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High-Efficiency Gas

Brad Rowe
bradley.rowe@frymaster.com

1. Hours 8-5
2. Lunch 12-1
3. Class Photo
4. Breaks
5. Smoking area
6. Restrooms
7. Phones
8. **Questionnaire**

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High-Efficiency Gas

Year Fryer Was Built	Month Fryer Was Built	Family Model	Production Sequence
S/N 24 07 ID 0106			

Frymaster

SERIAL NO. 21071D0106 SERIES-CA MH-90 US

MODEL-FFP4000-30 GAS-NATURAL

R.T.U. - 1050 IN. MC. MAN. PRESS. - 3.00 R.T.U. /HR LEFT-00000

R.T.U. /HR. CENT. - 60 R.T.U. /HR. RIGHT-00000

ORIFICE-3.40 VOLTS-110-120 60 Hz. 1 PHASE AMPS- 12.50

AMBI 2003 11-2016/CSA 1.0-2016 FOOD SERVICE KITCH.

INTENDED FOR OTHER THAN HOUSEHOLD USE. SUITABLE FOR

INSTALLATION ON COMBUSTIBLE FUELS USING 6 IN. ADJUSTABLE

LEGS OR CASTERS.

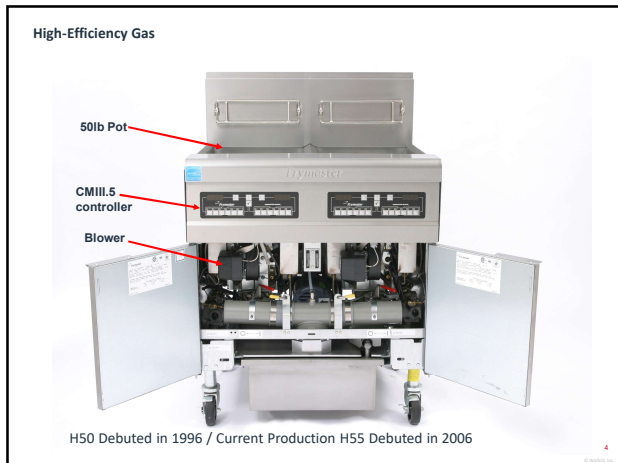
CONSTRUCTION CLEARANCES:

FRONT	RIGHT SIDE	LEFT SIDE
6 IN.	6 IN.	6 IN.

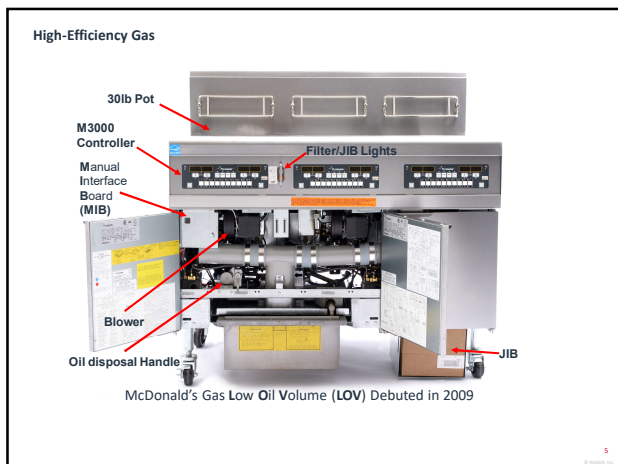
THIS PRODUCT CONTAINS INFORMATION OR TECHNOLOGY PROPRIETARY TO AND/OR PATENTED BY WELBILT, INC.

MADE IN USA

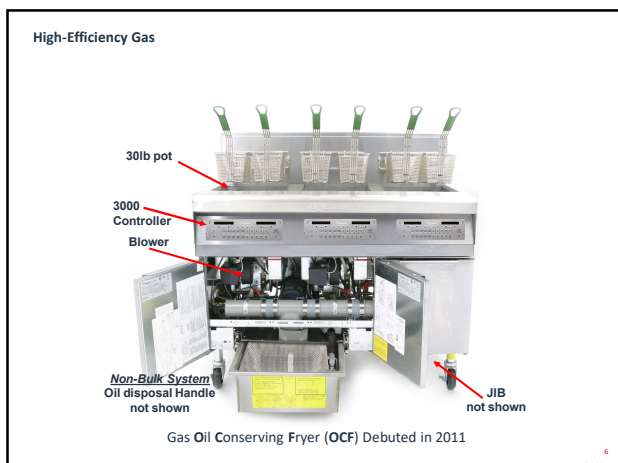
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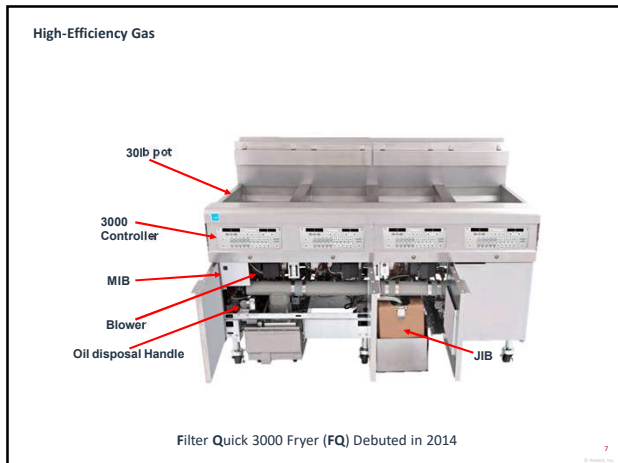
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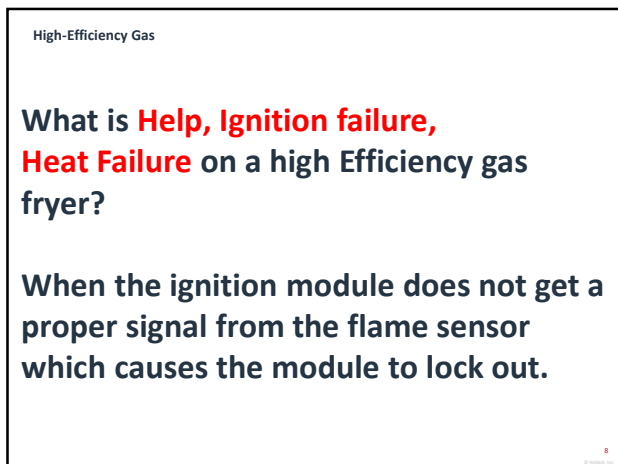
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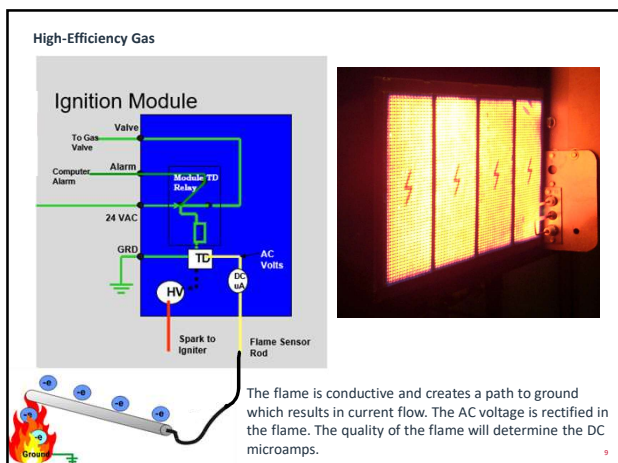
6



7



8



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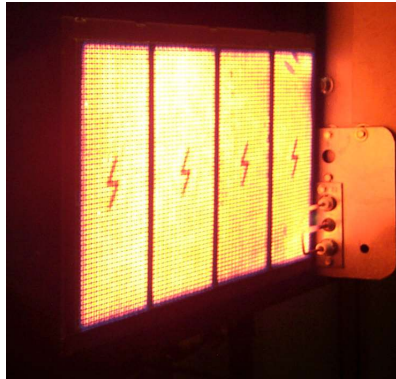
High-Efficiency Gas

The ceramics of the burner should glow orange after a minute of operation.

A blue burner is an indication of a gas/air mixture problem.

An adjustment to the blower shutter can improve the flame.

The quality of the flame will directly affect flame current.



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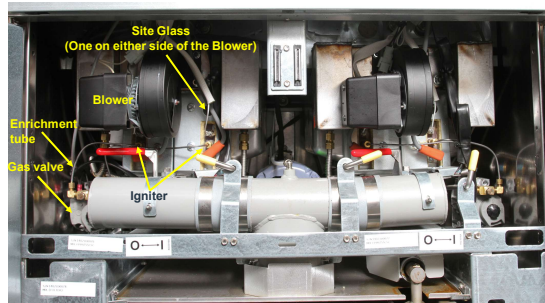
High-Efficiency Gas

- Starting in December 2025, Metal Fiber burners replaced the older ceramic burners on the 30lb frypot
- The metal surface of the burner provides a larger grounding area for flame rectification resulting in a higher flame sense current of 5-7 micro amps
- Gas orifice, gas pressure and blower settings are identical to the existing ceramic burners



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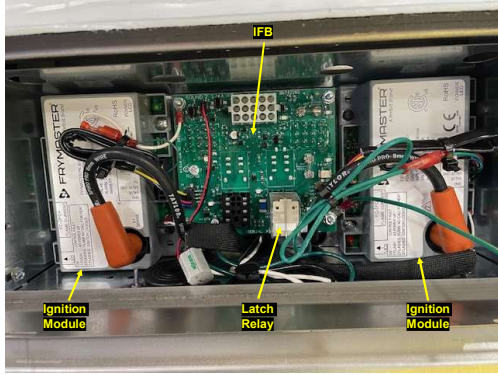
High-Efficiency Gas



H55

12

High-Efficiency Gas

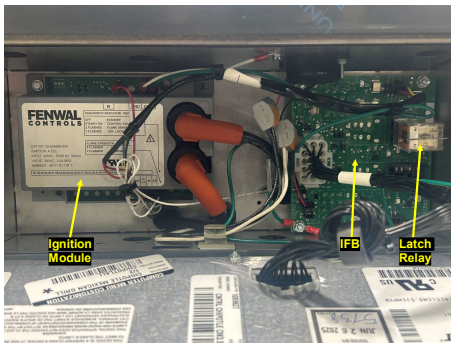


H55 FV Component Box with Single Spark Modules

13

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High-Efficiency Gas

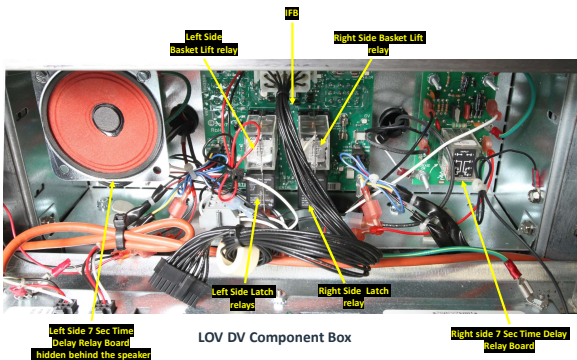


H55 FV Component Box with a Dual Spark Module

14

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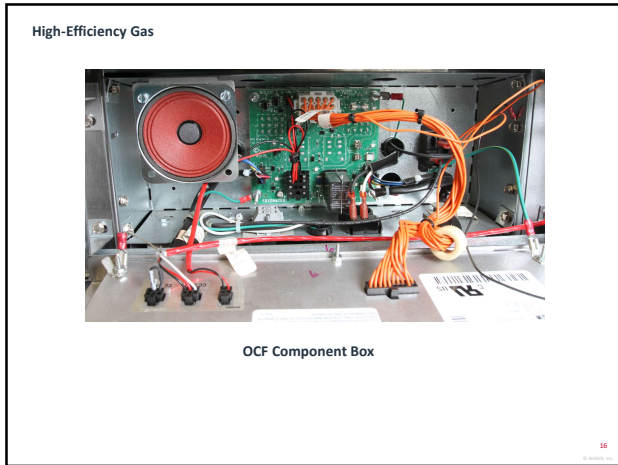
High-Efficiency Gas

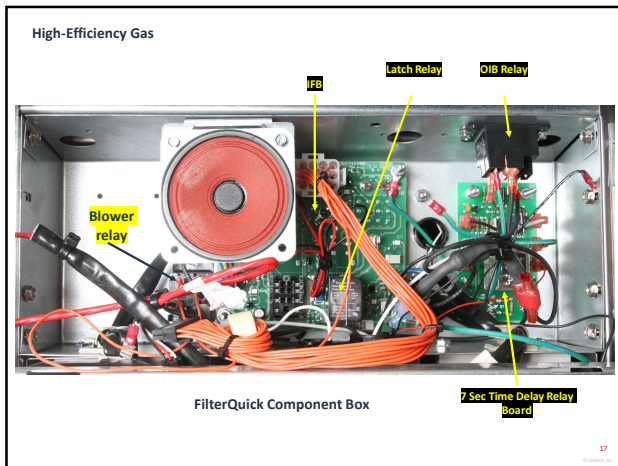


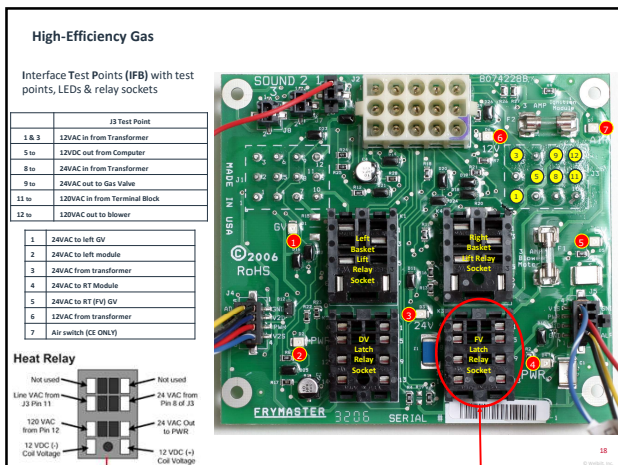
LOV DV Component Box

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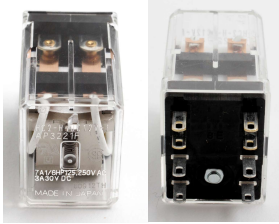






High-Efficiency Gas

H50/52/55 Latch Relay



•Coil voltage is 12 VDC from the Controller

•The relay is a double pole, double throw

Provides

• 24 VAC to the ignition / gas circuit

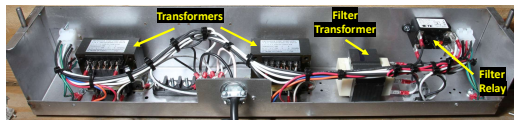
• 120 VAC to the combustion blower

P/N 807-6084

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High-Efficiency Gas



H255 Transformer Box

20

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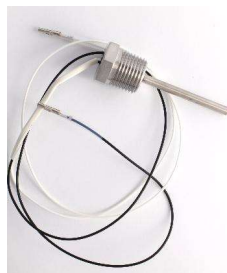
High-Efficiency Gas

Temperature sensing

- Frymaster's controllers use a temperature probe rather than a thermostat
- The probe's resistance changes as the temperature changes
- The controller recognize the resistance change and reacts

How can a Probe fail

- If the probe's resistance is below 1000 Ω at 32°F (0°C) or above 1950 Ω or the wires are shorted – the controller displays an error message "Prob"
- A Temp Probe reading out of range or shorted to ground is bad and needs to be replaced



Temp Probe P/N 8064206

- Use Loctite 567 when installing the Temp Probe

- Why?

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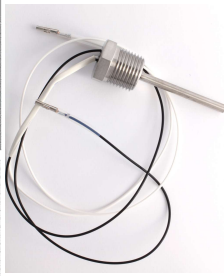
High-Efficiency Gas

Temperature sensing

Probe Resistance Chart

*For use with Minco or Hysol Thermistor Probes only (fryer equipped).
Not for use with Spigitel's Magic System Probes.*

F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C	F	OHMS	C
32	1000	0	83	1107	28	134	1214	27	185	1303	85	230	1424	113			
33	1002	1	84	1110	29	135	1218	27	186	1307	86	231	1426	114			
34	1004	1	85	1112	29	136	1219	28	187	1314	88	233	1428	114			
35	1006	2	86	1114	30	137	1220	28	188	1320	89	234	1430	115			
36	1008	2	87	1118	31	138	1222	29	189	1323	90	235	1432	116			
37	1011	3	88	1119	31	139	1223	29	190	1325	91	237	1434	116			
38	1013	3	89	1120	32	140	1225	30	191	1332	92	241	1438	117			
39	1015	4	90	1122	32	141	1226	31	192	1334	93	243	1439	117			
40	1017	4	91	1124	33	142	1227	31	193	1336	94	244	1440	118			
41	1019	5	92	1126	33	143	1229	32	194	1338	95	246	1442	118			
42	1021	5	93	1128	34	144	1230	32	195	1340	96	248	1444	119			
43	1023	6	94	1131	34	145	1232	33	196	1342	97	249	1447	119			
44	1025	6	95	1133	35	146	1233	33	197	1344	98	251	1449	120			
45	1030	7	96	1135	36	147	1241	34	198	1346	99	249	1451	121			
295	1044	146	345	1645	174	337	1748	203	445	1848	211	490	1945	220			
296	1046	147	347	1648	175	338	1750	203	446	1850	212	491	1950	220			
297	1048	147	348	1650	176	339	1752	204	447	1852	212	491	1952	221			
298	1050	148	349	1652	176	340	1754	204	448	1854	213	492	1954	221			
299	1052	148	350	1654	177	341	1756	205	449	1856	213	493	1956	222			
300	1054	149	351	1656	177	342	1758	205	450	1858	214	494	1958	222			
301	1056	149	352	1658	178	343	1760	206	451	1860	214	495	1960	223			
302	1058	150	353	1660	178	344	1762	207	452	1862	215	496	1962	223			
303	1060	151	354	1662	179	345	1764	207	453	1864	215	497	1964	224			
304	1062	151	355	1664	179	346	1766	208	454	1866	216	498	1966	224			
305	1064	152	356	1666	180	347	1768	208	455	1868	217	499	1968	225			
306	1066	152	357	1668	181	348	1770	209	456	1870	217	500	1970	225			
307	1068	153	358	1670	181	349	1772	209	457	1872	218	501	1972	226			
308	1070	153	359	1672	182	350	1774	210	458	1874	218	502	1974	226			
309	1072	154	360	1674	182	351	1776	211	459	1876	219	503	1976	227			



TRM 2-4 & B-2

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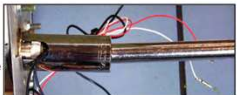
High-Efficiency Gas

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-Limit

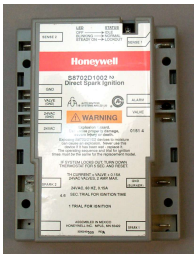
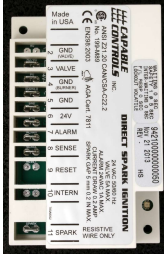


A socket with a cutout to accommodate wiring is necessary when installing a probe or high-limit: 7/8" (815-0386).

High limit Kit 826-1177

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High-Efficiency Gas

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

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

TRM 2-4

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Legacy Controllers

Basic Controller operation/features

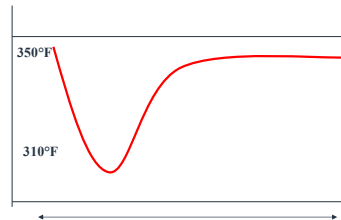


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Legacy Controllers

Sensitivity

Oil temperature drops farther with heavy loads. Additional cook time is added transparently to cover for the reduced temperature.

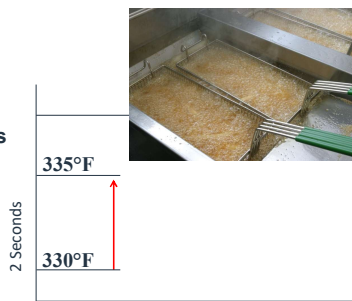


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Legacy Controllers

Rate of Rise

If the Computer sees a temperature increase of over 5°F in 2 seconds, the controller stops calling for heat for 20-30 seconds.



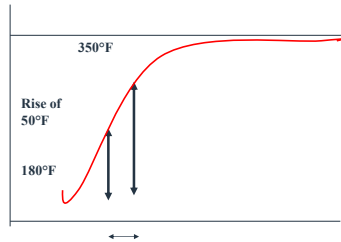
30

Legacy Controllers

Recovery

- The time required for the oil to rise from 250°F to 300°F.
- The measurement is taken any time the oil drops below:
- Legacy 180°F
- All others 200°F

- ☐ Gas 2:25
- ☐ Electric 1:40



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High-Efficiency Gas



This McDonald's fryer is shown in a universal hood that was introduced in 1995 and incorporates adjustable locking tabs to secure the fryer under the hood.

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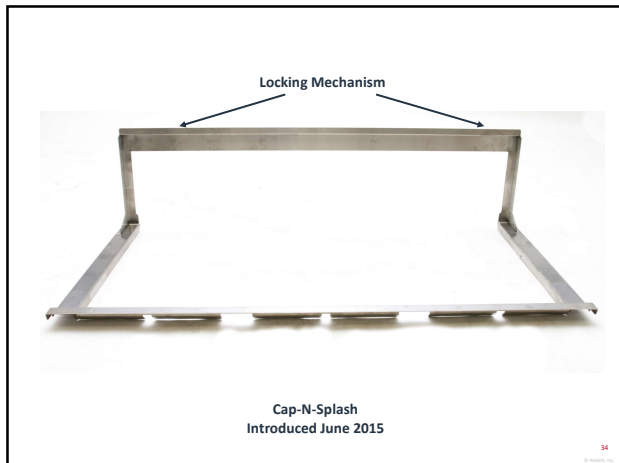
High-Efficiency Gas



Prior to the Universal Hood, A fryer without the Cap-N-Splash locking mechanism leaves a gap in the hood, which disrupts air flow and gathers grease.

33

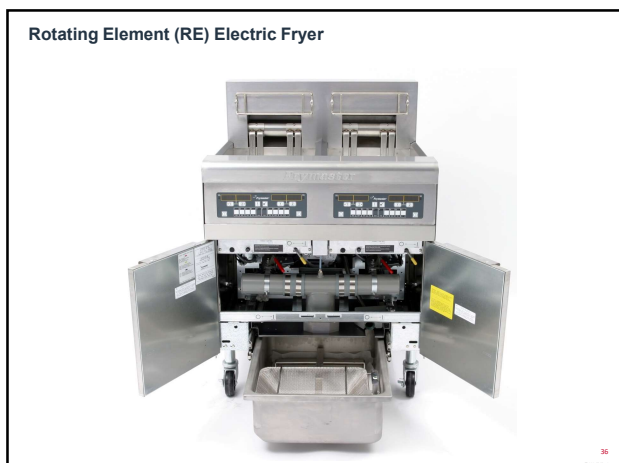
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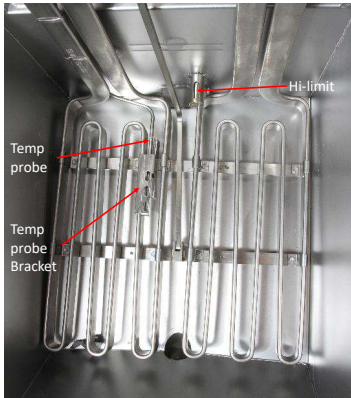
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Rotating Element (RE) Electric Fryer

Frypot



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Rotating Element (RE) Electric Fryer

Tilt Housing



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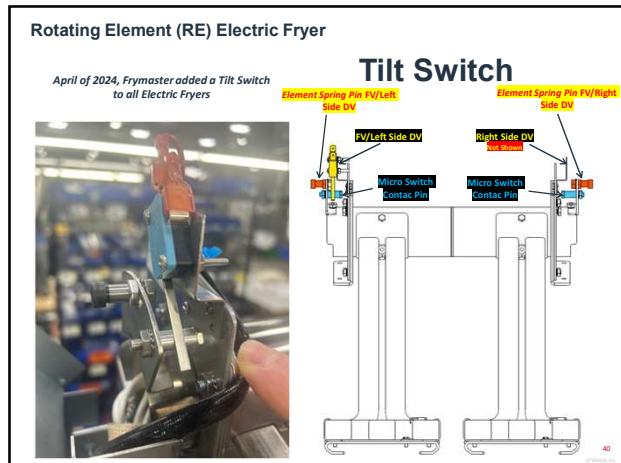
Rotating Element (RE) Electric Fryer

Tilt Housing Removed

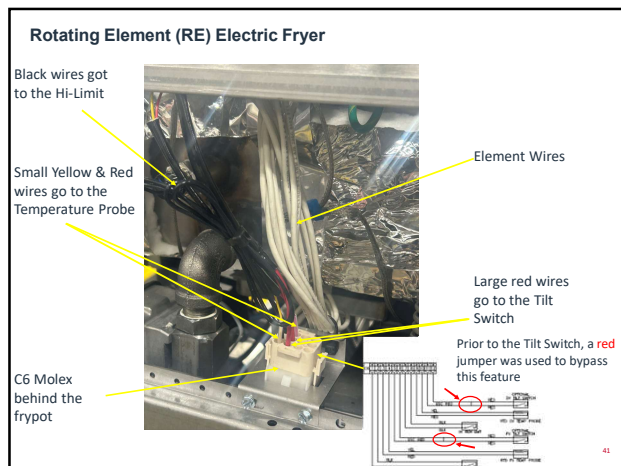


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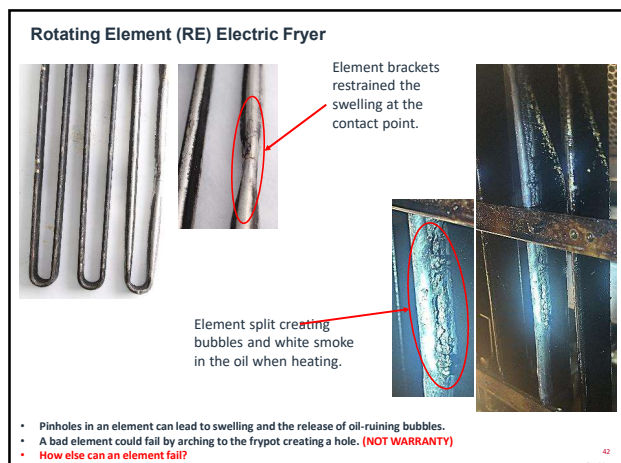
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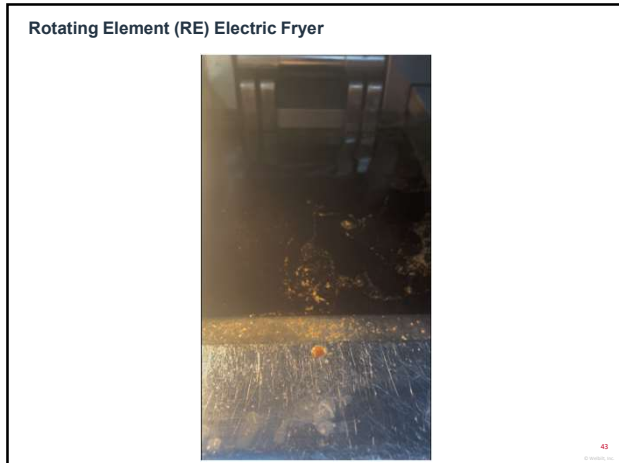
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Rotating Element (RE) Electric Fryer

Heating Element

Values
-10% / + 5%

208 Volts

7,000 watts
16.8 – 19.5 ohms

8,500 watts
13.9 – 16.0 ohms

11,000- watts
10.7 – 12.4 ohms

Values
-10% / + 5%

240 Volts

7,000 watts
22.4 - 25.9 ohms

8,500 watts
18.4 - 21.3 ohms

11,000 watts
14.3 - 15.8 ohms

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Rotating Element (RE) Electric Fryer

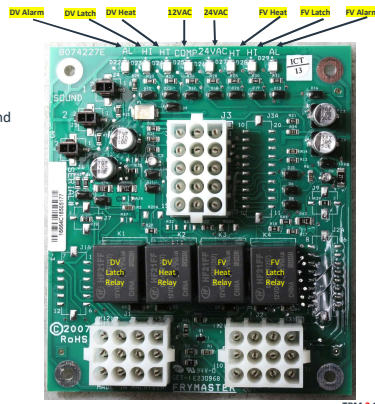
H-SERIES AMP DRAW							
Power	Voltage	14kW Line	14kW Element	17kW Line	17kW Element	22kW Line	22kW Element
DELTA	208	39	11.3	48	13.9	61	17.6
	240	34	9.8	41	11.8	53	15.3
	480	17	4.9	21	6.0	27	7.8
WYE	220/380	21	7	26	8.6	33	11
	230/400	20	6.8	24.6	8.2	31.8	10.6
	240/415	19	6.5	23.6	7.9	30.9	10.2

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Rotating Element (RE) Electric Fryer

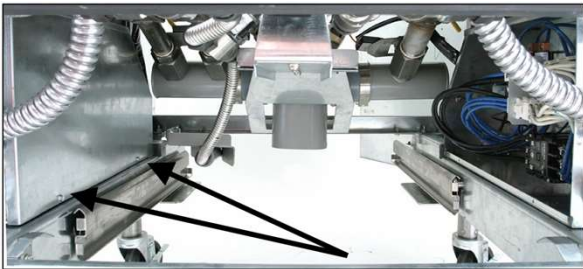
Interface Board

- LED's indicate power on circuits.
- Relays operate latching and heat circuit.



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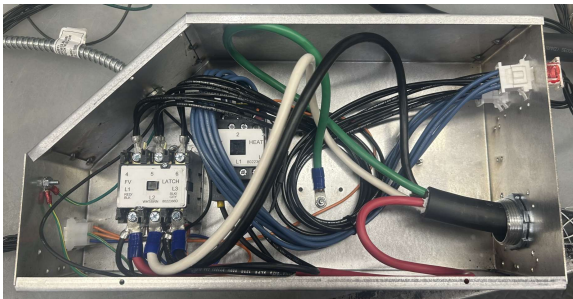
Rotating Element (RE) Electric Fryer



Remove two screws to access
the contactor box

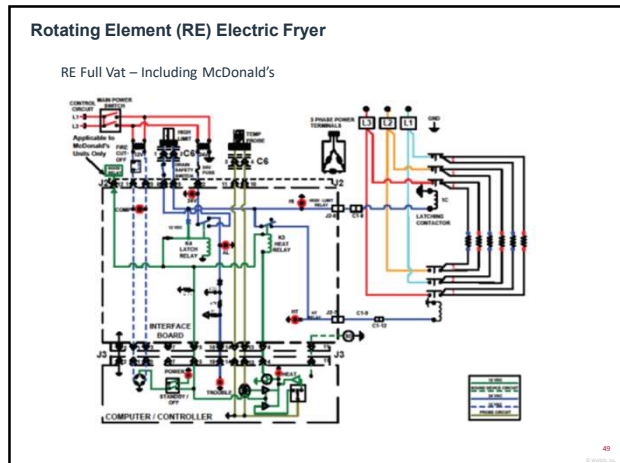
47

Rotating Element (RE) Electric Fryer



FV Contactor box with new mechanical contactors.

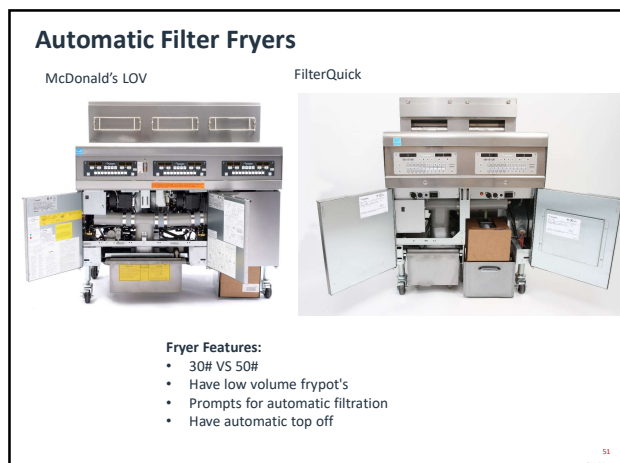
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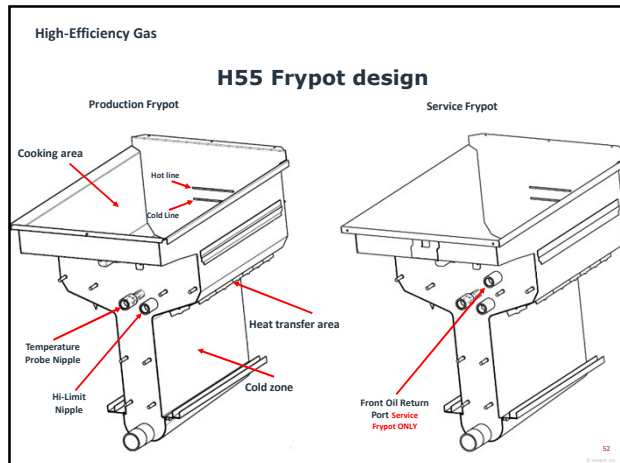
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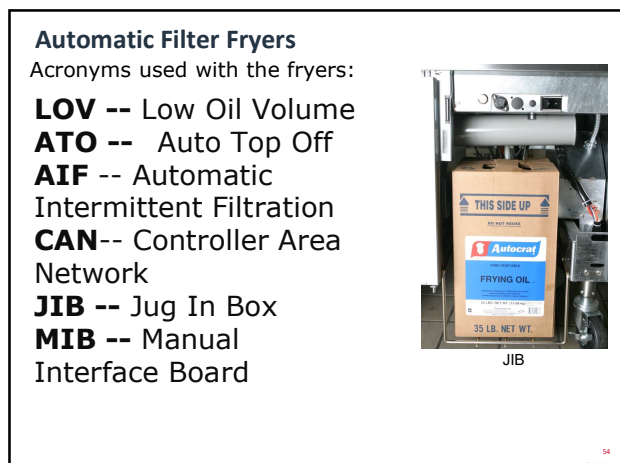
51



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Automatic Filter Fryers

Controller Overview

- With the computer displaying OFF, press and release the TEMP button to see the 3000/MIB/AIF/ATO software versions on each computer.
- Software updated on left controller via SD Card



SD Card Reader

- Power reset rocker is hidden;
- Behind the Left fryer door on Gas
- Behind the Right fryer door on Electric



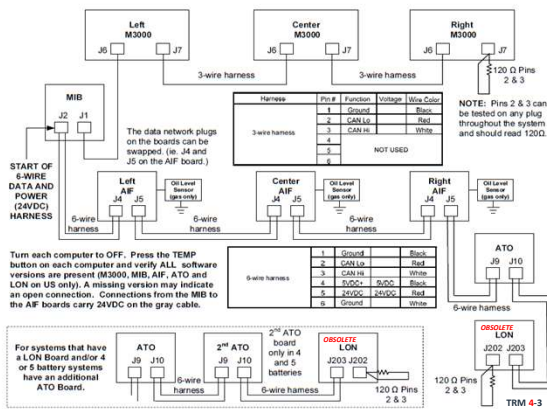
Universal Data Network Plugs



OCF Drain Micro Switch Plug

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Data Network

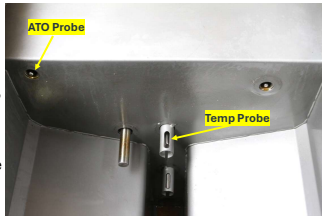


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Automatic Filter Fryers

Automatic Top Off

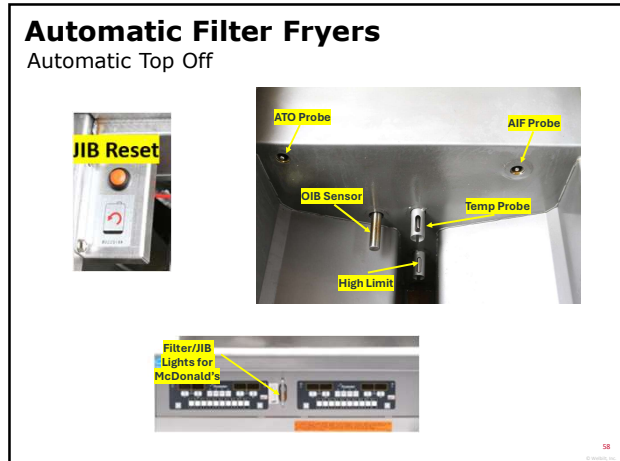
- Oil levels are monitored by RTD's.
- When the fryer is at Set Point and the ATO Probe Temperature drops 60° below setpoint, a top off is triggered.
- When the oil touches the ATO Probe, it senses a rapid rise in temperature.
- Once the ATO temp is within 55° of Set Point, the top off stops.
- If the Temp & ATO Probes do not see the temperature get to within 55° of Each other after several attempts, you will be prompted to check the JIB.



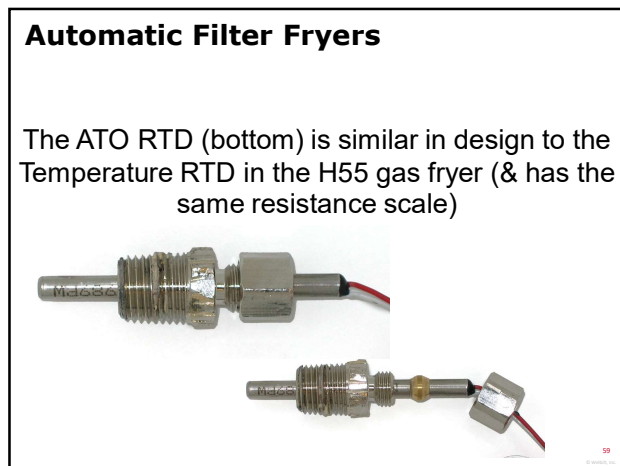
- For McDonald's fryers, the JIB light will illuminate
- For Non-McDonald's, the controller will display JIB Empty.

The ATO is NOT active if the oil is not at set temp, while cooking, during a filtration or a Bulk Oil operation.

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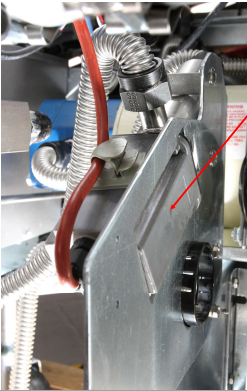


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WB FilterQuick™ FQE30-T



The fryer may have an Optional Oil Quality Sensor (OQS) which Measures the Total Polar Material (TPM) in the oil and indicates oil quality and remaining life.

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Automatic Filter Fryers

Rotary Actuators



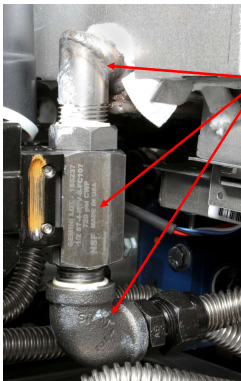
Rotary actuators, which don't require brackets or linkage, replaced linear actuators on LOV Electric fryers Jan 2012 and LOV Gas May 2012.

Linear & Rotary are **NOT** interchangeable.

All FilterQuicks fryers are equipped with rotary actuators.

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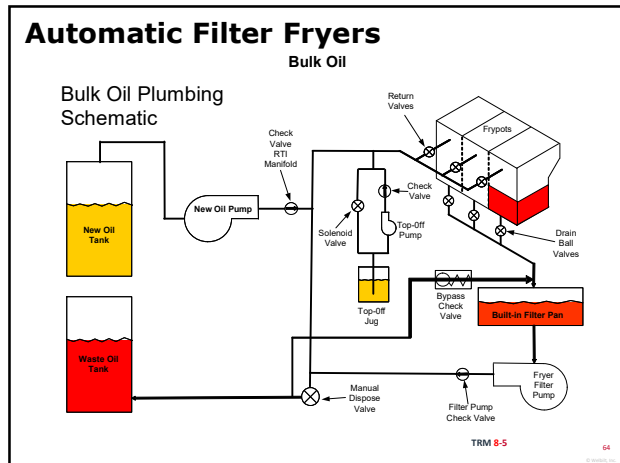
WB FilterQuick™ FQE30-T



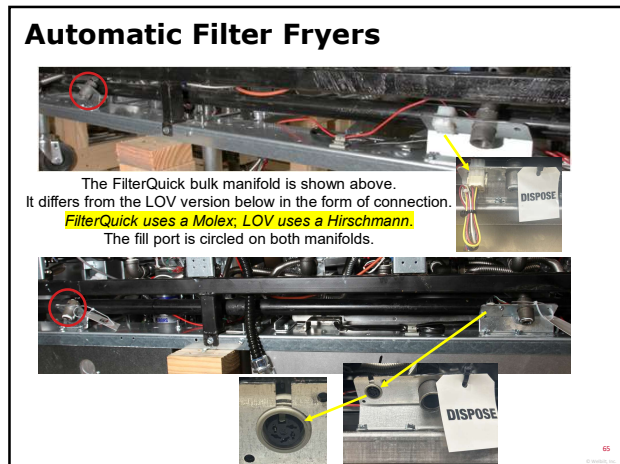
The elbows & return valve on the frypot's oil return can become a problem in stores that allow large sediment loads to gather in the vat.

In addition to not filtering frequently, not refilling/replacing the JIB when empty will also contribute to clogs by opening the return valve and pumping air into the line which in turn pulls oil and crumbs back into the return valve and elbows.

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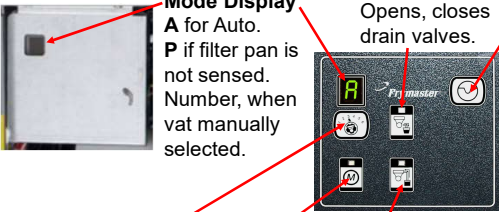
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Automatic Filter Fryers

ATO -- MIB



Mode Display
A for Auto.
P if filter pan is not sensed.
Number, when vat manually selected.

Drain
Opens, closes drain valves.

Reset
Short press resets system.
Long press resets MIB, clears errors.

Vat selection
Use to navigate to desired vat.

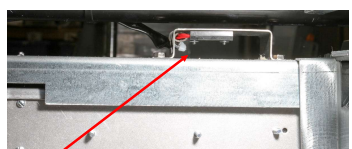
Manual/Auto
Toggle between auto and manual operation.

Return
Opens, closes return valves; turns on pump

TRM 4-4

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Automatic Filter Fryers

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

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Automatic Filter Fryers

Oil-Is-Back-Sensor



Oil-Is-Back Sensor (Gas Only):
Must be cleaned daily

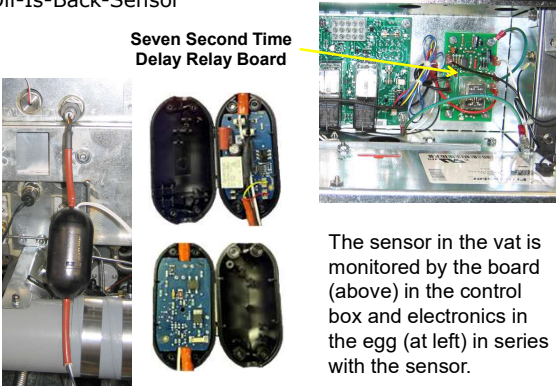
- The oil-is-back sensor serves as a safety to prevent the fryer from heating before oil returns to the vat in a gas fryer.
- The heat of the constantly powered oil sensor rises when the oil leaves the pot. When the temperature of the probe reaches 550°F, the line voltage supplied to the seven second time-delay board begins to switch on and off every four seconds.

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Automatic Filter Fryers

Oil-Is-Back-Sensor

Seven Second Time Delay Relay Board

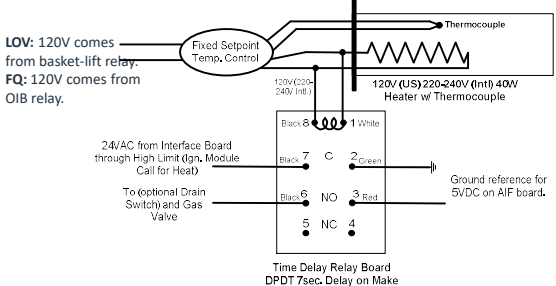


The sensor in the vat is monitored by the board (above) in the control box and electronics in the egg (at left) in series with the sensor.

70

Automatic Filter Fryers

Oil-Is-Back-Sensor



LOV: 120V comes from basket-lift relay.
FQ: 120V comes from OIB relay.

Fixed Setpoint Temp. Control

Thermocouple

120V (US) 220-240V (Int) 40W Heater w/ Thermocouple

24V AC from Interface Board through High Limit (Ign. Module Call for Heat)

To Optional Drain Switchy and Gas Valve

Time Delay Relay Board
DPDT 7sec. Delay on Make

The coil in the circuit opens and denies 24 volts to the gas valve and the ground reference to the 5VDC for the AIF board. The fryer won't heat.

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Frymaster
FilterQuick-Touchscreen
30LB Fryer Training

WELBILT
an All Group Company

6/30/2026 72

FilterQuick-Touchscreen

Brief overview



Benefits

1. Common controller among multiple brands.
2. Very intuitive.
3. Displays are customizable.
4. Most chains have these approved in their system.

Touch screens were introduced at McDonalds in Japan 2014, and we had a full roll out with Taco Bell in 2016. It is a proven concept.

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FilterQuick-Touchscreen

Fryer Acronyms

- **UIB** — User Interface Board (Touchscreen controller)
- **SIB** — Smart Interface Board
- **VIB** — Valve Interface Board
- **FIB** — Filter Interface Board
- **ATO** — Automatic Top-Off
- **OQS** — Oil Quality Sensor
- **OIB** — Oil is Back
- **KCCM** — Kitchen Connect Control Module. Manages communication between fryer and store's monitoring network.
- **FQLink** — Replaces KCCM (Kitchen Connect Control Module). Manages communication using the front left controller between fryer and store's monitoring network.
- **USB** — Universal Serial Bus, used to upgrade software

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Critical boards and their locations

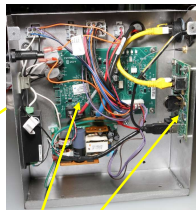


The SIB is located behind the UIB/UIC on each fryer.

One SIB for each FV Two SIBs for each DV

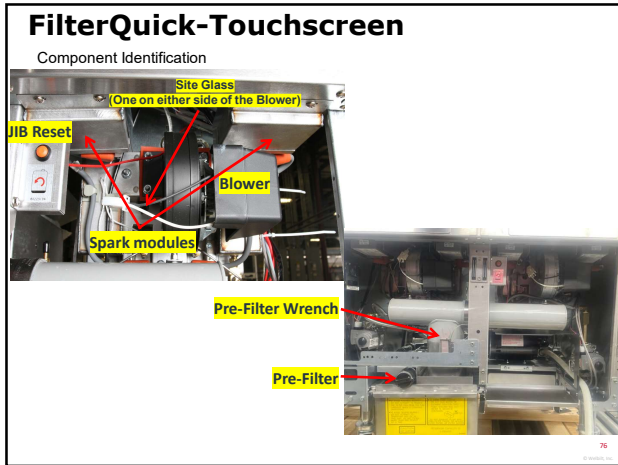


One VIB located under each vat

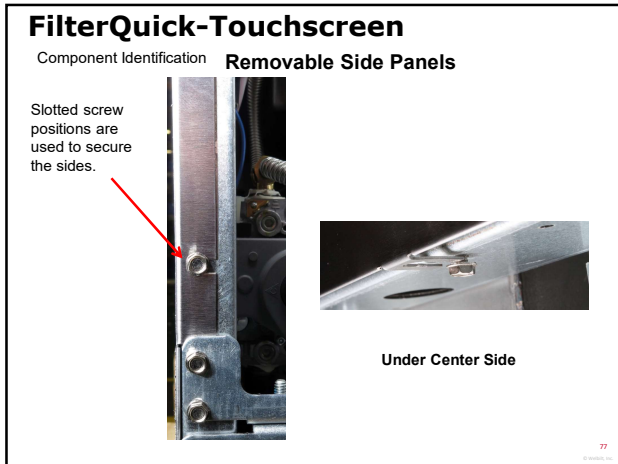


FIB & KCCM - Located in the FIB box behind JIB. One per bank of fryers.

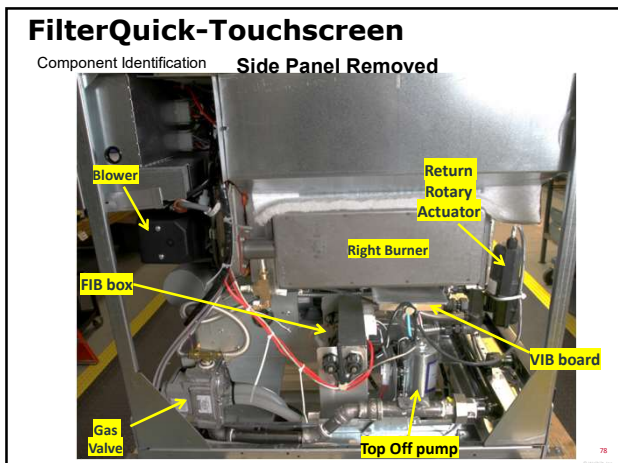
75



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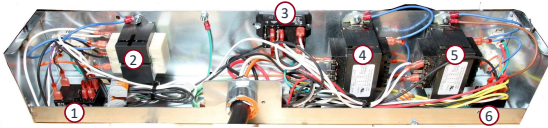


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The transformer box, located in the back of the fryer.

- | | |
|---|--|
| 1 | Filter pump relay |
| 2 | Filter pump transformer |
| 3 | Control reset relay |
| 4 | 24VAC transformer (each fryer has its own) |
| 5 | 24VAC transformer |
| 6 | Hood relay (McDonald's only) |

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FilterQuick-Touchscreen

Service

- Manager (H6d)
- E-Log
- Passcode Setup
- USB Menu Operation
 - Copy Menu from USB to Fryer
 - Copy Menu from Fryer to USB
- Service (2000d)
 - Manual Filtration
 - Password Filter
 - Test Mode
 - Factory Menu (Reverts Product Recipes)
 - Set CAC (Reverts All)
 - Recovery 1 (Set Control (Reverts All))
 - Recovery Factory Default (Reverts to Factory Default)
 - Reset QCS Sensor
 - QCS Replacement Prompt (Enables/Disables)
 - Reset QCS Sensor (Reset QCS after Replacement)
 - Reset TPM Value (Resets TPM Value to 1)
 - Toggle to Select
 - P to C1 C' to P' (Toggles Temperature Scale)
 - Filter Time Setting
 - Clear Statistics
 - Filter State Data (Clears Filter State)
 - E-Log (Clears E-Log Error)
 - Software Upgrade
 - Vat Tuning (Engineering only)
 - Component Check (P000)
 - Revert
 - Revert Menu
 - Select Vat ID (Common Controller Only)

Control Products (UIB)

JABIL (UIC)

Ultratronik (UDX)

Replaced by the Common Controller March/April 2022 on 3000 Fryers After August 2022 on Tube Fryers

Uses a locator wire to identify Board ID

AKA: Common Controller 2602

Replaced by UIC on fryers starting 2602

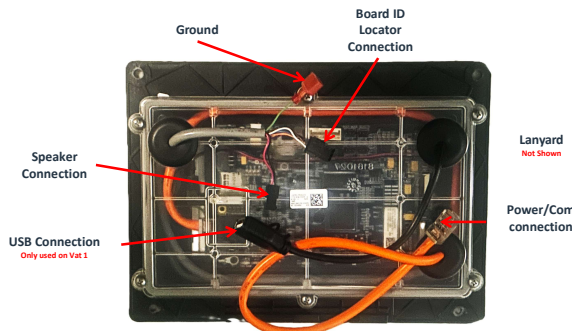
AKA: Ultratronik Common Controller

Board ID is programmable on the UIC & UDX but called Select Vat ID in programming

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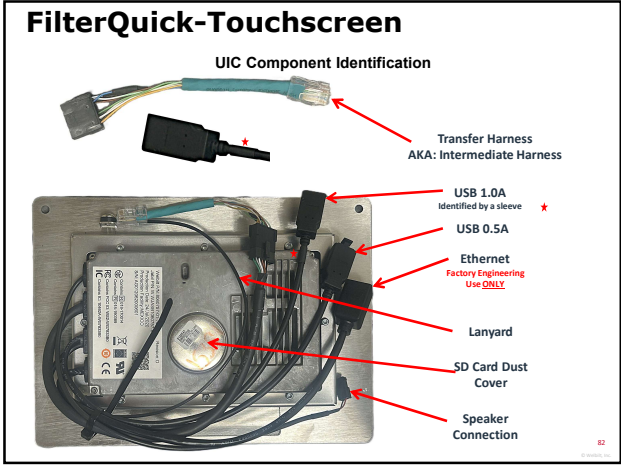
FilterQuick-Touchscreen

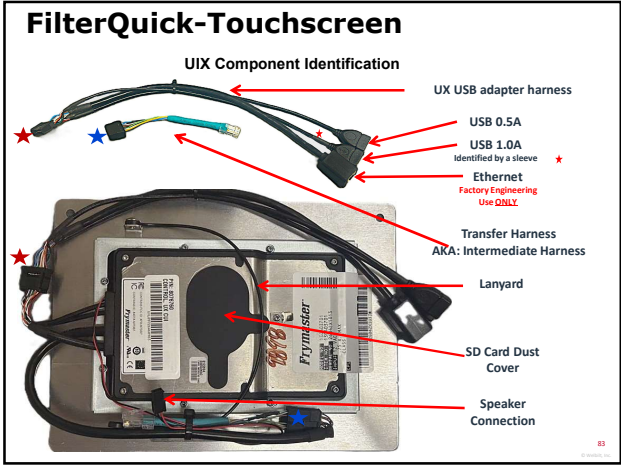
UIB Component Identification

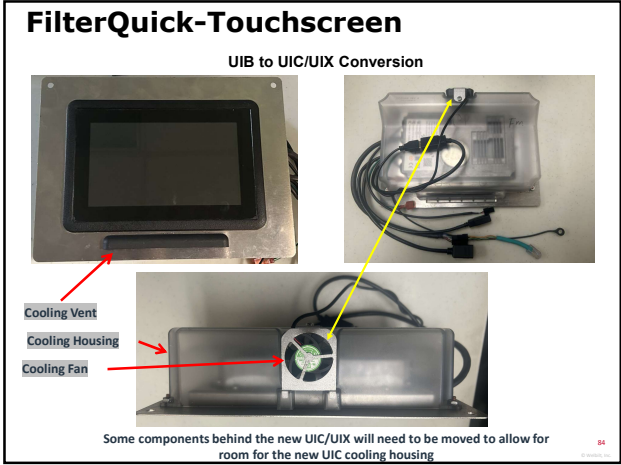


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FilterQuick-Touchscreen

Updating Software

www.frymaster.com ← To access software go to the Frymaster home page

Select **Service**

Select **SOFTWARE**

Software Information

ENTER PASSWORD TO VIEW SOFTWARE INFORMATION

Password: **tech**

VIEW

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FilterQuick-Touchscreen

Updating Software

There are three different software suites depending on the type of controller/s you have on the bank of fryers being updated

30LB fryers manufactured PRIOR to April/May 2022 or 60LB and 80LB fryers manufactured PRIOR to SEPTEMBER 2022

30LB fryers manufactured AFTER March/April 2022 fryers or 60LB & 80LB fryers manufactured AFTER AUGUST 2022

Fryers that have BOTH OLDER style controllers with BLACK WIDE PLASTIC surrounds AND NEWER controllers with SILVER METAL surrounds MIXED in the SAME battery of fryers!

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FilterQuick-Touchscreen

Updating Software

FQ4000 General Market Software Version

UIB-C MIX: 10.00.142, VIB: 01.03.003, FIB: 10.00.062 and Menu File

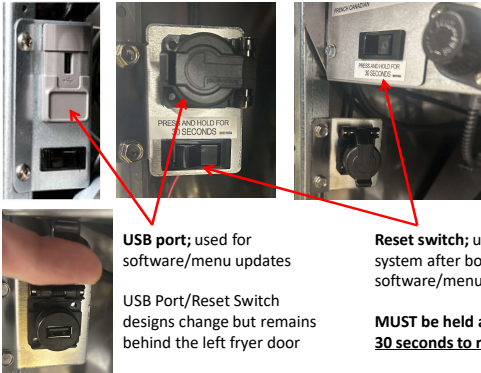
Name	Type	Compressed size	Password p...	Size	Ratio	Date modified
B19-7467 NOV 25 GM LIC-8 10.00...	Adobe Acrobat Document	956 KB	No	960 KB	3%	11/3/2025 1:20 PM
BKFBimg 10.00.062	HEX File	177 KB	No	723 KB	76%	11/3/2025 11:38 AM
BKFBimg.bin	BIN File	177 KB	No	723 KB	76%	11/3/2025 11:38 AM
BKUBimg 10.00.142	HEX File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
BKUBimg.bin	BIN File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
BKUCimg 10.00.142	HEX File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
BKUCimg.bin	BIN File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
GMFBimg 10.00.062	HEX File	177 KB	No	723 KB	76%	11/3/2025 11:38 AM
GMFBimg.bin	BIN File	177 KB	No	723 KB	76%	11/3/2025 11:38 AM
GMOP-10.77.004	HEX File	54 KB	No	204 KB	74%	3/16/2024 7:24 PM
GMOPimg.bin	BIN File	54 KB	No	204 KB	74%	3/16/2024 7:24 PM
GMUBimg 10.00.142	HEX File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
GMUBimg.bin	BIN File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
GMUCimg 10.00.142	HEX File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
GMUCimg.bin	BIN File	2,061 KB	No	2,068 KB	1%	11/3/2025 11:28 AM
VIBimg 01.03.003	HEX File	70 KB	No	263 KB	74%	10/29/2024 3:40 PM
VIBimg.bin	BIN File	70 KB	No	263 KB	74%	10/29/2024 3:40 PM

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FilterQuick-Touchscreen

Component Identification



USB port; used for software/menu updates

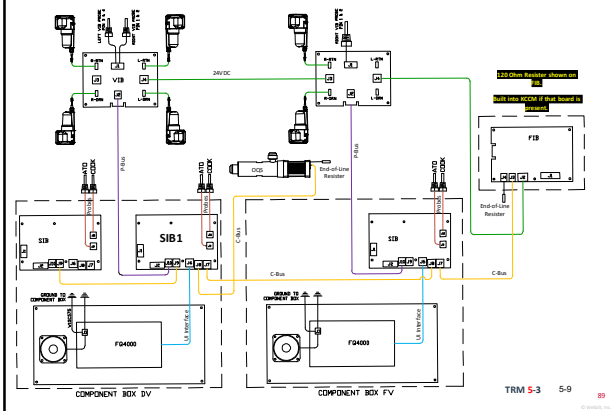
USB Port/Reset Switch designs change but remains behind the left fryer door

Reset switch; used to reset system after board changes, software/menu updates.

MUST be held a minimum of 30 seconds to reset the fryer.

88

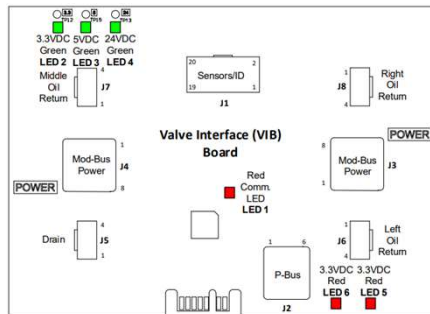
FilterQuick-Touchscreen



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FQG60T/80T/120T easyTouch®

Valve Interface Board - VIB

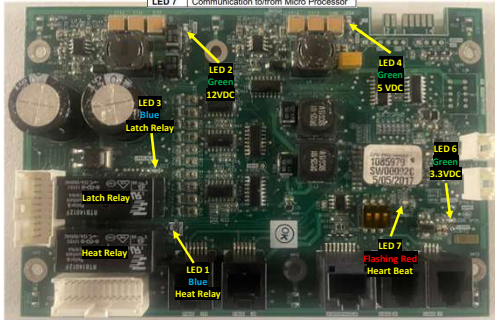


- The same VIB is used on all Touch Screen Fryers excluding Intuition
- Software determined how the VIB will function

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FilterQuick-Touchscreen

SMART INTERFACE BOARD LED DIAGNOSTIC LIGHTS	
LED 1	24VAC Heat Relay
LED 2	12VDC to Controller
LED 3	24VAC Latch Relay
LED 4	5VDC to probes and switches
LED 6	3.3VDC to Micro Processor
LED 7	Communication to/from Micro Processor

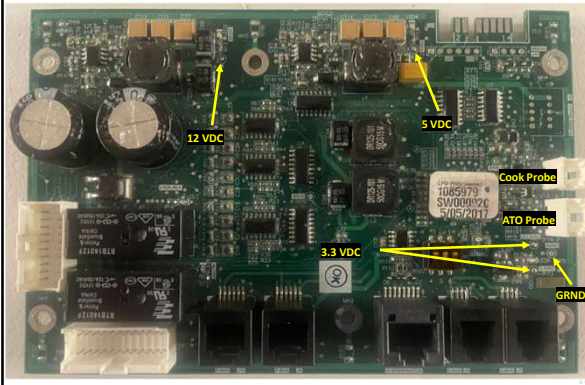


TRM 5-10

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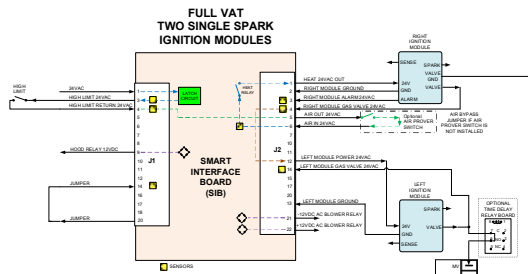
FilterQuick-Touchscreen

SIB test points



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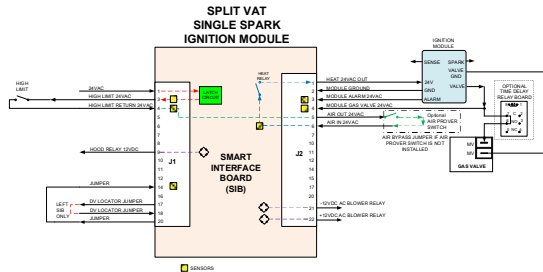
FilterQuick-Touchscreen



TRM 5-6

93

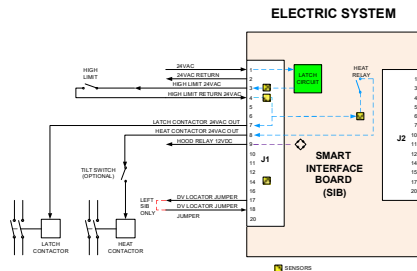
FilterQuick-Touchscreen



TRM 5-6

94

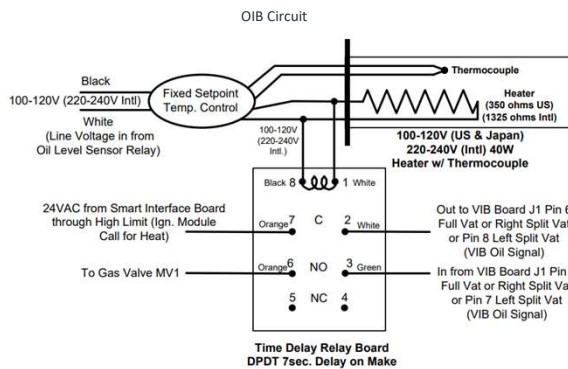
FilterQuick-Touchscreen



TRM 5-7

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FilterQuick-Touchscreen



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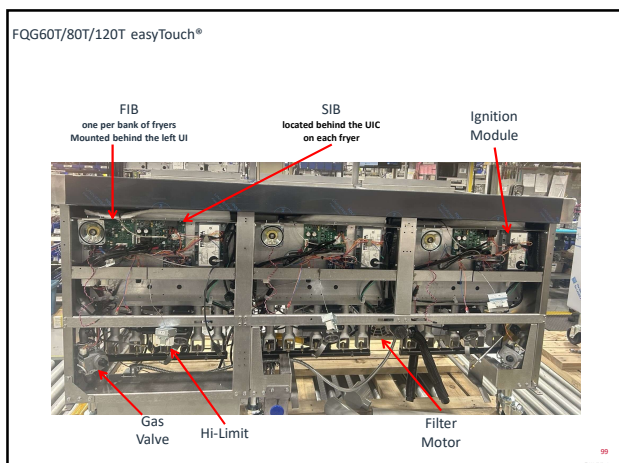
97

FilterQuick-Touchscreen

Fryer Acronyms

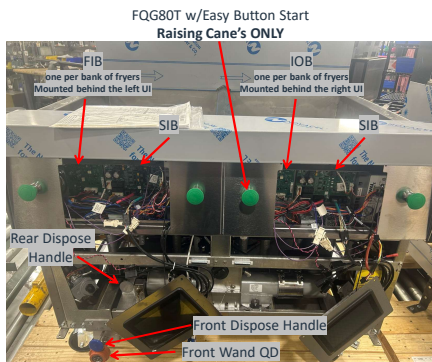
- **UIB** — User Interface Board (Touchscreen controller)
- **SIB** — Smart Interface Board
- **VIB** — Valve Interface Board
- **FIB** — Filter Interface Board
- **IOB** — In/Out Board
- **ATO** — Automatic Top-Off
- **OQS** — Oil Quality Sensor
- **KCCM** — Kitchen Connect Control Module. Manages communication between fryer and store's monitoring network.
- **FQLink** — Replaces KCCM (Kitchen Connect Control Module). Manages communication using the front left controller between fryer and store's monitoring network.
- **USB** — Universal Serial Bus, used to upgrade software

98



99

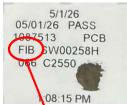
FQG60T/80T/120T easyTouch®



100

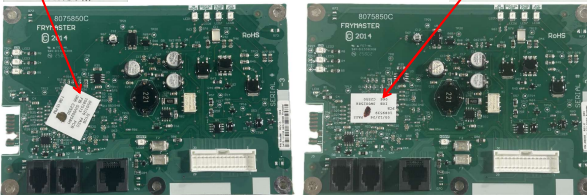
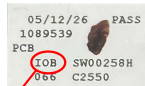
FQG60T/80T/120T easyTouch®

**FIB operates the fryers
filter and bulk oil
systems**



- Fryer with both front wand & rear dispose require an FIB & IOB
- The FIB & IOB physical boards without software are the same part number board.
- Once software is added, it either becomes an FIB or IOB and they are not interchangeable
- A tag on the board will identify which board it is

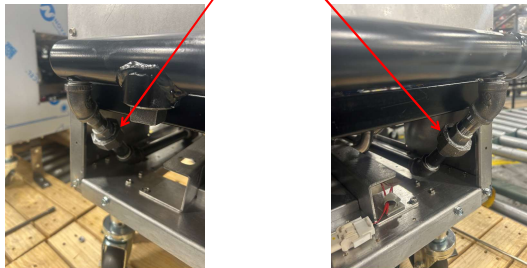
**IOB operates the fryers
front oil dispose wand
ONLY**



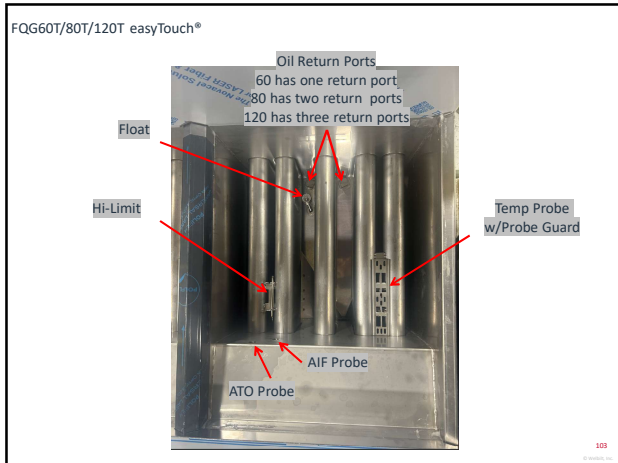
101

FQG60T/80T/120T easyTouch®

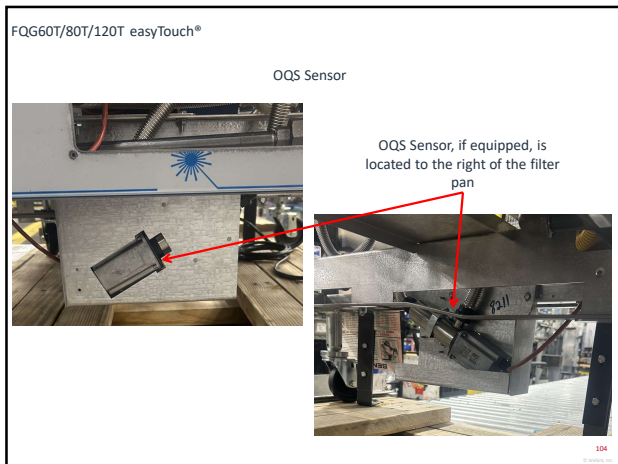
Fryer Will Not Fit Through The Door
Disconnect and remove the gas manifold at the
unions at both ends of the manifold



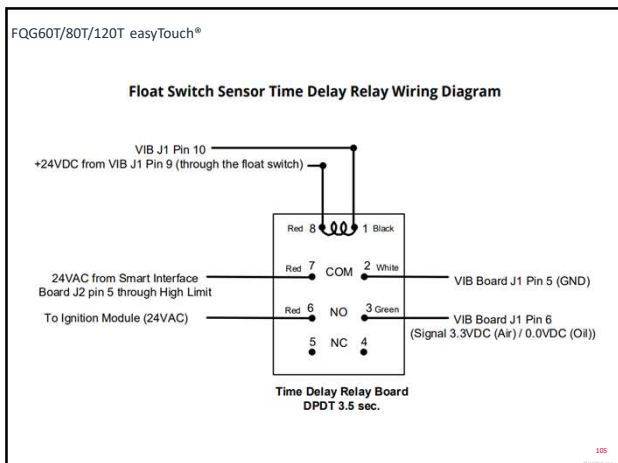
102



103



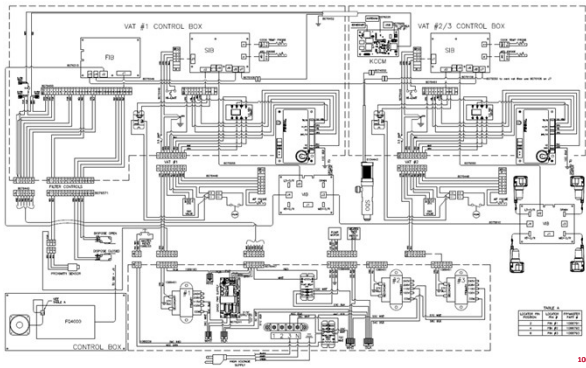
104



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FQG60T/80T/120T easyTouch®

Wiring Diagram FQG120T

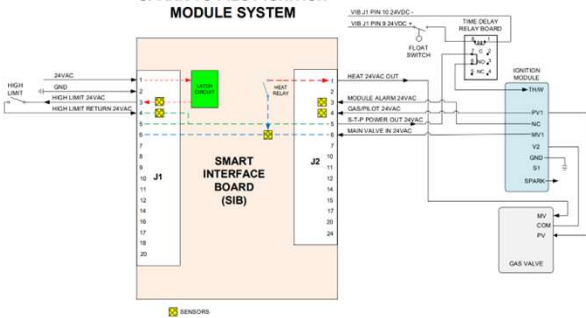


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FQG60T/80T/120T easyTouch®

Ignition Circuit

SPARK TO PILOT IGNITION MODULE SYSTEM

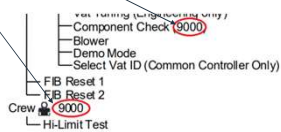


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FilterQuick-Touchscreen

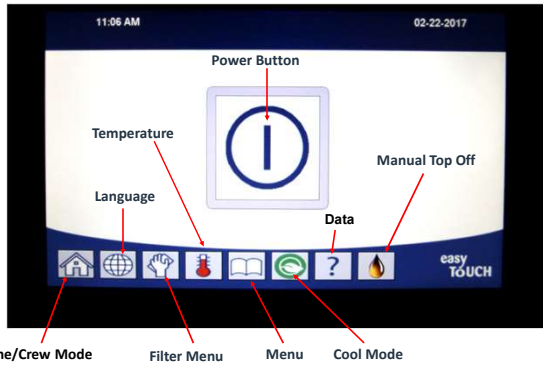
Menu Tree for FQ4000

- This varies by chain
- Use the Service
- Manual Menu Tree for the Fryer/Customer Chain you're working on
- This Menu Tree has the service level options



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FilterQuick-Touchscreen



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FilterQuick-Touchscreen

Using Controller for Diagnostics

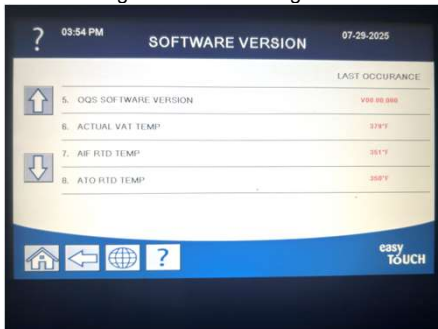


Missing software versions on the display is indicative of network problems.

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FilterQuick-Touchscreen

Using Controller for Diagnostics



Wide variation in ATO, AIF and TEMP Probe readings suggests oil level or probe issues.

111

FilterQuick-Touchscreen

Using Controller for Diagnostics



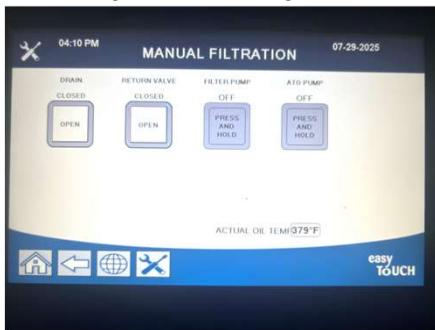
Board ID and Connectivity

112

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FilterQuick-Touchscreen

Using Controller for Diagnostics



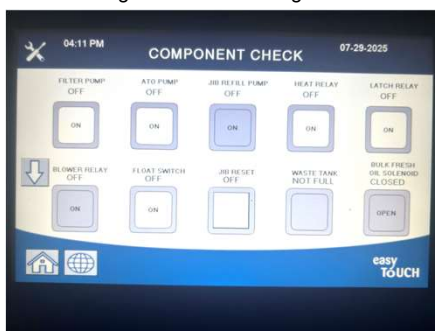
Allows you to manually operate the drain/return actuators and filter pump for troubleshooting

113

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FilterQuick-Touchscreen

Using Controller for Diagnostics



Allows you to manually operate a variety of components for troubleshooting, including the filter system

114

114

FilterQuick-Touchscreen

Using Controller for Diagnostics



Page 2 Component Check

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The Intuition is a new design:

- All DC running components
- Greater serviceability
- New touchscreen controller

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Intuition Fryer

New Fryer, New Acronyms

- **SCB:** System Control Board. It's in the box behind the JIB and controls system wide functions of the fryer, such as filtration. There is one per battery
- **HCB:** Heat Control Board is behind and connected to the Controller under a translucent cover and controls vat-specific operations. There is one per vat
- **VFD:** Variable Frequency Drive. It's in the box behind the JIB. It provides three-phase power to the filter motor, which allows it to operate at variable speeds both clockwise and counterclockwise at. There is one per battery

Familiar Acronyms

- **UIB:** User Interface Board, aka, Touchscreen Controller or Controller
- **OIB:** Oil Is Back. This frypot probe detects the departure and return of oil. It must be satisfied for the vat to heat. The OIB in the Intuition is a simpler design with fewer parts than earlier OIB's. There is one per vat
- **OQS:** Oil Quality Sensor. It measures the quality of the oil by measuring suspended particles and projects its longevity. There is one per battery
- **ATO:** Automatic Top Off. This frypot probe detects oil and calls for top off when oil is off the probe. There is one per vat
- **AIF:** Automatic Intermittent Filtration. This frypot probe detects oil movement during a filter cycle. There is one per vat

WELBILT 118

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Intuition Fryer

Removing From The Pallet

After removing the bolt-on brackets (right), aligned the fryer's rear wheels with the pallet's metal brace/guide



WELBILT 119

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Intuition Fryer

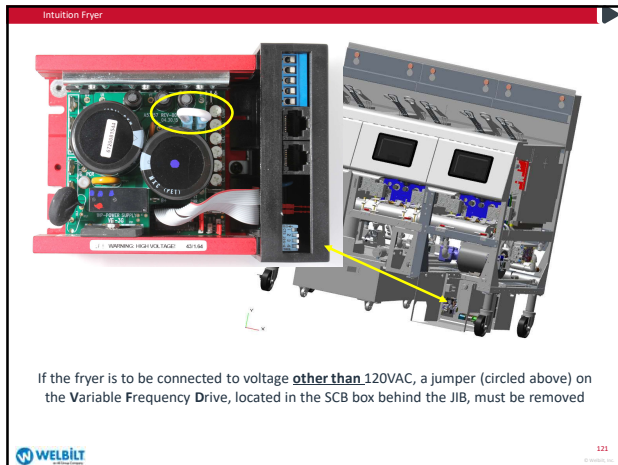
Removing From The Pallet



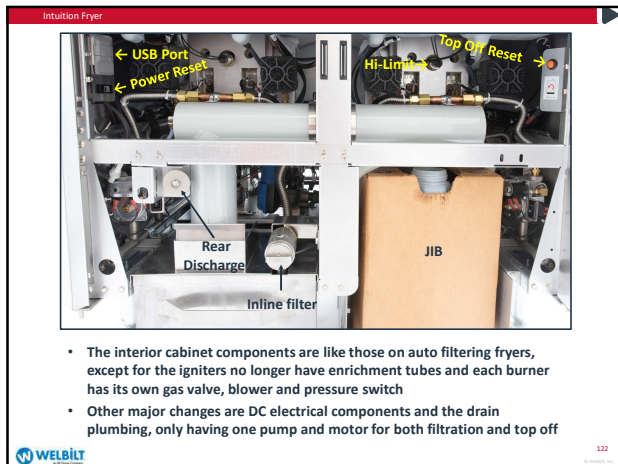
- It is essential that the fryer's SCB box roll off the pallet at its lowest point last to prevent damage to the box
- The metal guide ensures the box is aligned with the lowest point

WELBILT 120

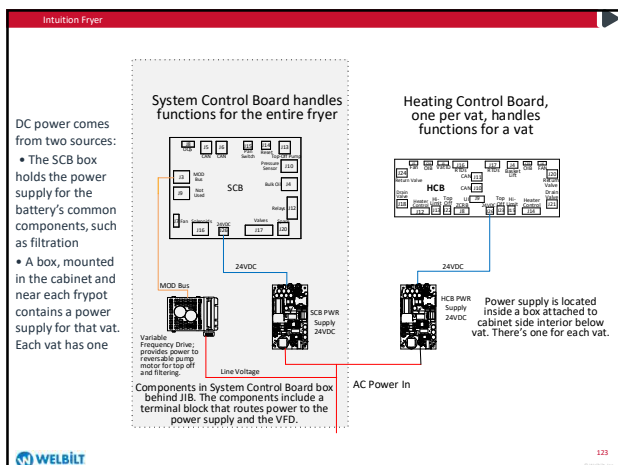
120



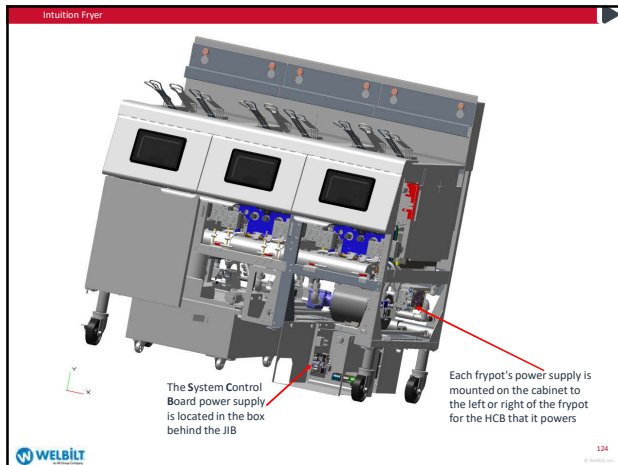
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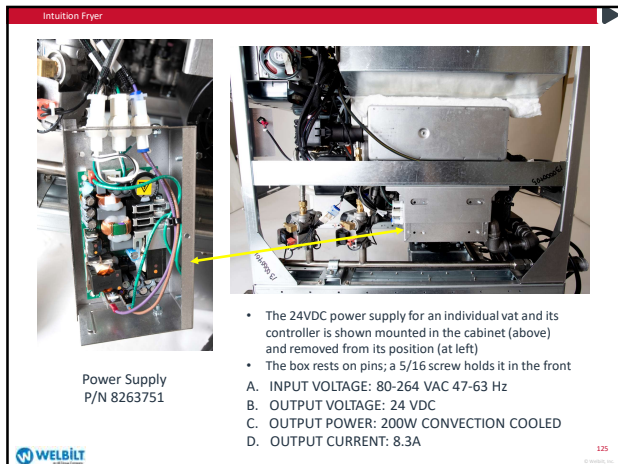
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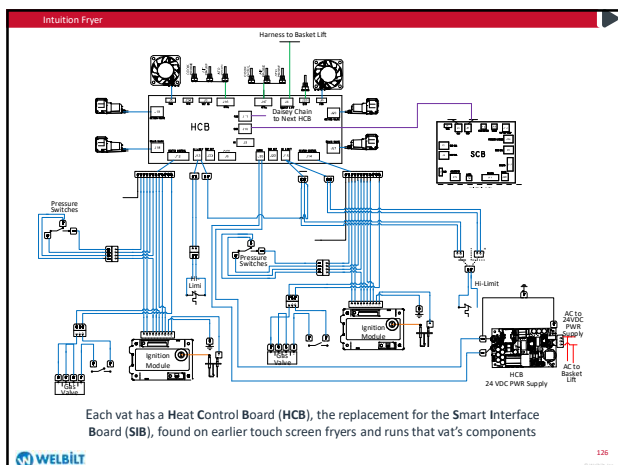
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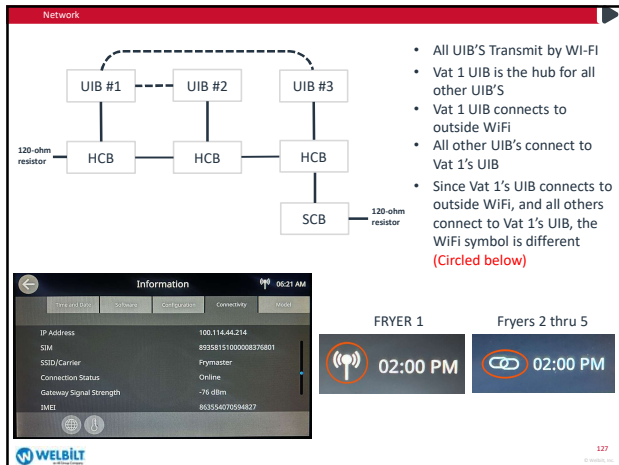
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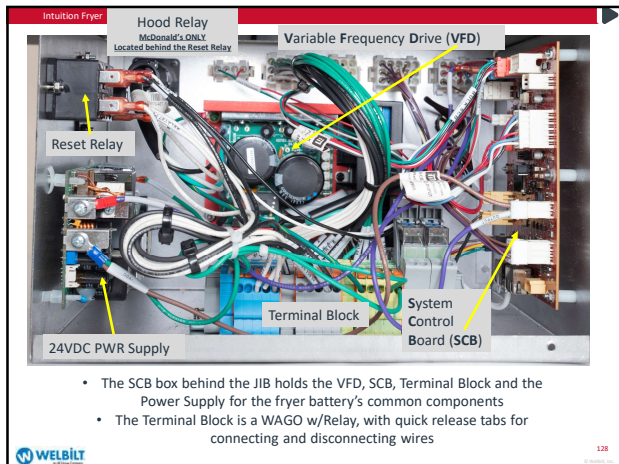
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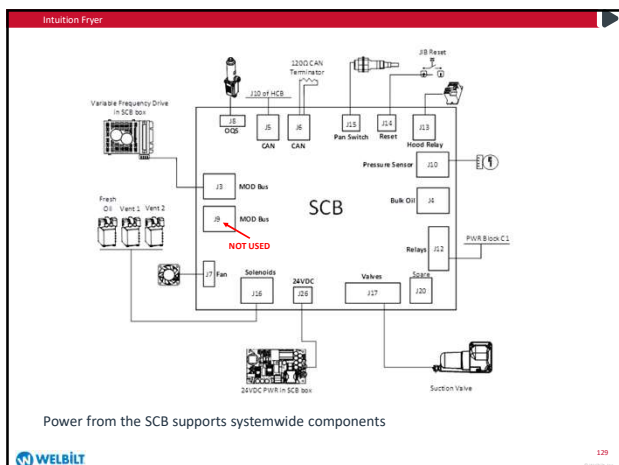
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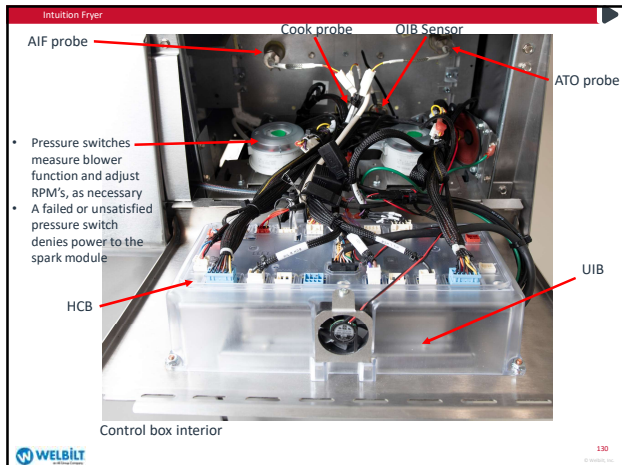
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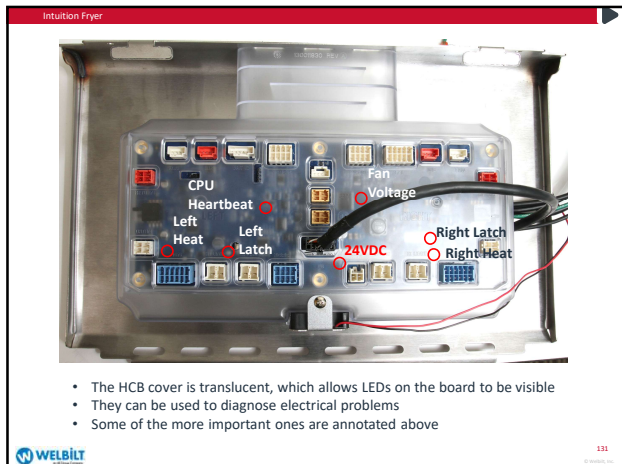
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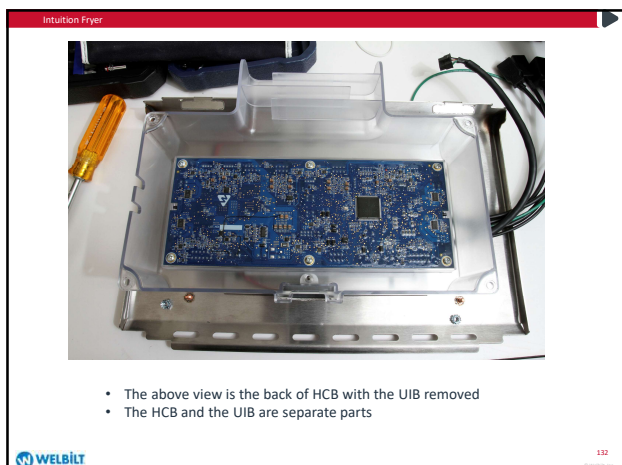
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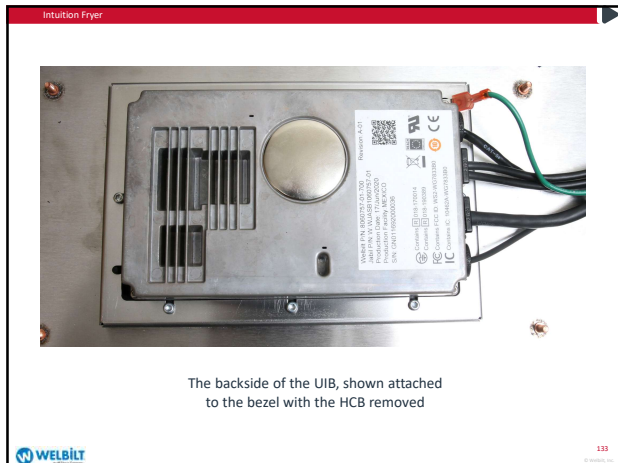
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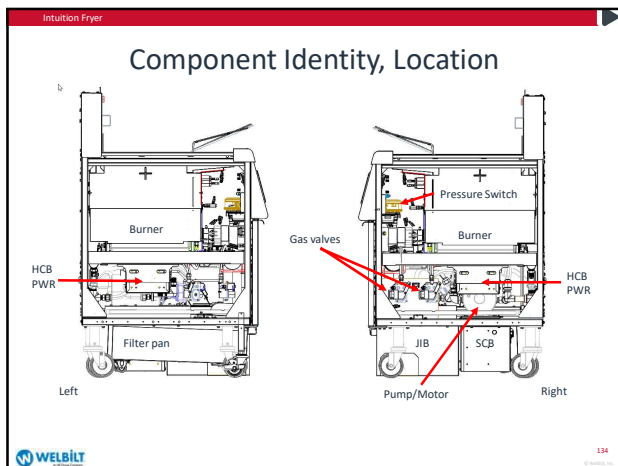
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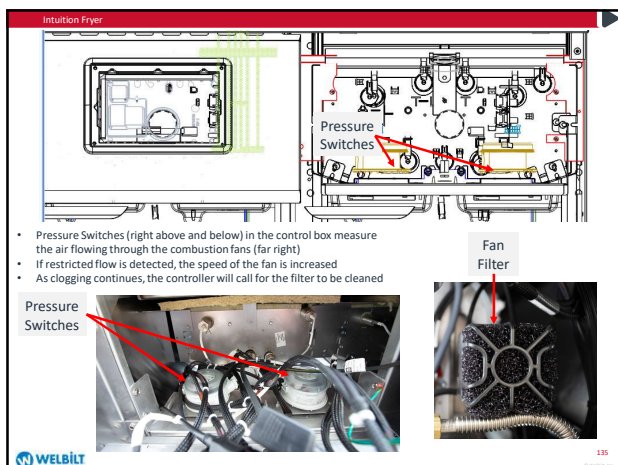
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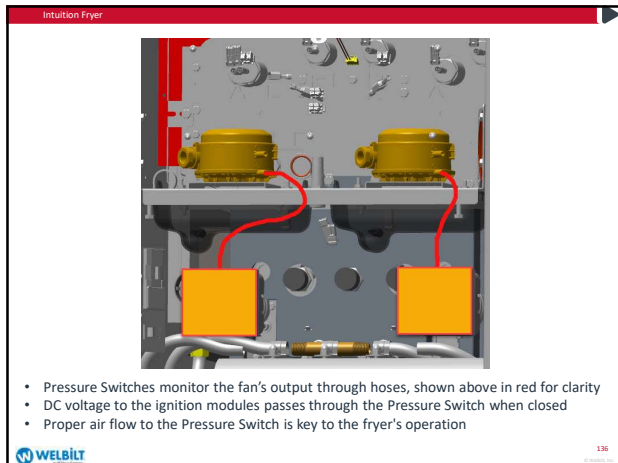
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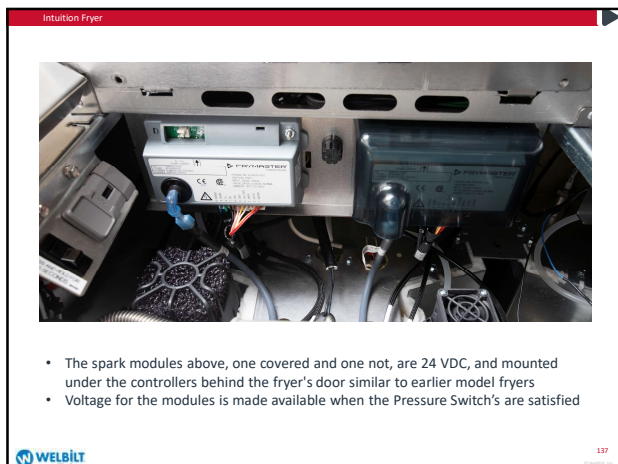
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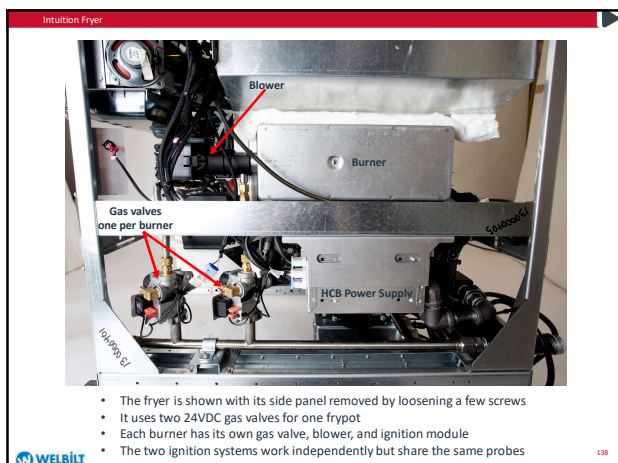
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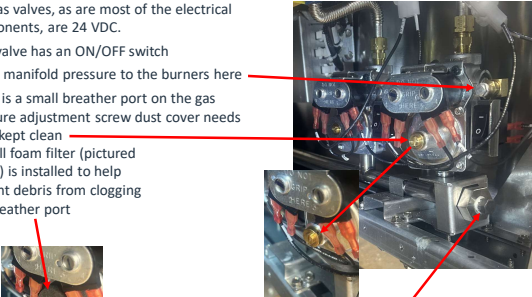
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Intuition Fryer

- The gas valves, as are most of the electrical components, are 24 VDC.
- Each valve has an ON/OFF switch
- Check manifold pressure to the burners here
- There is a small breather port on the gas pressure adjustment screw dust cover needs to be kept clean
- A small foam filter (pictured below) is installed to help prevent debris from clogging the breather port

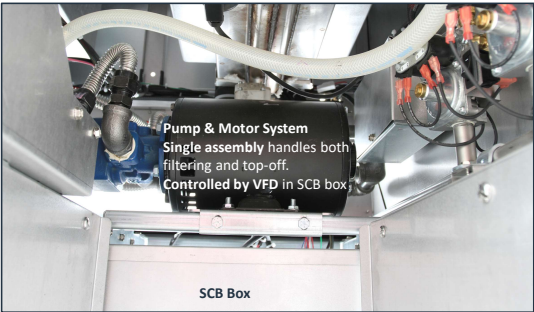


- You can check incoming gas pressure manually here or on the UIB where it is monitored

WELBILT 139

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Intuition Fryer



Pump & Motor System
Single assembly handles both filtering and top-off.
Controlled by VFD in SCB box

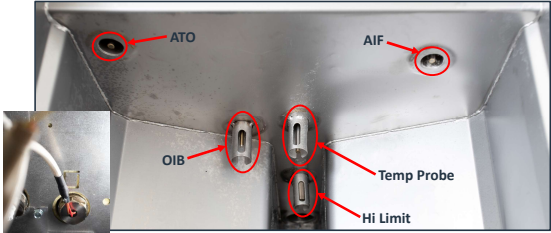
SCB Box

- The VFD converts single-phase AC to three-phase.
- Enables forward/reverse motor operation.
- Voltage checks:**
 - Low: **90–130 VAC**
 - High: **190–260 VAC**
- Speed control** via frequency.
- Easy access** for service; one-motor design simplified components but changed plumbing.

WELBILT 140

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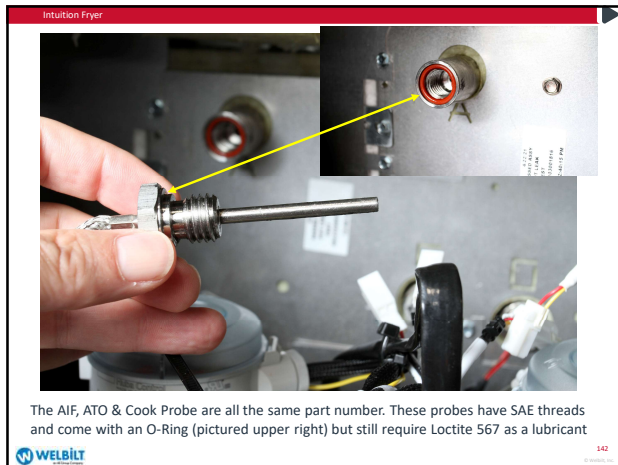
Intuition Fryer



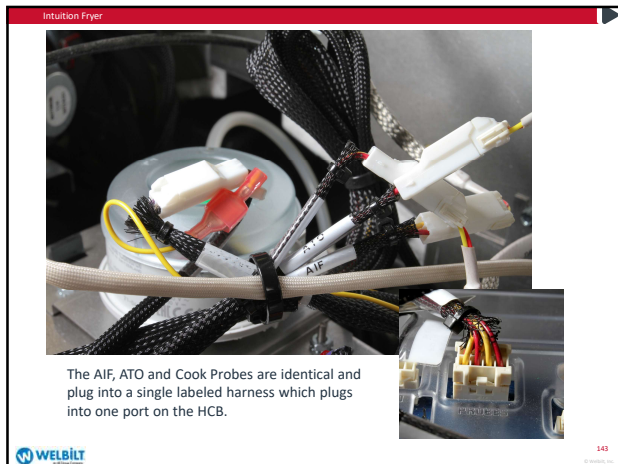
- The OIB is simpler than the current unit and measures rate-of-rise, like an electric fryer. If temperatures rise too quickly, the heat is cut off
- If the OIB reads the same or lower than the Temp Probe, the OIB heater has failed. The OIB should read 10 to 30 degrees higher than the Temp Probe which can be read from the UI
- The other frypot components labeled above are the familiar ones used to manage oil flow, filtration, and temperature in auto filtering fryers

WELBILT 141

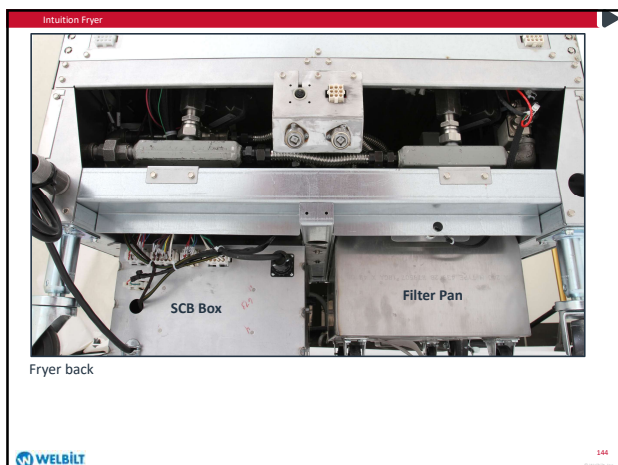
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Intuition Fryer

There are two electrical points for the bulk oil company to plug into

- one is a 9-pin female Molex for General Market and comes with a 9-pin male pigtail connected to it (pictured bottom left)
- The other is a Hirschmann connector for McDonald
- The Bulk Oil Company provides the male side for the Hirschmann connector

If the fryer is missing the male pigtail when received/during Start-Up, call Frymaster to have one sent at no charge.

Bulk oil connections

Right Basket Lift Connection

Left Basket Lift Connection

The fryer is shown with the back off.

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Intuition Fryer

Troubleshooting

Spark

- LED's on the spark module help with troubleshooting.
- A single red flash (right) from a front-mounted LED indicates the HCB latch contactor is closed and the module is ready for a call for heat
- Three flashes indicate trouble: the ignition window has closed, and flame has not been detected. The module tries four more times at five-second intervals before locking out

Key Troubleshooting Areas

- Wire connections
- Pressure switch hose connection
- Filter clogging
- Fan adapter mounting, O-ring sealing
- Fan Mounting
- Gas Valve turned OFF

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Intuition Fryer

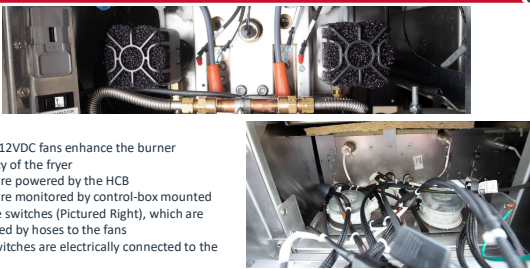
- A green LED, harder to see on the opposite side of the module (circled at right), indicates 24VDC is present for the spark and gas.
- The green LED is lit when voltage is present.
- The green LED goes out when voltage is not present.
- If voltage is below 18VDC, the green LED is not illuminated and the red LED shows a solid light.

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Intuition Fryer

Air



- Small 12VDC fans enhance the burner efficiency of the fryer
- They are powered by the HCB
- They are monitored by control-box mounted pressure switches (Pictured Right), which are connected by hoses to the fans
- The switches are electrically connected to the HCB
- As the removable filters get dirty, reducing their efficiency, the HCB increases the RPM of the fans
- Depending on the severity of the restricted air flow, as related to fan RPMs, the UI will display one of the errors seen right
- To clear the error, select **Clean Fan Filter** on the UI and follow the prompts

Pressure switches

- E186L - Left Fan Filter is Dirty
Clean fan filter
- E186R - Right Fan Filter is Dirty
Clean fan filter
- E187L - Left Filter Fan Is Clogged
Clean Filter Now
- E187R - Right Filter Fan Is Clogged
Clean Filter Now

WELBILT

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Intuition Fryer

Pressure sensor close-up



The indexed dial under the lid can be used to adjust the sensitivity of the sensor

WELBILT

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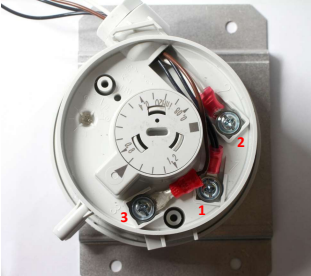
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Intuition Fryer

- The 24VDC for the spark module passes from the HCB through the pressure switches. Without sufficient pressure, the switches do not close, denying power to the module and the gas valve
- DC voltage from the HCB can be measured at the pressure switch:

Fan Off: $9.3 \pm .2$ between 1-3
Fan On: 24 ± 1 between 1-2

- The indexed dial in the switch allows adjustment of the air flow that affects DC Micro Amp output for flame sensing
- The optimal DC Micro Amp output is measurable with an Ohm meter in series with the flame sensor and can also be read on the UI in Heating Statistics
- Lockout is 0.5uA
- The Optimal range is $6.0 \pm 1.0\mu A$
- The output should be checked when the vat is out of Melt Cycle and in a Full heat



WELBILT

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Intuition Fryer



- **Air pressure:** Factory-set to ensure proper combustion airflow
- **Microamp setting:** Target is $6.0 \pm 1.0 \mu\text{A}$, which relates to flame sensing sensitivity
- **Adjustment protocol:** If you change the air pressure or microamp setting, you must go to the **"Replace Fan"** screen on the UI. This triggers the system to recalibrate fan RPM and microamp values for accurate ignition performance

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Intuition Fryer

Purpose: Lowering air pressure reduces microamp output, while increasing air pressure raise microamp output, affecting flame sensing sensitivity

Adjustment: **ONLY** move the dial $\frac{1}{2}$ a line at a time—each small change results in about 500 RPM difference in fan speed

Recalibration: After adjustment, you must go to the **"Replace Fan"** screen on the UI so the system recalibrates RPM and microamp values. This is part of the ignition calibration process

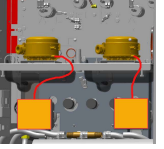
The goal is to maintain proper flame sensing (typically around $6.0 \pm 1.0 \mu\text{A}$) and airflow for efficient combustion. Pressure too low can cause ignition failure; too high can lead to excess air and unstable flame



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Intuition Fryer



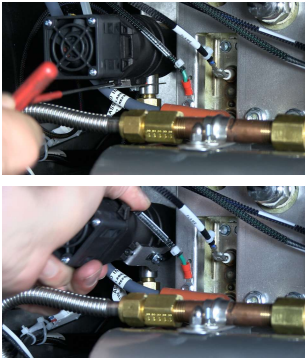

- The hose connecting the switch to the fan must be connecting to the + port (circled right)
- The negative port is a vent and must be kept clear

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Intuition Fryer

- The fans, if replaced, are removed completely. The throat and fan come off together
- A split-tail bracket aligns the throat with the gas inlet, which it straddles
- The bracket must be pulled forward with an allen wrench to allow the fan body to rotate off the burner inlet
- Once the fan has been replaced, you must go to the **"Replace Fan"** screen on the UI and follow the steps for recalibration.
- The life cycle of a fan should be about 3.5 Million cycles

WELBILT

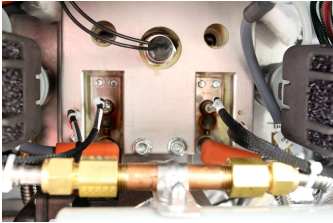
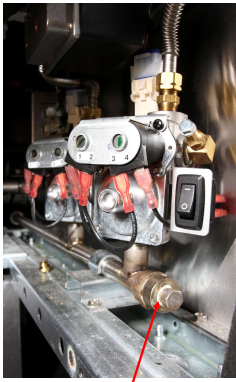
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Intuition Fryer

Fuel

- DC gas valves (right) are used. Their ON/OFF switch should be checked if the fryer won't ignite
- The condition of the ignition and sense wires (below) are other quick checks

- The igniters do not use enrichment tubes for ignition. They do, however, use the familiar spark rod and flame sensor on the igniter assembly for ignition and flame sensing.

Incoming Gas Manifold Pressure Tap

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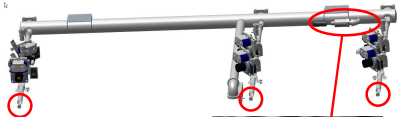
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Intuition Fryer

Fuel

- The pressure of the incoming gas is measured by a sensor on the manifold (circled right and below right) and can be checked on the UI by going to: **Home > Statistics > Heating > Gas pressure** or manually on the manifold below the front gas valve (circled above)
- An orange glow, indicating a good flame, can be seen in the sight glass.





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Intuition Fryer

Ignition Sequence

The HCB is mounted to the back of the UIB

Pressure switch

Ignition module

Fan

Gas flow

- The fan runs, closing the pressure switch and pushing air in the burner
- The HCB detects the air via the switch and provides 24VDC from the vat-specific power supply through the pressure switch to the spark module
- The spark module sends 24VDC volts to the gas valves, provides spark and checks for flame with the sense rod

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Intuition Fryer

Burner Air Restrictor

Restrictor

- **Burner Inlet Restriction**
A restrictor in the burner inlet creates back pressure for the combustion fan, which increases static pressure at the burner tube. If the restrictor is missing, the pressure switch will not activate, and the system will not call for heat
- The restrictor can sometimes be seen through the fan blades but is difficult
- The best way to confirm that it is installed is to remove the fan adapter

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Intuition Fryer

Igniter:

Manifold Pressure adjustment screws with dust cover removed

- The igniter is the source of spark and has a sense rod to monitor the flame during operation
- If the ceramics or high-voltage electrodes are broken or out of place, the system will not work
- The base of the igniter must be grounded
- Poor igniter bracket grounding will cause the system to fail

Gas Valve:

- The gas valve controls gas to the burner
- It has an internal regulator that must be set correctly
- It is powered by the ignition module and has an independent power switch

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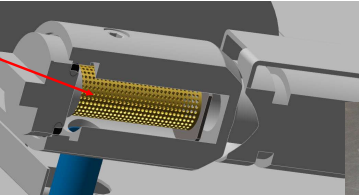
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Intuition Fryer

What Can Go Wrong

Inline filter




The oil return system is subject to the same neglect that harms other filter systems:

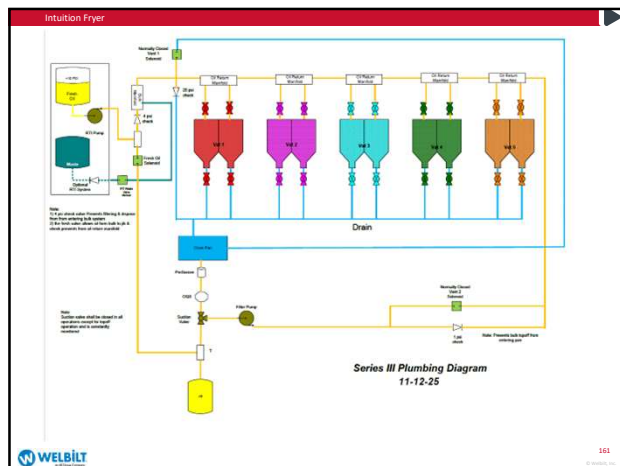
- Failure to assemble the filter pan components properly
- Failure to clean the inline filter
- Failure to filter at the prescribed intervals, leading to blockages.
- Failure to adequately clean the pan and replace the filter paper
- Failure to fill/replace the JIB when prompted (**Why is this important**)

Inline filters can get clogged due to improper filter pan assembly.

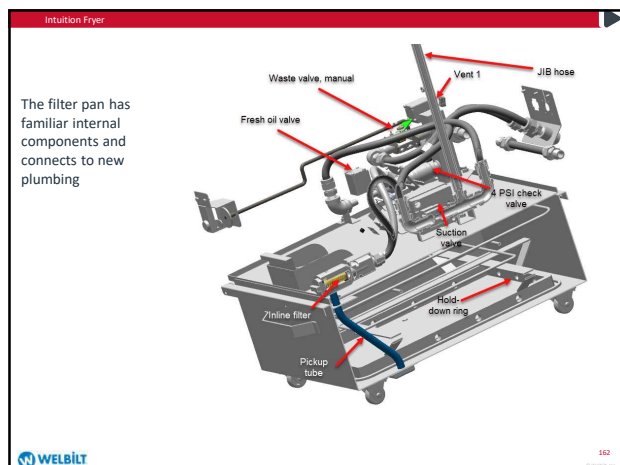
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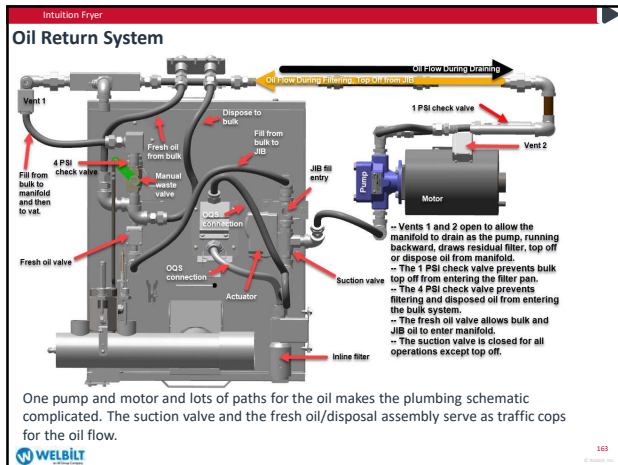
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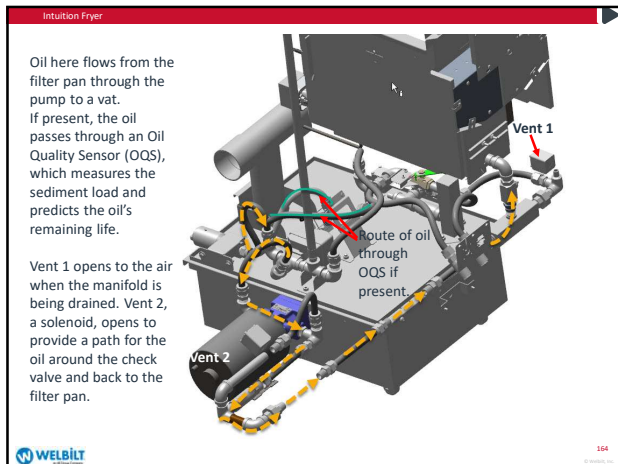
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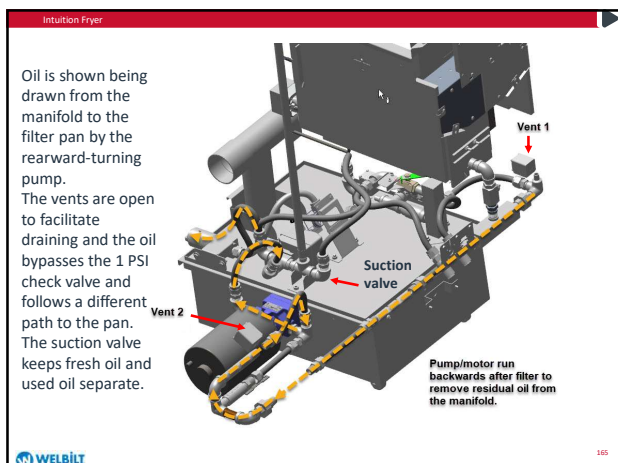
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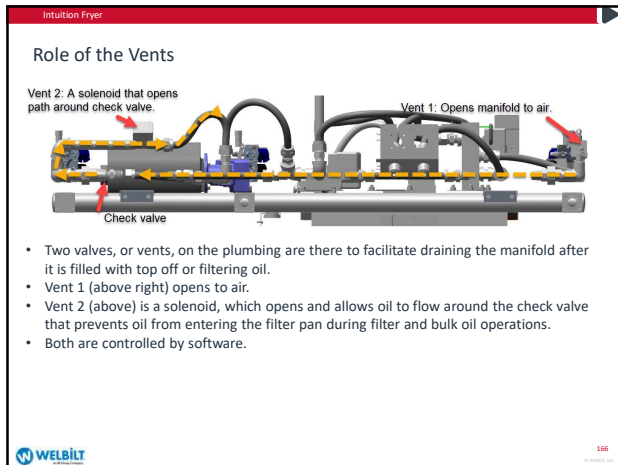
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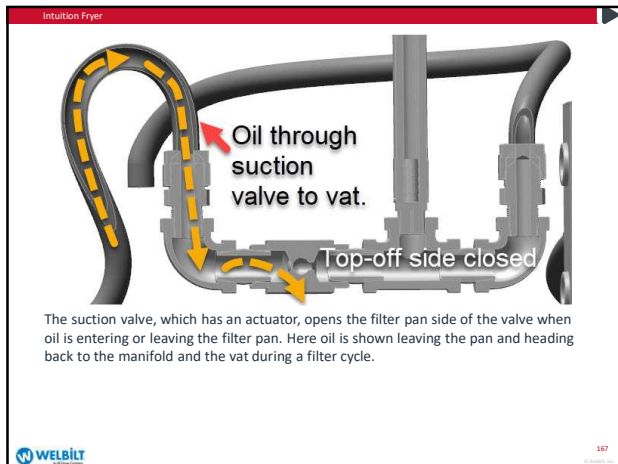
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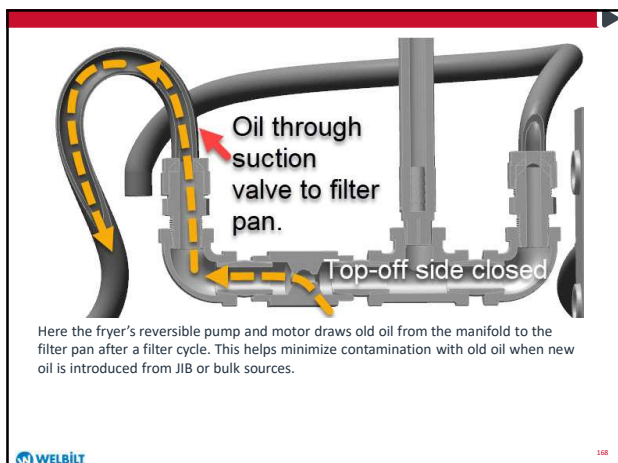
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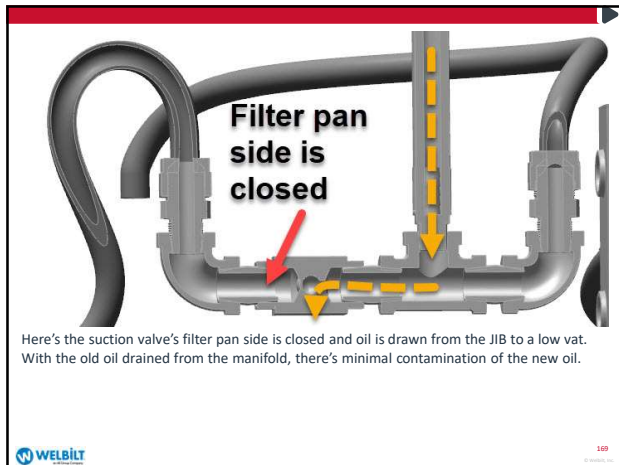
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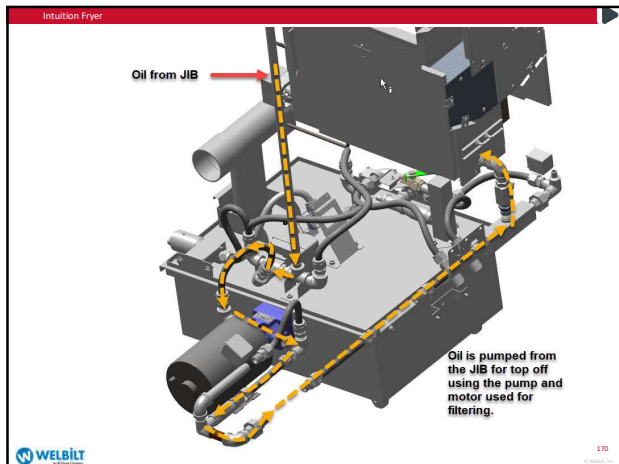
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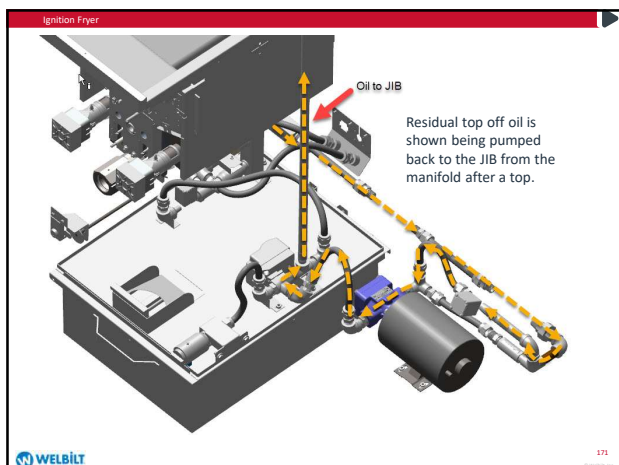
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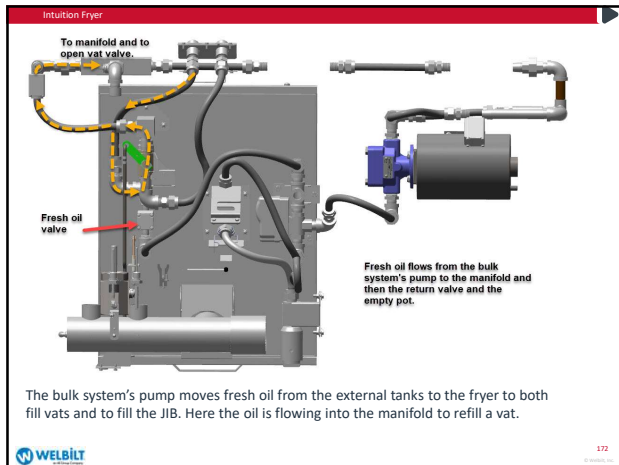
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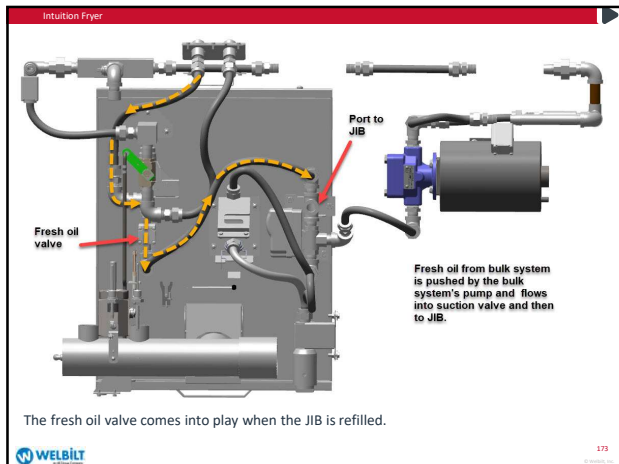
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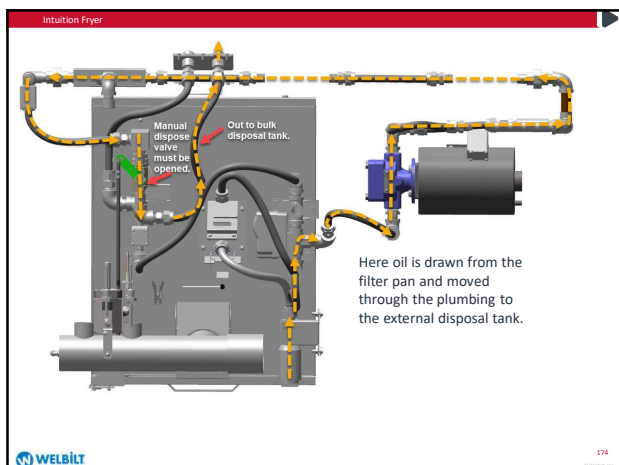
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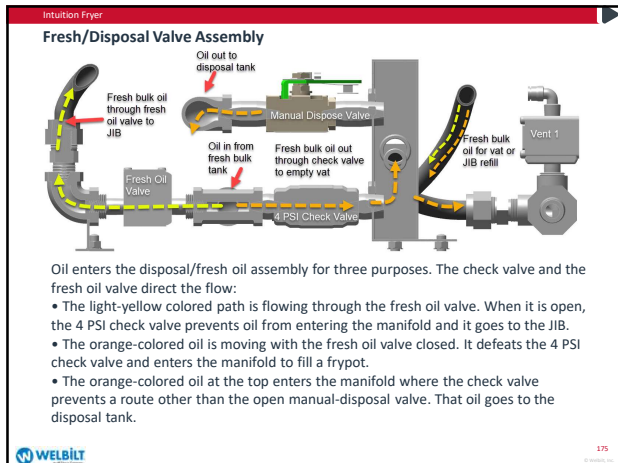
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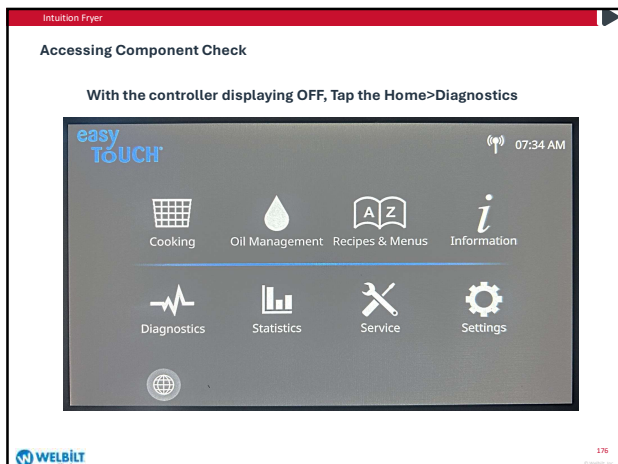
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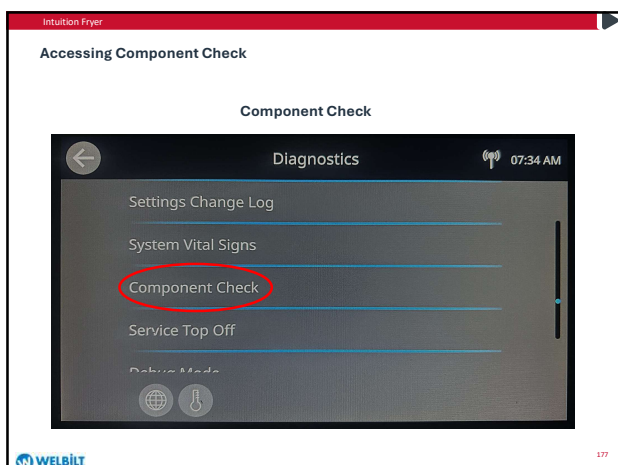
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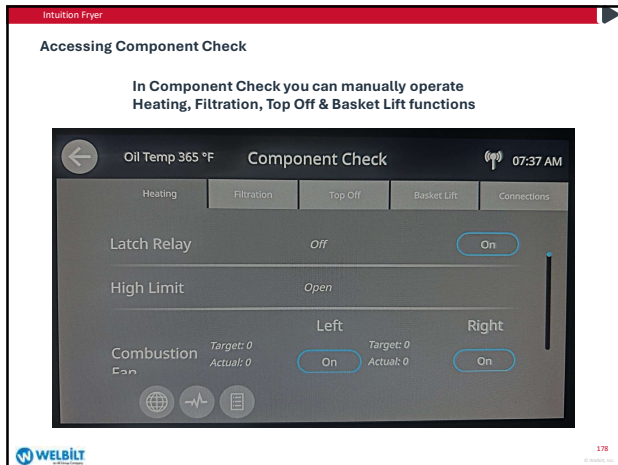
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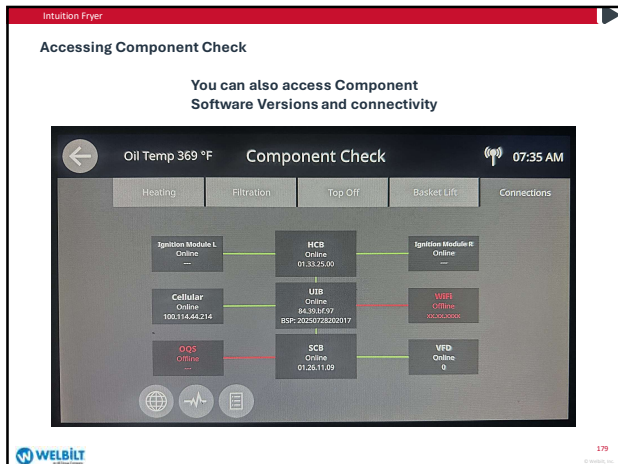
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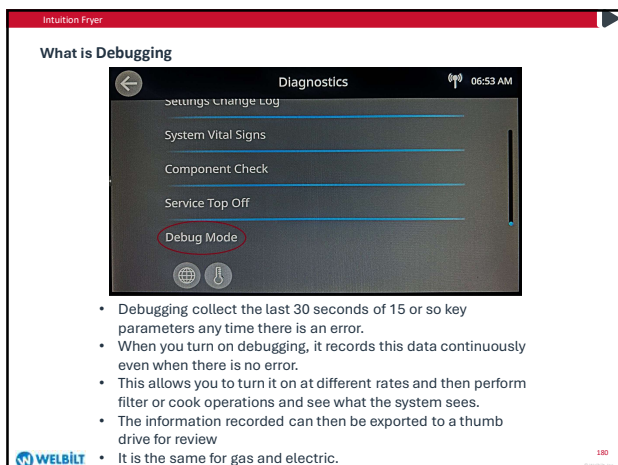
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