## **SERVICE DATA SHEET**

# 318204852 (1007) 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**

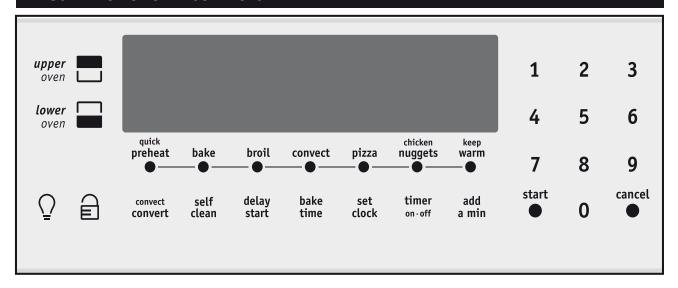
- 1. This unit includes an EOC Relay Board and an EOC Display Board.
- 2. The included board is not field repairable.
- 3. The oven temperature can be calibrated, see Use and Care Manual.
- 4. The pin on board connectors indicates pin number 1.

#### DATA SHEET ABBREVIATIONS AND TERMINOLOGY

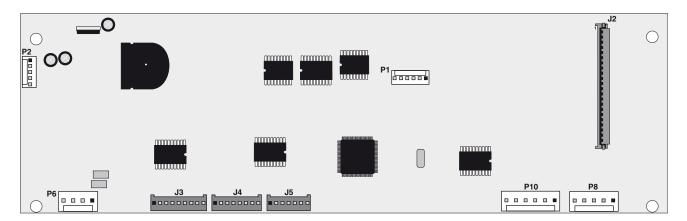
EOC : Electronic Oven Control LED : Light-Emitting Diode MDL : Motor Door Latch

RTD: Resistance Temperature Detector / Oven Probe

## **ILLUSTRATION OF OVEN CONTROLS**



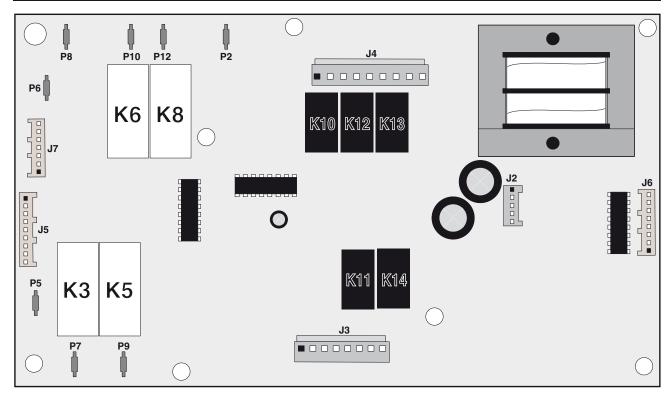
## **ELECTRONIC OVEN CONTROL (EOC) - DISPLAY BOARD**



### **Display Board Legend:**

- J2 Keyboard connection.
- P1 Micro programming (not used).
- P2 DC power input.
- **J3** Relays control outputs (bake & broil burners, light, MDL) for upper oven.
- J4 Relays control outputs.
- J5 Relays control outputs (bake burner, light, MDL, Conv. fan, Conv. element) for lower oven.
- P6 Temperature probe inputs.
- **P8** Door switch and MDL switch for upper oven.
- P10 Door switch and MDL switch for lower oven.

## **ELECTRONIC OVEN CONTROL (EOC) - RELAY BOARD**



#### **Relay Board Legend:**

- P2 Not used.
- **P5** L1, upper oven.
- P6 L1, lower oven.
- **P7** Broil, upper oven.
- P8 Not used.
- **P9** Bake, upper oven.
- P10 Bake, lower oven.
- P12 Convection element, lower oven.

- **K3** Broil relay, upper oven.
- **K5** Bake relay, upper oven.
- **K6** Bake relay, lower oven.
- **K8** Convection element relay, lower oven.
- **K10** Convection fan relay, lower oven.
- **K11** Motor door latch relay, upper oven.
- **K12** Motor door latch relay, lower oven.
- K13 Oven light relay, lower oven.
- **K14** Oven light relay, upper oven.

- **J2** DC power output to display board.
- **J3** AC power outputs (motor door latch, light) for upper oven. L1 and Neutral input.
- J4 AC power outputs (motor door latch, light, convection fan) for lower oven. L1 and Neutral input.
- J5 Relays control inputs (bake & broil burners, light, motor door latch) for upper oven.
- **J6** Relays control inputs.
- J7 Relays control inputs (bake burner, light, motor door latch, conv fan, conv element) for lower oven.

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				

	BURNER RAT	BURNER RATING				
nms)	Upper Oven Broil Burner Rating	10 000 BTU				
0	Burrier haurig					
3	Upper Oven Bake Burner Rating	11 500 BTU				
9						
.8	Lower Oven Bake Burner Rating	12 500 BTU				
.5	Lower Oven Convection					
.8	Element	350W				
.5						
4						



UPPER OVEN CIRCUIT ANALYSIS MATRIX						
	On Relay Board				On Display Board	
	BURI	BURNERS		Door		
	Bake P9	Broil P7	Light J3-6	Motor J3-5	Door Switch P8-3 / P8-5	
Bake	Χ					
Broil		Χ				
Clean	Χ					
Locking / Unlocking				Х		
Light			Х			
Door Open			Χ			
Door Closed					Х	

LOWER OVEN CIRCUIT ANALYSIS Matrix						
	On Relay Board				On Display Board	
	BURNERS Bake P10	Oven Light J4-7	Door Motor J4-6	Conv Fan J4-5	Conv Element P12	Door Switch P10-3 / P10-6
Bake	Х					
Conv Bake/Roast	Х			Χ	Χ	
Clean	Х					
Locking / Unlocking			Χ			
Light		Х				
Door Open		Χ				
Door Closed						X

Relay will operate in this condition only

ELECTRONIC OVEN CONTROL (EOC) FAULT CODE DESCRIPTIONS					
Note: Generally speaking "F1x" implies a control failure, "F3x" an oven probe problem, and "F9x" a latch motor problem.					
Code	Condition / Cause	Suggested Corrective Action			
F10	Control has sensed a potential runaway oven condition. Control may have shorted relay, RTD sensor probe may have a gone bad.	- Check RTD sensor probe and replace if necessary. If oven is overheating, disconnect power. If oven continues to overheat when power is reapplied, replace the EOC-Display Board.			
F11	Shorted Key: a key has been detected as pressed (for a long period) will be considered a shorted key alarm and will terminate all oven activity.	- Press <b>Stop</b> key If fault returns, replace the keyboard (membrane) If the problem persists, replace the EOC- Display Board.			
F13	Control's internal checksum may have become corrupted.	- Press <b>Stop</b> key Disconnect power, wait 10 seconds ad reapply power. If fault returns upon power-up, replace EOC- Display Board.			
F14	Misconnected keyboard cable.	- Disconnect power. Verify the flat cable connection between the keyboard membrane and the EOC- Display Board on J2 If the problem persists, replace the EOC- Display Board If the connection is good but the problem persists, replace the keyboard (membrane switch).			
F15	Controller self check failed.	- Replace the EOC- Display Board.			
F30	Open RTD sensor probe/ wiring problem. Note: EOC may initially display an "F10", thinking a runaway condition exists.	- Check wiring in probe circuit for possible open condition Check RTD resistance at room temperature (compare to probe resistance chart). If resistance does not match the chart, replace the RTD sensor probe.			
F31	Shorted RTD sensor probe / wiring problem.	- Let the oven cool down and restart the function - If the problem persists, replace the EOC- Display Board.			
F62	Missing zero-cross signal.	- The 60Hz synchronization signal (zero-cross) is sent by the EOC-Relay Board to the EOC-Display Board. Verify first the connection between the EOC-Relay Board on connector J2 pin 5 and the EOC-Display Board on connector P2 pin 5 (check for continuity) If wiring is good, replace the EOC-Relay Board If problem persists, replace the EOC- Display Board.			
F90	Door motor mechanism failure. The controller does not see the motor rotating.	- Press <b>Stop</b> key If <b>Stop</b> key does not eliminate problem, turn off power for 30 seconds, then turn on power Check wiring of Lock Motor, Lock Switch and Door Switch circuits Unplug the lock motor from the board and apply power (L1) directly to the Lock Motor. If the motor does not rotate, replace Lock Motor Assembly Check Lock Switch for proper operation (do they open and close, check with ohmmeter). The Lock Motor may be powered as in above step to open and close Lock Switch. If the Lock Switch is defective, replace Motor Lock Assembly If all above steps fail to correct situation, replace the EOC- Display Board or the EOC- Relay Board in the event of a motor that does not rotate.			

## NOTES

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	Neutral Neutral	Neutra	Neutral	N Peutral
	Broil Burner Upper Bake Burner Upper	Motor Door Latch Upper Oven Light Upper	Bake Burner Lower Conv Element Lower*	Neutral Convection Fan Lower Motor Door Latch Lower Oven Light Lower
-	L1 B B A	Motor Doo	L1 Bak	L1 Conve
ard	P5 = L1 IN ↑ ↑ P7 = K3 Relay ↑ P9 = K5 Relay	pin 1 = Neutral IN pin 2 = Not Used pin 3 = IV pin 1 = Not Used pin 3 = IV pin 4 = Not Used pin 5 = K14 Relay pin 7 = Not Used pin 8 = Not Used pin 8 = Not Used	P6 = L1 IN P8 = Not Used P10 = K6 Relay P12 = K8 Relay	pin 1 = Neutral IN hin 2 = Not Used hin 3 = L1 IN hin 4 = Not Used hin 5 = K10 Relay hin 6 = K12 Relay hin 6 = K13 Relay hin 7 = K13 Relay hin 9 = Not Used hin 9 = Not Used
ES61x Relay and Power Board	P5 = L1 IN   P7 = K3 R   P9 = K5 R   P7 = K5 R   P9 = K5 R   P8   P8   P8   P8   P8   P8   P8	Din 1   Din 2   Din 3   Din 3   Din 3   Din 3   Din 4   Din 5   Din 6   Din6	P6 = L1 IN   P8 = NOT U	Din 1   Din 2   Din 3   Din 3   Din 3   Din 3   Din 4   Din 5   Din5   Din 5   Din 5
ay and P	Upper oven relay controls	J6 Relay Controls	J7 Lower oven relay controls	J2 Power Supply Output
361x Rel	otor 1  ed ed ed arrange 1  rner 1	<u> </u>	ner 2 ment 1.2 for 2 th 2	3 V DC SSS
Ä	pin 1 = Oven Ligt pin 2 = Latch Mol pin 2 = Latch Mol pin 4 = Not Used pin 5 = Not Used pin 6 = Bake Burr pin 6 = Bake Burr pin 7 = Boil Burr pin 8 = Not Used	pin 1= Not Used pin 2= Not Used pin 3= Not Used pin 3= Not Used pin 4= Not Used pin 6= Not Used pin 6= Not Used pin 7= Not Used pin 8= PWM relE	pin 1 = Not Used  pin 2 = Bake Burn  pin 3 = Conv Eler  pin 4 = Not Used  pin 5 = Conv Fan  pin 6 = Latch Mot  pin 7 = Oven Ligt	pin 1 = Ground pin 2 = V_LED 8 pin 3 = V_UR 16 pin 4 = Not Used pin 5 = Zero Cros
\.			+ -   -   - + .	'
	- -			16 V DC 4 16 V DC 88d S8d S8d S708s
	pin 1 = Oven Light 1 pin 2 = Latch Motor 1 pin 3 = Not Used pin 4 = Not Used pin 6 = Not Used pin 6 = Bake Burner pin 7 = Boil Burner 1 pin 8 = Mot Used pin 9 = Wiggler		Example   Interest	=  pin 1 = Ground  2 =  pin 2 = V_LED 8 V DC  3 =  pin 2 = V_LED 8 V DC  4 =  pin 4 = Not Used  5 =  pin 5 = Zero Cross
	Upper pin oven pin controls pin	pin 1 =   pin 2 =   pin 2 =   pin 3 =   pin 4 =   pin 4 =   pin 4 =   pin 5 =   pin 5 =   pin 5 =   pin 5 =   pin 7 =   pin 7 =   pin 8 =   pin	J5 pin 1 = 2   Din 2 = 2   Din 3 = 0   Din 4 = 0   Din 4 = 1   Din 5 = 1   Din	P2 pin 1= Power pin 3= Supply pin 4= Input pin 5=
Board	Oven 2 Switch Inputs Inputs	Switch	P6 Probe inputs	
ES61x Display Board	Motor 1 ed Door 1 ed Patch Switch Motor Door 2 ed Door 2	ed ed arch Switch	Trobe Oven 1 Trobe Oven 1 Trobe Oven 2 Trobe Oven 2 Tropin header	
ES61x	Pin 1 = Switch Motor 1	pin 4 = Not Used pin 5 = Not Used pin 5 = Not used pin 6 = return Patch Switch	Pin 1 = Probe Oven 1	
•	Switch Motor Door 1 Switch Door 1 Switch Motor Door 2 Switch Motor Door 2		Oven Probe 1  Oven Probe 2  Keyboard	N O O O
	Switch N Switch N Switch N		Over Over Kep	