SERVICE DATA SHEET 318047462 (1108) Rev. B

Appliance with Electronic Oven Control

NOTICE

This service data sheet is intended for use by persons having electrical and mechanical training and a level of knowledge of these subjects generally considered acceptable in the appliance repair trade. **The manufacturer cannot be responsible, nor assume any liability, for injury or damage of any kind arising from the use of this data sheet.**

SAFE SERVICING PRACTICES

To avoid the possibility of personal injury and/or property damage, it is important that safe servicing practices be observed. The following are some, but not all, examples of safe practices.

1. Do not attempt a product repair if you have any doubts as to your ability to complete it in a safe and satisfactory manner.
2. Before servicing or moving an appliance, remove power cord from electric outlet, trip circuit breaker to Off, or remove fuse.
3. Never interfere with the proper installation of any safety device.
4. USE ONLY REPLACEMENT PARTS SPECIFIED FOR THIS APPLIANCE. SUBSTITUTIONS MAY DEFEAT COMPLIANCE WITH SAFETY STANDARDS SET FOR HOME APPLIANCES.
5. GROUNDING: The standard color coding for safety ground wires is GREEN OR GREEN WITH YELLOW STRIPES. Ground leads are not to be used as current carrying conductors. IT IS EXTREMELY IMPORTANT THAT THE SERVICE TECHNICIAN REESTABLISH ALL SAFETY GROUNDS PRIOR TO COMPLETION OF SERVICE. FAILURE TO DO SO WILL CREATE A POTENTIAL HAZARD.
6. Prior to returning the product to service, ensure that:
   - All electric connections are correct and secure.
   - All electrical leads are properly dressed and secured away from sharp edges, high-temperature components, and moving parts.
   - All uninsulated electrical terminals, connectors, heaters, etc. are adequately spaced away from all metal parts and panels.
   - All safety grounds (both internal and external) are correctly and securely reassembled.
   - All panels are properly and securely reassembled.

IMPORTANT NOTES

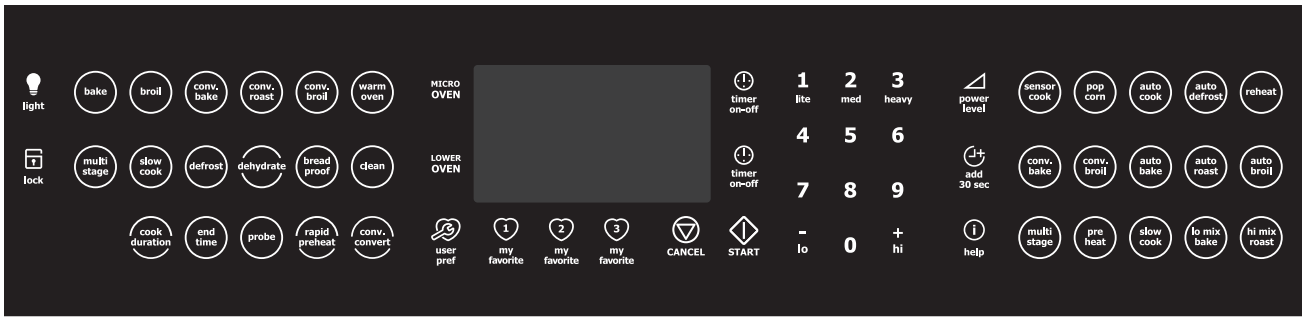
1. This unit includes a *User Interface Board*, an *Appliance Control Board* and a *Microwave Control Board.*
2. The included board is not field repairable.
3. The oven temperature can be calibrated, see Use and Care Manual.

DATA SHEET ABBREVIATIONS AND TERMINOLOGY

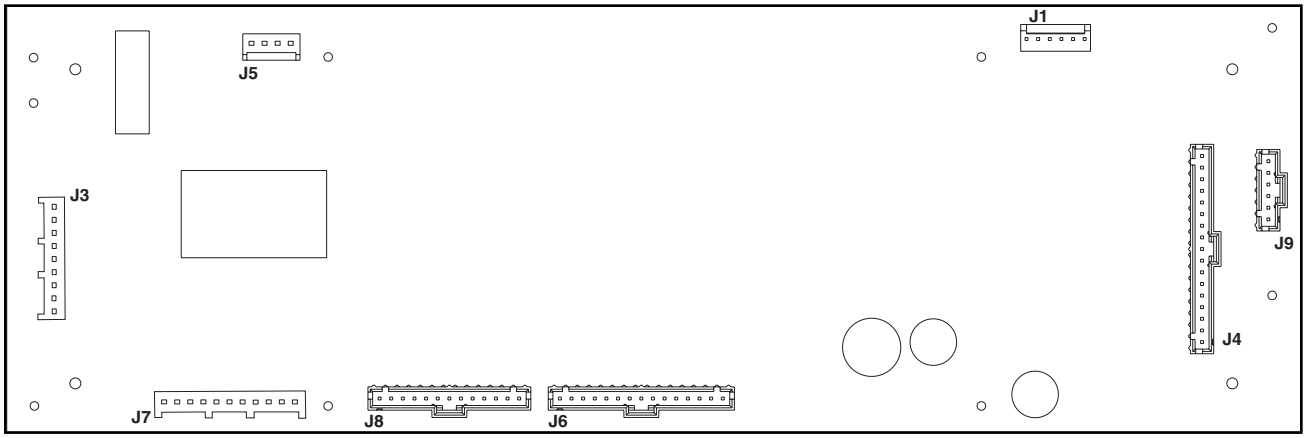
EOC : Electronic Oven Control
LED : Light-Emitting Diode
MDL : Motor Door Latch
DLB : Double Line Break
RTD : Resistance Temperature Detector / Oven Probe

ILLUSTRATION OF UNIT CONTROLS - ELECTROLUX MODEL

ILLUSTRATION OF UNIT CONTROLS - ELECTROLUX | ICON MODEL



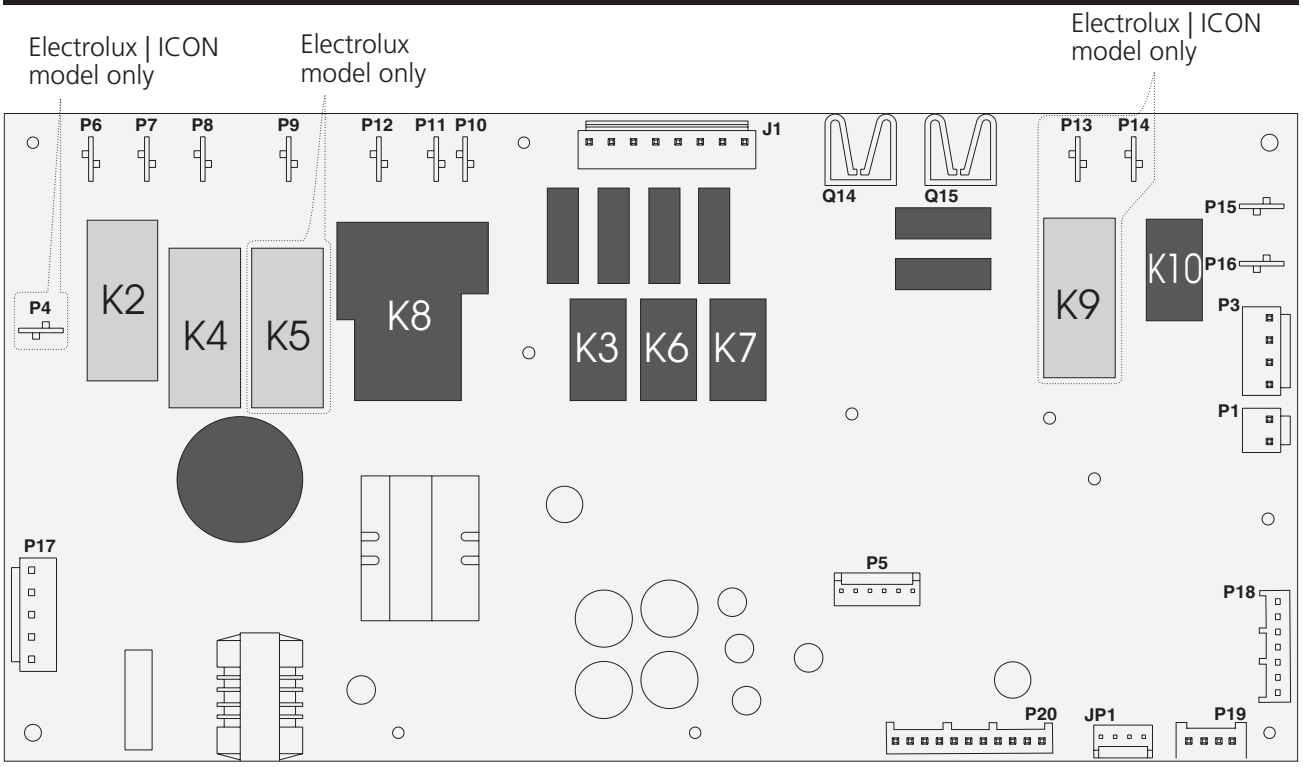
USER INTERFACE BOARD (DISPLAY BOARD)



Display Board Legend:

J1. Micro programming header (not used)
J3. Communication with microwave control
J4. Connection to touch panel (keyboard)
J5. Diagnostic interface (not used)
J6. Connection to touch panel (LEDs)
J7. DC power input and communication with relay board
J8. Connection to touch panel (LEDs)
J9. Connection to touch panel (keyboard)

APPLIANCE CONTROL BOARD (RELAY BOARD)



Relay Board Legend:

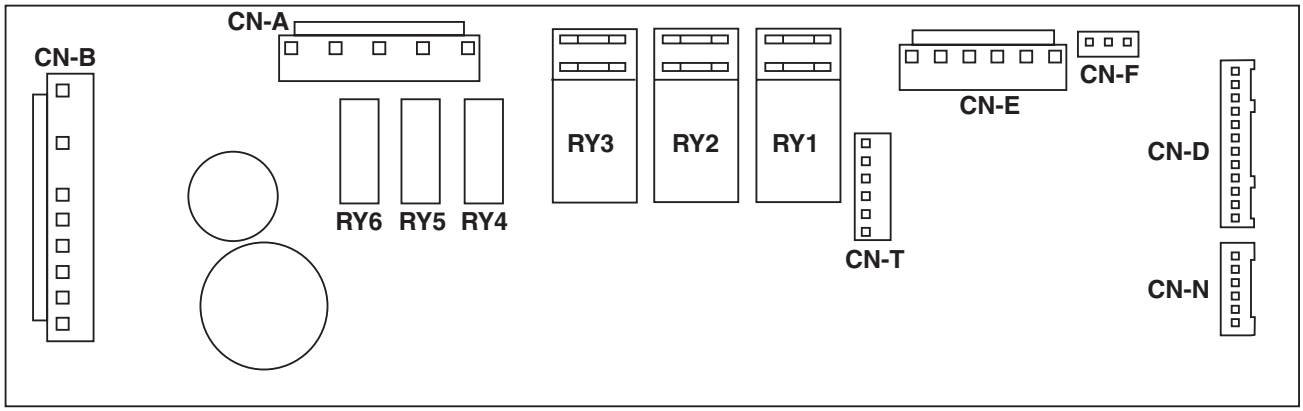
K2. Lower oven broil element relay
K3. Motor door latch relay
K4. Lower oven bake element relay
K5. Lower oven convection element relay (Electrolux model only)
K6. Lower oven cooling fan low speed relay
K7. Lower oven cooling fan high speed relay
K8. Lower oven DLB relay
K9. Lower oven convection element relay (Electrolux | ICON model only)
K10. Microwave external cooling fan relay

Q14. Triac controlling lower oven convection fan
Q15. Triac controlling lower oven light

JP1. Diagnostic interface (not used)
J1. Lower oven relay and triac outputs (MDL, cooling fan, oven light, convection fan). L1 and Neutral input.

P1. Meat probe connector
P3. Lower oven probe connector
P4. L1 for lower oven convection element (broil interlock) output. (Electrolux | ICON model only)
P5. Micro programming (not used)
P6. L1 in for oven elements
P7. Connection to lower oven broil element
P8. Connection to lower oven bake element
P9. Not used
P10. L2 in
P11. Not used
P12. L2 out
P13. Connection to lower oven convection element (Electrolux | ICON model only)
P14. L1 for lower oven convection element (Electrolux | ICON model only)
P15. Connection to microwave external cooling fan motor
P16. L1 in for microwave external cooling fan
P17. Line voltage (AC) and Neutral input
P18. Switches (MDL, door, rack sense) interface
P19. Microwave external cooling fan tachometer input
P20. Power supply output and communication to display board

MICROWAVE CONTROL BOARD



Microwave Control Board Legend:

CN-A. 120VAC input (pin 1 & 3) and relay outputs:
- Cooling fan motor (pin 5)
- Convection fan motor (pin 7) (Electrolux | ICON model only)
- Damper motor (pin 9) (Electrolux | ICON model only)

CN-B. Connections to low voltage transformer
CN-D. Connections to user interface board (communication)
CN-E. Connections to door switch (pin 1 & 2), microwave thermistor (pin 3 & 4) and damper switch (pin 5 & 6)
CN-F. Connections to humidity sensor
CN-N. Not used
CN-T. Not used

RY1. Light and turntable motor relay
RY2. Power transformer and magnetron relay
RY3. Convection element (heater) relay (Electrolux | ICON model only)
RY4. Damper motor relay (Electrolux | ICON model only)
RY5. Convection fan motor relay (Electrolux | ICON model only)
RY6. Cooling fan motor relay

LOWER OVEN 2 SPEEDS COOLING FAN

The Appliance Control Board controls the speed of the lower oven cooling fan. The cooling fan is activated at low speed during any cooking function and will remain on until the oven cools down. The high speed is activated during clean cycles when the temperature is above approximately 575°F. On Electrolux models, the cooling fan is also activated at high speed during a broil or convection broil.

On the 30" Electrolux model, if the microwave oven is used at the same time as the lower oven then the lower oven cooling fan will be forced to high speed.

RTD SCALE		
Temp. °F	Temp. °C	Resistance (ohms)
32 ± 1.9	0.0 ± 1.1	1000 ± 4.0
75 ± 2.5	23.9 ± 1.4	1091 ± 5.3
250 ± 4.4	121.1 ± 2.4	1453 ± 8.9
350 ± 5.4	176.7 ± 3.0	1654 ± 10.8
450 ± 6.9	232.2 ± 3.8	1852 ± 13.5
550 ± 8.2	287.8 ± 4.6	2047 ± 15.8
650 ± 9.6	343.3 ± 5.3	2237 ± 18.5
900 ± 13.6	482.2 ± 7.6	2697 ± 24.4

ELECTRICAL RATING		
	Lower Oven	**Micro Oven**
Bake Element Wattage	2200W / 1652W	-
Broil Element Wattage	4000W / 3004W	-
Convection Element Wattage	ICON: 1600W / 1202W Electrolux: 2500W/1878W	1500W / 1127W
KW Rating	See serial plate	

LOWER OVEN CIRCUIT ANALYSIS MATRIX

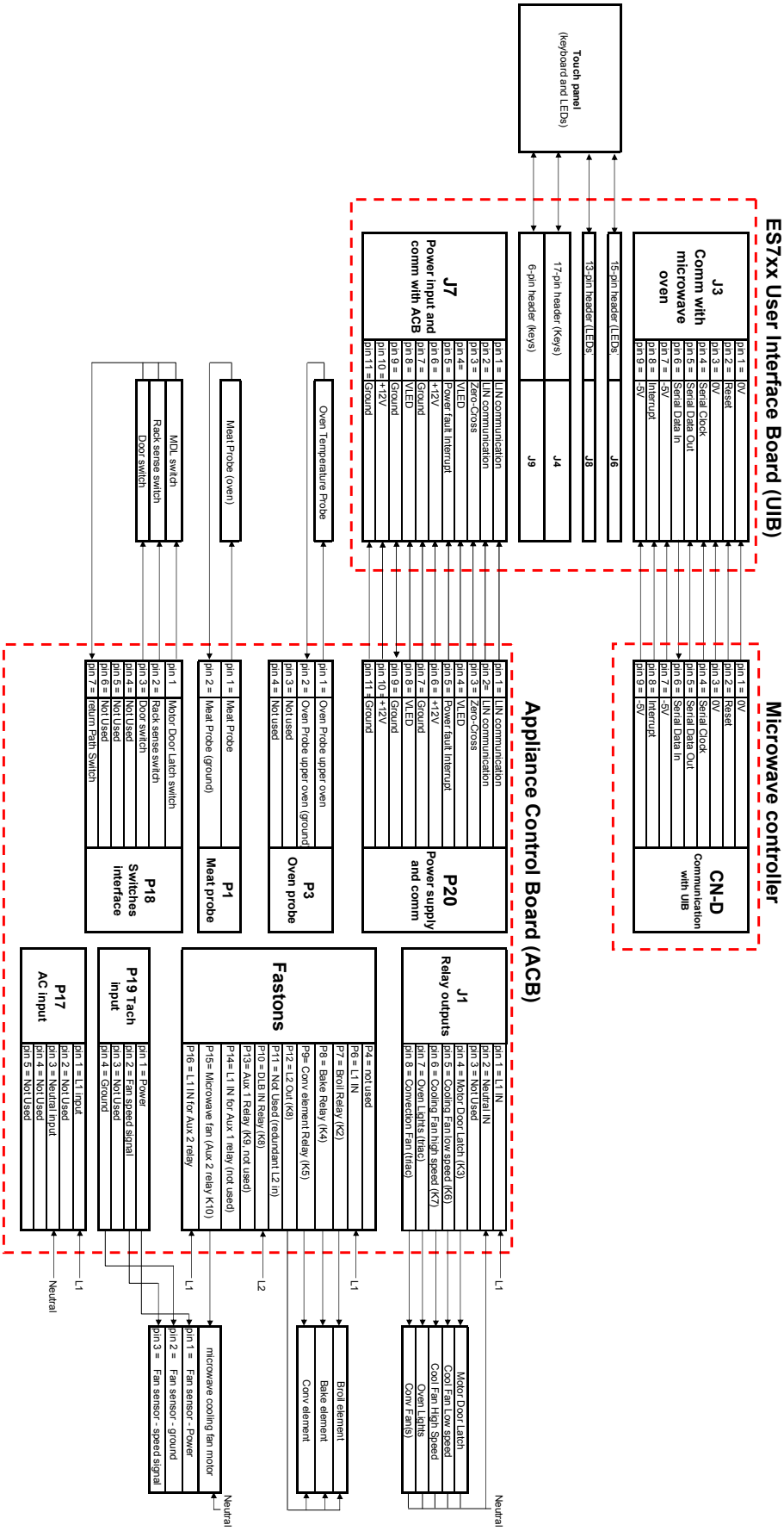
	ELEMENTS			**Conv Fan J1-8**	**Oven Light J1-7**	**Door Motor J1-4**	**DLB L2 out P12**	**Cooling Fan Low Speed J1-5**	**Cooling Fan High Speed J1-6**	**Door Switch P18-3 / P18-7**	**Rack Sense Switch P18-2 / P18-7**
	Bake P8	**Broil P7**	**Conv P9 or P13**								
Bake	**X**	**X**	**X***	**X***			**X**	**X**			
Broil		**X**					**X**	**X**	**X****		
Convection Bake	**X**	**X**	**X**	**X**			**X**	**X**			
Convection Roast	**X**	**X**	**X**	**X**			**X**	**X**			
Convection Broil		**X**		**X**			**X**	**X**	**X****		
Clean	**X**	**X**	**X****	**X****			**X**	**X**	**X**		
Locking / Unlocking						**X**					
Light					**X**						
Door Open					**X**						
Door Closed										**X**	
Racks Not Installed											**X**

Relay will operate in this condition only.

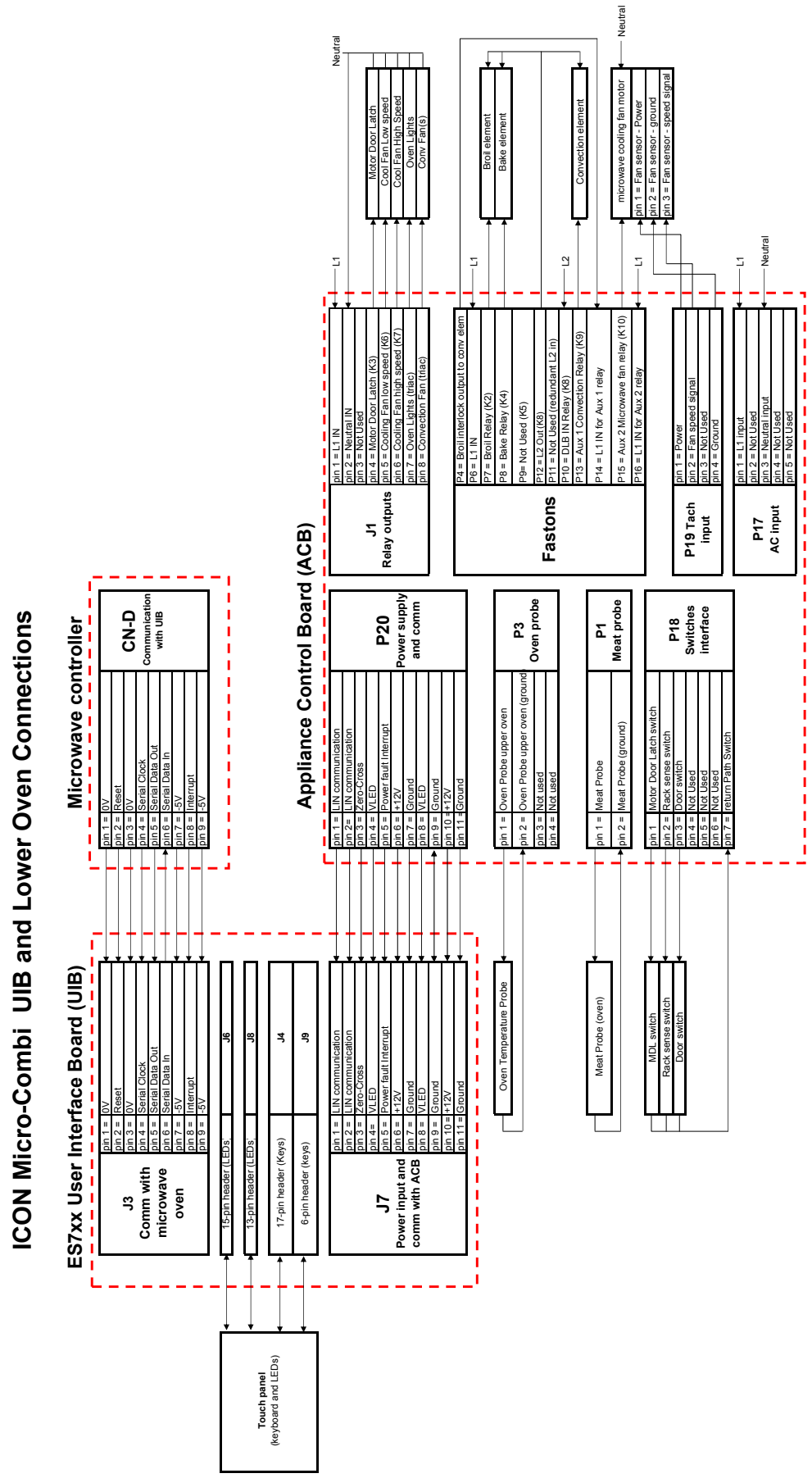
***** Convection element and fan are used during the preheat of bake.

****** Electrolux models only.

LOWER OVEN BLOCK DIAGRAM - ELECTROLUX MODEL



LOWER OVEN BLOCK DIAGRAM - ELECTROLUX | ICON MODEL



MICROWAVE SERVICING WARNINGS

This service manual is intended for use by persons having electrical and mechanical training and a level of knowledge of these subjects generally considered acceptable in the appliance repair trade. Electrolux home products cannot be responsible, nor assume any liability, for injury or damage of any kind arising from the use of this manual.

Never operate the oven until the following points are ensured:

(a) The door is tightly closed.
(b) The door brackets and hinges are not defective.
(c) The door packing is not damaged.
(d) The door is not deformed or warped.
(e) There is no other visible damage with the oven.

Servicing and repair work must be carried out only by trained service personnel.

Certain initial parts are intentionally not grounded and present a risk of electrical shock only during servicing. Service personnel - DO NOT contact the following parts while the appliance is energized: inverter unit, that includes high voltage capacitor, high voltage power transformer, high voltage rectifier, heat sink, etc., and magnetron, high voltage harness etc.; if provided, fan assembly, cooling fan motor. All the parts marked "*" on parts list are used at voltages more than 250v. Removal of the outer wrapper gives access to voltage above 250v. All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

Precautions To Be Observed Before And During Servicing To Avoid Possible Exposure To Excessive Microwave Energy

(a) Do not operate or allow the oven to be operated with the door open.
(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary: (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.
(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.
(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(e) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

DANGER HIGH VOLTAGE

Do not energize a microwave oven with the outer case cabinet removed, because a microwave oven generates high voltage in the circuit.
If you intend to operate the oven employing the high frequency switching power converter circuit, you should take special precautions to avoid an electrical shock hazard.
The high voltage transformer, high voltage capacitor and high voltage diode have energized high voltage potential of approximately 8KV.
DO NOT ACCESS THE HIGH VOLTAGE TRANSFORMER, HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE DIODE WHEN THE POWER SUPPLY IS CONNECTED TO AN ELECTRICAL OUTLET.

Microwave ovens contain circuitry capable of producing very high voltage and current.
Contact with the following parts may result in a severe, possibly fatal, electrical shock:

Inverter unit, that includes high voltage capacitor, high voltage power transformer, high voltage rectifier, heat sink etc., and magnetron, high voltage harness etc..

Carefully follow all instructions.

BEFORE SERVICING MICROWAVE OVEN

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual. If microwave emissions level is in excess of the specified limit, contact ELECTROLUX MAJOR APPLIANCES immediately.

If the unit operates with the door open, service person should 1) tell the user not to operate the oven and 2) contact ELECTROLUX MAJOR APPLIANCES and Food and Drug Administration's Center for Devices and Radiological Health immediately.

Service personnel should inform ELECTROLUX MAJOR APPLIANCES of any certified unit found with emissions in excess of 4mW/cm^2. The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

BEFORE AND AFTER SERVICING MICROWAVE OVEN

Before Servicing

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

> **CAUTION**
> To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Whenever troubleshooting is performed, the power supply must be disconnected. It may, in some cases, be necessary to connect the power supply after the outer case has been removed, in this event:

1. Disconnect the oven power supply cord and then remove the outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect leads to the primary of high voltage transformer.
5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

When Testing Is Completed

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

> **CAUTION**
> To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Reconnect leads to the primary of the high voltage transformer.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

After repairing

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case (cabinet).
3. Reconnect the power supply cord after the outer case is installed.
4. Run the oven and check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and then set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

MICROWAVE MEASUREMENT PROCEDURE (USA)

A. Requirements:

1) Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed 1 mW/cm2 at any point 5 cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 m/cWm2 at any point 5 cm or more from the external surface of the oven.
2) Safety interlock switches: Primary interlock switch shall prevent microwave radiation emission in excess of the requirement as above mentioned, secondary interlock switch shall prevent microwave radiation emission in excess of 5 mW/cm2 at any point 5 cm or more from the external surface of the oven.

B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

1) Make sure that the actual instrument is operating normally as specified in its instruction booklet.

   Important:

   Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.
2) Place the oven tray in the oven cavity.
3) Place the load of 275±15 ml (9.8 oz) of tap water initially at 20°±5C (68°F) in the center of the oven cavity. The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically non-conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4) Set the cooking control on Full Power Cooking Mode.
5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test:

Closed-door leakage test (microwave measurement)

1) Grasp the probe of the survey instrument and hold it perpendicular to the gap between the door and the body of the oven.
2) Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around the door pull the door away from the front of the oven as far as is permitted by the closed latch assembly.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4 mW/cm2, and that the primary interlock switch and secondary interlock switch do turn the oven OFF before any door movement.

NOTE: After servicing, record data on service invoice and microwave leakage report.

MICROWAVE MEASUREMENT PROCEDURE (CANADA)

After adjustment of the door switches are completed individually or collectively, switch test and microwave leakage test must be performed with survey instrument and test result must be confirmed to meet the requirement of the performance standard for microwave ovens as under mentioned.

A. Requirements:

Every microwave oven shall function in such a manner that when the oven is fully assembled and operating with its service controls and user controls adjusted to yield the maximum output, the leakage radiation, at all points at least 5 cm. from the external surface of the oven, does not exceed:

1) 1.0 mW/cm2 with the test load of 275 ± 15 ml of water at an initial temperature 20 ± 5°C.
2) 5.0 mW/cm2 when the outer enclosure is removed with a test load of 275 ± 15 ml of water at an initial temperature 20 ± 5.°C
3) 5.0 mW/cm2 without a test load.

B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

1) Make sure that the actual instrument is operating normally as specified in its instruction booklet. Survey instruments that comply with the requirement for instrumentation as prescribed by CSA and NHW performance standard for microwave ovens must be used for testing recommended instruments are, NARDA 8100 and NARDA 8200.
2) Place the oven tray in the oven cavity.
3) Place the load of 275±15 ml (9.8 oz) of tap water initially at 20°±5C (68°F) in the center of oven cavity. The water container shall be a low form of a 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4) Set the cooking control on Full Power Cooking Mode.
5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test with enclosure installed:

1) Grasp probe of survey instrument and hold it perpendicular to gap between door and the body of the oven.
2) Move the probe slowly, not faster than 2.5 cm/sec. along the gap, watching for maximum indication on meter.
3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around door, pull door away from the front of the oven as far as is permitted by the closed latch assembly.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4 mW/cm2, and that the primary interlock switch and secondary interlock switch do turn the oven OFF before any door movement.

D. Leakage test without enclosure:

1) Remove the enclosure (cabinet).
2) Grasp the probe of the survey instrument and hold it perpendicular to all mechanical and electric parts of the oven that is accessible to the user of the oven including, but not limited to, the waveguide, cavity seams, magnetron gap between the door and the body of the oven.
3) Move probe slowly, not faster than 2.5 cm/sec. along the gap, watching for the maximum indication on meter.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is under 5 mW/cm2.

CAUTION: Special attention should be given to avoid electrical shock because HIGH VOLTAGE is generated during this test.

E. No Load test

1) Operate the oven without a load and measure the leakage by the same method as the above test procedure "Leakage test with enclosure installed"
2) Make sure that the highest leakage should not exceed 5 mW/cm2.

NOTE: After servicing, record data on service invoice and microwave leakage report.

MAGNETRON ASSEMBLY TEST

WARNING: HIGH VOLTAGES ARE PRESENT DURING THE COOK CYCLE, SO EXTREME CAUTION SHOULD BE OBSERVED. DISCHARGE THE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

To test for an open filament, isolate the magnetron from the high voltage circuit. A continuity check across the magnetron filament leads should indicate less than 1 ohm.

To test for a shorted magnetron, connect the ohmmeter leads between the magnetron filament leads and chassis ground. This test should indicate an infinite resistance. If there is little or no resistance the magnetron is grounded and must be replaced.

Power output of the magnetron can be measured by performing a water temperature rise test. This test should only be used if above tests do not indicate a faulty magnetron and there is no defect in the following components or wiring: silicon rectifier, high voltage capacitor and power transformer. This test will require a 16 ounce (453 cc.) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully:

1. Fill the measuring cup with 16 oz. (453 cc.) of tap water and measure the temperature of the water with a thermometer or thermocouple temperature tester. Stir the thermometer or thermocouple through the water until the temperature stabilizes. Record the temperature of the water.
2. Place the cup of water in the oven. Operate oven at POWER HI(HIGH) selecting more than 60 seconds cook time. Allow the water to heat for 60 seconds, measuring with a stop watch, second hand of a watch or the digital read-out countdown.
3. Remove the cup from the oven and again measure the temperature, making sure to stir the thermometer or thermocouple through the water until the maximum temperature is recorded.
4. Subtract the cold water temperature from the hot water temperature. The normal result should be 22 to 43°F (12.2 to 23.8°C) rise in temperature. If the water temperatures are accurately measured and tested for the required time period the test results will indicate if the magnetron tube has low power output (low rise in water temperature) which would extend cooking time or high power output (high rise in water temperature) which would reduce cooking time. Because cooking time can be adjusted to compensate for power output, the magnetron tube assembly should be replaced only if the water temperature rise test indicates a power output well beyond the normal limits. The test is only accurate if the power supply line voltage is 120 volts and the oven cavity is clean.

OPERATING SEQUENCE DESCRIPTION

The following is a description of component functions during microwave oven operation.

OFF CONDITION

Closing the door activates the door sensing switch, primary interlock switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.) When oven is plugged in, 120 volts AC is supplied to the control unit.

NOTE: When door is opened, the oven lamp comes on.

Electrolux Icon model only: A signal is input to control unit, energizing the coil of shut-off relay (RY-4). RY4 contacts close, completing a circuit to the damper motor. The damper motor now operates moving the damper to the open position, thereby closing the contacts of damper switch and sending a signal to the control unit. The coil of relay RY-4 is de-energized, opening its contacts, thereby turning off the damper motor.

COOKING CONDITION MICROWAVE MODE

Program desired cooking time with Variable Cooking Control by touching the NUMBER pads and the power level pad. When the START button is touched, the following operations occur:

1. The contacts of relays are closed and components connected to the relays are turned on as follows:

RELAY CONNECTED COMPONENTS
RY-1 Oven Lamp / Turntable Motor
RY-2 Power Transformer
RY-3 Heating Element } Electrolux Icon model only
RY-4 Damper Motor
RY-5 Convection Motor
RY-6 Fan Motor

2. 120 volts AC is supplied to the primary winding of the power transformer and is converted to about 3.0 volts AC output on the filament winding, and approximately 2360 volts AC on the high voltage winding.

3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.

4. The microwave energy produced by the magnetron is channeled through the waveguide into the cavity feedbox, and then into the cavity where the food is placed to be cooked.

5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.

6. When the door is opened during a cook cycle, third door switch, monitor switch, door sensing switch, the secondary interlock relay and the primary interlock switch are activated with the following results. The circuits to the turntable motor, the cooling fan motor, and the high voltage components are de-energized, the oven lamp remains on, and the digital read-out displays the time still remaining in the cook cycle when the door was opened.

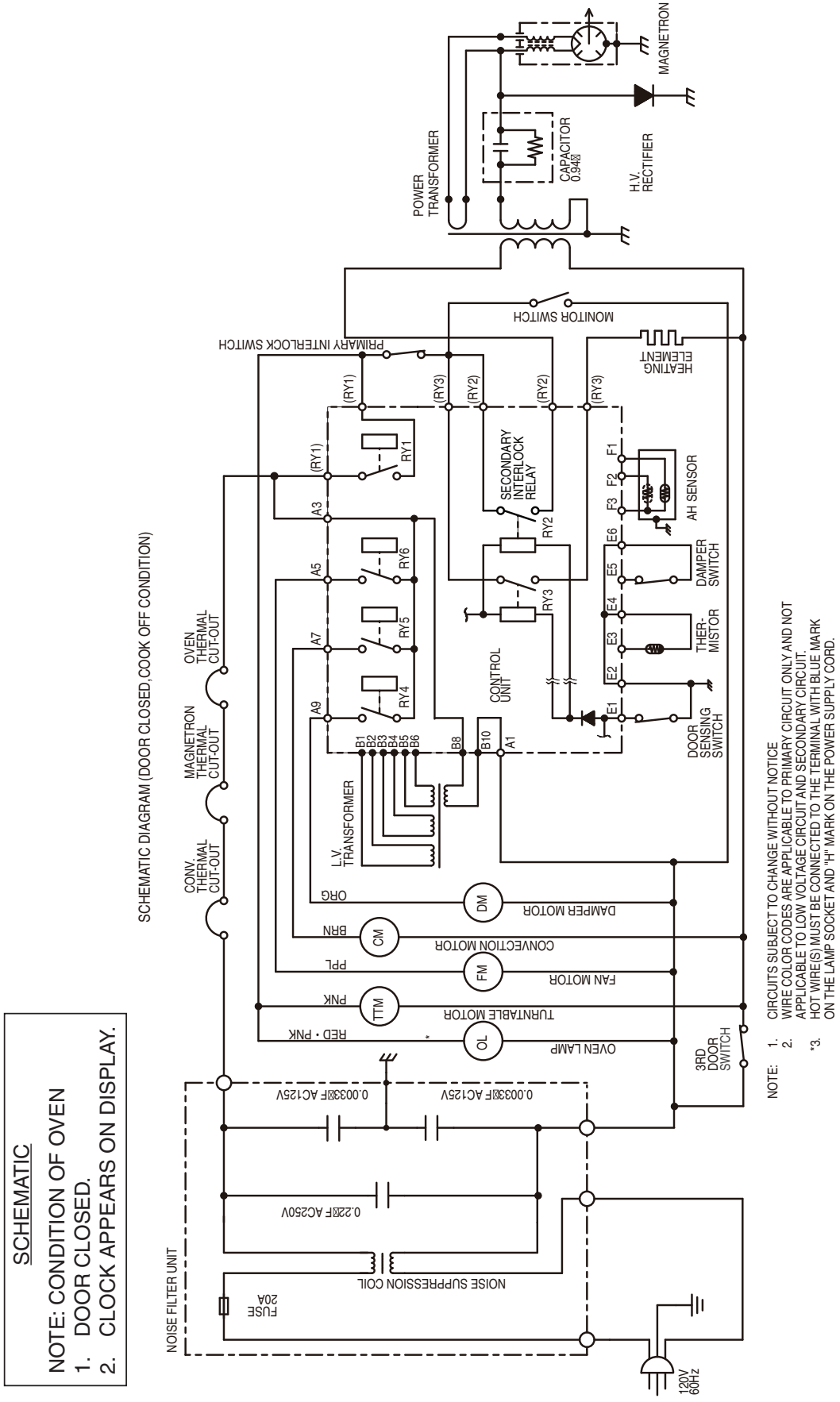
7. The monitor switch is electrically monitoring the operation of the relay (RY1) and the primary interlock switch and is mechanically associated with the door so that it will function in the following sequence.

(1) When the door opens from a closed position, the door sensing switch and the primary interlock switch open their contacts, and then the monitor switch contacts close and then the third door switch contacts open.

(2) When the door is closed from the open position, the monitor switch contacts open and the third door switch contacts close first, and then the contacts of the primary interlock switch and the door sensing switch close.

If relay (RY1) and the primary interlock switch fail with their contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the monitor fuse, the relay (RY1) and the primary interlock switch, causing the monitor fuse to blow.

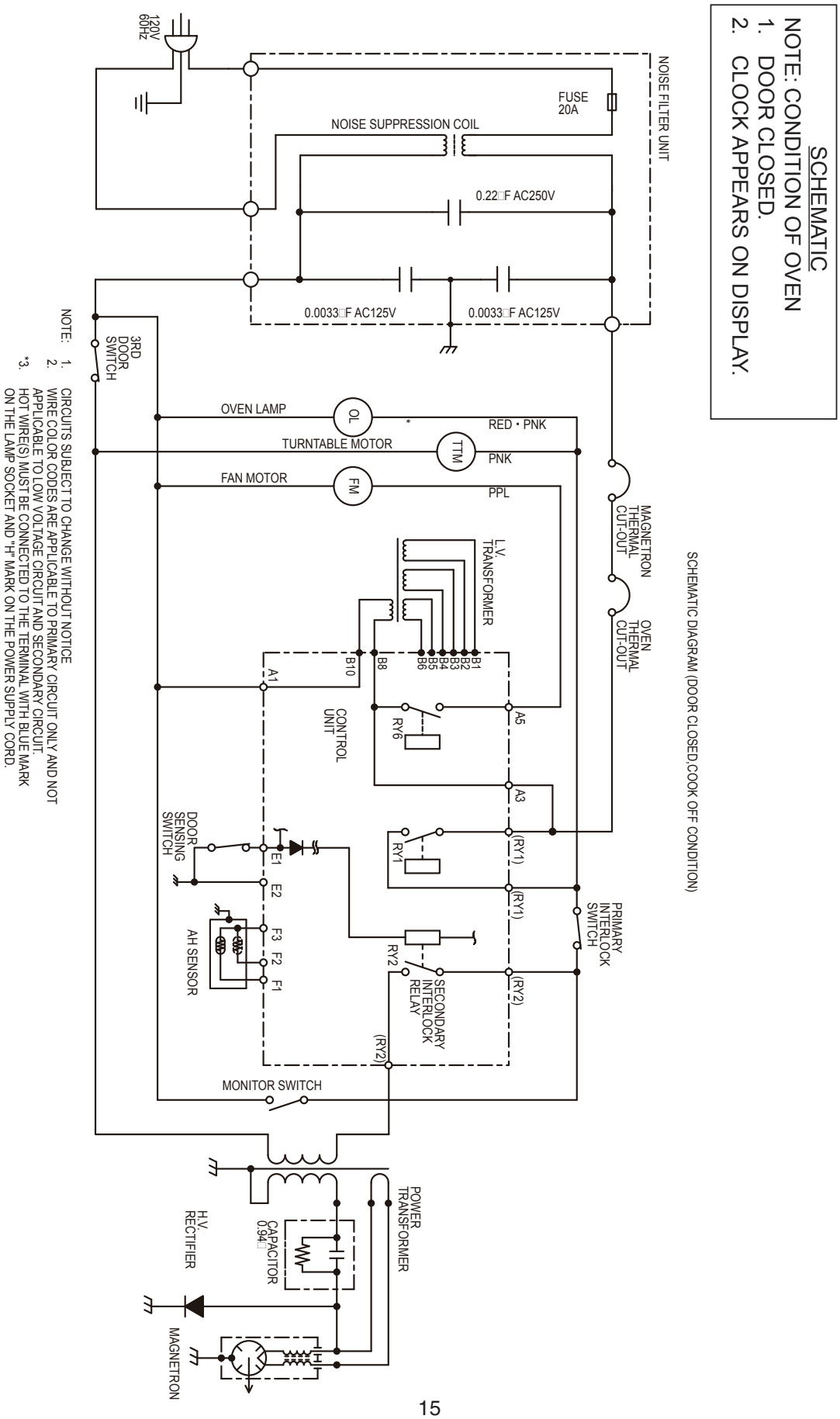
MICROWAVE BLOCK DIAGRAM - ELECTROLUX | ICON MODELS



SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. CLOCK APPEARS ON DISPLAY.

MICROWAVE BLOCK DIAGRAM - ELECTROLUX MODELS



MICROWAVE OPERATIONS

CONVECTION COOKING CONDITION (ELECTROLUX | ICON MODELS ONLY)

The heating element is located at the left side of the oven cavity. It is intended to heat air driven by the convection fan. The heating air is kept in the oven and force circulated and reheated by the heating element.

Program desired convection temperature by touching the CONVECTION pad and TEMPERATURE pad. When the START pad is touched, the following operations occur:

1. The coil of shut-off relays (RY1, RY3, RY5 and RY6) are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.
2. The coil of relay (RY4) is energized by the control unit. The damper is moved to the closed position, opening the damper switch contacts. The opening of damper switch contacts sends a signal to microwave control board de-energizing relay (RY4) and opening the circuit to the damper motor.
3. The coil heater relay (RY3) is energized by the control unit and the main supply voltage is applied to the heating element.
4. When the oven temperature reaches the selected preheat temperature, the heater relay is de-energized by the control unit temperature circuit and thermistor, opening the circuit to the heating element.
5. Upon completion of cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and convection motor are de-energized. At the end of the convection cycle, if the cavity air temperature is above 275F, the circuit to RY6 will be maintained (by the thermistor circuit) to continue operation of internal cooling fan motor until the temperature drops below 245F, at which time the relay will be de-energized, turning off the fan motor. Relay RY5 will however open as soon as the convection cycle has ended, turning off the convection fan motor.
6. At the end of the convection cook cycle, shut-off relay (RY4) is energized turning on the damper motor. The damper is returned to the open position, closing the damper switch contacts which send a signal to the microwave control board, de-energizing shut-off relay (RY4).

THERMAL CUT-OUTS

MAGNETRON THERMAL CUT-OUT

The magnetron thermal cut-out, located on the wave-guide, is designed to prevent damage to the magnetron if an over heated condition develops in the magnetron due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc.

Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the magnetron, the thermal cut-out will open at 257F (125C) causing the oven to shut down. The magnetron thermal cut-out is not reset at room temperature.

OVEN THERMAL CUT-OUT

The oven thermal cut-out, located on the side of the steam duct, is designed to prevent damage to the unit if foods in the oven catch fire due to over heating produced by improper setting of cooking time or failure of control unit.

Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the oven cavity, the thermal cut-out will open at 302˚F/150˚C for Electrolux models, or 338˚F/170˚C for Electrolux|Icon models causing the oven to shut down. When the thermal cut-out has cooled, the thermal cut-out closes at 266˚F (130˚C) for Electrolux models, or 302˚F/150˚C for Electrolux|Icon models.

CONVECTION THERMAL CUT-OUT (ELECTROLUX | ICON ONLY)

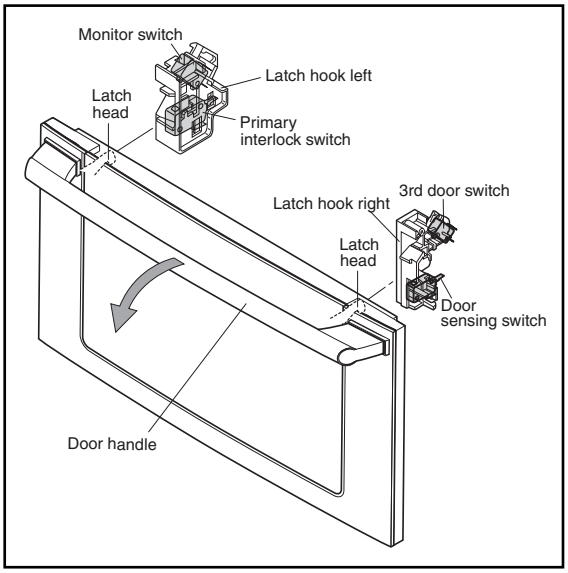
The convection thermal cut-out located on the left side of the thermal protection plate (left) is designed to prevent damage to the heater unit if an over heated condition develops in the tube due to cooling fan failure, obstructed air ducts, dirty or blocked air intake, etc.

Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the heater unit, the thermal cut-out will open at 338˚F/170˚C causing the oven to shut down. When the thermal cut-out had cooled, the thermal cut-out closes at 302˚F/150˚C.

MICROWAVE DOOR SWITCHES

DOOR SENSING AND PRIMARY INTERLOCK SWITCH

The door sensing switch, in the third door switch system, is mounted on the right latch hook. The primary and monitor interlock switch are mounted on the left latch hook. They are activated by the latch heads on the door. When the door is opened, the switches interrupt the circuit to all components. A cook cycle cannot take place until the door is firmly closed, thereby activating both interlock switches. The third door switch system consists of the door sensing switch and secondary interlock relay located on the control circuit board.



MONITOR SWITCH

The monitor switch is mounted on the middle position of latch hook. It is activated (the contacts opened) by the lower latch head while the door is closed. The switch is intended to render the oven inoperative by means of blowing the monitor fuse when the contacts of the relay RY1 and primary interlock switch fail to open when the door is opened.

Functions:

1. When the door is opened, the monitor switch contacts close (to the ON condition) due to their being normally closed. At this time, the door sensing and primary interlock and third door switches are in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts are first opened and then the door sensing switch, third door switch and the primary interlock switch contacts close. (On opening the door, each of these switches operate inversely).
3. If the door is opened, and the relay RY1 and the primary interlock switch contacts fail to open, the monitor fuse blows simultaneously with closing of the monitor switch contacts.

CAUTION: Before replacing a blown monitor fuse, test the door sensing switch, primary interlock switch, Relay (RY1) and monitor switch for proper operation.

NOTE: Monitor fuse and switch are replaced as an assembly.

THIRD DOOR SWITCH

The switch is activated by the latch heads, while the door is closed. When the door is opened, the switch interrupts the circuit to the power transformer. This switch prevents the power transformer engaging and microwave from operating when the door is opened.

MICROWAVE DOOR SWITCHES

DOOR SENSING SWITCH, PRIMARY/THIRD INTERLOCK SWITCH AND MONITOR SWITCH REPLACEMENT

REMOVAL:

1. Disconnect the oven power supply cord and outer case.
2. Open the door and block it open
3. Discharge high voltage capacitor.

CAUTION: To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Disconnect the wire leads from the switch.
5. Remove the one (1) screw holding the latch hook (right or left) to the oven cavity front plate, and release the latch hook (right or left).
6. Keep pushing stopper tub holding switch to the latch hook (right or left) and revolve the switch on the pole.
7. Remove the switch from the latch hook (right or left).

REINSTALL:

1. Re-install each switch in its place. The door sensing switch is in the lower position of the latch hook right. The primary interlock switch is in the lower position of latch hook left. The monitor switch is in the upper position of the latch hook left.
2. Hold the latch hook (right or left) to the oven cavity front plate and secure with the one (1) screw.
3. Reconnect the wire leads to the switch.
4. Make sure that monitor switch is operating properly and check continuity of the monitor circuit.

ADJUSTMENT:

If the door sensing switch, primary interlock switch, third interlock switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

1. Disconnect the oven power supply cord and remove outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.

CAUTION: To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Loosen each one (1) screw holding the latch hook right and the latch hook left to the oven cavity front plate.
5. With door closed, adjust the latch hook right and the latch hook left by moving them back and forth and up and down. In and out play of the door allowed by the latch hook right and the latch hook left should be less than 0.5mm. The vertical position of the latch hook right and the latch hook left should be adjusted so that the door sensing switch and the primary interlock switch are activated with the door closed. The horizontal position of the latch hook right and the latch hook left should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
6. Secure the screws firmly.
7. Check all of the switches operation. If any switch had not activated with the door closed, loosen the screws and adjust the position of the latch hook right and the latch hook left.
8. To ensure proper interlock switch adjustment, perform a "soft-touch door open and close" by gently opening and closing the door while visually verifying the latch heads completely drop down and fully depress the switch plunger - 0 Gap.

AFTER ADJUSTMENT, CHECK THE FOLLOWING:

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The door sensing switch, and secondary interlock switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. The contact of door sensing switch and secondary interlock switch open within 1.2mm gap between right side of cavity face plate and door when door is open.
5. To ensure proper interlock switch adjustment, perform a "soft-touch door open and close" by gently opening and closing the door while visually verifying the latch heads completely drop down and fully depress the switch plunger - 0 Gap.
6. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter.

FAULT CODE DESCRIPTIONS		
Code	**Condition / Cause**	**Suggested Corrective Action**
F10	The oven control has sensed a potential runaway condition in the lower oven. The Appliance Control Board may have a shorted relay, RTD sensor may have gone bad.	- If oven is overheating, disconnect power. Check RTD sensor probe and replace if necessary. - If oven continues to overheat when power is reapplied, replace Appliance Control Board. - If problem persists replace the User Interface Board.
F11	Shorted keypad: key has been detected as pressed for a long period and is triggering a shorted key alarm, terminating all oven activity.	- If a key was pressed inadvertently for a long time the fault code should go away once the key is released. - If the fault code cannot be cleared the touch panel is most likely defective (replace touch panel). - If changing the touch panel did not fix the problem replace the User Interface Board.
F13	Incorrect EEPROM checksum: the control (User Interface Board or Appliance Control Board) internal memory maybe have become corrupted.	-Disconnect power, wait 30 seconds and reapply power. If fault returns upon power-up, replace the Appliance Control Board. - If problem persists replace the User Interface Board
F14	Misconnected flat cable. The User Interface Board does not see the glass touch panel as being well connected (4 flat cables).	- Check the 4 flat cables connections between the User Interface Board (J4, J6, J8, J9) and the touch panel. Make sure the cables are fully inserted into the connectors. Check for bent pins and verify cable integrity. - If all 4 cables appear to be good replace the User Interface Board. - If the problem persists replace the touch panel.
F15	Controller self check failed. The User Interface Board or the Appliance Control Board has detected a problem with its internal circuit.	- Replace the User Interface Board. - If the problem persists replace the touch panel. - If the problem persist replace the Appliance Control Board.
F20	Communication problem between the User Interface Board and the Appliance Control Board: the User Interface Board is not able to initiate communication with the Appliance control board.	- Check the communication harness from connector P20 (pins 1,2,7,9,11) on the Appliance Control Board to connector J2 on the User Interface Board. - If the problem persists replace the Appliance Control Board. - If the problem persists replace the User Interface Board.
F21	Communication problem between the User Interface Board and the Appliance Control Board: the User Interface Board is no longer able to detect communication from the Appliance control board.	
F30	Open RTD sensor probe/ wiring problem: the Appliance Control board sees the lower oven temperature probe as being an open circuit.	- Check wiring in lower oven probe circuit for possible open or short condition - Check RTD resistance at room temperature (compare to probe resistance chart). If resistance does not match the chart, replace the RTD sensor probe. - Let the oven cool down and restart the function. If the problem persists, replace the Appliance Control Board.
F31	Shorted RTD sensor probe/ wiring problem: the Appliance Control board sees the lower oven temperature probe as being a short circuit.	

FAULT CODE DESCRIPTIONS		
Code	**Condition / Cause**	**Suggested Corrective Action**
F43	The microwave "external" cooling fan speed (as read by the tachometer input of the Appliance Control Board) is abnormally slow	- Check if the microwave "external" cooling fan (the one outside of the microwave chassis) is turning. This fan is supposed to be active anytime the microwave is used and is expected to remain ON for a few minutes after the microwave has stopped. A fan not turning at all or a fan abnormally slow will trigger an F43 fault code - Check the connection to the cooling fan speed sensor from P19 on the appliance control board to the sensor located on the fan. - If the fan is not turning or turns very slowly check the 120VAC voltage on the fan. If 120VAC is present at the fan but the fan does not physically turn replace the fan. If 120VAC is not present check the wiring from the Appliance Control Board (is there 120VAC on P16? Is the fan correctly connected between P15 and Neutral?). - If the cooling fan appears to turn normally but an F43 fault code is generated it means there is a problem with the reading of the fan speed sensor. Make sure the connection to the fan sensor is properly made and make sure it is connected to connector P19 on the Appliance Control Board. Make sure the wires in this harness go to the right connector pins. If the wiring is good replace the cooling fan. If the problem persists replace the Appliance Control Board.
F44	The microwave "external" cooling fan speed (as read by the tachometer input of the Appliance Control Board) is abnormally high	- Visually inspect the microwave "external" cooling fan (the one outside of the microwave chassis). This fan is supposed to be active anytime the microwave is used and is expected to remain ON for a few minutes after the microwave has stopped. A fan turning abnormally fast will trigger an F44 fault code. Verify the mechanical construction of the fan. - Verify there is nothing blocking the air flow of the fan (that would make the fan turn faster). - Check the 120VAC voltage on the fan. A voltage higher than 120VAC + 10% could make it go too fast. - If the cooling fan appears to turn normally but an F44 fault code is generated there could be a problem with the reading of the fan speed sensor. Make sure the connection to the fan sensor is properly made and make sure it is connected to connector P19 on the Appliance Control Board. Make sure the wires in this harness go to the right connector pins. If the wiring is good replace the cooling fan. If the problem persists replace the Appliance Control Board.
F61	Loss of zero-cross synchronization signal at the ACB	- Verify the appliance control board (ACB) is connected to L1 on connector J1 pin 1 and to neutral on connector J1 pin 2. - If the line and neutral connector is good and problem persist replace the ACB.
F62	Loss of the zero-cross synchronization signal at the user interface board.	- Verify the zero-cross signal from ACB connector P20 pin 3 is properly connected to the user interface board on connector J1 pin 3. - If the problem persist replace the user interface board.
F80	Communication problem between the User Interface Board and the Microwave Control Board: the User Interface Board is not able to initiate communication with the Microwave Control Board.	- Verify if the microwave is powered (120VAC) by doing this simple test: Open the microwave door and check if the microwave light (inside the cavity) turns ON or not. If it does not turn ON it means the microwave and it's controller have no power and it explains why the Microwave Control Board is not able to communicate with the User Interface Board. In that event an investigation must be done to find out why it has not power: it could be a fuse opened (fuse external to the microwave chassis or fuse internal to the microwave chassis). A fuse could be opened due to an over-current or a microwave door switch problem (see door switch adjustment section). - If the F80 error occurred while the oven was hot there is a possibility the fault code was caused be a microwave thermal cut-out that opened. Verify nothing is blocking the air flowing out of the microwave and verify cooling fans (internal and external) are working. Note that a thermal cut-out will close once the unit cools down. A continuity check across the thermal cut-out terminals can be done. Refer to the thermal cut-out section. - If the microwave appears to be powered (fuses and thermal cut-outs ok) but there is still no communication between the User Interface Board and the Microwave Control Board verify the wire harness that connects the two boards, from J3 on the User Interface Board to connector "D" on the Microwave Control Board. If the harness is good there could be a problem with the User Interface board. Try replacing it. If the problem persists replace the Microwave Control Board.

FAULT CODE DESCRIPTIONS		
Code	**Condition / Cause**	**Suggested Corrective Action**
F81	Damper Error (Icon model only). The Microwave Control Board reports that it is not able to detect the proper position of the damper.	- Expected operation: when the micro-combi unit is plugged in, the damper motor operates (relay RY4) until the damper is opened and the damper switch closes. Then the damper motor stops operation. - If the Microwave Control Board is not reading the position of the damper as opened, the F81 error will also be generated when using microwaves functions (non-convection). - When a convection function is started the Microwave Control Board attempts to move the damper to the closed position by energizing the damper motor and reading the damper switch. If after 59 seconds it has not seen the closed position the microwave stops and the F81 fault code is generated. - If the damper motor does not turn, verify it is getting 120VAC from the Microwave Control Board. If 120VAC is present but the motor still does not turn replace the motor. If 120VAC is not present check the wire harness and the Microwave Control Board. - If the damper motor is good check the damper switch. When switch actuator is pushed by the damper motor cam, a meter should indicate a closed circuit. When power cord is plugged into the wall receptacle, the damper motor operates and damper cam will start to rotate. When the switch actuator is released, a meter should be indicating an open circuit. If improper operation is indicated, replace the damper switch.
F82	Microwave thermistor open error (Icon model only). The microwave control is not able to read correctly the temperature in the microwave cavity, or there is no heat generated by the convection element.	- The fault code could have been generated because the convection element is not heating. In that case the microwave operation stops after approximately 4 minutes and 15 seconds and generates the F82 fault code. Verify the operation of the microwave convection element. Start a convection function (ex: Conv Bake 350F for 10 minutes), wait a few minutes. Check if you see the temperature rising or not in the unit's display. You can also try to touch the left side wall in the microwave cavity (where the convection element is located) to see if the element is heating or not, but take care not to burn yourself. The convection element can also be tested using this procedure: Disconnect power supply cord, and remove outer case. Open the door and block it open. Discharge high voltage capacitor. Make sure the heating element is fully cooled and test as follows: Disconnect wire leads and measure the resistance with an ohmmeter. The resistance between the heating element terminals should be approximately 10.2ohm. Disconnect wire leads and measure the insulation resistance with 500V - 100Mohm insulation resistance meter. The insulation resistance between heating element terminal and cavity should be more than 0.5Mohm. Reconnect all leads removed from components. Reinstall the outer case (cabinet). - Another possible root cause for the convection element not heating could be a door switch problem. If the 3rd door switch is not closed whole the door is closed the convection element will not heat. Refer to the microwave door switches section. - If the convection element is good the problem could come from the microwave thermistor. The thermistor can be tested following this procedure: disconnect power supply cord, and remove outer case. Open the door and block it open. Discharge high voltage capacitor. Disconnect connector-E from the microwave controller. Measure the resistance of the thermistor with an ohmmeter by connecting the ohmmeter leads to connector "E" Pin 3 and 4. At room temperature (68°F(20°C) - 86°F(30°C) the resistance should be approx. 350k - 155K. If the meter does not indicate a resistance within this range replace the thermistor. Reconnect all leads removed from components during testing. Reinstall the outer case (cabinet). Reconnect power supply cord after the outer case is installed. Run oven and check all functions.
F83	Fire detected in microwave oven	- By sensing sudden changes of the microwave thermistor value the Microwave Control Board can detect a fire in the microwave cavity. In that event it terminates all microwave activity and generate an F83 fault code. Clear the condition that possibly created a fire in the cavity and test the microwave again.
F84	Communication problem between the User Interface Board and the Microwave Control Board: the User Interface Board lost communication with the Microwave Control Board (loss of microwave communication "heart beat").	See F80.

FAULT CODE DESCRIPTIONS		
Code	**Condition / Cause**	**Suggested Corrective Action**
F90	Motor Door Latch mechanism failure. The oven control has not been able to lock or unlock the lower oven door successfully.	- Turn off power for 30 seconds, then turn on power. Try again to make the door lock or unlock (ex: initiate a Lockout or a Clean cycle). - Check if the Lock Motor is turning or not. If it is not then check if there is 120VAC at the motor when it is expected to turn to see if the failure originates from a bad motor (120VAC present but not turning) or a problem with the relay board (J1 pin 4 on Appliance Control Board is the output to the Lock Motor). The Lock Motor can also be tested by applying 120VAC directly to the motor (unplug it from the Appliance Control Board first). Replace the Lock Motor or Appliance Control Board if necessary. - If the Lock Motor is turning but the oven control cannot find the locked or unlocked position (ex: motor turns continuously until F90 fault code is generated) the Lock Switch needs to be verified. Check wiring to the Appliance Control Board. Verify with ohmmeter if the switch makes contact properly. If the Lock Switch is defective replace the Motor Lock Assembly. - If all above steps failed to correct the situation, replace the Appliance Control Board.

MICROWAVE EXTERNAL COOLING FAN

In addition to the cooling fan located inside the microwave chassis there is a second cooling fan located on the back of the microwave chassis. This "external" fan is needed to provide adequate ventilation of the microwave oven. It is controlled by the Appliance Control Board and should be active anytime the microwave oven is used (convection or microwaves). It may remain active a few minutes after the microwave has ceased its function to allow further cooling. The fan is equipped with a speed sensor. The sensor is read by the Appliance Control Board. The purpose of this fan speed monitoring is to terminate the microwave activity if the fan turns abnormally slow or fast. Refer to F43 and F44 error codes in the fault code descriptions. The Appliance Control Board starts checking the fan speed approximately 5 minutes after a function was started in the microwave. After this 5 minutes start-up period, it will trigger an alarm at the moment it reads a speed value out of range.

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