

Remote panel includes:

- Record the unit's Serial Number. The first 2 digits indicate the year of manufacturing.
- Determine the remote panel type from the list below. Knowing the sequence of operation will help aid in trouble shooting this equipment. See sequence of operation.
- If there is not an electrical diagram available on site, select an electrical diagram based on the remote panel type from the library on our website. Review the wiring connections between the remote panel and the control panel, do the electrical connections match?
- Compare the gas type and supply pressure on site with the equipment rating tag.



Bananza®

1100 Seven Mile Road NW Comstock Park, MI 49321

Telephone: +1.616.726.8800

www.bananza.com

BNSCRTS

08/22 Orig

Problem / Possible Causes & Solutions

Supply fan will not start

- a. Check high voltage fuses and wiring. Verify voltage at all 3 phases to motor starter is within + or – 10% of voltage rating on the equipment's data plate.
 - Replace blown fuses if needed.
- b. Verify state of motor overload relay
 - If overload relay is tripped, reset it, and check voltage and amperage on motor legs once running to ensure motor is not running over its rated running amps.
 - Verify motor overload setting matches the full amps on the motor rating tag for the specific supply voltage.
 - Check the motor, does the shaft turn freely, is it hot or is there a smell that suggest the motor windings have failed, measure resistance to ground at each motor lead. Reference motor manufacture manual. Replace motor if needed.
- c. Supply fan start delay timer not timed out or failed.
 - Verify timer is set to on delay, for approximately 30 seconds, and wired normally open.
 - Verify timer gets energized and times out closing contact to start fan. If not replace fan start delay timer.
- d. Verify coil voltage on motor starter is 120 VAC.
 - If voltage present and motor starter contacts do not engage, replace contactor and overload.

Burner will not light

- a. No power to burner control / no trial for ignition when burner switch is on
 - Using the airflow switch test ports, check the pressure differential across the burner while in spray mode with all dampers open and supply fan running. Target pressure differential is 0.5-1.0" W.C. The low airflow switch opens when the pressure differential falls below 0.2" W.C. The high airflow switch opens when the pressure differential exceeds 1.35" W.C.

If pressure differential is too low, optional clogged filter indicator may be on:

- a. Check supply fan rotation, clean or replace air filters, and verify supply fan blower belts are in good condition and tensioned properly.
- b. Verify no blockage exists in the intake or discharge duct such as closed dampers or other debris. Improper duct design can also create fan system effect reducing airflow.
- c. Check that the exhaust fan is running, and the booth is not over pressurized. Proper supply and exhaust air flow is required to maintain correct booth pressure and not create a system effect that negatively affects airflow across the burner.
- d. Increase air flow by increasing supply fan speed if the equipment has an adjustable motor sheave. Close the sheave groove(s) to increase the fan speed. Measure and verify motor operating amps while increasing fan speed to avoid overloading the motor.

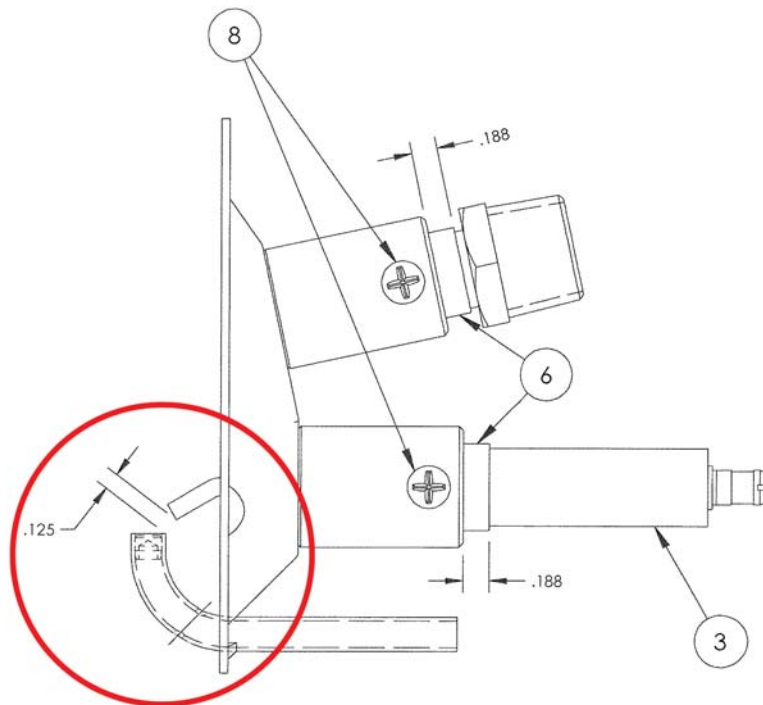
Burner will not light (continued)

If pressure differential across the burner is too high:

- a. Adjust motor sheave groove(s) open to slow the fan speed.
 - Check high temperature limit switch located on the outside of the supply fan blower housing, reset switch if tripped.
Important Note: HTL trips typically coincide with low airflow or temperature control issues. Always investigate and correct the cause for HTL trip.
 - If equipped, check high and low gas pressure switches and reset if needed. Verify inlet gas pressure is between the minimum and maximum values on the unit ratings tag while the burner is operating. If the high gas pressure switch is tripped, measure the gas pressure to the burner while the burner is forced into high fire. Make sure high fire gas pressure is set to approximate high fire pressure setting listed on the unit rating tag. If the high fire gas pressure is set properly, adjust high gas pressure switch setting to 1.5" above the burner high fire gas pressure setting.

Flame Relay / Burner Control alarms during PTFI - Pilot Trial for Ignition

- a. Verify igniter sparks when Pilot (Honeywell)LED or PTFI (Fireye) LED illuminates
- b. No spark present:
 - Inspect the igniter. Clean or replace igniter as condition requires.
 - Verify 120 VAC to ignition transformer and that ignition cable is in good condition.
 - Verify gap between igniter and pilot gas tube is about 1/8" if burner is equipped with Midco burner and pilot assembly.



Burner will not light (continued)

- On older units with a Maxon burner, verify igniter gap shown below for Maxon igniters I-31 and I-31-1.



I-31



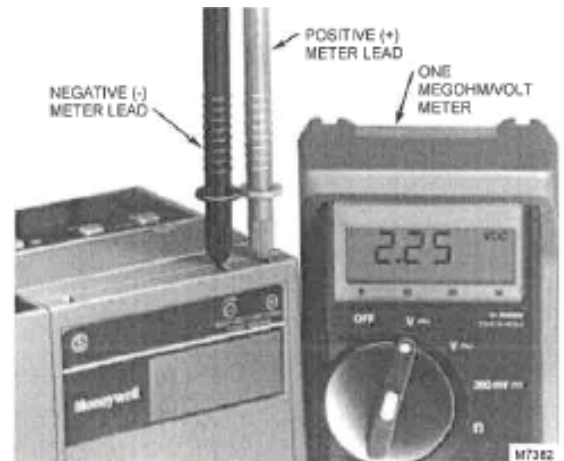
I-31-1

Spark verified visually, but pilot does not light:

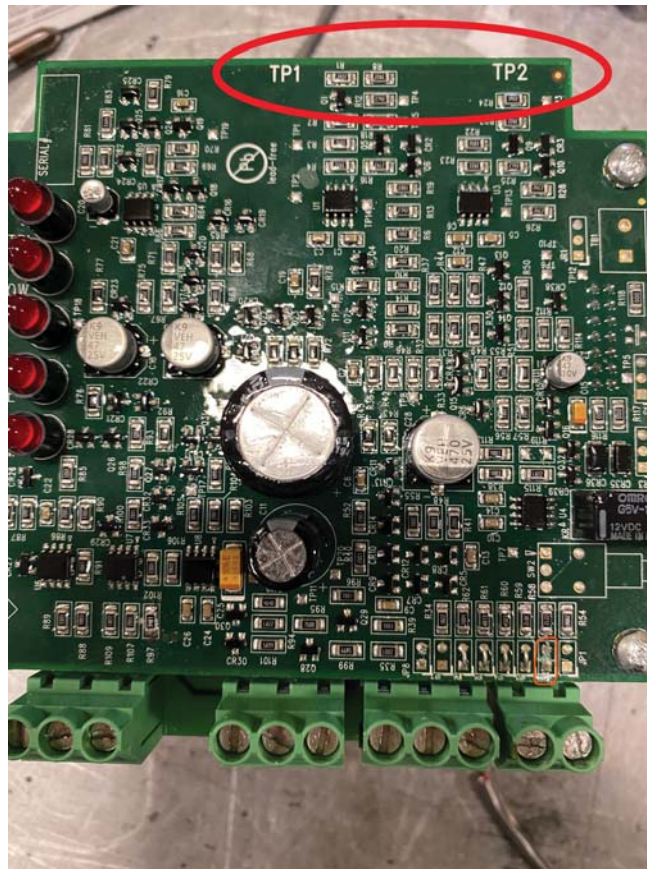
- Verify pilot solenoid is powered with 120 VAC when Pilot / PFTI LED illuminates
- Verify pilot gas pressure of somewhere in the range of 2-3" (+-) W.C for NG or 1-1.5" (+-) W.C for LP is present downstream of pilot solenoid and pilot regulator. Adjust the pilot regulator as needed. Once visible, the pilot flame should be approximately the size of a baseball.
- Verify no obstructions in pilot line/tubing such as ice, water, rust, or other debris.
- Clear debris, replace faulty pilot solenoid valve and / or pilot regulator if needed.

Spark and pilot flame verified visually:

- Check for adequate pilot flame signal
 - 1.25-5.0 VDC flame signal needed for Honeywell 7800 Series burner control, measure DC voltage at + and - terminals on bottom right of amplifier card.



- 6-18 VDC flame signal required for Fireye M4RT1 burner control, measure across TP1 and TP2 terminals at the top right of control behind the green board.



- If no flame signal is measured, using a lighter, either place flame in front of the UV scanner lens or engulf the flame rod in flame. If the flame LED illuminates on the Honeywell or Fireye control, the UV scanner or flame rod can be considered good. If flame LED does not illuminate, replace the UV scanner, the flame rod or flame rod wiring as needed.
- b. Flame sensor verified functional
 - Verify UV scanner or flame rod is angled properly to detect the pilot flame.
 - Check burner plates and casting for corrosion, cracks, or enlarged holes.
 - c. Clean burner, flame rod or igniter as needed
 - d. Drill burner orifices out if plugged, see drill chart, do not use an oversized drill bit
 - e. Replace burner if open cracks in stainless steel air mixing plates or burner orifice holes have been enlarged
 - Verify the differential pressure drop across burner is within the operating range of the air flow switches. Low opens at 0.2" W.C and the high opens at 1.35" W.C. Target pressure range is 0.5" W.C to 1.1" W.C
 - f. See steps above for increasing or decreasing pressure differential across the burner.
 - g. Replace burner if damaged or corroded. Contact Bananza with unit Serial # for replacement pricing.

Burner control alarms during Main Flame Establishing Period or Run – Main Flame Failure

- a. Measure inlet gas pressure to the manifold and verify it is within the minimum and maximum gas pressure ratings listed on the unit ratings tag during burner operation.
 - Verify main gas valves open when energized
- b. Measure and verify voltage present at gas valves when main flame is expected.
- c. Replace main valves if voltage present but no gas flow.
 - Verify low fire flame is large enough for detection
- d. With the burner operating, remove one wire from MRV coil to force minimum gas flow to the burner, low fire condition. Visually verify a continuous flame across the entire burner, flame length approximately 2" long.
- e. If flame length is less than 1.5" to 2" in length with no gaps in flame across the burner, adjust the low fire setting on MRV to increase the minimum gas flow. See Appendix I. Loosen set screw C and increase flow using the D adjustment cam.
- f. If gaps in flame ribbon or burner not lit fully, drill out burner orifice holes as needed.
 - Check flame signal using instructions shown above.
- g. Check flame sensor for corrosion or damage.
- h. Clean/replace flame sensor.

The Booth is Overheating

- a. Burner in use when outside air temperature is warm
 - Operating the equipment with the burner on will increase the discharge air temperature on average 7 to 15 degrees over outside air temperature regardless of heating setpoint. On hot days, operate in Spray Mode without the burner on.
- b. Excessive low fire / excessive minimum burner temperature rise, typically more than a 15-degree temperature rise.
 - With the burner operating, remove one wire from MRV coil to force minimum gas flow to the burner, low fire condition.
 - Visually verify a continuous flame across the entire burner, flame length approximately 2"
- c. If flame length is too long (3+ inches), adjust the low fire setting on MRV to decrease the minimum gas flow. See Appendix I. Loosen set screw C and decrease flow using the D adjustment cam shown below.
- d. If no change in flame characteristics, debris is likely holding the valve open slightly, or the valve is damaged. Contact Bananza Technical Support for further instruction / MRV replacement pricing.

Temperature Control

1494 Amplifier – See Appendix II

- a. Measure DC voltage across terminals 3 and 4 on the 1494 amplifier to determine if voltage is modulating or static 20 volts or higher. If modulating, check for low airflow. If static 20 volts or higher, continue to next step:

- b. Check resistance of discharge air sensor. An open discharge air sensor circuit will force maximum output voltage of 20 VDC or higher to the Maxitrol MRV.
- c. Check wiring between the A1014 amplifier and the discharge temperature sensor.
- d. Check resistance across the temperature selector using resistance chart. See Appendix IV.
- e. Check wiring between the amplifier and the temperature selector.
- f. Repair circuits or replace parts as needed.

The Booth is Underheating

- a. Gas supply to air handler insufficient or burner high fire gas pressure set to low:
 - Measure inlet gas pressure while burner is forced into a high fire condition. The inlet gas pressure and volume must be close to the BTU requirement of the air handler at high fire, as listed on unit ratings tag.
 - Force burner high fire condition and verify voltage to the MRV is 15 VDC or higher. Measure the gas pressure on the outlet side of the MRV. Verify that the burner high fire gas pressure is approximately the same as listed on the ratings tag and temperature rise between outdoor air and supply air is close to the design temperature rise. Use the high fire regulator on the MRV to increase high fire gas pressure as needed. See Appendix I.
- b. Continuous Low Fire
 - 1494 Amplifier - With the burner operating and temperature selector dial turned all the way up, measure voltage on MRV coil to see if DC voltage is modulating or static at 0 VDC. If 0 VDC, remove wire from MRV coil and measure resistance across coil. Resistance should be between 40-80 Ohms. If resistance measurement does not fall in range, replace MRV coil and amplifier. If voltage to MRV and coil resistance checks out, it can be assumed that the MRV has failed, or water has collected in the valve and blocking gas from flowing to burner.
 - 1014 Amplifier – With the burner operating, remove wire from the Maxitrol amplifier terminal 4 to force the burner to high fire. Measure DC voltage on MRV coil to see if DC signal is present. Voltage measurement should be 15 VDC or higher. If 0 VDC the amplifier has failed. Remove wires from MRV coil and measure resistance across coil. Resistance should be between 40-80 Ohms. If resistance measurement differs, replace the MRV coil and amplifier. If voltage to MRV and coil resistance checks out, it can be assumed that the MRV has failed, or water has collected in the valve and blocking gas from flowing to burner.
- c. Discharge Air Sensor Location
 - Depending on the application, the space being heated can be a considerable distance from the make-up air unit where the discharge air sensor is factory located. If the booth temperature is noticeably lower than the displayed or measured discharge air temperature, move the sensor to a location downstream in the duct where the duct is fully pressurized for a more accurate booth temperature. Moving the discharge sensor too far downstream may lead to higher burner output and possibly high temperature limit trips.

Discharge Air Temperature Swings ± 6 Degrees or more from Setpoint

- a. The air is turbulent at this location, which can lead to stratification, and the sensor can be reading in a hot or cool spot causing the modulating valve to react erratically under certain duct conditions. Rotate the Maxitrol junction box containing the discharge air sensor up to 180 degrees in either direction to try and capture a different part of the air stream.
- b. Move discharge air sensor further downstream in the discharge duct where discharge air is more stable and well blended if instructions above do not smooth out burner modulation.

Burner Fires in Spray, Turns off in Cure

- a. Identify if and which type of CFM reducing damper the equipment is using for cure mode.
 - Discharge damper
 - Burner bypass damper
- b. Discharge Damper
 - Verify damper moves freely and closes approximately 50% during cure cycle.
 - Measure pressure differential across burner during cure cycle. Pressure differential must exceed minimum setpoint of the low airflow switch for burner to operate.
- c. Burner Bypass Damper
 - Verify damper moves freely and closes to block about 80% of the airstream during Cure mode.
 - Honeywell foot mounted damper actuators will have auxiliary switch that closes to by pass the high airflow switch during cure mode operation. Verify damper actuator end switch is closed during cure cycle. Repair or replace wiring or damper actuator as needed.
 - Direct drive actuators controlling the burner bypass damper will be accompanied by a high airflow bypass timer. The timer should be wired normally open for off delay, set for at least 1 minute.

Booth Air Balance / Booth Doors Blow Open

- a. Inspect booth filters, replace filters if needed. Verify no obstructions in exhaust system.
- b. Verify exhaust fan is running
- c. Extend supply fan delay timer to match or exceed ramp time of exhaust fan VFD to create a negative booth pressure before starting the delayed supply fan.
- d. Fine tune supply fan delay timer and minimum/maximum frequency, acceleration/ deceleration times in VFD to find the best configuration depending on the timing of the doors blowing open.

VFD Problems

- a. VFD display is blank / no response
 - Verify all fuses are intact, measure voltage across all incoming lines.
 - Contact Bananza Customer Service for a replacement VFD
- b. VFD will not start
 - Verify VFD is set to Remote start and not local mode
 - Verify VFD start relay is energized and the contacts are closed
 - Verify parameters match Bananza parameter list for the model VFD in use.
All parameters not listed are to remain default

Purge, Cure or Cooldown Timing Discrepancies

- a. Purge or Cure timer not timing accurately, or will not switch from purge to cure, or from cure to cooldown
 - Verify Purge / Cure timer is wired correctly, and potentiometer wiring is connected
 - Replace purge / cure timer and potentiometers. Note voltage listed on device, call Bananza Customer Service for pricing
- b. Cooldown timer not timing accurately, or the unit will not shut down after desired cooldown time
 - Verify timer is set and wired properly. Once timed out, the normally closed contact should open to shut the system off. Factory recommends 4 minutes cooldown period minimum.
- c. Replace cooldown timer, call Bananza Customer Service for pricing

Deluxe Digital Remote Temperature Display Shows Random Numbers

- a. "1" is displayed: Open discharge air sensor or circuit.
- b. "400" is displayed: Discharge air sensor or discharge air sensor wiring shorted.
- c. "440" is displayed: Modulating Valve is connected to discharge sensor input.
- d. Random display temperatures, letters, and other oddities:
 - Remove ribbon cable connection between selector display and amplifier, clean connection and reinstall.
 - This problem is otherwise an indicator of a faulty selector display TD294E or 1494 amplifier. See Appendix II