



Flame Safeguard Fault Code Diagnostics



As manager of Tech Services, it probably comes as no surprise I spend some time discussing fault codes and corresponding corrective actions. If there is only one thing you ever do, because I recommended you to do so, is this ... **GET A HONEYWELL KEYBOARD DISPLAY MODULE** ... it pinpoints the issue and saves hours of time.

For example, a “blinking 22 fault code” on the flame safeguard corresponds to “flame signal absent.” Well Joyce, what does this mean? It could be the pilot, main flame, or a fault during ignition - which obviously leads to more questions and required trouble-shooting. However with the Display Module, a direct read-out identifies the fault and when it occurs.



We know right where to go, trust me this little device will save you hours and pay for itself in one call. I have compiled a list of faults I see and what to do to correct them (see below).

As always, feel free to call in.

Joyce Vino

Attachments:

- Honeywell Trouble Shooting for TS boilers - Blinking Codes
- Honeywell Trouble Shooting for TS boilers – Keyboard Display Module

Trouble Shooting – Full Modulation Evolution Boilers

BLINKING CODES

Fault Code 1-1, Low Line voltage

Check incoming line pressure at back of boiler in junction box.

Fault Code 2-1, Flame sensed when not expected

Make sure there is no flame present in combustion chamber

Remove the amplifier and check connections

Remove the UV scanner from pilot still wired up and see if it is strobing. If it is, it is bad. Replace it.

Fault Code 2-2, Main flame failure during RUN

Check the main gas valves for proper operation

Check the gas supply for proper pressure

Confirm all manual gas shut-off valves are open (inside and outside boiler jacket)

Confirm flame is bright orange when firing on high and low fire

If not, adjust combustion to obtain O₂ readings between 5% and 6%

Check flame signal on high fire and also low fire

If flame signal is unsteady at low fire check the following:

Remove pilot assembly and make sure insulation above the burner is not in way of UV scanner

If so, use large screwdriver to push insulation back (be careful not to damage burner)

UV scanner could be getting hot

Check heat block below UV scanner for cracks

Make sure heat block is in place and UV scanner connection is tight

Install a new air cooled pilot assembly

Fault Code 2-2, Main flame failure during IGNITION

Confirm all manual gas shut-off valves are open (inside and outside boiler jacket)

Check the main gas valves for proper operation

Check the gas supply for proper pressure

Check for proper gas line sizing (if main gas line is too small pilot could be extinguished when main gas valves open – observe pilot when main gas valves open, confirm it remains burning)

If fan was replaced, be sure air orifice between fan and mixer was re-installed

Fault Code 2-2, Pilot flame failure

Check flame signal during 1st 5 seconds of pilot ignition (PFEP is 10 seconds)

If it is 0vdc, no spark is present

Check ignition transformer and ignition cable

Check ignition electrode for cracked ceramic insulator

Remove pilot assembly and check for carbon build-up or carbon thread between electrode and pilot assembly (clean and replace)

Check and tighten pilot assembly ground wire

Fault Code 2-2, Pilot flame failure (continued)

If it is 5vdc for 5 seconds then drops to 0vdc for 6 thru 10 seconds, spark is present, but not gas

Boiler has early spark termination, ignition transformer shuts off after 5 seconds

Confirm pilot manual gas cock is open (rear of boiler)

Check and measure pilot gas pressure – adjust as needed to assure blue pilot flame

Check operation of pilot solenoid valve

Remove gas tubing going to pilot assembly and check gas orifice in brass elbow fitting

Remove and clean gas orifice (set screw with hole drilled in it) if needed, then replace orifice

Fault Code 3-1, Running interlock during prepurge (air switch circuit)

Check to make sure fan is starting on a call for heat

If so, air switch must make with-in 10 seconds or lock-out will occur

Check for a blockage in the air inlet ducting

Check air tubing going to air switch for blockage or loose connections

Check for cracks in air switch housing

Check proper operation of air switch, (air switch closes at 0.5” W.C. air pressure)

Check to see if fan coming up to speed quickly (look at vfd display)

If not, check acceleration time in programming of vfd (see vfd manual and vfd parameter list)

If fan is starting, but then slowing down before making air switch

Check to see if CRA1 relay coil is losing 120vac signal from Flame safeguard

Check the CRA1 relay for tight connections

Remove relay from socket and firmly replace

Wiggle relay while fan is starting, does display on vfd flash erratically?

Install new My2 relay and new relay socket

If fan is not starting, check all of the above and then the following

Is vfd in a fault condition (see vfd manual to check faults)

Check the connections between the vfd and the fan motor

Check the fan motor for electrical failure

Fault Code 3-1, Running interlock (air switch circuit during RUN)

Put the boiler in manual mode (press and hold the exit button on RWF40 for 5 seconds)

Run the boiler on low fire and check the air pressure going to the air switch

If it is 0.5" W.C. or less, increase the low fire Hz setting of the vfd (see vfd manual)

If it is above 0.5" W.C., replace air switch (air switch closes at 0.5" W.C. air pressure)

Check for loose air tubing connections between fan and air switch

Check for cracks in air switch housing

Is fan slowing down below low fire Hz setting

Check to see if CRA1 relay coil is losing 120vac signal from Flame safeguard

Check the CRA1 relay for tight connections

Remove relay from socket and firmly replace

Wiggle relay while fan is running, does display on vfd flash erratically?

Install new MY2 relay and new relay socket

Is vfd in a fault condition (see vfd manual to check faults)

Check the connections between the vfd and the fan motor

Check the fan motor for electrical failure

Fault Code 3-2, Running ILK On

Airflow switch is closed when it should be open.

Airflow switch could be faulty or if you were troubleshooting with jumpers you may have left the jumper on the airflow switch. You can not start the boiler with a jumper on the switch. remove it.

Fault Code 4-1, No Purge Card

The purge card is missing. Replace it. When you get a new Honeywell flame safeguard as a replacement part, it does not come with the purge card or amplifier card. You must move them to the new control from the old one.

Code 4-4, Jumper Wrong

Jumper configuration was changed after the 200 hr. burn it time. The control has to be replaced. You cannot cut the jumpers after 200 hrs.of operation.

Fault Code 5-1, Preignition ILK

Occurs with IRI POC if the POC switches are not working or making in time. Check POC on valves to determine which one is bad. Replace actuator. You cannot repair the switches.

Fault Code 5-2 , high fire sw., low fire switch on

If you have a low proven start option on the boiler, make sure the gap on the spark plug is 1/8". If it is not a low proven start boiler and you replaced the Honeywell Flame Safeguard base, make sure there is a jumper from 18 to 19.

Trouble Shooting – Full Modulation Evolution Boilers **WITH A KEYBOARD DISPLAY MODULE**

Fault Code 1, No Purge Card

The purge card is missing. Replace it. When you get a new Honeywell flame safeguard as a replacement part, it does not come with the purge card or amplifier card. You must move them to the new control from the old one.

Fault Code 10 or 33, Pre-Ignition ILK

Occurs with IRI POC if the POC switches are not working or making in time. Check POC On valves to determine which one is bad. Replace actuator. You can not repair the switches.

Fault Code 11 or 12, Running ILK On

Airflow switch is closed when it should be open.

Airflow switch could be faulty or if you were troubleshooting with jumpers you may have left the jumper on the airflow switch. You can not start the boiler with a jumper on the switch. remove it.

Fault Code 14, 20, 31, or 45, High Fire Switch, Low Fire Switch On

If you have a low proven start option on the boiler, make sure the gap on the spark plug is 1/8". If it is not a low proven start boiler and you replaced the Honeywell Flame Safeguard base, make sure there is a jumper from 18 to 19.

Fault Code 9, 15, or 18, Flame sensed when not expected

Make sure there is no flame present in combustion chamber

Remove the amplifier and check connections

Remove the UV scanner and look into the lens. If it is strobing, it is defective. Replace it.

Fault Code 17, Main flame failure during RUN

Check the main gas valves for proper operation

Check the gas supply for proper pressure

Confirm all manual gas shut-off valves are open (inside and outside boiler jacket)

Confirm flame is bright orange when firing on high and low fire

If not, adjust combustion to obtain O2 readings between 5% and 6%

Check flame signal on high fire and also low fire

If flame signal is unsteady at low fire check the following:

Remove pilot assembly and make sure insulation above the burner is not in way of UV scanner

If so, use large screwdriver to push insulation back (be careful not to damage burner)
UV scanner could be getting hot
Check heat block below UV scanner for cracks
Make sure heat block is in place and UV scanner connection is tight
Install a new air cooled pilot assembly

Fault Code 19, Main flame failure during IGNITION

Confirm all manual gas shut-off valves are open (inside and outside boiler jacket)
Check the main gas valves for proper operation
Check the gas supply for proper pressure
Check for proper gas line sizing (if main gas line is too small pilot could be extinguished when main gas valves open – observe pilot when main gas valves open, confirm it remains burning)
If fan was replaced, be sure air orifice between fan and mixer was re-installed
If you notice a hard light off or a woofing at ignition, you need to add more gas. If you do not have more gas available on the jobsite, call the factory to see what we can turn the purge down to for a smoother light off. You must have 4 air changes. We can give you the allowable min setting for purge.

Fault Code 28, Pilot flame failure

Check flame signal during 1st 5 seconds of pilot ignition (PFEP is 10 seconds)
If it is 0vdc, no spark is present
 Check ignition transformer and ignition cable
 Check ignition electrode for cracked ceramic insulator
 Remove pilot assembly and check for carbon build-up or carbon thread between electrode and pilot assembly (clean and replace)
 Check and tighten pilot assembly ground wire

Fault Code 28, Pilot flame failure (continued)

If it is 5vdc for 5 seconds then drops to 0vdc for 6 thru 10 seconds, spark is present, but not gas
 Boiler has early spark termination, ignition transformer shuts off after 5 seconds
 Confirm pilot manual gas cock is open (rear of boiler)
 Check and measure pilot gas pressure – adjust as needed to assure blue pilot flame
 Check operation of pilot solenoid valve
 Remove gas tubing going to pilot assembly and check gas orifice in brass elbow fitting
 Remove and clean gas orifice (set screw with hole drilled in it) if needed, then replace orifice

Fault Code 29, Lockout interlock (air switch circuit)

Check to make sure fan is starting on a call for heat
 If so, air switch must make with-in 10 seconds or lock-out will occur
 Check for a blockage in the air inlet ducting
 Check air tubing going to air switch for blockage or loose connections

Check for cracks in air switch housing

Check proper operation of air switch, (air switch closes at 0.5" W.C. air pressure)

Check to see if fan coming up to speed quickly (look at vfd display)

If not, check acceleration time in programming of vfd (see vfd manual and vfd parameter list)

If fan is starting, but then slowing down before making air switch

Check to see if CRA1 relay coil is losing 120vac signal from Flame safeguard

Check the CRA1 relay for tight connections

Remove relay from socket and firmly replace

Wiggle relay while fan is starting, does display on vfd flash erratically?

Install new My2 relay and new relay socket

If fan is not starting, check all of the above and then the following

Is vfd in a fault condition (see vfd manual to check faults)

Check the connections between the vfd and the fan motor

Check the fan motor for electrical failure

Fault Code 30, Running interlock (air switch circuit during RUN)

Put the boiler in manual mode (press and hold the exit button on RWF40 for 5 seconds)

Run the boiler on low fire and check the air pressure going to the air switch

If it is 0.5" W.C. or less, increase the low fire Hz setting of the vfd (see vfd manual)

If it is above 0.5" W.C., replace air switch (air switch closes at 0.5" W.C. air pressure)

Check for loose air tubing connections between fan and air switch

Check for cracks in air switch housing

Is fan slowing down below low fire Hz setting

Check to see if CRA1 relay coil is losing 120vac signal from Flame safeguard

Check the CRA1 relay for tight connections

Remove relay from socket and firmly replace

Wiggle relay while fan is running, does display on vfd flash erratically?

Install new MY2 relay and new relay socket

Is vfd in a fault condition (see vfd manual to check faults)

Check the connections between the vfd and the fan motor

Check the fan motor for electrical failure

Fault Code 50, Jumper Wrong

Jumper configuration was changed after the 200 hr. burn in time. The control has to be replaced.

You can not cut the jumpers after 200 hrs. of operation.