryer's controllers and other features. The serial number can also be found in the frypot (shown below). The model number is annotated in the Charts and Tables section.



Frypot Serial Number Placement

The serial number is etched inside the frypot. A flashlight held at a sharp angle is useful in finding and reading the number.



The frypot serial number is located inside the frypot on the front wall.

Chapter 2: High-Efficiency Gas

H55

LOV

OCF

FilterQuick

- Troubleshooting
- Ignition Components
- Legacy Controllers
- Frypots
- Burners

H55

McD LOV Service

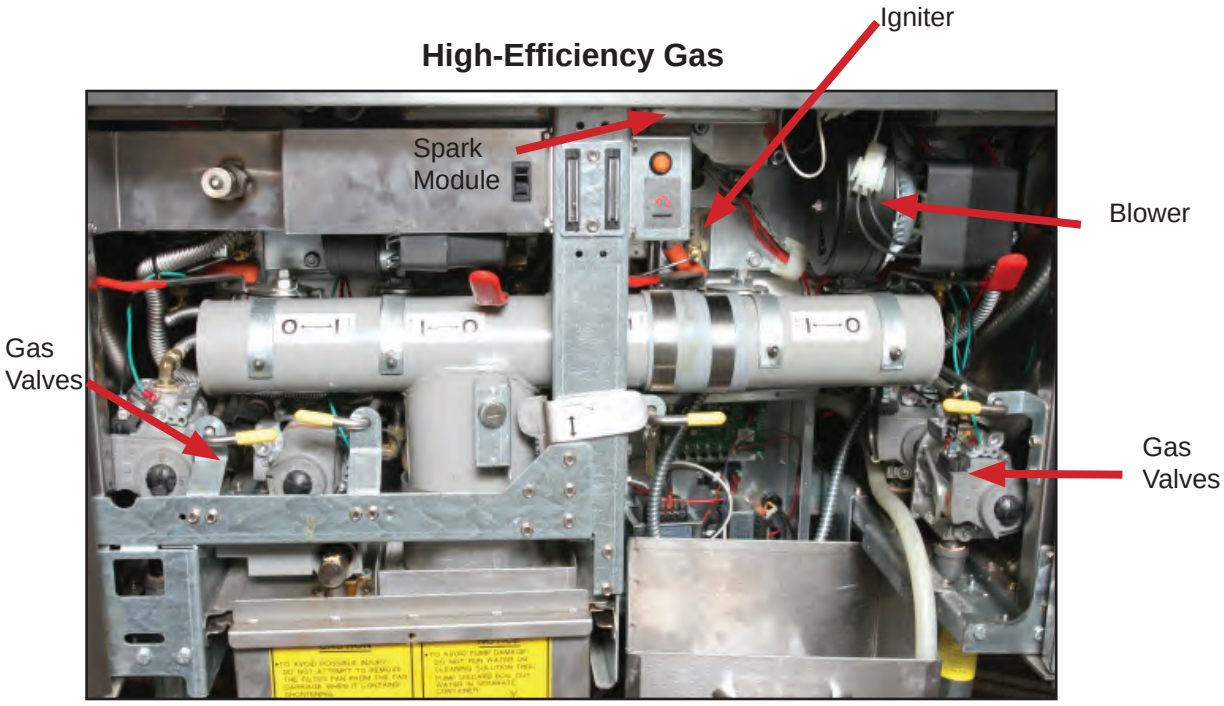
McD LOV Parts

OCF Parts

FQ Service

FQ Parts

High-Efficiency Gas



The cabinet interior of an Oil Conserving Fryer or OCF exhibits the same ignition components as the 50-55, LOV and FilterQuick fryers.

The closed burner and ignition system on 50 and 30lb high-efficiency gas fryers work the same. The fryers in the platforms shown here share a number of common ignition parts:

- **Interface boards** behind the controller hold relays that send 24VAC to the ignition system.
- **Spark modules** open the gas valve, create spark and check for flame in the burner.
- **Blowers** enhance the operation of the closed burner.
- **Temperature probes** in the frypot monitor oil via resistance and report back to the interface board and then the controller display.
- **Hi-limit probes** open to prevent further heating if the oil becomes too hot.

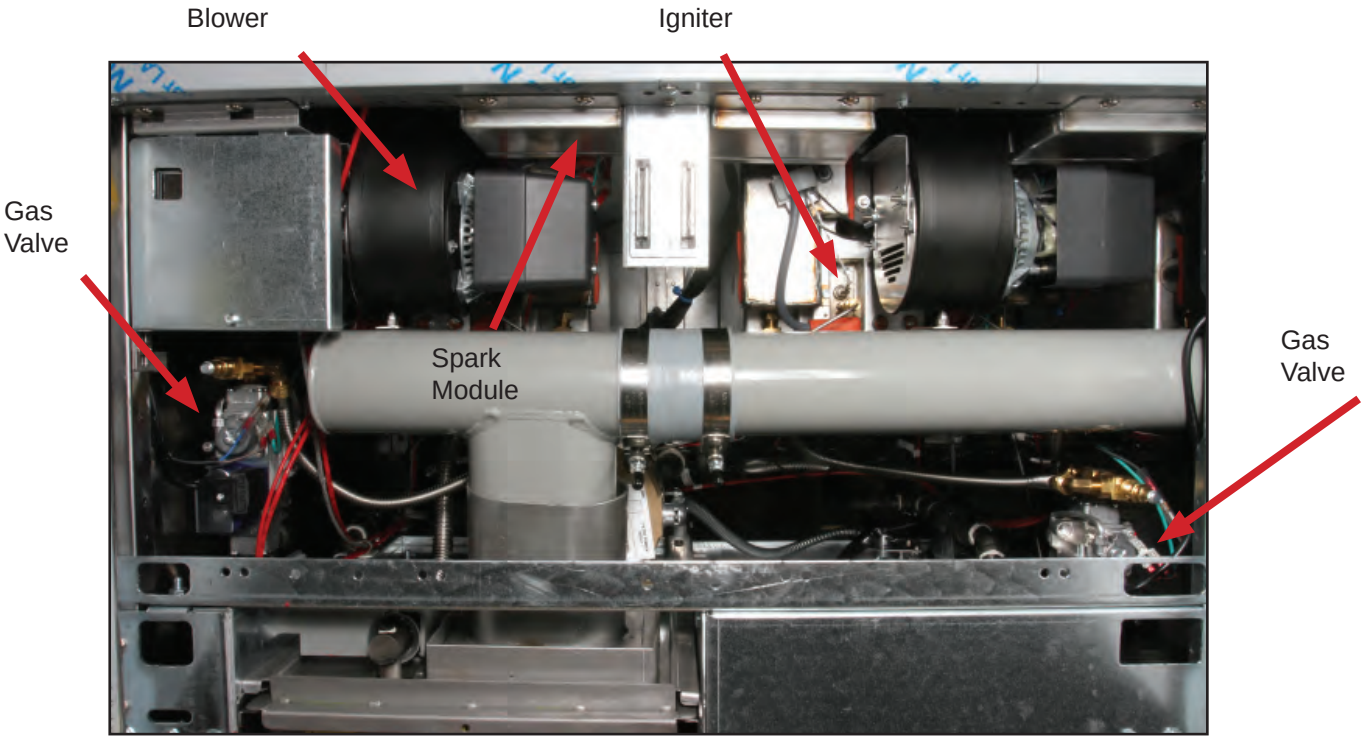
The LOV and FilterQuick fryers have 30lb frypots and additional features for automatic filtering and topoff. The OCF gas has 30lb frypots, automatic top off and prompted manual filtering. Those features are described in more detail in an online course. However, the burner and ignition system works the same as the earlier high efficiency gas fryers. .

The problems that prevent any of these fryers from heating will be similar and largely the troubleshooting techniques are the same.

The following pages show inside views of the cabinet and the control boxes of the high-efficiency gas fryers.

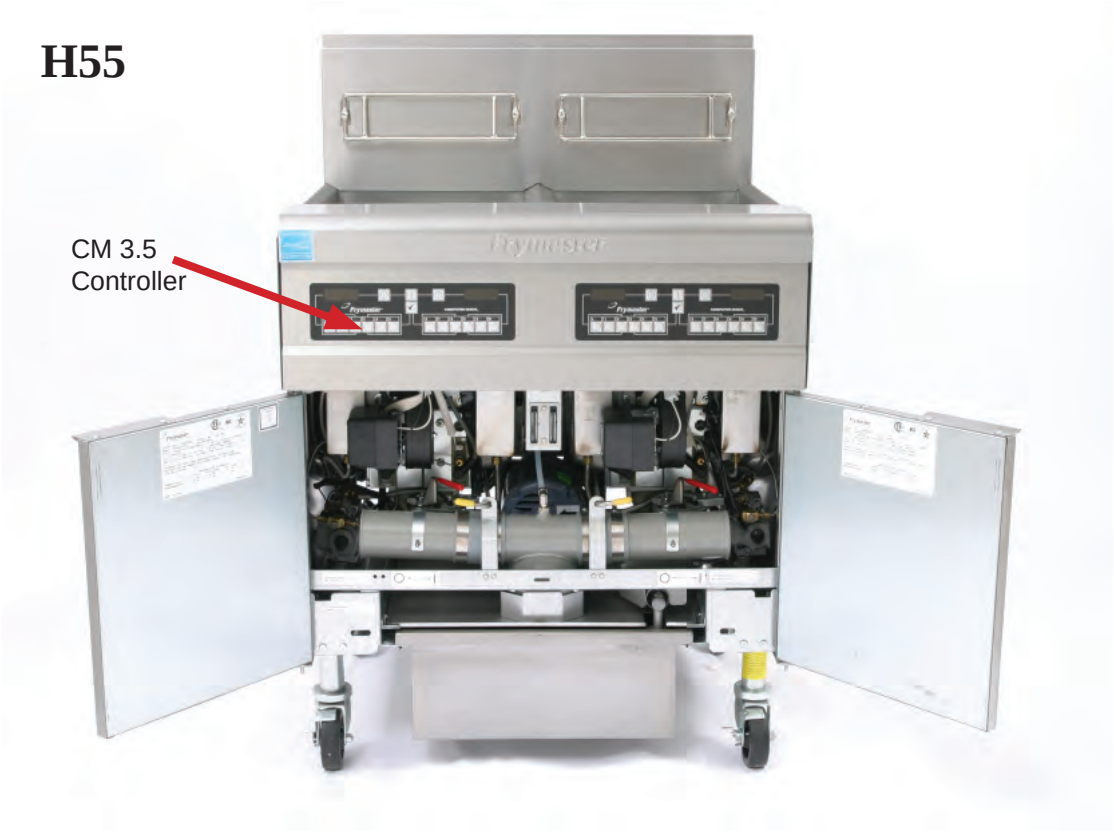
Behind the Doors of High-Efficiency Gas Fryers

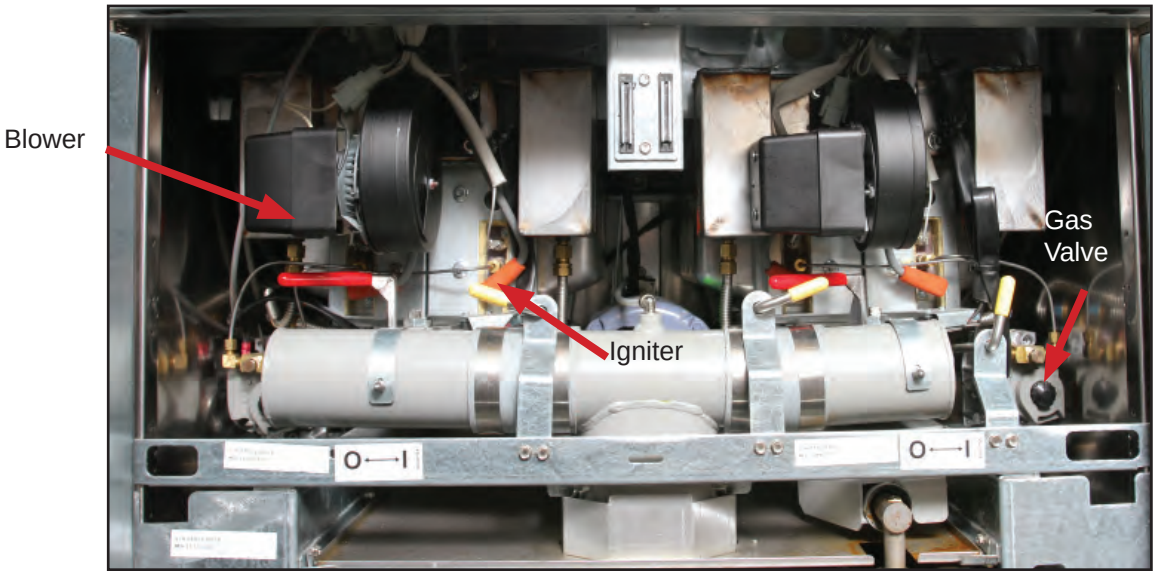
FilterQuick



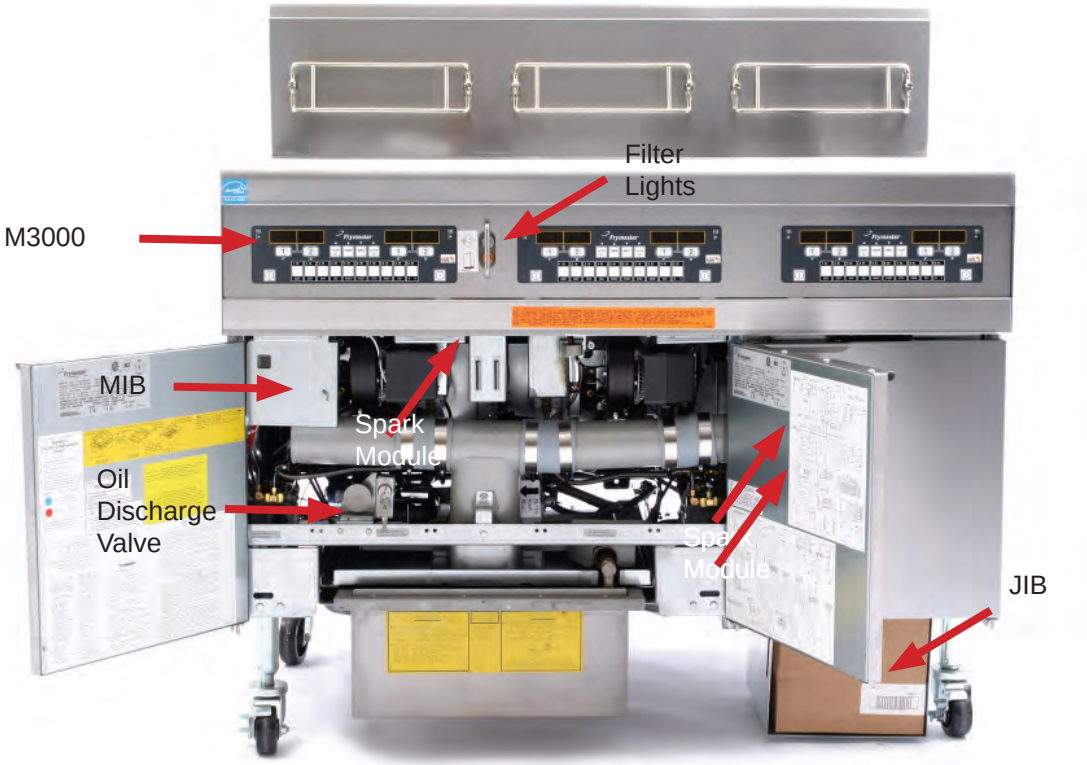
High-Efficiency Gas

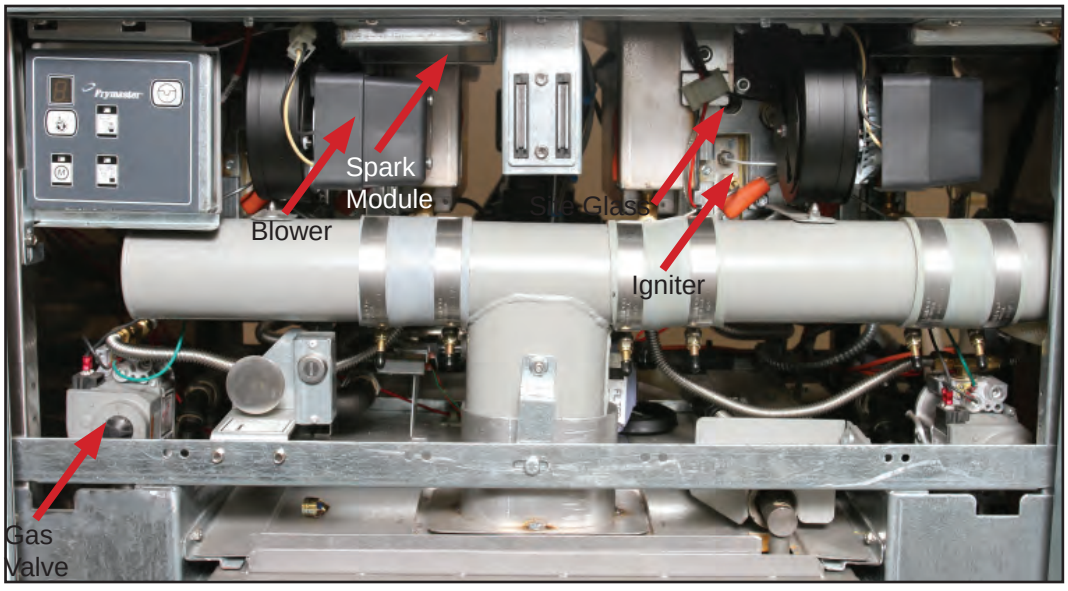
H55





McDonald's LOV



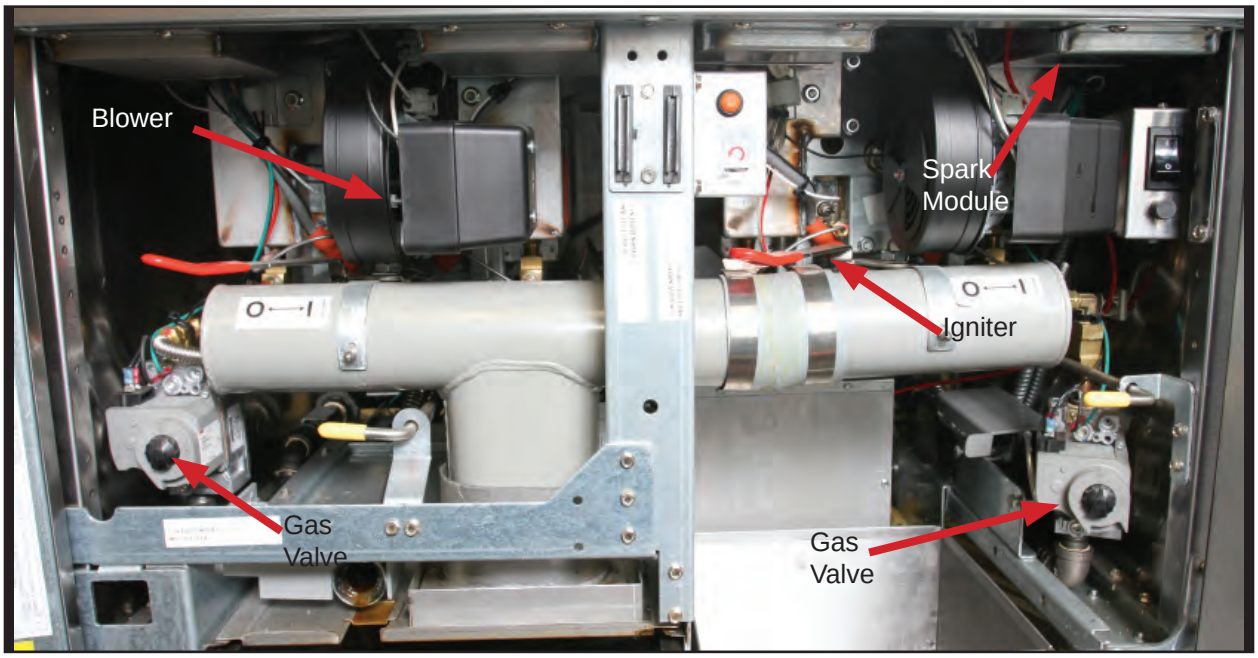


Frymaster McDonald's LOV Fryer

Video Content

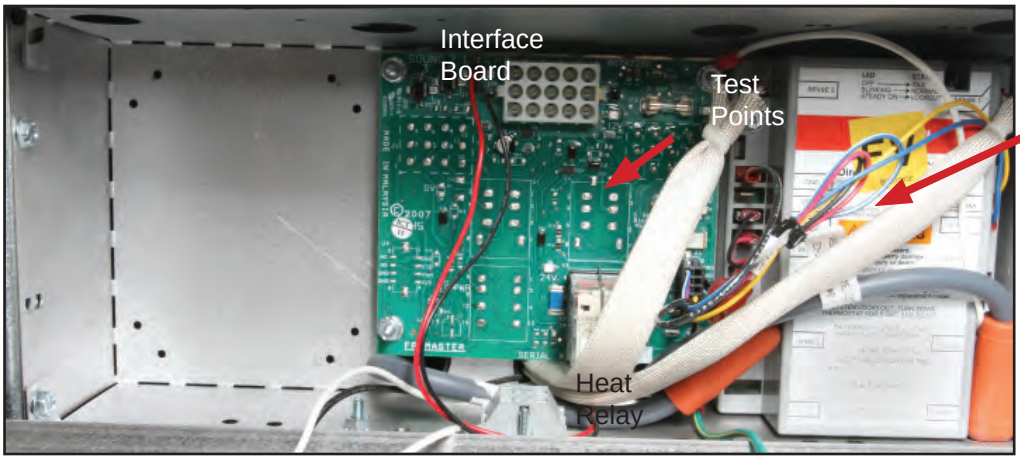
OCF


Frymaster
Nutra-Clear

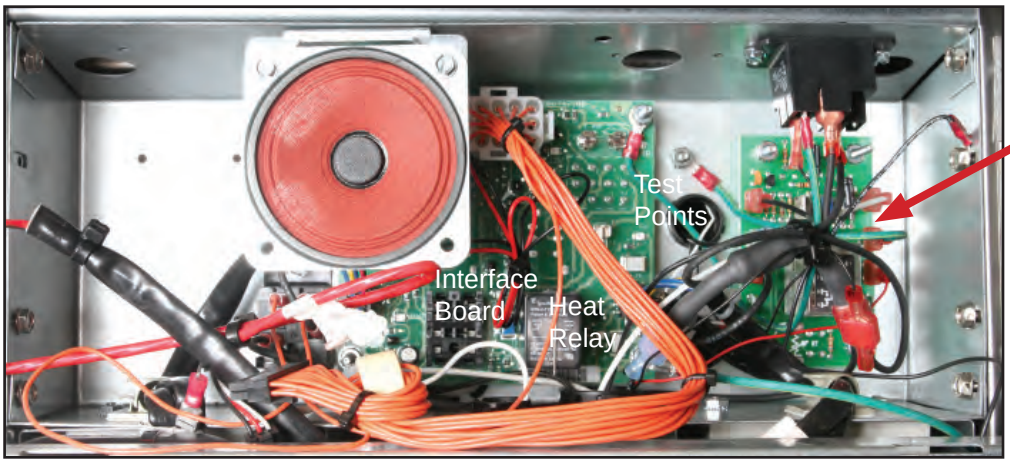

Blower
Spark Module
Igniter
Gas Valve
Gas Valve

Control Boxes

Control boxes, behind the controllers, contain the components that monitor the vat temperatures and control the heat: interface boards, heat relays and in some cases the spark module.

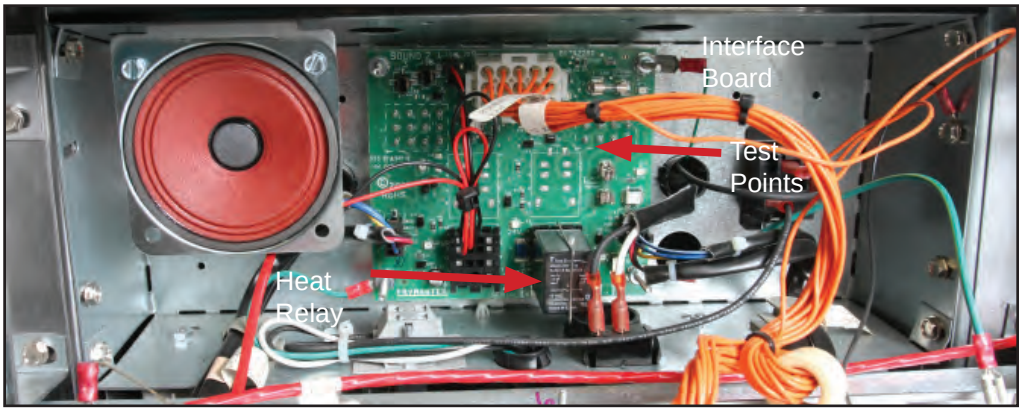


An H55 full vat control box.



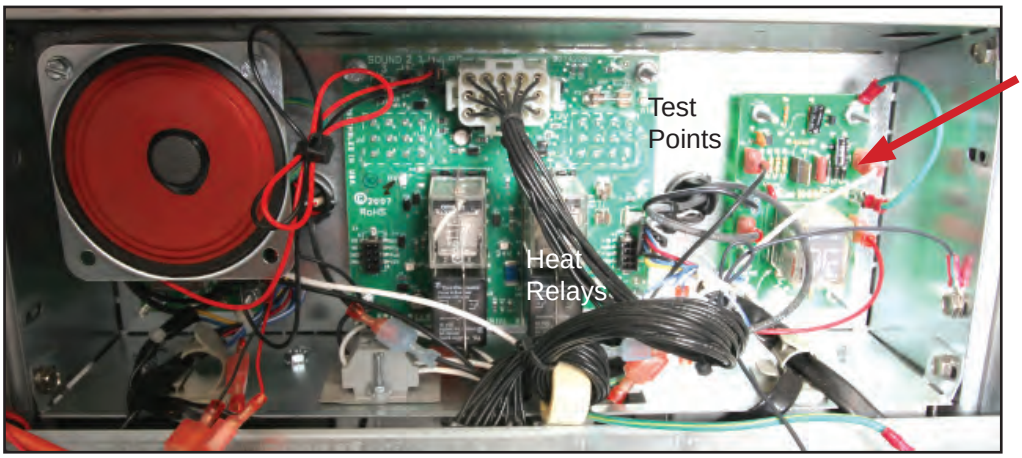
Oil is Back
Used to detect returning oil and described elsewhere. This board can halt the ignition system.

A FilterQuick control box



An OCF control box. Oil filtration is manual; there is no OIB board.

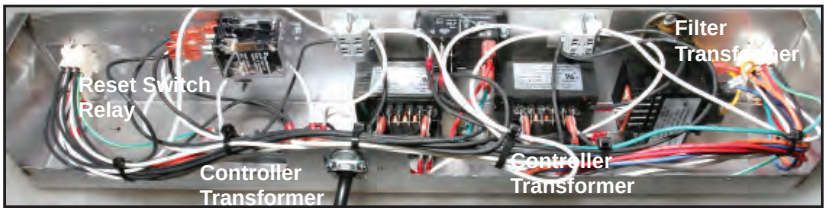
Spark modules for the FilterQuick 3000 are below the control box in metal boxes.



Oil is Back
Used to detect returning oil and described elsewhere. This board can halt the ignition system.

A LOV control box.

Transformer Boxes



FilterQuick transformer box.

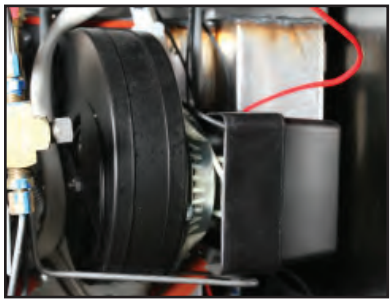
H255 transformer box.

Components in the Ignition System

A sequence of successful events by a series of components is necessary for the fryer to fire. Below we examine the components.

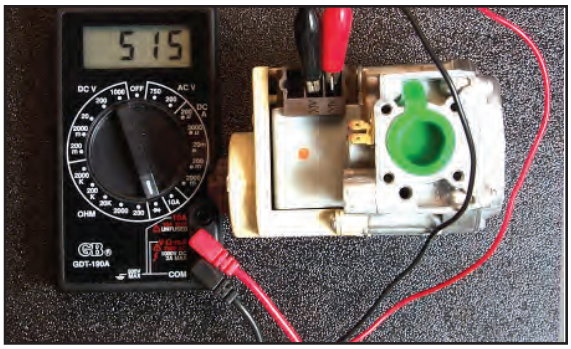
Blower Motor

The blower is an integral component in the combustion system. It's on when the fryer is calling for heat and the air flow it creates enhances the burn. Proper air flow helps produces microamps measured by the spark module. A poorly performing fan can cause a spark module lockout.



A blower in an H55 fryer.

Gas Valve



Frymaster's high-efficiency gas fryers use Honeywell valves. It is opened by current flowing through the spark module.

Testing Gas Valves

The resistance across the contacts for the coils of the Honeywell valve: 400-650 ohms on the diode setting.

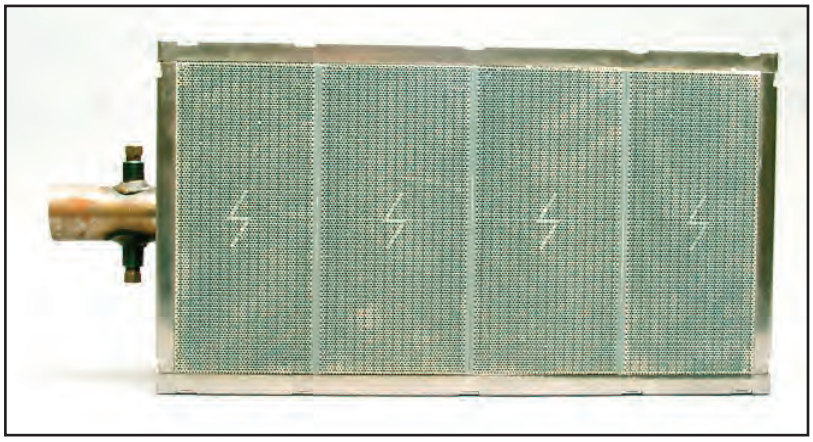
Safety Drain Switch

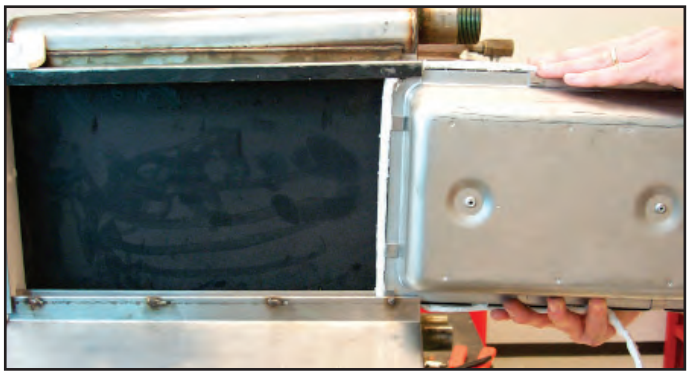
Safety drain switch on H55 drain valve.

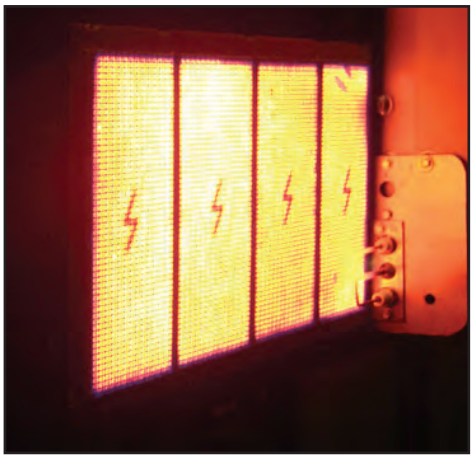
Drain switches (here shown on an H55 fryer) break the 24VAC to the gas valve, preventing the fryer from heating if the drain valve is open. These switches are not on automatically operated valves on the LOV and FilterQuick fryers.

Burners

The service replacement burner for the H55 is fitted with two gas inlets and ceramics that function with natural gas or propane. This approach means the burner will fit either side of a vat on a natural or propane-fueled fryer. The same approach is taken with smaller service burners for 30-lb frypots.



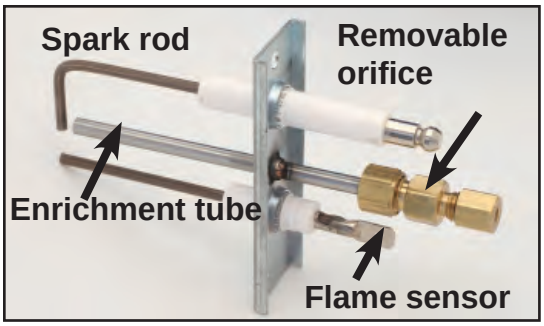




The burner must have an airtight fit to heat efficiently. Insulation strips are wrapped around the burner rails (above) to ensure a good seal. The radiants of a burner glow blue at startup. After approximately 1 minute, a bright orange glow (right above) should appear. If the burner remains blue,there's an improper gas/air mixture.

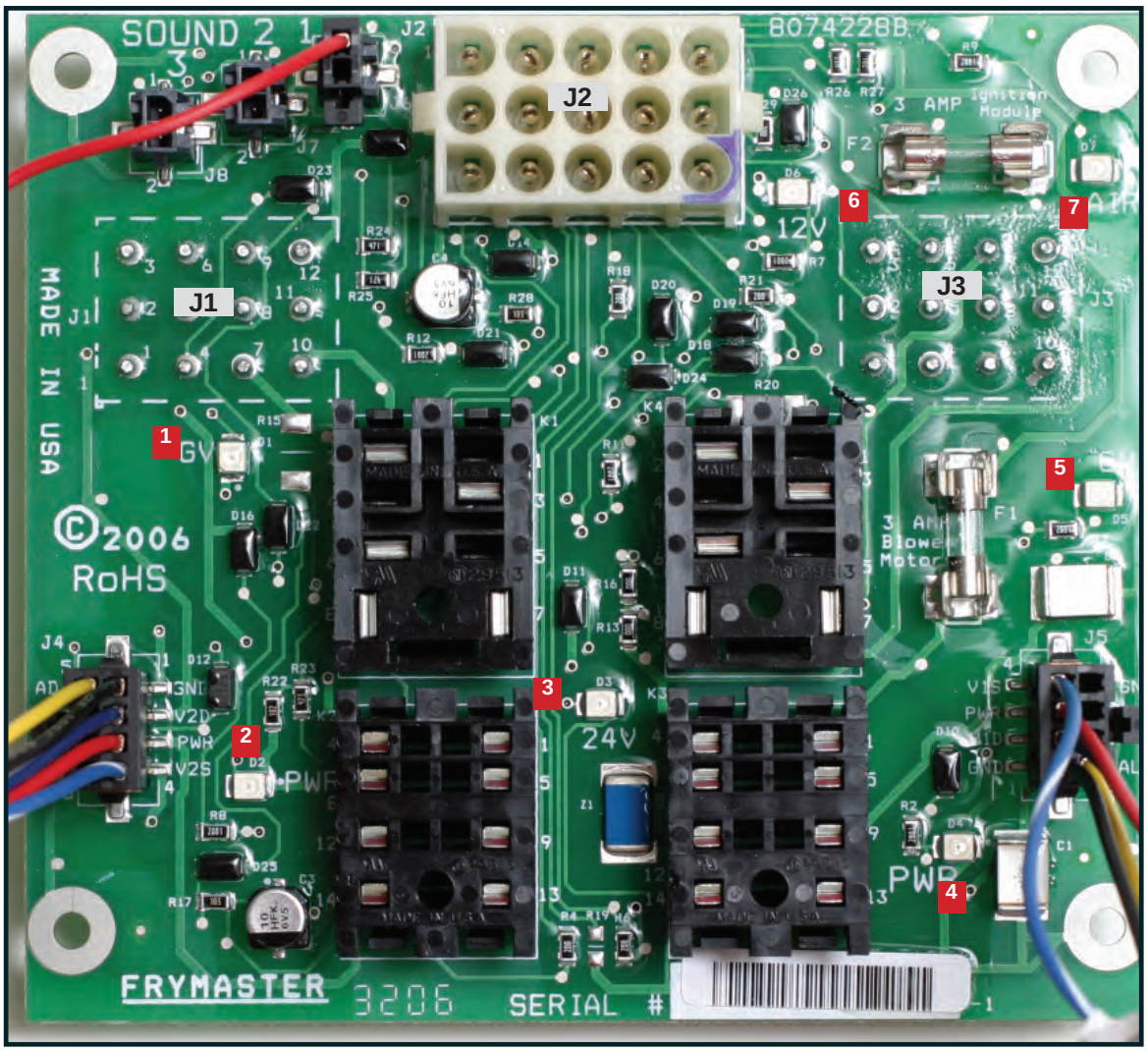
Ignitors

The condition of the ignitor and its installation are critical factors in the efficient operation of a high-efficiency burner. An ignitor is placed into a frypot combustion chamber with the insulating gasket held in place. The igniter's components should be parallel to the face of the burner.



A Solaronics igniter, introduced in 2012, is shown.

Service Interface Boards



High-Efficiency Gas Interface Board. LED's are numbered and identified on page 2-11 chart.

High-Efficiency Gas

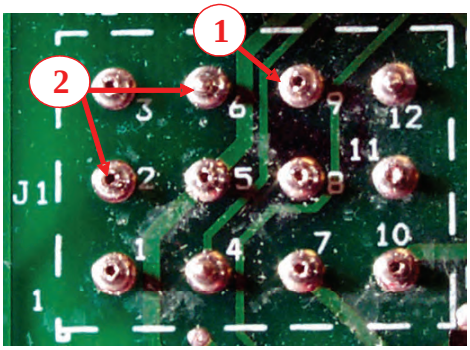
The interface board holds the circuitry to execute controller commands to the fryer.
The board design on 2-10 features removable relays, fuses and LEDs arrayed around the board.

LED Indications	
LED*	**Illumination indicates**
1	**24VAC to left gas valve**
2	**24VAC to left module**
3	**24VAC from transformer**
4	**24VAC to right module**
5	**24VAC to right or full-pot gas valve**
6	**12 VAC**
7	**Proves blower is working (CE)**

*Numbered on page 2-10

IMPORTANT: Disconnect harness from the controller or interface board before testing probe circuit.

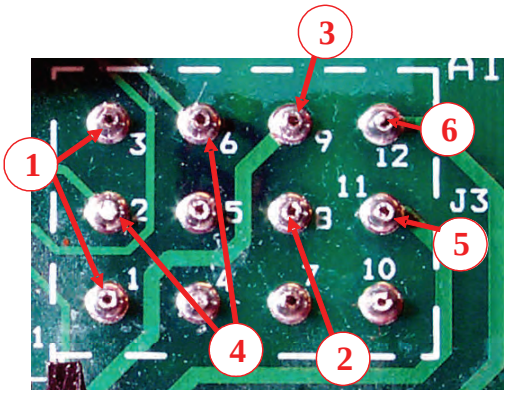
Test Points



J1 Test Points
(Split Vat Left Side)

1 - High Limit – Pin 9 to gas valve wire 12C

2 - Probe – Pin 2 to Pin 6



J3 Test Points
(Full Vat & Split Vat Right Side)

1 - 12 Volt – Pin 1 to Pin 3

2 - 24 Volt – Pin 8 to Ground

3 - High Limit – Pin 9 to gas valve wire 13C

4 - Probe – Pin 2 to Pin 6 **(Disconnect 15-pin harness.)**

5 - Line Voltage In – Pin 11 to Ground

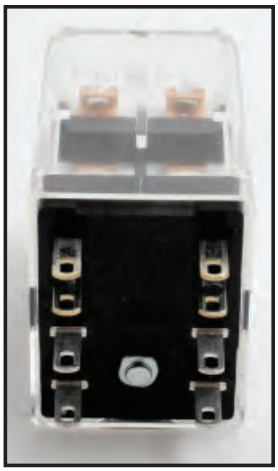
6 - Line Voltage to blower – Pin 12 to Ground

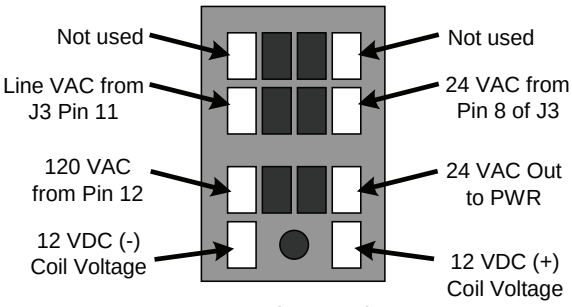
Heat Relays

Heat relays operate on 12 volts DC from the controller. The relays are dual-pole/dual-throw and switch both the 24 VAC to the ignition/gas circuit and 120 VAC to the combustion fan motor.

The relays are removable, which allows inspection and testing.

Use caution when installing. There is no stud to prevent upside down placement, which damages the controller and the interface board.





Heat Relay Socket

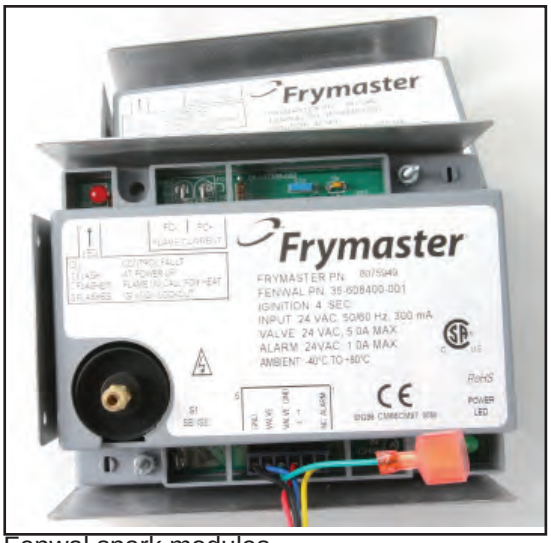
Different Spark Modules

The style and brand of ignition module has changed over the years. Honeywell units are the current module and the most frequently used. Capable Controls modules were introduced in December of 2014 and stayed in use until December of 2015.

Capable Controls doesn't produce a dual-spark module and the units have a different flame sensing specification.

Capable Control modules and Honeywells are interchangeable. Replacing a Honeywell with a Capable Control requires a kit.

Fenwal modules were introduced in 2017 for use in the 30-lb fryers.



Fenwal spark modules

High-Efficiency Gas
Ignition Module Timelines

2000 —2014 — Current

Use	Domestic
Spark Outputs	Single/Dual
Fused	No
Lockout	0.6
Optimal UA output	2.5-3.5

2014 — 2015

Use	All
Spark Outputs	Single
Fused	No
Lockout	0.15
Optimal UA output	0.4- 0.8

LOV, FQ, OCF Only

June 17 — Current

Use	All
Spark Outputs	Single
Fused	No
Lockout	0.5
Optimal UA output	1.7-3.0

Power Flow Through Ignition Module

The heat relay provides power to ignition module. Power flows to the contacts of the internal relay. If the module does not energize, the alarm circuit is energized.

Power flows through the coil of the internal relay to ground for at least the period of the time delay (4 seconds).

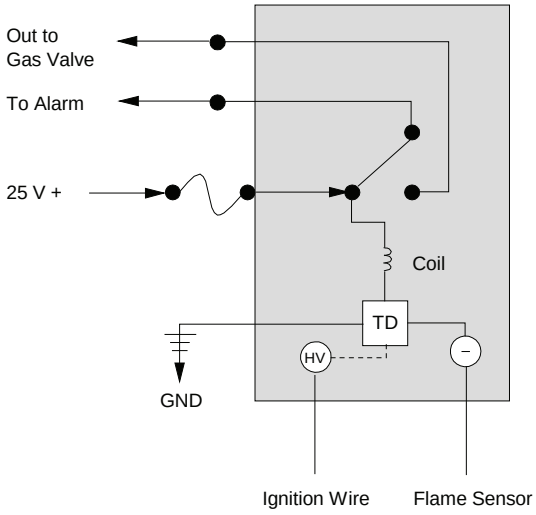
The relay stays closed, if all components are operating, and allows 24 VAC to flow through the system, and to the gas valve.

The blower is now running, the module is sparking, the gas valve is open and a flame is in the burner.

Once a flame is in the burner, the flame sensor current has to be above the lockout minimum for the module. This provides the hold for the relay coil.

Should the flame sensor lose flame current, the module will try to relight the burner for the period of the time delay. If flame sensing is not re-established, the module will lockout.

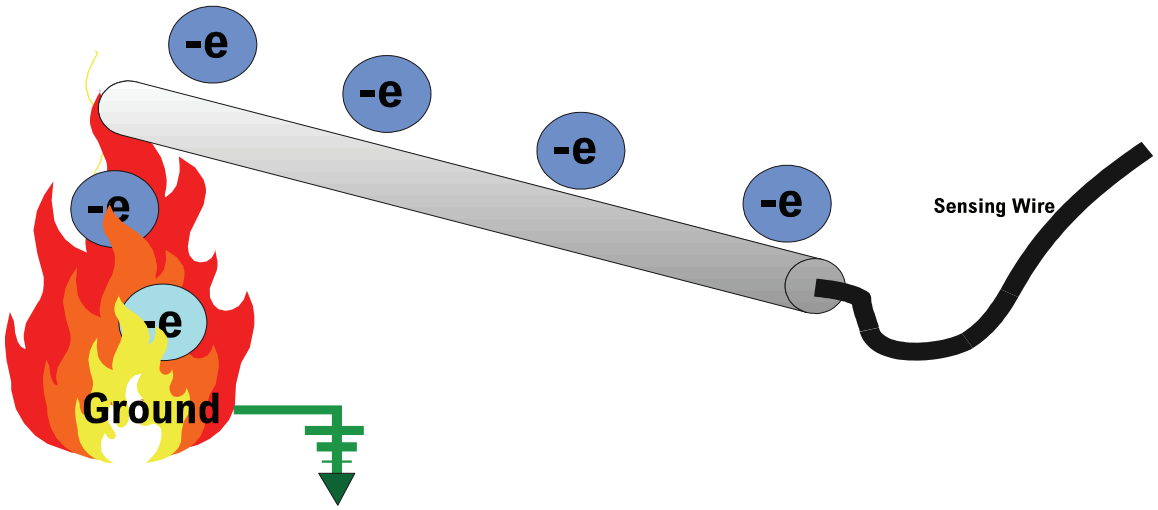
Inside the Ignition Module



TD = Time Delay Relay (4 Seconds)
HV = High Voltage

Ignition Module Functions:

1. Produces high voltage for spark.
2. Senses the flame.
3. Provides 24V to gas valve.
4. Provides the Alarm Circuit (24V) to the controller.
5. Fenwal modules are used in 30lb fryer pots: LOV, OCF, FilterQuick

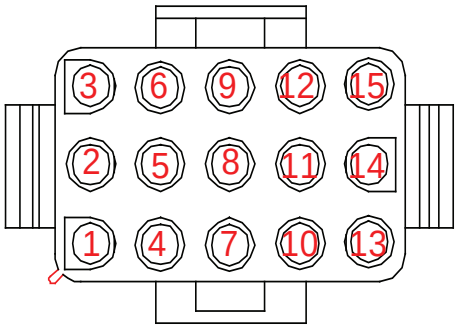


Flame Rectification

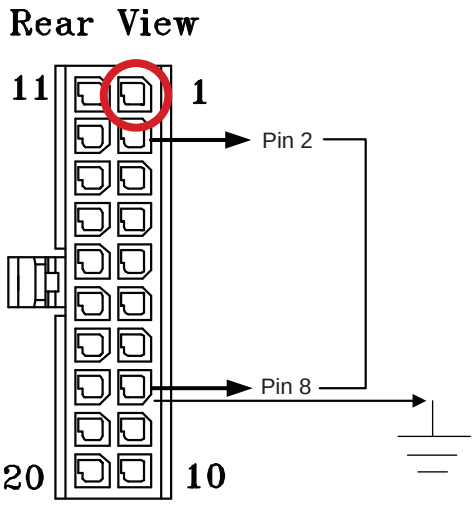
The spark module checks for the presence of flame in the burner by sending an AC signal (graphic above) into the flame. It is rectified there to DC and detected by the sensing rod on the igniter assembly. With sufficient flame, a path to ground is created and the signal is provided to prevent module lock out and keep the gas valve open. With insufficient flame, the ground path isn't created and the module routes the 24 volts from the gas valve to the alarm circuit.

Probes

Frymaster's controllers use a temperature probe rather than a thermostat. The probe's resistance changes as the temperature changes. The controls recognize the resistance change and react.



The pin counting starts at the ridge (shown in red) on the 15-pin probe plug (above) and at the top right on the 20-pin SMT plug.



What Causes Problems

If the probe's resistance reading falls between 1000-1950 — well outside acceptable operating temperatures or the wires are shorted — the controller displays a error message:

CM3.5: **Prob**
M2000 **Probe Failure**
FQ3000:**Temp Probe Failure**
Touchscreen: **Probe Error** (See Chart: 6-8, 6-9)

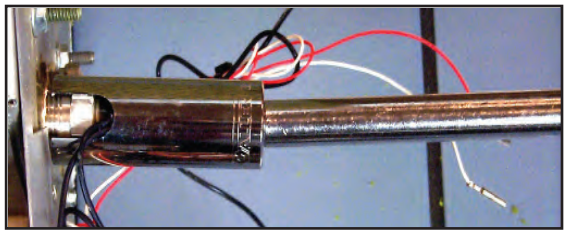
H55 temp probe

High-Limit Thermostat

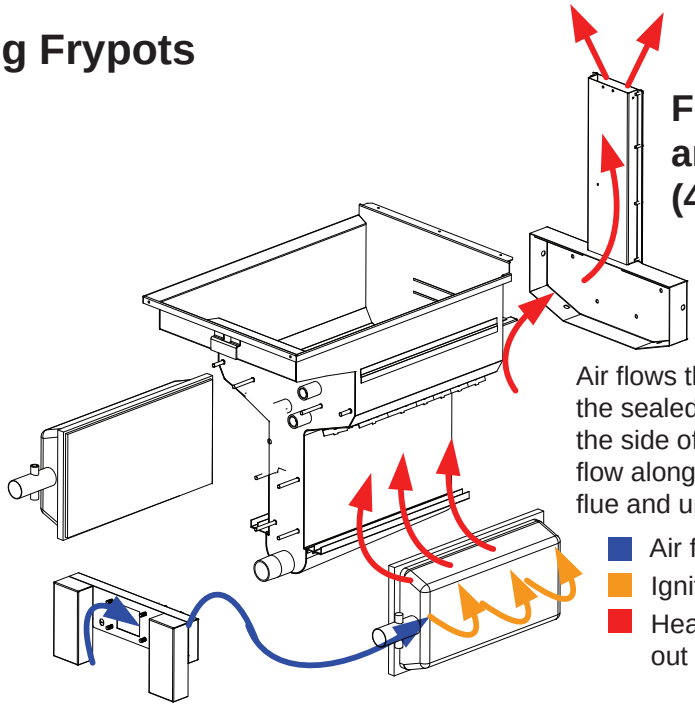
The high-limit breaks voltage to the gas valve, preventing the fryer from dangerously overheating. It acts as a normally closed switch, which opens when exposed to temperatures above 425°F ±12°F / 218°C ±7°C. The high-limit automatically resets when the oil temperature drops below 350°F / 177°C.

High-Lmiit

A socket with a cutout to accommodate wiring is necessary when installing a probe or high-limit:7/8" (815-0386).



Heating Frypots



Flue temperatures are 800 to 850°F (427 to 454°C)

Air flows through the plenum and into the sealed burners. Heat is applied to the side of the pot and exhaust gases flow along the side of the pot, to the flue and up.

- Air from plenum
- Ignited gas-air mixture in burner
- Heated air flowing across pot, out flue

Failure to maintain a clean path for the flue gasses to escape the fryer leads to problems for hoods and fryers.

Before Replacing a Frypot

A frypot should be closely examined before removing it for leaking. The problem may be the seal of a probe or high-limit. Probe replacement missteps lead to future leaks. The port for a high-limit or probe should be thoroughly cleaned before installing the new component. Residue left in the threads of a port can cause the component to seat poorly, leading to leaks.

A port is shown clogged with oil (above). Residue left from inadequate cleaning will cause a poor seal on a new component.

Cleaning the port and clearing the threads with a tap (1/2-14 NPT PN 810-3146) (above) ensures a good seal for the new component.

A trail of caramelized oil is visible here, leaking from a service pot plug.

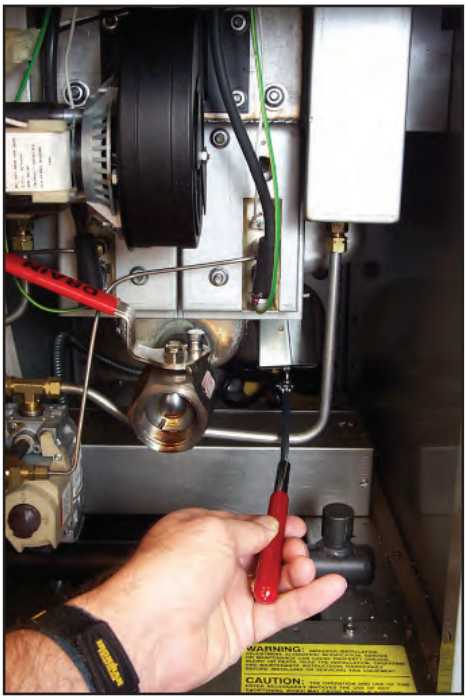
When installing a frypot:

- Apply only steady even pressure when aligning drain nipples. Do not jerk on extensions used to align drains.
- Nuts on frypot studs should be snug, not over tightened. One turn past hand-tight is sufficient torque.

Replacement Frypot Inspection

Like production frypots, service frypots are inspected for weld integrity and leaks. However, the service pots are not connected to a gas supply and tested for combustion leaks. Perform these steps after installing a replacement frypot or anytime the combustion chamber insulation is disturbed:

1. Fill the frypot with oil and turn the fryer on. Turn off or bypass the melt cycle. Run the burner for 10 minutes.
2. Inspect the burner flame. The color and intensity should be equal on both sides.
3. Use an inspection mirror to check for leaks, which will appear as fog on the mirror surface. This type of leak is not detectable with a visual check.
4. If a leak is detected, tighten all the lower insulation retainer nuts, allow the fryer to run for five additional minutes and repeat steps two and three until the leak is eliminated.



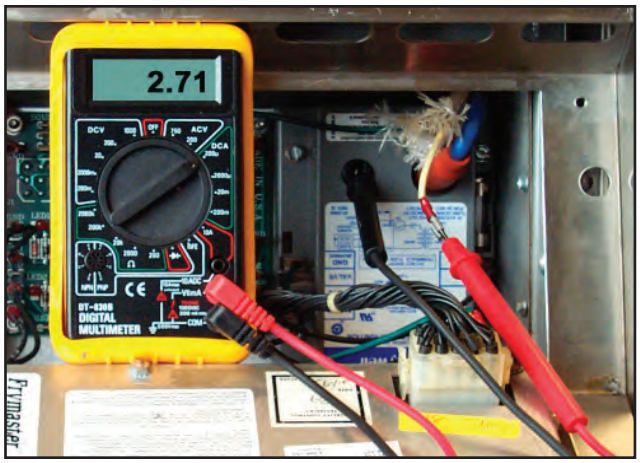
Inspect the burner seal with a mirror.

Ignition Failure

An alarm signal is sent and the gas valve is shut off if the module's microamp sensing circuit doesn't confirm a flame in 4 seconds.

When the module locks out, 24VAC is sent through the interface board alarm circuit to the controller.

CMIII.5 controls display HELP; M2000 controllers display Ignition Failure; 3000's display heat failure.



Microamps are measurable by placing a multimeter capable of measuring microamps (not milliamps) in series with the white sensing wire on the ignition module. See output requirements for different igniton modules on page 2-13.

Video Content

Click to launch YouTube video on microamp check.

Tips on Troubleshooting Ignition Failure

- Take a multi-meter and manometer on every call.
- Have the customer describe the specific complaint. Are clues to the problem inherent in the complaint: happens during lunch hour, etc..
- Eliminate components that are obviously working.
- Operate the fryer and verify the problem.
- Verify a flame is in the chamber when the fryer calls for re-ignition.
- If no flame is present:
  - ✓ Check for power to the gas valve during the restart.
  - ✓ If flame is present in the chamber during call for ignition: Check for proper gas pressure under high-volume conditions (lunch time).
- Check microamp level (2.5 - 3.5 microamps for Honeywell module; 0.4 - 0.8 for Capable Controls; 1.7-3.0 for Fenwal module) for each ignitor's flame sensor.
- Determine which side (left or right) is causing the failure. Use the LEDs on the interface to determine faulty side.

Troubleshooting Probes

As the probe temperature increases 1°F, the resistance increases by 2 ohms. A probe resistance/temperature chart is provided in the Charts & Tables section. To check the performance of a temperature probe, the probe's reading should be compared to a measurement taken as near as possible to the probe with an external thermometer or pyrometer.

Probe resistance can be checked from the 15-pin or 20-pin SMT controller plug. The probe circuits are found by counting pin locations on the plug.

If the probe resistance exceeds the tolerance levels, below 1000 Ω or above 1950 Ω or a short is detected on either wire, the controls will indicate the problem as follows:

• **Solid-State Controller:** Instant trouble light with no other lights on full vat. On split vats, the trouble light will stay on with the controller turned off. If the probe is shorted, the fryer will continue to heat.

• **CM3.5:** Prob

M2000 (McDonald's controller): Probe Failure

M3000 (McDonald's controller): Temp Probe Failure

3000/3010: Tempr Probe Failure

Checking for Ignition Issues

Check ignition system using two microamp meters.

- Conduct closer inspection of ignitor alignment and positioning.
- Balance microamp readings with blower air intake.
- Inspect burner surfaces.
- Check flues for restriction.
- Check for air leaks at rails.
- Check for poor insulation.
- Ensure orifices are of the same size and clear of debris.
- Check modules for evidence of overheating.
- Replace spade terminals on both ignitor sensors.
- Check fryer and its environment for:
  - ✓ Heat leaks or heat loss at front of pot.
  - ✓ Poor exhaust performance.
  - ✓ Heavy buildup of grease on filters.
  - ✓ Grease dripping down back of fryer wall.

A delayed ignition is most often described as popping. It is caused when the gas and air mixture fail to ignite immediately.

Causes include:

- Cracked igniter or ignition wire.
- Cracked burner.
- Defective combustion fan assembly.
- Burned or pitted contacts in the heat relay.
- Dirty blower motor.
- Incorrect or fluctuating gas pressure.
- Defective ignition module.
- Inadequate make-up air.
- Heat damage to controller or ignition modules.
- Incorrect blower adjustment.
- Air leaks in the combustion chamber or plenum gaskets.

How High-Efficiency Fryers Work

Sealed-burner fryers — 30 or 50 lb frypots — operate the same. Gas and air, pushed by a blower, are delivered to a sealed burner and ignited. A series of events, before and after the ignition, ensure the successful operation of the fryer.

How it happens:

• Line voltage is supplied to 12 and 24-volt transformers. The 12 VAC goes to the controller where it becomes 12VDC.
• 24VAC is provided to the ignition circuit, which flows through the drain safety switch and the hi-limit.
• The controller's 12VDC flows to the interface board and powers the heat relay.
• When the temp probe, monitored by the controller, detects low temperature, the controller calls for heat.
• The heat relay closes and pulls in the 24VAC for the spark modules and the line voltage for the blower.
• The spark module provides 24VAC to the gas valve, power for the spark and at the same time checks for presence of flame in the burner. If the flame is there, the gas valve stays open.

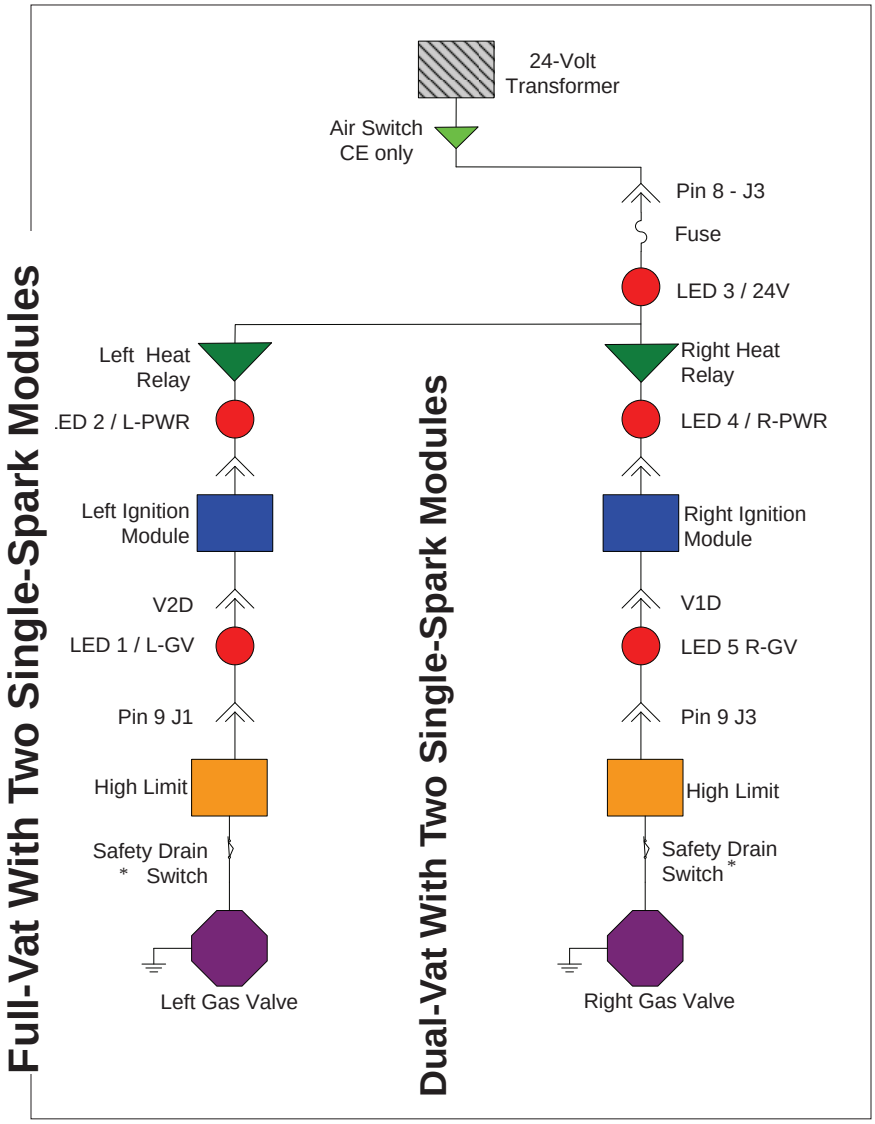
What can go wrong:

• Failed 12VAC transformer, no power to the controller.
• Failed 24VAC transformer, no power to the spark module or gas valve.
• Failed controller, no 12VDC power out to the heat relay: no power to the spark module and nothing to the gas valve.
• LED's on the interface board indicate power for the controller and can be used as a guide.
• A failed heat relay on the interface board means no power to the spark module and, because it works a double pole-double throw switch, no power to the blower.
• An open hi-limit prevents power from reaching the spark module circuit.
• Popping occurs when the ignition is delayed.
• The spark module uses flame rectification (explained on page 2-14) to prove the presence of fire in the burner chamber. If no flame is sensed, the gas valve is denied power; the valve closes and an alarm circuit is energized.

Simplified versions of the electrical circuits for fryers with a single or two spark modules are shown on the following page.

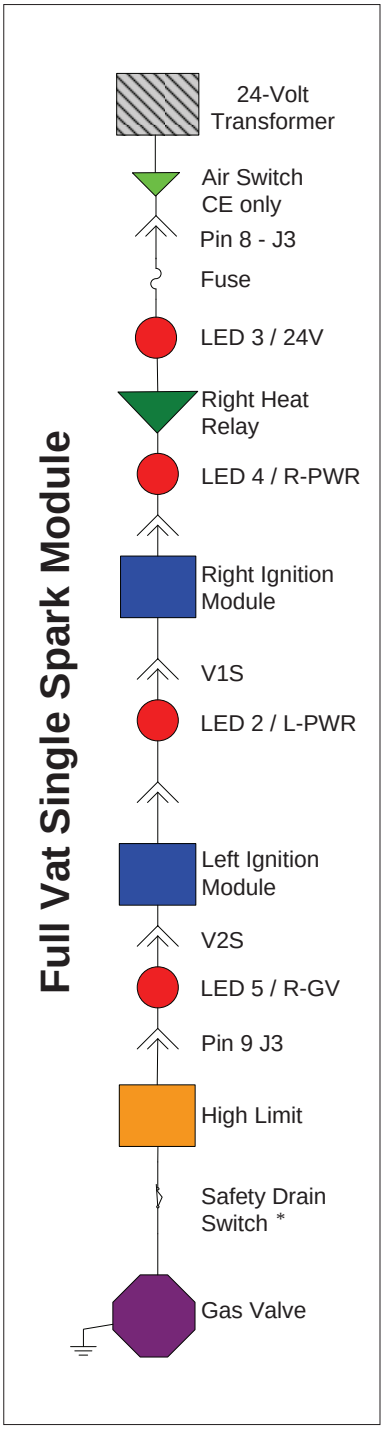
Troubleshooting

• LED's light up on the interface board along the path of the power, which can indicate where, down stream, the problem with the fryer begins.



These charts show the flow of electricity through the circuitry of an HE gas fryer in normal operation. All components and wiring connections are shown.

The 24-Volt Circuit

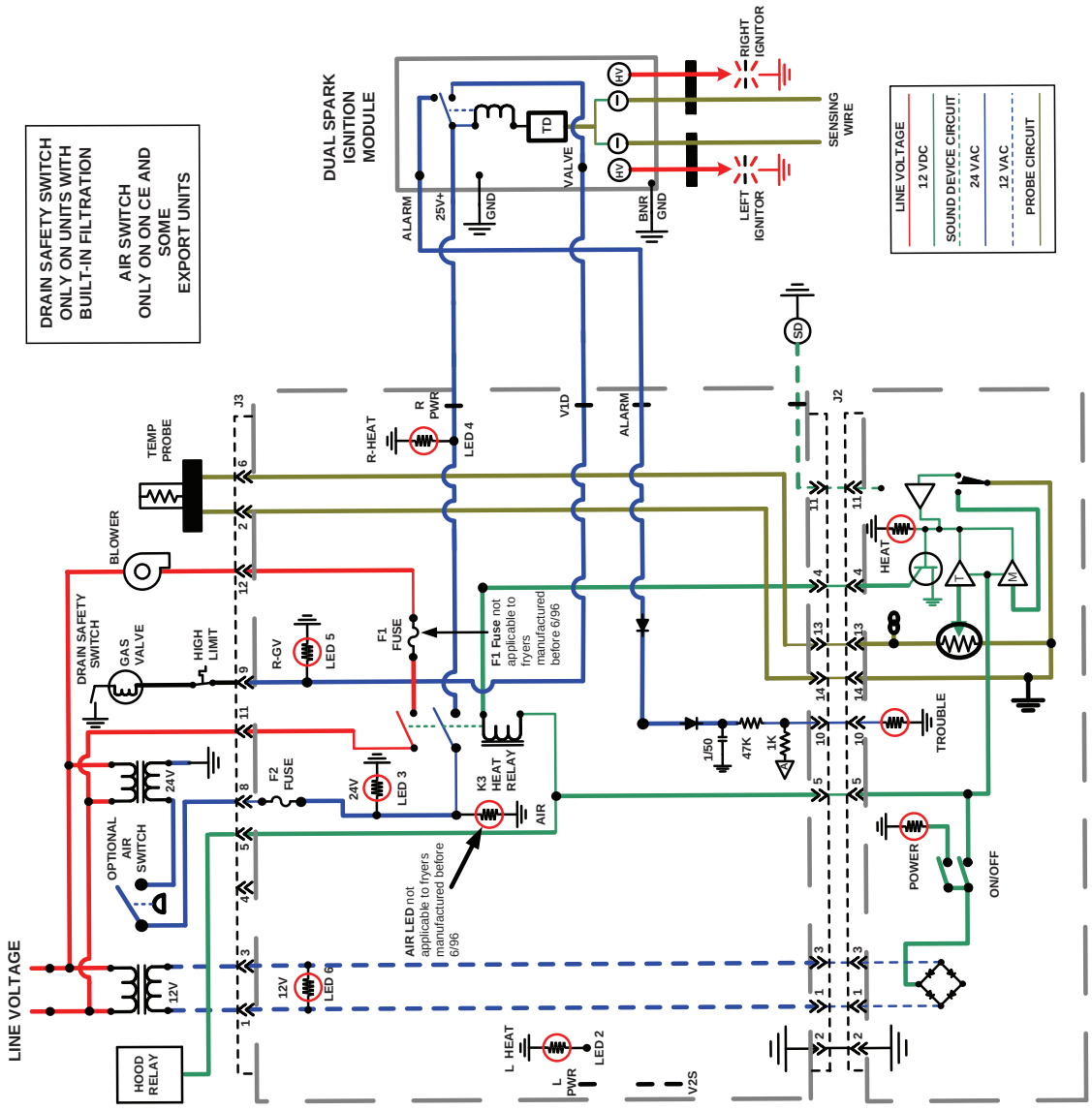


* On FQ, LOV position of 7-second OIB relay.

Domestic Production

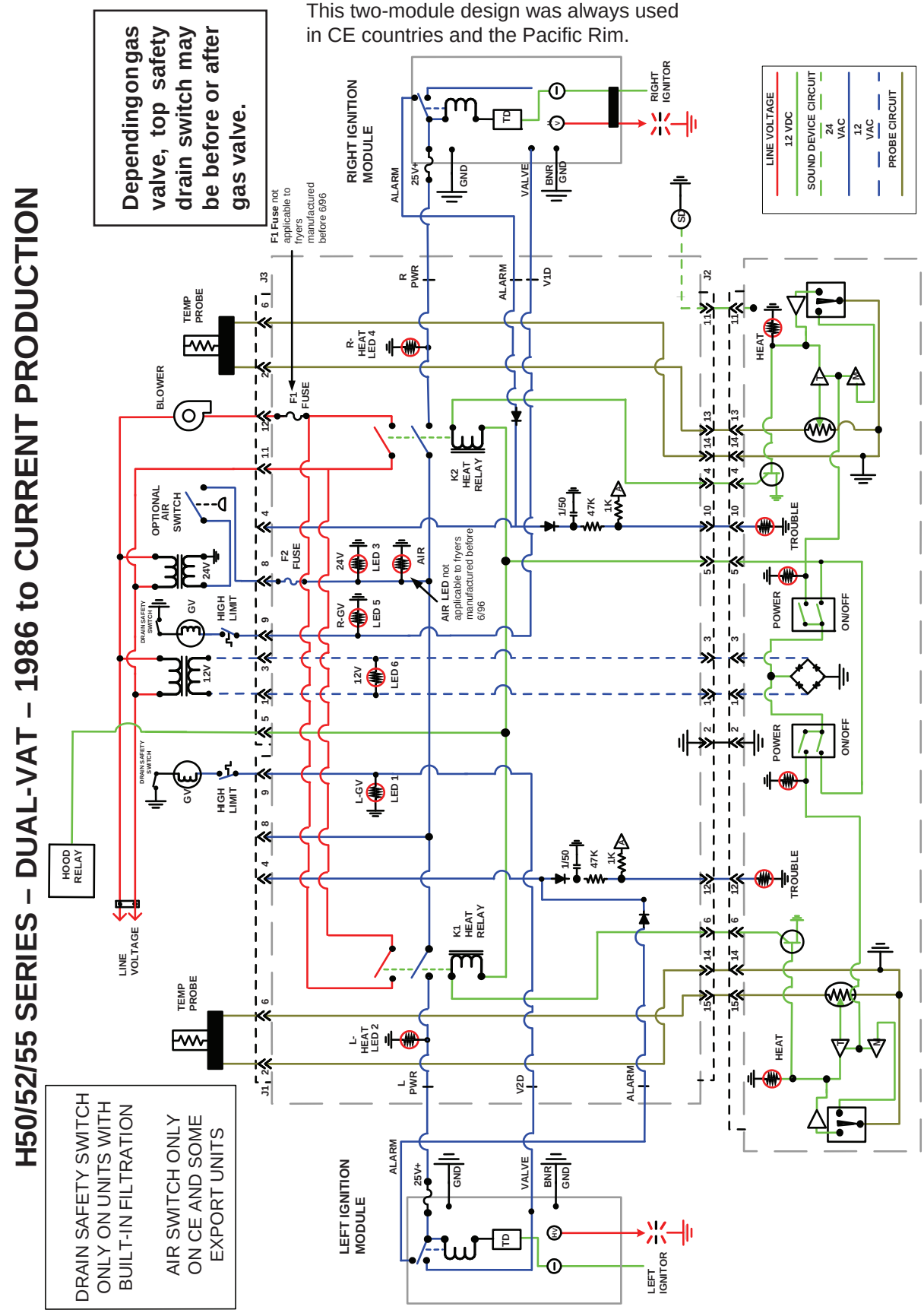
One Ignition Module

H50/52/55 SERIES – FULL-VAT WITH ONE DUAL-SPARK IGNITION MODULE



High-Efficiency Gas

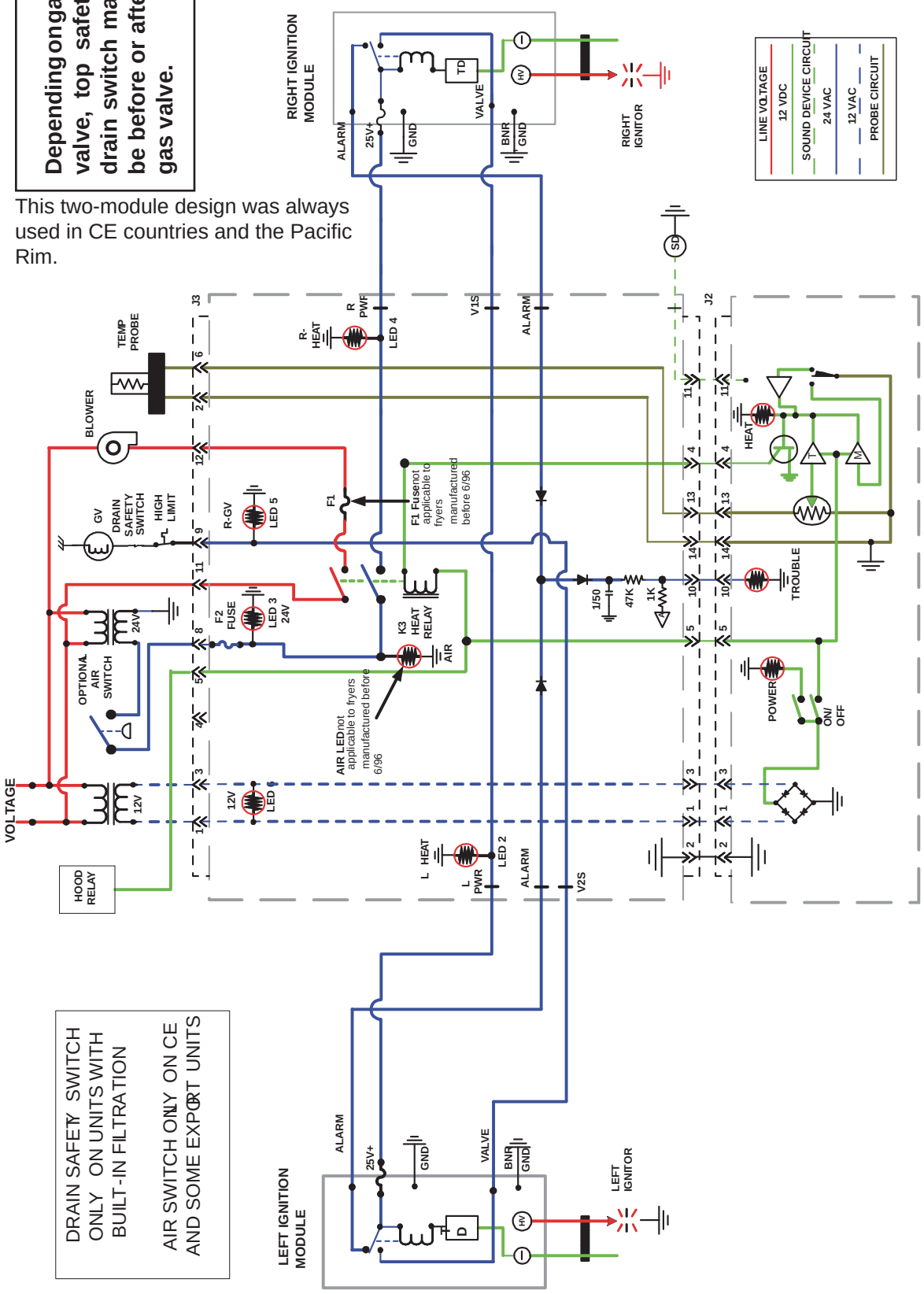
This two-module design was always used in CE countries and the Pacific Rim.

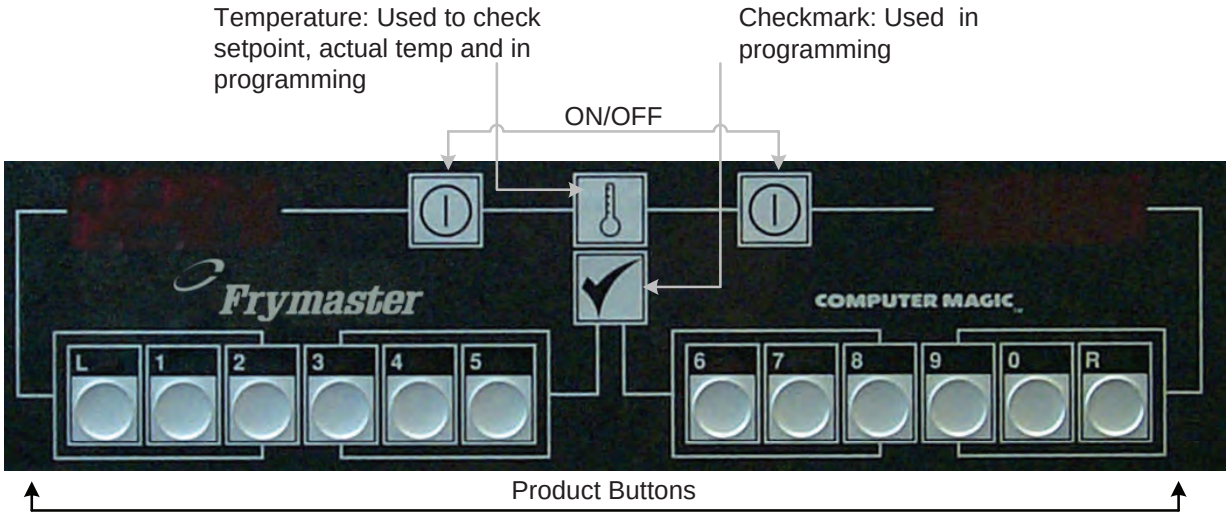


H50/53/55 SERIES — Two Ignition Modules

Depending on gas valve, top safety drain switch may be before or after gas valve.

This two-module design was always used in CE countries and the Pacific Rim.

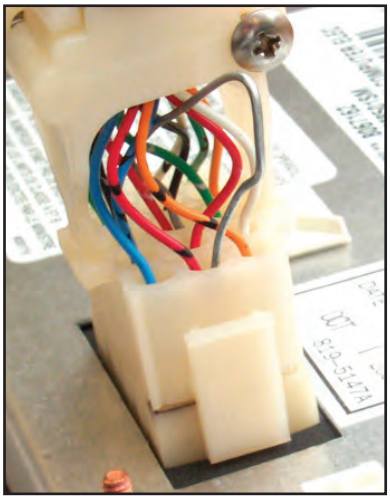




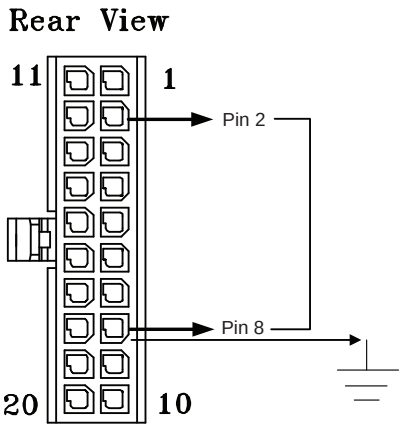
CM III.5

Controllers introduce features that affect a fryer's performance.

The CMIII.5 incorporates rate of rise and sensitivity. The controllers also monitor and report the fryer's recovery rate, a useful diagnostic tool.



Pin 8 on the controller plug must be grounded to pin 2 or the chassis of the fryer to put the controller in set-up mode. A paperclip will serve as jumper.



On controllers with SMT connections grounding Pin 8 and Pin 2 puts the controller in set up mode. **NOTE: It may be easier to ground on the interface board.**

Controller Features

Sensitivity

Sensitivity or stretch time is a programmable feature, patented by Frymaster, which increases or stretches the cook time based on the oil's temperature drop when cold product is placed in the vat. For instance, a single order of french fries doesn't lower the oil temperature as much as four orders cooked simultaneously. However, the fryer will produce the same results from both batches. This is achieved by stretching the cook time to negate the cooling effect the large batch has on the oil.

The degree to which the fryer reacts to the changing temperature of the oil is programmable: a sensitivity setting is available for each product button on the CMIII.5.

CMIII/III.5 Melt Cycles	
Fryer	**Melt Cycle**
HE Gas	6 on, 24 off
Electric	3 on, 12 off

The setting for each button is between 0 and 9, with 0 disabling the feature. A 9 provides the highest sensitivity or most pronounced change. The correct sensitivity for a product is based on its density, the setpoint and customer requirements. McDonald's-specific settings are the factory default in their controllers.

Rate of Rise

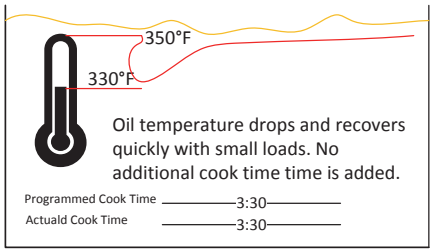
If the controller sees a temperature increase (**Rate of Rise**) > **5°F** in two seconds it will lock out the controller for 20-30 seconds to self test.

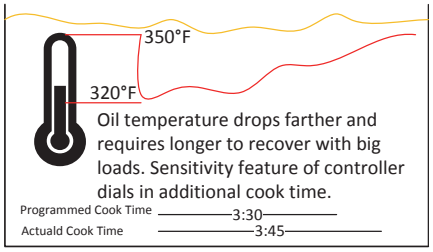
Recovery

The recovery check is a diagnostic tool, which measures the time required for the fryer to raise the temperature of the oil 50°F, between 250°F and 300°F. The measure is taken each time the oil drops below 180°F.

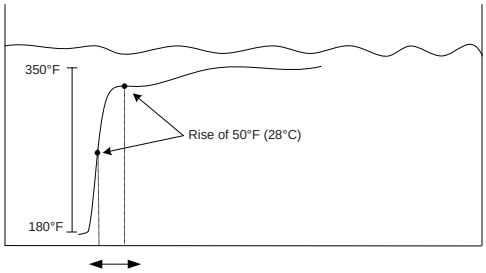
A standard HE gas fryer should achieve the 50-degree rise in 2:25. Electric fryers recover in 1:40. The M2000 does not lock out on recovery failures. The result of the most recent recovery check is displayed when you enter the code 1652 on the CMIII.5 or the M2000.

Sensitivity Adds Cook Time



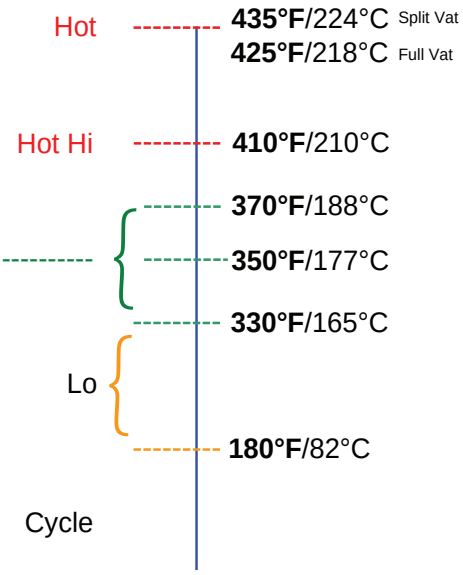


Recovery Measurement



Measured times – Gas 2:25
Electric 1:40

3.5 Setup		
Left Display	**Right**	**Action**
OFF		Press ✓
CODE		Enter 1656
GAS	1 or 0	Remove ground; 0 = electric; 1= gas; Press ✓
SPLT	1 or 0	0= Full; 1=Split; Press ✓
CNTR	1 or 0	1= controlling; 0=non-controlling; Press ✓
ACYC	1 or 0	1= melt cycle bypass; 0= no melt cycle bypass. Press ✓
CON	Number	On (in seconds) for melt cycle (see chart) Press ✓
COFF	Number	Off cycle (in seconds) for melt cycle. Press ✓



Useful Codes

Recovery	**1652**
Programming	**1650**
Fahrenheit to Celsius	**1658**
Set-up mode	**1656**
Constant Temp Display	**165L**
Boil Out	**1653**

Fryer Flue Problems Can Point to Hoods

A fryer's flue gases must rise. A clogged or improperly maintained hood prevents that and causes fryer problems.

Oil dripping from the hood will fall into the fryer flue, frypot and, through the upward flow of heated air, will find its way onto wiring.

Lack of adequate cooling air can damage spark modules.

Poor air flow caused by improper installation leads to components overheating. Spark modules can melt.

There are a number of visual cues to inadequately maintained hoods:

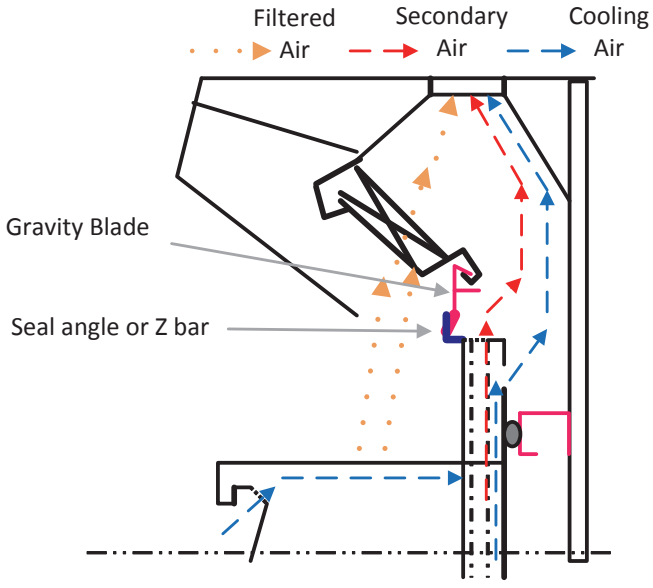
- Missing or over filled drip cups.
- Clogged weep holes in the hood filter.
- Excessive oil on the top and back of the fryer.
- Fryer not fully under the hood.

Over filled drip cup.

Another contributor to hood- associated fryer problems is the mismatching of Cap-N-Splash hoods and non-Cap-N-Splash fryers. Cap-N-Splash fryers lock into place with a pivoting rim that encircles the frypots and attaches the fryer to the special hood.

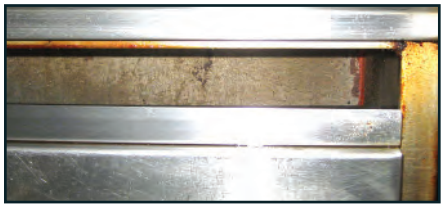
There's a gap visible between the hood and the fryer when a non Cap-N-Splash fryer is in a Cap-N- Splash hood.

A fryer pulled from a Cap-N-Spash hood shows signs of poor hood maintenance.



When installed properly, the components of the hood and fryer systems separate the air flows.

• Don't install a non-Cap-N-Splash fryer into a Cap-N-Splash hood. It can't be rigged to work and both the fryer and the hood can be damaged.

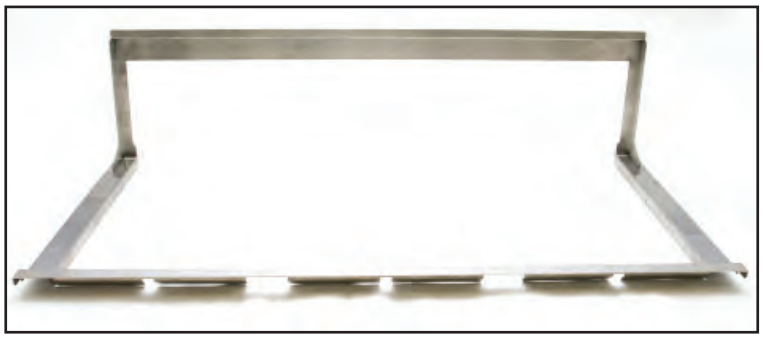


The gap left when a non-Cap-N-Splash fryer is installed in a Cap-N-Splash hood is shown (above).

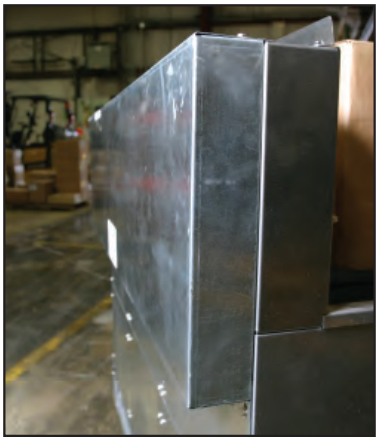
The rim encircling the frypots and attaching to the backsplash is shown raised (above).

• Another contributor to fryer-hood matchup confusion is a spacer on the back of gas fryers, which has to be removed for a Cap-N-Splash installation. It stays in place in a universal hood.

A fryer is shown in a universal hood (above). This installation requires a gas fryer to retain a spacer (below) that is attached at the factory. Installation in a Cap-N-Splash hood requires the removal of the spacer and the Cap-N-Splash locking device must be in place.



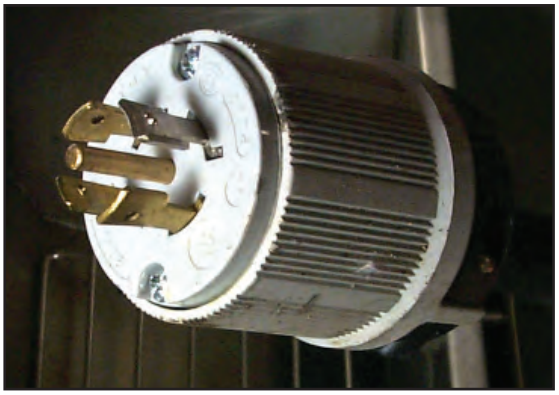
A new style Cap-N-Splash, introduced in 2015.



Gas fryer hood spacer for universal hood installations. It is removed for Cap-N-Splash installations.

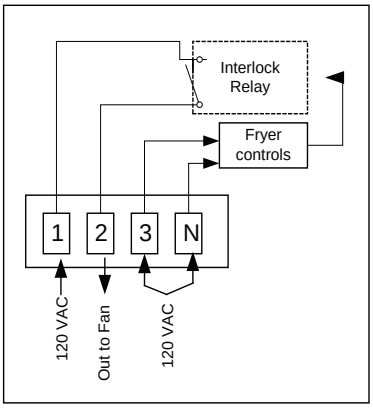
McDonald's Components

The McDonald's version of the HE gas fryer includes an interlock circuit for the exhaust hood. When the fryer is turned on, a relay in the fryer activates the hood system exhaust fan.



NEMA L21-20P used by McDonald's in the U.S.

McDonald's fryers include a prewired interlock cord set. The plug is a five-prong twist lock (NEMA L21-20P).



Depending on the restaurant wiring, the terminal block or the plug may require rewiring to work properly. See diagram for details.

Chapter 3: Electric Fryers

- RE80, 1814
- RE14, RE17, RE22 Fryers
- Components
- Wiring Diagrams

1814 Service and Parts Manual

McDonald's RE Service and Parts Manual

RE 80 Service and Parts Manual

How Electric Fryers Work

Electric fryers with computer or electronic controllers — 30 or 50lb or larger versions— perform their oil heating tasks with the same components as more advanced fryers with automatic filtering and topping off functions. The filtering and topping components are not involved in heating the frypot.

How it Happens:

• The elements operate on three-phase and L1 and L3 provide line voltage for the fryer's 12 and 24 volt transformers. The 12 volt transformer feeds the controller. The 24-volt transformer powers the contactors.

• When the fryer is turned on, 12VAC is provided to the controller, which produces 12VDC for the relays on the interface board.

• The DC-operated latch relay on the interface board closes, putting 24VAC on the coil of the latch contactor. Half of the heating circuit is closed.

• The hi-limit and the drain safety switches are both in the 24VAC latch relay circuit.

• The controller monitors the temp probe and calls for heat as needed.

• The 12VDC ground closes the relay on the interface board, putting 24VAC on the heat contactor's coil.

• Closing the heat contactor completes the circuit made possible by the earlier closing of the latch contactor. The element is energized.

• At setpoint, the heat relay on the interface board opens, which removes 24VAC from the heat contactor. The element is de-energized.

What Can Go Wrong

• A failed 12-volt transformer will deny power to the controller, which then can't provide 12VDC to the interface board for the operation of the relays. The relays won't close. The fryer won't heat.

• A failed 24-volt transformer means no power to the latch or heat contactor coils.

• A failed coil in the latch contactor will prevent a complete circuit for the element.

• A stuck coil in the heat contactor will cause the element to overheat.

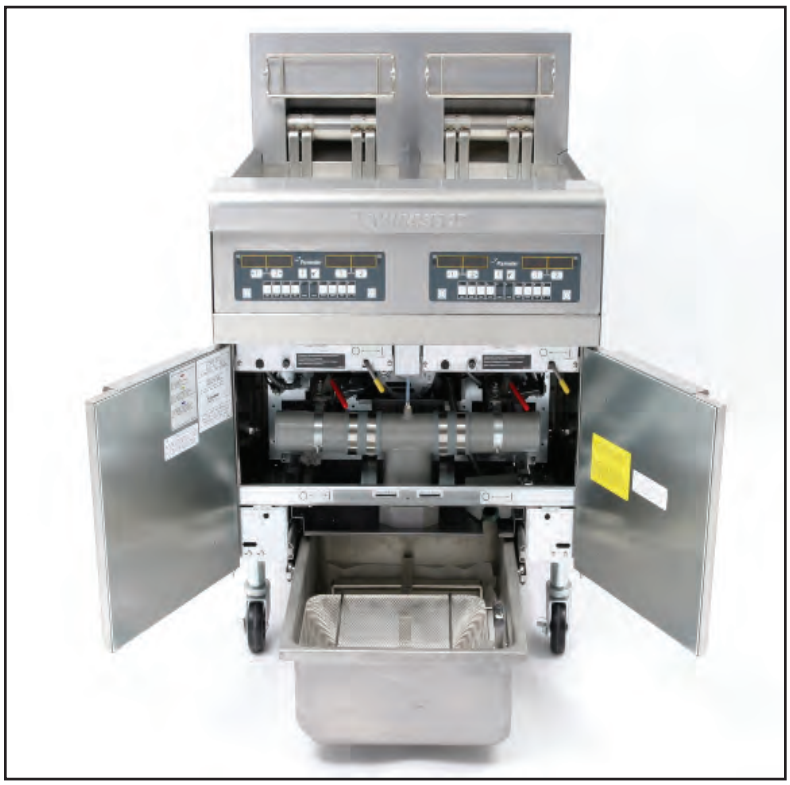
• A sticking relay on the interface board will cause similar problems.

• Failure to properly clean the vat and its components will cause the temperature probe to lose sensitivity; the fryer can overheat.

• An element with an internal short can heat continuously.

• An element with a pinhole will swell, oil leaks into the element and air escapes. Smoke rises from the oil, which is ruined by the failed element.

RE14, RE17, RE22 Electric Fryers



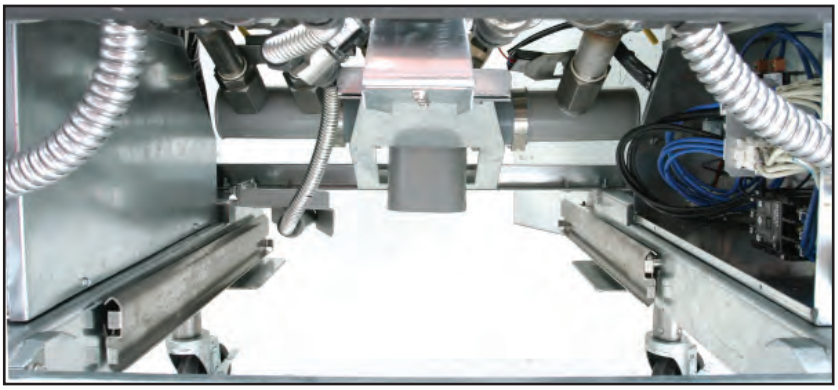
RE217 fryer

On May 1, 2006 the RE-series fryer was introduced. This fryer has rotating elements as well as a tightly sealed tilt housing.

The heating components in these fryers: elements, contactors, etc., are identical to those in more feature-laden fryers like LOV and FilterQuicks. Problems in the heating circuits troubleshoot the same in all fryer platforms.

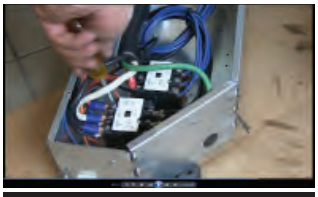
The elements are attached to a horizontal tube, which rotates on bushings.

The three-phase wiring, enclosed in a conduit and sheath to meet new UL requirements, enters the rotating tube through an open end. The probe is shielded to reduce RF interference. The temp probe wiring on a replacement element or probe may be wire tied to the outside of the conduit.



The contactor boxes are parallel to the exterior cabinet walls and accessible from under the fryer.

A special wrench (230-4028) is available to capture the element-securing nut inside the tube.



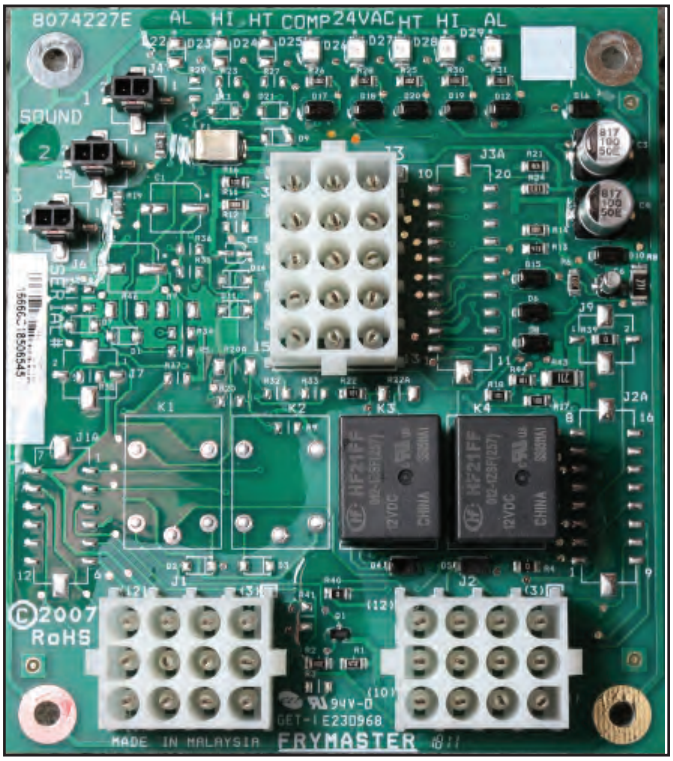
Video Content

Contactor Replacement

The contactor box of an RE Electric

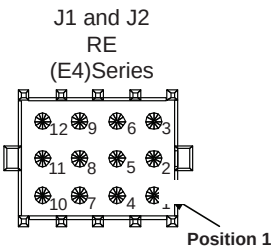
Interface Boards

The electric fryer interface board is similar to interface boards on the H.E. gas fryers. LED indicators aid in troubleshooting, and the board acts as a common junction for the fryer's electrical components. Unlike the gas version, the electric board includes an additional relay for the latching circuit. All the wire connections for this circuit are located on the front side of the board. The table below provides ten system checks. The meter reading must agree with the values in the table.



Video Content

Click to launch YouTube video on temp probe replacement.



RE14/17/22 Test Points

May 2006 - Current

Test	Set Meter	Pin	&	Pin	Results
12VAC Power	50VAC Scale	3 of J2	&	1 of J2	12-16VAC
24VAC Power	50VAC Scale	2 of J2	&	Chassis	24-30VAC
Probe Resistance - RT*	R x 1000 Ω	11 of J2 or 13 of J3	&	10 of J2 or 14 of J3	† See chart.
Probe Resistance - LT*	R x 1000 Ω	1 of J1 or 15 of J3	&	2 of J1 or 14 of J3	† See chart.
High-limit Continuity - RT	R x 1 Ω	9 of J2	&	6 of J2	0- Ω
High-limit Continuity - LT	R x 1 Ω	6 of J1	&	9 of J1	0- Ω
Latch Contactor Coil - RT	R x 1 Ω	8 of J2	&	Chassis	3-10 Ω
Latch Contactor Coil - LT	R x 1 Ω	5 of J1	&	Chassis	3-10 Ω
Heat Contactor Coil - RT	R x 1 Ω	7 of J2	&	Chassis	11-15 Ω
Heat Contactor Coil - LT	R x 1 Ω	4 of J1	&	Chassis	11-15 Ω

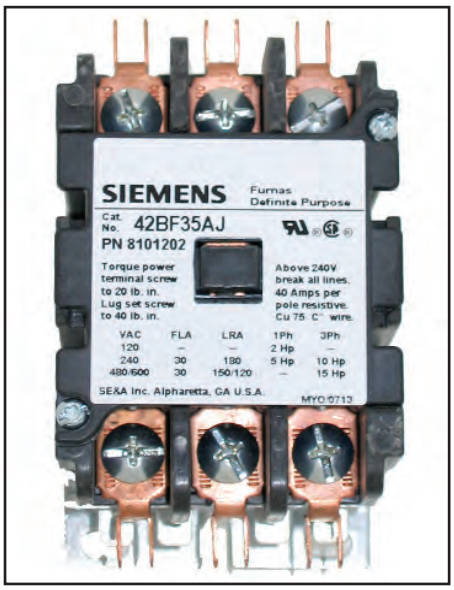
** Disconnect the 15-pin harness from the computer or controller before testing the probe circuit.*
† See Probe Resistance Chart in Chapter 7 for the correct resistance value.

Components

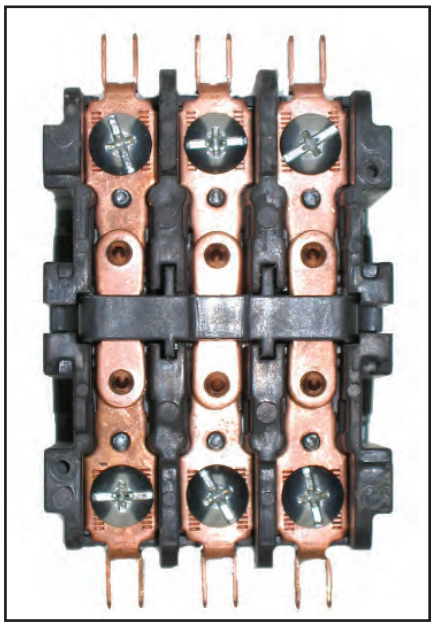
Contactors

A latching contactor and a heating contactor control power to the elements. The latching contactor engages when the main power switch is turned on and the hi-limit and drain switches are closed. The heating (or cycling) contactor energizes as the controller calls for heat. If the high-limit thermostat or the drain safety switch is open, power is cut to the coil of the latching relay.

In most cases, the latching contactor is activated at the beginning of the workday, and deactivated at closing. The 24VAC coil of the latching contactor is wired in series with the latch relay contacts. Heating contactors, also mechanical, are a more robust design and cycle each time the controller calls for heat.



Latching 40 amp contactor. (3-10 ohms on coil)

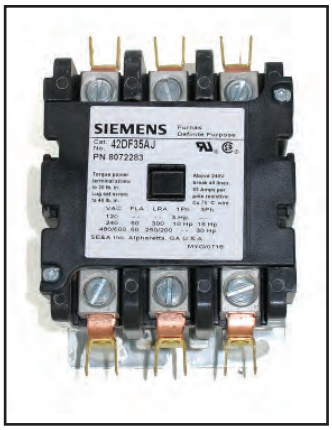


Latching contactor with cover removed.

Electric Fryers

A new heat contactor, introduced in June 2017, ships in a kit with a bracket (shown). It has a different footprint.

14-17kW Mechanical 50 amp heating contactor. (5-10 ohms coil). Used on domestic units after April 08 until June 2017.

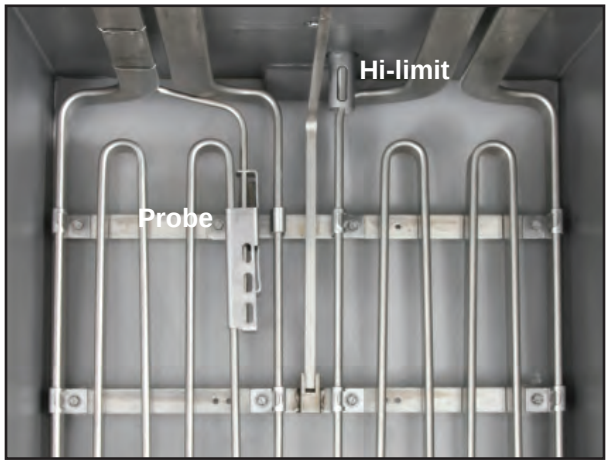


22kW Mechanical 63 amp heating contactor. (3-7 ohms coil). This contactor replaced mercury contactors on domestic fryers in April 08 until June 2017.

Hi-Limits

Hi-limits are color coded at the base for easy identification. See the following table for the color-code and part description.

Black and red color-coded hi-limits.



The temp probe and hi-limit are visible in an electric frypot.

Color	Description
RED	435°F (218°C) - used on 22kW FV & DV, 17kW DV, 14kW DV
BLACK	425°F (224°C) - used on 17kW FV, 14kW FV

Elements

Frymaster electric fryers use ribbon-style elements. This design increases the heating surface and makes the elements easier to service and clean.

Signs of Element Failure

- Swelling
- Discoloration
- Bubbles rising from submerged elements

An element lead shorted in the photo above within the element housing and them to the frypot itself, knocking holes in the element and the frypot.

Elements with a pinhole puncture will swell and discolor (shown at left). The indentions in the inset photo show where the element brackets restrained the swelling of the ribbon.

Smoke rises from the oil as air escapes from the hole. The failure, referred to as a “smoker”, quickly ruins the oil.

Element wiring. Each element listed in the chart (following page) performs at the stated wattage when the specified voltage is applied. However, it is not unusual for the power source to vary by as much as 10%. The change in supply will affect the element performance.

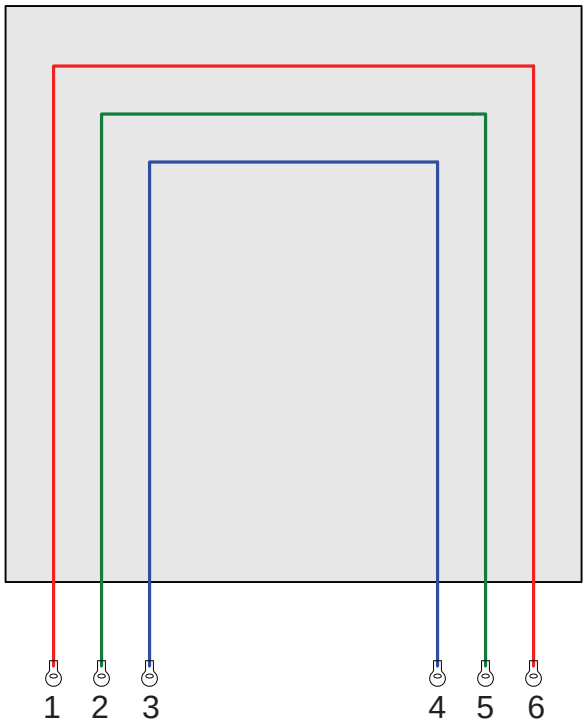
Electric Fryers

WATTS	VOLTAGE	OHM TOLERANCE
7000	208V	16.8 – 19.5 Ω
7000	240V	22.4 – 25.9 Ω
7000	480V	89.6–103.7 Ω
8500	208V	13.9 – 16.0 Ω
8500	240V	18.4 – 21.3 Ω
8500	480V	73.0 – 85.2 Ω
11000	208V	10.7 – 12.4 Ω
11000	240V	14.3 – 15.8 Ω
11000	480V	57.0 – 66.0 Ω

Improper element wiring: The fryer elements contain separate wires (two for each phase). Improper wiring connections will cause one or more of the following symptoms:

- Slowly rising or creeping fryer temperature.
- Improper amperage draw.
- Slow Recovery.
- Over heating

Defective elements: Elements shorted internally cause several symptoms, which are similar to incorrect element wiring. These elements must be replaced; they cannot be repaired.



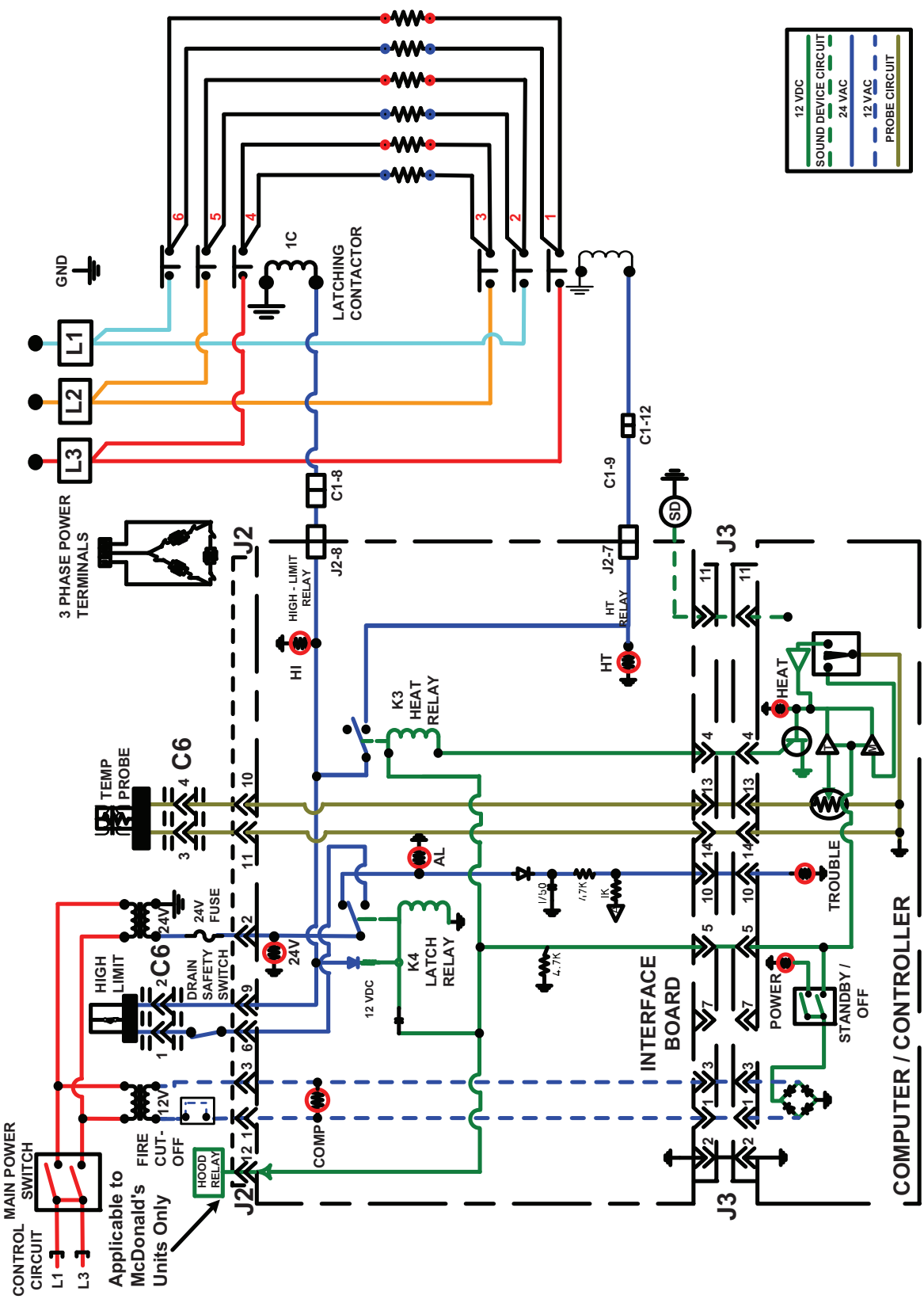
Element wiring connections.

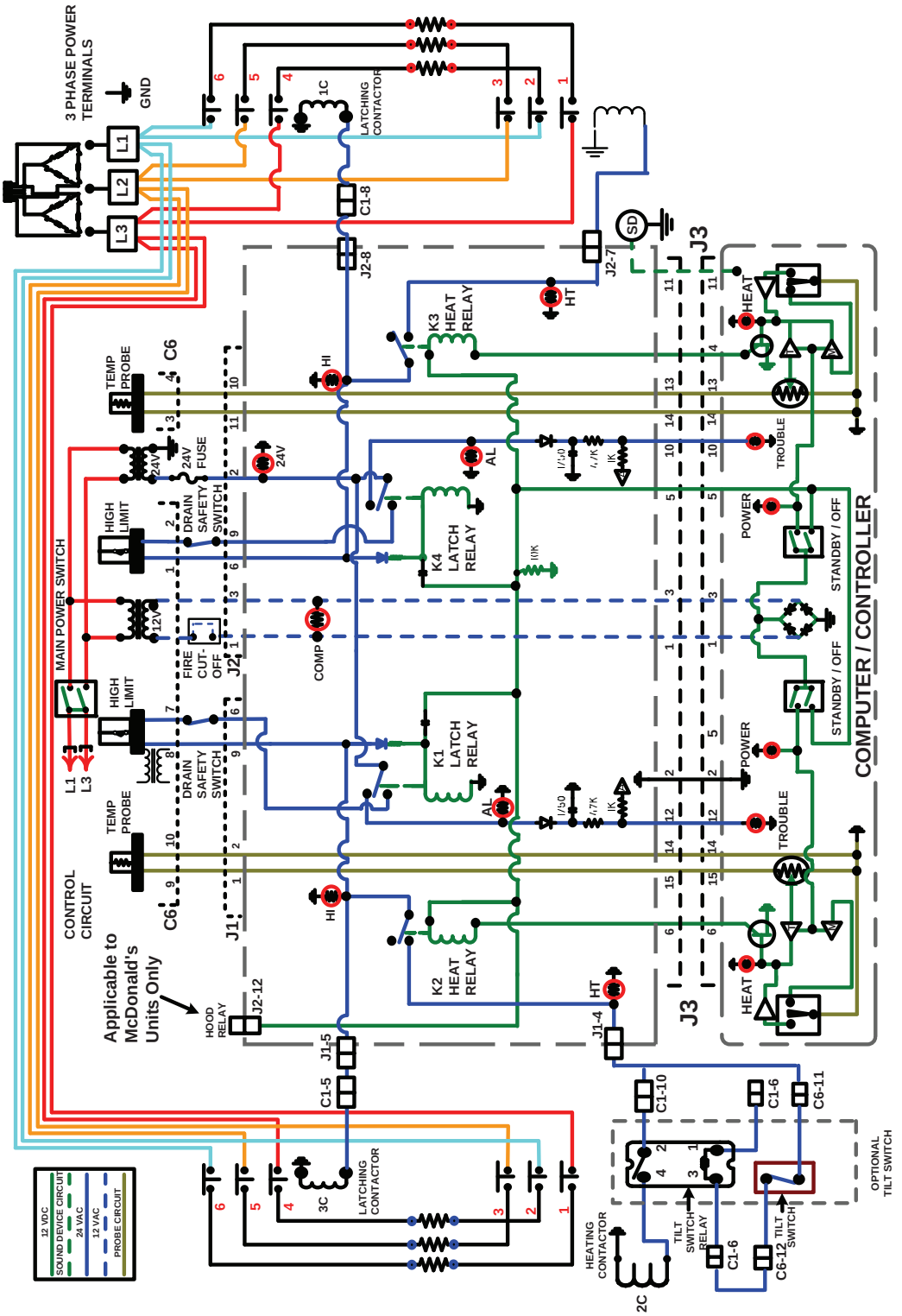
When the fryer is on, an element with two phases connecting internally will heat continuously. Use an amp meter on the element wires to determine which phases are shorted. Perform the check when the fryer is not calling for heat.

When an element shorts to the chassis or element housing, it heats continuously when the fryer is on. An amp meter will identify the line drawing current. Check when the fryer is not calling for heat.

H-SERIES AMP DRAW			
Voltage	**14kW**	**17kW**	**22KW**
208	39	48	61
240	34	41	53
480	17	21	27
220/380	21	26	34
230/400	21	25	32
240/415	20	24	31

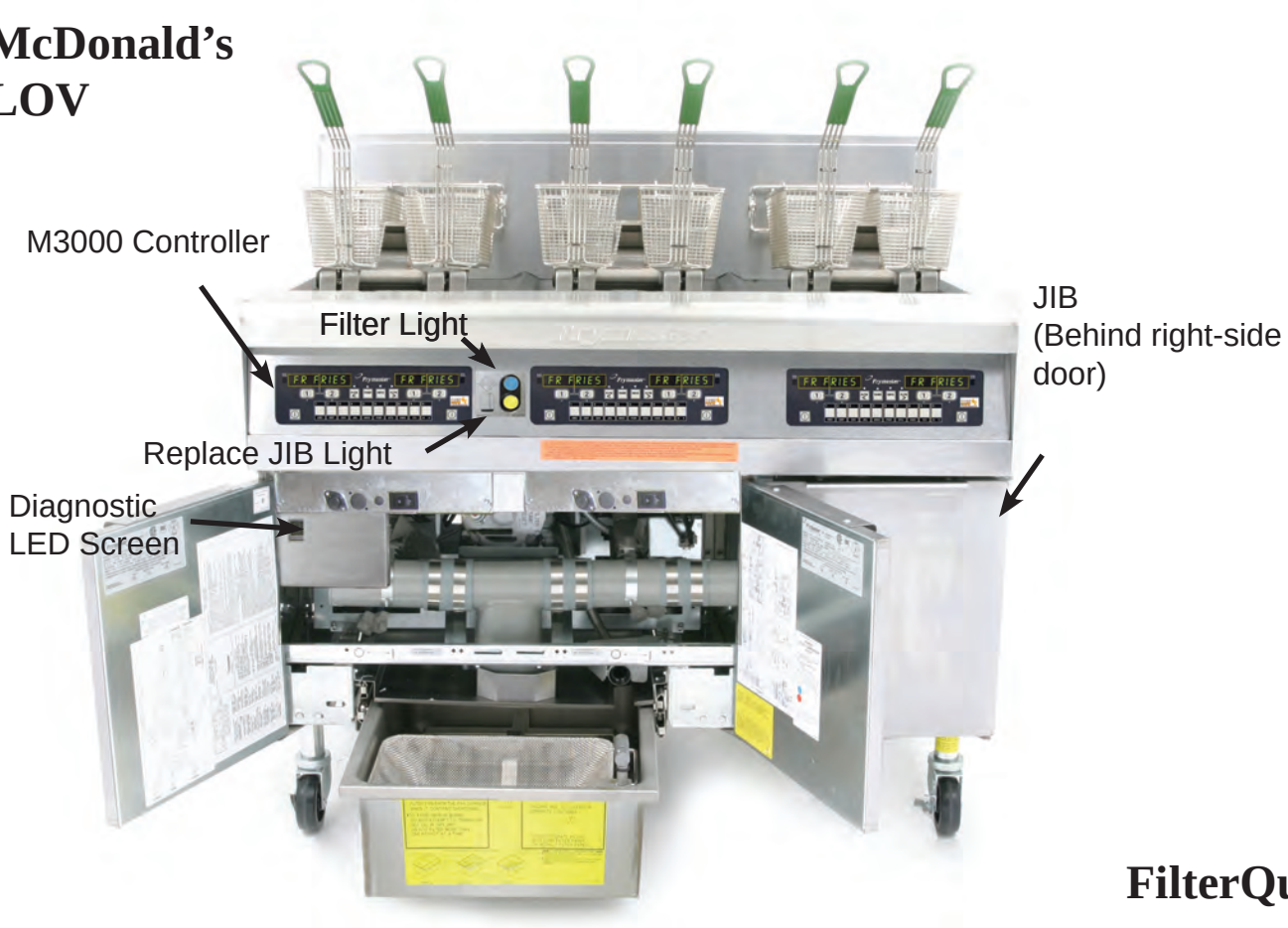
Rotating Electric RE14/RE17/RE22 Series (Including McDonald's) - Full-vat




3 PHASE POWER TERMINALS
GND
L1
L2
L3
1C
LATCHING CONTACTOR
C1-8
J2-8
J2-7
SD
HT
HI
K3 HEAT RELAY
K4 LATCH RELAY
K1 LATCH RELAY
K2 HEAT RELAY
AL
TEMP PROBE
C6
24V FUSE
24V
HIGH LIMIT
DRAIN SAFETY SWITCH
MAIN POWER SWITCH
12V
FIRE CUT-OFF
J2
COMP
J1
CONTROL CIRCUIT
Applicable to McDonald's Units Only
HOOD RELAY
J2-12
J1-5
C1-5
J1-4
J3
HEAT
TROUBLE
POWER
STANDBY / OFF
COMPUTER / CONTROLLER
3C
2C
HEATING CONTACTOR
TILT SWITCH RELAY
TILT SWITCH
C1-10
C1-6
C6-11
C6-12
OPTIONAL TILT SWITCH
12 VDC SOUND DEVICE CIRCUIT
24 VAC
12 VAC PROBE CIRCUIT

Chapter 4: Automatic Filtering Fryers

McDonald's LOV



FilterQuick

Features

• **Low volume frypot (LOV)** — 30 pounds rather than 50 pounds of oil.

• **Automatic top-off (ATO)** — Automatically maintains an optimal oil level with a reservoir in the cabinet.

• **CAN** — Controller Area Network

• **Manual Interface Board (MIB)** — Controls the filtration and top off system.

• **Automatic Intermittent Filtration Board (AIF)** — Controls the actuators.

• **Automatic filtration** — Performs hands-free filtering at prescribed cook cycle counts or at prescribed times.

• **Oil savings** — The combination of a low-volume fry vat and oil automatically kept at a optimal level, reducing oil usage.

Online Access to Automatic Filtering Fryer Manuals

LOV Gas Service

LOV Gas Parts

FilterQuick Gas Service

LOV Electric Diagrams

LOV Electric Service

LOV Electric Parts

FilterQuick Gas Parts

FilterQuick Electric Wiring Diagrams

FilterQuick Electric Service

FilterQuick Electric Parts

Auto Filtering Fryers Built on 30lb Platform

The auto filtering fryers are built on a 30lb frypot platform, which dials in a 40 percent reduction in oil to fill each pot. Oil Conserving Fryers (OCF's) and auto filtering models produce savings in oil with low-volume vats

The new platform also features:

- Automatic filtering.
- Automatic top off.

The auto filtering fryers bring the smaller (left) — 30 vs. 50lbs frypots — into an advanced platform. The vat sizes are largely the same. The cold zone is different.

The automatic filtering fryers get special attention at start up and time is allotted for training store staff on operation. Two hours per system is provided for start up and an additional two hours for training the staff.

Among the items that need stressing is response to the filter requests, changing of the filter paper or pad, keeping the filter pan free of debris and, on gas fryers, the cleaning of the Oil Is Back, or

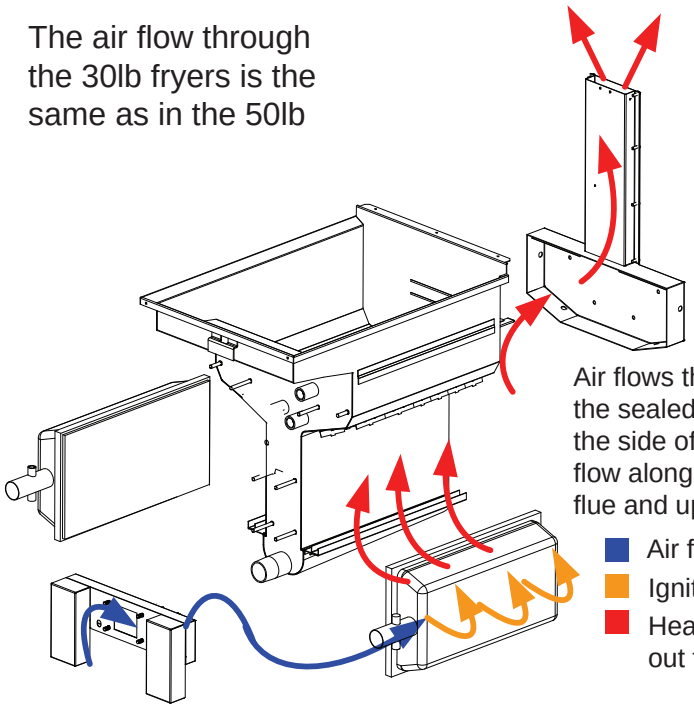
OIB, sensor.

The fryers monitor the length of time required for oil to return to the frypot after a filter cycle and interpret sluggish return times as a problem in the filter pan.

The volume difference is largely in the cold zone of the smaller frypot (right) which is shallower and narrower.

These fryers are available in a McDonald's-exclusive configuration and also a general market version. The fryers share a lot of similarities, including circuit boards that monitor the automated systems and a Controller Area Network (CAN) that carries the communication in the system. Although similar, the boards and their software are not interchangeable across the platforms.

The air flow through the 30lb fryers is the same as in the 50lb



Air flows through the plenum and into the sealed burners. Heat is applied to the side of the pot and exhaust gases flow along the side of the pot, to the flue and up.

- Air from plenum
- Ignited gas-air mixture in burner
- Heated air flowing across pot, out flue

Here are features the chain-specific and general market platforms share:

- A manual interface board, or MIB, monitors the oil filtration and top off.
- An automatic top off board, or ATO, works with the MIB to direct oil to a frypot low on oil.
- An automatic intermittent filter board, or AIF, operates actuators, opening and closing valves during an automatic filter cycle.
- A Controller Area Network (CAN) communication system.
- A JIB, or jug in a box, is positioned in the cabinet to provide oil to the top off system. The level of the JIB is also monitored by the fryer's control system.

Both fryer systems produce savings in oil with the use of the low-volume oil vats and the management of optimal oil levels. The systems differ in the operation of the automatic filter system.

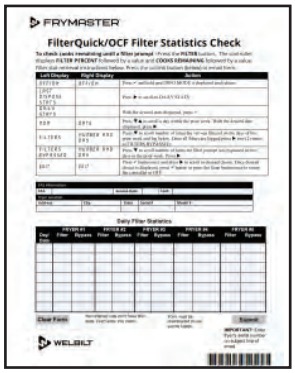
The McDonald's unit signals the need for filtration with a blue LED on the bezel and a prompt from the M3000 controller. Responding Yes to the prompt with a key on the controller launches the filter cycle.

The FilterQuick signals the need for a filter with a blue LED-encircled button and a prompt on the FilterQuick 3000 controller. Pushing the button opens the drain, the first step in the filter cycle.

Skipped Filters Leads to Fryer Problems

Ignoring requests to filter from the fryer will lead to early problems (such as the clogged pan at right) with a restaurant staff new to an auto-filtering fryer. Training on responding to the fryer is crucial.

Failure to respond to the fryer's request for filtering leads to oil issues: oil is slow to drain from the pot, oil is slow to return to the frypot from the filter pan. The pump gets clogged. These are often not warranty repair issues and, for that reason, Frymaster requires filter stats be collected on fryers such as the auto-filtering models that collect data.

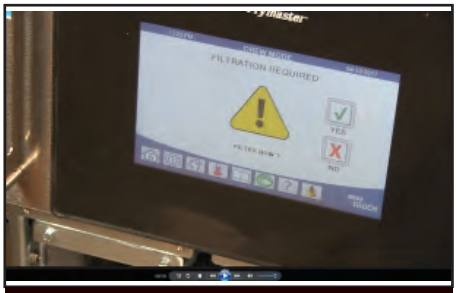

FRYMASTER

FilterQuick/OCF Filter Statistics Check

Daily Filter Statistics

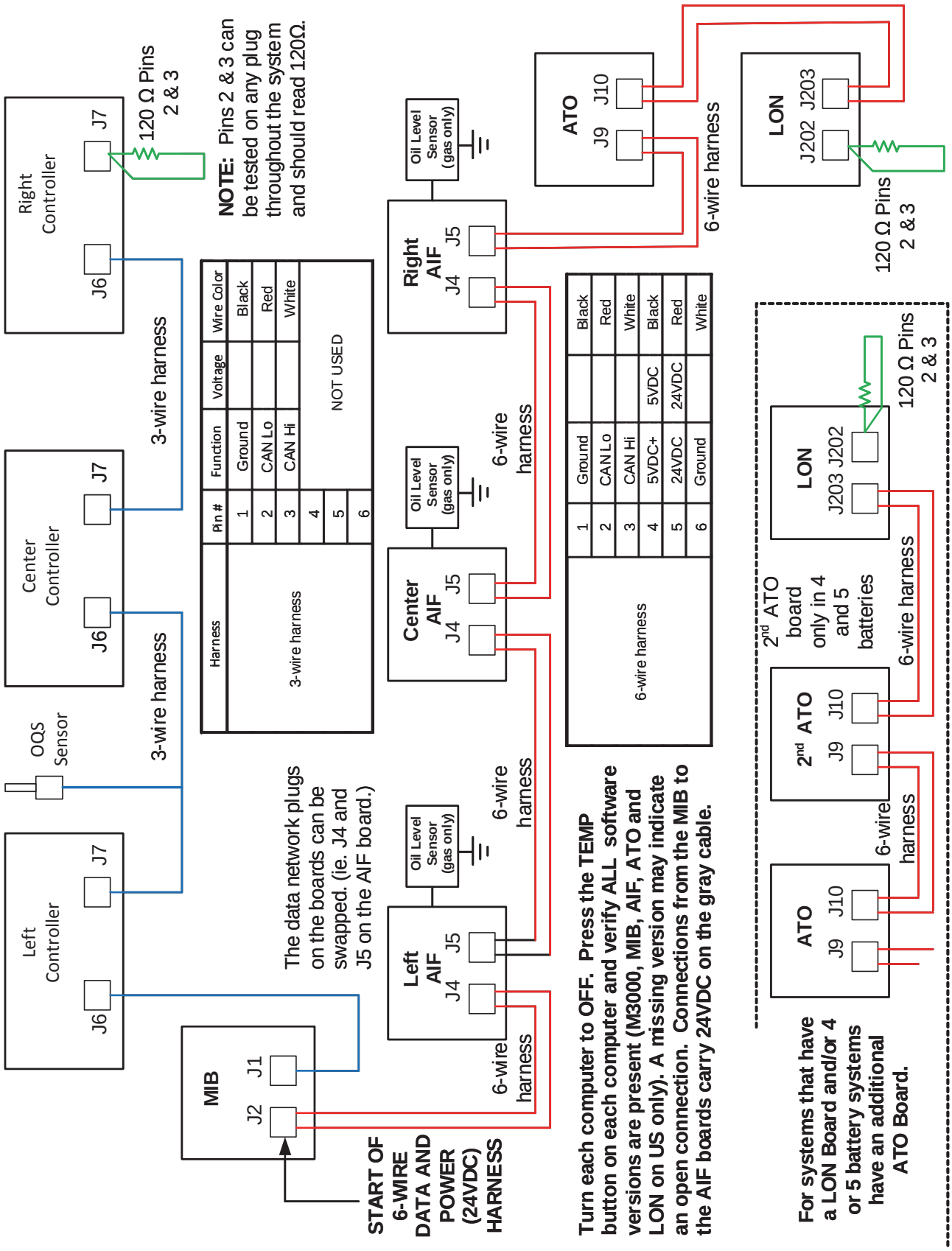
WELBILT

The form to collect the data can be filled out on a tablet and it is self-emailing with the push of a button on the form.



Video Content

Data Network Flow Chart



Auto Top Off System

The core of the system is the automatic top-off board. It senses when the oil is low and fills the pot to the top line.

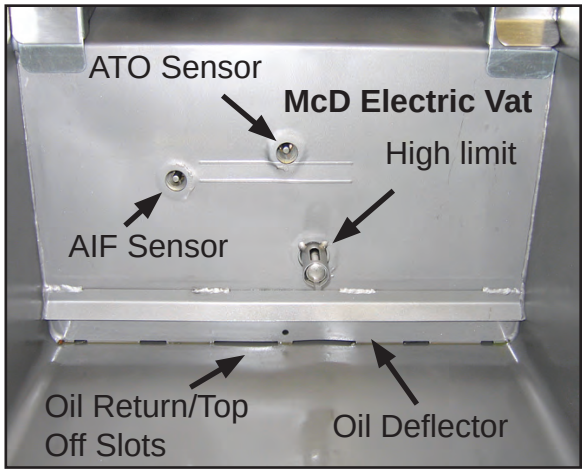
The oil level is monitored by an RTD (Resistance Temperature Detector) sensor in the frypot at the upper oil level. The oil is pumped to the pot from a reservoir, called a JIB (Jug In Box).

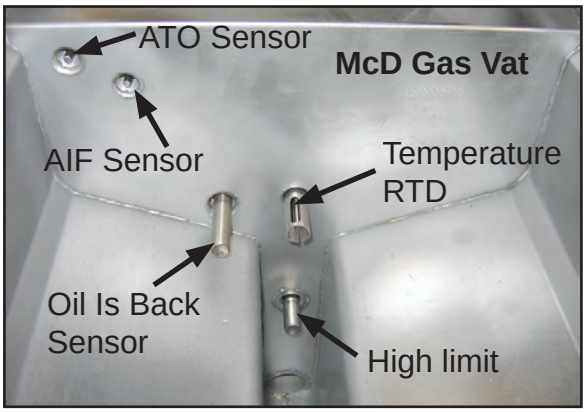
A circuit board, the ATO (Automatic Top Off), is located inside a box behind the JIB. It monitors the oil-level RTD and activates the pump when it senses an oil temperature drop of 60°F below setpoint, indicating the oil has moved away from the sensor. The ATO sends a signal to the MIB (Manual Interface Board), which then sends a signal to the AIF to open the actuator on the return valve of the frypot to be topped off.

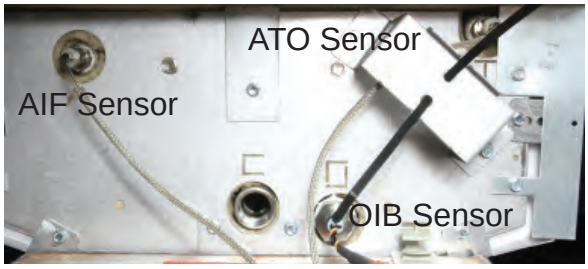
Once the actuator has opened the return valve, oil is pumped into the vat until the ATO RTD detects a temperature within 55°F of setpoint or 60 seconds elapses. When the RTD is satisfied, the actuator closes the valve. Top off will continue on the next vat if needed.

The system is not active until the oil reaches setpoint. That temperature is monitored by the temperature probe. The activation of the system is handled by the fryer's controller. The automatic top off system is also inactive during cooking, filter and dispose cycles.

When the JIB is empty, the 60-second pumping is followed by a short halt and then another pumping session. There is one longer pumping session and, assuming the RTD still doesn't sense oil, the empty JIB LED is illuminated or an EMPTY JIB display scrolls on the controller.



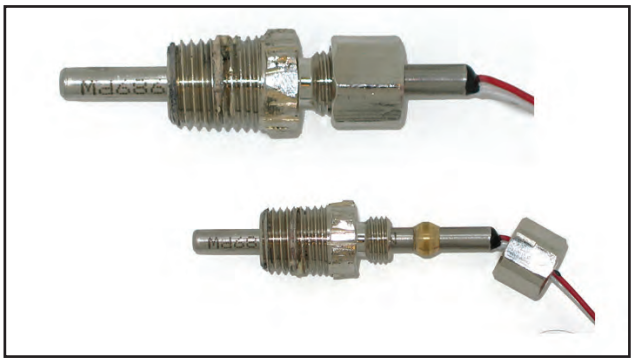




The probes that make the top off and automatic filtering work are shown inside and outide the frypot (above). The oil's movement can be hindered by clogs in the drain elbow (left) in stores that allow crumbs to gather in the frypot.

A JIB (Jug in a Box) is shown being placed in a fryer cabinet.

A 24-volt pump moves the oil from the JIB to the frypots. The pump is accessible from the rear of the fryer. It is mounted vertically or horizontally, depending on the space available in the fryer cabinet. If the hose is clogged and pressure builds in the system, a 45PSI pressure switch trips and prevents the pump from running. The system can be checked by removing the hose from the pump to see if the pump resumes running.



The ATO RTD (bottom in picture above) used in auto filtering fryers is similar to the probe used in the H55 (top) and has the same resistance scale. However, it is not interchangeable; it's much smaller. The low-volume frypot probe uses a nut and ferrule.

An Automatic Top Off Board, or ATO, (see arrow) monitors frypot oil levels and opens valves and runs a top-off pump to move oil from a JIB to the low frypot. The ATO board is housed behind the JIB along with transformers and a relay related to the top-off system. The McDonald's box may hold a LON board (eliminated in December 2014), a device for internal controller-based monitoring of the complete fryer system. The instructions for removal of the LON board are posted online: 8197211.

Diagnostics with the Controllers

The FilterQuick 3000 controller has a quick way to compare the resistance value of the ATO RTD to the vat temperature. This is a handy diagnostic tool. With the controller OFF, press and hold the TEMP button. The controller will display AIF and current temperature followed by ATO and current temperature. Compare the resistance of the probe against the controller's temperature reading, using the chart on page 6-8 and 6-9 If the values differ greatly, a harness issue may exist. This diagnostic feature is available on FilterQuick and OCF fryers. It's not on LOV fryers.

With either controller, verify the presence of system boards with this test, which should be the first step in diagnosing system related failures: failure to filter, failure to top off, etc.

With the controller displaying OFF, press the temperature button. The Controller/MIB/AIF/ATO versions scroll. Absence of a component in the display can point to a harness or connection issue. Also ensure each board's version numbers match and are the current version.

Troubleshooting the Top Off System

Problem	Probable Causes	Corrective Action
Frypot tops off cold.	Incorrect setpoint.	Ensure setpoint is correct.
No power to ATO board.	A. J5 connection unplugged. B. Fuse blown. C. Transformer malfunction.	A. Check to ensure J5 on front of ATO board is fully locked into connector. B. Ensure fuse below right control box (McD); right side of ATO box (FQF) is not blown. C. Check that proper voltage is present at transformer. See charts on pages 6-53.
The yellow JIB low light (McD platform only) won't illuminate.	A. Loose wire connection. B. Power in the component box is not present. C. Failed transformer.	A. Ensure the yellow LED is securely attached to plug J6 on the ATO board. B. Ensure power is present in the component box. C. If power is present in component box, check the transformer for correct voltage.

Problem	Probable Causes	Corrective Action
Frypots won't top off.	A. Probe temperature lower than setpoint. B. Oil is too cold. C. Bad connection. D. ATO board power loss. E. Failed transformer/ harness. F. ATO pump failed. G. Failed ATO board. H. ATO pump/lines plugged I. Empty JIB	A. Fryer temperature must be at setpoint. Check ATO probe resistance. If probe is bad, replace the probe. B. Ensure that the oil in the JIB is above 70°F (21°C). C. With the controller OFF, press **TEMP** button and ensure the ATO version appears. If not, the connection between the AIF and the ATO board may be bad. Ensure the 6-pin CAN connectors are tight between AIF (J4 and J5) and ATO (J10) boards. D. Power to the ATO board has been cut off. Restore power to the board and clear any service-required errors. E. Check power from transformer to ATO board. Ensure all harnesses are plugged securely into place. F. Check voltage to pump. Replace the pump if defective. G. Check for proper voltages using the pin-position charts found on pages 1-53 — 1-56. If ATO found defective, replace ATO board and clear any errors. H. Clear pump/lines. I. Ensure JIB has oil.
One vat tops off but other vats fail to top off.	A. Loose wire connection. B. Actuator issue.	A. Ensure all wiring harnesses are securely connected to ATO board and solenoids. B. Check return actuator to ensure actuator is functional.
Incorrect vat tops off.	A. Wired incorrectly. B. Flexlines connected to wrong vat.	A. Check wiring. B. Switch flexlines to correct vat.
One vat doesn't top off.	A. Filter error exists. B. Actuator, pump, loose connection, RTD or ATO issue.	A. Clear filter error properly. When CHANGE FILTER PAD (or paper) YES/NO is displayed, do NOT press any button until the pan has been removed for at least thirty seconds. After thirty seconds have elapsed, the controller returns to OFF or last display. B. Check actuator, ATO pump, wire connections, RTD and ATO board.

Auto Filtration (MIB and AIF)

The auto filtration system is controlled by the fryer's controller, the AIF (Automatic Intermittent Filtration) board and the MIB (Manual Interface Board). The filtration is largely hands-off. A button push starts the operation.

Actuators — linear on the early McDonald's fryers and rotary on FilterQuicks and later McDonald's units — operate the valves.

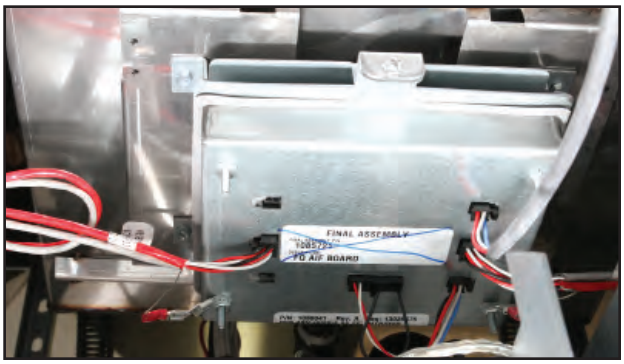
The controller is programmable and it allows filter cycles to be launched after a set number of cook cycles and a prescribed elapsed time.

The system can be set to lock out automatic filtration during busy times, such as the lunch rush.

The operator can decline a filter; cooking can continue. When an automatic filter cycle is launched, the MIB and the AIF boards communicate. The MIB controls and oversees the filtration; the AIF board operates the actuators, which open and close the valves.

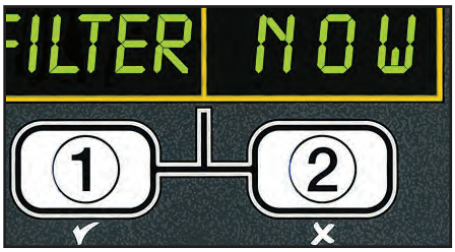
The MIB is in the fryer cabinet. It is partially covered by a sheet metal cover and the LED display is visible. Buttons behind the cover allow limited manual operation

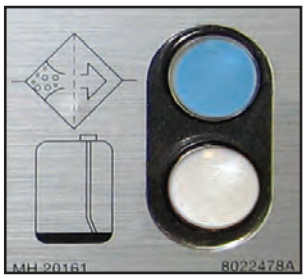
The LED displays codes that can be used to diagnose failures.



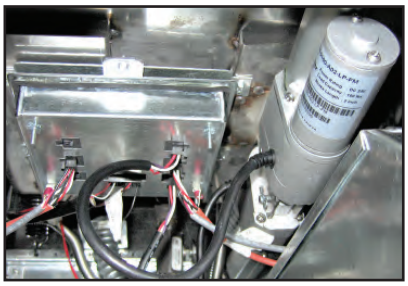
An AIF board is mounted under each fry vat.

Video Content
Click to Play FilterQuick (left) McDonald's (right)

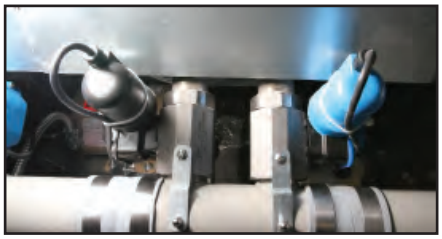




The controllers (FilterQuick above left and M3000 above right) scroll a request to filter when the fryer vat reaches a pre-programmed number of cook cycles. The McDonald's fryer (above) flashes a large blue LED on the bezel. The FilterQuick illuminates (right above) a button below the controller.



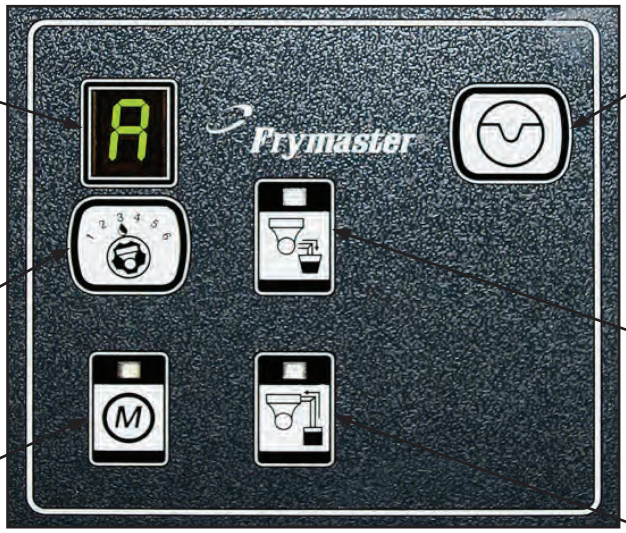
Valve actuators were initially linear (above right) on the LOV fryers. Rotary actuators (right) became the standard on the electric model in January of 2012 and on the gas in May of that year. Linear and rotary are not interchangeable.



Mode Display
Shows status (auto or manual) vat number (when operating valves manuals) and displays error codes.

Vat Selection
Selects vat for manual operation of valves.

Manual/Auto
Switches fryer from auto to manual operation.



The MIB board.

Reset
Short press -resets system, ensures all valves are closed. Long press - (15 sec) resets MIB board and clears all errors.

Drain
Opens and closes drain valves in manual mode.

Return
Opens and closes return valves and turns on filter pump in manual mode.

Error Codes

The mode display on the face of the MIB board displays a range of letters, which indicate activity or an error. **(See below.)**

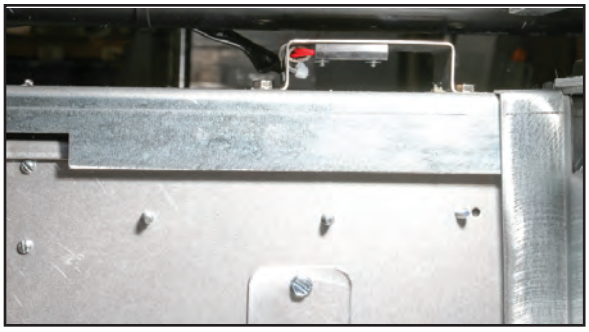
1L, 1r - 5L, 5r — Numbers correspond to vats: "L" indicates the left side of a split vat. "r" indicates a full vat or the right side of a split vat.

A — Auto mode: auto filtration enabled.

P — Pan switch: filter pan is not in place or not sensed. Auto Filtration disabled.

r — Reset: r alternating with a vat number indicates that the MIB board is resetting. If **r** is displayed without alternating with a vat number, a problem may exist with the MIB board itself.

The MIB is mounted behind the left door on automatic fryers. See arrow.

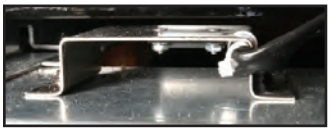


The reed switch is visible in the rear of the filter cabinet (top right) and close-up (right). The button-size magnet is circled on the pan front (below).

Detecting the Filter Pan

The filter pan must be present in the fryer for auto filtering to function. A circuit, closed when the pan is in place by a reed switch in the cabinet interior (left and below) and a magnet on the pan's front edge (circled below), tells the system that the pan is in place. The P, displayed on the MIB, goes away when the pan is detected.

The placement of the switch and the magnet has varied over time and auto filtering fryer models.



Manual Draining, Filling, Filtering with MIB

1. Press the M button, which switches the board to manual. The display becomes the number of the vat to be controlled manually.
2. Press the vat selector button until the desired vat number is displayed.
3. Press the drain button to drain the oil or press and hold the return button to return oil to the vat displayed. Opening the drain and pressing and holding the return button after valve is open allows filtration.
4. Pressing the M button again returns the board to automatic mode.

Troubleshooting the Manual Interface Board (MIB)

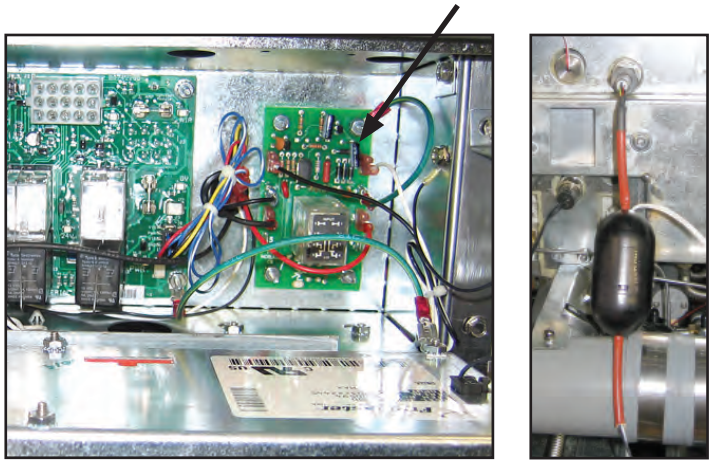
Problem	Probable Cause	Corrective Action
Auto filtration won't start. *** McDonald's only**	1. Filter pan out of position. 2. Oil Level is too low. 3. Ensure MIB board is not in manual mode. 4. Ensure MIB cover is not damaged and pressing against buttons. 5. Filter relay has failed. **6. AIF disable*** is set to YES, blue light doesn't light. 7. Filter motor thermal switch is tripped. **8. AIF clock*** enabled.	1. Ensure filter pan is fully inserted into fryer. 2. Ensure oil level is above the oil level sensor. 3. Ensure MIB board is in "A" automatic mode. 4. Remove and replace cover and see if filtration will start. 5. Replace filter relay with part number 807-4482 24VDC relay. **6. Set AIF* disable** in Level 1 to NO. 7. Press filter motor thermal switch. **8. Ensure AIF*** clock is set to disabled.
MIB display shows something other than an "A" or vat number.	An error has occurred and displayed character indicates error.	See MIB display diagnostics on page 1-9 for explanation.
No power present at the MIB board	Transformer has failed in left component box.	Check output on the left transformer in left component box; should read 24VAC. If not replace transformer.
MIB will not clear error.	Error remains in non-volatile memory.	Press and hold reset button in top right corner for five seconds. The drain, return and manual/auto LED's will illuminate and the MIB will reset and clear any remaining errors from memory. Allow 60 seconds to reset. If an error still exists, there's another issue.
MIB indicates incorrect number of vats.	• Network is not terminated correctly. • Wiring harnesses are loose or damaged. • AIF board issue. • Locator pin issue.	Ensure the CAN bus system is terminated at **BOTH ENDS** (on the controller connector J6 and on the ATO board connector J9) with a resistor-equipped 6-pin connector. • Unplug and reseat all wiring harnesses in CAN system. Resistance between pins 2 and 3 on the CAN network connectors should be 120 ohms. • Check software version numbers on all controllers and ensure all display an AIF version. If an AIF version is missing, the AIF board may be missing power. Check pins 5 and on J4 and J5 of the affected AIF board for proper voltage. • The locator pin in J2 of the AIF board is either loose or in the incorrect position. See the chart on page 4-45..

Problem	Probable Cause	Corrective Action
MIB board alternating "E" and "vat number and side."	Network error on the CAN bus communication.	A. Ensure the CAN bus system is terminated at BOTH ENDS (on the controller connector J6; ATO board connector J10) with a resistor-equipped 6-pin connector. B. With the controller OFF, press **TEMP** button and ensure the AIF version appears. If not, the 24V to the AIF boards may be missing. Ensure all 6-pin CAN connectors are tight between the controller (J6 and J7), MIB (J1 and J2), AIF (J4 and J5) and ATO (J10) boards. C. With the controller OFF, press TEMP button and ensure the ATO version appears. If not, check the CAN wire harness between the AIF board J4 or J5 and the ATO board J9 or J10. The ATO fuse on the right side of the ATO box may be loose or blown; the 110V to the ATO transformer may be missing or bad. The J4/J5 connector may be loose. D. Check if MIB has 24V on pins 5 and 6 of J2. Check to see if 24V is present on pins 5 and 6 of wire harness plugging into J4 or J5 of the first AIF board. If 24V missing, check the pins. Replace the harness if necessary. E. Check continuity between each color wire on the CAN connectors into J7 on the far right controller and J10 on back of the ATO board (black to black, white to white, and red to red) and ensure there is no continuity between different color wires (black to red, red to white, and white to black). F. Ensure black controller locator wires are connected from ground to correct pin position (see pages 1-54 — 1-58). G. Ensure all boards have the corner ground wire attached and tightened. H. Check for loose locator pin or incorrect positioning in J2 of the AIF board. See the charts on pages 1-54 — 1-58 of this manual for proper pin position. I. Bad MIB and/or AIF board. J. Broken resistor lead. Unwrap the resistor leads and check ends.

Troubleshooting the AIF System (AIF)

Problem	Probable Cause	Fix
Wrong vat opens.	1. Actuator is plugged into wrong connector. 2. Locator pin is in wrong position.	1. Ensure the actuator is plugged into the correct connection (J1 for FV return, J3 for DV return; J6 for FV drain, J7 for DV drain). 2. Ensure the locator pin is in the proper position in plug J2. (See charts on pages 1-53 — 1-60 of this manual for proper pin position.)
Actuator doesn't function.	1. No power to AIF board. 2. Actuator unplugged. 3. AIF board failure. 4. Actuator readings are out of tolerance. 5. Actuator is bad.	1. Check pins 5 and 6 of J2 at the MIB board. Should read 24VDC. Check voltage on pins 5 and 6 at the other end of the harness and ensure 24VDC is present. Check pins 5 and 6 for 24VDC on plugs J4 and J5 on AIF boards. 2. Ensure actuator leads are plugged into AIF board (J1 for FV return, J3 for DV return; J6 for FV drain, J7 for DV drain). 3. Check the power on the connector of the problem actuator while manually opening or closing the actuator. Pins 1 (black) and 4 (white) should produce +24VDC when the actuator is opening; -24VDC should be read from Pins 2 (red) and 4 (white) when the actuator is closing. If either voltage is missing, the AIF board is likely bad. Test the actuator by plugging into another connector to open or close. If the actuator operates, replace the board. 4. Check resistance of the potentiometer between pin 3 (purple wire) and pin 4 (gray/white wire). Closed should read 0-560Ω. Open should read 3.8KΩ - 6.6KΩ. 5. If proper voltages are seen at the connector and the actuator doesn't operate, replace the actuator.

Oil Return Sensor (OIB) Troubleshooting (Gas Only)



The oil return sensor is controlled by a small board and the electronics inside the egg-shaped device shown above. The board is in the control box; the "egg" is near the probe. The basket lift relay is used to close the coil on the OIB board in the McDonald's unit above. A relay in the box (arrow below) controls the coil on the board in a FilterQuick gas fryer.

The heated oil-return sensor prevents dry firing of the frypot. It's energized with line voltage when the controller is powered on. The sensor is in series with a 7-second time delay board in the control box that provides 24VAC to the gas valve. In the absence of oil, the sensor heats to its 570°F setpoint, which sets off a 4-second internal relay (in an egg-shaped device connected to the probe) to control its temperature. The 4-second cycling of the power disrupts the 7-second delay relay board providing power to the gas valve. The fryer can't heat without oil in the vat.

McDonald's Fryer: The otherwise unused basket lift relay controls the coil that sends power to the heated probe. Power goes out pin 7 on J1 (DV) or pin 7 on J3 (FV).

FilterQuick: A relay in the control box controls the coil that sends power to the heated probe.

Typical sensor-related failures:

- Low temp but no call for heat (heat light).
- Stuck in melt cycle with no call for heat.

Regular cleaning of the Oil is Back sensor is critical. Insulating oil residue affects its operation and oil won't return to the frypot.

If the controller doesn't exit melt cycle or continues to display low temp and does not heat, ensure that the gas supply, gas valve, and other components are working properly. If no heat lamp illuminates because no call for heat is initiated, check for carbon buildup on the OIB sensor.

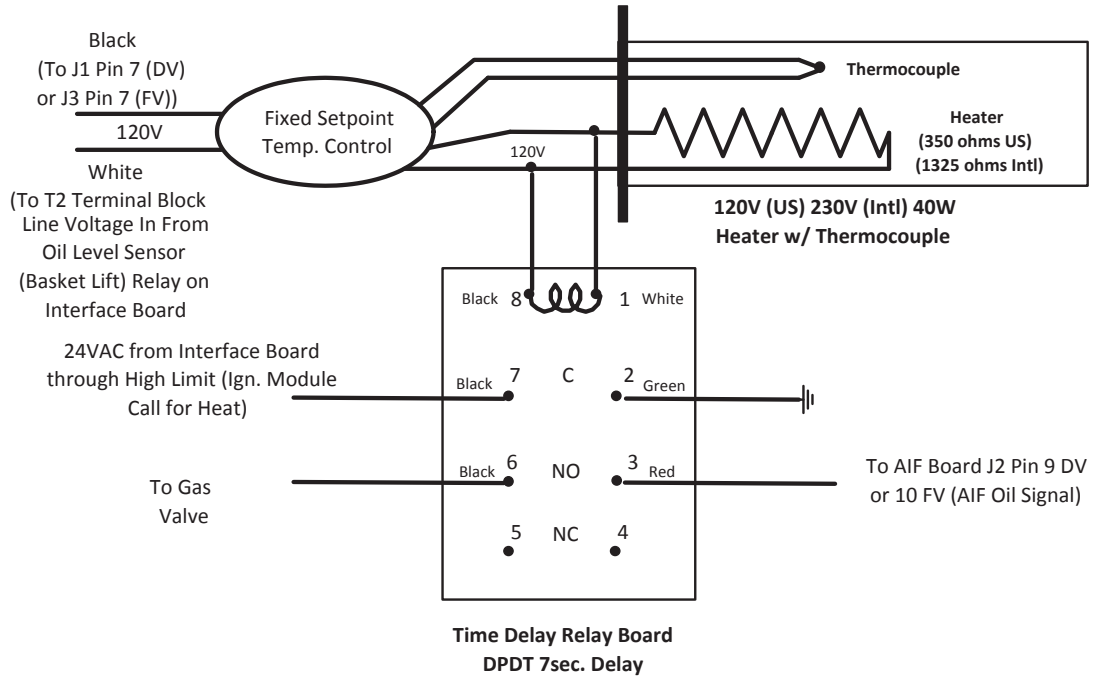
- Power to oil sensor (from relay used for basket lifts on other interface boards K1(DV) or K4 (FV)). Check pin 7 on J1 (DV) or pin 7 on J3 (FV) for 120VAC.
- Power to heater/relay coil on relay board. Check voltage to the coil on pins 8 and 1 to ensure that 120VAC is present with oil in the vat. If the vat is empty, the power will

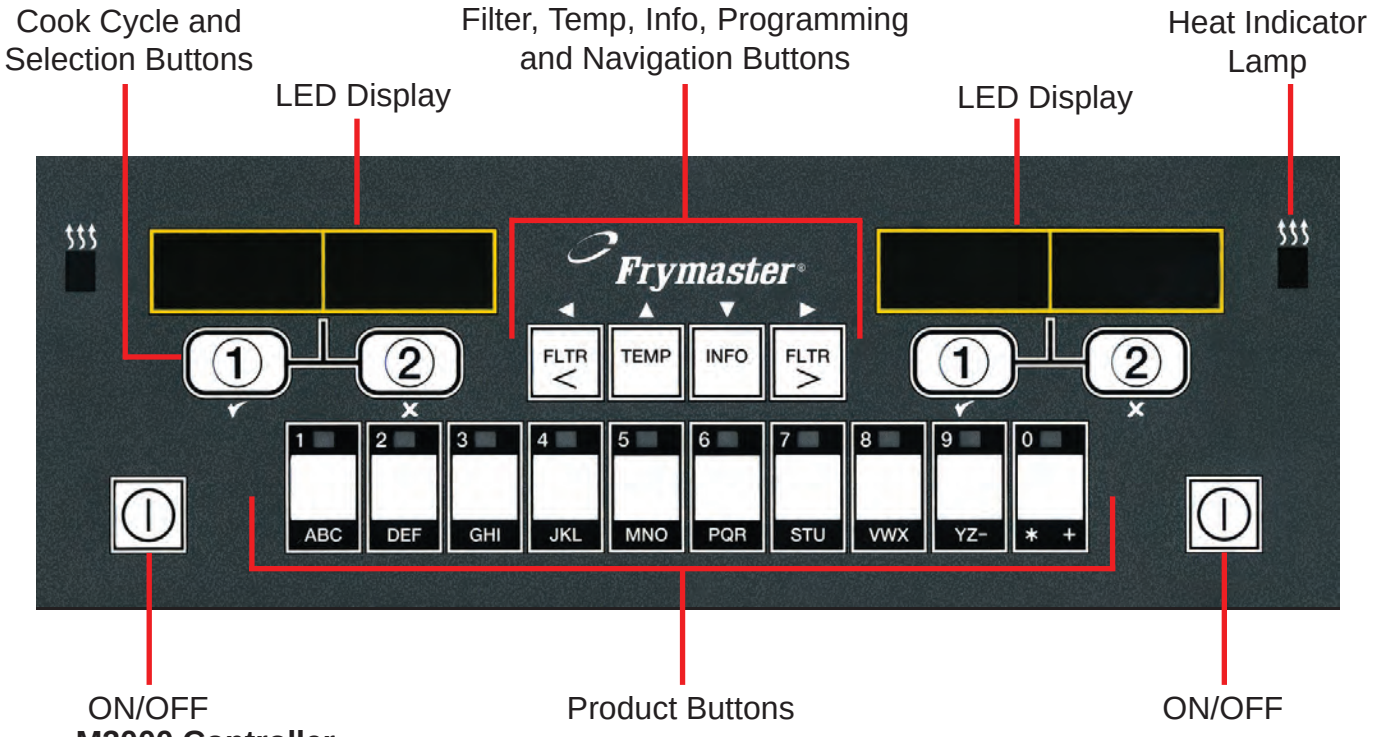
cycle 4 seconds on, 4 seconds off.

- Check between pin 3 and 2; 5VDC for air and 0VDC for oil. A common message for a shorted harness or issue is IS DRAIN CLEAR? with oil in the filter pan.
- Check ground on pin 2 on relay board to stud for a secure ground.
- Check AIF communication harness. Interrupted communication will prevent the fryer from heating.
- If the oil level sensor is cycling 4 sec. on/off and oil is surrounding the sensor and LOW TEMP is displayed, the sensor may have a carbon build up that is insulating the sensor. Use a no-scratch pad to remove carbon build up. Carbon build up on the OIB counts for a large number of customer issues.

LOV: 120V comes from the basket-lift relay, which is energized by 12VDC from the controller.

FilterQuick: 120V comes from the OIB relay, which is energized by 12VDC from the controller.





M3000 Controller

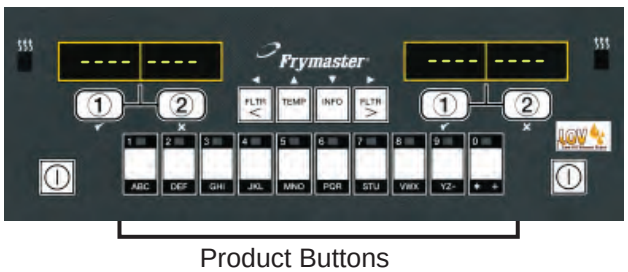
Overview

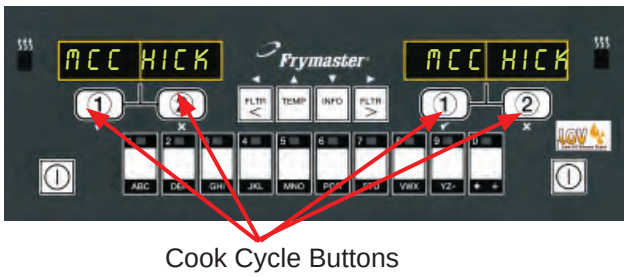
The M3000 has a 40-product menu capability. It operates on electric and gas fryers, both full- and split-vat.

On dedicated vats, press any of the cook cycle buttons to begin cooking. On non-dedicated (multi-product) vats, press a product button, and then a cook cycle button under the display showing the desired product name.

For example, a typical M3000 controller on a 3-vat fry station will display FR FRIES. Pressing one of the cook cycle buttons will begin a cook cycle for French fries.

The chicken/fillet station will usually display dashed lines [----]. Pressing the product button assigned to McChicken, for example, will cause MCCHICK to be displayed. Then, press a cook cycle button beneath the word MCCHICK to start a cook cycle for McChicken.





This chart maps the menu options available in the M3000.

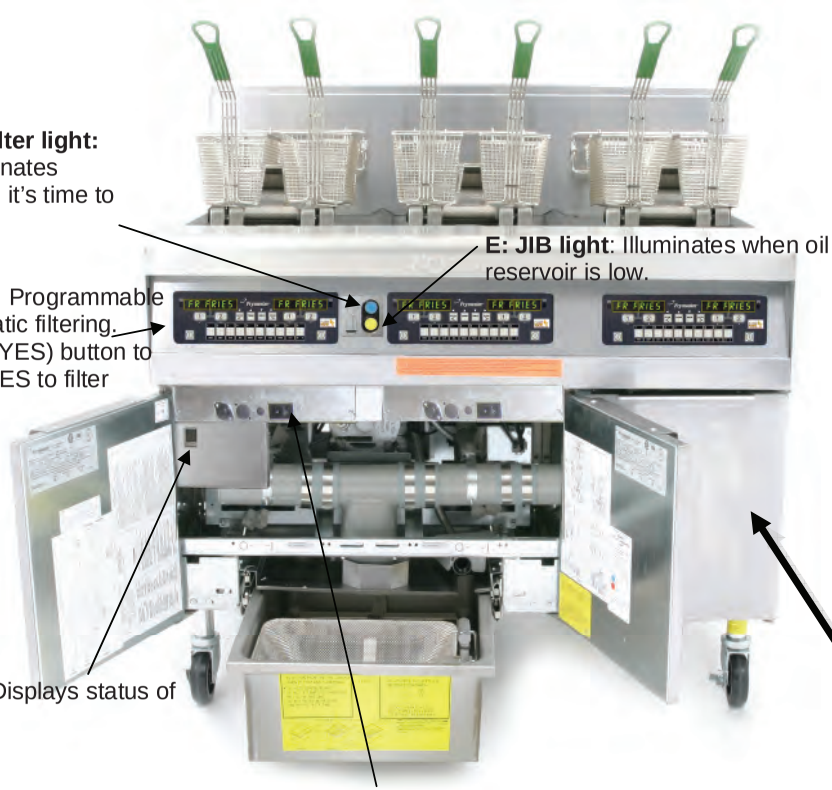
- Filter Menu
  - [Press and hold ◄ FLTR or FLTR ►]
  - Auto Filter
  - Maint Filter
  - Dispose
  - Drain to Pan
  - Fill Vat from Drain Pan
  - Fill Vat from Bulk (Bulk Only)
  - Pan to Waste (Bulk Only)
- Programming
  - Level 1 Program
    - [Press and hold TEMP and INFO buttons, 2 beeps, displays Level 1, enter 1234]
    - Product Selection
      - Name
      - Cook Time
      - Temp
      - Cook ID
      - Duty Time 1
      - Duty Time 2
      - Qual Tmr
      - AIF Disable
      - Assign Btn
    - AIF Clock
      - Disabled Filet of Fish only
      - Enabled
    - Deep Clean Mode
    - High-Limit Test
    - Fryer Setup
  - Level 2 Program (Manager Level)
    - [Press and hold TEMP and INFO buttons, 3 beeps, displays Level 2, enter 1234]
    - Prod Comp Sensitivity for product
    - E-Log Log of last 10 error codes
    - Password Setup Change passwords
      - Setup [enter 1234]
      - Usage [enter 4321]
      - Level 1 [enter 1234]
      - Level 2 [enter 1234]
    - Alert Tone Volume and Tone
      - Volume 1-9
      - Tone 1-3
    - Filter After Sets number of cooks before filter prompt
    - Filter Time Sets amount of time between filter cycles
  - Tech Mode
    - [Press and hold ◄ and ► for 10 seconds, 3 beeps, displays TECH MODE, enter 1650]
    - Clear Passwords
    - Clear Signatures
    - Filter Pad Time 25 hours or 12 hours.
- Info Mode
  - [Press and hold INFO for 3 seconds, displays Info Mode]
  - Full/Split Vat Configuration
    - Filter Stats
    - Review Usage
    - Last Load

M3000 Setup

Left Display	Right Display	Action
OFF	OFF	Press the **TEMP** and **INFO** buttons simultaneously for **THREE** seconds until LEVEL 1 is displayed.
ENTER CODE	Blank	Enter 1234.
LEVEL 1	PROGRAM	None required.
PRODUCT SELECTION	Blank	Press the ▲ button once to scroll to FRYER SETUP.
FRYER SETUP	Blank	Press the ✓ (**1**) button.
ENTER CODE	Blank	Enter 1234.
LANGUAGE	ENGLISH	Use the ◄ and ► buttons to scroll through the language menu. With the desired language selection displayed, press the ▼ button.
TEMP FORMAT	F	Press the ◄ and ► buttons to toggle between F and C temperature scales. **NOTE: F** is used for Fahrenheit, **C** is used for Celsius. With the desired format displayed, press the ▼ button.
TIME FORMAT	12 HR	Press the ◄ and ► buttons to toggle between 12HR and 24HR. With the desired format displayed, press the ▼ button.
ENTER TIME	HH:MM	Enter time in hours and minutes using the number buttons 0-9. **Example:** 7:30 AM is entered 0730 if using the 12 hour format. 2:30 is entered 1430 if using 24 hour format. To change AM and PM use the ▲▼ buttons. With the correct time displayed, press the ▼ button.
DATE FORMAT	US	Press the ◄ and ► buttons to toggle between US and INTERNTL. With the desired format displayed, press the ▼ button.
ENTER DATE	MM-DD-YY or DD-MM-YY	Enter the date using the number buttons 0-9. **Example:** US Format – Dec. 5, 2010 is entered as 120510. International Format – 5 Dec. 2010 is entered as 051210 With the correct date displayed, press the ▼ button.
FRYER TYPE	ELEC	Press the ◄ and ► buttons to toggle between ELEC and GAS. With the fryer type displayed, press the ▼ button.
VAT TYPE	SPLIT	Press the ◄ and ► buttons to toggle between SPLIT and FULL. With the vat type displayed, press the ▼ button.
OIL SYSTEM	NONE	Press the ▼ button.
DISPOSE SYSTEM	NONE	Press the ▼ button.
LANGUAGE	ENGLISH	Press the ▲▼ buttons to scroll and edit any additional fields. Press the ✕ **(2)** button to exit.
SETUP	COMPLETE	None required.
OFF	OFF	None required.

LOV™ Quick Start:

1. Turn on power switches (**D**).
2. Fill vats to lower fill line.
3. Turn computers on using the ⏻ button.
4. Computer displays “CHANGE FILTER PAD? YES/NO”
5. Press ✓1 (YES) and computer displays “REMOVE PAN”
6. Remove pan and computer displays “CHANGE FILTER PAD”
7. Assemble filter pan, ensuring pan is out 30 seconds. Re-install filter pan.
8. Position JIB (Jug in a Box) in the right cabinet, placing pick-up tube in open jug (**G**).
9. Press and hold the JIB reset switch until light goes out. (**F**).
10. Ensure ***A*** is showing on the display of the MIB. A ***P*** indicates the filter pan is not properly placed. Reseat the filter pan if necessary.
11. While cooking, respond YES to the Filter Now Prompt in display (**B**) and illuminated blue light (**A**) by pressing the ✓1 (YES) button.
12. Respond to the JIB light (**E**) by replacing the JIB (**G**) and resetting (**F**) or refilling the JIB with RTI system.



A: Filter light: Illuminates when it’s time to filter.

E: JIB light: Illuminates when oil reservoir is low.

B: M3000: Programmable for automatic filtering. Press ✓1(YES) button to respond YES to filter prompt.

C: MIB: Displays status of system.

D: Power switch: One in cabinet under each computer (domestic electric only).

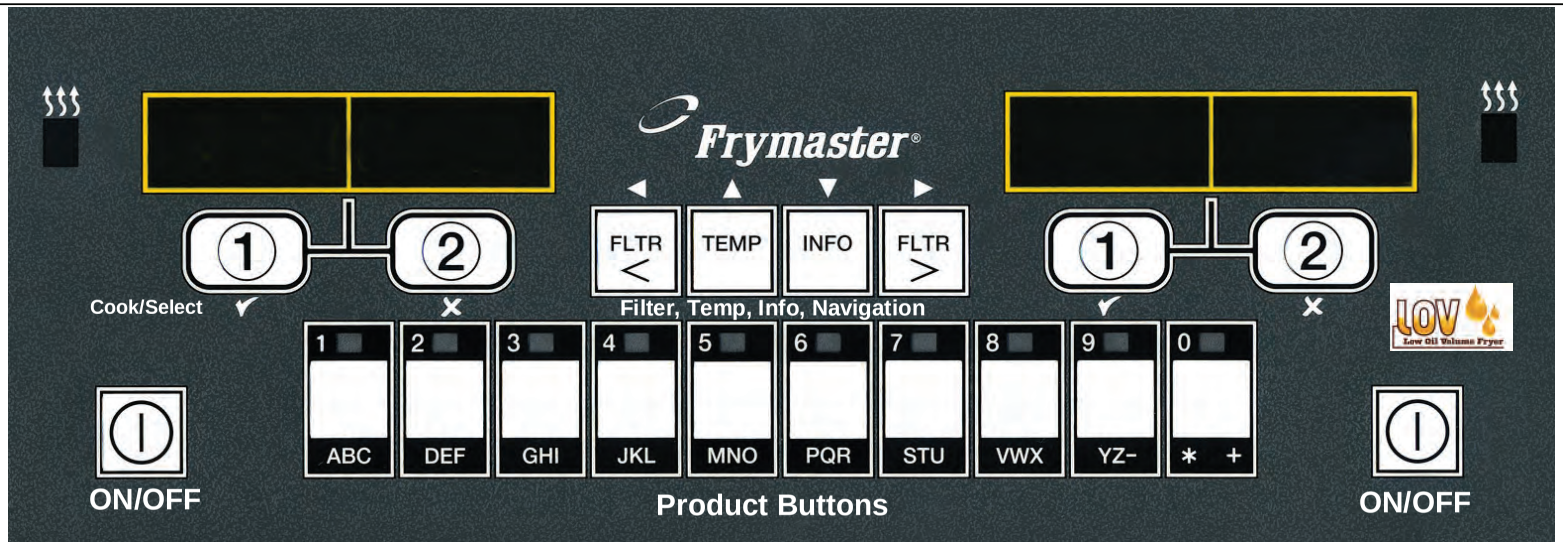
F: JIB reset button: Press and hold after replacing the JIB until yellow light goes out..

G: JIB: Jug in a Box, holds oil for automatic top-off system. It’s not used to fill the vats, just to maintain the oil level. Use only fresh oil in top off system.

Frymaster

LOV Low Oil Volume Fryer

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



M3000 Button Guide

ON/OFF: Full vat: either side turns on computer. Split vat: button turns on associated side.

Product Button: Access menu items in multi-product mode; enter items when programming.

Cook Cycle Buttons: ✓**1** Start cook cycles, respond yes to prompts.

×2 Start cook cycles, respond no to prompts.

Filter Buttons: Press and release displays cook cycles until next automatic filter cycle. Press and hold accesses filter menu.

Temp Button: Press once for current temperature, twice for setpoint. Press with computer off to display software version.

Info Button: Press and release displays recovery time; press and hold to accesses filter statistics.

Left/Right Cursor Buttons: Move through menu items and advance or reverse the cursor.

Up/Down Buttons: Advance or reverse in programming.

Navigation Quick Reference

Filter Menus

Press and hold either filter button. Computer displays Filter Menu, changing to Auto Filter. Scroll to other choices with ▼ ▲ buttons.
Make selection with ✓**1** button.
Exit, at any time, with **×2** button.

Programming Levels

Level 1: Used to modify or add new items, deep clean and enable or disable automatic filtration clock.

Press and hold Temp and Info buttons.
Code appears on display.
Enter 1234 with buttons.
Computer displays Level 1 changing to Product Selection .
Scroll with ▼ ▲ buttons to desired item.
Make selection with ✓**1** button.
Exit, at any time, with **×2** button.

Level 2: Used to modify product compensation, set passwords, adjust tone levels, and filter frequency, see error codes.

Press and hold Temp and Info buttons for 10 seconds.
Code appears on display.
Enter 1234.
Computer displays Level 2 changing to Prod Comp.
Scroll with ▼ ▲ buttons to desired item.
Make selection with ✓**1** button.
Exit, at any time, with **×2** button.

Info Mode: Used to access filter stats, review usage, last load.

Press and hold Info button for three seconds.
Computer displays Info Mode, changing to Filter Stats.
Scroll with ▼ ▲ buttons to desired item.
Make selection with ✓**1** button.
Exit, at any time, with **×2** button.

Troubleshooting

Fryer not topping off? Check JIB light, replace/refill.
Computer displays Insert Pan?: Reseat filter pan.
Computer displays Is Vat Full? Yes/No: Follow displayed steps to return oil.
Computer displays Change Filter Pad? Change filter pad, ensuring the pan is out of the fryer for at least 30 seconds.

LOV Quick Reference

Responding to Filtration Questions on the M3000 Computer Display

Is Vat Full?

1. Computer displays IS VAT FULL? YES/NO*.
2. Press ×2 (NO).
3. Computer displays FILLING, as the oil is being pumped back to the frypot.
4. After pumping cycle quits, computer displays IS VAT FULL? YES/NO.
5. If pot is filled press ✓1 (YES) and go to Step 9.
6. If pot is not filled, press ×2 (NO). The pump will run again for 30 seconds and display IS VAT FULL? YES /NO. (Three unsuccessful attempts to fill the vat will lead to a CHANGE FILTER PAD? YES/NO display.)
7. Computer displays CHANGE FILTER PAD? YES/NO. Press ✓1 (YES) .
8. Clean the filter pan and replace the filter pad.
9. Once the pan is pulled from the cabinet for a minimum of thirty seconds the computer display returns to the last state or OFF.
10. Re-install the filter pan.

*NOTE: After six unsuccessful attempts to fill the vat, the fryer displays SERVICE REQUIRED. Pressing NO allows cooking , but the fryer will re-prompt every 15 minutes. Call for service.

Clogged Drain

1. Computer displays CLEAR DRAIN changing to IS DRAIN CLEAR? alternating with YES.
2. Clear debris from the drain using the fryer's friend and press the ✓ (1 YES) button once the drain is cleared to continue.
3. The computer displays DRAINING and normal auto filtration operation resumes.

Responding to Fryer Filter Prompts

Yes to Filter Prompt

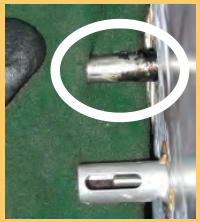
1. Computer displays FILTER NOW? YES NO and the blue LED flashes.
2. Press ✓1 (YES) .
3. Computer displays SKIM VAT.
4. Use skimmer to remove debris from frypot.
5. Computer displays CONFIRM? YES NO.
6. Press ✓1 (YES) .
7. Computer displays DRAINING. WASHING. FILLING during filtration.
8. Computer displays LOW TEMP until back to operating temperature.
9. Computer displays product name or dashed lines.

No to Filter Prompt

1. Computer displays FILTER NOW? YES NO and the blue LED flashes.
2. Press ×2 (NO).
3. Fryer resumes normal operation.

Daily Maintenance Filtration

1. Press and hold Filter button for three seconds (right side for full vat; desired side for split vat).
2. Computer chirps, displays FILTER MENU and AUTO FILTER.
3. Use ▼ button to scroll to MAINT FILTER.
4. Press ✓1 .
5. Computer displays MAINT FILTER? and YES NO.
6. Press ✓1 (YES).
7. Computer displays FILTERING.
8. Oil drains from frypot
9. Computer displays SCRUB VAT COMPLETE? and YES.
10. Scrub vat and Press ✓1 (YES).
11. Computer displays IS OIL SENSOR CLEAN? and YES (gas only).
12. Clean oil sensor (gas only) with a no scratch pad and press ✓1 (YES) (see photo).
13. Computer displays WASH VAT? and YES.
14. Press ✓1 (YES).
15. Oil flows across frypot and computer displays WASHING.
16. Computer displays WASH AGAIN? and YES NO.
17. Press ×2 for NO; ✓1 for YES.
18. After NO response, computer displays RINSING.
19. Oil washes across frypot.
20. Computer Displays RINSE AGAIN? and YES NO.
21. Press ×2 for NO; ✓1 for YES.
22. After NO response, computer displays POLISH? and YES NO.
23. Press ✓1
24. Oil flows through frypot.
25. Computer displays POLISHING and a five-minute countdown timer.
26. After five minutes, or a pressing of the ×2 button to stop the polishing, the computer displays FILL VAT? and YES.
27. Press ✓1 (YES).
28. Frypot fills and displays FILLING.
29. Computer displays IS VAT FULL? and YES NO.
30. Press ✓1 for yes; ×2 for no.
31. With yes selection, computer displays OFF.
32. With a no selection, pump runs and steps repeat, starting at step 29.



Responding to Low Oil Warning Light

JIB System (Jug In Box)

1. Orange LED on fryer lights.
2. Open cabinet door to access JIB.
3. Remove oil line from JIB
4. Remove JIB.
5. Open new oil jug and remove liner under cap.
6. Position pick-up tube in new box with attached cap in place.
7. Position the new jug in the fryer cabinet.
8. Press and hold orange reset button until orange LED goes out.

Bulk Oil System

1. Orange LED on fryer lights.
2. Open JIB door.
3. Press and hold orange reset button until the jug is full then release. DO NOT OVERFILL THE JUG.
4. Orange light goes out.

Frymaster

Daily Filter Pan Cleaning and Preparation

The filter pad in a LOV™ fryer must be replaced at least once daily. In high-volume stores it should be replaced more often.

Replace O-rings every 90 days.

The filter pan must be cleaned daily and the filter pad replaced. Follow these instructions to prepare the filter pan:

Remove and disassemble the pan. Discard old filter pad. Clean thoroughly. Leave no water in the pan.

Reassemble the pan in this order:

1. Position the inner screen.
2. Place the filter pad, textured side up, in the pan.
3. Position the hold-down ring on the filter pad.
4. Position the crumb tray.
5. Firmly seat the filter pan in the cabinet. Ensure the MIB display is on A.

FilterQuick 3000

Controller Menu Tree

Main Menu and Tech Modes

[With computer OFF, press and hold ✓(check) button 10 seconds, displays Main Menu - Product Setup]

- Product Setup
  - [Enter 1650]
  - Select Product
    - Long Name
    - Short Name
    - Cooking Mode
    - 1 Time
    - 1 Tempr
    - 1 Sensitivity
    - 1 Alarm Time (Shake)
    - 1 Alarm Name (Shake)
    - 1 Alarm Mode (Shake)
    - 1 Alarm Tone (Shake)
    - 2 Alarm Time (Shake) Time entered here, produces a 3rd alarm time.
    - Filter Prompt
    - Instant On
    - Hold Time
  - Load Standard (Load Default Product Menu)

NOTE: Three alarm times are programmable. The steps for programming the 2nd alarm are just like the first. A third alarm prompt follows completion of the 2nd.

- Vat Setup
  - [Enter 1656]
  - System
    - Language
    - 2nd Language
    - Locale (CE or Non-CE)
    - Energy (Gas or Elec)
    - Type (Vat)
    - System Volume (Sound Level)
    - Tempr Format (F or C)
    - Exit Melt Tempr
    - Cool Mode Tempr
    - Cool Mode Default
    - Fresh Oil
    - Waste
    - Recovery Alarm Manual or Auto
    - Basket Lift
    - Hold Time
  - Time/Date
  - DST(Daylight Savings Time) Setup
  - Filter
    - Cooks til Filter
    - Filter Lockout
    - EOD Filter Timer
    - EOD Filter Time
    - Flushing Timer
    - Clean (Hot or Cold)
    - Clean Timer (Hot or Cold)
    - Polish Lockout
    - 1 Polish Timer
    - 1 Polish Prompt Time
    - 1 Polish Delay Timer
    - 1 Polish Duration
    - Enable Filters Percent
    - 1 Polish Start Tempr
    - Clean and Filter Timer
    - Clean and Filter Prompt Time
    - Clean and Filter Delay Timer
    - Clean and Filter Start Tempr
    - Change Filter Pad Interval H
    - OQS
      - Clean and Filter with OQS
      - OQS Type
      - Display Type – Text / Number
      - Discard Now
      - Discard Soon
      - Dispose Delay Timer
  - E-Log List of last 10 error codes
  - Change Password

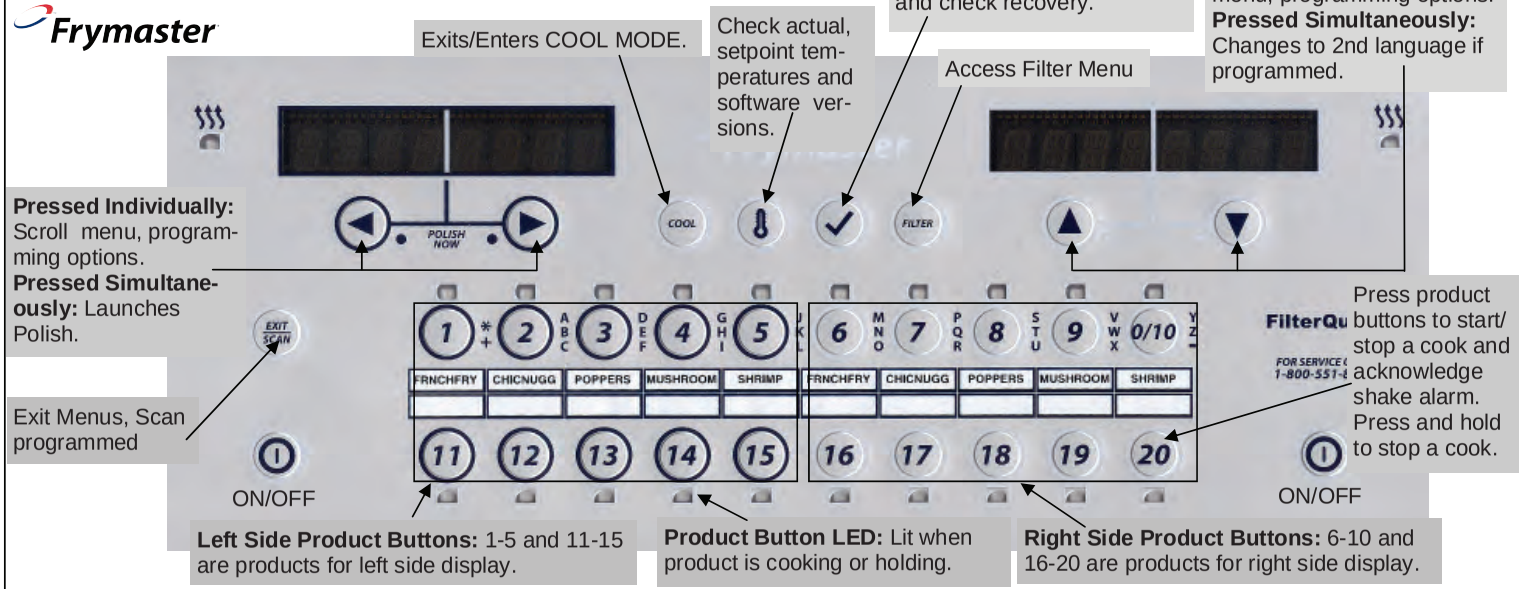
NOTE: Ensure Basket Lift is set to Disabled in Setup when attempting to change lange count.

- Tech Mode
  - [Enter 3000]
  - Clear E-Log
  - Clear Passwords
  - Lane Count
  - Hold Mode
  - Hi-Limit Test

NOTE: If the lane count doesn't change, set the basket lift to disabled in Vat Setup.

FilterQuick™: Quick Reference

Frymaster



ON/OFF

- Press ON/OFF button. Fryer enters melt cycle before switching to full temperature and heating to setpoint.
- Exit melt cycle by pressing and releasing the Exit Cool button or any programmed product button. Displays show Exit Melt? on left and YES NO on the right. Press ▲ to exit.

Cooking

- **COOL displayed:** Press product button or Exit Cool button; fryer heats to setpoint and displays READY.
  Press product button and drop product.
- **- - - - displayed:** The vat temperature is out of the READY zone.
- **READY displayed:** Press product button and drop product.
- **SHAKE displayed**: If shake is needed, alarm sounds. Press blinking product button to cancel alarm.
- **DONE displayed:** Press product button to cancel alarm.
- **HOLD displayed:** Press blinking product button to cancel hold alarm.
- **Cancel Cook Cycle:** Press and hold product button.

Controller Button Navigation

- **Product:** Press to start cook cycle. Press at end of cook cycle to stop alarm.
- **Exit/Scan:** Press once, all programmed product buttons are lit; Select Product displayed. Press product button to view product name. Press right arrow to view parameters. Press Exit/Scan again to repeat. Press Exit/Scan twice to escape.
- **Left/Right Arrows (◀▶):** Navigate options in left display. Press and hold simultaneously to launch Polish cycle.
- **Up/Down Arrows (▼▲):** Navigate options in right display. Press and hold simultaneously to change language if programmed.
- **Exit Cool:** Press to enter/exit Cool Mode.
- **Thermometer (🌡): Fryer ON:** Press and release for setpoint/left; vat temp/right.
- **Thermometer (🌡): Fryer OFF:** Press and release to display temperature, time, date, system version, FilterQuick version, circuit board versions.
- **Checkmark(✓): Fryer OFF:** Press and release: Check recovery; Press and hold 3 seconds: Scroll filter usage; Press and hold 10 seconds: Main Menu-Product setup
- **Checkmark(✓): Fryer ON:** Press and release: Check recovery; Press and hold 4 seconds: Info Mode.
- **Filter: Press and hold:** Filter options: FILTER, CLEAN AND FILTER, DISPOSE, DRAIN TO PAN, BOIL OUT or CLEAN, FILL VAT FROM PAN, PAN TO WASTE (Bulk only) and FILL VAT FROM BULK (Bulk only).
- **Filter: Press and release**: Displays total percentage of products cooked and cooks remaining to filter cycle.

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Common programming and navigation are shown below. The left and middle column show the computer displays; the right column has the action necessary to continue. Exit from a programming step at any time by pressing the Scan key until the display returns to its pre-programming status. To delete a product from a button enter a time of 0:00 and press the SCAN button.

Programming

Left Display	Right Display	Action
OFF	**OFF**	Press ✓until Main Menu changing to Product Setup is displayed.
PRODUCT setup	Blank	Press✓.
Product Setup	**Enter Code**	Enter 1650.
Select Product	Blank	Press desired product button.
LONG Name	**Product name** or **button number**	Enter product name with letter keys. Press ▶.
Short Name	**Product name** or **button number**	Enter abbreviated product name with letter keys. Press ▶.
COOKING MODE	**SINGLE SETPOINT**	Press ▶. If multiple setpoint cooking is desired press ▼ MULTIPLE SETPOINT.
1 Time	**0:00** or previously entered time	Enter time with numbered keys. Press ▶. (Enter 0:00 here and press Exit/Scan to unassign a button.)
1 TempR	**Temp**	Enter new temperature. Press ▶.
1 SENSITIVITY	**Number**	Set to desired position with ▼▲keys. Press ▶.
1 Alarm TIME	**0:00** or previously entered time	Enter time in cook cycle for audible alarm for shaking. Press ▶.
1 alarm name	**Shake**	Set to desired position with ▼▲ keys. Press ▶.
1 Alarm Mode	**Auto or manual**	Set to desired position with ▼▲keys. Press ▶.
1 Alarm tome	**Short**	Set to desired position with ▼▲keys. Press ▶.
2 Alarm Time	**:00**	This is a second alarm and is entered like the first.
Filter Prompt	**0**	Enter the number of cook cycles for the product before a filter cycle is prompted.
Instant On	**5** or previously set number	This is the time, in seconds, the fryer heats at 100%, after the product button is pressed before the controller adjusts the temperature. Enter value and press ▶. (Default is 5. 0=OFF). **NOTE: Instant on time may need to be adjusted for light cooking loads.**
HOLD TIME	**0**	Enter time in minutes to hold product before discarding. Press ▶.
Exit	**Exit**	Press Scan button to exit or the ✓ button for additional programming.

Filter Menu Navigation

Left Display	Right Display	Action
Cool or **READY**	**Cool** or **READY**	Press and hold Filter button for 10 seconds
Filter	Blank	Press ▶ to scroll to choices: Filter, Clean and Filter, Dispose, Drain to Pan, Boil Out or Clean, Fill Vat from Pan, Pan to Waste (Bulk only), Fill Vat from Bulk (Bulk only) and Exit. With the desired choice displayed press ✓. **(NOTE: Some choices are only available in the "ON" mode and some are only available when in the "OFF" mode.)**

Responding to Fryer Filter Prompts

Yes to Filter Prompt

1. Controller displays **FILTER NOW? Yes no**.
2. Press ▲ (YES) .
3. Controller displays **SKIM VAT**.
4. Use skimmer to remove debris from frypot.
5. Controller displays **START FILTRATION** and blue drain LED blinks.
6. Push the button with the blinking LED.
7. Controller displays **DRAINING** and **FLUSHING** during filtration.
8. Controller displays **FILLING** while the vat is filling.
9. Controller displays **LOW TEMP** alternating with the temperature or - - - - - - until back to operating temperature.
10. Controller displays **ready**.

No to Filter Prompt

1. Controller displays **FiLTER NOW? Yes no**.
2. Press (NO).
3. Fryer resumes normal operation.

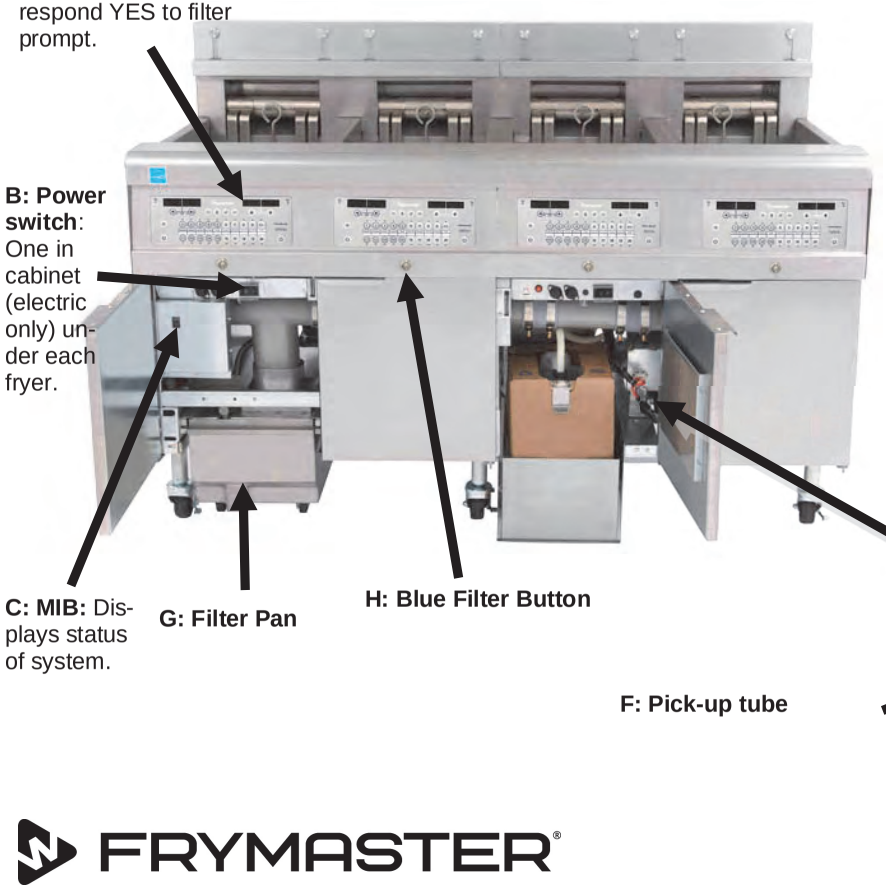
Responding to Low Oil Warning

JIB System (Jug In Box)

1. Controller displays **TOPOFF OIL EMPTY** in the left display and **CONFIRM** in the right display. Press ▲ (CONFIRM).
2. Open cabinet door to access JIB.
3. Remove oil line from JIB
4. Remove JIB.
5. Open new oil jug and remove liner under cap.
6. Position pick-up tube in new box with attached cap in place.
7. Position the new jug in the fryer cabinet.
8. Press and hold orange reset button for three (3) seconds to reset system.

FilterQuick™ Quick Start:

1. Fill vats with oil to lower fill line.
2. Turn on power switches if applicable (**D**).
3. Turn controllers on by pressing the power button.
4. Controller (**A**) displays “CHANGE FILTER PAD? YES/NO”
5. Press (YES) and controller displays “REMOVE PAN”
6. Remove filter pan (**G**) and computer displays “CHANGE FILTER PAD”
7. Assemble filter pan, ensuring pan is out 30 seconds. Re-install filter pan.
8. Position oil container [JIB (Jug in a Box)] in the right cabinet, placing pick-up tube (**F**) in open oil container (**E**).
9. Press and hold the top off reset switch (**D**) until JIB is full or Top Off Empty display goes out on controller **(A)**.
10. Ensure an **“A”** is showing on the display of the MIB. A **“P”** indicates the filter pan is not properly placed. Reseat the filter pan if necessary.
11. While cooking, respond YES to the Filter Now Prompt in display (**A**) by pressing the (YES) button and pressing the BLUE filter button when blinking (**H**) .
12. Respond to the empty oil container Top Off Empty notification by replacing the oil container (**E**) and resetting the top off reset switch (**D**) or refilling the oil container with bulk oil system.



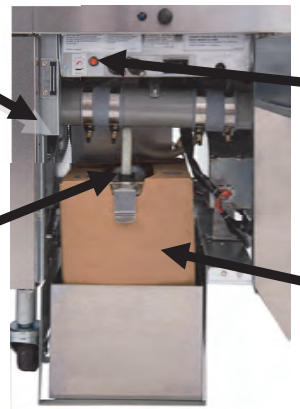
A: FQ3000: Programmable for automatic filtering. Press (YES) button to respond YES to filter prompt.

B: Power switch: One in cabinet (electric only) under each fryer.

C: MIB: Displays status of system.

G: Filter Pan

H: Blue Filter Button



F: Pick-up tube

D: Top off reset button: Press and hold orange button after replacing the oil until top off empty notice goes out.

E: Oil Container: Holds oil for automatic/manual top-off system. It’s not used to fill the vats, just to maintain the oil level. Use only fresh oil in top off system.

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

8 1 9 7 4 5 8

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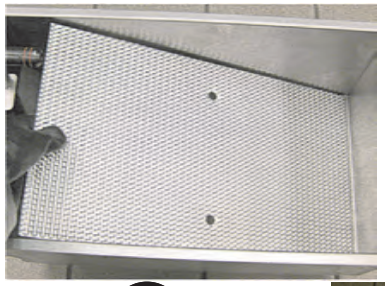
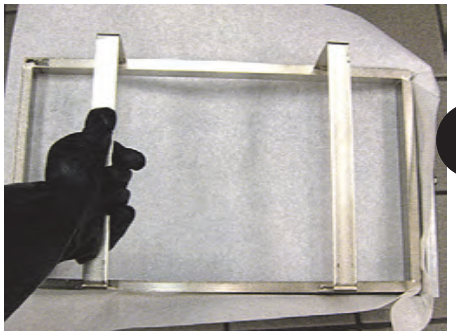
Daily Filter Pan Cleaning and Preparation

The filter paper in a FilterQuick™ fryer must be replaced at least once daily. In high-volume stores it should be replaced more often. Use Frymaster PN 8030445 16.5”x25.5” filter paper.

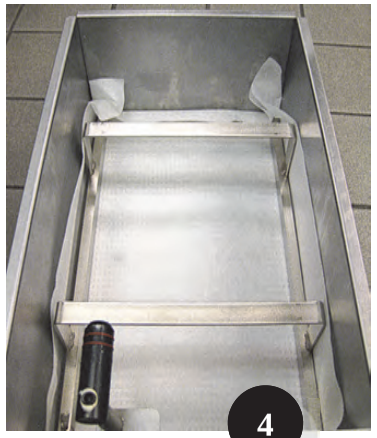


1

2



3



4

5

Replace O-rings every 90 days.

6

The filter pan must be cleaned daily and the filter paper replaced. Follow these instructions to prepare the filter pan:

Remove and disassemble the pan. Discard old filter paper. Clean thoroughly. **Do NOT leave any water in the pan.**

Reassemble the pan in this order:

1. Position the inner screen.
2. Place the filter paper on the pan.
3. Position the hold-down ring on the filter paper and lower into the pan.
4. Ensure the paper is folded up around the hold down ring.
5. Position the crumb tray.
6. Firmly seat the filter pan in the fryer. Ensure the “**A**” is visible on the display above the filter pan.

LOV/FQ Error Codes

CODE	ERROR MESSAGE	EXPLANATION
E01	**M3000 ONLY** REMOVE DISCARD (Right)	A product cook is started on the right side of a split vat or in a full vat that has a different setpoint other than the current vat temperature.
E02	**M3000 ONLY** REMOVE DISCARD (Left)	A product cook is started on the right side of a split vat or in a full vat that has a different setpoint other than the current vat temperature.
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 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.
E07	ERROR MIB SOFTWARE	Internal MIB software error.
E08	ERROR ATO BOARD	MIB detects ATO board connection lost; ATO board failure.
E09	ERROR PUMP NOT FILLING	Oil not returning to vat quickly. Possible problems: dirty pad, bad or missing O-rings, tripped or defective filter pump, actuators or linkage.
E10	ERROR DRAIN VALVE NOT OPEN	Drain valve failed to open; valve's position is unknown.
E11	ERROR DRAIN VALVE NOT CLOSED	Drain valve failed to close; valve's position is unknown.
E12	ERROR RETURN VALVE NOT OPEN	Return valve failed to open; valve's position is unknown.
E13	ERROR RETURN VALVE NOT CLOSED	Return valve failed to close; valve's position is unknown.
E14	ERROR AIF BOARD	MIB detects AIF missing; AIF board failure.
E15	ERROR MIB BOARD	Cooking controller detects MIB connections lost; check software version on each controller. If versions are missing, check CAN connections between each controller; MIB board failure.
E16	ERROR AIF PROBE	AIF RTD reading out of range.
E17	ERROR ATO PROBE	ATO RTD reading out of range.
E18	Not Used	
E19	CAN TX FULL©	Connection between controllers lost.
E20	INVALID CODE LOCATION	SD card removed during update.
E21	FILTER PAD/PAPER PROCEDURE ERROR (Change Filter Pad or Paper)	25 hour timer has expired or dirty filter logic has activated.
E22	OIL IN PAN ERROR	The MIB has detected oil may be in the pan.
E23	CLOGGED DRAIN (Gas)	Vat did not empty during filtration.
E24	OIL RETURN (level) SENSOR FAILED (Gas)	Oil return sensor may have failed.
E25	RECOVERY FAULT	Recovery time exceeded maximum time limit.
E26	**M3000 ONLY** RECOVERY FAULT CALL SERVICE	Recovery time exceeded maximum time limit for two or more cycles.
E27	LOW TEMP ALARM	Oil temperature has dropped lower than 15°F (8°C) in idle mode or 45°F (25°C) in cook mode.
E28	**FilterQuick3000 ONLY** HIGH TEMP ALARM	Oil temperature has risen 40°F (22.2°C) higher than setpoint. If temperature continues to rise, the high limit will shut the power off at 425°F (218°C) Non-CE or 395°F (202°C) CE.

FilterQuick 3000 OQS Error Codes

Code	Message	Description
E70	OQS Temp High	Oil temperature is too high. Filter between 300ºF and 375ºF.
E71	OQS Temp Low	Oil temperature is too low. Filter between 300ºF and 375ºF.
E72	TPM Range Low	The TPM is too low. This may be seen with new oil. The incorrect oil type may be selected in the setup menu. The sensor may not be calibrated for the oil type. See oil type chart in instruction document 8197316. If issue continues contact an FAS.
E73	TPM Range High	The TPM reading is too high. Dispose the oil.
E74	OQS Error	The OQS has an internal error. If issue continues contact an FAS.
E75	OQS Air Error	The sensor is detecting air in the oil. Check the O-rings and check/tighten prescreen filter to ensure no air is entering the OQS sensor. If issue continues contact an FAS.
E76	OQS ERROR	The OQS sensor has a communication error. Check connections to the OQS sensor. Power cycle the entire fryer battery. If issue continues contact an FAS.
E77-E80	N/A	

Bulk Oil-equipped Systems

Some stores may be equipped with bulk oil storage systems. If so, some of the settings, wiring, and troubleshooting may differ from normal LOV and FilterQuick fryer systems. **The LOV and FilterQuick fryers will ONLY operate with bulk systems that have a three-pole float switch. If the float switch is the older two-pole switch, call the bulk system provider.** The float switches are polarity specific and may short to ground and damage the MIB board.

Normal AC Voltage Measurements (MIB J6 8-pin connector with everything connected)

- Pin 1 to Pin 2 - 24 VAC.
- Pin 2 to Pin 8 - 24 VAC when waste tank is full, 0 VAC when it is not full.
- Pin 2 to Pin 3 - 24 VAC when RTI fill pump is on, 0 VAC when it is off.

Troubleshooting

Bulk oil system pump is not operating or JIB is not filling:

1. Reset the power; wait 60 seconds and see if the valve opens.

With the JIB button pressed:

2. Voltage at MIB board from Pin 1 to Pin 2 should be 24 VAC. If not, check connections from bulk system 24VAC transformer and check transformer's output.

3. Voltage at MIB board from Pin 2 to Pin 3 should be 24 VAC when filling the JIB or vat; if not, MIB board is bad or wires to pump relay are shorted or both.

4. Voltage at bulk system's add pump relay should be 24 VAC; if not, check wiring from MIB board. Check bulk system's relay.

5. Check voltage at ATO board on J8. Pin 9 to Pin 1 should be 24 VAC when the orange button is pressed.

Waste full signal: Pin 2 to Pin 8 should be 24 VAC when full, 0 VAC when not full; if there is no voltage change, then the connection from the bulk system switch or MIB board is bad.

Disposal, Fill with RTI-equipped Systems

Video Content
Click to Play

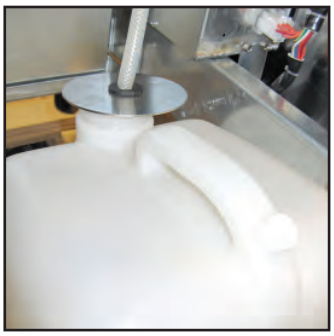
Bulk oil systems have large oil storage tanks, typically located in the rear of the restaurant, that are connected to plumbing at the rear of the fryer. Waste oil is pumped from the fryer through a fitting on the rear into the disposal tanks. Fresh oil is pumped from the fresh tank through another fitting.

The McDonald's and FilterQuick plumbing assemblies for the delivery of fresh oil and disposal of used oil are different. The McDonald's assembly is one-piece with a plate covering the port for the Hirschmann connector, which connects it to the wiring harness of the bulk system.

The FilterQuick plumbing is two piece. A Molex plug for the bulk wiring is on the disposal mounting bracket.

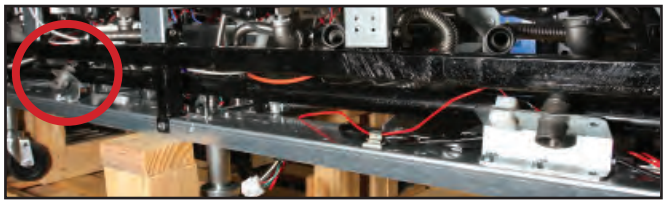
The systems have a great many similarities:

A plastic reservoir, often provided by the bulk oil supplier, replaces the cardboard surrounded-JIB in fryers without a bulk oil connection. Old oil, collected from the filter pan or another fryer, should not be added to the plastic JIB. Hot oil will damage the jug and debris in the used oil can clog the system.



The bulk JIB with fitting.

Opening the bulk dispose valve.

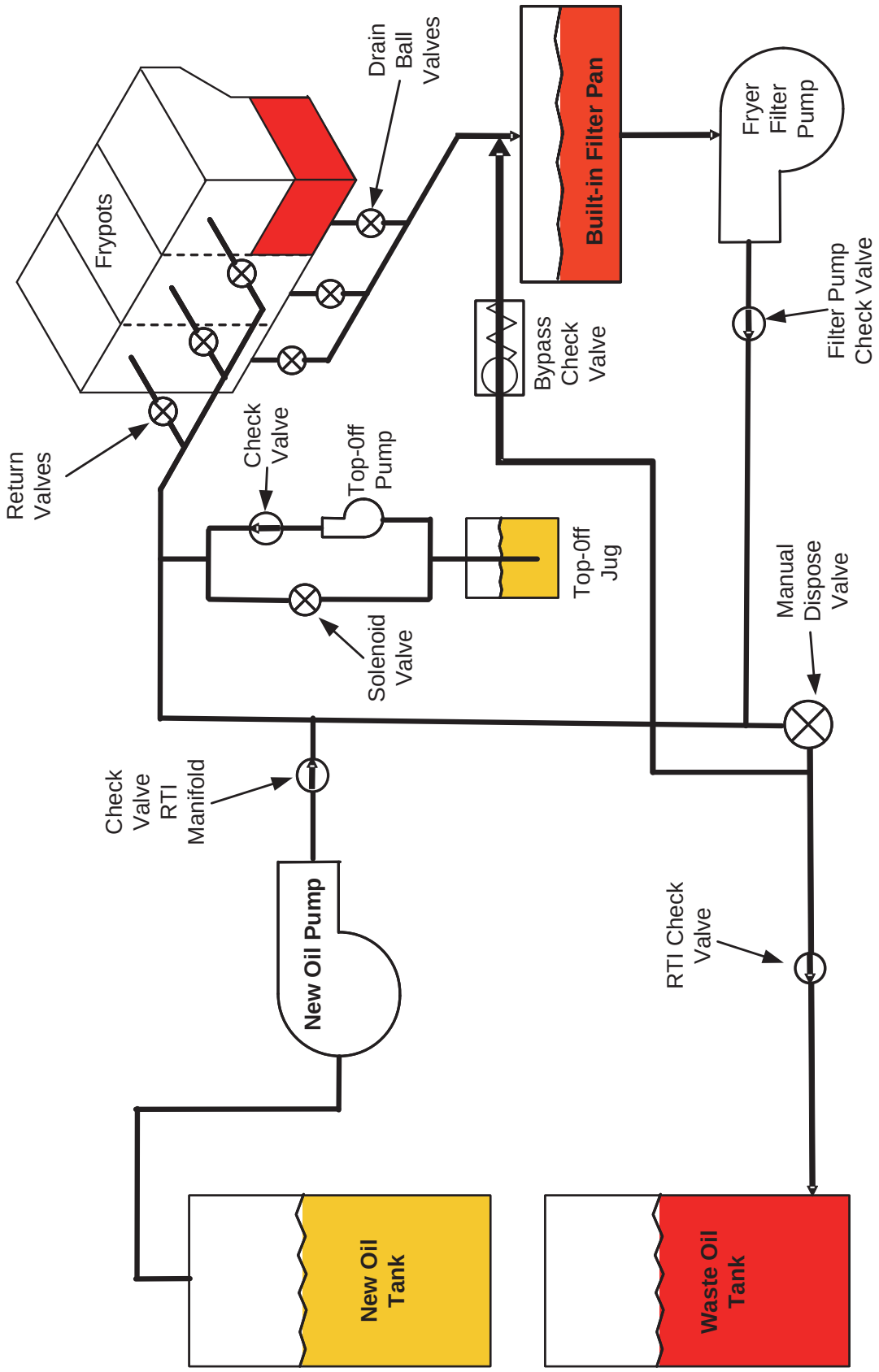


The FilterQuick bulk oil manifold is shown above and right. The fill line is on the left. The dispose is on the right next to the molex-plug,

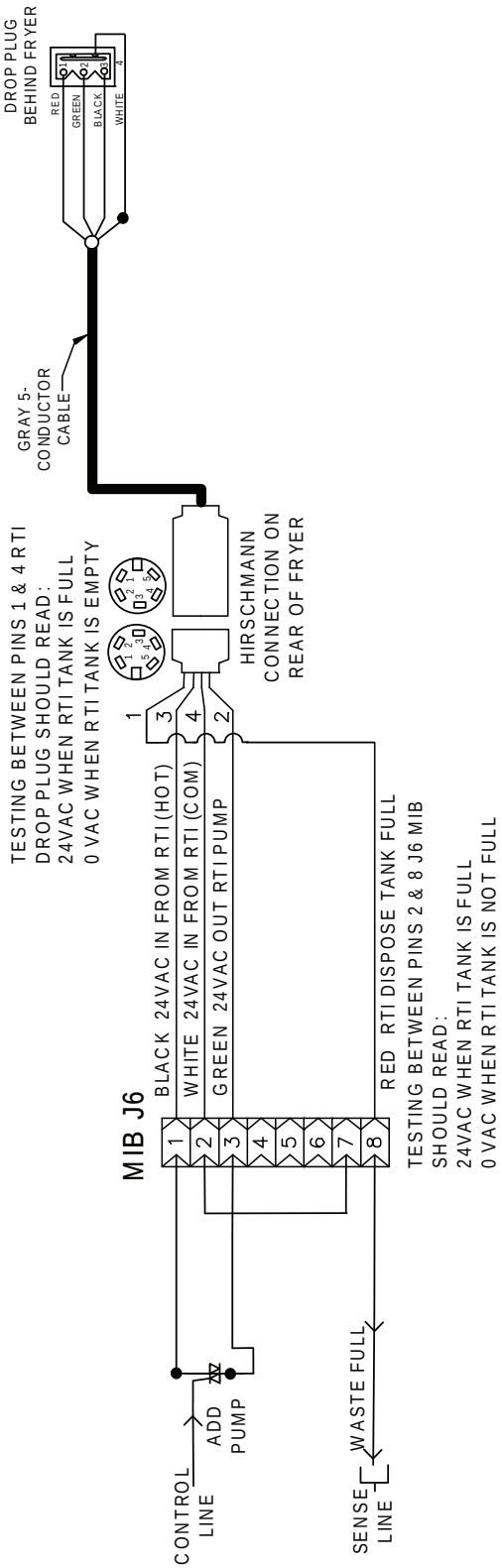
The orange JIB reset button is pressed to reset the system and pressed and held to refill the JIB from the bulk oil system.

The LOV bulk oil manifold is shown above and right. The fill line is on the left. The dispose is on the right next to the Hirschmann plug.

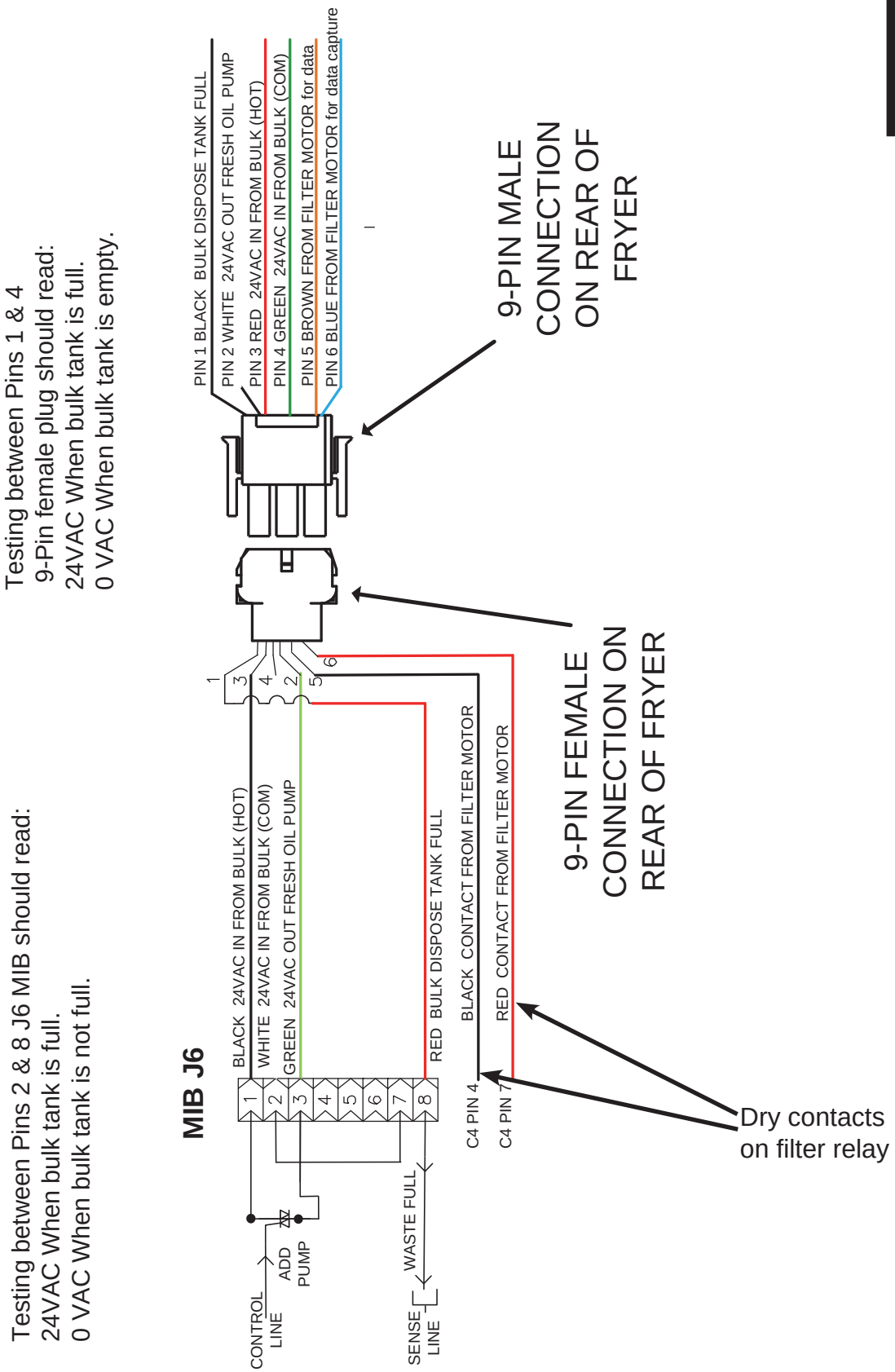
Fryer and Bulk Oil System Plumbing Schematic



Bulk Oil McDonald's Wiring



Bulk Oil FilterQuick Wiring



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McDonald's LOV Statistics Check

To check cooks remaining until a filter prompt –Press the **FILTER** button. Write the
Follow these steps to check the daily filter stats:

Press the submit button below to email form.

Left Display	Right Display	Action
OFF	OFF	Press and hold the **INFO** button for **THREE** seconds until INFO MODE is displayed.
INFO MODE	Blank	None required.
FILTER STATS	Blank	Press the ✓ (**1**) button.
Current Day (ex. TUE)	Current date (ex. 06/04/10)	Use the ◄ and ► buttons to scroll from the current day and going back one week. When the day is selected press the ▼ (**INFO**) button. **NOTE:** Split vats have an L or R in front of the left display indicating statistics for either the left or right side of the vat.
FILTERED	(ex. 4 FRI)	Press the ▼ (**INFO**) button. Number of times vat filtered and day.
FLT BPSD	(ex. 0 FRI)	Press the ▼ (**INFO**) button. Number of times filter was bypassed and day.
FLT AVG	(ex. 12 FRI)	Press the ▼ (**INFO**) button. Average number of cook cycles per filter and day.
FILTERED	(ex. 4 FRI)	Use the ◄ and ► buttons to scroll to another day or press the ✕ **(2)** button two times to exit.
OFF	OFF	

FAS Information					
FAS		**Service Date**		**Tech**	
Fryer Location					
Address	**City**	**State**	**Serial #**	**Model #**	

Daily Filter Statistics

	FRYER #1		FRYER #2		FRYER #3		FRYER #4		FRYER #5	
Date	**Filter**	**Bypass**	**Filter**	**Bypass**	**Filter**	**Bypass**	**Filter**	**Bypass**	**Filter**	**Bypass**

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Clear Form

Form must be downloaded to use submit button.

Submit

Important: Enter fryer's serial number in subject line of email.

NOTE: Unfiltered vats won't have filter stats. Do not include in matrix.

8 1 9 7 7 2 7

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FilterQuick/OCF Filter Statistics Check

To check cooks remaining until a filter prompt –Press the **FILTER** button. The controller displays **FILTER PERCENT** followed by a value and **COOKS REMAINING** followed by a value. Filter stat retrieval instructions below. Press the submit button (below) to email form.

Left Display	Right Display	Action
OFF/ON	OFF/ON	Press ✓ and hold until INFO MODE is displayed and release.
LAST DISPOSE STATS		Press ▶ to scroll to DAILY STATS.
DAILY STATS		With the desired stats displayed, press ✓.
MON	DATE	Press ▼▲ to scroll a day within the prior week. With the desired date displayed, press ▶.
FILTERS	NUMBER AND DAY	Press ▼ to scroll number of times the vat was filtered on the days of the prior week and log below. Once all filters are logged press ▶ two (2) times to FILTERS BYPASSED.
FILTERS BYPASSED	NUMBER AND DAY	Press ▼ to scroll number of times the filter prompt was bypassed on the days in the prior week. Press ▶.
EXIT	EXIT	Press ✓ button once and press ▶ to scroll to desired choice. Once desired choice is displayed, press ✓ button or press the Scan button once to return the controller to OFF.

FAS Information					
FAS		**Service Date**		**Tech**	
Fryer Location					
Address	**City**	**State**	**Serial #**	**Model #**	

Daily Filter Statistics

Day/ Date	FRYER #1 Filter	FRYER #1 Bypass	FRYER #2 Filter	FRYER #2 Bypass	FRYER #3 Filter	FRYER #3 Bypass	FRYER #4 Filter	FRYER #4 Bypass	FRYER #5 Filter	FRYER #5 Bypass

Clear Form

Non-filterred vats don't have filter stats. Don't enter into matrix.

Form must be downloaded to use submit button.

Submit

IMPORTANT: Enter fryer's serial number on subject line of email.

WELBILT

8 1 9 7 7 2 8

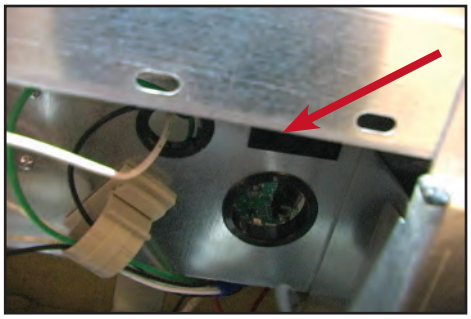
Board and Controller Replacement

Readdress All Boards

It is necessary to readdress the system when any board or controller has been replaced or when the system has been changed from JIB to BULK oil. A readdress resets power to the entire fryer battery.

The control power reset switch is a momentary rocker switch located behind the control box, above the JIB on electric and under the far left control box on gas, that resets all power to all the controllers and boards in the fryer. Press and hold the switch for at least **15 seconds** to ensure power has sufficiently drained from boards. After releasing the momentary control power reset switch, wait at least 60 seconds before starting a function.

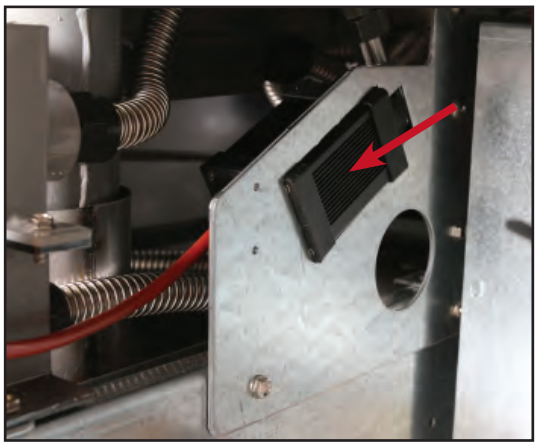
Resetting the power on an electric LOV.



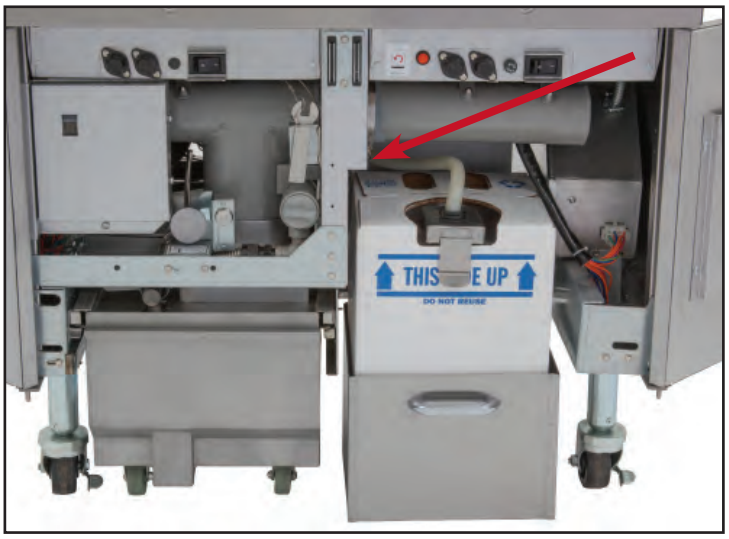
Reset switch on gas LOV.

Oil Quality Sensor

The Oil Quality Sensor, or OQS, was introduced in the fall of 2015. The sensor is in line with the flow of oil as it is filtered. The unit, available on McDonald's LOV or Filter-Quick fryers, measures total polar material (TPM's). The count, which is displayed on the controller, is a measure of the oil quality and its service life. The type of oil used in the restaurant, which effects how the readings are taken, must be entered during the setup of the controller/OQS system. The user is prompted to dispose of the oil as the TPM count goes up. The conroller can display the actual TPM count or a text message, indicating oil quality.



The sensor (arrow) is shown mounted adjacent and above the oil pan.



The oil sensor and its related in-line pre-filter are installed above and adjacent to the filter pan (see arrow above).

Video Content

The sensor is wired in series with the CAN bus. The existing CAN cable is disconnected from the second controller from the left and the sensor plugged in. The OQS sensor cable is shown on the right: black terminal to existing CAN; gray to controller and ground.

Oil Quality Sensor

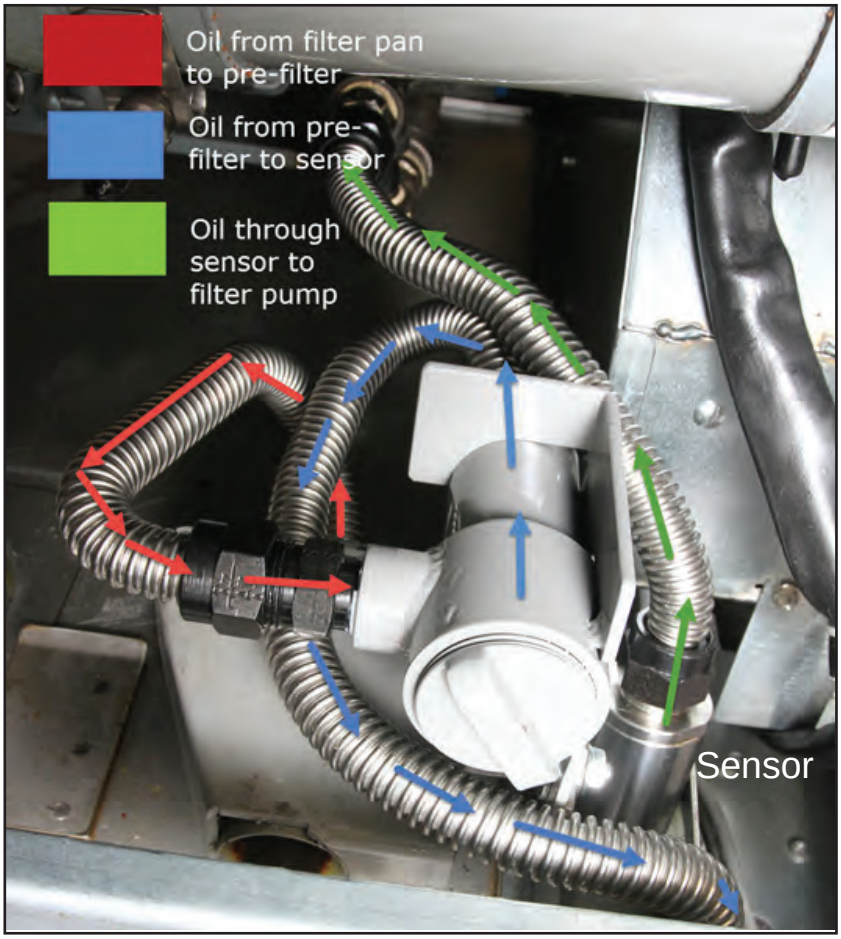
Troubleshooting

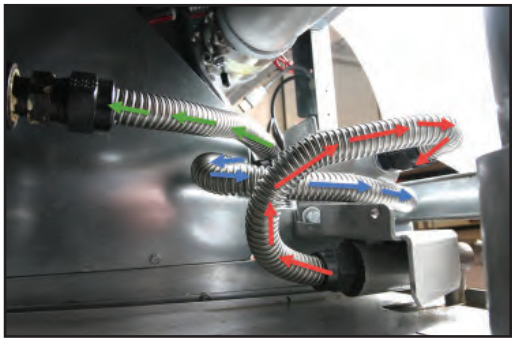
Problem	Corrective Action
No TPM results displayed	**Check the following items and perform another OQS filter.** • Ensure the vat is at setpoint temperature. • Inspect the pre-screen filter and ensure it is screwed in tightly. • Inspect the O-rings on the filter pan, and ensure they are both present and not cracked or worn. If so, replace them. • Ensure the filter paper is not clogged and clean filter paper is used. Did the vat refill the first time for the previous filter? If not change the filter paper.

Viewing OQS TPM Stats

Left Display	Right Display	Action
OFF/ON	OFF/ON	Press ✔ until Info Mode is displayed. Release
Last Dispose Stats		Press ◀ two times to scroll to TPM.
TPM		With desired stats displayed, press ✔.
Current day	Current day	Press ▼ to view TPM.
TPM	Number/Current Day	Press ▲ ▼ to scroll for last measured TPM value that day. Press ▶. NOTE: If OQS is not installed, or an invalid or no reading is taken, dashed lines are shown.
TPM	Number/Current Day	Press ◀ to scroll to TPM values for previous week. Press ▲ to view dates
EXIT	EXIT	Press the Scan button twice to return the controller to OFF.

Oil Flow Through the OQS System





Oil flows from the filter pan (red arrows) to the in-line or pre-filter.

From there it flows to the sensor (blue arrows) to the Oil Quality Sensor.

From the sensor (green arrows) it flows to the filter pump and back to the fry pot.

The in-line filter, a line of defence for the sensor and the filter pump, (left) must be cleaned regularly. A month's worth of debris is shown in a clogged filter (center, above). A clean filter is shown right. Slow return of oil to the fry pot can often be traced to a clogged in-line filter.

Pin Positions

LOV ATO (Automatic Top Off) Pin Positions and Harnesses

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J8	RTI Add Solenoid	8074671	1	24VAC Ret	24VAC	Black
			2			
			3			
	ATO Pump Relay		4	24VAC Ret	24VAC	Black
			5			
			6			
			7			
	JIB Reset Switch		8	JIB Low Reset	16VDC	Black
	RTI Add Solenoid		9	24VAC	24VAC	Red
			10			
			11			
	ATO Pump Relay		12	24VAC	24VAC	Red
			13			
			14			
			15			
	JIB Reset Switch		16	Ground	16VDC	Red
J4 (Rear) / J5 (Front)	Transformer	8074553	1	24VAC Ret	24VAC	Orange
			2	24VAC		Blue
			3			
			4			
			5	12VAC Ret	12VAC	Red
			6	12VAC		Brown
	Jumper 4 & 5 Battery	8074657	7	Jumper Wire	Ohm	Black
			8	Jumper Wire		Black
J3 - Vat #3 J2 - Vat #2 J1 - Vat #1	ATO RTD	8074655 - Vat #1 8074654 - Vat #2 8074621 - Vat #3	1	DV - Probe Ground	Ohm	White
			2	DV - Probe		Red
			3	FV - Probe Ground		White
			4	FV - Probe		Red
J6	Orange LED	8074555	1	16VDC	16VDC	Black
			2	16VDC Ret		Red
J7			1			
			2			
			3	Ground		
			4	RB7/DATA		
			5	RB6/CLOCK		
J10	Network Resistor (pins 2 & 3) or to next ATO Board (4 & 5 vat units)	8074552	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J9	AIF J5	8074546	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White

LOV MIB (Manual Interface Board) Pin Positions and Harnesses

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	M3000 J7	8074546	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J2	AIF J4	8074547	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J5	Transformer	8074649 RTI 8074844 NON-RTI 8074780 Gas LOV	1	24VAC	24VAC	Black
			2	24VAC Ret		White
	Filter Relay		3	Pump Motor	24VDC	Red
			4	Pump Motor		Green
	Blue LED		5	Blue LED +	24VDC	Red
			6	Blue LED -		Black
	RTI Open Switch		7	Open Switch +		Black
	RTI Closed Switch		8	Closed Switch +		Red
			9			
			10			
	Pan Switch		11	Pan Sw +	24VDC	Black
			12	Pan Sw -		Red
			13			
			14			
	RTI Open Switch		15	Ground -		White
	RTI Closed Switch		16	Ground -		Green
J6	To RTI connection in rear of fryer	8074760	1	From RTI transformer	24VAC	Black
			2	Common		White
			3	To RTI “Add Pump” Relay	24VAC	Green
			4			
			5			
			6			
			7			
			8	From RTI “Waste Tank Full Sensor” Test Pins 2 to 8	24VAC – Full 0VAC – Not Full	Red

LOV AIF (Auto Intermittent Filtration) Actuator Board Pin Positions

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	FV Return Actuator	N/A	1	Ret + (Open)	24VDC	Black
			2	Ret – (Closed)	24VDC	Red
			3	Ret Position		Purple
			4	Ground		White
J2	FV AIF RTD		1	Ground		White
			2	FV - Temp		Red
	DV AIF RTD		3	Ground		White
			4	DV - Temp		Red
			5			
			6			
			7			
			8			
	Oil Level Sensor (Gas)		9	DV – OLS (Gas)		Black
			10	FV – OLS (Gas)		Red
	Locator Pin		11	Locator Vat #5		Black
			12	Locator Vat #4		
			13	Locator Vat #3		
			14	Locator Vat #2		
			15	Locator Vat #1		
	Locator		16	Locator Signal		Black
J3	DV Return Actuator	N/A	1	Ret + (Open)	24VDC	Black
			2	Ret – (Closed)	24VDC	Red
			3	Ret Position		Purple
			4	Ground		White
J4	MIB J2 or AIF J5	8074547 AIF Board Communication and Power	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J5	AIF J4 or ATO J10	8074547 AIF Board Communication and Power	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J6	FV Drain Actuator	N/A	1	Drain + (Open)	24VDC	Black
			2	Drain – (Closed)	24VDC	Red
			3	Drain Position		Purple
			4	Ground		White
J7	DV Drain Actuator	N/A	1	Drain + (Open)	24VDC	Black
			2	Drain – (Closed)	24VDC	Red
			3	Drain Position		Purple
			4	Ground		White

LOV M3000 Board, Harnesses, and Pin Positions

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J2	Interface Board to Controller	807-4199 SMT Controller to Interface Board Harness	1	12VAC In	12VAC	Black
			2	Ground		
			3	12VAC In	12VAC	
			4	FV Heat Demand		
			5	V Relay	12VDC	
			6	DV Heat Demand		
			7	R/H B/L	12VDC	
			8	Analog Ground		
			9	L/H B/L	12VDC	
			10	ALARM		
			11	Sound Device	5VDC	
			12	ALARM		
			13	FV Probe		
			14	Common Probes		
			15	DV Probe		
			16			
			17			
			18			
			19			
			20			
J6	Next M3000 J7 or Network Resistor	807-4546 Controller Communication Harness	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J7	MIB J1 or previous M3000 J6	807-4546 Controller Communication Harness	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J9	ONLY USED ON NON-AIF UNITS					
J10	Interface Board Ground to Controller	807-4573 Controller Locator Harness	1	Vat #1		Black
			2	Vat #2		
			3	Vat #3		
			4	Vat #4		
			5	Vat #5		
			6			
J11	SD Card					

FilterQuick ATO (Automatic Top Off) Pin Positions and Harnesses

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J8	Bulk Fresh Oil Solenoid	8074671	1	24VAC Ret	24VAC	Black
			2			
			3			
	Top Off Pump Relay		4	24VAC Ret	24VAC	Black
			5			
			6			
			7			
	JIB Reset Switch		8	JIB Low Reset	16VDC	Black
	Bulk Fresh Oil Solenoid		9	24VAC	24VAC	Red
			10			
			11			
	Top Off Pump Relay		12	24VAC	24VAC	Red
			13			
			14			
			15			
	JIB Reset Switch		16	Ground	16VDC	Red
J4 (Rear) / J5 (Front)	Transformer	8074553	1	24VAC Ret	24VAC	Orange
			2	24VAC		Blue
			3			
			4			
			5	12VAC Ret	12VAC	Red
			6	12VAC		Brown
	ATO 4 & 5 Battery Jumper	8074657	7	Jumper	Ohm	Black
			8	Jumper		Black
J1 - Vat #1 J2 - Vat #2 J3 - Vat #3	ATO RTD	8262569- Probe Kit, 8074845 – 28” Ext., 8074655 – 20” Ext.,	1	DV - Probe Ground	Ohm	White
			2	DV - Probe		Red
			3	FV - Probe Ground		White
			4	FV - Probe		Red
J6						
J10	Network Resistor (pins 2 & 3) or to next ATO Board (4 & 5 vat units)	8074552 (Network resistor), 8074546 to next ATO board	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J9	AIF J5	8074547	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White

FilterQuick MIB (Manual Interface Board) Display Diagnostics

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	FilterQuick™ Controller/ J6	8074546	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J2	AIF J5	8074850	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J5	Transformer	8075800 Bulk 8075780 Non-Bulk	1	24VAC In	24VAC	Black
			2	24VAC In Ret		White
	Filter Relay		3	Pump Motor + Out	24VDC	Red
			4	Pump Motor - Out		Green
			5			
			6			
	Bulk Open Switch		7	Open Switch +		Black
	Bulk Closed Switch		8	Closed Switch +		Red
			9			
			10			
	Pan Switch		11	Pan Sw +	24VDC	Black
			12	Pan Sw -		Red
			13			
			14			
	Bulk Open Switch		15	Ground -		White
	Bulk Closed Switch		16	Ground -		Green
J6	To Bulk connection in rear of fryer	8075789	1	From bulk oil trans-former	24VAC	Black
			2	Common Return		White
			3	To bulk oil fresh oil pump relay	24VAC	Green
			4			
			5			
			6			
			7			
			8	From bulk oil “Waste Tank Full Sensor” Test Pins 2 to 8	24VAC – Full 0VAC – Not Full	Red

FilterQuick AIF (Auto Intermittent Filtration) Actuator Board Pin Positions

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	FV Return	N/A	1	Ret + (Open)	24VDC	Black
			2	Ret – (Closed)	24VDC	Red
			3	Ret Position		Blue
			4	Ground		White
J2	FV AIF RTD		1	Ground		Red
			2	FV - Temp		White
	DV AIF RTD		3	Ground		Red
			4	DV - Temp		White
	Oil Level Sensor (Gas)		5	OIB Sensor FV from Pin 5 on J3 of Interface Bd	12VDC	Red
			6	OIB Sensor FV		Black
			7	OIB Sensor DV from Pin 5 on J3 of Interface Bd	12VDC	Red
			8	OIB Sensor DV		Black
	Oil Level Sensor communication (Gas)		9	DV – OLS (Gas)		Black
			10	FV – OLS (Gas)		Red
	Locator Pin		11	Locator Vat #5		Black
			12	Locator Vat #4		
			13	Locator Vat #3		
			14	Locator Vat #2		
			15	Locator Vat #1		
	Locator		16	Locator Signal		Black
J3	DV Return	N/A	1	Ret + (Open)	24VDC	Black
			2	Ret – (Closed)	24VDC	Red
			3	Ret Position		Blue
			4	Ground		White
J4	MIB J2 or AIF J5	8074547	1	Ground		Black
		AIF Board Communication and Power	2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J5	AIF J4 or ATO J10	8074547	1	Ground		Black
		AIF Board Communication and Power	2	CAN Lo		Red
			3	CAN Hi		White
			4	5VDC+	5VDC	Black
			5	24VDC	24VDC	Red
			6	Ground		White
J6	FV Drain	N/A	1	Drain + (Open)	24VDC	Black
			2	Drain – (Closed)	24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J7	DV Drain	N/A	1	Drain + (Open)	24VDC	Black
			2	Drain – (Closed)	24VDC	Red
			3	Drain Position		Blue
			4	Ground		White

FilterQuick 3000 Board, Harnesses, and Pin Positions

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	**SD Card**					
J2	**Interface Board to Controller**	**8075165 SMT Controller to Interface Board Harness**	1	12VAC In	12VAC	Orange
			2	Ground		
			3	12VAC Return In	12VAC	
			4	FV Heat Demand		
			5	V Relay	12VDC	
			6	DV Heat Demand		
			7	R/H B/L	12VDC	
			8	Analog Ground		
			9	L/H B/L	12VDC	
			10	ALARM		
			11	Sound Device	5VDC	
			12	ALARM		
			13	FV Probe		
			14	Common Probes		
			15	DV Probe		
			16			
			17			
			18			
			19	Blower Cool Down Ground		
			20			
J3	**Interface Board Ground to Controller**	**Controller Locator Harness**	1	Vat #1		Black
			2	Vat #2		
			3	Vat #3		
			4	Vat #4		
			5	Vat #5		
			6	Ground		
J4	**Drain Switch and LED**	**1085672**	1	Ground		Black
			2	Push Pull Switch In		Red
			3	Ground		Black
			4	Drain Indicator LED		Red
J6	**Next Controller J7 or Network Resistor**	**8074546 Controller Communication Harness**	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			
			5			
			6			
J7	**MIB J1 or previous Controller J6**	**8074546 Controller Communication Harness**	1	Ground		Black
			2	CAN Lo		Red
			3	CAN Hi		White
			4			

FRYMASTER

LOV™ FRYER COMMISSION AND DEMONSTRATION FORM

8700 LINE AVENUE SHREVEPORT, LA 71106 (800) 551-8633

Date_____

Store Name _____
Store # (if applicable) _____
Address _____
City/State _____
Store Phone ( )_____

Technician _____
Service Agency _____
Address _____
City/State _____
Country _____

FRYER/FILTER MODEL NUMBER	SERIAL NUMBER (10 DIGIT)

- ❑ **No one is to perform start-up or training unless they are Level 2 or Level 3 certified and their certification is current.**
- ❑ Verify exhaust blank-off plates are installed with Electric Fryers ☐ YES ☐ NO ☐ N/A (GAS)
- ❑ Verify Universal hoods have 2" (50mm) of clearance behind fryer ☐ YES ☐ NO
- ❑ Verify Seal Angle, Stand-off Channel & Gravity Blade are properly installed ☐ YES ☐ NO ☐ N/A (Universal Hood)
- ❑ Verify gas hose quick disconnect is connected to gas line input beneath the center of the fryer and verify the left gas input connection is properly capped.
- ❑ Remove Warranty Label date tabs.
- ❑ Ensure fryer is level and properly restrained in accordance with the operator's manual.
- ❑ Perform SETUP on all computers. Refer to manual. **Record Software Controller**_____ **MIB**_____**AIF**_____**ATO**_____ **OQS (if applicable)**_____
- ❑ **Ensure Time and Date are correct in setup.**
- ❑ Verify Filter After settings in Level 2 are set to 12 for Fry Stations and 6 for Protein Stations.
- ❑ Program computers for products to be cooked as per managers request - FR FRIES, HASH BRN, NUGGETS, MCCHICK, etc. Refer to manual. Attach product stickers to bezel **below** product buttons.
- ❑ Is the fry system being installed connected to a **BULK OIL SUPPLY / DISPOSAL SYSTEM (RTI)** ☐ YES ☐ NO
- ❑ If fryer was setup as a **BULK OIL SUPPLY / DISPOSAL SYSTEM (RTI)** was power cycled after setup? ☐ YES ☐ NO
- ❑ Is the gas restraining kit installed on the fryer? ☐ YES ☐ NO
- ❑ Place full JIB in fryer for ATO system, or fill provided JIB from Bulk Oil system (as applicable). Refer to manual.
- ❑ Thoroughly clean and dry all vats. Fill all vats with oil to ½" below cold oil line. Allow fryers to heat to set point (see gas and electric checks below) and verify temperatures are at set point +/- 5°F / 2°C**. Verify that oil level is below ATO level sensor (upper oil level line) but *above AIF sensor* (lower oil level) (add/remove oil if necessary) and that each vat tops off from JIB.**
- ❑ Check restaurant to ensure that it doesn't have a severe positive or negative air balance.
- ❑ **GAS** fryers - While units are heating up, check incoming gas pressure (Natural Gas: 6-14" W.C.; LP Gas: 11-14" W.C.). Record actual incoming pressure _____. Check burner manifold pressure. Record actual burner manifold pressure below. Check for proper combustion; fryers should have a bright orange flame after approximately 1 minute of operation. Adjust blower air inlet to achieve 1.2 - 2.0 uA (micro amps) on Fenwal Modules or .3 – .9 uA on Capable Control Modules on each igniter flame sense circuit. Record micro amp readings below.

Gas	Vat #1	Vat #2	Vat #3	Vat #4	Vat #5	Vat # 6	Vat # 7	Vat # 8	Vat # 9	Vat # 10
Burner Pressure										
Left uA										
Right uA										

Two (2) hours are allowed for Commission per fryer system; fry or protein station. Two (2) hours are allowed for one (1) Demonstration per store location.

Continued on next page

FRYMASTER

- ❑ **ELECTRIC** fryers - While units are heating up, ensure applied voltage matches the rating plate. Ensure all phases are balanced and there is no current draw when controller heat light is off.

AMP DRAW										
Electric	Vat #1	Vat #2	Vat #3	Vat #4	Vat #5	Vat # 6	Vat # 7	Vat # 8	Vat # 9	Vat # 10
L1										
L2										
L3										

- ❑ Verify that all filter parts (filter pan, filter screen, filter pad or paper, hold-down ring, crumb tray, and O-rings) are present. Visually inspect the oil drain and return system to ensure all connections are tight.
- ❑ Verify filter pan alignment. The pan should slide smoothly into position with an "**A**" displayed on the MIB. Ensure pick-up tube is fully engaged in the pan suction tube. "**P**" should be displayed on the MIB when the pan is pulled forward.
- ❑ Perform an Auto Filter on a vat to ensure the filter pump is operational and check the drain and return system for leaks. If OQS is installed, TPM value._____
- ❑ **Remove old Fryer's Friend from the store and replace with the new Fryer's Friend.**
- ❑ The startup tech is responsible for training the operators following the steps below.

LOV™ Fryer Training

Ensure all trainees refer to the Quick Reference, Quick Start, Fry Guides and Operation Manual located in the manual holder inside the fryer door for the following.
Hands on demonstration and performance are essential for all trainees.

CREW / FILTRATION PERSON(S) / MANAGERS

- ❑ **OVERVIEW**
  - ❑ Provide an overview of what a LOV is Vs traditional fryer – Smaller vat, Low Oil Volume
  - ❑ Explain the benefits when used properly – Use less oil, Auto Filter, Auto Top Off

- ❑ **COMPUTER**

  - ❑ **Identify M3000 Computer buttons and functions / LED's for LOV – Refer to the LOV Quick Start Guide**
    - ❑ ON / OFF Buttons – Full and Split Functions
    - ❑ Product Buttons - Multi product cooking buttons and entering codes for programming
    - ❑ Cook Cycle Buttons – Start a cook cycle / cancel alarms and change from Dedicated to Multi Product
    - ❑ Filter Buttons – On- Press -Cooks Remaining / On = Press and hold to access Filter Menu / Menu navigation
    - ❑ Temp Button – Off – Versions of software / On = 1(X) actual temp 2(X) set-point
    - ❑ Info Button – 1(X) Recovery check of fryer / Press and hold 3 seconds = Filter Stats, Usage, Last Load
    - ❑ Filter Light Blue LED
    - ❑ JIB Orange LED / JIB Reset
    - ❑ Master Power Switch (per vat) (US ONLY)
    - ❑ MIB Display Window – "A" for Auto or "P" filter pan installation issue. Check for proper installation of pan.

- ❑ **Demonstrate how to use the operating controls – Cooking Functions – Refer to the LOV Fryer Station Guides**
  - ❑ Turning the computer ON / OFF for heating the vats
  - ❑ One button cooking – Dedicated Mode - **Refer to the LOV Fry Station Guide (French Fries/Hashbrowns)**
  - ❑ Two button cooking – Multi Product. Show **REMOVE DISCARD PRODUCT** message if setpoint is different for product being cooked. - **Refer to the LOV Fry Station Guide (McNuggets, Crispy, etc.)**
  - ❑ Changing from breakfast to lunch and back
  - ❑ Cancel a cook cycle or alarms

- ❑ **Demonstrate JIB System (JIB and Bulk Oil Systems) – Refer to the LOV Quick Reference Guide**
  - ❑ Demonstrate setup of the JIB
  - ❑ Filling vats with oil (Bulk or JIB)

- ❑ **AUTO TOP-OFF (ATO) – Refer to the LOV Quick Reference Guide**
  - ❑ Instruct on function of Yellow "JIB Empty" LED (Use remaining oil in box)

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- ❑ Demonstrate when JIB is changed JIB reset must be pressed and held to reset light
- ❑ Demonstrate Auto Top-Off on a vat by moving oil out of vat

❑ **AUTOMATIC INTERMITTENT FILTRATION (AIF) – Refer to the LOV Quick Reference Guide**

- ❑ Demonstrate assembly of the filter pan (Emphasize need for daily pad change / more often as needed)
- ❑ Demonstrate AIF cycle on "TEST" menu item. Air bubbles should only be observed in unit being filtered.
- ❑ Show Blue LED, SAY "YES" TO THE BLUE LIGHT
- ❑ Show "FILTER NOW" displayed on vat to be filtered
- ❑ Demonstrate new skimming procedure
- ❑ Show filtration issues (OIL TOO LOW, errors created by not changing the pad (monitor oil returned to vat levels – should be where it started)
- ❑ Show FILTER BUSY message by trying to manual filter while another vat is filtering.
- ❑ Six consecutive unsuccessful filtrations and unit goes to **SERVICE REQUIRED** an authorized technician is needed.
- ❑ Show location of thermal reset on Filter Motor

❑ **TROUBLESHOOTING**

- ❑ Common error messages
  - ❑ Is Vat Full? – a problem may exist in the filtration system – Follow instructions on the computer.
  - ❑ Drain Clogged- Clear Drain-Is Drain Clear? (Gas Only) – Follow instructions on the computer using the new fryers friend to clear the drain.
  - ❑ Filter Busy – a filtration process is in another vat
  - ❑ Probe Failure – Temperature circuitry has a problem – Turn off fryer and call for service
  - ❑ Heating Failure – Unit is not heating – Turn off fryer and turn on again.
  - ❑ Low Temp – Oil temperature below set point – may occur during cooking cycle
  - ❑ Recovery Fault – Vat did not meet minimum specs for temperature recovery – Press the ✓ to continue.
  - ❑ Service Required – a problem exists that requires a technician.
- ❑ Frymaster's Hot line and ASA contact person / with phone numbers

FILTRATION PERSON(S) / MANAGERS

Refer to LOV Quick Reference Guide and Operations Manual Chapter 4

❑ **Demonstrate daily cleaning of the oil sensor during maintenance filters with no-scratch pad (gas only).**

❑ **FILTER MENU** (**Press and hold LEFT or RIGHT FLTR button based on the type of vat being filtered)**

- ❑ **NON BULK OIL SYSTEM**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show AUTO FILTER and explain what it does
    - ❑ Show MAINT FLTR **(always filter the Fish vat last)**
    - ❑ Show DISPOSE and explain what it does (Use of MSDU)
    - ❑ Show DRAIN TO PAN and explain what it does
    - ❑ Show FILL VAT FROM DRAIN PAN and explain what it does
- ❑ **BULK OIL SYSTEM**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show AUTO FILTER and explain what it does
    - ❑ Show MAINT FLTR **(always filter the Fish vat last)**
    - ❑ Show DISPOSE and explain what it does
    - ❑ Show DRAIN TO PAN and explain what it does
    - ❑ Show FILL VAT FROM DRAIN PAN and explain what it does
    - ❑ Show FILL VAT FROM BULK and explain what it does
    - ❑ Show PAN TO WASTE and explain what it does

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STORE MANAGERS ONLY (OR DESIGNATED PERSONS)

Refer to LOV Quick Start Guide and Operations Manual Chapter 4

- ❑ **Demonstrate how to access LEVEL 1 PROGRAMMING – (Press and hold TEMP and INFO) Code 1234**
  - ❑ Demonstrate Product Selection and setting up an item and Assigning Buttons
  - ❑ Demonstrate how to add a new Menu Item – setup a test menu item (short cook cycle)
  - ❑ Deep Clean
  - ❑ High Limit Check
  - ❑ Fryer Setup Mode
- ❑ **Demonstrate how to access LEVEL 2 PROGRAMMING – (Press and hold TEMP and INFO) Code 1234**
- ❑ **Demonstrate how to access INFO MODE (Press and hold INFO for three seconds)**
  - ❑ Show FILTER STATS menu
  - ❑ Show REVIEW USAGE menu
  - ❑ Show LAST LOAD menu
- ❑ **Demonstrate Deep Clean Procedures – as much as practical (Refer to Operations Manual Chapter 4)**

Key Points

Review with all employees

- **Blue Light – Choose YES to Filter Now? and Confirm**
- **Orange Light – Change JIB and press reset (Bulk users fill JIB)**
- **Start a cook on the fry station by pressing the cook button**
- **Start a cook on the protein station by pressing the product button and then the cook button.**
- **Is Vat Full? – Answer YES only when oil it at the top line.**
- **Maintenance filter daily**
- **Change filter pad daily or twice daily in high volume or 24 hour stores**

Date of Training _____

Training has been conducted on the following areas:

1) Computer functions
2) Operating the Fryer
3) JIB System
4) Auto Top Off
5) Auto Filter and Filter Menu
6) Level 1 Programming
7) Level 2 Programming
8) Accessing Info Mode
9) Explain Deep Cleaning Process
10) Troubleshooting

Training / Demo Signature Sheet – Key Personnel

*** Store Manager's Signature**		Printed Name	
*** Filtration Person Signature**		Printed Name	
*** Key Shift Person Signature**		Printed Name	

FRYMASTER

O/O / Staff Personnel		Printed Name	

Technician's Signature		Printed Name	

* - Mandatory Attendee

TRAINING DECLINED

O/O / Corporate Manager Signature		Printed Name	

FAS: Provide a copy of all five (5) pages to the customer and to Frymaster. Retain a copy for two years from date of installation

FRYMASTER

FILTERQUICK™ FRYER START-UP FORM

8700 LINE AVENUE SHREVEPORT, LA 71106 (800) 551-8633

Date_____

Store Name _____	Technician _____
Store # (if applicable) _____	Service Agency _____
Address _____	Address _____
City/State _____	City/State _____
Store Phone ( ) _____	Country _____

FRYER/FILTER MODEL NUMBER	SERIAL NUMBER (10 DIGIT)									

- ❑ **No one is to perform start-up or training unless they are Level 3 certified and their certification is current.**
- ❑ Verify gas hose quick disconnect is connected to gas line input beneath the center of the fryer and verify the left gas input connection is properly capped.
- ❑ Remove Warranty Label date tabs.
- ❑ Ensure fryer is level and properly restrained in accordance with the operator's manual.
- ❑ Perform SETUP on all computers. Refer to manual.
- ❑ **Record Software Controller**_____ **MIB**_____**AIF**_____ **ATO**_____ **OQS(if applicable)**_____
- ❑ **Ensure Time and Date are correct in setup.**
- ❑ Program controllers for products to be cooked as per managers request - Refer to controller manual.
- ❑ Is the fry system being installed connected to a **BULK OIL SUPPLY / WASTE DISPOSAL SYSTEM** ☐ YES ☐ NO
- ❑ If fryer was setup as a **BULK OIL SUPPLY / WASTE DISPOSAL SYSTEM** was power cycled after setup? ☐ YES ☐ NO
- ❑ Place full JIB in fryer for ATO system, or fill provided JIB from Bulk Oil system (as applicable). Refer to controller manual.
- ❑ Thoroughly clean and dry all vats. Fill all vats with oil to ½" below cold oil line. Allow fryers to heat to set point (see gas and electric checks below) and verify temperatures are at set point +/- 5°F / 2°C**. Verify that oil level is below ATO level sensor (upper oil level line) but *above AIF sensor* (lower oil level) (add/remove oil if necessary) and that each vat tops off from JIB. NOTE: HEAT LED must cycle 3 times before top off is activated.**
- ❑ Check restaurant to ensure that it doesn't have a severe positive or negative air balance.
- ❑ **GAS** fryers - While units are heating up, check incoming gas pressure (Natural Gas: 6-14" W.C.; LP Gas: 11-14" W.C.). Record actual incoming pressure _____. Check burner manifold pressure. Record actual burner manifold pressure below. Check for proper combustion; fryers should have a bright orange flame after approximately 1 minute of operation. Adjust blower air inlet to achieve 1.2 - 2.0 uA (micro amps) on Fenwal Modules or .3 – .9 uA on Capable Control Modules on each igniter flame sense circuit. Record micro amp readings below.

Gas	Vat #1	Vat #2	Vat #3	Vat #4	Vat #5	Vat # 6	Vat # 7	Vat # 8	Vat # 9	Vat # 10
Burner Pressure										
Left uA										
Right uA										

- ❑ **ELECTRIC** fryers - While units are heating up, ensure applied voltage matches the rating plate. Ensure all phases are balanced and there is no current draw when controller heat light is off.

AMP DRAW										
Electric	**Vat #1**	**Vat #2**	**Vat #3**	**Vat #4**	**Vat #5**	**Vat # 6**	**Vat # 7**	**Vat # 8**	**Vat # 9**	**Vat # 10**
L1										
L2										
L3										

- ❑ Verify that all filter parts (filter pan, filter screen, filter pad or paper, hold-down ring, crumb tray, and O-rings) are present. Visually inspect the oil drain and return system to ensure all connections are tight.
- ❑ Verify filter pan alignment. The pan should slide smoothly into position with an "**A**" displayed on the MIB. Ensure pick-up tube is fully engaged in the pan suction tube. "**P**" should be displayed on the MIB when the pan is pulled forward.

Two (2) hours are allowed for the above to Start-Up one system.

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- ❑ Perform an Auto Filter or OQS Filter (if applicable) on a vat to ensure the filter pump is operational and check the drain and return system for leaks. If OQS is installed, TPM value/Oil is Good_____
- ❑ **Remove old Fryer's Friend from the store and replace with the new Fryer's Friend**
- ❑ The startup tech is responsible for training the operators following the following the steps below.

FILTERQUICK™ FRYER TRAINING

Ensure all trainees refer to the Quick Reference, Quick Start, Controller Manual and Operation Manual located in the manual holder inside the fryer door for the following.

Hands on demonstration and performance are essential for all trainees.

CREW / FILTRATION PERSON(S) / MANAGERS

- ❑ **OVERVIEW**
  - ❑ Provide an overview of what a FilterQuick is vs. traditional fryer – Smaller vat, Low Oil Volume
  - ❑ Explain the benefits when used properly – Use less oil, Semi-automatic Filter, Auto Top Off

- ❑ **CONTROLLER**

  - ❑ **Identify FilterQuick™ Controller buttons and functions / LED's for filtration – Refer to the FilterQuick™ Quick Start Guide**
    - ❑ ON / OFF Buttons — Demonstrate full and split functions.
    - ❑ Cook Cycle Buttons — Demonstrate a cook cycle/stop a cook cycle.
    - ❑ Exit Cool Button — Demonstrate entering and exiting the energy-saving Cool Mode.
    - ❑ Temp Button — Demonstrate Use: **ON** – Setpoint and vat temperature; **OFF** – Temp, time, date, software versions.
    - ❑ Checkmark Button — Demonstrate Use: **ON** – Enter codes, respond to prompts; **OFF** – Press and hold 3 seconds: Scroll filter usage.
    - ❑ Filter Button — Demonstrate Use: Press and release: Cooks remaining or percentage and cooks remaining to filter prompt; Press and hold: Filter options.
    - ❑ Exit Scan — Demonstrate Use: Scan programmed menu items and exit menus.
    - ❑ JIB Reset switch / Bulk fill switch on bulk fresh oil systems
    - ❑ Master Power Switch (per vat) (Electric and US ONLY)
    - ❑ MIB Display Window – "A" for Auto or "P" filter pan installation issue. Check for proper installation of pan.
    - ❑ Reset switch (Behind control box in far right Electric fryers, under control box in far left Gas fryers)

  - ❑ **Demonstrate JIB System (JIB and Bulk Oil Systems) – Refer to the FilterQuick™ Quick Start Guide and the Installation and Operation Manual**
    - ❑ Demonstrate setup of the JIB
    - ❑ Filling vats with oil (Bulk or JIB)

  - ❑ **AUTO TOP-OFF (ATO) – Refer to the FilterQuick™ Quick Start Guide and the Installation and Operation Manual**
    - ❑ Instruct on function Top Off Oil Empty Display.
    - ❑ Demonstrate pressing and holding the JIB reset button after JIB replacement will clear the top off empty message and reset the top off system
    - ❑ Demonstrate Auto Top-Off on a vat by moving oil out of vat.

  - ❑ **FILTRATION – Refer to the FilterQuick™ Quick Start Guide and the Installation and Operation Manual**
    - ❑ Demonstrate assembly of the filter pan (Emphasize need for daily filter paper/pad change / more often as needed)
    - ❑ Demonstrate FILTER. Show "FILTER NOW" displayed on vat to be filtered. Explain YES and NO responses. Air bubbles should only be observed in unit being filtered.
    - ❑ Show filtration issues (OIL TOO LOW – Oil level is too low to filter; Errors created by not changing the paper/pad (monitor oil returned to vat levels – should be where it started)
    - ❑ Show FILTER BUSY message by trying to filter or perform a filter menu function while another vat is filtering.

- ❑ Show location of thermal reset on Filter Motor
- ❑ Have filter prompts been added or demonstrated?

❑ **TROUBLESHOOTING**

- ❑ Common error messages
  - ❑ Is Vat Full? – a problem may exist in the filtration system – Follow instructions on the controller to ensure any or all oil is returned from the filter pan.
  - ❑ Drain Clogged- Clear Drain-Is Drain Clear? (Gas Only) – Follow instructions on the controller using the new fryers friend to clear the drain.
  - ❑ Filter Busy – a filtration process is in another vat
  - ❑ Probe Failure – Temperature circuitry has a problem – Turn off fryer and call for service
  - ❑ Heating Failure – Unit is not heating – Turn off fryer and turn on again.
  - ❑ Low Temp – Oil temperature below set point – may occur during cooking cycle
  - ❑ Recovery Fault – Vat did not meet minimum specs for temperature recovery – Press the YES button to continue.
  - ❑ Service Required – a problem exists that requires a technician.
- ❑ Frymaster's Hot line and FAS contact person / with phone numbers

FILTRATION PERSON(S) / MANAGERS

Refer to Refer to the FilterQuick™ Quick Start Guide and the FilterQuick™ Controller Manual Chapter 1

❑ **Demonstrate daily cleaning of the oil sensor during Clean and Filter with no-scratch pad (gas only).**

❑ **FILTER MENU** (**Press and hold FILTER button)**

- ❑ **NON BULK OIL SYSTEM**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show FILTER and explain what it does
    - ❑ Show CLEAN and FILTER (clean oil sensor on gas units)
    - ❑ Show DISPOSE and explain what it does (Use of SDU)
    - ❑ Show DRAIN TO PAN and explain what it does
    - ❑ Show BOIL OUT and explain what it does
    - ❑ Show FILL VAT FROM PAN and explain what it does
- ❑ **BULK OIL SYSTEM**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show FILTER and explain what it does
    - ❑ Show CLEAN and FILTER (clean oil sensor on gas units)
    - ❑ Show DISPOSE and explain what it does
    - ❑ Show DRAIN TO PAN and explain what it does
    - ❑ Show BOIL OUT and explain what it does
    - ❑ Show PAN TO WASTE and explain what it does
    - ❑ Show FILL VAT FROM PAN and explain what it does
    - ❑ Show FILL VAT FROM BULK and explain what it does

STORE MANAGERS ONLY (OR DESIGNATED PERSONS)

Refer to Refer to the FilterQuick™ Quick Start Guide and the FilterQuick™ Controller Manual Chapter 1

- ❑ **Demonstrate how to access MAIN MENU PROGRAMMING – (Press and hold CHECK) Code 1650**
  - ❑ Demonstrate Product Setup and setting up an item and Assigning Buttons
  - ❑ Demonstrate how to add a new Menu Item – setup a test menu item (short cook cycle)
  - ❑ Demonstrate placement and use of the menu strip
- ❑ **Demonstrate how to access INFO MODE (Press and hold INFO for three seconds)**

- ❑ Show FILTER STATS menu
- ❑ Show REVIEW USAGE menu
- ❑ Show LAST LOAD menu

Key Points

Review with all employees

- **Start a cook on the fry station by pressing the cook button**
- **Clean and Filter daily**
- **Change filter pad daily or twice daily in high volume or 24-hour stores**
- **Filter Now? – Choose YES to Filter Now?**
- **Top Off Oil Empty – Change JIB and press reset (Bulk users fill JIB)**
- **Is Vat Full? – Answer YES only when oil it at the top line. Otherwise answer NO until oil is at the top line to prevent uneven oil levels**

Training Date_____

Technician Signature_____ **Printed Name**_____

Manager Signature_____ **Printed Name**_____

Other Staff Signature_____ **Printed Name**_____

FAS: Provide a copy of all four (4) pages to the customer and to Frymaster. Retain a copy for two years from date of installation

Chapter 5: FilterQuick Touch

Four-vat FilterQuick FQGLA-T

FilterQuick platform fryers build on the technology introduced with the Low Oil Volume fryers and add a touchscreen controller. New circuit boards are part of the package and the Smart Interface Board assumes the role of the

— Continued on Page Next Page

Video Content

Features

- **Advanced touchscreen controller**
- **Wireless connectivity for off-site monitoring**
- **Automatic intermittent filtration**
- **Low-volume frypots**
- **Redesigned interface board**
- **Redesigned oil-return monitoring**

Acronyms

- **FQ4000 —** Touchscreen controller.
- **UI —** User Interface, another name for touchscreen.
- **SIB —** Smart Interface Board.
- **VIB —** Valve Interface Board (like AIF).
- **FIB —** Filter Interface Board (like ATO).
- **ATO —** Automatic Top Off system.
- **OQS** — Oil Quality Sensor.
- **C-Bus —** Data connection between SIB's, FIB, SUI.
- **P-Bus —** Data connection between SIB's and VIB's.
- **MOD-Bus —** 24VDC between VIB and SIB.
- **SUI — System User Interface** Manages fryer network communication.

FilterQuick FQGLA-T with basket lifts

NOTE: The fryer's top off, oil quality sensor and rotary valve actuators are like those on the auto filtering fryers and are covered in that section.

traditional interface board used in the earlier LOV fryers.

The UI and the SIB assume the role of the Manual Interface Board that was on the earlier fryers, meaning manual functions performed on the MIB are now performed with the touchscreen. Onboard diagnostics improve trouble-shooting. Valves and motors can be turned on and off from the UI.

Video Content
Compare touchscreen fryers to legacy units.

How it happens:

In the gas fryer, line voltage is supplied to 24 volt transformers and 24-volt power supplies. The transformer provides voltage for the spark module, gas valve and the controller. The Smart Interface Board converts the voltage to DC and uses 12V for the heat and latch relays; 5 VDC to power the sense circuits, 3.3 VDC for the processor. Voltage on the board is marked by illuminated LED's.

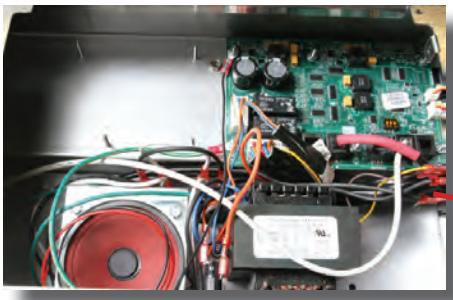
The ignition circuit is like the H55: Latch and heat relays are operated by 12VDC from SIB; heat relay closes when the temp probe, monitored by the SIB, shows low temp. The heat relay opens when the temp probe is satisfied.

The boards that monitor oil levels and oil movement during filtration have little to do with regular heating of the oil.

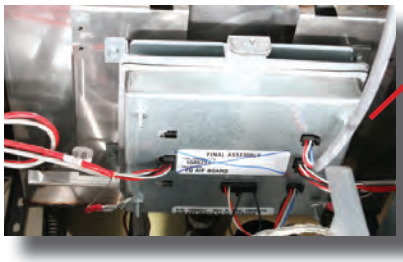
- The Filter Interface Board communicates with the SIB, the controller and the Valve Interface Board to control top off and automatic intermittent filtration. The SIB monitors the Automatic Top Off probe, the highest probe in the vat, and calls for top off oil, when that probe doesn't sense oil.
- The VIB monitors a lower probe, the VIB (AIF in earlier LOV fryers) , during automatic filtering cycles. The VIB probe must sense oil for the fryer to resume heating at the end of a filter cycle.
- In most models (Taco Bell is the exception) an additional safety, the Oil is Back or OIB, also prevents the fryer from heating until it is satisfied.

All the circuit boards work in unison to monitor the oil temperature, keep the vats topped off and ensure the oil is filtered. **(See the circuit board pictures and diagrams in this section.)**

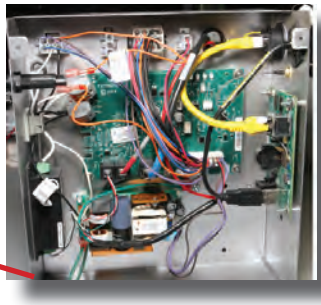
Critical Circuit Boards and Their Locations



The Smart Interface Board (SIB) is located behind the touchscreen controller.



The Valve Interface Board (VIB) is located under each vat. Replacement boards come encased in sheet metal.



The Filter Interface Board (FIB) is in a box with other components behind the JIB. The box also contains the SUI communication board and power supplies for the top off pump and the communication components.

When oil is low, the SIB, monitoring the Automatic Top Off Probe, signals the Filter Interface Board, which causes the Valve Interface Board to direct 24VDC to the rotary actuator on the return valve of the affected vat. The FIB also sends 24VDC to the top off pump.

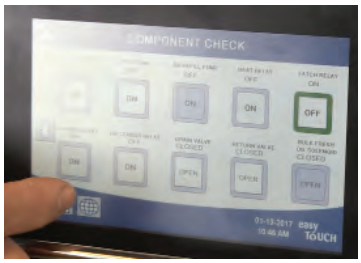
Oil flows from the JIB until the Automatic Top Off probe senses the oil. The SIB then signals to halt the filling. The FIB then signals the VIB to close the return valve. It also stops the top off pump.

The FQ4000 configured for Taco Bell calls for filter cycles in the morning and evening. The morning filter is longer and includes cleaning.

The automated filtration has a similar sequence. The SIB monitors cook cycles in most restaurant settings and the fryers calls for a filtration when the programmed cook count is reached for the product in question. In Taco Bell stores, the SIB signals for a filter twice a day, AM and PM. The AM filter is longer and prompted cleaning steps are displayed during the filter.

After a Yes response to a displayed filter request, the SIB signals the FIB to open the drain, via the VIB, on the affected vat. Oil drains to the filter pan. The SIB, through the VIB's probe, notes a drop in temperature in the vat. The SIB signals the FIB and it starts the filter pump.

The steps of the filter cycle and prompts for cleaning are displayed on the touchscreen. When the timed filter cycle is complete, the FIB signals the VIB to close the drain and open the return. Oil is pumped back to the frypot.



Actuators showing Fault on the Component check screen are likely not receiving power.

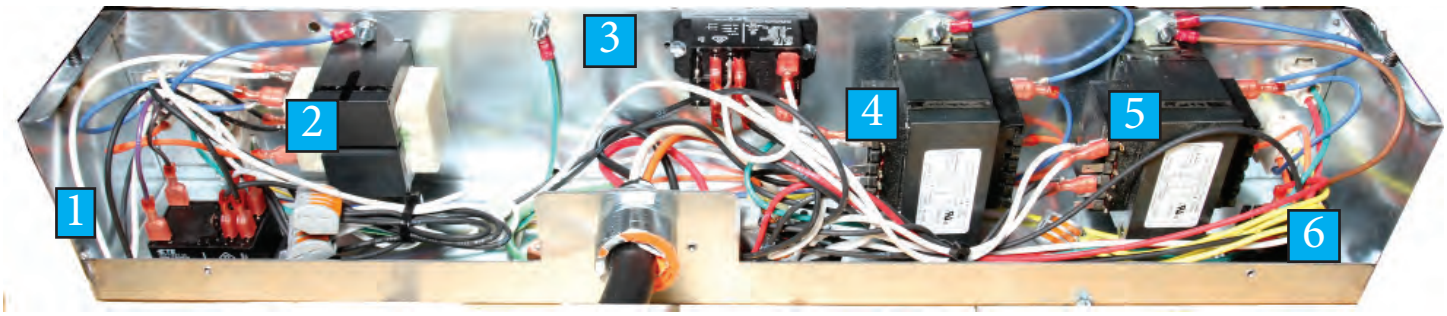
The temperature and AIF probes, monitored by the SIB, look for the oil to leave the frypot and also for its return. The screen asks if the frypot is full when the cycle is complete. Pressing Yes causes the frypot to heat the oil to setpoint.

See Pin Outs on pages 5-19—5-30

Data and power flow can be seen in the schematics on pages 5-5, 5-6. The FIB signals for 24VDC to go to the valve actuators and the top-off pump.

A second 24VDC power supply operates the communication system, which takes data gathered by the SIB and sends it, via the SUI board, to a router provided by the store. The communication system is shown on page 5-15

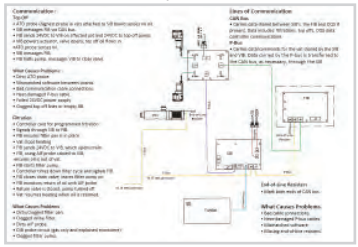
Transformer Box Holds Control Reset Relay

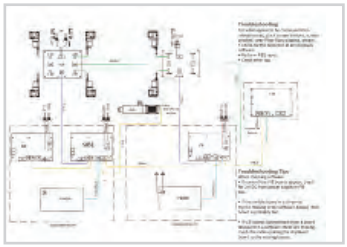


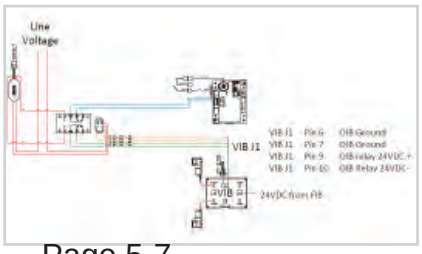
The transformer box, mounted at the back of the gas fryers, is annotated above. This is a 2-vat McDonald's unit and includes a hood relay, which is unique to the McDonald's box. Other gas touchscreens have the same transformer box configuration minus the hood relay.

1	Filter pump relay
2	Filter pump transformer, 24VAC, 50VA
3	Control reset relay
4	Right (on two vat configuration) or 2nd pot transformer 24VAC, 80VA
5	Left (on two vat configuration) or 1st pot transformer 24VAC, 80VA
6	Hood relay (McDonald's only)

The Fryer's Communications in 3 Graphics


Page 5-5


Page 5-6



Page 5-7

The following graphics and related text describe the operation of the fryer's communication system.

The first graphic shows the system on just one vat, establishing the role of the CAN-bus, which shares information across the SIB's, controllers, FIB and OQS, components that collect data on multiple vats. The P-bus carries data between a VIB and SIB.

The second graphic shows an expanded view of the communication system. There is a separate P-Bus cable for each VIB.

The third graphic and accompanying photos describe the OIB circuit, which is only used on gas fryers.

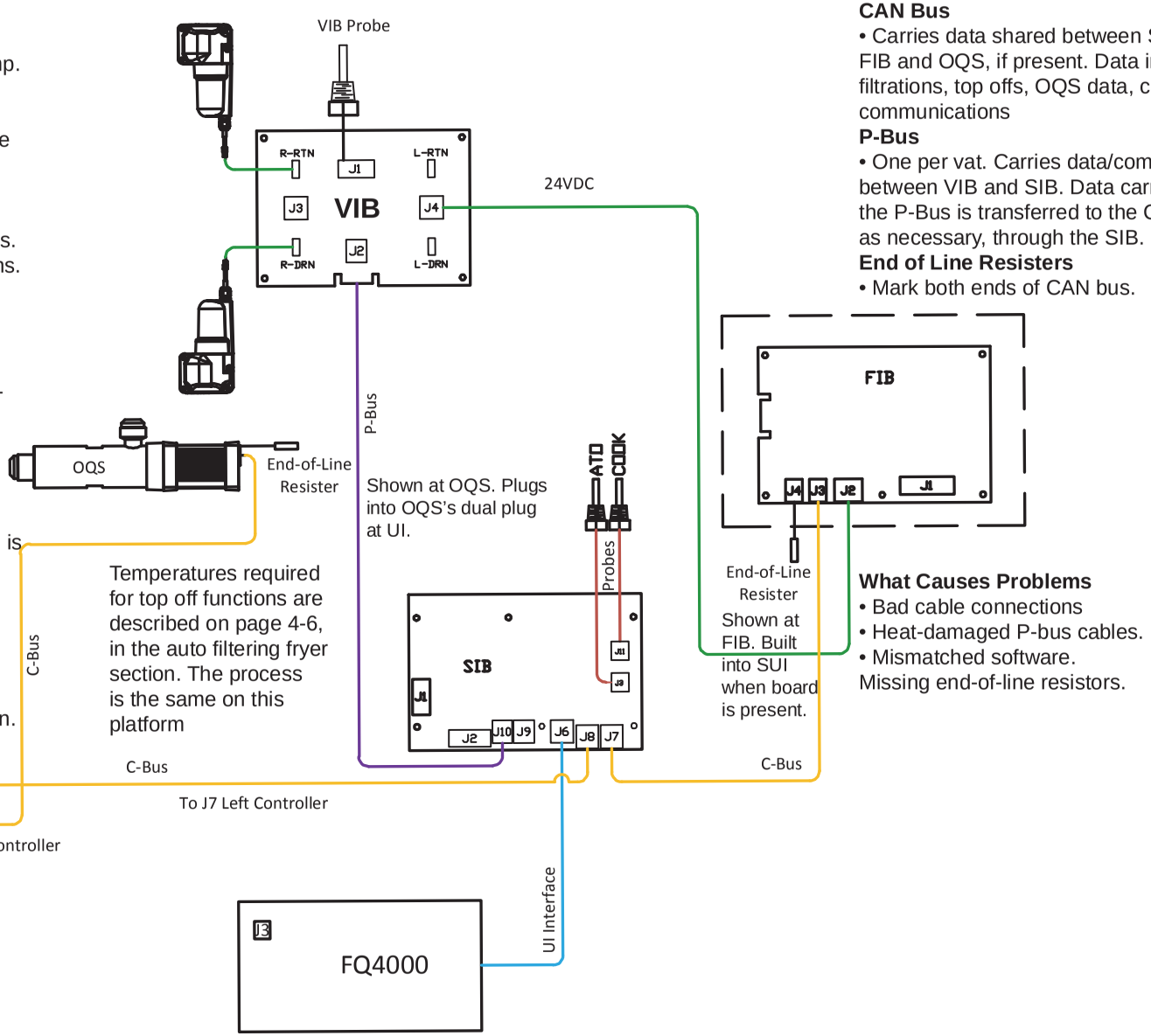
Communication

Top Off
• ATO probe (highest probe in the vat) attached to the SIB senses no oil.
• SIB messages FIB via CAN bus.
• FIB directs 24VDC on VIB board of affected vat to open valve.
• FIB also sends 24VDC to top off pump.
• Oil returns to ATO probe level.
• SIB messages FIB.
FIB halts pump, messages VIB to close valve.

What Causes Problems
• Dirty ATO probe.
• Mismatched software between boards.
• Bad communication cable connections.
• Heat-damaged P-bus cable.
Failed 24VDC power supply.
Clogged top off lines or empty JIB.

Filtration
• Controller calls for programmed filtration.
• Signals through SIB to FIB.
• FIB ensures filter pan is in place.
• FIB directs 24VDC on VIB to open drain.
• FIB, using AIF/VIB probe, ensures oil is out of vat.
• FIB starts filter pump.
• FIB monitors return of oil with VIB probe.
• Controller times down filter cycle and signals FIB.
• FIB closes drain valve; pump stays on.
• FIB monitors return of oil with VIB.
• Return valve is closed; pump turned off.
• Vat resumes heating when oil is detected.

What Causes Problems
• Dirty/clogged filter pan.
• Clogged inline filter.
• Dirty AIF probe.
• OIB probe circuit (gas only and explained elsewhere).
• Clogged filter pump.

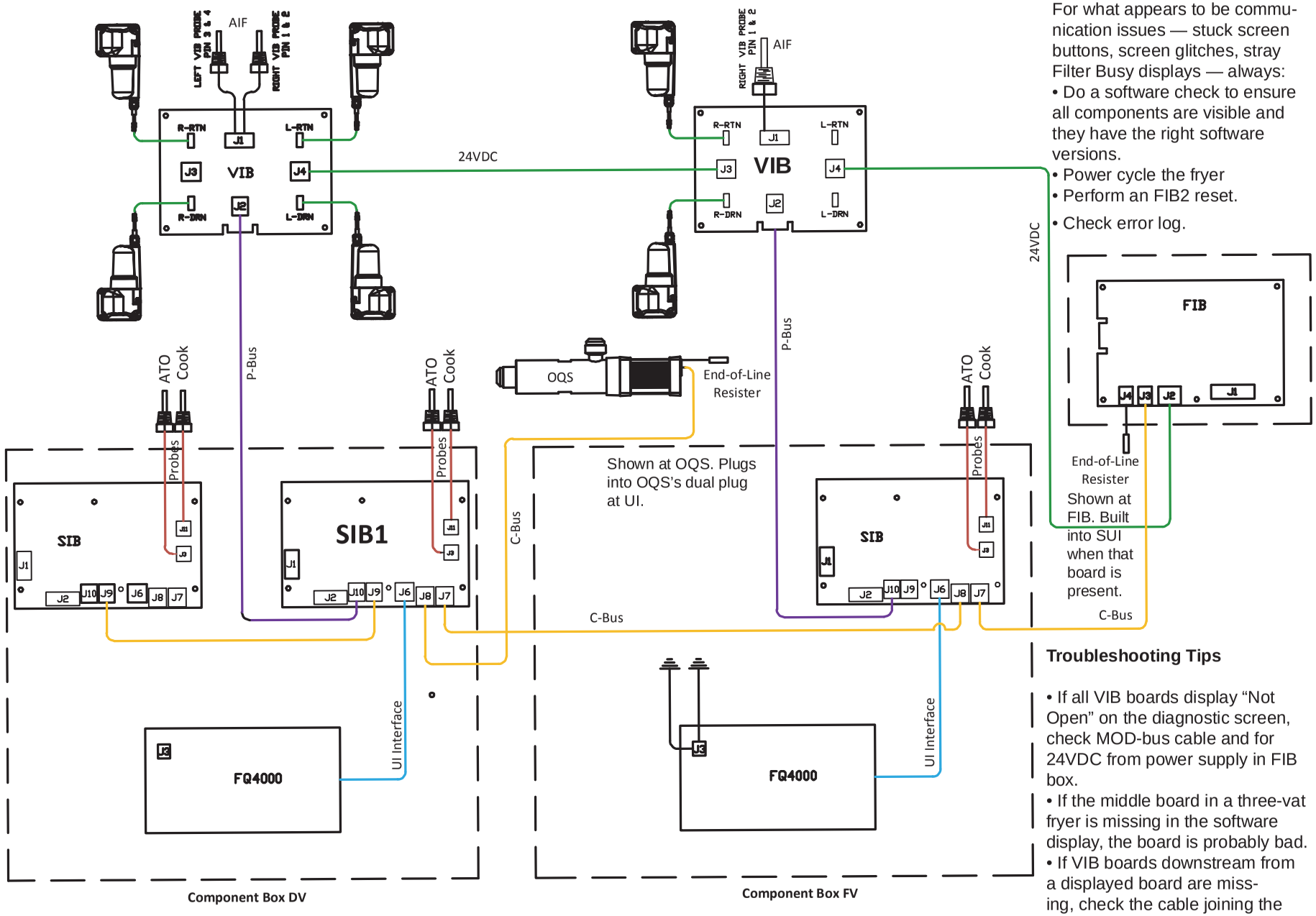


Communication Cables
CAN Bus
• Carries data shared between SIB's, the FIB and OQS, if present. Data includes: filtrations, top offs, OQS data, controller communications

P-Bus
• One per vat. Carries data/commands between VIB and SIB. Data carried on the P-Bus is transferred to the CAN bus, as necessary, through the SIB.

End of Line Resisters
• Mark both ends of CAN bus.

What Causes Problems
• Bad cable connections
• Heat-damaged P-bus cables.
• Mismatched software.
Missing end-of-line resistors.



Troubleshooting

For what appears to be communication issues — stuck screen buttons, screen glitches, stray Filter Busy displays — always:

- Do a software check to ensure all components are visible and they have the right software versions.
- Power cycle the fryer
- Perform an FIB2 reset.
- Check error log.

Troubleshooting Tips

- If all VIB boards display "Not Open" on the diagnostic screen, check MOD-bus cable and for 24VDC from power supply in FIB box.
- If the middle board in a three-vat fryer is missing in the software display, the board is probably bad.
- If VIB boards downstream from a displayed board are missing, check the cable joining the displayed board to the missing boards and the P-bus cable between the SIB and the VIB.

Oil-is-Back Circuit (gas only) Explained

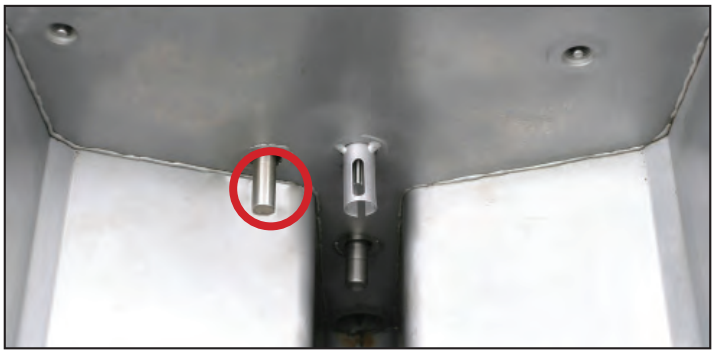
The Oil is Back circuit (shown below) is a safety. It prevents the ignition system in a gas fryer from firing when there is insufficient oil in the frypot.

How it Works

- An additional probe (circled at right) in the gas frypot holds a heater that's powered by an attached electronic egg and attached to a seven-second delay board.
- With oil in the vat, the probe's heater is "cooled" and kept below its 570°F setpoint.
- With oil out of the pot, the heater rises in temperature and a four-second relay in the egg begins cycling to lower the heater's temperature.
- The cycling of the four-second relay disrupts the seven-second relay board.
- The seven-second board opens, denying 24VAC to the gas valve and DC voltage from the VIB to the OIB relay.The UI doesn't call for heat and no errors are displayed.
- When the probe cools with the return of the oil, the egg's relay quits cycling, the seven-second relay board closes, DC voltage from the VIB closes the OIB relay circuit, and the valve gets power.

What Causes Problems:

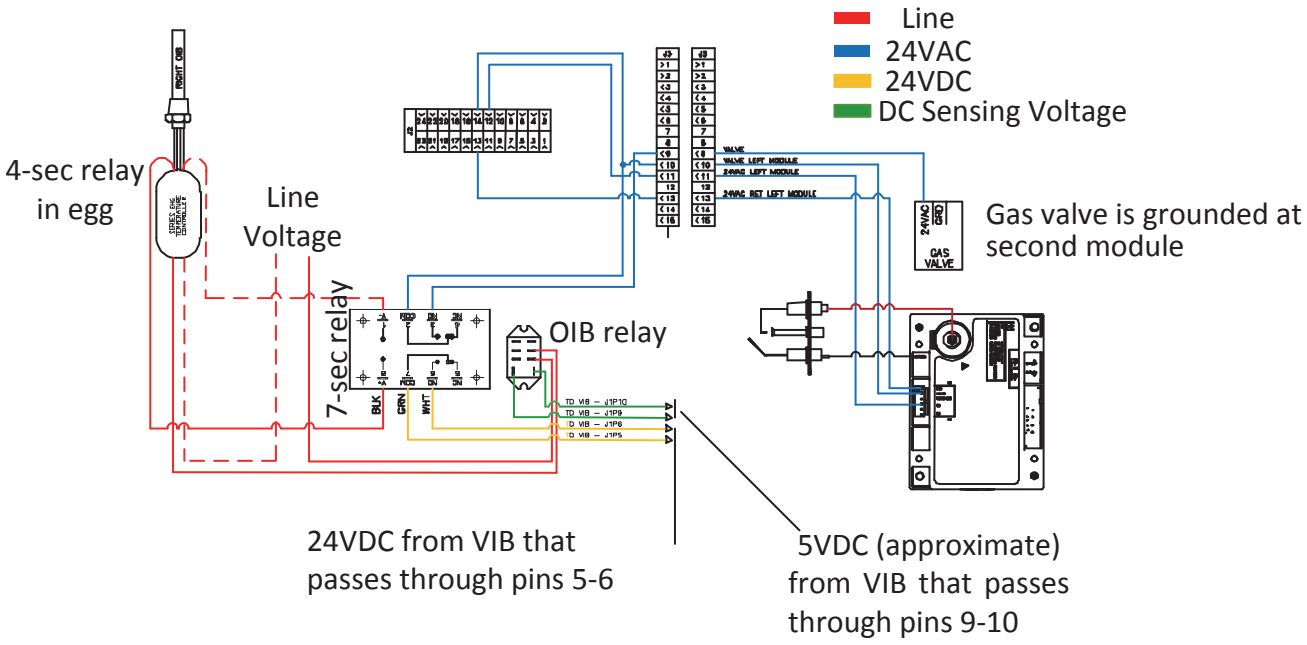
- Failure to regularly clean the OIB probe insulates it from the "cooling" effect of the frypot's oil and will cause the vat to not heat.
- Open contacts on the seven-second board's relay.
- Bad ground on OIB circuit.



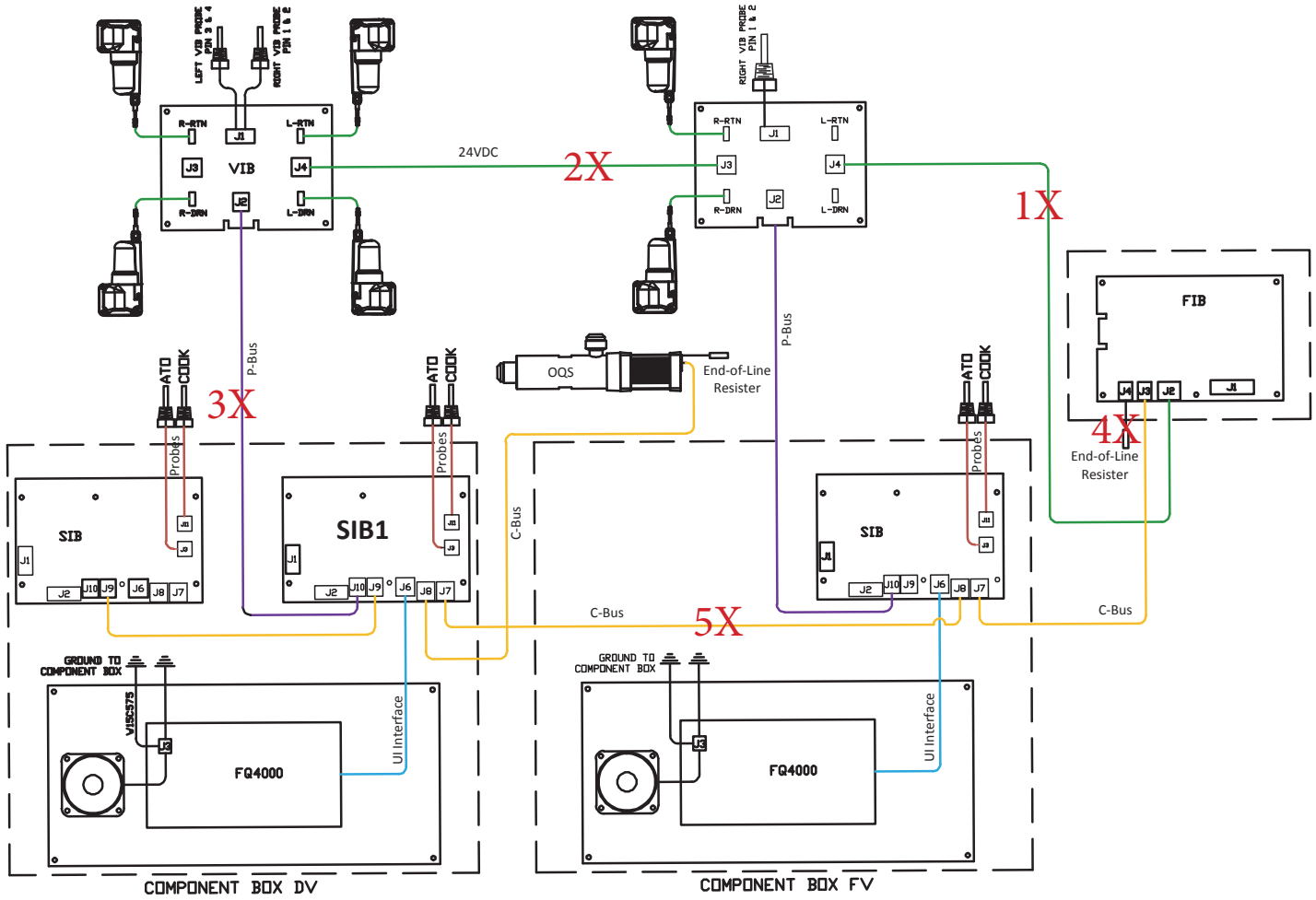
The OIB sensor is circled (above).

The seven-second time-delay board (above) in a McDonald's touch fryer and the egg-shaped electronics housing on the OIB heater (right).

The OIB probe must be regularly cleaned.



Communication Failures Lead to Filtration, Feature Failures



1X	A bad connection between the FIB and the first VIB will deny power to the boards, which control valves for filtration, and top off. On the touchscreen's diagnostic screen, the VIB's will be shown as open. On the software screen, the VIB's are visible. The software check is on the P-Bus.
2X	A bad or broken connection between VIB's will deny power to the actuators downstream from the break. Downstream valves won't open. On the diagnostic screen, valves will be shown as open. On the software screen, the VIB's will be visible.
3X	DC voltage from the FIB flows through the VIB to a gas fryer's oil is back circuit. A break here can cause the fryer not to heat. Power to the OIB's relay is denied, which prevents 24VAC from reaching the gas valve. This break will kill visibility of the VIB's on the software screen.
4X	The end of line resistors establish the two ends of the CAN bus and absorb stray data. A missing resistor in the FIB box will cause errors on the network's messages. Some network communication issues can be related to the communication board, or SUI, that's in the FIB box. If the end of line resister is plugged into the SUI, the resistor can be moved to the FIB's CAN plug, J3 or J4, and the SUI unplugged. If the end-of-line resistor is built-in to the SUI, a separate end-of-line resister must be plugged into J3 or J4 on the FIB before removing the SUI. Without an end-of-line resistor, power can be removed from the SUI with it otherwise left in place to determine if the cause is SUI-related.
5X	A bad CAN issue here will cause the left UI to see everything but the FIB. The right will see everything but the OQS, the component with the end-of-line resistor on the other side of the circuit. The mixed view on the controllers is the hint the issue is between the SIB's.

Video Content

Diagnosing Module-Related Ignition Issues

Left module with view of flashing LED in inset.

Ignition modules are mounted horizontally under the controller box. LED's on the modules are guides when diagnosing ignition problems.

The yellow-circled LED's light when the module gets power.

The red-circled LED's light as the module self tests, sparks and locks out.

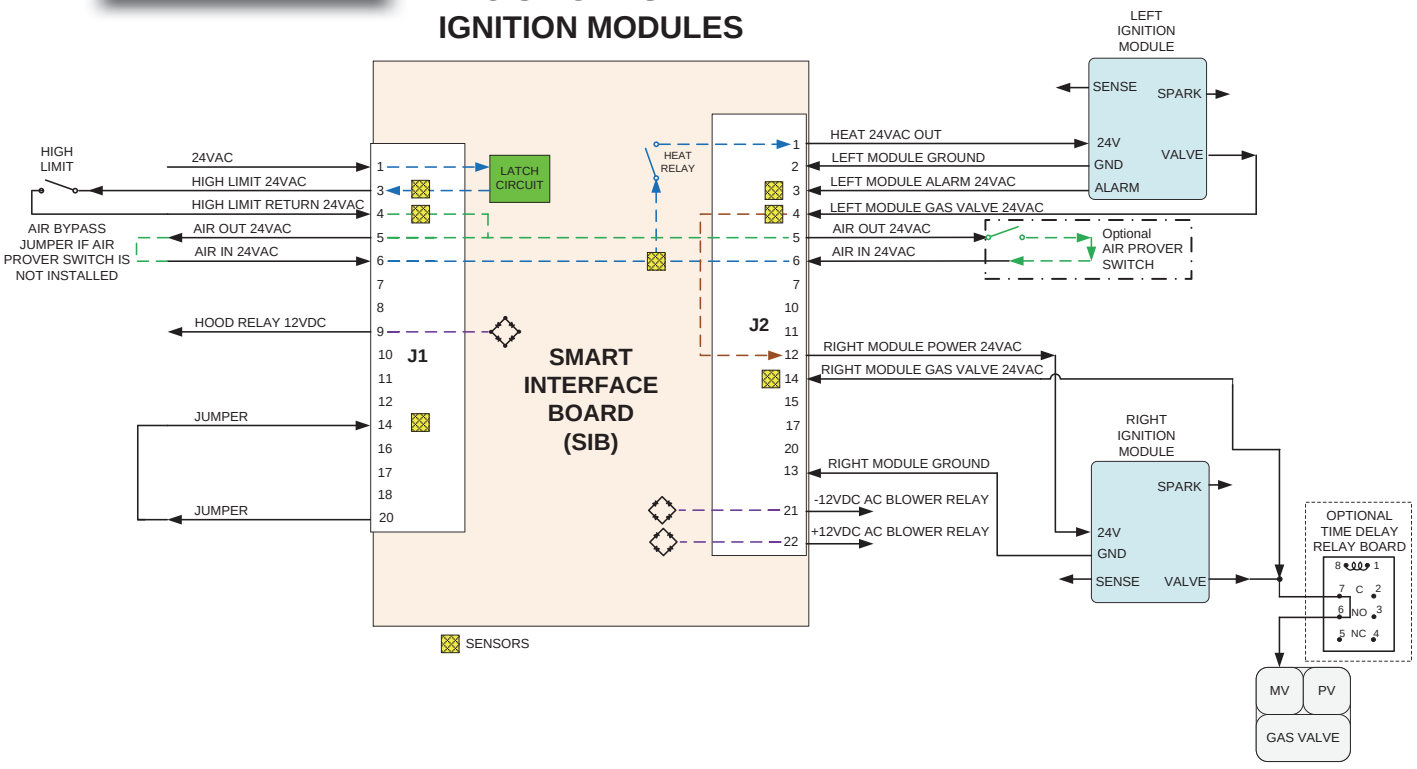
There's one flash with the self test, two flashes as it sparks for ignition and three flashes if flame is not sensed and the module locks out.

Depending on the wiring harness, the left module will light first followed by the right or the right module will light first followed by the left. In all cases, one module follows the other in the ignition sequence. To determine which is locking out, the red LED's have to be directly observed by removing the metal covering over the modules.

Right module with view of dimmer flashing LED in inset.

Video Content

FULL VAT TWO SINGLE SPARK IGNITION MODULES

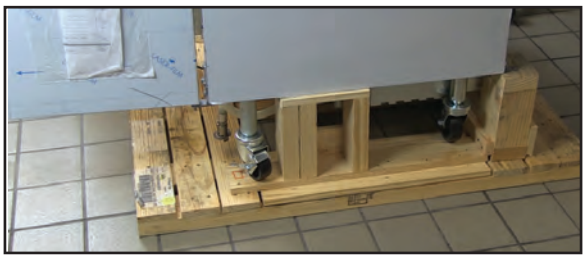


Installation

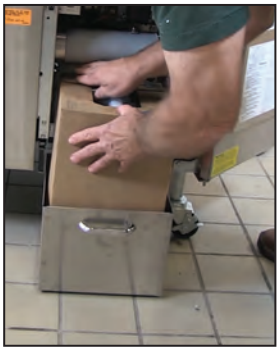
The fryer requires attention to detail as it is installed.

- It must be carefully removed from the pallet to ensure the filter system and the box holding the filter interface components are not damaged.
- It must be leveled to ensure the top off system works accurately.
- The manifold and burner gas pressure should be checked.
- The JIB brace must be removed from the fryer cabinet.
- A JIB placed in the cabinet.
- The staff must be trained on the new fryer.

In some instances, the installation, or commissioning, can be done by an in-house installation company and the demonstration and checks done by an FAS. Videos covering commissioning and demonstration are posted. See links on 5-1.



The standards holding the fryer to the pallet must be carefully removed to avoid damage to the filter system.



The brace (above) that stiffens the cabinet for transport must be removed and a JIB placed in the cabinet (right) during the setup.

Different Models, Different Manuals

The FilterQuick fryer with a touchscreen controller was initially built on a chassis used on a Japanese-specific fryer. The current production, which began in December 2017, fryer is built on a different platform.

Due to the different platforms, there are two parts manuals. 819-7446 for the earlier fryer and 819-7478 for the later model.

The most pronounced visual difference between the fryers is the style of door handle. The earlier fryer has black recessed door handles. The newer model has curved stainless handles on the top of the door.

FQGLA-T (early)

FQG30-T (current)

FilterQuick Training Module

FQGLA-T Installation/Operation

FQGLA-T Parts

FQGLA-T Service

FQG30-T Parts

FQ4000 Controller/TB

FQ4000 Con-

Scan with QR-code reader to access manuals. Click links to access posted training modules. Cover adjacent QR-codes to retrieve desired manual.

Actual temperature is continuously displayed on Taco Bell unit.

Accesses Menus. Allows changing the displayed array of products, dinner items vs. lunch items for example.

Total Polar Material (TPM) reading, a measure of the oil's quality.

Change displayed language.

Accesses Crew Mode

Manual top off, allows top off pump to be run manually

Accesses fryer use and maintenance data also software version numbers

Accesses Cool Mode, a feature that reduces the holding temperature of an idle frypot

Accesses Menus. Allows changing the displayed array of products, dinner items vs. lunch items for example

Accesses Temperatures, actual and setpoint

Accesses Filter menus

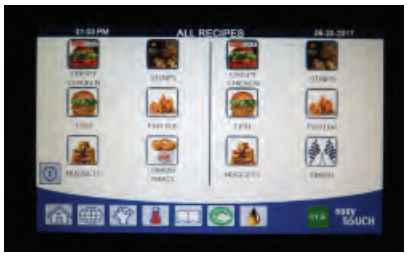
Change displayed language

Accesses Crew Mode

Same Controllers, Different Looks

The controller is configurable for chains. Some restaurants want filters at specific times, others after a number of cook cycles. Some want a button to put idle vats into a energy-conserving cool mode. Some want to display the measurements of an on-board oil quality sensor.

The Taco Bell controller adds a filter icon to its display when in cooking mode. The Burger King controller (below) removes the Question Mark icon when in cooking mode.



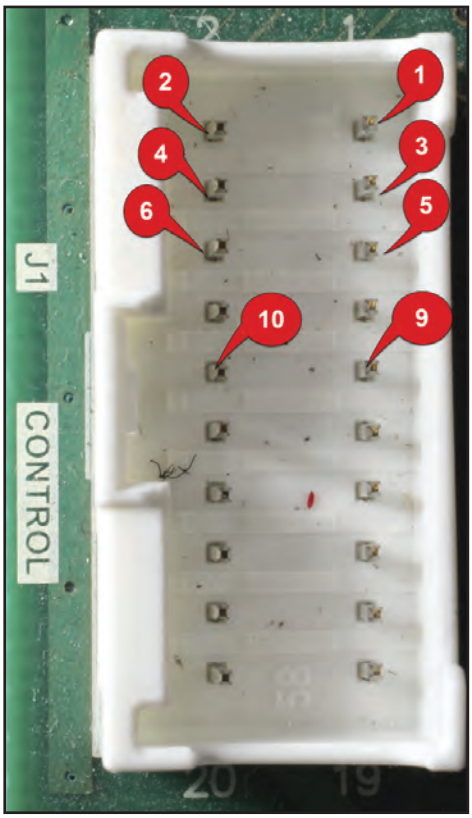
These features in the touchscreen platform are turned on or off at the customer's request. The result is a slightly different interface. The Burger King model (top right) has more buttons on its OFF display.

The Taco Bell unit (top left) continuously displays vat temperature and its Total Polar Material count is shown in a small box on the face of the controller.

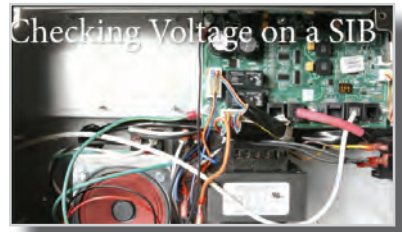
McDonald's units differ from other chains in the number of products shown in cooking mode.

In crew mode (right), the controllers are largely the same. Icons take users to: Crew, where the cooking menu is launched; Menus, where breakfast, lunch, etc, is selected; Recipes, where cooking parameters are adjusted; Settings, where the vat is set up and Service, where diagnostics are accessed.

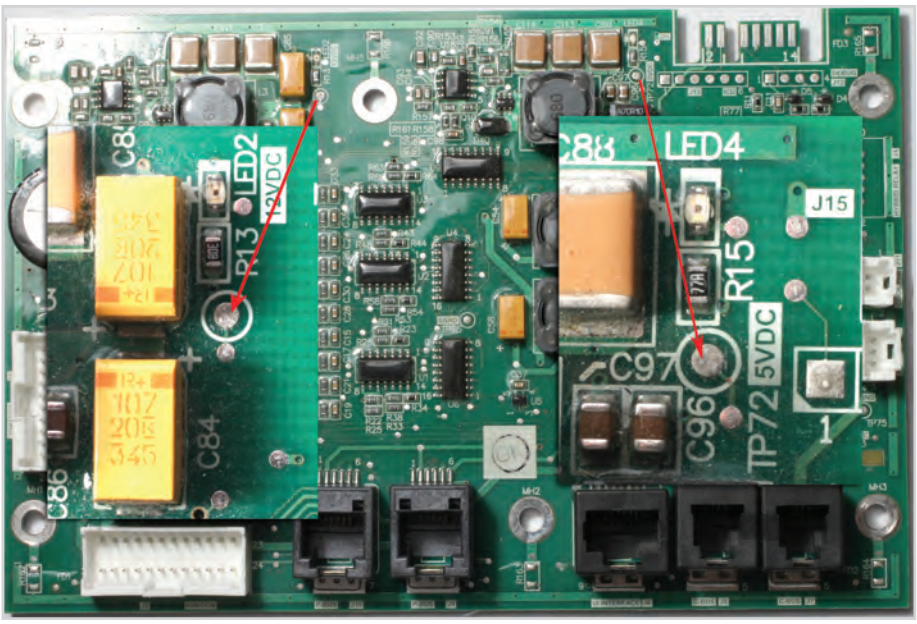
LED's, Pins on the Fryer's SIB Board



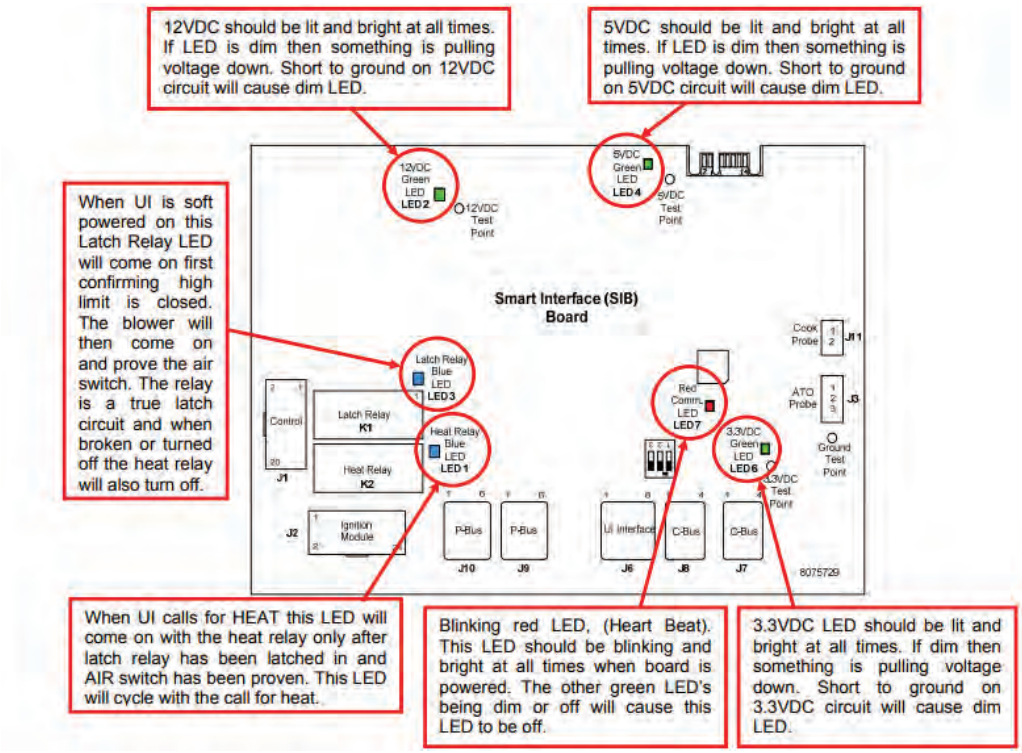
The SIB's J1 (vertical) and J2 (horizontal)plugs are numbered from the top right corner, right to left, as shown above on the J1 plug. The 9 and 10 pins are for the hood relay in McDonald's.



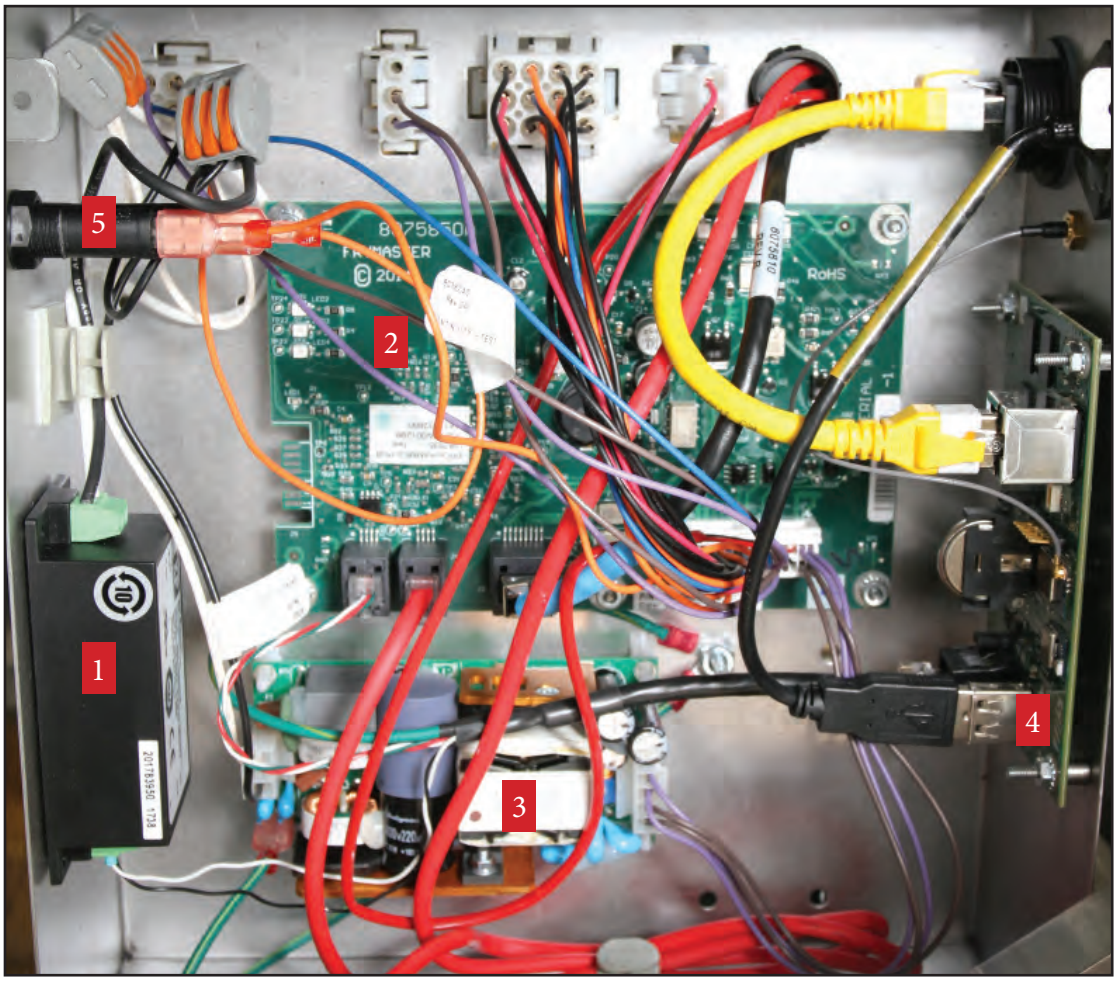
Video Content



Test points on the SIB have been enlarged and overlayed on the image above. A video (linked below) shows voltage tests on the board.

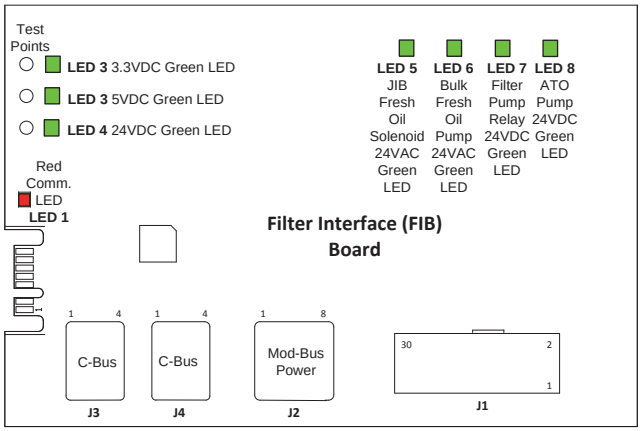


See Pin Outs on pages 5-19—5-30



Annotated View of Filter Interface Board Box

1	24VDC power supply for communication.
2	Filter Interface Board (FIB)
3	24VDC power supply for top off pump, valve actuators
4	SUI communication board
5	Fuse on 24VAC to FIB board



Video Content

See Pin Outs on pages 5-19—5-30

Use Controller's Version, Component Check Features for Diagnostics

Two features in the controller make checking on the presence and performance of components in the network easy. Navigating to the software version window allows temperature comparison between the ATO and the temperature probe. A dramatic difference indicates a probe problem or an oil level problem.

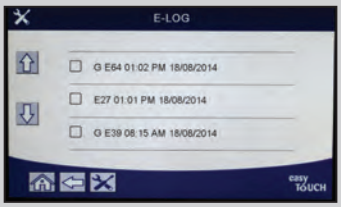
Navigating to the Component Check window, allows relays to be opened/closed, latch relays to be checked, blower motors to be run.

Use Software Display for Diagnostics

- Press the Home button
- Press the Question Mark button.
- Press the down arrow to navigate to the Software version icon.
- Press the software icon.
- Press the down arrow to scroll the software versions for each component: SIB, FIB, VIB, SUI, OQS, etc.
- The numbers should match current version numbers.
- The absence of numbers or the presence of all zeros in a component field means that component is not being seen on the network.
- Scroll with the down arrow again to the temperature display for the ATO and the temperature probe.
- The numbers should be very close. A big difference indicates a probe issue or an oil level problem.

How to Use Component Check Feature

- Turn the fryer off.
- Press the Home button.
- At the Crew Mode screen, press the Service icon.
- Press the Service Man Icon.
- Enter 9-0-0-0 on the keyboard.
- Press the check mark.
- Tap Tech Mode.
- Navigate to the Component Check screen and press the button.
- The controller populates with buttons for fryer components.
- Turn the components on and off as necessary to check component function. Listen closely for relays to open and close.
- Be careful opening drain valves and running pumps. There are no safeties in diagnostic mode.



See Error Code Log, Pages 5-17, 5-18

Use Error Codes to Track Problems

- Press Home button.
- Press Service button.
- Press Manager button.
- Enter 1656
- Press check mark.
- Scroll recorded error codes with up and down arrow keys.
- The codes are displayed, in the order they were recorded, in windows of three.
- There's a video guide to responding to error codes included on the flash drive.
- Error codes can point to operational issues, such as failure to filter, that lead to required maintenance.

Draining to Pan/Filling From Pan

When a repair, such as a probe replacement, requires draining a vat, the controller is used to move the oil to the filter pan. Follow the steps below to drain the affected frypot.

- Press the Filter button.
- Select vat (if split) to drain from display.
- Scroll to Drain to Pan and select it.
- Press check mark.
- Ensure the filter pan is fully inserted.
- Press Blue button to start draining.
- Insert Pan is displayed if pan is not fully in place.
- Draining is followed by Vat Empty.
- Tap Yes when the vat is empty.
- Follow prompts to return oil to vat when work is finished.

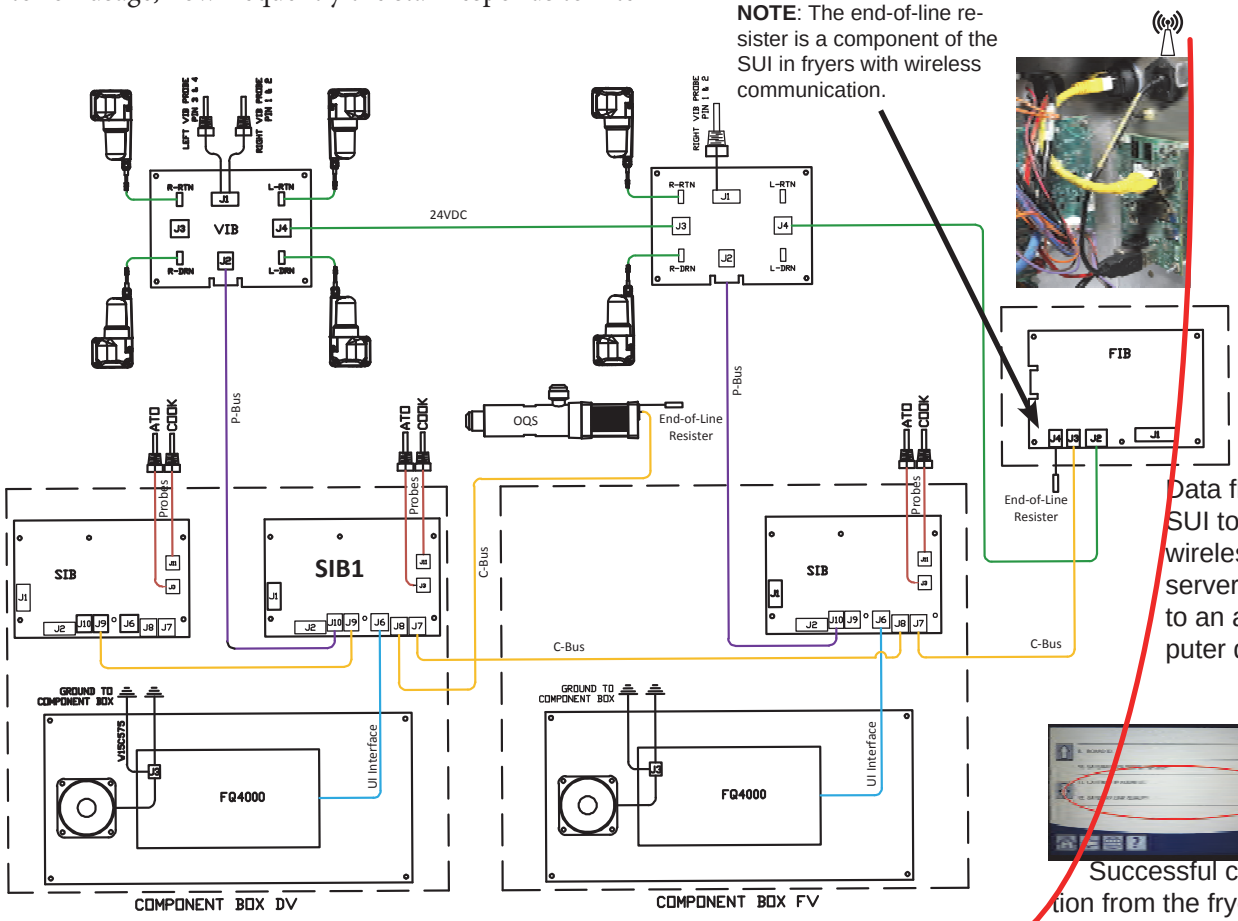
The FQ4000 Controller Introduces Fryer Connectivity

Data on the fryer's use is collected on the circuit boards, consolidated by the Smart Interface Board and passed over the bus to the SUI board, located in the Filter Interface Board box.

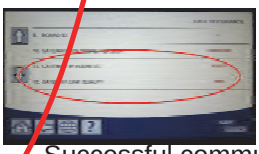
The data is then transfered, via the store's wireless router or a cellular router, to an internet-based dashboard hosted on a server. Store management can monitor oil usage, how frequently the staff responds to filter requests, cook cycles and store-level fryer management.

Successful communication from the fryer can be determined from the Software Version screen of the controller, where signal strength and the IP address can be seen (see below).

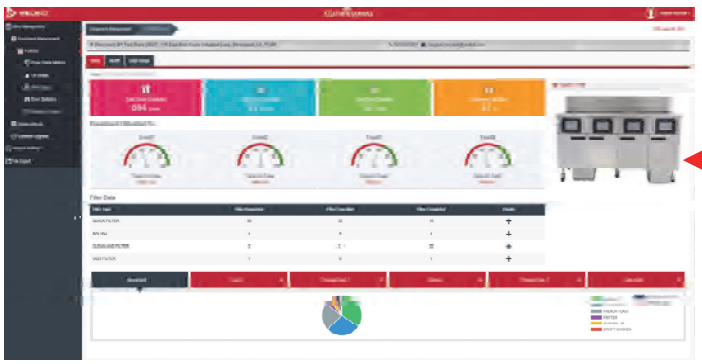
NOTE: The end-of-line resister is a component of the SUI in fryers with wireless communication.



Data flow from the SUI to the store's wireless to a cloud server and then on to an analytic computer display.

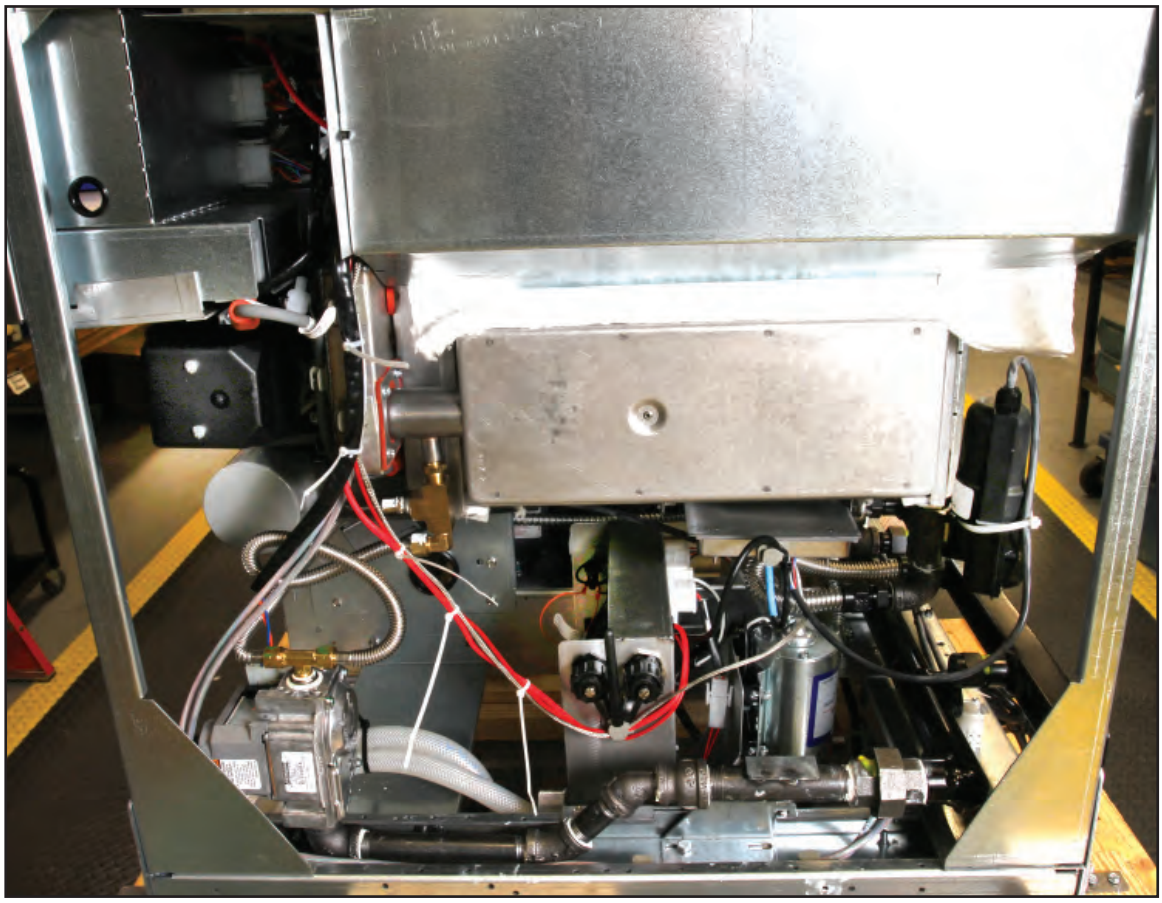


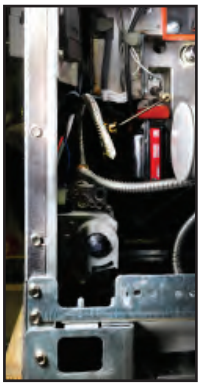
Successful communication from the fryer can be determined at the Software Version screen on the controller, where the signal strength and the IP address can be seen.

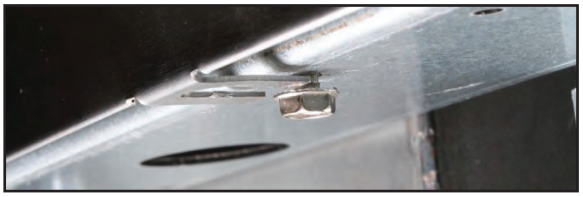


An antenna on the exterior of the FIB is the connection to the store's wireless. Caps on either side of the antenna provide access to LAN and USB ports.

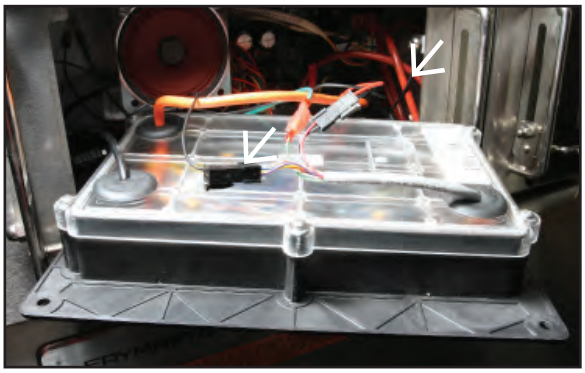
Parts Accessible Behind Removable Panels







The sides of the fryer are removable. Screws fit into slots on the side panels and bottom (left and above). Loosening them allows the side to be removed to access the gas valve, top off pump.



The controller is constrained by a lanyard (arrow) when removed from the bezel. The locator is visible in the front.

Spark modules on gas units are suspended under the control box. Two screws hold the cover. Two bolts attach the module's box to the bezel above.

In most instances, the USB port for software updates and the rocker switch for platform resets are in the left column of the left door.

Error Log Codes

To access the error log, press the home button. Press the service button. Press the manager button. Enter 1656 and press the check button. Press the E-log button. The ten most recent errors are listed from top to bottom, with the top error being the most recent error. A "G" indicates a global error such as a filtration error. Side-specific errors in split vats are indicated by L for left or R for right. Pressing the left down arrow allows scrolling through the errors. If no errors are present the screen will be blank.

Code	ERROR MESSAGE	EXPLANATION
E13	TEMPERATURE PROBE FAILURE	TEMP Probe reading out of range
E16	HIGH LIMIT 1 EXCEEDED	High limit temperature is past more than 410°F (210°C), or in CE countries, 395°F (202°C)
E17	HIGH LIMIT 2 EXCEEDED	High limit switch has opened.
E18	HIGH LIMIT PROBLEM DISCONNECT POWER	Vat temperature exceeds 460°F (238°C) and the high limit has failed to open. Immediately disconnect power to the fryer and call service.
E19	HEATING FAILURE – XXX F or XXX C	Heating Control latch circuit failed. Heat Contactor failed to latch.
E25	HEATING FAILURE - BLOWER	The air pressure switch(s) failed to close.
E27	HEATING FAILURE - PRESSURE SWITCH - CALL SERVICE	The air pressure switch has failed closed.
E28	HEATING FAILURE – XXX F or XXX C	The fryer has failed to ignite and has locked out the ignition module.
E29	TOP OFF PROBE FAILURE - CALL SERVICE	ATO RTD reading out of range
E32	DRAIN VALVE NOT OPEN - FILTRATION AND TOP OFF DISABLED - CALL SERVICE	Drain valve was trying to open and confirmation is missing
E33	DRAIN VALVE NOT CLOSED - FILTRATION AND TOP OFF DISABLED - CALL SERVICE	Drain valve was trying to close and confirmation is missing
E34	RETURN VALVE NOT OPEN - FILTRATION AND TOP OFF DISABLED - CALL SERVICE	Return valve was trying to open and confirmation is missing
E35	RETURN VALVE NOT CLOSED - FILTRATION AND TOP OFF DISABLED - CALL SERVICE	Return valve was trying to close and confirmation is missing
E36	VALVE INTERFACE BOARD FAILURE - FILTRATION AND TOP OFF DISABLED - CALL SERVICE	Valve Interface Board connections lost or board failure.
E37	AUTOMATIC INTERMITTENT FILTRATION PROBE FAILURE - FILTRATION DISABLED - CALL SERVICE	AIF (VIB Probe) RTD reading out of range.
E39	CHANGE FILTER PAD	25-hour timer has expired or dirty filter logic has activated.
E41	OIL IN PAN ERROR	The system detects that oil may be present in the filter pan.
E42	CLOGGED DRAIN (Gas)	Vat did not empty during filtration
E43	OIL SENSOR FAILURE - CALL SERVICE	Oil level sensor may have failed.
E44	RECOVERY FAULT	Recovery time exceeded maximum time limit.
E45	RECOVERY FAULT – CALL SERVICE	Recovery time exceeded maximum time limit for two or more cycles. Reset the error code by going to: HOME -> SERVICE -> SERVICE ->3000-> TECH MODE -> RESETS -> RECOVERY FAULT CALL SERVICE -> YES.
E46	SYSTEM INTERFACE BOARD 1 MISSING - CALL SERVICE	SIB board 1 connection lost or board failure.
E51	DUPLICATE BOARD ID - CALL SERVICE	Two or more controllers have the same location ID.
E52	USER INTERFACE CONTROLLER ERROR - CALL SERVICE	The controller has an unknown error.
E53	CAN BUS ERROR - CALL SERVICE	Communications are lost between boards.
E55	SYSTEM INTERFACE BOARD 2 MISSING - CALL SERVICE	SIB board 2 connection lost or board failure.
E62	SLOW HEATING FAILURE XXXF OR XXXC - CHECK ENERGY SOURCE - CALL SERVICE	The vat is not heating properly.
E63	RATE OF RISE	Rate of rise error occurred during a recovery test.
E64	FILTRATION INTERFACE BOARD FAILURE - FILTRATION AND TOP OFF DISABLED - CALL SERVICE	Filtration Interface Board connections lost or board failure.
E65	CLEAN OIB SENSOR – XXX F OR XXX C - CALL SERVICE	Gas -The oil is back sensor does not detect oil. Clean optional oil sensor.
E66	DRAIN VALVE OPEN – XXXF OR XXXC	Drain valve is opened during cooking.
E67	SYSTEM INTERFACE BOARD NOT CONFIGURED - CALL SERVICE	Controller is turned on when the SIB board is not configured.

Code	ERROR MESSAGE	EXPLANATION
E68	OIB FUSE TRIPPED – CALL SERVICE	The VIB board OIB fuse has tripped and didn't reset.
E69	RECIPES NOT AVAILABLE	The controller has not been programmed with product recipes. Replace controller with factory programmed controller.
E70	OQS TEMP HIGH	Oil temperature is too high for a valid OQS reading. Filter at a temperature between 300ºF (149ºC) and 375ºF (191ºC).
E71	OQS TEMP LOW	Oil temperature is too low for a valid OQS reading. Filter at a temperature between 300ºF (149ºC) and 375ºF (191ºC).
E72	TPM RANGE LOW	The TPM is too low for a valid OQS reading. This may also be seen with fresh new oil. The incorrect oil type may be selected in the setup menu. The sensor may not be calibrated for the oil type. See oil type chart in instruction document 8197316. If issue continues contact an FAS.
E73	TPM RANGE HIGH	The TPM reading is too high for a valid OQS reading. Dispose the oil.
E74	OQS ERROR	The OQS has an internal error. If issue continues contact an FAS.
E75	OQS AIR ERROR	The OQS is detecting air in the oil. Check the O-rings and check/tighten prescreen filter to ensure no air is entering the OQS sensor. If issue continues contact an FAS.
E76	OQS ERROR	The OQS sensor has a communication error. Check connections to the OQS sensor. Power cycle the entire fryer battery. If issue continues contact an FAS.
E81	SAFE MODE FAILURE ERROR	The system has detected the fryer is not heating properly due to low oil conditions. Ensure the fryer has oil to the bottom fill line or higher. If not, add oil to the bottom fill line.

Circuit Board Pin Outs

McD_T Electric SIB (Smart Interface Board) Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED (except ATO and Temp Probes) AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	From Transformer	8075951 Full or Right of Split 8075952 Left Split	1	24VAC Input	24VAC	Orange
			2	Ground -		Blue
	To High Limit		3	24VAC Out	24VAC	Orange
	From High Limit		4	24VAC Input	24VAC	Blue
	To Latch Contactor		7	24VAC Out	24VAC	Orange
	To Heat Contactor		8	24VAC Out	24VAC	Orange
	To Hood Relay		9	12VDC Out	12VDC	Yellow
			10			Yellow
			11			Brown
			14			Blue
			16			Blue
	Left SIB Jumper		17	Ground -		Black
	Left SIB Jumper		18	5VDC Out	5VDC	Black
			20			Orange
J2	Not Used					
J3	ATO Probe	8263286	1	Ground		Yellow
			2	RTD		Red
			3			
J6	Controller		1	C-BUS +	5VDC	
			2	C-BUS -	5VDC	
			3	5VDC	5VDC	
			4	RS485 -	5VDC	
			5	RS485 +	5VDC	
			6	Signal Ground		
			7	12VDC	12VDC	
			8	Signal Ground		
J7	C-Bus Harness	8075549 or 8075551	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J8	C-Bus Harness or Network Resistor (pins 2 & 3)	8075549 or 8075551 or (8075632 Resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J9	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075553	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J10	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075555	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J11	Cooking Probe	8263450	1	Ground		Yellow
			2	Probe		Red

McD_T Electric FIB (Filter Interface Board) Filtration and Top-off Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	Input from Power Supply	8076240	1	Ground -		Brown
			2	24VDC Input	+24VDC	Purple
			3	Ground -		Brown
			4	24VDC Input	+24VDC	Purple
	JIB Reset Switch		5	Ground -	3.3VDC	Black
			6	JIB Low Reset		Red
	Filter Pump Relay		9	Pump Motor +	24VDC	Purple
			10	Pump Motor -		Brown
	Pan Switch		13	Pan Sw Ground -	3.3VDC	Red
			14	Pan Sw +		Red
	ATO Pump Relay		15	Pump Relay Ground -	24VDC	Purple
			16	ATO Pump Relay		Brown
	Input from 24VAC Transformer		17	24VAC	24VAC	Orange
			18	24VAC Ret		Blue
	To RTI JIB Add Solenoid		19	24VAC	24VAC	Black
			20	24VAC Ret		Black
	RTI connector rear of fryer		21	From RTI transformer (1 on Hirschman)	24VAC	Orange
			22	Common (Ret) (4 on Hirschman)		Blue
			23	To RTI Fresh Oil Relay (3 on Hirschman)	24VAC	Orange
			24	From RTI "Waste Tank Full Sensor" Test Pins 22 to 24 (1 to 4 on Hirschman)	24VAC –Full 0VAC – Not Full	Orange
	Waste Closed Switch		25	Closed Switch +	3.3VDC	Black
			26	Closed Switch Ground -		Black
	Waste Open Switch		27	Open Switch +	3.3VDC	Black
			28	Open Switch Ground -		Black
	Filter Pump Relay Contact Signal When Pump Is On		29	Filter Pump On Contact		
			30	Filter Pump On Contact		
J2	24VDC Power Output from FIB to Far-Right VIB Board (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J3	C-Bus from Far-Right SIB Board (RJ11)	8075551	1	5VDC	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J4	C-Bus or Network Resistor (pins 2 & 3) (RJ11)	(8075632 resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		

FQ_T Electric VIB (Valve Interface Board) Actuator Board Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	VIB (AIF) Probes	1087136 Full VIB 1087137 Split VIB 8263287 VIB (AIF) Probe Only	1	Right VIB Probe Ground	Ohm	Yellow
			2	Right VIB Probe		Red
			3	Left VIB Probe Ground		Yellow
			4	Left VIB Probe		Red
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13	Ground		
			14	24VDC +	24VDC	
J2	P-Bus Power Communication from SIB (RJ11)	8075555	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J3	24VDC Power Input between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J4	24VDC Power Output between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J5	FV (Right) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J6	DV (Left) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J7	FV (Right) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White
J8	DV (Left) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White

McD_T Gas SIB (Smart Interface Board) Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED (except ATO and Temp Probes) AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	From Transformer	8076364 Full 8076365 Split	1	24VAC Input	24VAC	Orange
			2	Ground -		Blue
	To High Limit		3	24VAC Out	24VAC	Orange
	From High Limit		4	24VAC Input	24VAC	Blue
	To Hood Relay		9	12VDC Out	12VDC	Yellow
			10			Yellow
			11			Brown
			12			Brown
	Left SIB Jumper		17	Ground -		Gray
	Left SIB Jumper		18	5VDC Out	5VDC	Gray
J2	To 24VAC Rt Ignition Module		1	24VAC Out	24VAC	Orange
	From 24VAC Right Ign Module		2	Ground		Green
	From Right Ignition Module		3	Alarm In	24VAC	Yellow
	From Right Module Gas Valve		4	24VAC In	24VAC	Orange
	To Air Switch		5	24VAC Out	24VAC	Orange
	From Air Switch		6	2VAC In	24VAC	Blue
	To 24VAC Left Ignition Module		12	24VAC Out	24VAC	Red
	From 24VAC Left Ign Module		13	Ground		Green
	From Left Module Gas Valve		14	24VAC In	24VAC	Orange
	To AC Blower Relay		21	AC Blower Relay	-12VDC	Brown
	To AC Blower Relay		22	AC Blower Relay	+12VDC	Yellow
J3	ATO Probe	8263286	1	Ground		Yellow
			2	RTD		Red
			3			
J6	Controller		1	C-BUS +	5VDC	
			2	C-BUS -	5VDC	
			3	5VDC	5VDC	
			4	RS485 -	5VDC	
			5	RS485 +	5VDC	
			6	Signal Ground		
			7	12VDC	12VDC	
			8	Signal Ground		
J7	C-Bus Harness	8075549 or 8075551	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J8	C-Bus Harness or Network Resistor (pins 2 & 3)	8075549 or 8075551 or (8075632 Resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J9	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075555 or 8075553	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J10	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075555 or 8075553	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J11	Cooking Probe	8263285	1	Ground		Yellow
			2	Probe		Red

McD_T Gas FIB (Filter Interface Board) Filtration and Top-off Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	Input from Power Supply	8076240	1	Ground -		Brown
			2	24VDC Input	+24VDC	Purple
			3	Ground -		Brown
			4	24VDC Input	+24VDC	Purple
	JIB Reset Switch		5	Ground -	3.3VDC	Black
			6	JIB Low Reset		Red
	Filter Pump Relay		9	Pump Motor +	24VDC	Purple
			10	Pump Motor -		Brown
	Pan Switch		13	Pan Sw Ground -	3.3VDC	Red
			14	Pan Sw +		Red
	ATO Pump Relay		15	Pump Relay Ground -	24VDC	Purple
			16	ATO Pump Relay		Brown
	Input from 24VAC Transformer		17	24VAC	24VAC	Orange
			18	24VAC Ret		Blue
	To RTI JIB Add Solenoid		19	24VAC	24VAC	Black
			20	24VAC Ret		Black
	RTI connector rear of fryer		21	From RTI transformer (1 on Hirschman)	24VAC	Orange
			22	Common (Ret) (4 on Hirschman)		Blue
			23	To RTI Fresh Oil Relay (3 on Hirschman)	24VAC	Orange
			24	From RTI "Waste Tank Full Sensor" Test Pins 22 to 24 (1 to 4 on Hirschman)	24VAC –Full 0VAC – Not Full	Orange
	Waste Closed Switch		25	Closed Switch +	3.3VDC	Black
			26	Closed Switch Ground -		Black
	Waste Open Switch		27	Open Switch +	3.3VDC	Black
			28	Open Switch Ground -		Black
	Filter Pump Relay Contact Signal When Pump Is On		29	Filter Pump On Contact		Red
			30	Filter Pump On Contact		Black
J2	24VDC Power Output from FIB to Far Right VIB Board (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J3	C-Bus from Far-Right SIB Board (RJ11)	8075551	1	5VDC	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J4	C-Bus or Network Resistor (pins 2 & 3) (RJ11)	(8075632 resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		

McD_T Gas VIB (Valve Interface Board) Actuator Board Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	VIB (AIF) Probes, OIB Probes	1086013 Full VIB 1086014 Split VIB 8263287 VIB (AIF) Probe Only	1	Right VIB Probe Ground	Ohm	Yellow
			2	Right VIB Probe		Red
			3	Left VIB Probe Ground		Yellow
			4	Left VIB Probe		Red
			5	Right OIB Ground		Green
			6	Right OIB Probe		White
			7	Left OIB Ground		Green
			8	Left OIB Probe		White
			9	Right OIB Relay +	24VDC	Red
			10	Right OIB Relay -		Black
			11	Left OIB Relay +	24VDC	Red
			12	Left OIB Relay -		Black
			13	Ground		
			14	24VDC +	24VDC	
J2	P-Bus Power Communication from SIB (RJ11)	8075555	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J3	24VDC Power Input between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J4	24VDC Power Output between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J5	FV (Right) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J6	DV (Left) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J7	FV (Right) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White
J8	DV (Left) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White

FQ_T Electric SIB (Smart Interface Board) Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED (except ATO and Temp Probes) AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	From Transformer	8075951 Full or Right of Split 8075952 Left Split	1	24VAC Input	24VAC	Orange
			2	Ground -		Blue
	To High Limit		3	24VAC Out	24VAC	Orange
	From High Limit		4	24VAC Input	24VAC	Blue
	To Latch Contactor		7	24VAC Out	24VAC	Orange
	To Heat Contactor		8	24VAC Out	24VAC	Orange
	To Hood Relay		9	12VDC Out	12VDC	Yellow
			10			Yellow
			11			Brown
			14			Blue
			16			Blue
	Left SIB Jumper		17	Ground -		Black
	Left SIB Jumper		18	5VDC Out	5VDC	Black
			20			Orange
J2	Not Used					
J3	ATO Probe	8263286	1	Ground		Yellow
			2	RTD	3.3VDC	Red
			3			
J6	Controller		1	C-BUS +	5VDC	
			2	C-BUS -	5VDC	
			3	5VDC	5VDC	
			4	RS485 -	5VDC	
			5	RS485 +	5VDC	
			6	Signal Ground		
			7	12VDC	12VDC	
			8	Signal Ground		
J7	C-Bus Harness	8075549 or 8075551	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J8	C-Bus Harness or Network Resistor (pins 2 & 3)	8075549 or 8075551 or (8075632 Resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J9	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075553	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J10	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075555	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J11	Cooking Probe	8263450	1	Ground		Yellow
			2	Probe	3.3VDC	Red

FQ_T Electric FIB (Filter Interface Board) Filtration and Top-off Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	Input from Power Supply	8076240	1	Ground -		Brown
			2	24VDC Input	+24VDC	Purple
			3	Ground -		Brown
			4	24VDC Input	+24VDC	Purple
	JIB Reset Switch		5	Ground -	3.3VDC	Black
			6	JIB Low Reset		Red
	Filter Pump Relay		9	Pump Motor +	24VDC	Purple
			10	Pump Motor -		Brown
	Pan Switch		13	Pan Sw Ground -	3.3VDC	Red
			14	Pan Sw +		Red
	ATO Pump Relay		15	Pump Relay Ground -	24VDC	Purple
			16	ATO Pump Relay		Brown
	Input from 24VAC Transformer		17	24VAC	24VAC	Orange
			18	24VAC Ret		Blue
	To RTI JIB Add Solenoid		19	24VAC	24VAC	Black
			20	24VAC Ret		Black
	RTI connector rear of fryer		21	From RTI transformer (1 on Hirschman)	24VAC	Orange
			22	Common (Ret) (4 on Hirschman)		Blue
			23	To RTI Fresh Oil Relay (3 on Hirschman)	24VAC	Orange
			24	From RTI "Waste Tank Full Sensor" Test Pins 22 to 24 (1 to 4 on Hirschman)	24VAC –Full 0VAC – Not Full	Orange
	Waste Closed Switch		25	Closed Switch +	3.3VDC	Black
			26	Closed Switch Ground -		Black
	Waste Open Switch		27	Open Switch +	3.3VDC	Black
			28	Open Switch Ground -		Black
	Filter Pump Relay Contact Signal When Pump Is On		29	Filter Pump On Contact		
			30	Filter Pump On Contact		
J2	24VDC Power Output from FIB to Far-Right VIB Board (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J3	C-Bus from Far-Right SIB Board (RJ11)	8075551	1	5VDC	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J4	C-Bus or Network Resistor (pins 2 & 3) (RJ11)	(8075632 resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		

FQ_T Electric VIB (Valve Interface Board) Actuator Board Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	VIB (AIF) Probes	1087136 Full VIB 1087137 Split VIB 8263287 VIB (AIF) Probe Only	1	Right VIB Probe Ground	Ohm	Yellow
			2	Right VIB Probe		Red
			3	Left VIB Probe Ground		Yellow
			4	Left VIB Probe		Red
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13	Ground		
			14	24VDC +	24VDC	
J2	P-Bus Power Communication from SIB (RJ11)	8075555	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J3	24VDC Power Input between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J4	24VDC Power Output between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J5	FV (Right) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J6	DV (Left) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J7	FV (Right) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White
J8	DV (Left) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White

FQ_T Gas SIB (Smart Interface Board) Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED (except ATO and Temp Probes) AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	From Transformer	8076243 Full without OIB 8196364 Full with OIB 8076244 Split without OIB 8076365 Split with OIB	1	24VAC Input	24VAC	Orange
			2	Ground -		Blue
	To High Limit		3	24VAC Out	24VAC	Orange
	From High Limit		4	24VAC Input	24VAC	Blue
	From Basket Lift V-Relay		10	12VDC Input	12VDC	Yellow
	To Right Basket Lift		11	12VDC Out	12VDC	Brown
	To Left Basket Lift		12	12VDC Out	12VDC	Brown
	Left SIB Jumper		17	Ground -		Gray
	Left SIB Jumper		18	5VDC Out	5VDC	Gray
J2	To 24VAC Right Ignition Module		1	24VAC Out	24VAC	Orange
	From 24VAC Right Ignition Module		2	Ground		Green
	From Right Ignition Module		3	Alarm In	24VAC	Yellow
	From Right Module Gas Valve		4	24VAC Input	24VAC	Orange
	To Air Switch		5	24VAC Out	24VAC	Orange
	From Air Switch		6	2VAC Input	24VAC	Blue
	To 24VAC Left Ignition Module		12	24VAC Out	24VAC	Red
	From 24VAC Left Ignition Module		13	Ground		Green
	From Left Module Gas Valve		14	24VAC Input	24VAC	Orange
	To AC Blower Relay		21	AC Blower Relay	-12VDC	Brown
	To AC Blower Relay		22	AC Blower Relay	+12VDC	Yellow
J3	ATO Probe	8263286	1	Ground		Yellow
			2	RTD		Red
			3			
J6	From Controller		1	C-BUS +	5VDC	
			2	C-BUS -	5VDC	
			3	5VDC	5VDC	
			4	RS485 -	5VDC	
			5	RS485 +	5VDC	
			6	Signal Ground		
			7	12VDC	12VDC	
			8	Signal Ground		
J7	C-Bus Harness	8075549 or 8075551	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J8	C-Bus Harness or Network Resistor (pins 2 & 3)	8075549 or 8075551 or (8075632 Resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J9	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075555 or 8075553	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J10	P-Bus Power Communication from SIB to VIB or between SIB's RJ11	8075555 or 8075553	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J11	Cooking Probe	8263285	1	Ground		Yellow
			2	Probe		Red

FQ_T Gas FIB (Filter Interface Board) Filtration and Top-off Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness #	Pin #	Function	Voltage	Wire Color
J1	Input from Power Supply	8076240	1	Ground -		Brown
			2	24VDC Input	+24VDC	Purple
			3	Ground -		Brown
			4	24VDC Input	+24VDC	Purple
	JIB Reset Switch		5	Ground -	3.3VDC	Black
			6	JIB Low Reset		Red
	Filter Pump Relay		9	Pump Motor +	24VDC	Purple
			10	Pump Motor -		Brown
	Pan Switch		13	Pan Sw Ground -	3.3VDC	Red
			14	Pan Sw +		Red
	ATO Pump Relay		15	Pump Relay Ground -	24VDC	Purple
			16	ATO Pump Relay		Brown
	Input from 24VAC Transformer		17	24VAC	24VAC	Orange
			18	24VAC Ret		Blue
	To Bulk Fresh Oil JIB Add Solenoid		19	24VAC	24VAC	Black
			20	24VAC Ret		Black
	Bulk connector rear of fryer		21	From bulk oil fresh transformer (Pin 1 on 9 pin)	24VAC	Orange
			22	Common (Ret) (Pin 4 on 9 pin)		Blue
			23	To bulk oil Fresh Oil Relay (Pin 3 on 9 pin)	24VAC	Orange
			24	From bulk "Waste Tank Full Sensor" Test Pins 22 to 24 (Pin1 to Pin4 on 9 pin)	24VAC –Full 0VAC – Not Full	Orange
	Waste Closed Switch		25	Closed Switch +	3.3VDC	Black
			26	Closed Switch Ground -		Black
	Waste Open Switch		27	Open Switch +	3.3VDC	Black
			28	Open Switch Ground -		Black
	Filter Pump Relay Contact Signal When Pump Is On		29	Filter Pump On Contact		
			30	Filter Pump On Contact		
J2	24VDC Power Output from FIB to Far Right VIB Board (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J3	C-Bus from Far-Right SIB Board (RJ11)	8075551	1	5VDC	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		
J4	C-Bus or Network Resistor (pins 2 & 3) (RJ11)	(8075632 resistor)	1	5VDC+	+5VDC	
			2	CAN High		
			3	CAN Low		
			4	Ground		

FQ_T Gas VIB (Valve Interface Board) Actuator Board Pin Positions and Harnesses

NOTE: DO NOT CHECK WITH HARNESSES UNPLUGGED AS SHORTING THE PINS MAY OCCUR WHICH WILL DAMAGE THE BOARD.

Connector	From/To	Harness PN	Pin #	Function	Voltage	Wire Color
J1	VIB (AIF) Probes, OIB Probes	1086013 Full VIB 1086014 Split VIB 8263287 VIB (AIF) Probe Only	1	Right VIB Probe Ground	Ohm	Yellow
			2	Right VIB Probe		Red
			3	Left VIB Probe Ground		Yellow
			4	Left VIB Probe		Red
			5	Right OIB Ground		Green
			6	Right OIB Probe		White
			7	Left OIB Ground		Green
			8	Left OIB Probe		White
			9	Right OIB Relay +	24VDC	Red
			10	Right OIB Relay -		Black
			11	Left OIB Relay +	24VDC	Red
			12	Left OIB Relay -		Black
			13	Ground		
			14	24VDC +	24VDC	
J2	P-Bus Power Communication from SIB (RJ11)	8075555	1	Ground		
			2	P-BUS power	+5VDC	
			3	Modbus RS485 B		
			4	Modbus RS485 A		
			5	Signal ground		
			6	P-BUS power	+12VDC	
J3	24VDC Power Input between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J4	24VDC Power Output between VIB Boards (RJ45)	8075810	1	Ground		
			2	Ground		
			3	Ground		
			4	Ground		
			5	Power	+24VDC	
			6	Power	+24VDC	
			7	Power	+24VDC	
			8	Power	+24VDC	
J5	FV (Right) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J6	DV (Left) Drain		1	Drain + (Open)	+24VDC	Black
			2	Drain – (Closed)	-24VDC	Red
			3	Drain Position		Blue
			4	Ground		White
J7	FV (Right) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White
J8	DV (Left) Return		1	Ret + (Open)	+24VDC	Black
			2	Ret – (Closed)	-24VDC	Red
			3	Ret Position		Blue
			4	Ground		White

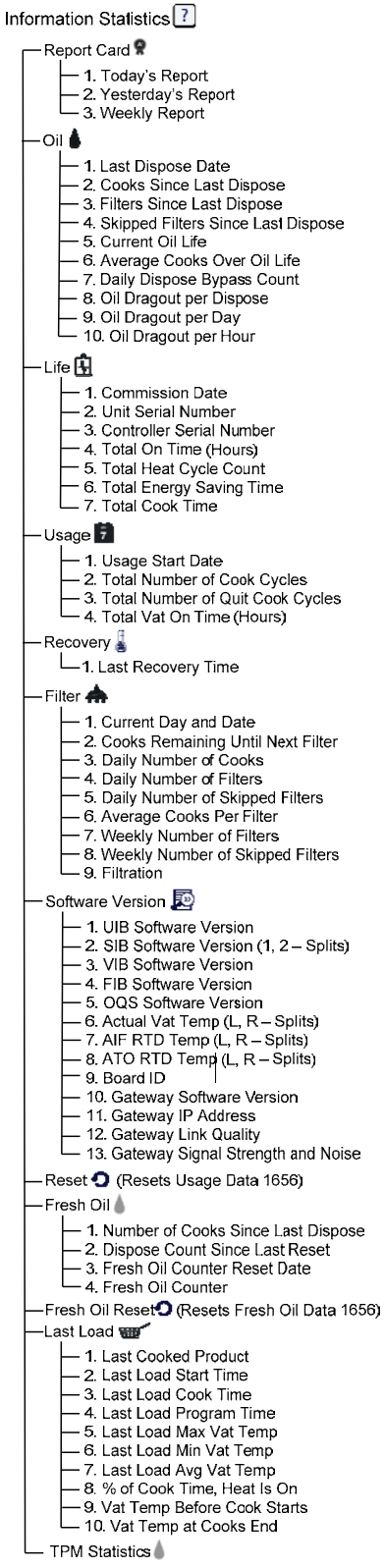
FQ4000 Menu Summary Trees

FQ4000 Menu Tree General Market/Burger King

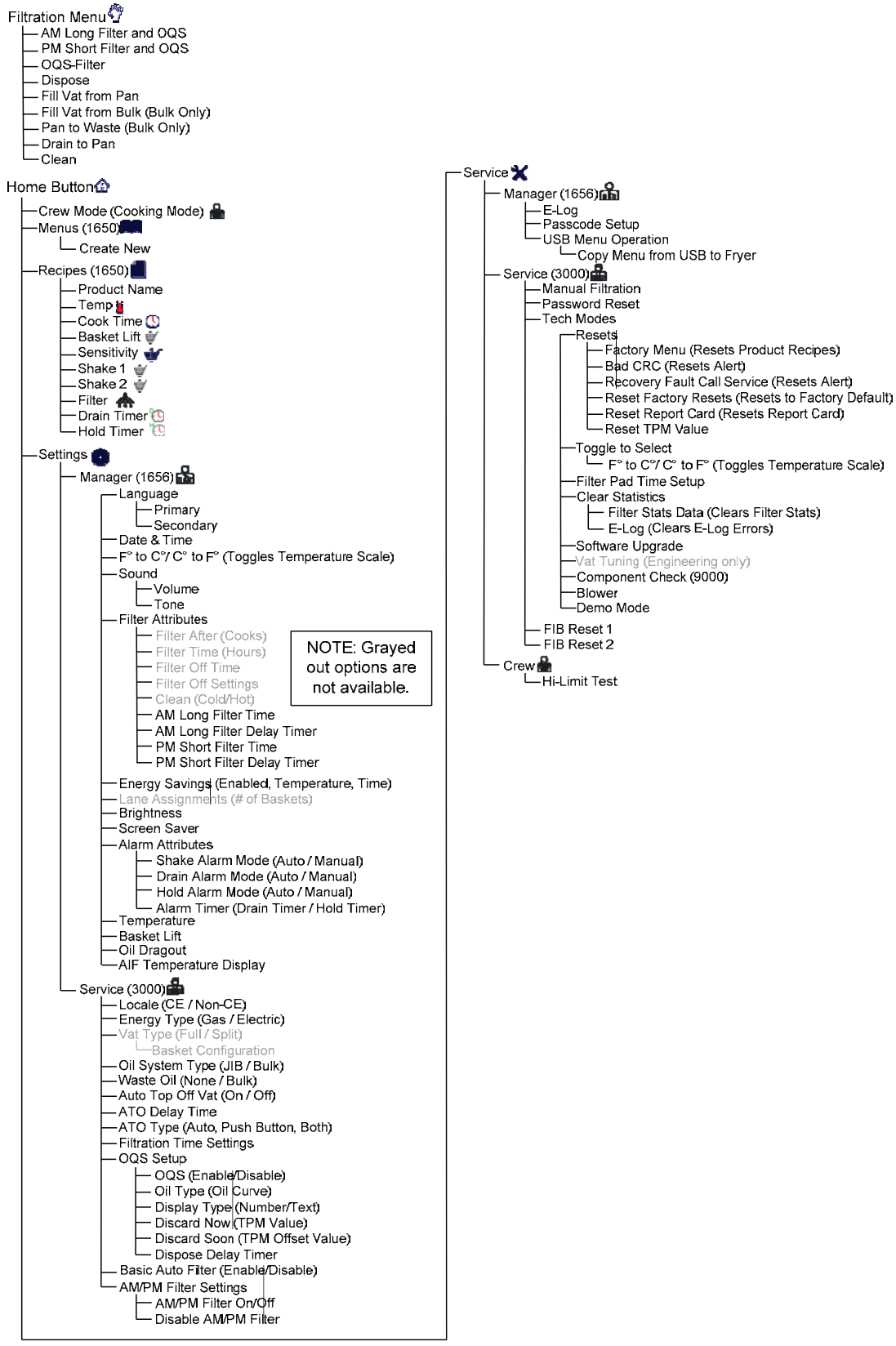
below are the major programming sections in the FQ4000 and the order in which the headings will be found in the controller.

- Filtration Menu
  - Quick Filter
  - Clean and Filter (with OQS)
  - Dispose
  - Advanced Filter Options
    - OQS-Filter
    - Fill Vat from Pan
    - Fill Vat from Bulk (Bulk Only)
    - Pan to Waste (Bulk Only)
    - Drain to Pan
    - Clean
    - Polish
- Home Button
  - Crew Mode (Cooking Mode)
  - Menus (1650)
    - Create New
  - Recipes (1650)
    - Product Name
    - Temp
    - Cook Time
    - Sensitivity
    - Hold Timer
    - Shake 1
    - Shake 2
    - Filter
  - Settings
    - Manager (1656)
      - Language
        - Primary
        - Secondary
      - Date & Time
      - F° to C°/ C° to F° (Toggles Temperature Scale)
      - Sound
        - Volume
        - Tone
      - Filter Attributes
        - Filter After (Cooks)
        - Filter Time (Hours)
        - Filter Off Time
        - Filtration Off Settings
        - Clean (Cold/Hot)
        - Quick Filter Settings
          - Initial Delay Time
          - Skipped Delay Time
      - Energy Savings (Enabled, Temperature, Time)
      - Lane Assignments (# of Baskets)
      - Brightness
      - Screen Saver
      - Alarm Attributes
        - Shake Alarm Mode (Auto / Manual)
        - Hold Alarm Mode (Auto / Manual)
        - Alarm Timer (Shake Timer / Hold Timer)
      - Temperature
      - Oil Dragout
      - Basket Lift
      - AIF/ATO Temp Display
      - Menu Book (Enable/Disable)
    - Service (3000)
      - Locale (CE / Non-CE)
      - Energy Type (Gas / Electric)
      - Vat Type (Full / Split)
        - Basket Configuration
      - Oil System Type (JIB / Bulk)
      - Waste Oil (Disposal Unit/Bulk/Wand Frt/Wand Ext.)
      - Auto Top Off Vat (On / Off)
      - ATO Delay Time
      - ATO Type (Auto, Push Button, Both)
      - Filtration Time Settings
      - OQS Setup
        - OQS (Enable/Disable)
        - Oil Type (Oil Curve)
        - Display Type (Number/Text)
        - Discard Now (TPM Value)
        - Discard Soon (TPM Offset Value)
        - Dispose Delay Timer
      - Basic Auto Filter (Enable/Disable)
      - Low Temp Alarm (Enable/Disable)
      - Sediment Tray (Enable/Disable)
- Service
  - Manager (1656)
    - E-Log
    - Passcode Setup
    - USB Menu Operation
      - Copy Menu from USB to Fryer
  - Service (3000)
    - Manual Filtration
    - Password Reset
    - Tech Modes
      - Resets
        - Factory Menu (Resets Product Recipes)
        - Bad CRC (Resets Alert)
        - Recovery Fault Call Service (Resets Alert)
        - Reset Factory Resets (Resets to Factory Default)
        - Reset Report Card (Resets Report Card)
      - Toggle to Select
        - F° to C°/ C° to F° (Toggles Temperature Scale)
      - Filter Pad Time Setup
      - Clear Statistics
        - Filter Stats Data (Clears Filter Stats)
        - E-Log (Clears E-Log Errors)
      - Software Upgrade
      - Vat Tuning (Engineering only)
      - Component Check (9000)
      - Blower
      - Demo Mode
      - Replace OQS Sensor
    - FIB Reset 1
    - FIB Reset 2
  - Crew
    - Hi-Limit Test

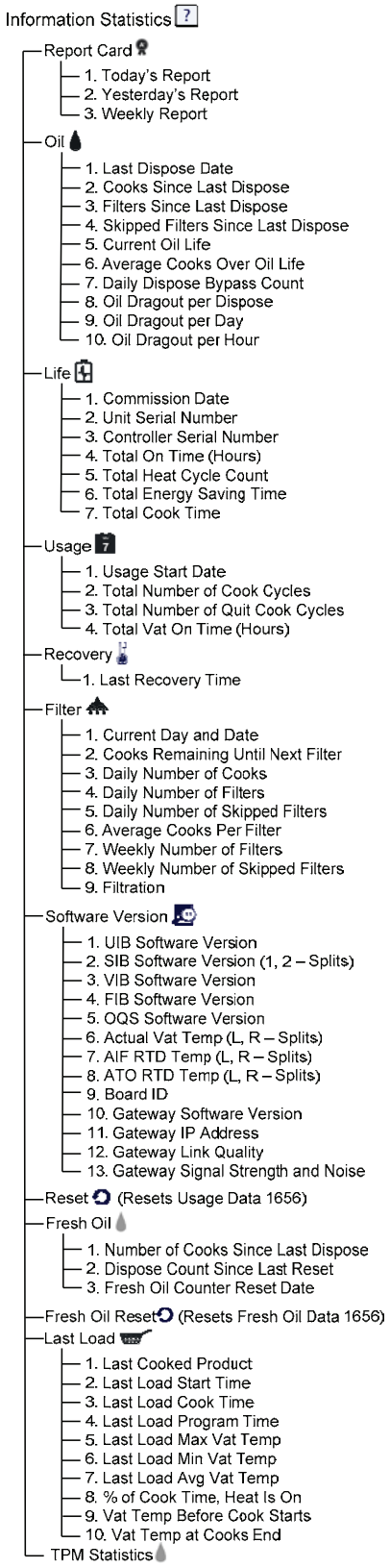
FQ4000 Information Statistics Menu Tree General Market/Burger King



FQ4000 Menu Tree Taco Bell



FQ4000 Information Statistics Menu Tree Taco Bell



FQGLA-T SERIES FILTERQUICK GAS FRYERS

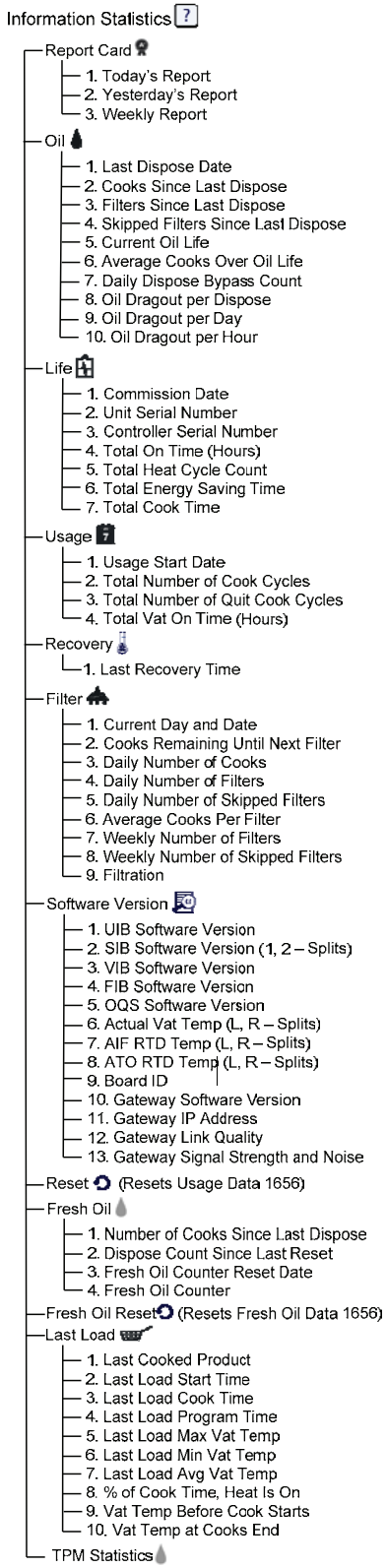
FQ4000 Menu Tree General Market/Burger King

- Filtration Menu
  - Quick Filter
  - Clean and Filter (with OQS)
  - OQS-Filter
  - Dispose
  - Fill Vat from Pan
  - Fill Vat from Bulk (Bulk Only)
  - Pan to Waste (Bulk Only)
  - Drain to Pan
  - Clean
  - Polish

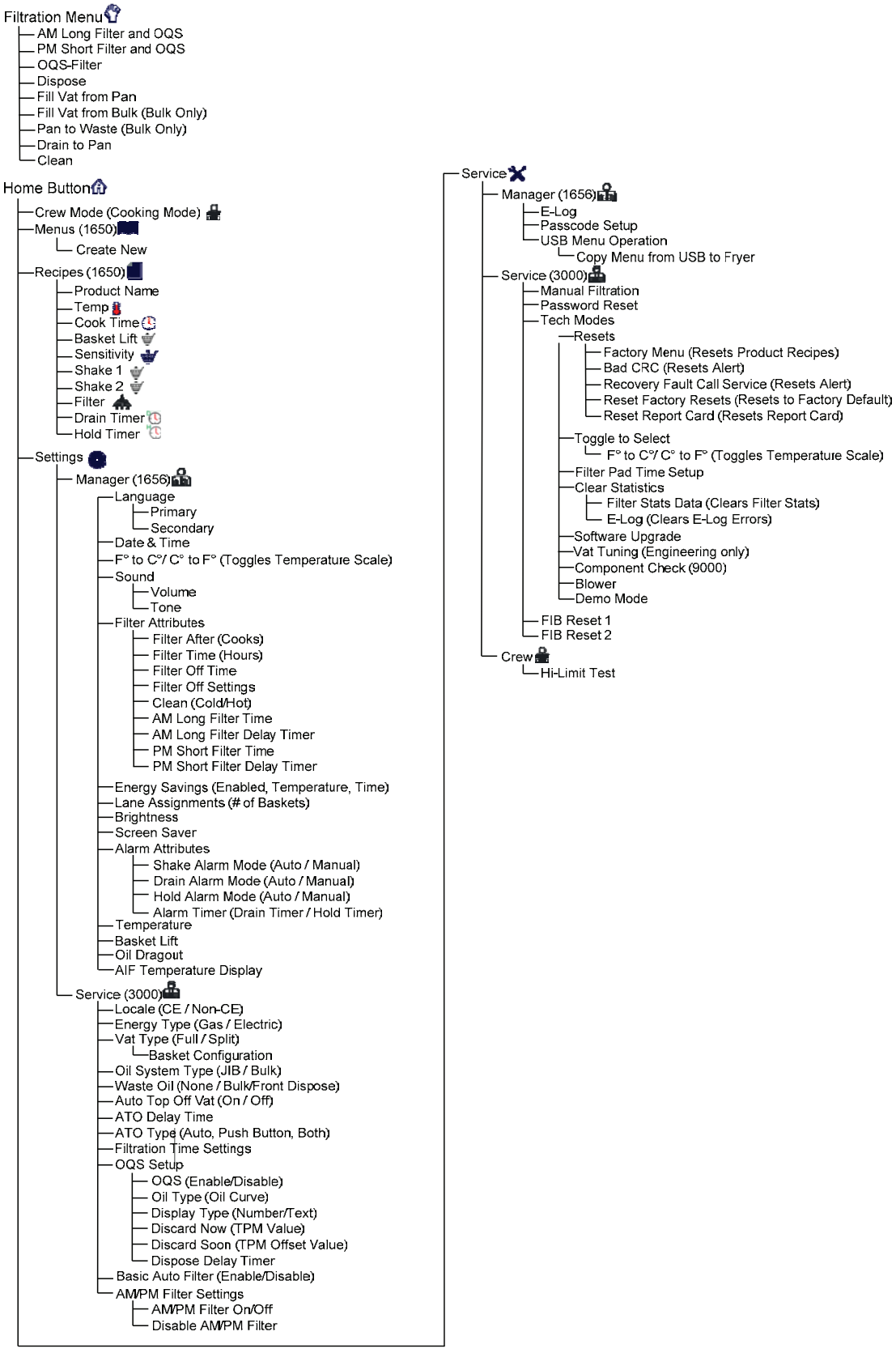
- Home Button
  - Crew Mode (Cooking Mode)
  - Menus (1650)
    - Create New
  - Recipes (1650)
    - Product Name
    - Temp
    - Cook Time
    - Sensitivity
    - Hold Timer
    - Shake 1
    - Shake 2
    - Filter
  - Settings
    - Manager (1656)
      - Language
        - Primary
        - Secondary
      - Date & Time
      - F° to C°/ C° to F° (Toggles Temperature Scale)
      - Sound
        - Volume
        - Tone
      - Filter Attributes
        - Filter After (Cooks)
        - Filter Time (Hours)
        - Filter Off Time
        - Filtration Off Settings
        - Clean (Cold/Hot)
      - Energy Savings (Enabled, Temperature, Time)
      - Lane Assignments (# of Baskets)
      - Brightness
      - Screen Saver
      - Alarm Attributes
        - Shake Alarm Mode (Auto / Manual)
        - Hold Alarm Mode (Auto / Manual)
        - Alarm Timer (Shake Timer / Hold Timer)
      - Temperature
      - Oil Dragout
      - Basket Lift
    - Service (3000)
      - Locale (CE / Non-CE)
      - Energy Type (Gas / Electric)
      - Vat Type (Full / Split)
        - Basket Configuration
      - Oil System Type (JIB / Bulk)
      - Waste Oil (None / Bulk/Front Dispose)
      - Auto Top Off Vat (On / Off)
      - ATO Delay Time
      - ATO Type (Auto, Push Button, Both)
      - Filtration Time Settings
      - OQS Setup
        - OQS (Enable/Disable)
        - Oil Type (Oil Curve)
        - Display Type (Number/Text)
        - Discard Now (TPM Value)
        - Discard Soon (TPM Offset Value)
        - Dispose Delay Timer
      - Basic Auto Filter (Enable/Disable)

- Service
  - Manager (1656)
    - E-Log
    - Passcode Setup
    - USB Menu Operation
      - Copy Menu from USB to Fryer
  - Service (3000)
    - Manual Filtration
    - Password Reset
    - Tech Modes
      - Resets
        - Factory Menu (Resets Product Recipes)
        - Bad CRC (Resets Alert)
        - Recovery Fault Call Service (Resets Alert)
        - Reset Factory Resets (Resets to Factory Default)
        - Reset Report Card (Resets Report Card)
      - Toggle to Select
        - F° to C°/ C° to F° (Toggles Temperature Scale)
      - Filter Pad Time Setup
      - Clear Statistics
        - Filter Stats Data (Clears Filter Stats)
        - E-Log (Clears E-Log Errors)
      - Software Upgrade
      - Vat Tuning (Engineering only)
      - Component Check (9000)
      - Blower
      - Demo Mode
    - FIB Reset 1
    - FIB Reset 2
  - Crew
    - Hi-Limit Test

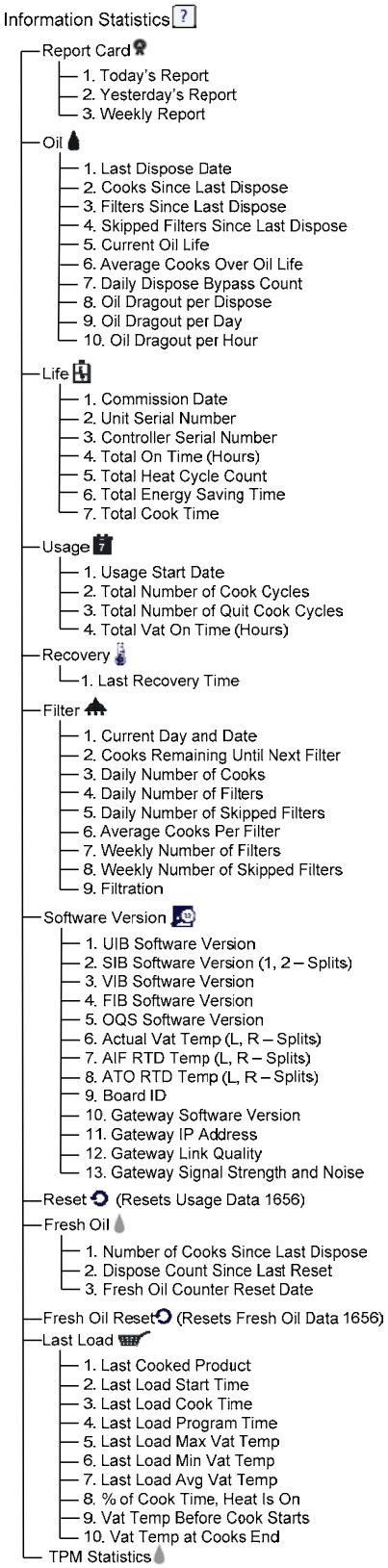
FQ4000 Information Statistics Menu Tree General Market/Burger King



FQ4000 Menu Tree Taco Bell

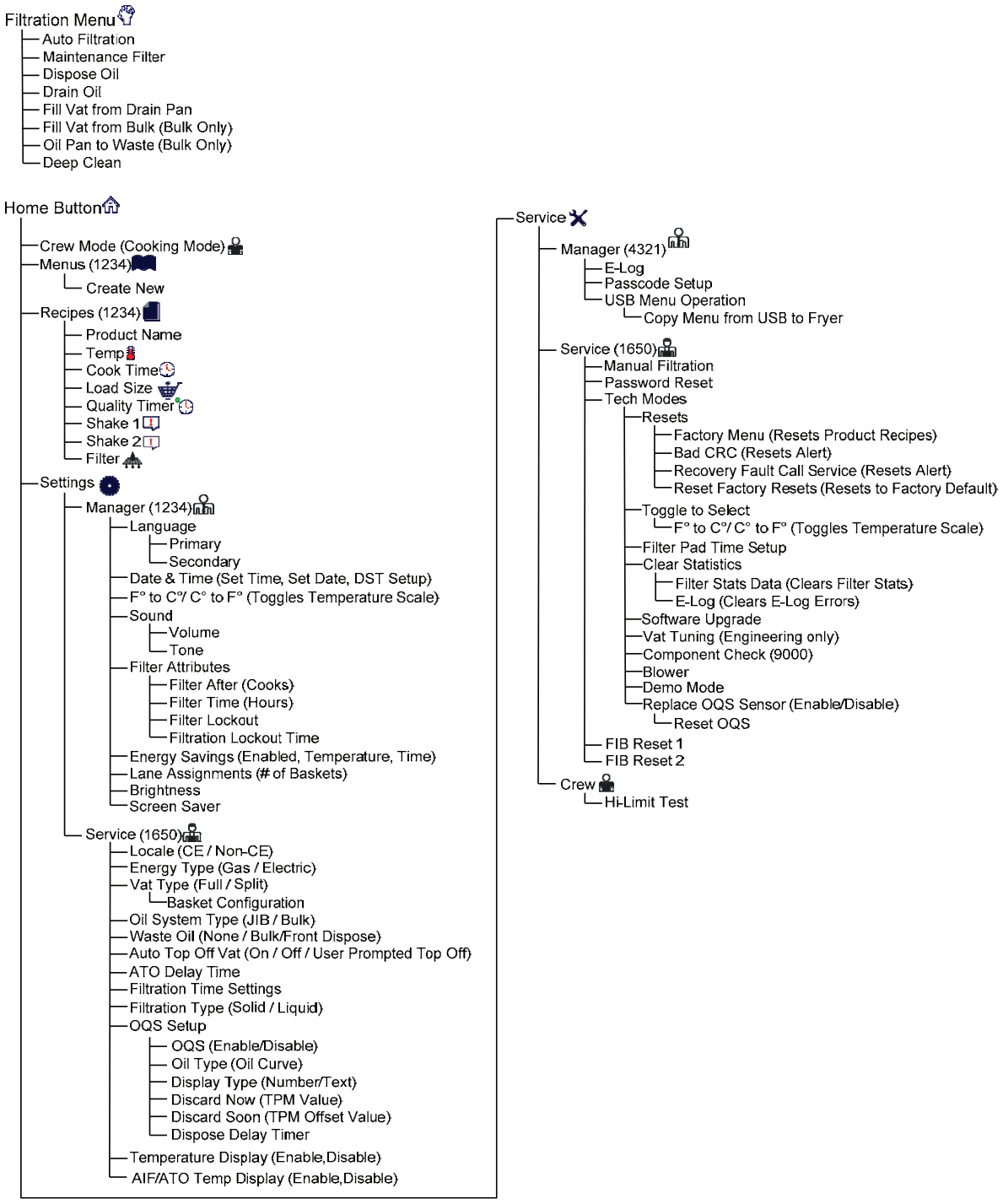


FQ4000 Information Statistics Menu Tree Taco Bell

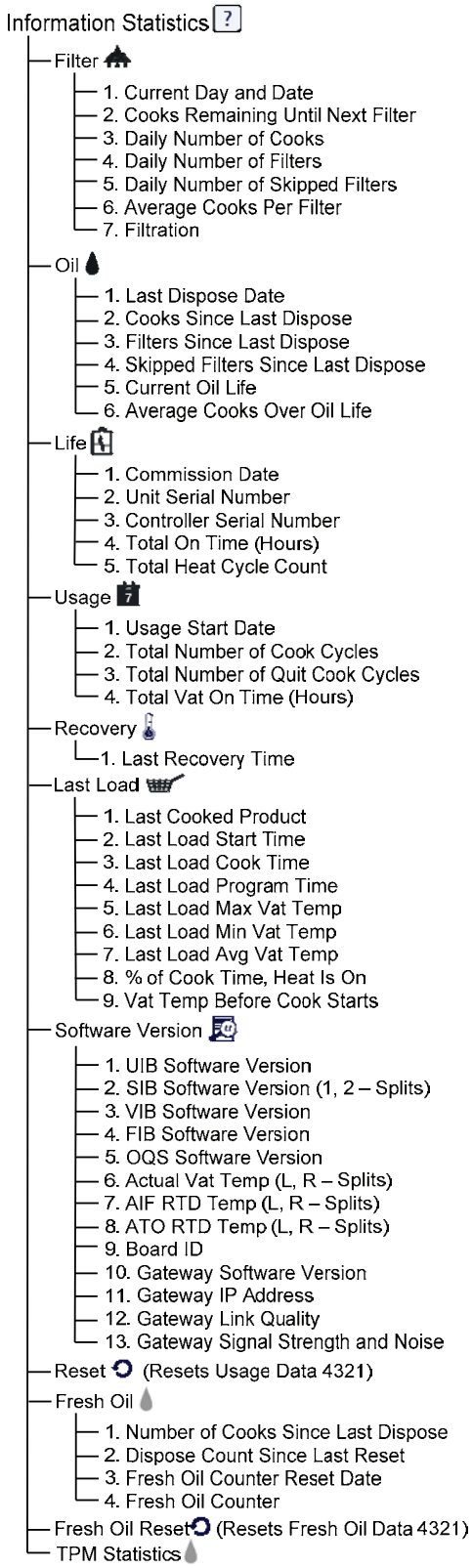


M4000 Menu Summary Trees

1.1.1 M4000 Menu Tree



M4000 Information Statistics Menu Tree



M4000 Menu Summary Trees

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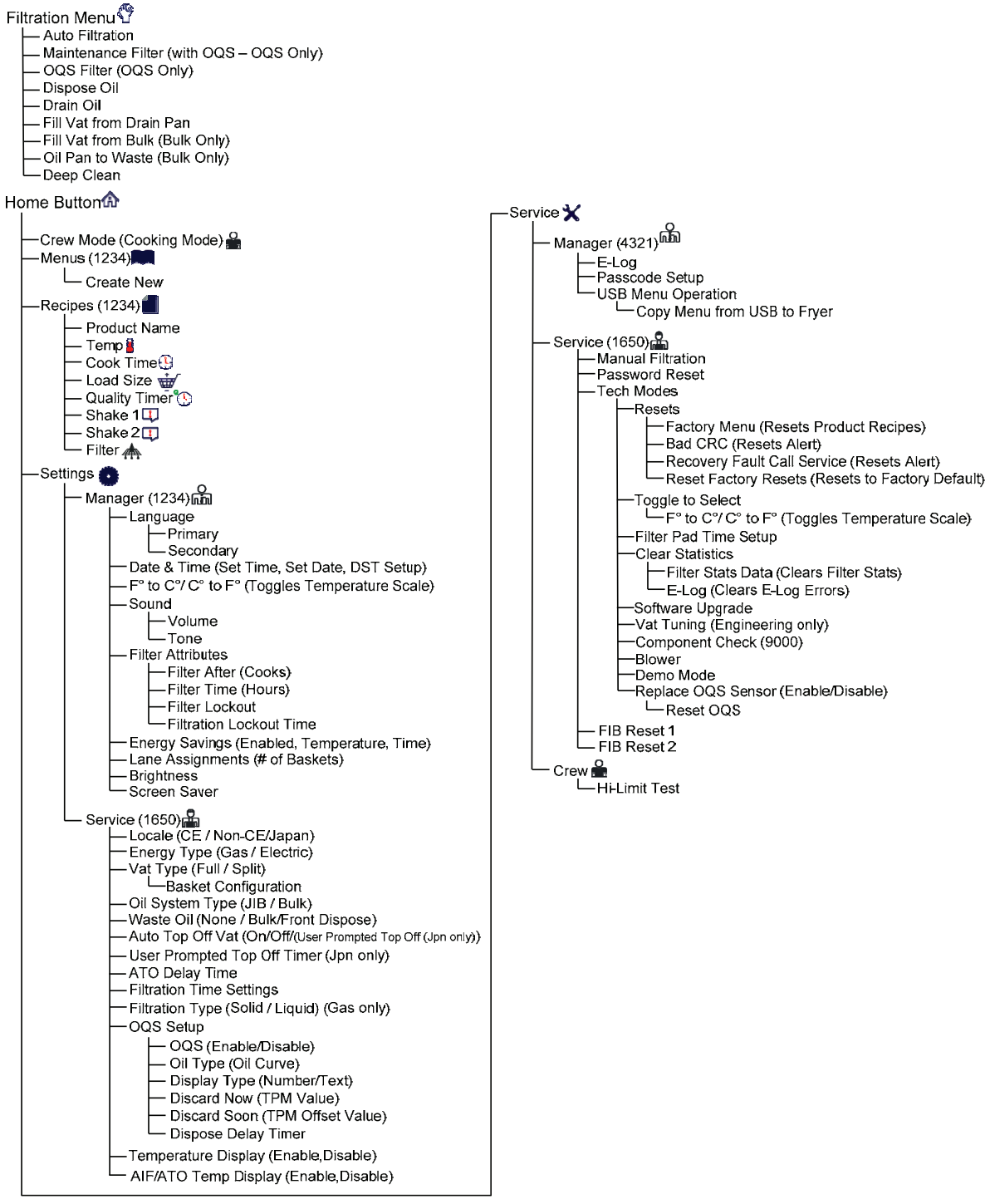
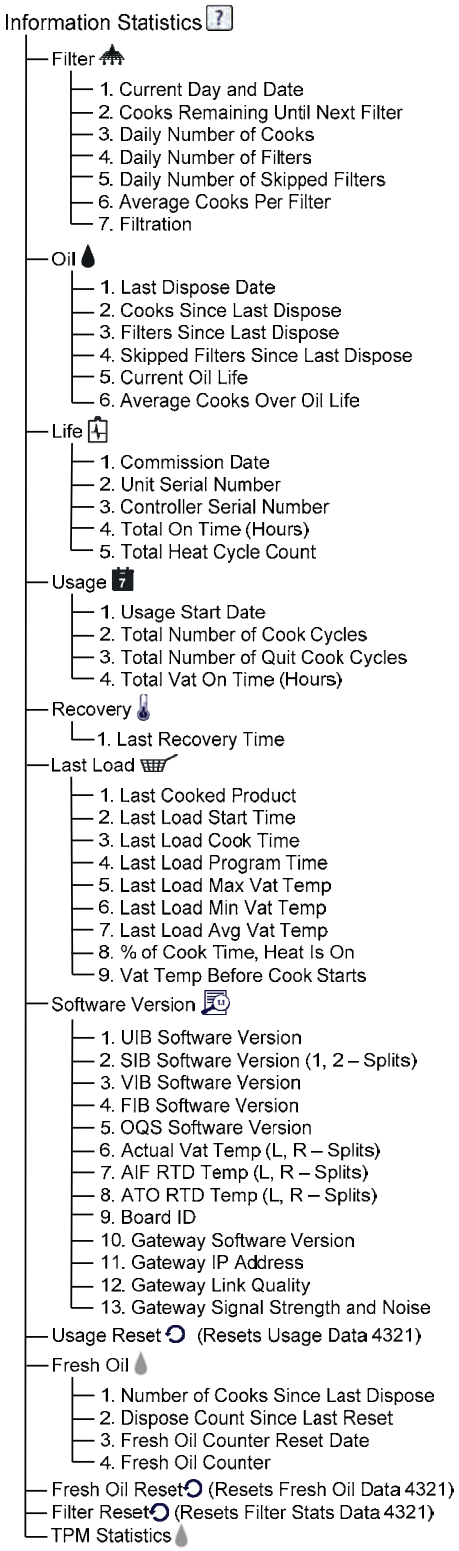


M4000 Information Statistics Menu Tree



FRYMASTER

FilterQuick with FQ4000 for Taco Bell


Cooking


AM FILTER


PM FILTER


Changing JIB


Cleaning Inline Filter

Move a smartphone with QR-scanning software over a QR-code to see a short video on a fryer operation. The videos can be accessed one at a time with the code or by scrolling the displayed menu when any are playing.

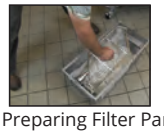
NOTE: QR-code readers are quick to react. Cover adjacent codes, if necessary, to ensure you open the video you want.

The complete playlist of videos specific to the FilterQuick with FQ4000 for Taco Bell is available at the site below.


Starting, Using Controller


Changing Products


Changing Menus


Preparing Filter Pan

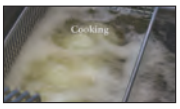

Fryer's Friend Use

WELBILT

819-7486
10/17

FRYMASTER
A Welbilt Brand

FilterQuick with FQ4000 Quick Reference


Cooking


Clean and Filter


Low JIB


Navigating Controller


Manual Top Off

Move a smartphone with QR-scanning software over a QR-code to see a short video on a fryer operation. The videos can be accessed one at a time with the codes or selected from the viewer menu when any of these are playing.

NOTE: QR code readers are sensitive, quick to react. Cover adjacent codes, if necessary, to ensure you open the video you want.

Other FilterQuick videos, such as in-line filter cleaning (below), can also be found on Frymaster's Channel.

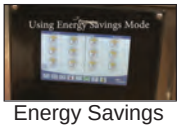
WELBILT


Yes to Filter Now


Oil Quality Check


Filter Pan Prep


Changing Menus, Products



Energy Savings Mode

819-7449

6/17

FRYMASTER WELBILT

FQ30-T™ FRYER COMMISSION AND DEMONSTRATION FORM

8700 LINE AVENUE SHREVEPORT, LA 71106 (800) 551-8633

Date_____

Store Name _____
Store # (if applicable) _____
Address _____
City/State _____
Store Phone ( )

Technician _____
Service Agency _____
Address _____
City/State _____
Country _____

FRYER/FILTER MODEL NUMBER	SERIAL NUMBER (10 DIGIT)									

- ❑ **No one is to perform start-up or training unless they are Level 2 or Level 3 certified and their certification is current.**
- ❑ Verify Universal hoods have 2" (50mm) of clearance behind fryer ☐ YES ☐ NO
- ❑ Verify gas hose quick disconnect is connected to gas line input beneath the center of the fryer and verify the left gas input connection is properly capped.
- ❑ Remove Warranty Label date tabs.
- ❑ Ensure fryer is level and properly restrained in accordance with the operator's manual.
- ❑ Perform SETUP on all controllers. Refer to manual. **Record Software UIB**_____**SIB1**_____ **SIB2**_____ **VIB**_____**FIB**_____ **OQS**_____
- ❑ **Ensure Time and Date are correct in setup.**
- ❑ Verify Filter After settings in Settings/Manager/Filter Attributes/Filter After are set correctly.
- ❑ Program controllers for products to be cooked as per managers request - FRIES, etc. Refer to manual.
- ❑ Is the fry system being installed connected to a **BULK FRESH OIL / WASTE DISPOSAL SYSTEM** ☐ YES ☐ NO
- ❑ If fryer was setup as a **BULK FRESH OIL / WASTE DISPOSAL SYSTEM** was it power cycled after setup? ☐ YES ☐ NO
- ❑ Place full oil container in fryer for ATO system, or fill provided oil container from Bulk Oil system (as applicable). Refer to manual.
- ❑ Thoroughly clean and dry all vats. Fill all vats with oil to ½" below cold oil line. Allow fryers to heat to set point (see gas and electric checks below) and verify temperatures are at set point +/- 5°F / 2°C**. Verify that oil level is below ATO level sensor (upper oil level line) but *above AIF sensor if applicable* (lower oil level) (add/remove oil if necessary) and that each vat tops off.**
- ❑ Check restaurant to ensure that it doesn't have a severe positive or negative air balance.
- ❑ **GAS** fryers - While units are heating up, check incoming gas pressure (Natural Gas: 6-14" W.C.; LP Gas: 11-14" W.C.). Record actual incoming pressure _____. Check burner manifold pressure. Record actual burner manifold pressure below. Check for proper combustion; fryers should have a bright orange flame after approximately 1 minute of operation. Adjust blower air inlet to achieve 1.2 - 2.0 uA (micro amps) on each igniter flame sense circuit. Record micro amp readings below.

Gas	Vat #1	Vat #2	Vat #3	Vat #4	Vat #5	Vat # 6	Vat # 7	Vat # 8	Vat # 9	Vat # 10
Burner Pressure										
Left uA										
Right uA										

- ❑ **ELECTRIC** fryers - While units are heating up, ensure applied voltage matches the rating plate. Ensure all phases are balanced and there is no current draw when controller heat light is off.

AMP DRAW										
Electric	Vat #1	Vat #2	Vat #3	Vat #4	Vat #5	Vat # 6	Vat # 7	Vat # 8	Vat # 9	Vat # 10
L1										
L2										
L3										

- ❑ Verify that all filter parts (filter pan, filter screen, filter pad or paper, hold-down ring, crumb tray, and O-rings) are present. Visually inspect the oil drain and return system to ensure all connections are tight.

Two (2) hours are allowed for the above, to Commission one system.
Two (2) hours are allowed to Demonstrate one system.

FRYMASTER

- ❑ Verify filter pan alignment. The pan should slide smoothly into position. Ensure pick-up tube is fully engaged in the pan suction tube. "**P**" should be displayed on the controller when the pan is pulled out.
  Perform an Auto Filter on a vat to ensure the filter pump is operational and check the drain and return system for leaks.
- ❑ **Remove old Fryer's Friend from the store if applicable and replace with the new Fryer's Friend.**

FQ30-T ™ FRYER TRAINING

Ensure all trainees refer to the Quick Reference, Quick Start, and Operation Manual located in the manual holder inside the fryer door for the following.

Hands on demonstration and performance are essential for all trainees.

CREW / FILTRATION PERSON(S) / MANAGERS

- ❑ **Overview**
  - ❑ Provide an overview of what a FilterQuick fryer is Vs traditional fryer – Smaller vat, Low Oil Volume
  - ❑ Explain the benefits when used properly – Use less oil, Auto Filter, Auto Top Off, Manual Top Off

- ❑ **Controller**

  - ❑ **Identify FQ4000 Controller buttons and functions – Refer to the FQ4000 Quick Reference / FQ30-T Quick Start Card**
    - ❑ ON / OFF Buttons – Full and Split Functions
    - ❑ Products – Programming and selecting products
    - ❑ Start Buttons – Start a cook cycle / cancel alarms
    - ❑ Filter Button – Access Filtration Menu / Menu navigation
    - ❑ Temp Button – Checking actual vat temperature and set-point
    - ❑ Information Button – Checks Filter Stats, Oil Stats, Life Stats, Usage Stats, Recovery Check, Last Load Stats
    - ❑ Language change
    - ❑ Manual Top Off button
    - ❑ Low Oil Reservoir Indicator / Reset Button
    - ❑ Master Reset Switch / Power Switch (Elec per vat U.S. only)
    - ❑ Pan Indicator - "P" filter pan installation issue. Check for proper installation of pan.

- ❑ **Demonstrate how to use the operating controls – Cooking Functions – Refer to FQ4000 Quick Reference Guide**
  - ❑ Turning the controller ON / OFF for heating the vats
  - ❑ Demonstrate cooking
  - ❑ Cancel a cook cycle or alarms
  - ❑ Demonstrate changing between products

- ❑ **Demonstrate Top Off System (Top Off Reservoir, Solid Shortening and Bulk Oil Systems) – Refer to the Refer to the FQ30-T Installation and Operator Manual and Quick Start Guide**
  - ❑ Demonstrate setup of the top off reservoir
  - ❑ Filling vats with oil (Top off Jug, Bulk or Solid Shortening)

- ❑ **Auto and Manual Top-Off – Refer to the FQ30-T and FQ4000 Installation and Operation Manuals and Quick Start Guide**
  - ❑ Instruct on function of top off empty reservoir indicator (Use remaining oil in box to top off vats)
  - ❑ Demonstrate when oil is changed top off reset must be pressed and held to reset indicator
  - ❑ Demonstrate Auto Top-Off on a vat by moving oil out of vat
  - ❑ Demonstrate Manual Top Off by pressing the Manual Top Off button

- ❑ **Automatic Filtration – Refer to the FQ30-T and FQ4000 Installation and Operator Manuals**
  - ❑ Demonstrate assembly of the filter pan (Emphasize need for daily pad/paper change / more often as needed)
  - ❑ Demonstrate Auto Filtration cycle. Air bubbles should only be observed in unit being filtered.

FRYMASTER

- ❑ Show "FILTER NOW" displayed on vat to be filtered (cook 15 cooks)
- ❑ Demonstrate skimming procedure
- ❑ Show filtration issues (errors created by not changing the pad/paper (monitor oil returned to vat levels – should be where it started, or close if first filter with new pad/paper.)
- ❑ Show FILTER BUSY message by trying to manual filter while another vat is filtering.
- ❑ Show location of thermal reset on Filter Motor
- ❑ Six consecutive unsuccessful filtrations and unit goes to **SERVICE REQUIRED** an authorized technician is needed.

❑ **Troubleshooting**

- ❑ Common error messages
  - ❑ Is Vat Full? – Ensure vat is full of oil and press the YES ✓ button to continue.
  - ❑ Drain Clogged- Clear Drain-Is Drain Clear? (Gas Only) – Follow instructions on the controller using the new fryers friend to clear the drain.
  - ❑ Filter Busy – a filtration is in process on another vat
  - ❑ Heating Failure – Unit is not heating – Turn off fryer and turn on again.
  - ❑ Low Temp – Oil temperature below set point – may occur during cooking cycle
  - ❑ Recovery Fault – Vat did not meet minimum specs for temperature recovery – Press the ✓ to continue.
  - ❑ Service Required – a problem exists that requires a technician.
  - ❑ Probe Failure – Temperature circuitry has a problem – Turn off fryer and call for service
- ❑ Frymaster's Hot line and FAS contact person / with phone numbers

FILTRATION PERSON(S) / MANAGERS

Refer to FQ4000 Operation Manual Chapter 2

❑ **Filtration Menu (Press the filtration menu button)**

- ❑ **Non-Bulk Oil System**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show QUICK FILTER and explain how it functions
    - ❑ Show CLEAN AND FILTER and explain how it functions
    - ❑ Show POLISH and explain how it functions
    - ❑ Show OQS FILTER (if applicable) and explain how it functions
    - ❑ Show DRAIN TO PAN and explain how it functions
    - ❑ Show FILL VAT FROM PAN and explain how it functions
    - ❑ Show CLEAN and explain how it functions
    - ❑ Show DISPOSE and explain how it functions (Use of SDU, Bulk or Front Dispose if applicable)
- ❑ **Bulk Oil System**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show QUICK FILTER and explain how it functions
    - ❑ Show CLEAN AND FILTER and explain how it functions
    - ❑ Show POLISH and explain how it functions
    - ❑ Show OQS FILTER (if applicable) and explain how it functions
    - ❑ Show DRAIN TO PAN and explain how it functions
    - ❑ Show FILL VAT FROM PAN and explain how it functions
    - ❑ Show FILL VAT FROM BULK and explain how it functions
    - ❑ Show PAN TO WASTE and explain how it functions
    - ❑ Show CLEAN and explain how it functions
    - ❑ Show DISPOSE and explain how it functions (Use of SDU, Bulk or Front Dispose if applicable)

FRYMASTER

STORE MANAGERS ONLY (OR DESIGNATED PERSONS)

Refer to FQ4000 Operation Manual Chapter 1

- ❑ **Demonstrate how to access RECIPES and MENUS – (Code 1650)**
  - ❑ Demonstrate adding or editing a product recipe (Press Recipe button)
  - ❑ Demonstrate how to add a product to a menu (Press Menu button)

- ❑ **Demonstrate how to access SETTINGS – (Press Settings button, press Manager button) Code 1656**
  - ❑ Demonstrate setting the primary and secondary languages
  - ❑ Demonstrate setting the date and time

- ❑ **Demonstrate how to access High Limit Check – (Press Service button, press Crew button)**

- ❑ **Demonstrate how to access SERVICE – (Press Service button, press Manager button) Code 1656**
  - ❑ Demonstrate retrieving Error Log (E-Log)
  - ❑ Explain changing passwords
  - ❑ Explain loading menus to/from USB

- ❑ **Demonstrate how to access INFORMATION STATISTICS (Press "?" INFORMATION STATISTICS)**
  - ❑ Explain FILTER STATS menu
  - ❑ Explain OIL STATS menu
  - ❑ Explain LIFE STATS menu
  - ❑ Explain USAGE STATS menu
  - ❑ Explain Recovery
  - ❑ Explain LAST LOAD menu
  - ❑ Explain Resetting Usage Stats (Code 1656)

Key Points

Review with all employees

- **Filter Now Prompt – Choose YES to Filter Now? and Confirm**
- **Top Off Oil Empty Indicator – Change top off reservoir and press reset (Bulk users fill reservoir)**
- **Start a cook by pressing the START button**
- **Is Vat Full? – Answer YES only when oil is at the top line.**
- **Clean and Filter daily**
- **Change filter pad/paper daily or twice daily in high volume or 24-hour stores**

Training / Demo Signatures – Key Personnel

*** Store Manager's Signature**		Printed Name	

*** Filtration Person Signature**		Printed Name	

*** Key Shift Person Signature**		Printed Name	

FRYMASTER

O/O / Staff Personnel		Printed Name	

Technician's Signature		Printed Name	

* - Mandatory Attendee

TRAINING DECLINED

O/O / Corporate Manager Signature		Printed Name	

FAS: Provide a copy of all five (5) pages to the customer and to Frymaster. Retain a copy for two years from date of installation

FRYMASTER® WELBILT®

FQ30-T™ TACO BELL FRYER COMMISSION AND DEMONSTRATION FORM

8700 LINE AVENUE SHREVEPORT, LA 71106 (800) 551-8633

Date_____

Store Name _____
Store # (if applicable) _____
Address _____
City/State _____
Store Phone ( )_____

Technician _____
Service Agency _____
Address _____
City/State _____
Country _____

FRYER/FILTER MODEL NUMBER	SERIAL NUMBER (10 DIGIT)									

- ❑ **No one is to perform start-up or training unless they are Level 2 or Level 3 certified and their certification is current.**
- ❑ Verify Universal hoods have 2" (50mm) of clearance behind fryer ☐ YES ☐ NO
- ❑ Verify gas hose quick disconnect is connected to gas line input beneath the center of the fryer and verify the left gas input connection is properly capped.
- ❑ Remove Warranty Label date tabs.
- ❑ Ensure fryer is level and properly restrained in accordance with the operator's manual.
- ❑ Perform SETUP on all controllers. Refer to manual. **Record Software UIB**_____**SIB1**_____ **SIB2**_____ **VIB**_____**FIB**_____ **OQS**_____
- ❑ **Ensure Time and Date are correct in setup.**
- ❑ Verify Filter After settings in Settings/Manager/Filter Attributes/Filter After are set correctly.
- ❑ Program controllers for products to be cooked as per managers request - FRIES, etc. Refer to manual.
- ❑ Is the fry system being installed connected to a **BULK FRESH OIL / WASTE DISPOSAL SYSTEM** ☐ YES ☐ NO
- ❑ If fryer was setup as a **BULK FRESH OIL / WASTE DISPOSAL SYSTEM** was it power cycled after setup? ☐ YES ☐ NO
- ❑ Place full oil container in fryer for ATO system, or fill provided oil container from Bulk Oil system (as applicable). Refer to manual.
- ❑ Thoroughly clean and dry all vats. Fill all vats with oil to ½" below cold oil line. Allow fryers to heat to set point (see gas and electric checks below) and verify temperatures are at set point +/- 5°F / 2°C**. Verify that oil level is below ATO level sensor (upper oil level line) but *above AIF sensor if applicable* (lower oil level) (add/remove oil if necessary) and that each vat tops off.**
- ❑ Check restaurant to ensure that it doesn't have a severe positive or negative air balance.
- ❑ **GAS** fryers - While units are heating up, check incoming gas pressure (Natural Gas: 6-14" W.C.; LP Gas: 11-14" W.C.). Record actual incoming pressure _____. Check burner manifold pressure. Record actual burner manifold pressure below. Check for proper combustion; fryers should have a bright orange flame after approximately 1 minute of operation. Adjust blower air inlet to achieve 1.2 - 2.0 uA (micro amps) on each igniter flame sense circuit. Record micro amp readings below.

Gas	Vat #1	Vat #2	Vat #3	Vat #4	Vat #5	Vat # 6	Vat # 7	Vat # 8	Vat # 9	Vat # 10
Burner Pressure										
Left uA										
Right uA										

- ❑ **ELECTRIC** fryers - While units are heating up, ensure applied voltage matches the rating plate. Ensure all phases are balanced and there is no current draw when controller heat light is off.

AMP DRAW										
Electric	**Vat #1**	**Vat #2**	**Vat #3**	**Vat #4**	**Vat #5**	**Vat # 6**	**Vat # 7**	**Vat # 8**	**Vat # 9**	**Vat # 10**
L1										
L2										
L3										

- ❑ Verify that all filter parts (filter pan, filter screen, filter pad or paper, hold-down ring, crumb tray, and O-rings) are present. Visually inspect the oil drain and return system to ensure all connections are tight.

Two (2) hours are allowed for the above, to Commission one system. Two (2) hours are allowed to Demonstrate one system.

FRYMASTER

- ❑ Verify filter pan alignment. The pan should slide smoothly into position. Ensure pick-up tube is fully engaged in the pan suction tube. "**P**" should be displayed on the controller when the pan is pulled out.
- ❑ Perform an Auto Filter on a vat to ensure the filter pump is operational and check the drain and return system for leaks.
- ❑ **Remove old Fryer's Friend from the store if applicable and replace with the new Fryer's Friend.**

FQ30-T ™ TACO BELL FRYER TRAINING

Ensure all trainees refer to the Quick Reference, Quick Start, and Operation Manuals located in the manual holder inside the fryer door for the following.

Hands on demonstration and performance are essential for all trainees.

CREW / FILTRATION PERSON(S) / MANAGERS

- ❑ **Overview**
  - ❑ Provide an overview of what a FilterQuick fryer is vs traditional fryer – Smaller vat, Low Oil Volume
  - ❑ Explain the benefits when used properly – Use less oil, Auto Filter, Auto Top Off, Manual Top Off

- ❑ **Controller**

  - ❑ **Identify FQ4000 Controller buttons and functions – Refer to the FQ4000 Quick Reference / FQ30-T Quick Start Card**
    - ❑ ON / OFF Buttons – Full and Split Functions
    - ❑ Products – Programming and selecting products
    - ❑ Start Buttons – Start a cook cycle / cancel alarms
    - ❑ Filter Button – Access Filtration Menu / Menu navigation
    - ❑ Temp Button – Checking actual vat temperature and set-point
    - ❑ Information Button – Checks Filter Stats, Oil Stats, Life Stats, Usage Stats, Recovery Check, Last Load Stats
    - ❑ Language change
    - ❑ Manual Top Off button
    - ❑ Low Oil Reservoir Indicator / Reset Button
    - ❑ Master Reset Switch / Power Switch (Elec per vat U.S. only)
    - ❑ Pan Indicator - "P" filter pan installation issue. Check for proper installation of pan.

- ❑ **Demonstrate how to use the operating controls – Cooking Functions – Refer to FQ4000 Quick Reference Guide**
  - ❑ Turning the controller ON / OFF for heating the vats
  - ❑ Demonstrate cooking
  - ❑ Cancel a cook cycle or alarms
  - ❑ Demonstrate changing between products

- ❑ **Demonstrate Top Off System (Top Off Reservoir, Solid Shortening and Bulk Oil Systems) – Refer to the Refer to the FQ30-T Installation and Operator Manual and Quick Start Guide**
  - ❑ Demonstrate setup of the top off reservoir
  - ❑ Filling vats with oil (Top off Jug, Bulk or Solid Shortening)

- ❑ **Auto and Manual Top-Off – Refer to the FQ30-T and FQ4000 Installation and Operation Manuals and Quick Start Guide**
  - ❑ Instruct on function of top off empty reservoir indicator (Use remaining oil in box to top off vats)
  - ❑ Demonstrate when oil is changed top off reset must be pressed and held to reset indicator
  - ❑ Demonstrate Auto Top-Off on a vat by moving oil out of vat
  - ❑ Demonstrate Manual Top Off by pressing the Manual Top Off button

- ❑ **Automatic Filtration – Refer to the FQ30-T and FQ4000 Installation and Operation Manuals**
  - ❑ Demonstrate assembly of the filter pan (Emphasize need for daily pad/paper change / more often as needed)

FRYMASTER

- ❑ Demonstrate AM Filter cycle. Air bubbles should only be observed in unit being filtered.
- ❑ Demonstrate PM Filter cycle. Air bubbles should only be observed in unit being filtered.
- ❑ Demonstrate skimming procedure
- ❑ Show filtration issues (errors created by not changing the pad/paper (monitor oil returned to vat levels – should be where it started, or close if first filter with new pad/paper.)
- ❑ Show FILTER BUSY message by trying to manual filter while another vat is filtering.
- ❑ Show location of thermal reset on Filter Motor

❑ **Troubleshooting**

- ❑ Common error messages
  - ❑ Is Vat Full? – Ensure vat is full of oil and press the YES ✓ button to continue.
  - ❑ Drain Clogged- Clear Drain-Is Drain Clear? (Gas Only) – Follow instructions on the controller using the new fryers friend to clear the drain.
  - ❑ Filter Busy – a filtration is in process on another vat
  - ❑ Heating Failure – Unit is not heating – Turn off fryer and turn on again.
  - ❑ Low Temp – Oil temperature below set point – may occur during cooking cycle
  - ❑ Recovery Fault – Vat did not meet minimum specs for temperature recovery – Press the ✓ to continue.
  - ❑ Service Required – a problem exists that requires a technician.
  - ❑ Probe Failure – Temperature circuitry has a problem – Turn off fryer and call for service
- ❑ Frymaster's Hot line and FAS contact person / with phone numbers

FILTRATION PERSON(S) / MANAGERS

Refer to Taco Bell FQ4000 Operation Manual Chapter 2

❑ **Filtration Menu (Press the filtration menu button)**

- ❑ **Non-Bulk Oil System**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show AM LONG FILTER and explain how it functions
    - ❑ Show PM SHORT FILTER AND OQS and explain how it functions
    - ❑ Show OQS FILTER (if applicable) and explain how it functions
    - ❑ Show DISPOSE and explain how it functions (Use of ODC)
    - ❑ Show DRAIN TO PAN and explain how it functions
    - ❑ Show FILL VAT FROM PAN and explain how it functions
- ❑ **Bulk Oil System**
  - ❑ **Demonstrate how to access FILTER MENU**
    - ❑ Show AM LONG FILTER and explain how it functions
    - ❑ Show PM SHORT FILTER AND OQS and explain how it functions
    - ❑ Show OQS FILTER (if applicable) and explain how it functions
    - ❑ Show DISPOSE and explain how it functions (Use of ODC)
    - ❑ Show DRAIN TO PAN and explain how it functions
    - ❑ Show FILL VAT FROM PAN and explain how it functions
    - ❑ Show FILL VAT FROM BULK and explain how it functions
    - ❑ Show PAN TO WASTE and explain how it functions

STORE MANAGERS ONLY (OR DESIGNATED PERSONS)

Refer to Taco Bell FQ4000 Operation Manual Chapter 1

- ❑ **Demonstrate how to access RECIPES and MENUS – (Code 1650)**
  - ❑ Demonstrate adding or editing a product recipe (Press Recipe button)
  - ❑ Demonstrate how to add a product to a menu (Press Menu button)

FRYMASTER

- ❑ **Demonstrate how to access SETTINGS – (Press Settings button, press Manager button) Code 1656**
  - ❑ Demonstrate setting the primary and secondary languages
  - ❑ Demonstrate setting the date and time
- ❑ **Demonstrate how to access High Limit Check – (Press Service button, press Crew button)**
- ❑ **Demonstrate how to access SERVICE – (Press Service button, press Manager button) Code 1656**
  - ❑ Demonstrate retrieving Error Log (E-Log)
  - ❑ Explain changing passwords
  - ❑ Explain loading menus to/from USB
- ❑ **Demonstrate how to access INFORMATION STATISTICS (Press "?" INFORMATION STATISTICS)**
  - ❑ Explain FILTER STATS menu
  - ❑ Explain OIL STATS menu
  - ❑ Explain LIFE STATS menu
  - ❑ Explain USAGE STATS menu
  - ❑ Explain Recovery
  - ❑ Explain LAST LOAD menu
  - ❑ Explain Resetting Usage Stats (Code 1656)
  - ❑ Explain TPM STATS menu

Key Points

Review with all employees

- **AM LONG FILTER NOW/ PM SHORT FILTER NOW Prompt – Choose YES to Filter Now?**
- **Top Off Oil Empty Indicator – Change top off reservoir and press reset (Bulk users fill reservoir)**
- **Start a cook by pressing the product button**
- **Is Vat Full? – Answer YES only when oil is at the top line.**
- **Clean and Filter daily**
- **Change filter pad/paper daily or twice daily in high volume or 24-hour stores**

Training / Demo Signatures – Key Personnel

*** Store Manager's Signature**		Printed Name	
*** Filtration Person Signature**		Printed Name	
*** Key Shift Person Signature**		Printed Name	
O/O / Staff Personnel		Printed Name	
Technician's Signature		Printed Name	

FRYMASTER

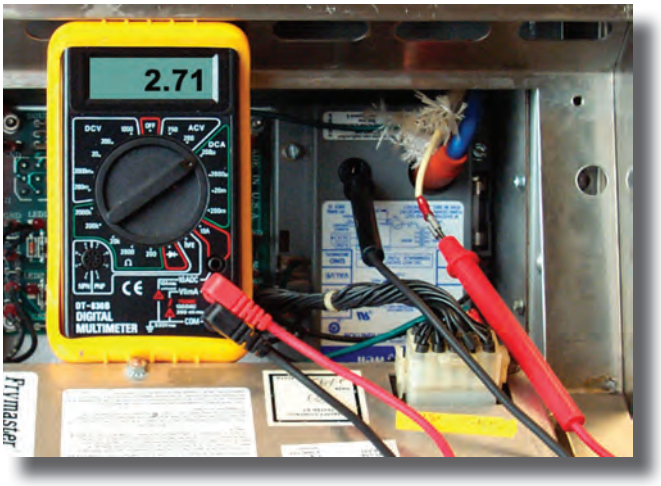
* - Mandatory Attendee

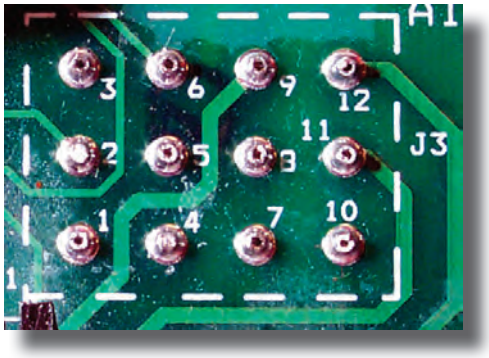
TRAINING DECLINED

O/O / Corporate Manager Signature		Printed Name	

FAS: Provide a copy of all five (5) pages to the customer and to Frymaster. Retain a copy for two years from date of installation

Chapter 6: Charts and Tables





- Computer Codes
- Electrical Formulas
- Conversion Formulas
- Probe Resistance Charts
- Pressure Conversion Table
- Orifice Chart

Charts and Tables

BK 3 Lane	
Recovery	1652
Program	1650
F° to C°	1658
Set Up	1656
Constant Temp Display	1651
Boil Out	1653
Manual Reset	3322
Language Choice	1655
Sound Level	1655
Total Cook Cycles	5000
Clear Total Cook Cycles	5005
Set to Multi-Product	5050
Set to Dedicated	5060
Enable-Disable Melt Cycle	1751
Enable-Disable Boil Out	1752

K/F3000	
Recovery	0042
Program	3228
Fahrenheit to Celsius	1658
Set Up	3228
Manual Reset	3322
Reset Usage	3228
Tech Mode	1650
Domestic to Int'l Menu	1212
Reset Filter Stats	0469
Reset BADCRC	9988
Reset Service Required	1111
Reset Call Tech	1000
Config Setup	7628

KFC-1	
Recovery	1652
Program	1650
F° to C°	1658
Set Up	1656
Manual Reset	1651

Wingstreet	
Recovery	1652
Program	1650
F° to C°	1658
Set Up	1656
Manual Reset	3322
Setback Temp	1212

CM4-S COMPUTER CODES	
Recovery	1652
Program	1650
F° to C°	1658
Set Up	1656
Manual Reset	1651
Heads Cooked	1653
Cooked/Last Filter	1654
Clear Head Counter	1657
Global Count	1658
Clear Filter Prompt	1111
Cancel Filter	1119

UHC-HD	
Program	1955
F° to C°	1955
Set Up	1955
Load Software	98765
View Software Version	090809
Update Language File	090709
Service Test Mode	1111
Switch 6 to 3 Row	11111
LON Works Test Pin	4557
Capture Menu	759248

CM3.5	
Recovery	1652
Program	1650
F° to C°	1658
Set Up	1656
Constant Temp Display	165L
Boil Out	1653

3000/FQ3000	
Recovery	0042
Program	1650
Fahrenheit to Celsius	1658
Set Up	1656
Reset Usage	1656
Tech Mode	3000
Domestic to Int'l Menu	1212
Reset Filter Stats	0469
Reset BADCRC	9988
Reset Service Required	1111
Reset Call Tech	1000
Config Setup	7628
Reset Stats FQ3000	1656
Reset Factory Menu	3322

FQ4000	
Menu	1650
Recipes	1650
Settings-Manager	1656
Settings-Service	3000
Service-Manager	1656
Service-Technician	3000
Component Check	9000

M2000	
Recovery	1652
Program	1650
F° to C°	1658
Set Up	1656
Manual Reset	3322
Language Choice	1655
Sound Level	1655
Hi-Limit Test L	8888
Hi-Limit Test R	9999

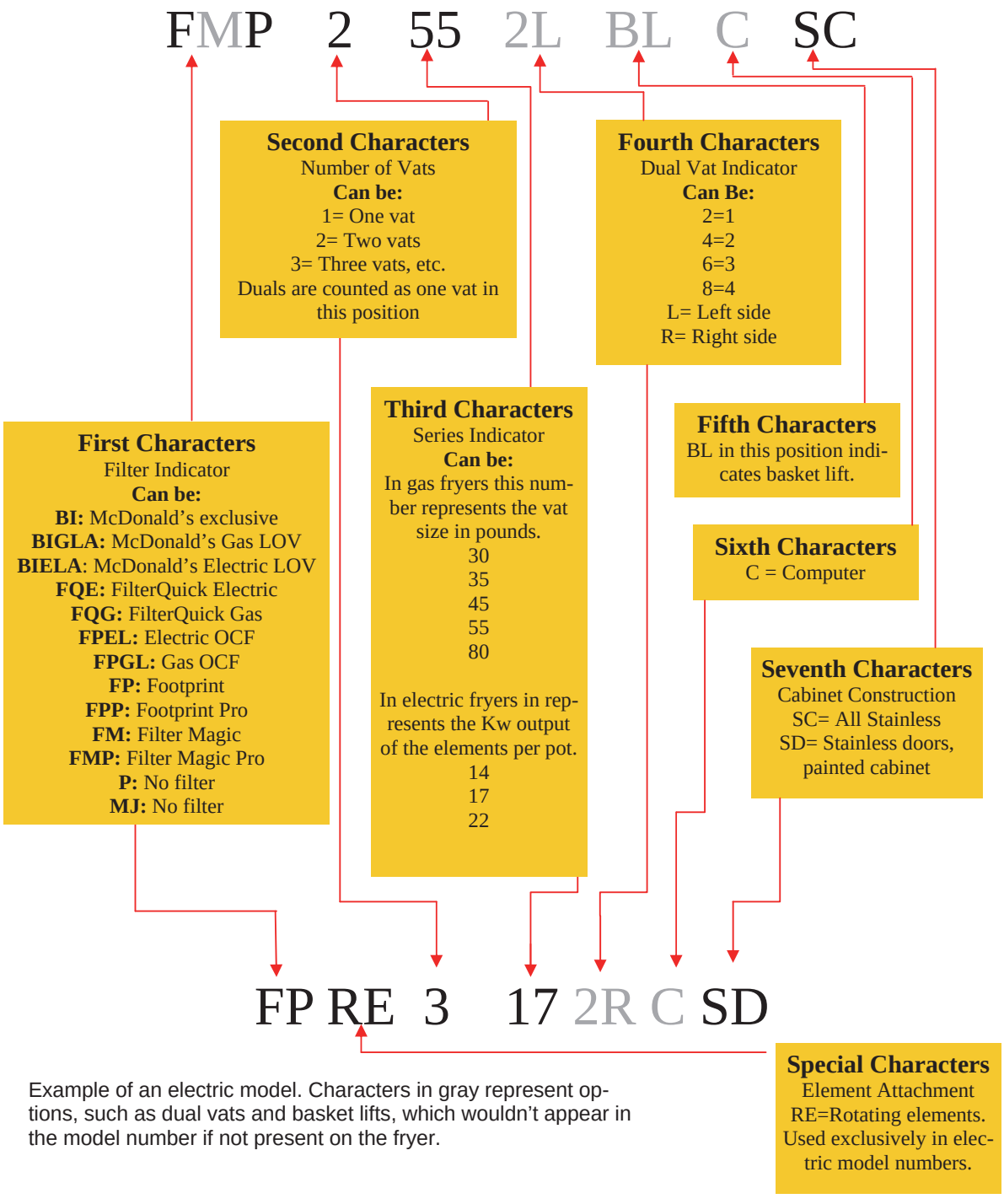
M3000	
Recovery	0042
Program	1234
F° to C°	1658
Set Up	1234
Manual Reset	3322
Manager Mode	4321
Reset Usage	4321
Tech Mode	1650
US to Int'l Menu	1212
Reset Filter Stats	0469
Reset Call Tech	1000
Reset BADCRC	9988
Reset Service Required	1111

M4000	
Menu	1234
Recipes	1234
Settings-Manager	1234
Settings-Service	1650
Service -Manager	4321
Service/Tech Mode-Tech	1650
Component Check	9000

NOTE: Some call-for-service resets require terminal plug removal and a power cycle.

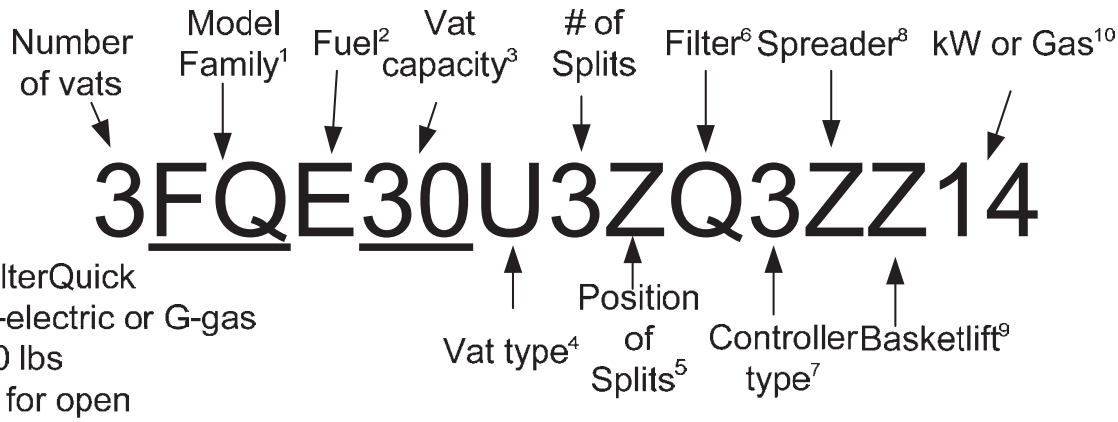
Model Numbers

Example of gas H55 model. Characters in gray represent options, such as dual vats and basket lifts, which wouldn't appear in the model number if not present on the fryer.



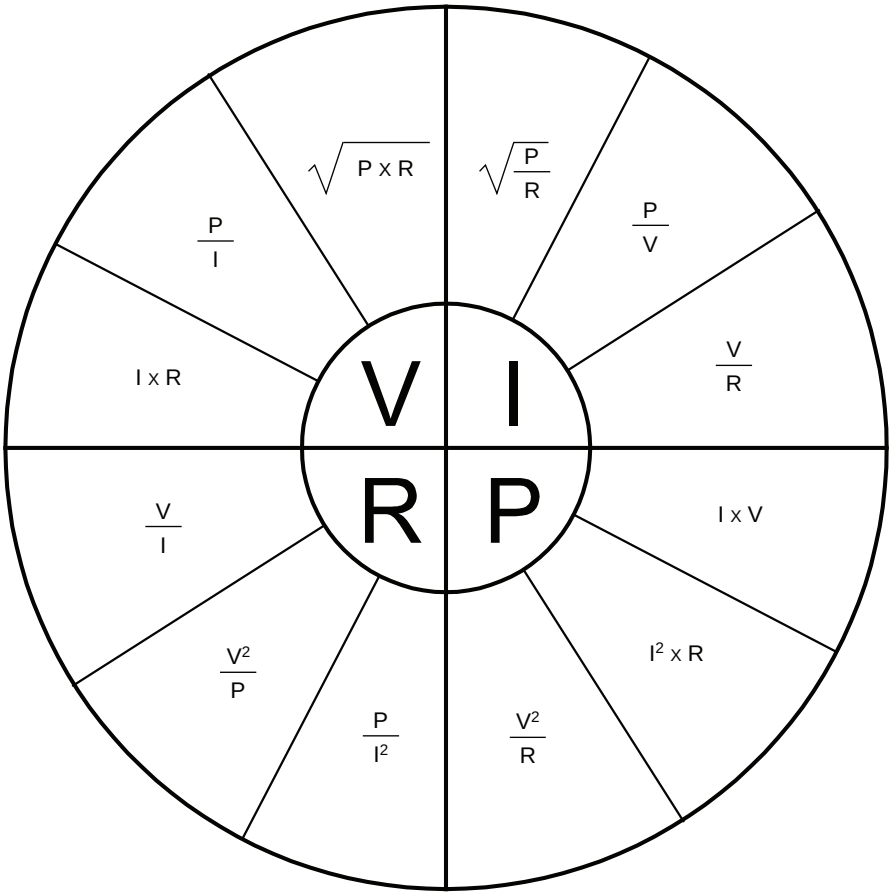
Example of an electric model. Characters in gray represent options, such as dual vats and basket lifts, which wouldn't appear in the model number if not present on the fryer.

Reading Model Numbers



1 = FilterQuick
2 = E-electric or G-gas
3 = 30 lbs
4 = U for open
5 = L-left of filter; R-right of filter; M-Middle; X-Mixed; Z-all
6 = Q-Semi-Auto w/ ATO
7 = FilterQuick 3000, T in this position = Touchscreen
8 = S-Spreader; Z-none
9 = B-Basket Lift; Z-none
10 = Kilowatts -14, 17, 22kW; Gas-NG (Natural), PG(Propane), BG(Butane), LG(LPMix)

Electrical Formulas



V = Voltage (Volts)
I = Current (Amps)
R = Resistance (Ohms)
P = Power (Watts)

MICRO = 1/1,000,000 (one millionth) e.g., microamps
MILLI = 1/1,000 (one thousandth) e.g., millivolts
KILO = 1000 X (one thousand times) e.g., kilowatts
MEGA = 1,000,000 X (one million times) e.g., megaohms

Pressure Conversion Table

Inches H_2O	PSI	Inches Hg	mm Hg	bar	mbar	Pa	kPA
1	0.036	0.073	1.868	0.002	2.488	248.827	0.249
2	0.072	0.147	3.735	0.005	4.977	497.654	0.498
3	0.108	0.220	5.603	0.007	7.465	746.481	0.746
4	0.144	0.294	7.470	0.010	9.953	995.309	0.995
5	0.180	0.367	9.338	0.012	12.441	1244.136	1.244
6	0.217	0.441	11.205	0.015	14.930	1492.963	1.493
7	0.253	0.514	13.073	0.017	17.418	1741.790	1.742
8	0.289	0.588	14.940	0.020	19.906	1990.617	1.991
9	0.325	0.661	16.808	0.022	22.394	2239.444	2.239
10	0.361	0.735	18.676	0.025	24.883	2488.271	2.488
11	0.397	0.808	20.543	0.027	27.371	2737.099	2.737
12	0.433	0.882	22.411	0.030	29.859	2985.926	2.986
13	0.469	0.955	24.278	0.032	32.348	3234.753	3.235
14	0.505	1.029	26.146	0.035	34.836	3483.580	3.484
15	0.541	1.102	28.013	0.037	37.324	3732.407	3.732
16	0.577	1.176	29.881	0.040	39.812	3981.234	3.981
17	0.613	1.249	31.748	0.042	42.301	4230.061	4.230
18	0.650	1.323	33.616	0.045	44.789	4478.888	4.479
19	0.686	1.396	35.484	0.047	47.277	4727.716	4.728
20	0.722	1.470	37.351	0.050	49.765	4976.543	4.977
21	0.758	1.543	39.219	0.052	52.254	5225.370	5.225
22	0.794	1.616	41.086	0.055	54.742	5474.197	5.474
23	0.830	1.690	42.954	0.057	57.230	5723.024	5.723
24	0.866	1.763	44.821	0.060	59.719	5971.851	5.972
25	0.902	1.837	46.689	0.062	62.207	6220.678	6.221
26	0.938	1.910	48.556	0.065	64.695	6469.506	6.470
27	0.974	1.984	50.424	0.067	67.183	6718.333	6.718
28	1.010	2.057	52.292	0.070	69.672	6967.160	6.967

Conversion Formulas

PSI = Inches H_2O/27.71
PSI x 27.71 = Inches H_2O
PSI x 2.036 = Inches Hg
PSI x 51.74 = Millimeters of Hg
PSI x .0689 = Bars
PSI x 68.95 = Millibars
PSI x 6895 = Pa
PSI x 6.895 = kPa

Orifice Chart for Common Models

Model	Gas Type	BTUs	Manifold Gas Pressure (Inches H_20)	Orifice Size (Drill/mm)	Part Number
J1C-MJ15	Natural	45,000	4	55/1.30	810-0131
	Propane	45,000	11	67/.81	810-0140
	Butane	45,000	11	68/.79	810-0141
35 Series	Natural	110,000	4	51/1.70	810-0129
	Propane	110,000	9	59/1.05	810-0134
45 Series	Natural	122,000	3.5	53/1.45	810-0315
	Propane	122,000	8.25	65/.86	810-0340
47 Series	Natural	122,000	3.5	53/1.45	826-1357
	Propane	122,000	8.25	65/.86	826-1387
CF/J3C Series	Natural	150,000	3.5	54/1.40	810-0330
	Propane	150,000	8.25	65/.86	810-0340
G18-G24FB/FBR	Natural	90,000	4	30/3.26	810-0916
	Propane	90,000	11	47/2.00	810-0917
GF14 Series	Natural	100,000	4	52/1.65	810-0496
	Propane	100,000	10	59/1.05	810-0134
GF40 Series	Natural	122,000	3.5	53/1.45	810-0315
	Propane	122,000	8.25	65/.86	810-0340
H50/H52 Series	Natural	80,000	3	29/3.40	810-0403
	Propane	80,000	8.25	44/2.10	810-0386
TCF Series	Natural	112,000	4	44/2.18	810-0675
	Propane	112,000	11	54/1.40	810-0710

Probe Resistance Charts

Probe Resistance Chart

For use with Minco or Hycal Thermistor Probes only (fryer equipped).
Not for use with Spaghetti Magic System Probes.

F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C
32	1000	0	83	1107	28	134	1214	57	185	1320	85	236	1424	113
33	1002	1	84	1110	29	135	1216	57	186	1322	86	237	1426	114
34	1004	1	85	1112	29	136	1218	58	187	1324	86	238	1428	114
35	1006	2	86	1114	30	137	1220	58	188	1326	87	239	1430	115
36	1008	2	87	1116	31	138	1222	59	189	1328	87	240	1432	116
37	1011	3	88	1118	31	139	1224	59	190	1330	88	241	1434	116
38	1013	3	89	1120	32	140	1226	60	191	1332	88	242	1436	117
39	1015	4	90	1122	32	141	1229	61	192	1334	89	243	1438	117
40	1017	4	91	1124	33	142	1231	61	193	1336	89	244	1440	118
41	1019	5	92	1126	33	143	1233	62	194	1338	90	245	1442	118
42	1021	6	93	1128	34	144	1235	62	195	1340	91	246	1444	119
43	1023	6	94	1131	34	145	1237	63	196	1342	91	247	1447	119
44	1025	7	95	1133	35	146	1239	63	197	1344	92	248	1449	120
45	1030	7	96	1135	36	147	1241	64	198	1346	92	249	1451	121
46	1032	8	97	1137	36	148	1243	64	199	1348	93	250	1453	121
47	1034	8	98	1139	37	149	1245	65	200	1350	93	251	1455	122
48	1036	9	99	1141	37	150	1247	66	201	1352	94	252	1457	122
49	1038	9	100	1143	38	151	1249	66	202	1354	94	253	1459	123
50	1040	10	101	1145	38	152	1251	67	203	1357	95	254	1461	123
51	1042	11	102	1147	39	153	1253	67	204	1359	96	255	1463	124
52	1044	11	103	1149	39	154	1255	68	205	1361	96	256	1465	124
53	1046	12	104	1151	40	155	1258	68	206	1363	97	257	1467	125
54	1049	12	105	1154	41	156	1260	69	207	1365	97	258	1469	126
55	1051	13	106	1156	41	157	1262	69	208	1367	98	259	1471	126
56	1053	13	107	1158	42	158	1264	70	209	1369	98	260	1473	127
57	1055	14	108	1160	42	159	1266	71	210	1371	99	261	1475	127
58	1057	14	109	1162	43	160	1268	71	211	1373	99	262	1477	128
59	1059	15	110	1164	43	161	1270	72	212	1375	100	263	1479	128
60	1061	16	111	1166	44	162	1272	72	213	1377	101	264	1481	129
61	1063	16	112	1168	44	163	1274	73	214	1379	101	265	1483	129
62	1065	17	113	1170	45	164	1276	73	215	1381	102	266	1485	130
63	1067	17	114	1172	46	165	1278	74	216	1383	102	267	1487	131
64	1068	18	115	1174	46	166	1280	74	217	1385	103	268	1489	131
65	1070	18	116	1176	47	167	1282	75	218	1387	103	269	1491	132
66	1072	19	117	1179	47	168	1284	76	219	1389	104	270	1493	132
67	1074	19	118	1181	48	169	1287	76	220	1391	104	271	1495	133
68	1076	20	119	1183	48	170	1289	77	221	1393	105	272	1497	133
69	1078	21	120	1185	49	171	1291	77	222	1395	106	273	1499	134
70	1080	21	121	1187	49	172	1293	78	223	1398	106	274	1501	134
71	1082	22	122	1189	50	173	1295	78	224	1400	107	275	1503	135
72	1084	22	123	1191	51	174	1297	79	225	1402	107	276	1505	136
73	1086	23	124	1193	51	175	1299	79	226	1404	108	277	1507	136
74	1089	23	125	1195	52	176	1301	80	227	1406	108	278	1509	137
75	1091	24	126	1197	52	177	1303	81	228	1408	109	279	1512	137
76	1093	24	127	1199	53	178	1305	81	229	1410	109	280	1514	138
77	1095	25	128	1201	53	179	1307	82	230	1412	110	281	1516	138
78	1097	26	129	1204	54	180	1309	82	231	1414	111	282	1518	139
79	1099	26	130	1206	54	181	1311	83	232	1416	111	283	1520	139
80	1101	27	131	1208	55	182	1313	83	233	1418	112	284	1522	140
81	1103	27	132	1210	56	183	1315	84	234	1420	112	285	1524	141
82	1105	28	133	1212	56	184	1317	84	235	1422	113	286	1526	141

Probe Resistance Chart (cont.)

For use with Minco or Hycal Thermistor Probes only (fryer equipped).
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F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C
287	1528	142	338	1630	170	389	1732	198	440	1833	227	491	1932	255
288	1530	142	339	1632	171	390	1734	199	441	1835	227	492	1934	256
289	1532	143	340	1634	171	391	1736	199	442	1837	228	493	1936	256
290	1534	143	341	1636	172	392	1738	200	443	1839	228	494	1938	257
291	1536	144	342	1638	172	393	1740	201	444	1841	229	495	1940	257
292	1538	144	343	1640	173	394	1742	201	445	1843	229	496	1942	258
293	1540	145	344	1642	173	395	1744	202	446	1845	230	497	1944	258
294	1542	146	345	1644	174	396	1746	202	447	1846	231	498	1946	259
295	1544	146	346	1646	174	397	1748	203	448	1848	231	499	1948	259
296	1546	147	347	1648	175	398	1750	203	449	1850	232	500	1950	260
297	1548	147	348	1650	176	399	1752	204	450	1852	232	501	1952	261
298	1550	148	349	1652	176	400	1754	204	451	1854	233	502	1954	261
299	1552	148	350	1654	177	401	1756	205	452	1856	233	503	1956	262
300	1554	149	351	1656	177	402	1758	206	453	1858	234	504	1958	262
301	1556	149	352	1658	178	403	1760	206	454	1860	234	505	1960	263
302	1558	150	353	1660	178	404	1762	207	455	1862	235	506	1962	263
303	1560	151	354	1662	179	405	1764	207	456	1864	236	507	1964	264
304	1562	151	355	1664	179	406	1766	208	457	1866	236	508	1965	264
305	1564	152	356	1666	180	407	1768	208	458	1868	237	509	1967	265
306	1566	152	357	1668	181	408	1770	209	459	1870	237	510	1969	266
307	1568	153	358	1670	181	409	1772	209	460	1872	238	511	1971	266
308	1570	153	359	1672	182	410	1774	210	461	1874	238	512	1973	267
309	1572	154	360	1674	182	411	1776	211	462	1876	239	513	1975	267
310	1574	154	361	1676	183	412	1778	211	463	1878	239	514	1977	268
311	1576	155	362	1678	183	413	1780	212	464	1880	240	515	1979	268
312	1578	156	363	1680	184	414	1781	212	465	1882	241	516	1981	269
313	1580	156	364	1682	184	415	1783	213	466	1884	241	517	1983	269
314	1582	157	365	1684	185	416	1785	213	467	1886	242	518	1985	270
315	1584	157	366	1686	186	417	1787	214	468	1888	242	519	1987	271
316	1586	158	367	1688	186	418	1789	214	469	1890	243	520	1989	271
317	1588	158	368	1690	187	419	1791	215	470	1892	243	521	1991	272
318	1590	159	369	1692	187	420	1793	216	471	1893	244	522	1993	272
319	1592	159	370	1694	188	421	1795	216	472	1895	244	523	1995	273
320	1594	160	371	1696	188	422	1797	217	473	1897	245	524	1996	273
321	1596	161	372	1698	189	423	1799	217	474	1899	246	525	1998	274
322	1598	161	373	1700	189	424	1801	218	475	1901	246	526	2000	274
323	1600	162	374	1702	190	425	1803	218	476	1903	247	527	2002	275
324	1602	162	375	1704	191	426	1805	219	477	1905	247	528	2004	276
325	1604	163	376	1706	191	427	1807	219	478	1907	248	529	2006	276
326	1606	163	377	1708	192	428	1809	220	479	1909	248	530	2008	277
327	1608	164	378	1710	192	429	1811	221	480	1911	249	531	2010	277
328	1610	164	379	1712	193	430	1813	221	481	1913	249	532	2012	278
329	1612	165	380	1714	193	431	1815	222	482	1915	250	533	2014	278
330	1614	166	381	1716	194	432	1817	222	483	1917	251	534	2016	279
331	1616	166	382	1718	194	433	1819	223	484	1919	251	535	2018	279
332	1618	167	383	1720	195	434	1821	223	485	1921	252	536	2020	280
333	1620	167	384	1722	196	435	1823	224	486	1923	252	537	2022	281
334	1622	168	385	1724	196	436	1825	224	487	1925	253	538	2025	281
335	1624	168	386	1726	197	437	1827	225	488	1927	253	539	2027	282
336	1626	169	387	1728	197	438	1829	226	489	1929	254	540	2029	282
337	1628	169	388	1730	198	439	1831	226	490	1931	254	541	2031	283

UHC RTD Probe Resistance Chart

All Cabinets: UHC, UHC-P, UHC-HD

Sensor Temp (°F)	R Sensor	Sensor Temp (°C)
55	104.984	12.77
60	106.065	15.55
65	107.145	18.33
70	108.224	21.11
75	109.302	23.88
80	110.380	26.66
85	111.456	29.44
90	112.532	32.22
95	113.606	35.00
100	114.680	37.77
105	115.753	40.55
110	116.825	43.33
115	117.896	46.11
120	118.966	48.88
125	120.036	51.66
130	121.104	54.44
135	122.172	57.22
140	123.239	60.00
145	124.304	62.77
150	125.369	65.55
155	126.433	68.33
160	127.496	71.11
165	128.559	73.88
170	129.620	76.66
175	130.680	79.44
180	131.740	82.22
185	132.799	85.00
190	133.856	87.77
195	134.913	90.55
200	135.969	93.33
205	137.024	96.11
210	138.078	98.88
215	139.132	101.66
220	140.184	104.44
225	141.235	107.22
230	142.286	110.00
235	143.336	112.77
240	144.385	115.55
245	145.433	118.33
250	146.480	121.11
255	147.526	123.88
260	148.570	126.66

Dean Thermatron® Probe Resistance Charts

Below are resistance charts applicable to Dean fryers equipped with Thermatron® controllers.

Electronic Thermostat Systems (Probe wire color: Two Black Wires or Two Brown Wires)		
° Celsius	**° Fahrenheit**	**Ohms (± 3%)**
21	70	108130
27	80	84606
32	90	66721
38	100	53020
43	110	42452
49	120	34206
54	130	27735
60	140	22641
66	150	18588
71	160	15349
77	170	12741
82	180	10635
88	190	8925
93	200	7527
99	210	6391
104	220	5470
110	230	4705
116	240	4030
121	250	3441
127	260	2967
132	270	2583
138	280	2255
143	290	1977
149	300	1729
154	310	1496
160	320	1320
166	330	1170
171	340	1051
177	350	942
182	360	840
188	370	750
193	380	676
199	390	605
204	400	541

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