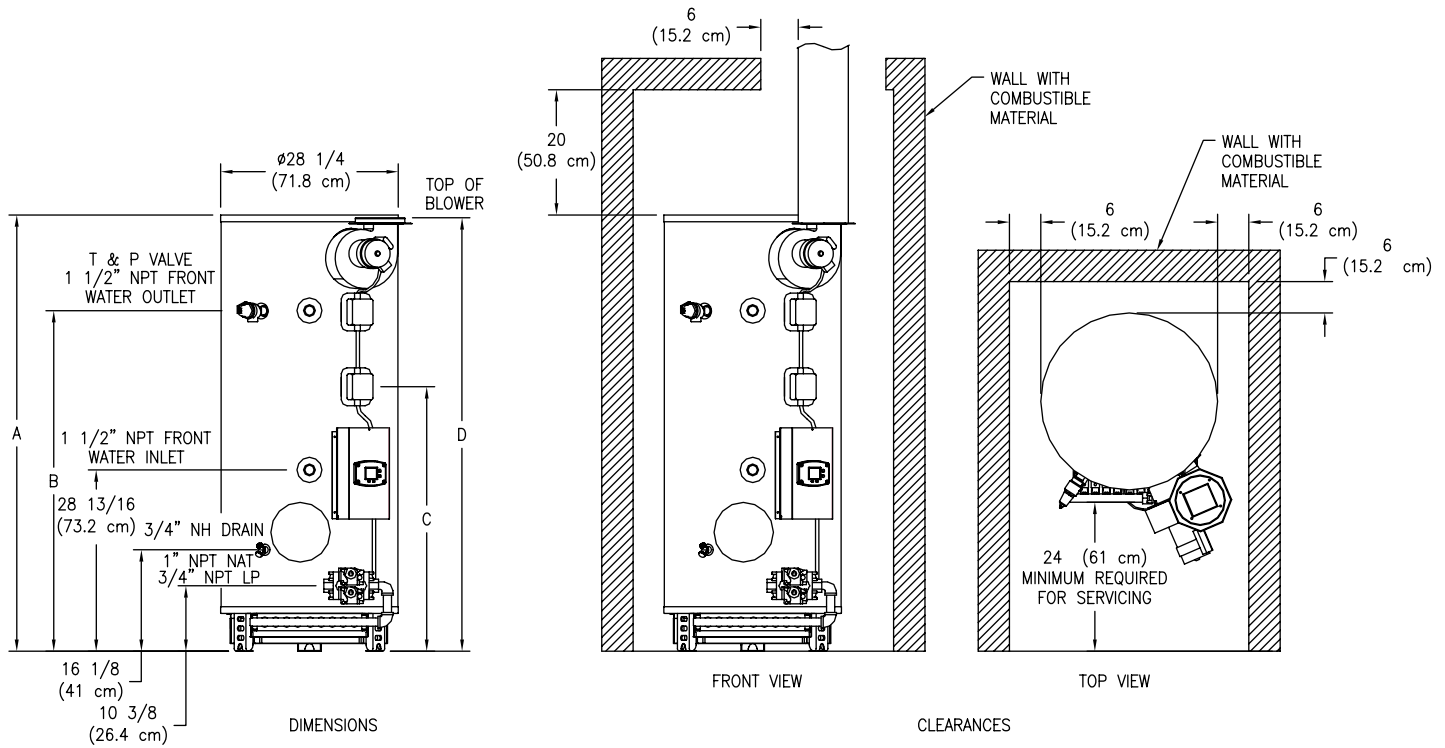


# INDUCED DRAFT COMMERCIAL WATER HEATERS SUPPLEMENT INSTRUCTIONS TO PART #238-47675-00

THIS INSTRUCTION SUPPLEMENT IS ONLY INTENDED TO GIVE INSTALLATION INSTRUCTIONS AND INFORMATION RELATED TO THE INDUCED DRAFT WATER HEATERS WHERE THESE MODELS DIFFER FROM THE ATMOSPHERICALLY VENTED MODELS IN THE GENERAL INSTALLATION INSTRUCTIONS (238-47675-00). REFER TO THE GENERAL INSTRUCTIONS (238-47675-00) FOR ALL APPLICABLE WARNINGS AND INSTALLATION PROCEDURES.

## SECTION II: SPECIFICATIONS



Capacity (gal.)	Input (BTU/Hr)	AMP Draw	A (in.)	B (in.)	C (in.)	D (in.)	Vent Dia (in.)
65	625,000	3.00	69 3/8	54 1/8	41 7/8	68 7/8	8
80	725,000	3.00	79 5/8	64 1/4	55 1/8	79 1/8	8

Capacity (Liters)	Input (kW/Hr)	AMP Draw	A (cm)	B (cm)	C (cm)	D (cm)	Vent Dia (cm)
246	183.0	3.00	176	137.5	106	175	20.3
303	212.5	3.00	202	163	135	201	20.3

**Notes:**

1. All models use an induced draft blower with integral damper and intermittent pilot ignition requiring a power source of (120volt, 60Hz or 220 volt, 50 Hz).
2. Suffix "N" denotes natural gas, Suffix "X" L.P. gas.
3. May be installed on combustible flooring.

## SECTION V: VENTING

The water heater models described above in this supplement are of the induced draft type which rely on an induced draft blower to pull the combustion products through the flue tubes of the water heater. An integral gravity damper on the induced draft blower outlet is forced open by the air pressure from the blower and closes at the end of each burner cycle. **NO ADDITIONAL VENT DAMPERS ARE TO BE ATTACHED TO THE OUTLET OF THESE APPLIANCES.**

These water heaters have been approved for vertical venting through a lined masonry chimney or double wall vent pipe. **DO NOT VENT THESE WATER HEATERS HORIZONTALLY WITH THE VENT TERMINATING THROUGH THE WALL TO THE OUTSIDE. ALL VENTING MUST TERMINATE THROUGH THE ROOF WITH A VERTICAL DISCHARGE.**

The vent connector attached to the vent collar on the blower must be 8" (20 cm) in diameter. The venting size was designed to produce a negative pressure inside the venting system when properly installed. Horizontal piping must be sloped upward at least 1/4" inch per linear foot (2.1 cm/m) of length. All vent piping must be well supported to avoid sagging or adding excessive weight onto the blower assembly. This water heater may be commonly vented with another gas appliance, providing the commonly shared vent is the proper size to handle exhaust gases from both appliances. For proper venting, limit the number of elbows in the venting system. All connections in the venting system must be securely fastened with sheet metal screws or other approved methods. Consult local codes and ordinances. See Figures 2 & 3 on the below for common venting connections.

### WARNING

**This water heater must not have another gas appliance vented into the vent connector.** Consult the venting tables in the latest edition of the National Fuel Gas Code ANSI Z223.1 or in Canada CAN1-B149.1 or B149.2 and/or local code officials for proper application for your area.

Failure to install a proper venting system can result in fire, injury, or death.

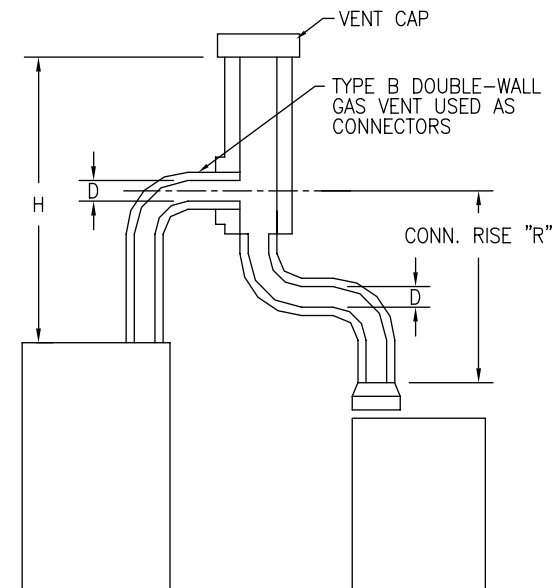


Figure 2

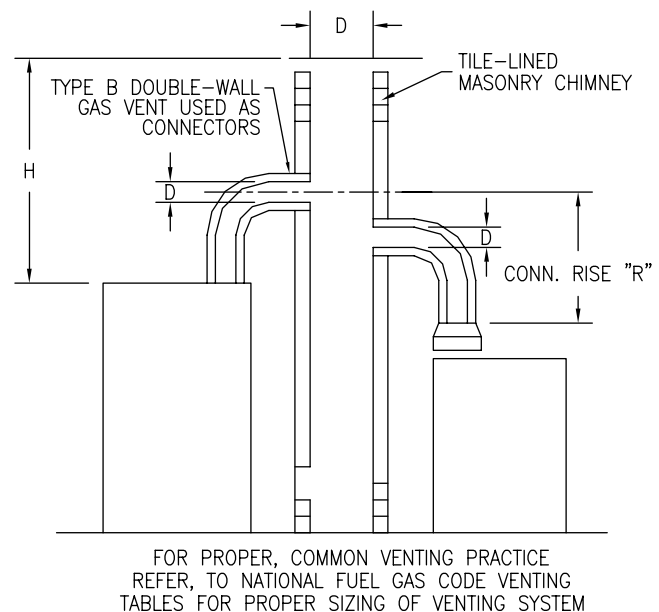
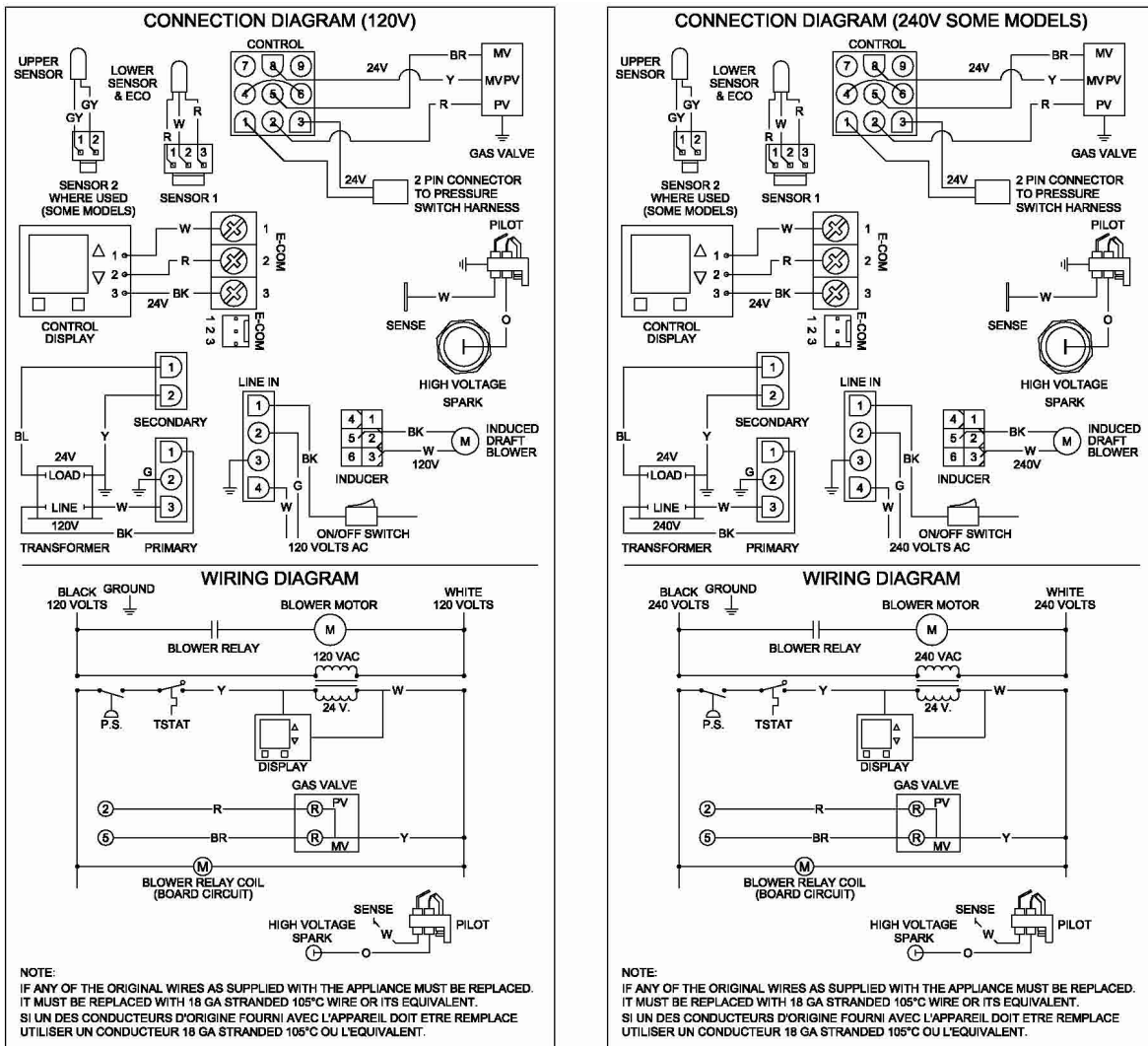


Figure 3

## SECTION VIII: ELECTRICAL CONNECTIONS

This water heater must be wired to a 120volt, 60Hz or 240 volt, 50/60 Hz. power supply. Refer to the wiring diagram on the water heater for proper field wiring connections. Refer to the water heater rating plate for the correct voltage. Refer to the nameplate for the total amp draw for this water heater. The water heater **must** be wired on a separate circuit and breaker.

If wiring in conduit is required, cut the line cord close to the control board and make the appropriate wiring connections.



**FIGURE 4**

### ⚠ WARNING

Turn off or disconnect the electrical power supply to the water heater before servicing. Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

All electrical wiring must be installed and grounded in accordance with local codes, or in the absence of local codes, the National Electrical Code, ANSI/NFPA 70 and/or CSA C22.2 Electrical Code. In Canada, follow the latest edition of the Canadian Electrical Code (Part 1, CSA-C22.1) and all applicable local codes.

### ⚠ CAUTION

This water heater **must** be wired on a separate circuit. Failure to wire on a separate circuit may cause improper operation or failure of the electrical components of the water heater. Refer to the "Electrical Connections" section of the Installation and Operating Instructions Manual for complete instructions on electrical wiring and connections to the water heater.

Do not energize the electric circuit before the water heater tank is filled with water.

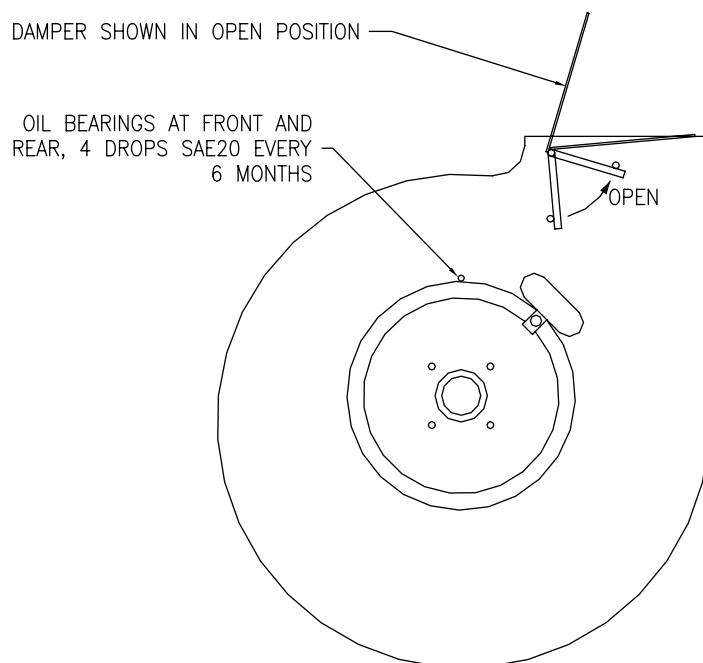
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## SECTION X: MAINTENANCE

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The following maintenance should be performed by a qualified service technician at the minimum periodic interval listed below.

1. Bi-annually, oil the induced draft motor in the ports of the front and rear motor bearings with 4 drops each of SAE 20 motor oil.
2. Annually, inspect the blower wheel for debris and clean as necessary.
3. Inspect the venting system for corrosion and leaks. Replace any defective sections of vent pipe.
4. Inspect the blower vent damper for proper movement, making sure the damper extends to the full open position after the blower reaches full speed (see Figure 5). If the damper blade does not fully open, remove the vent connector and make sure the blower wheel is clean and debris has not fallen on the damper blade or blower wheel. If the damper binds, replace the blower assembly. **DO NOT ATTEMPT TO REPAIR THE DAMPER!**



**Figure 5**

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## SECTION XI: DIAGNOSTIC AND TROUBLESHOOTING GUIDE

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### DIAGNOSTIC GUIDE FOR HONEYWELL INTEGRATED CONTROL SYSTEM SEQUENCE OF OPERATION FOR INDUCED DRAFT MODELS

1. When the tank temperature drops below the temperature setpoint on the display, the control sends power to the induced draft blower to start the ignition sequence.
2. When the blower reaches the full operating speed, the pressure switch closes, completing the 24 volt circuit to the safety circuit of the control. If the exhaust vent becomes blocked or the blower fails, the pressure switch will open, the gas valves close, and the blower stops after a 5 second post-purge. The blower will restart and continue to operate in the lockout condition until the blockage is removed or the venting problem is corrected. Error code 29 will appear on the water heater display.
3. The control will continue to operate the blower for 15 seconds to “prepurge” any flue products remaining before starting the ignition sequence.
4. After the prepurge period, the control sends 24 volt power to the pilot valve “PV” terminals on the gas valve allowing pilot gas to flow to the pilot. The control also sends high voltage through the pilot electrode to spark to the pilot hood and ignite the pilot gas. If the pilot does not ignite within 90 seconds, the pilot valve is denergized and the sparking stops for 75 seconds. The control will attempt to ignite the pilot two more times. If the pilot does not light on the 3<sup>rd</sup> attempt, the control will go into “soft lockout” for 1 hour and then will repeat the 3 ignition attempts. The blower is off during the “soft lockout” period.
5. When the pilot is lit, the flame is sensed by the flame sense rod. The flame sense signal received by the control board causes the sparking to stop and the main gas valve to open. The main burners ignite from the pilot flame. The pilot is continually monitored by the flame sensing circuit. If for any reason, the pilot flame is not sensed by the flame sensing circuit, the gas valves close. After a 75 second delay, the pilot valve opens and the pilot electrode sparks to relight the pilot. The same sequence will occur in the event of a power supply or gas supply interruption.
6. The main burners continue to operate until the water temperature in the tank increases past the control setpoint, which will cause the gas valve to close. The blower stops operating 5 seconds after the gas valve closes. The water heater remains in the standby mode until the temperature drops below the setpoint and initiates another heating cycle.
7. If for some reason, the tank temperature should reach or exceed 200°F, then the control closes the gas valve and goes into a “hard lockout” state and will not operate until reset by a qualified service person. The display will read “error code 65”, which indicates the tank high limit temperature has been exceeded. No attempt should be made to reset the control until a service person has corrected the cause of the high limit condition. Refer to the diagnostic service section at the end of this Installation and Operating Instructions Manual.

**DIAGNOSTIC ERROR CODES AND TROUBLESHOOTING PROCEDURES FOR HONEYWELL INTEGRATED CONTROLS (INDUCED DRAFT MODEL SERIES)**

Error Code	Definition of Code	Cause of Problem and Actions Taken to Correct
4	Low Flame Sense Current	Determine flame sense current in the Service Mode with the water heater operating. If less than 1.0 microamps, check pilot flame sense rod and wire. Clean flame sense rod with emery cloth. If problem is not solved, replace pilot.
2	Pressure Switch Failed to Open (Stuck Closed)	The pressure switch contacts did not return back to the normally open position at the end of the last heating cycle. The control checks to make sure the pressure switch is in the normally open position before allowing the blower to start the ignition sequence. Check to make sure the pressure switch tubing is not blocked. If the pressure switch tubing is clear, replace the pressure switch.
29	Pressure Switch Failed to Close	The pressure switch contacts did not close after the blower was energized. Check to make sure the blower is energized at the beginning of the heating cycle. If the blower did not start, check to make sure there is power to the motor. Replace blower or control board if defective. Check to make sure the venting system is not blocked. Make sure the vent length does not exceed the specified limits. Make sure the vent terminal is not blocked. Check to make sure the pressure switch tubing is clear. Replace the pressure switch if the venting system has checked out O.K. Control will reset once problem is corrected.
6	Flame Sensed Out of Normal Sequence (Before Opening Gas Valve or After Closing Gas Valve)	Check to make sure gas valve has closed. No voltage should be present at the gas valve before or after ignition cycle. Make sure wire positions on the wire harness are correct. If gas valve is stuck open, replace.
23	Flame Detected Before Ignition	Check to make sure gas valve has closed. No voltage should be present at the gas valve before the ignition cycle. Make sure wire positions on the wire harness are correct. If gas valve is stuck open, replace.
24	Flame Detected After Heating Cycle Completes	Check to make sure gas valve has closed. No voltage should be present at the gas valve before the ignition cycle. Make sure wire positions on the wire harness are correct. If gas valve is stuck open, replace.
31	Upper Sensor Readings Faulty	Resistance of upper sensor out of operating range. Check continuity of wire harness to upper sensor, and if O.K., replace upper sensor.
32	Lower Sensor Readings Faulty	Resistance of lower sensor out of operating range. Check continuity of wire harness to lower sensor, and if O.K., replace lower sensor.
57	Flame Rod Shorted to Ground	Pilot flame sensor rod is shorted to ground. Check to see if flame sensor wire has bare spots touching metal parts or if flame sensor rod is touching the pilot shield or other metal parts. Replace pilot if flame sense wire is damaged or flame rod is bent. Make sure pilot shield is not touching the pilot flame sensor.
58	AC Line Frequency Error – Signal Too Noisy or Frequency Incorrect	Check line voltage frequency to the water heater. Determine if there are wide fluctuations. Call an electrician if the problem persists. The water heater should be on a separate line.
59	Line Voltage Too Low or High	Check line voltage to the water heater. Determine cause of low or high voltage. Call an electrician or your utility. The water heater should be on a separate line.
61	DC Output Voltage Unstable	Check line voltage to the water heater for erratic readings. Also check wiring to make sure there are no shorts. If power supply and wiring are O.K., replace control board.
62	Maximum Number of Retries Detected	Pilot is either not lighting or not staying lit during ignition cycle. Check inlet gas pressure for minimum pressure on rating label. Is pilot electrode sparking? Check gas valve wire harness for broken wires or shorts. If 24 volts is present between PV and PV/MV terminals at the gas valve, replace gas valve. Check for voltage output to the yellow and red gas valve wires on the control board pins. If during the ignition trial period, there is no voltage present at the control board pin terminal for the red and yellow wires leading to the gas valve, then replace the control board. Replace pilot if wires are damaged or electrode is damaged.

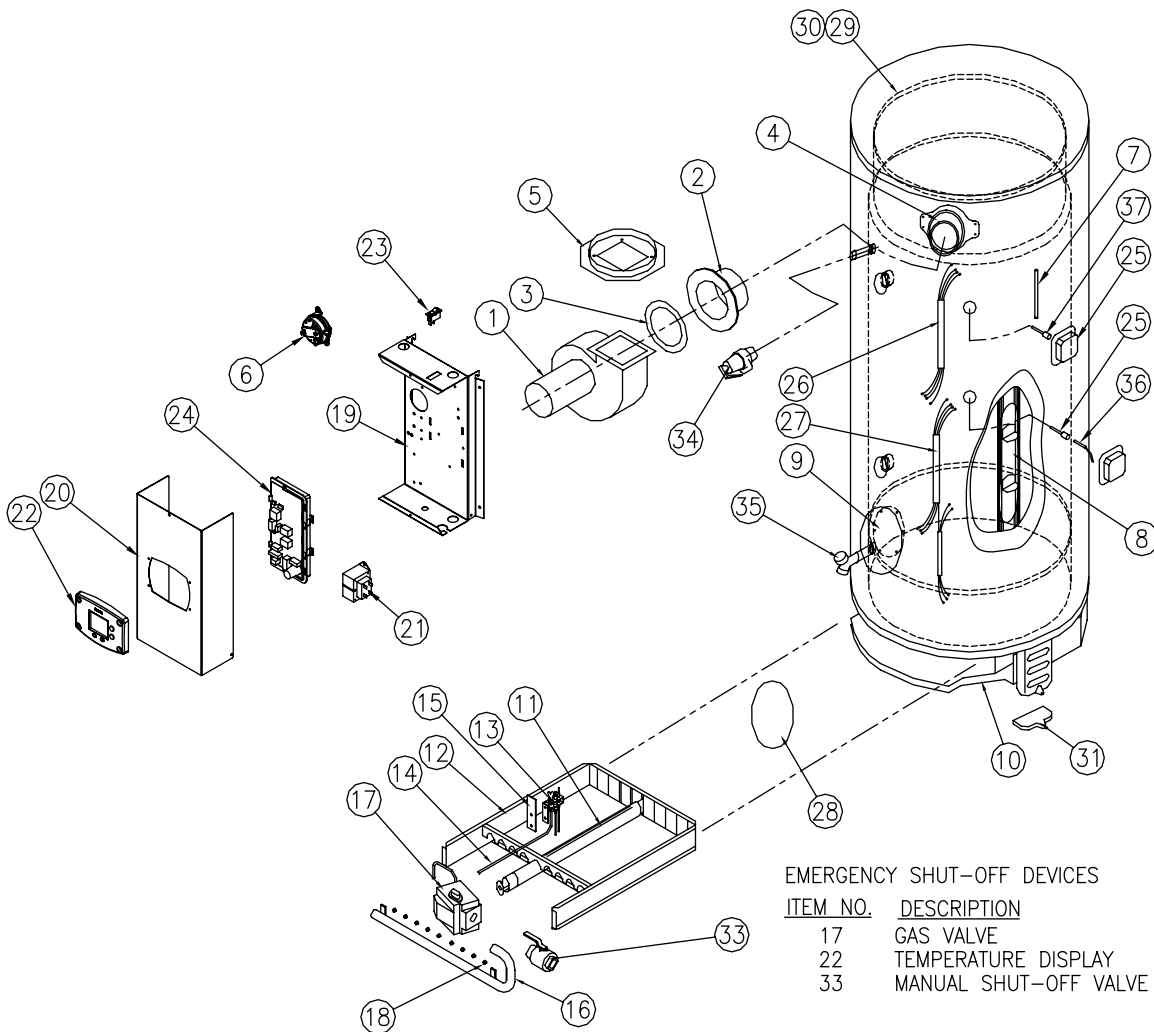
Error Code	Definition of Code	Cause of Problem and Actions Taken to Correct
63	Maximum Number of Ignition Recycles Detected	Pilot flame is lost during run cycle, then reestablished on ignition cycle. Check inlet gas pressure. Is gas pressure dropping below the minimum operating pressure on the rating label after the main gas valve opens? Is the gas pipe size to the water heater adequate? Check the pilot shield position and condition of the burners. Clean or replace as needed. Check the pilot flame and observe the microamp output on the run cycle. Check the pilot tubing to the pilot and replace if crimped or damaged. Replace pilot if wires, flame sensor, or electrode is damaged.
64	Electronics Failure	Replace control board.
65	High Water Temperature (Over 200°F)	Water temperature in tank has exceeded 200°F. Check lower sensor. Make sure sensor is fully inserted into the well (clip on sensor wire secures sensor in place). Check lower and upper (where used) sensor readings. If not within specifications, replace sensor. If sensor and wire harnesses check O.K., replace control board.

# PARTS LIST AND PARTS LIST DRAWING

## REPLACEMENT PARTS LIST FOR INDUCED DRAFT MODELS

Contact your supplier, plumbing professional or the company listed on the rating plate of the water heater for replacement parts.

Provide the part name as well as the model and serial number(s) of the water heater(s) when ordering parts. When applicable, the following information shall be provided: type of gas, voltage and amperage, item number (from the following list) and description (from the following list)



PART NAME AND DESCRIPTION	
1. Induced Draft Blower/Motor Assembly	19. Control Box
2. Blower Mounting Flange	20. Control Box Cover
3. Blower Mounting Flange Gasket	21. Transformer
4. Collector to Blower Transition Duct	22. Temperature display (Emergency shut-off)
5. Blower-Vent Pipe Adapter	23. On/Off Switch
6. Air Pressure Switch	24. Integrated Control
7. Pressure Switch Tubing	25. Sensor Well
8. Flue Baffle	26. Wire Harness - Thermostat to Blower
9. Clean-out Hole Tank Cover	27. Wire Harness - Control Box
9a. Clean-out Hole Cover O-Ring (not shown)	28. Outer Cleanout Cover
9b. Clean-out Hole Cover Gasket (not shown)	29. Flue Collector Cover
10. Radiation Shield	30. Flue Collector Cover Gasket
11. Main Burner(s)	31. Anode Rod (Not Shown)
12. Burner Tray	32. Tank Leg Thermal Break
13. Pilot Burner Assembly	33. Manual shut-off (optional)
14. Pilot Supply Tube	34. T&P Relief Valve
15. Pilot Draft Shield	35. Drain Valve
16. Main Burner Manifold	36. Lower Sensor
17. Gas Valve (Emergency Shut-off Device)	37. Upper Sensor
18. Main Burner Orifice(s)	