Burner on Gas Fired Equipment

WARNING: Setup and maintenance of the equipment should be performed by qualified personnel, who are experienced in handling all facets of this type of combustion system. All combustion systems are capable of producing violent explosions or fires that may result in equipment damage, personal injury or possible death when improperly setup, operated, or maintained. If you do not understand any part of the information contained within this guide, contact the Despatch Service Products Division at 1-800-473-7373 to schedule service.

Typically the information that you are looking for is included within the equipment's original operating instruction manual and vendor information guides.

The following are common checks that should be performed prior to proceeding:

- Supply gas static pressure at customer connection (refer to the **Gas pressure switch malfunction** section).
- Recirculation, Exhaust and Combustion Blower fan Rotation (*If applicable*).
- Burner flame signal.
- Burner safeties operation (*flame relay, main valve, block valve, vent valve, airflow switch(s), gas pressure switch(s)*).

The troubleshooting guide that follows is a general guide that covers a wide range of burner packages. In some cases the information listed in the probable cause section may not be applicable.

SYMPTOM	PROBABLE CAUSE
Burner flame relay malfunction:	‣ Burner flame relay tripped on flame failure or loss of flame signal. ‣ Burner flame relay will not cycle ON when requested for burner start. ‣ Burner flame relay does not detect flame when burner flame is present. ‣ Defective burner flame relay. ‣ Refer to vendor information guide.
Airflow switch malfunction:	‣ Indicator flag not up fully in the ON position. ‣ Defective switch.
Burner malfunction:	‣ Air in fuel line — On initial startup insure that fuel supply is free of air. ‣ Air limiting orifice is missing or partially plugged. ‣ Air shutter adjustment. ○ *Insufficient combustion air will cause incomplete combustion, wasting fuel and can produce soot or carbon buildup*. ○ *Excess combustion air can produce formaldehyde's which yields a foul odor and can irritate eyes*. ‣ Airflow switch malfunction. ‣ Burner dirty. ‣ Burner control toggle switch is in the **OFF** position. ‣ Burner flame relay malfunction. ‣ Combustion blower fan dirty, a dirty combustion blower fan would typically indicate that burner maintenance is required(*check semi-annually*).

- Combustion blower malfunction.
- Control relay **1CR** malfunction.
- Gas control valve malfunction.
- Gas metering orifice (**MTO**) partially plugged.
- Gas pressure switch (***LPS*** *(low),* ***HPS*** *(high)*) malfunction.
- Gas regulator malfunction.
- Heater box section static air pressure (*extreme positive or negative can effect burner operation*).
- Hi-limit controller malfunction (*tripped on over temperature*).
- Improper gas pressure, gas pressure outside of designed range:
  - Typical supply static pressure of 8.0" to 10.0" WC (*natural gas*), 10.0" to 12.0" WC (*propane*), +/- 1½" WC at customer connection.

    Refer to the equipment's original operating instruction manual, or the listed on the Nameplate mounted on the equipment (typically on the control compartment door, or the rear of the equipment).

- Improper pilot fire flame adjustment.
- Improperly sized supply piping to equipment (*typically 1 to 2 pipe diameters larger than equipment gas train*).
- Main gas valve malfunction.
- Motor starter malfunction.
- Temperature controller malfunction.

Control relay 1CR (manual start) malfunction:

- Defective control relay.
  - The burner will remain on as long as the Burner Start push-button/toggle switch is depressed.

Gas pressure switch malfunction:

- Defective switch:
  - Check switch setting:
    - *Typical factory settings,* ***LPS*** *(low) = 2.0" WC,* ***HPS*** *(high) = 13.0" WC*.
- Gas regulator malfunction.
  - Improper gas pressure, excessive inlet pressure (*check rating, typically (1) psig*).
- Improper gas pressure, gas pressure outside of designed range:
  - Typical supply static pressure of 8.0" to 10.0" WC (*natural gas*), 10.0" to 12.0" WC (*propane*), +/- 1½" WC at customer connection.

    Refer to the equipment's original operating instruction manual, or the listed on the Nameplate mounted on the equipment (typically on the control compartment door, or the rear of the equipment).

- Improperly sized supply piping to equipment (*lack of volume, typically 1 to 2 pipe diameters larger than equipment gas train*).

Gas regulator malfunction:

- Customer regulator improperly installed.
  - It is recommended that customer's gas regulator be located a minimum of fifteen (15) pipe diameters upstream of equipment's gas regulator to avoid hunting due to interaction between regulators.
    - *Example: 1½" dia. pipe = 22½" between regulators.*

	‣ Defective regulator: ○ Improper gas pressure, inlet gas pressure exceeds regulator rating (*check rating, typically (1) psig*).
Motor starter malfunction:	‣ Overload tripped (*motor amps, O/L setting*) ‣ Defective motor malfunction:
Purge cycle malfunction — will not complete:	‣ Airflow switch malfunction. ‣ Motor starter malfunction. ‣ Purge timer malfunction.
Temperature controller malfunction:	‣ Not signaling for heat, or temperature run away: ‣ Actual temperature higher then indicated by controller:

We hope you will find this information useful. THANK YOU for contacting us and allowing us to be a service to you. Please contact us at 1-800-473-7373 if you have any questions.