KEATING OF CHICAGO, INC.

SERVICE INSTRUCTIONS

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FIELD REPLACEMENT KIT - for replacing Flame Switch 037406 and Hardware with Spark Ignition Module

For use on all 14" rear drain and all larger size fryers

Installation instructions to convert manually-lighted pilot flame fryers using a flame switch (for proof of flame) to electronic spark ignition using a Spark Ignition Module (SIM) and remote sense electrode (for proof of flame). Procedures in these instructions apply to fryers where there is enough space in the Control Panel Back to mount the new Spark Ignition Module. **NOTE:** *A different update kit is required for fryers where there is not enough space to mount the module, such as 10x11 fryers and 14" front drain fryers. An external spark module box is required for these units, and the instruction procedures are different.*

NEW FEATURE: the converted fryer will automatically light the pilot runner tube when the fryer is powered on. This function replaces the need to manually light the pilot.

CONVERSION INSTRUCTIONS: The conversion involves replacing the Flame Switch, which is used to prove the flame on the pilot runner tube, with a Spark Ignition Module, which uses a "flame rectification" method to prove pilot runner tube flame. Generally on front drain fryers 18" and larger, the Spark Ignition Module will be mounted on the rear wall of the Control Panel Back, usually in the space vacated by the Flame Switch, between the High Limit switch on the left, and the Basket Lift connector or its opening, on the right. For rear drain fryers, the Spark Ignition Module will mount on a bracket. The SIM/bracket assembly will then be mounted to the Control Panel Back using existing holes on the right hand side, lower panel face.

The existing manually-lighted pilot tube assembly is also being replaced by a spark ignition type pilot tube assembly with the spark and flame sensors already mounted.

NOTE: After conversion, the "Hold-to-Light" Pilot switch will no longer be used to light the pilot and will not be functional.

ADDITIONAL TOOLS REQUIRED (not supplied in kit):

1. A "pin-extraction" tool, used to remove the pins from the Amp-style "MATE-N-LOK" (white) connector blocks. The pin-extraction tool recommended is TE Connectivity Part Number 1804030.
2. A "pin-insertion" tool used to insert a new pin into the connector blocks. The pin-insertion tool recommended is TE Connectivity Part Number 91002-1.

Read the instructions on these tools in order to properly use them to prevent damage to wires or terminal, AND TO INSURE PROPER INSERTION AND AVOID INTERMITTENT CONNECTIONS.

A. TURN THE FRYER OFF

- TURN OFF ALL GAS VALVES, OR DISCONNECT THE GAS LINE TO THE FRYER.
- UNPLUG THE FRYER FROM THE INCOMING AC POWER SOURCE.

B. Remove Pilot Runner Tube assembly:

1. Remove the two (2) Control Panel Assembly screws and rotate the control panel downward to expose the Control Panel Back assembly.
2. Remove the four (4) Control Panel Back Assembly screws and carefully set the assemblies on a stand or stool at about the same height. ***Be careful not to break or kink the capillary tubes from the high limit switch and the thermostat.***

3. Remove the two (2) mounting screws and the heat shield.
4. Remove the two (2) flanged nuts from the manifold bracket screws and remove the burner hold-down bar.
5. Remove the burners and the burner shields.
6. Disconnect the constant pilot tube from the pilot runner tube bracket and from the gas valve. It may be easier to disconnect the constant pilot tube from the gas valve after the pilot runner tube assembly has been completely removed.
7. After removing the constant pilot gas supply tube from the gas valve, insert a small flat blade screwdriver into the constant pilot gas valve adjustment on the gas valve. Turn clockwise (CW) to close the valve. Make sure the valve is closed completely. Make certain to check for gas leak after the fryer has been converted.
8. Loosen the screw and remove the flame switch clip and flame switch sensor from sensor bracket.
9. Disconnect the pilot runner gas supply line(s) from the runner tube (leave connected to gas valve). Be careful not to nick, scratch, or distort the fitting sleeve. If damaged, the fitting will need to be replaced to prevent gas leak.
10. Make note of the air shutter position so when the new assembly is installed the shutters can adjusted to their original position.
11. Loosen the locking nut(s) on the runner pilot orifice holder assembly(s), and remove the holder assembly(s) from the runner pilot tube.
12. Remove the pilot runner tube, including its elbow(s) from the manifold bracket.

C. Install new spark ignition Pilot Runner Tube assembly:

1. Install new Pilot Runner Tube assembly in the same position as the original assembly. See Figure 1.
2. Inspect to insure that the pilot runner tube is secured properly at both ends.
3. Re-install the runner pilot orifice holder assembly(s) making sure to include the air shutter; adjust the air shutter to its original position as noted.
4. Tighten the locking nut(s).
5. Re-attach the gas supply line(s) to the pilot orifice assembly, making sure that the fitting sleeve will make a leak tight seal. If not, replace fitting.
6. Confirm that the spark electrode (right end of pilot tube) has from 1/8" to 3/16" gap to the pilot tube. Bend to position if necessary.
7. For 14" fryers (and larger), make sure the sensor rod on the flame sensor electrode is positioned over the flame ports on the pilot tube from 3/16" to 1/4" above the tube. The rod must be immersed in flame in order to function properly.
8. The wire assemblies will be hooked up later.
9. Re-install the burner shields, burners, burner hold-down bar and hardware, and burner shield and hardware. Be sure not to kink or squash any of the electrode or ground wires while re-installing the hardware.

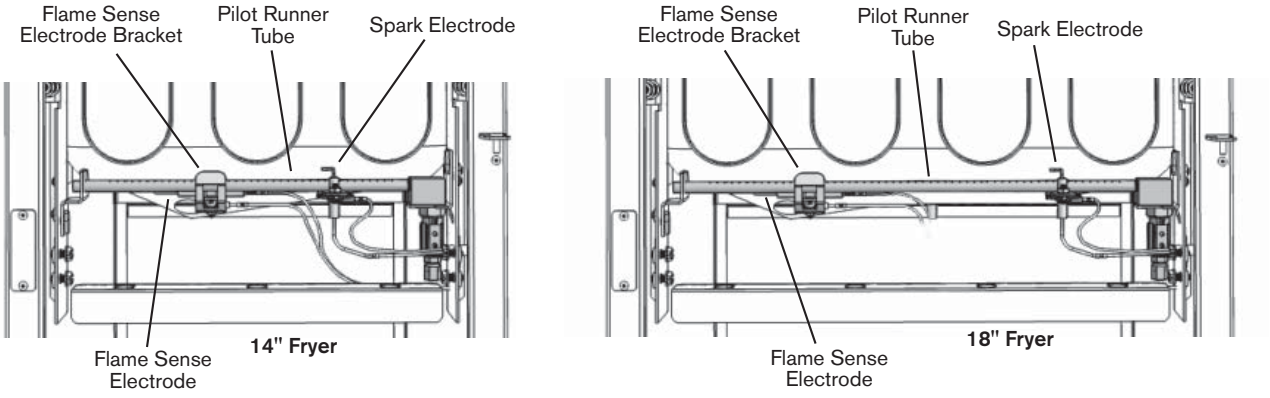


Figure 1
Install New Spark Ignition Runner Pilot Tube Assembly
New spark ignition pilot runner tube mounting detail for a 14" (left) and an 18" fryer (right).

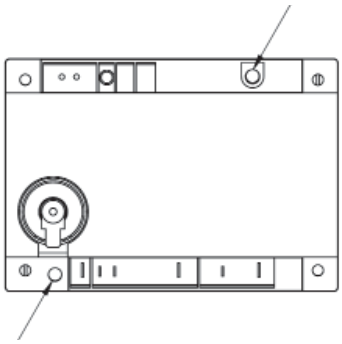
D. Replace flame switch with Spark Ignition Module:

Wire call-outs in the text below are formatted as wire #(wire color). For example 13 (WH) indicates wire #13, a WHITE wire.

1. Refer to the components inside the Control Panel Back assembly.

2. Remove all wires connected to the old flame switch (check appropriate wiring diagram, located in the fryer's Manual (fryer Manuals can be viewed/printed from our website, keatingofchicago.com). From the high limit switch, these wires will typically be numbered 12 (YL) on BB fryers, or 16 (YL) on TS fryers and connected wire 3 (YL) to one terminal on the Flame Switch. From the other terminal of the Flame Switch, these wires will be 5 (OR) (only wire on BB units) and connected wire 17 (OR), on TS units, from the other terminal. Remove all of these wires completely, at both ends. It will be necessary to use a “pin-extraction” tool to remove wire/terminals from the Quick Connect connectors (see above “Additional Tools Required”).
3. Remove old flame switch and bracket located inside the control panel back. The flame switch will no longer be used and can be discarded. **NOTE: THE FLAME SWITCH CONTAINS MERCURY!** It must be disposed of properly in order to comply with local, state, or federal laws.
4. Remove wire 4 (BU) between the 4-position “gas valve” connector and Control Panel insert connector (on all units). Use the pin extraction tool.
5. Remove the white wire from position 2 on the 4-position “gas valve” connector and all its connected wires. On BB front drain units, these will be 10 (WH) only; BB rear drain units, 18 (WH), 10 (WH) to FM switch; on TS front drain units, 14 (WH) and 13 (WH) from relay and FM switch; and on TS rear drain, 23 (WH) to relay, 14 (WH) from relay to relay, and 13 (WH) from relay to FM switch.
6. Remove the white wire from position 2 on the 4-position “gas valve” connector and all its connected wires. On BB front drain units, these will be 10 (WH) only; BB rear drain units, 18 (WH), 10(WH) to FM switch; on TS front drain units, 14 (WH) and 13 (WH) from relay and FM switch; and on TS rear drain, 23 (WH) to relay, 14 (WH) from relay to relay, and 13 (WH) from relay to FM switch.

Figure 2
Control Panel Back



7. Drill two (2) .128" (#30 drill size) holes. Position the module over the holes and secure with the two #8-18 thread cutting screws supplied. Using the supplied spark module as a template, position the module in a clear space and mark the hole locations as shown in Figure 2.
8. On rear drain type fryers, the control panel back will be deeper, about 4-3/8" deep. Look at the right or left side of the housing and find two (2) holes, aligned from front to back, and approximately 2-1/8" apart on centers. These holes should line up with the supplied module brackets. Mount the module to this bracket using (2) each 8-32 x 1" screw, lockwasher, and nut (supplied). Mount the module on the bracket facing away from the “L” angle of the bracket. Make sure that when mounted in the Control Panel Back, the module terminals face out for ease of connections. Then mount the module & bracket assembly to the Control Panel Back using the holes identified earlier using (2) supplied 10-24 screws.
9. If these holes are not available, drill them into the Control Panel Back and using the supplied bracket. Drill two (2) .201" holes, 2-1/8" apart aligned front to back, centered in the space between the back wall and the front edge of the housing. The centerline of the two holes should be about 0.4" in from the inside edge of the side wall. Use these holes then to mount the module/bracket assembly as in step 7.
10. The spark module can also be mounted on the back wall once clearance space has been identified. Use the instructions in steps 6 and 7.

E. Connect the wires to the Spark Ignition Module:

1. Wire assemblies for the different fryer configurations - BB front drain, BB rear drain, TS front drain, and TS rear drain - are included in the kit. Some of the wire assemblies will be used for some of the configurations and others will not. Follow the instructions closely in order to properly install all of the wires. The length of the wires in the assemblies have been designed to fit the largest fryers (34x24). For smaller fryers there will be excess wire but for convenience, these wires have been bundled with a small wire tie. The wire ties as supplied are slightly loose so that wire can be pulled out of the bundle to allow connection from one point to the next. Pull enough wire to reach the two connection points and then allow a small additional amount (an inch or so) so that the wires won't pull on the connections. When the wiring is complete, tighten the wire ties to make them snug.

2. In the wiring diagrams at the end of these instructions, wires **removed** are indicated by heavy dashed lines; wires **added**, by heavy solid lines. The diagrams show a representation of the Spark Ignition Module with HV (tower connection), S1, GND, V2, MV ("IND/MV1" on module), PV ("V1/PV1" on module), and TH ("TH/W" on module) connections to be made. Be sure to use the proper pin insertion tool to properly insert wires into the nylon connectors.
3. The diagrams also show wires 21(GR), 25 (GR), 66 (OR), and 67 (OR). These wires come from the newly installed Pilot Runner Tube assembly. Hook them up according to the wiring diagrams.

F. Conversion is complete:

COMPLETELY CHECK ALL INSTALLATION DETAILS - CHECK THAT COMPONENTS HAVE BEEN INSTALLED PROPERLY AND ARE SECURE, CHECK ALL WIRING TO INSURE THAT WIRES HAVE BEEN INSTALLED IN THE PROPER LOCATIONS, AND THAT ALL WIRES DESIGNATED TO BE REMOVED HAVE BEEN REMOVED.

CHECK ALL GAS CONNECTIONS - VALVE, PIPING, CONNECTIONS, ETC. - FOR GAS LEAKS.

REVIEW EACH STEP OF THE ASSEMBLY PROCESS TO INSURE THAT IT HAS BEEN DONE PROPERLY AND SECURELY. OPERATION AND RELIABILITY OF THE FRYER AFTER THE CONVERSION RELIES ON ALL OF THE STEPS BEING FOLLOWED PROPERLY AND COMPLETELY.

IF YOU HAVE ANY QUESTIONS ABOUT ANY OF THE CONVERSION PROCESS STEPS, PLEASE CALL KEATING OF CHICAGO, SERVICE REPRESENTATIVES.

G. Test the fryer:

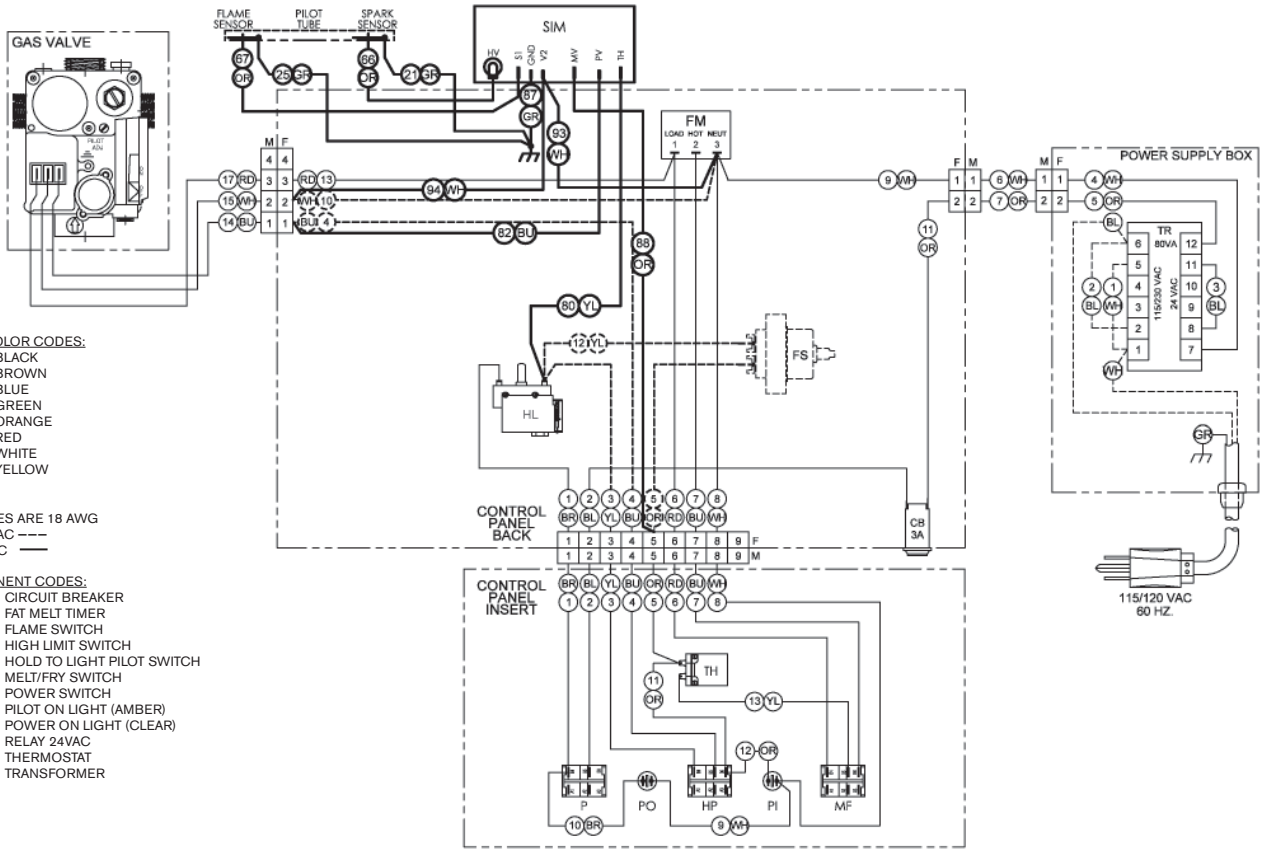
1. Hook up the gas line to the fryer, and turn the gas on (always check for leaks before taking the next step to operate the fryer).
2. Make sure the Power switch is in the OFF position, make sure that the thermostat is adjusted of OFF (completely counter-clockwise). Connect the AC line cord.
3. Turn the Power switch ON - the Spark Module will cause the spark electrode on the Pilot Runner Tube to begin sparking immediately. If gas is present in the pilot runner tube, it will light automatically. Keep in mind that if the gas line has been disconnected, it may take up to a few minutes for the gas to reach the pilot tube.
4. The spark module will continue to spark the electrode until pilot tube gas is lit and the sense electrode at the other end of the pilot runner tube is immersed in and detecting flame. (**NOTE:** The "remote" sense feature is not present on 10x11 fryers.) When the sense electrode is immersed in and detecting flame, the spark electrode will stop sparking.
5. Once the pilot tube is lit and sparking ceases, the fryer can be operated in the normal manner. **NOTE:** The "Hold-to-Light" Pilot switch will no longer be used to light the pilot and will not be functional.
6. Adjust the thermostat to call for heat. All burners should light in a normal manner and produce flame as they normally would.
7. If the fryer is operating normally, adjust the thermostat to the OFF position and shut the Power switch OFF.
8. Re-assemble the Control Panel Back and Control Panel completely.
9. When re-assembled, test the fryer again before placing back in service.
10. ***Affix the supplied lighting instruction label, Part Number 061024, over the original (found on the fryer door).***

SPARK IGNITION MODULE SPECIFICATIONS:

1. Tries for Ignition: 3 Tries, remote sense
2. Trial for Ignition Period: 90 sec.
3. Prepurge Timing: 0 sec.
4. Interpurge Timing: 4 min.
5. Fault Conditions:

LED INDICATION	FAULT MODE
2 Flashes	Pilot without call for heat
3 Flashes	Ignition Lockout
Steady On	Internal Control Fault

10x11 BB FRONT DRAIN FRYERS

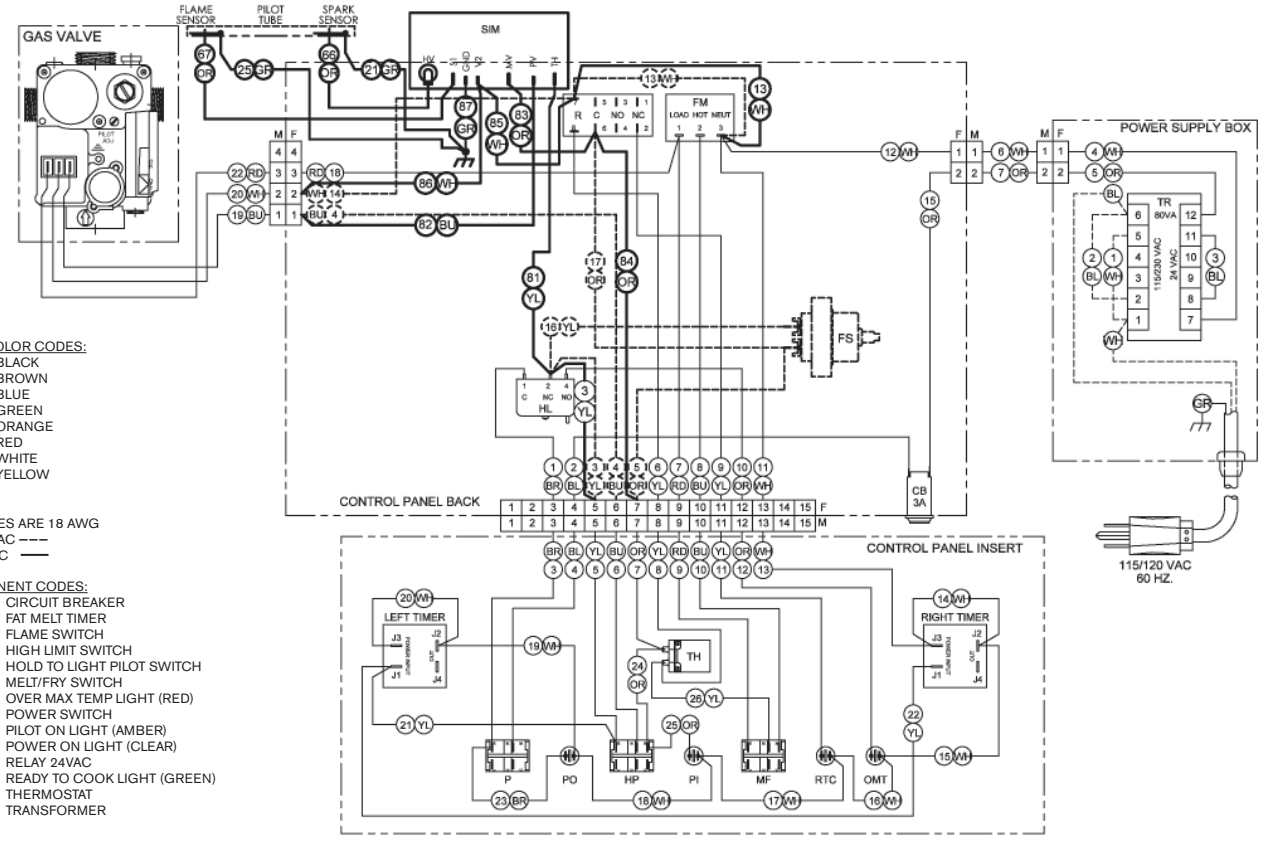


WIRE COLOR CODES:
BL - BLACK
BR - BROWN
BU - BLUE
GR - GREEN
OR - ORANGE
RD - RED
WH - WHITE
YL - YELLOW

NOTES:
ALL WIRES ARE 18 AWG
120 VAC – – –
24 VAC ——

COMPONENT CODES:
CB - CIRCUIT BREAKER
FM - FAT MELT TIMER
FS - FLAME SWITCH
HL - HIGH LIMIT SWITCH
HP - HOLD TO LIGHT PILOT SWITCH
MF - MELT/FRY SWITCH
P - POWER SWITCH
PI - PILOT ON LIGHT (AMBER)
PO - POWER ON LIGHT (CLEAR)
R - RELAY 24VAC
TH - THERMOSTAT
TR - TRANSFORMER

TS FRONT DRAIN FRYERS



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P - POWER SWITCH
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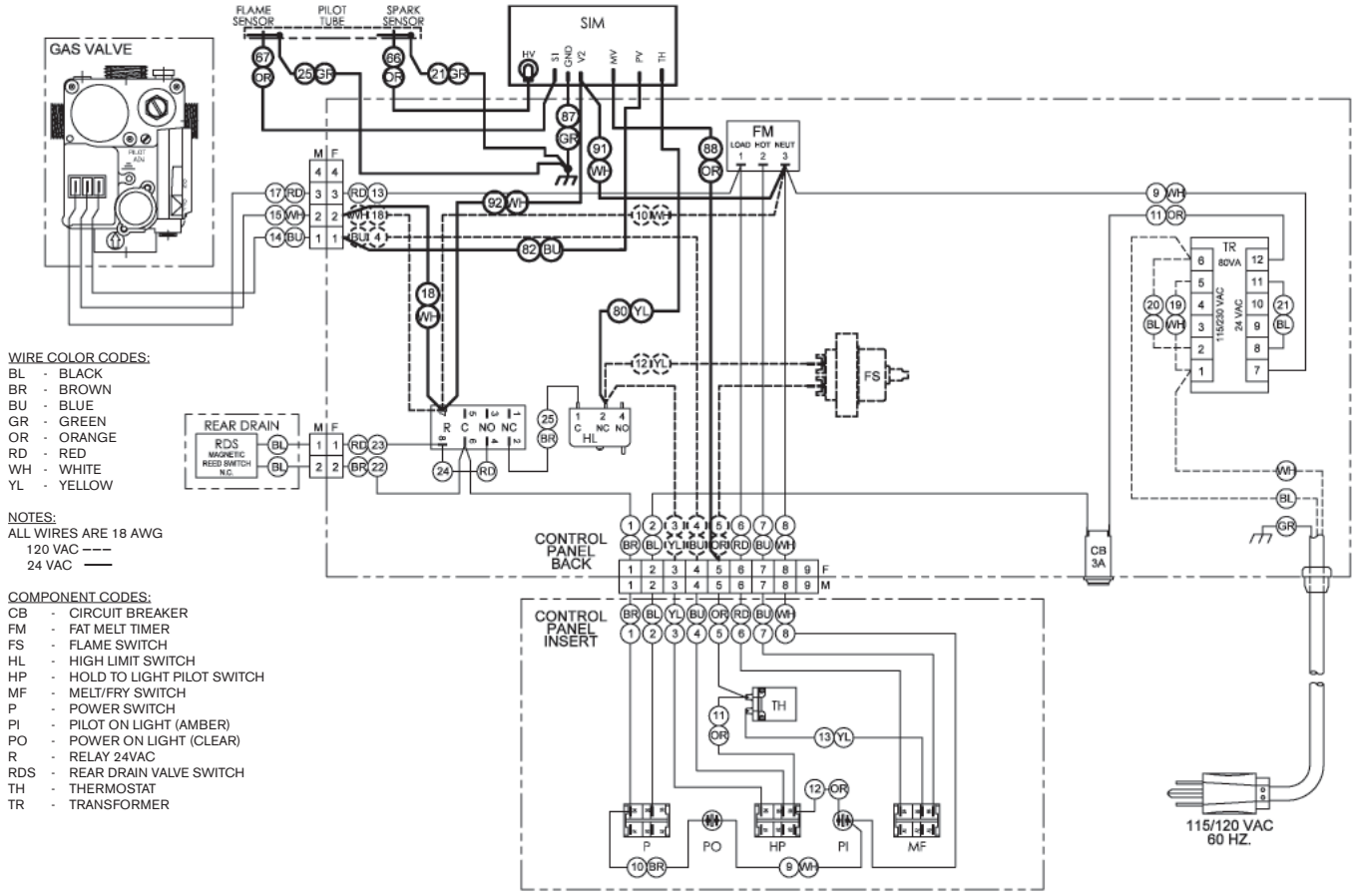
PO - POWER ON LIGHT (CLEAR)
R - RELAY 24VAC
RTC - READY TO COOK LIGHT (GREEN)
TH - THERMOSTAT
TR - TRANSFORMER

BB REAR DRAIN FRYERS



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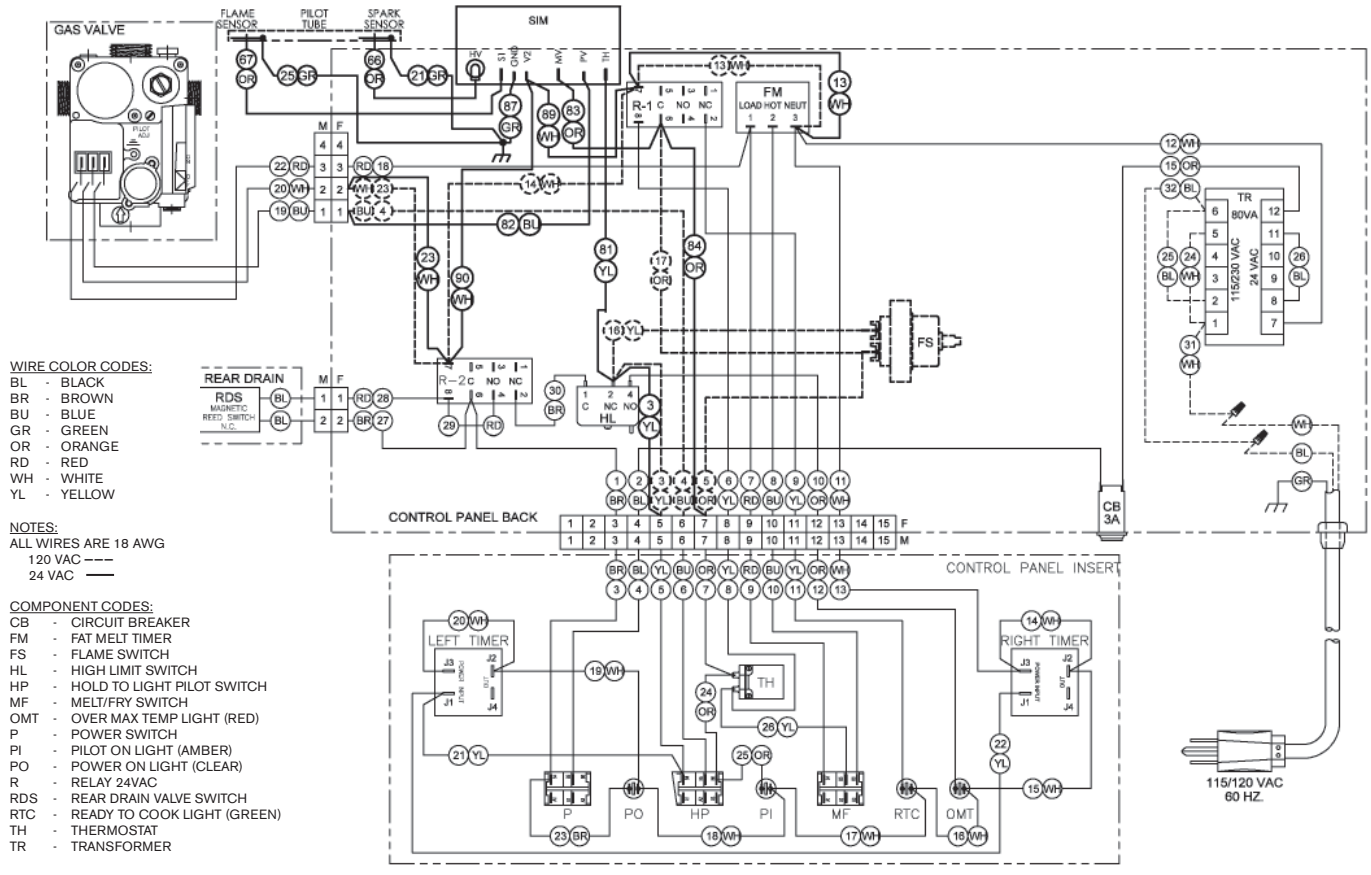
PO - POWER ON LIGHT (CLEAR)
R - RELAY 24VAC
RDS - REAR DRAIN VALVE SWITCH
TH - THERMOSTAT
TR - TRANSFORMER

TS REAR DRAIN FRYERS



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