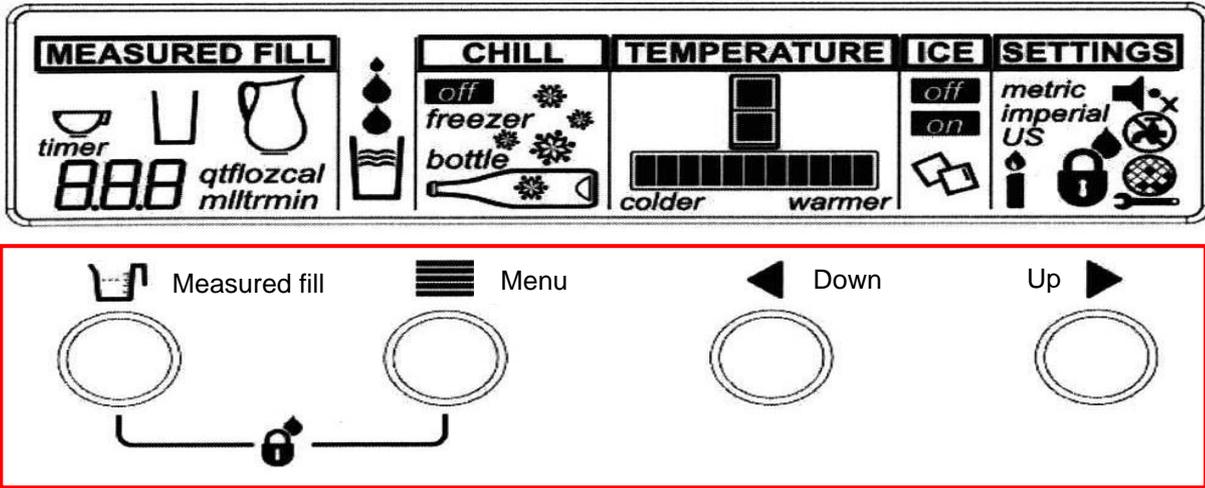


Diagnostic Manual

Models:
RF610A, RF540A, RF201A





Key Presses (Products before January 2009) – with measured fill feature

To activate any mode, certain combinations of key presses are required. The key-presses are as follows. Key presses used by the service technician are those shown shaded.

Function	Key Presses	Action	Press Time
Key Silent Mode	Menu ≡	On/Off	Hold down for 4 seconds
Key & Dispenser Lock	Menu + Measured fill ≡ + ☪	On/Off	Hold down for 2 seconds
Key Lock	Menu + Measured fill ≡ + ☪	On/Off	Hold down for 4 seconds
Diagnostic Mode	Menu + Up ≡ + ▶	On	Hold down for 4 seconds
Manually Forced Defrost	Menu + Down ≡ + ◀	On	Hold down for 4 seconds
Sabbath Mode	Menu + Measured fill + Down ≡ + ☪ + ◀	On/Off	Hold down for 4 seconds
Disable Filter Alarm	Menu + Measured fill + Up ≡ + ☪ + ▶	On/Off	Hold down for 4 seconds

Function	Key Presses	Action	Press Time
Show Off Mode	Menu + Down + Up  +  + 	On/Off	Hold down for 4 seconds
Flowmeter Calibration	Measured Fill + Down  + 	On	Hold down for 4 seconds
Filter Reset	Measured Fill + Up  + 	Reset	Hold down for 4 seconds
Manually Force Icemaker	Measured Fill + Down + Up  +  + 	Activates once	Hold down for 4 seconds

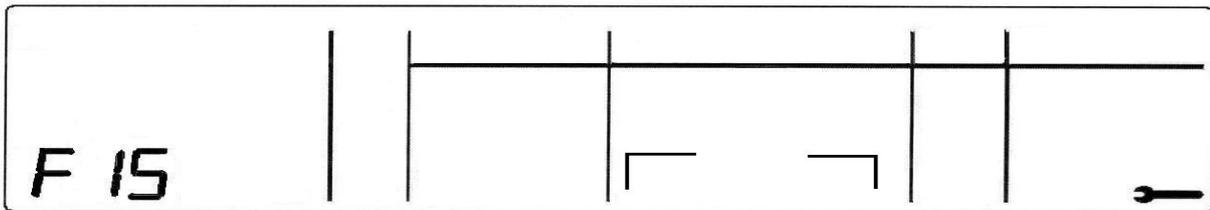
Key Presses (Products from January 2009) – NON measured fill

Function	Key Presses	Action	Press Time
Key Silent Mode	Up + Down 	On/Off	Hold down for 4 seconds
Dispenser Lock	Lock 	On/Off	Hold down for 2 seconds
Key Lock	Lock 	On/Off	Hold down for 4 seconds
Diagnostic Mode	Menu + Up  + 	On	Hold down for 4 seconds
Forced Defrost	Menu + Down  + 	On	Hold down for 4 seconds
Sabbath Mode	Menu + Down + Lock  +  + 	On/Off	Hold down for 4 seconds
Disable Filter Alarm	Menu + Up + Lock  +  + 	On/Off	Hold down for 4 seconds
Show Off Mode	Menu + Down + Up  +  + 	On/Off	Hold down for 4 seconds
Filter Reset	Up + Lock  + 	Reset	Hold down for 4 seconds
Force Manual Icemaker	Lock first then Down + Up  +  + 	Activates once	Press Lock key first then Down & Up keys and hold all 3 keys for 4 seconds

Diagnostics

A spanner symbol and LCD fault code will appear automatically if there is a fault in the temperature measuring system, defrost system, fans or low ambient heater. (Refer diagram below.)

When the PC door is opened an alarm will sound. The number of beeps also indicates the fault code. Pressing any of the control buttons can deactivate these alarms.



Example: When a fault develops, the LCD fault code appears with the spanner.

After rectifying the problem, the fault code and spanner will disappear. Faults are only rectified when that feature is used, so in the case of a defrost fault, the code will remain until a defrost is initiated and it is successful. To enter the diagnostic mode:

- Press and hold the **MENU** button, then press the **UP** button for 4 seconds. This enters Diagnostic mode.

Fault Codes

Fault Code 1

Reason: On the last power up, the power module failed self test.
Primary Action: Replace the power module.

Fault Code 2

Reason: The previous 2 defrosts were aborted after 40 minutes.
Primary Action: Check the defrost element assembly in the FC. If faulty, replace.

Fault Code 3

Reason: The resistance of all the temperature sensors is outside the normal range (> 45K Ohms).
Primary Action: Check the 6-way RAST connector at the power module.
Secondary Action: Re-terminate the 6-way RAST connector.
Tertiary Action: Replace the power module.

Fault Code 4

Reason: The resistance of all the temperature sensors is outside the normal range (< 660 Ohms).
Primary Action: Check the 6-way RAST connector at the power module.
Secondary Action: Re-terminate the 6-way RAST connector.
Tertiary Action: Replace the power module.

Fault Code 5

Reason: The resistance of the FC sensor is outside the normal range (> 45K Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 6

Reason: The resistance of the FC sensor is outside the normal range (<660 Ohms).
Primary Action: Check the sensor connection at the power module.
Secondary Action: Replace the sensor.

Fault Code 7

Reason: The resistance of the Evaporator sensor is outside the normal range (> 45K Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 8

Reason: The resistance of the Evaporator sensor is outside the normal range. (<660 Ohms)

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 9

Reason: The resistance of the PC sensor is outside the normal range (> 45K Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 10

Reason: The resistance of the PC sensor is outside the normal range (< 660 Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 11

Reason: The current measured for the ambient heater, PC fan and FC fan is lower than expected.

Primary Action: Check the 6-way fan/LAH RAST connector at the power module.

Secondary Action: Re-terminate the 6-way fan/LAH RAST connector.

Tertiary Action: Replace the power module.

Fault Code 12

- Reason: The current measured for the ambient heater, PC fan and FC fan is higher than expected.
- Primary Action: Check the 6-way fan/LAH RAST connector at the power module.
- Secondary Action: Re-terminate the 6-way fan/LAH RAST connector.
- Tertiary Action: Replace the power module.

Fault Code 13

- Reason: The low ambient heater is drawing less current than expected. Either the heater or wiring is open circuit or the heater is faulty.
- Primary Action: Check the wiring and connections at both heater and power module.
- Secondary Action: Check the low ambient heater resistance. If not within limits, replace.

Fault Code 14

- Reason: The low ambient heater is drawing more current than expected. Either there is a short in the heater, or the heater is faulty.
- Primary Action: Check the wiring and connections at both heater and power module.
- Secondary Action: Check the low ambient heater resistance. If not within limits, replace.

Fault Code 15

- Reason: The PC fan is drawing less current than is expected. Either the wiring is open circuit or the fan is faulty.
- Primary Action: Check the PC fan wiring and connections at both fan and power module.
- Secondary Action: Check the fan. If faulty, replace fan.

Fault Code 16

Reason: The PC fan is drawing more current than is expected. Either the wiring is shorted or the fan is faulty.

Primary Action: Check the PC fan wiring and connections at both fan and power module.

Secondary Action: Check the fan. If faulty, replace fan

Fault Code 17

Reason: The FC fan is drawing less current than is expected. Either the wiring is open circuit or the fan is faulty.

Primary Action: Check the FC fan wiring and connections at both fan and power module.

Secondary Action: Check the fan. If faulty, replace fan.

Fault Code 18

Reason: The FC fan is drawing more current than is expected. Either the wiring is shorted or the fan is faulty.

Primary Action: Check the FC fan wiring and connections at both fan and power module.

Secondary Action: Check the fan. If faulty, replace fan.

Fault Code 20

Reason: The flapper heater current is low.

Primary Action: Check the Molex connections for the flapper heater.

Secondary Action: Check the resistance of the heater. If open circuit, replace the heater.

Fault Code 21

Reason: The flapper heater current is high.

Primary Action: Check for short circuit the flapper heater. If faulty, replace the heater.

Fault Code 22

Reason: The resistance of the PC sensor 2 is outside the normal range (> 45K Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 23

Reason: The resistance of the PC sensor 2 is outside the normal range (< 660 Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 24

Reason: The resistance of the ice tray sensor is outside the normal range (> 45K Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 25

Reason: The resistance of the ice tray sensor is outside the normal range (< 660 Ohms).

Primary Action: Check the sensor connection at the power module.

Secondary Action: Replace the sensor.

Fault Code 26

Reason: The icemaker timer has timed out.

Primary Action: The icemaker gearbox is not returning to the start position where it sends a signal to the controller. Check the gearbox, and if faulty, replace.

Fault Code 27

Reason: The icemaker motor current high.

Primary Action: Check the motor for obstruction. Check the wiring at both the icemaker gearbox and the power module.

Secondary Action: Test the motor operations. Check the gearbox motor resistance. If not within limits, replace.

Fault Code 28

Reason: Icemaker solenoid current high.

Primary Action: Check connections to solenoid.

Secondary Action: Check resistance of solenoid. Replace solenoid if faulty.

Fault Code 29

Reason: Icemaker solenoid current low.

Primary Action: Check connection on solenoid.

Secondary Action: Check resistance of solenoid. Replace solenoid if faulty.

Fault Code 40

Reason: Icemaker solenoid transistor 1 short circuit. A transistor on the control module that drives the icemaker solenoid has failed. This could be as a result of a fault in the solenoid.

Primary Action: Check solenoid resistance. If not within limits, replace solenoid. Check wiring and connections of solenoid and module. If OK, replace control module.

Fault Code 41

Reason: Icemaker solenoid transistor 2 short circuit.

Primary Action: Check solenoid resistance. If not within limits replace solenoid. Check wiring and connections of solenoid and module. If OK, replace control module.

Water Dispenser Fault Codes

Fault Code 32

Reason: Solenoid driver 1 has failed. If this happens, the water dispenser will still be operating, however as solenoid driver 1 has failed, the product will revert to solenoid driver 2 to dispense water. Fault code 32 will be displayed to make the customer aware of the fault.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid.

Secondary Action: If solenoid resistance OK, replace the display module.

Fault Code 33

Reason: Solenoid driver 2 has failed. The display module has detected a fault with solenoid driver 2, however solenoid driver 1 may still be operating and the water dispenser is still working.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid.

Secondary Action: If solenoid resistance OK, replace the display module.

Fault Code 34

Reason: Both solenoid drivers have failed.

Primary Action: Check the solenoid resistance. If not within limits, replace the solenoid.

Secondary Action: If solenoid resistance OK, replace the display module.

Display Module Fault Codes

If a fault has occurred relating to the display board, the fault code will show on the display just like any other fault. The fault history is a tool to view intermittent faults.

Note: There will be no alarm/beeping if these faults occur.

Code	Fault
F30	No display signal received (shorted or broken wire)
F31	No display signal received (shorted or broken wire) clock or data line.

Icemaker Fault Codes

If a fault should develop with the Ice Making system, a LED will illuminate on the ice making PCB, which is attached to the power module. The LED is visible from the back of the product; hence the product must be wheeled away from the wall to view the fault codes. The number of LED flashes represents the fault code with the icemaker itself.

Code	Fault
0 (No LEDs)	No fault
1	Motor timeout
2	Motor current high – motor obstructed
3	Temperature sensor too hot
4	Temperature sensor too cold (or open circuit)
5	Water solenoid – current high

Water Solenoid Resistance

- Resistance of the water valves is $14 \Omega \pm 5\%$

Checking Ice Maker Sensor

- Disconnect the refrigerator from the power supply.
- Remove the power module from the product.
- Remove the 11-pin RAST connector from the icemaker PCB.
- The two white wires (Between Pin 10 & Pin 11) at the end of the RAST connectors are the sensor wires.
- Testing of the sensor should be in a known stable temperature, such as a glass of water full of ice cubes.

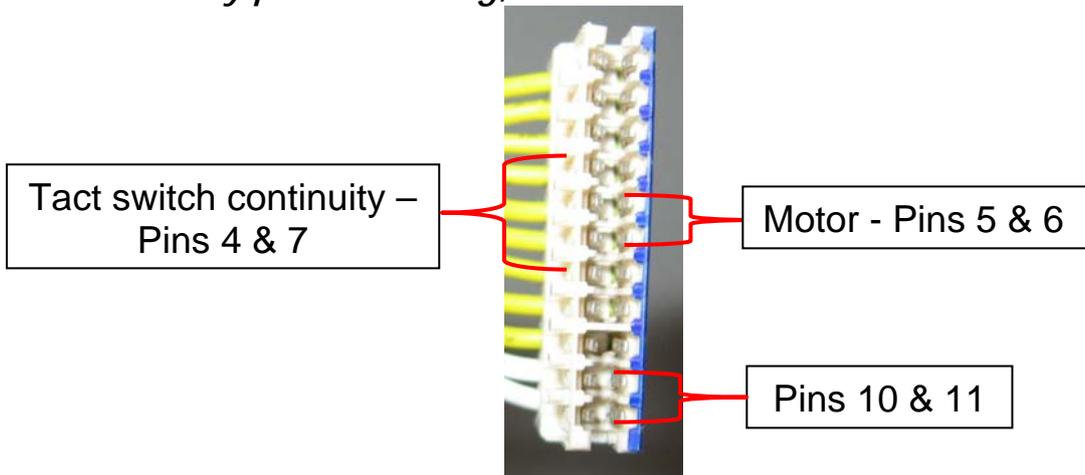
Icemaker Sensor Resistance Table

Temperature (°C)	Resistance (K Ω \pm 5%)
-30.0	25.17
-25.0	19.43
-20.0	15.13
-15.0	11.88
-10.0	9.392
-5.0	7.481
0.0	6.000
5.0	4.844
10.0	3.935
15.0	3.217
20.0	2.644
25.0	2.186
30.0	1.817
35.0	1.518
40.0	1.274
45.0	1.075
50.0	0.9106

Testing Icemaker Motor

- Check the resistance of the motor between pins 5 & 6 – Resistance should be $35\Omega \pm 5\%$.
- Check the tact switch continuity between pins 4 & 7 – The switch should be closed.

Note: To identify pin numbering, Pin 10 and 11 are White wires



Input / Output Status

To enter input / output status:

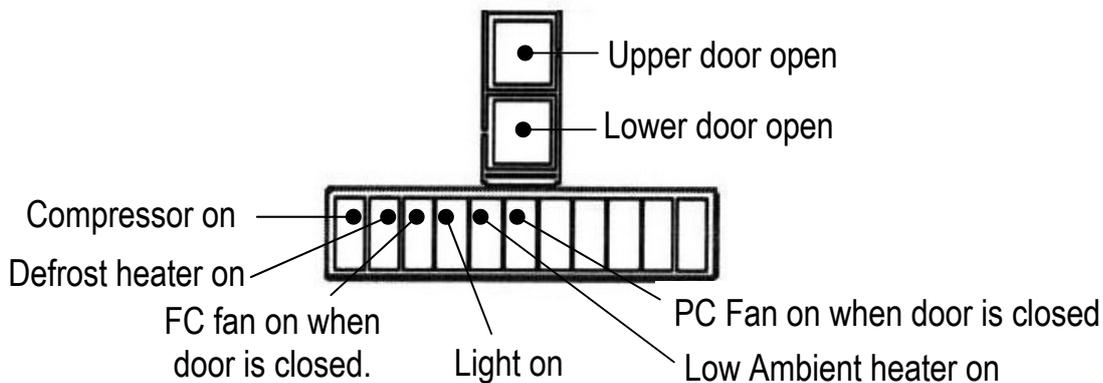
- Press and hold the MENU button, then press the UP button for 4 seconds. This enters Diagnostic mode.
- Press the UP button three times. The current input /output status will be displayed.

If a device is on or a door is open, the respective LCD will be on.

Return to normal operation by pressing the MENU button.

Note: Only the first 6 LCD's are used. The last 5 are not used.

Input/Output Status



Data Download

To place the product into download mode, press and hold the MENU button, then press the UP button for four seconds, then press DOWN button.

Once the product is in a download mode, either of the LEDs can be used. Place the download pen towards the LED and start the download. The display will have the letters “dl”, signifying the product is in a download mode.

WIRING DIAGRAM I&W VCC 900 WIDE

