

**INSTALLATION INSTRUCTIONS FOR FURNACE WITH #890 CONTROL
BOX (FIREYE FLAME SAFEGUARD) AND GUARDSMAN "J" AUTOMATIC
CONTROL OR MANUAL CONTROL**

POSITION FURNACE IN DESIRED LOCATION. IT SHOULD BE SPACED FAR ENOUGH FROM WALLS TO ALLOW EASY ACCESS FOR MAINTENANCE AND OPERATION.

ANY WALLS, CEILINGS OR FLOORS MADE FROM COMBUSTIBLE MATERIALS THAT ARE SUBJECTED TO THE RADIANT HEAT SHOULD BE PROTECTED WITH INSULATION BOARD OR SIMILAR MATERIAL. ON THE INITIAL HEATUP, CHECK TO SEE IF PROTECTION IS REQUIRED.

FOR EXHAUSTING FUMES AND EXHAUST GASES, A METAL HOOD WITH AN EXHAUST FAN CAN BE USED. THE HOOD SHOULD BE HIGH ENOUGH SO THAT IT DOES NOT INTERFERE WITH THE OPERATOR. A STACK SHOULD NOT BE CONNECTED DIRECTLY TO THE EXHAUST OPENING ON THE FURNACE.

MAKE SURE THE SPARK IGNITER IS POSITIONED PROPERLY. CONNECT THE IGNITION CABLE FROM THE #890 CONTROL BOX TO THE SPARK IGNITER.

MAKE SURE THE SCANNER FROM THE FIREYE CONTROL IS POSITIONED PROPERLY.

CONNECT THE GAS LINE TO THE GAS INLET. WHEN THE FURNACE IS IN OPERATION, THE PRESSURE, AT THIS POINT, SHOULD BE $\frac{1}{4}$ " TO $\frac{1}{4}$ " WATER COLUMN ON NATURAL GAS AND 11" ON L.P. GAS.

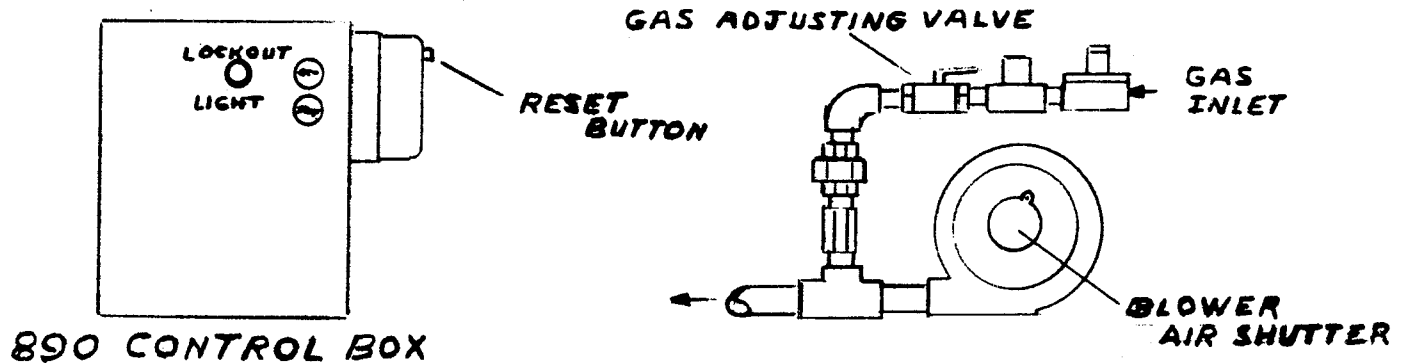
IF THE GUARDSMAN "J" CONTROL WAS ORDERED WITH THE FURNACE, MOUNT THE CONTROL IN A CONVENIENT LOCATION, AWAY FROM ANY RADIANT HEAT. CONSULT THE ATTACHED WIRING DIAGRAM FOR WIRING AND CONSULT THE GUARDSMAN "J" OPERATING AND SERVICE INSTRUCTION MANUAL.

CONNECT 115 VOLT-60 CYCLE POWER SOURCE TO THE BLACK AND WHITE LEADS EXTENDING FROM THE CONTROL BOX. TURN ON MAIN GAS AND POWER SUPPLY. CONSULT LIGHTING AND OPERATING INSTRUCTIONS FOR STARTING FURNACE.

ON THE FIRST HEATUP, THE FURNACE SHOULD BE RUN AT A LOW RATE FOR ABOUT 2 HOURS. IT IS NORMAL TO SEE WATER RUNNING FROM THE FURNACE ON THE FIRST FEW HEATUPS.

AFTER THE FURNACE HAS BEEN HEATED UP AND COOLED, YOU WILL NOTICE CRACKS APPEAR IN THE FURNACE LINING. THIS IS NORMAL DUE TO THE EXPANSION AND CONTRACTION OF THE REFRACTORY AND WILL NOT AFFECT THE PERFORMANCE OF THE FURNACE.

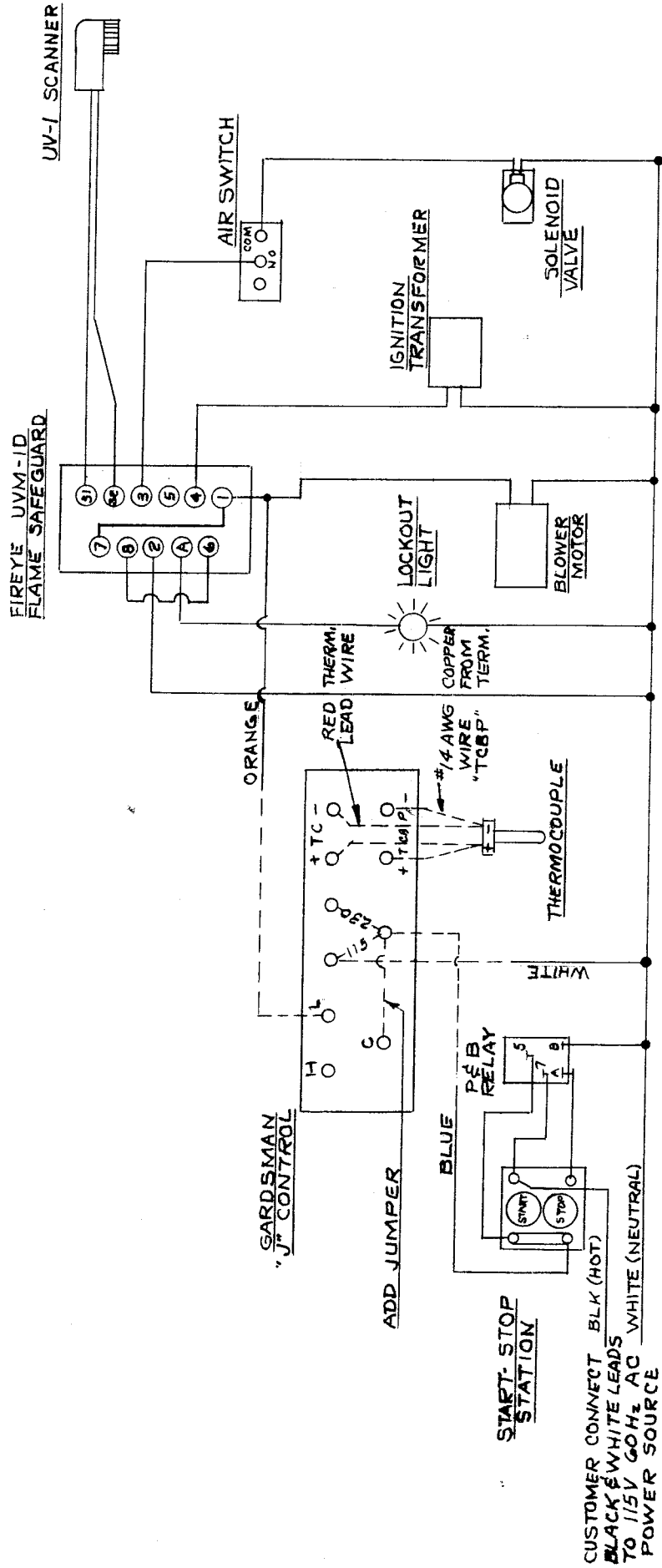
**LIGHTING AND OPERATING INSTRUCTIONS FOR FURNACE WITH
#890 CONTROL BOX (FIREYE UVM-1D FLAME SAFEGUARD) AND
EITHER GARDSMAN "J" AUTOMATIC OR MANUAL TEMPERATURE CONTROL**



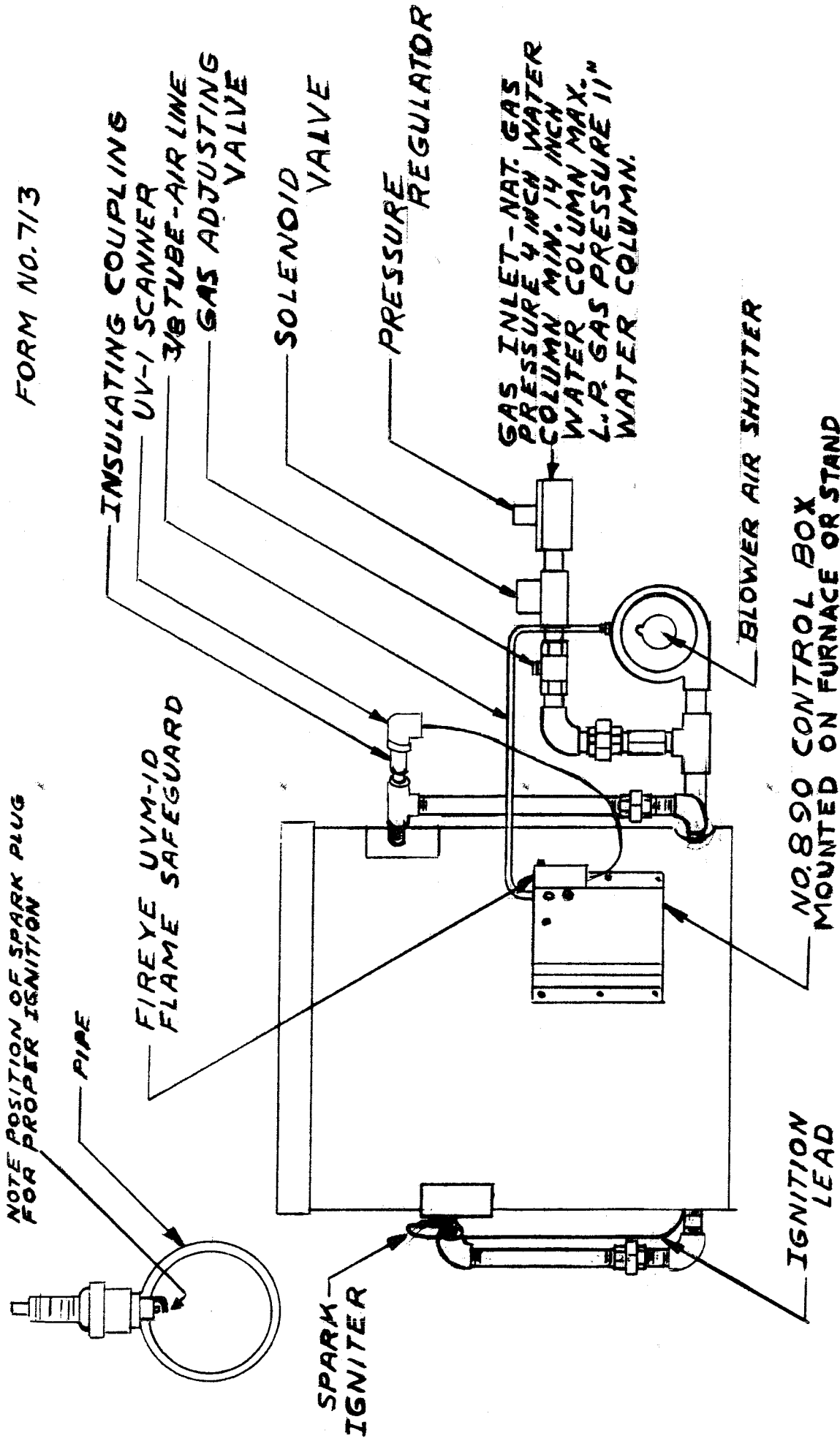
AFTER ALL WIRING AND PIPING ARE COMPLETED:

1. SET BLOWER AIR SHUTTER 1/2" OPEN. GAS ADJUSTING VALVE SHOULD BE CLOSED.
2. IF YOU HAVE AUTOMATIC TEMPERATURE CONTROL, SET THE POINTER TO YOUR DESIRED OPERATING TEMPERATURE.
3. DEPRESS AND RELEASE THE START BUTTON. THE BLOWER MOTOR WILL COME ON AND IN ABOUT 5 SECONDS, YOU WILL HEAR THE FIREYE CONTROL CONTACTS CLICK AND THE SPARK IGNITER "BUZZING". YOU THEN SLOWLY OPEN THE GAS ADJUSTING VALVE JUST TO THE POINT WHERE THE BURNERS IGNITE. NOTE: IF YOU DEPRESSED THE START BUTTON AND THE RED LOCKOUT LIGHT IS ON, YOU WILL HAVE TO DEPRESS THE RED RESET BUTTON THAT IS ON THE FIREYE CONTROL. THE LIGHT SHOULD GO OUT AND THE SPARK IGNITER WILL START "BUZZING". YOU CAN THEN SLOWLY OPEN THE GAS ADJUSTING VALVE TO THE POINT WHERE THE BURNERS IGNITE. IF YOU DEPRESSED THE RESET BUTTON AND THE LIGHT DID NOT GO OUT, WAIT ABOUT 30 SECONDS AND THEN DEPRESS THE RESET BUTTON.
4. AFTER THE FURNACE HAS WARMED UP ABOUT 10 MINUTES, ADJUST THE GAS ADJUSTING VALVE TO OBTAIN A SHARP TAIL OF FLAME OUT THE EXHAUST OPENING OF THE FURNACE. IF YOU HAVE NO FLAME, INCREASE THE AMOUNT OF GAS. IF YOU HAVE A HIGH, LAZY FLAME, DECREASE THE AMOUNT OF GAS.
5. TO INCREASE THE GAS INPUT, INCREASE THE BLOWER SHUTTER OPENING A SMALL AMOUNT AND THEN ADJUST THE GAS VALVE TO OBTAIN THE SHARP TAIL OF FLAME. REPEAT THIS PROCEDURE UNTIL THE DESIRED OR MAXIMUM GAS INPUT IS REACHED.
6. TO DECREASE THE AMOUNT OF GAS, DECREASE THE BLOWER SHUTTER OPENING A SMALL AMOUNT AND THEN ADJUST THE GAS VALVE TO OBTAIN A SHARP TAIL OF FLAME. REPEAT THIS PROCEDURE UNTIL THE DESIRED OR MINIMUM GAS INPUT IS REACHED.
7. TO SHUT DOWN THE FURNACE, DEPRESS AND RELEASE THE STOP BUTTON. THEN TURN THE GAS VALVE TO THE CLOSED POSITION.

WIRING DIAGRAM FOR FURNACE WITH GARDSMAN "J" CONTROL AND FIREYE UVM-1D FLAME SAFEGUARD CONTROL



NOTE:
 1. ALL WIRING SHOWN IN SOLID LINES COMPLETED AT FACTORY
 2. ALL WIRING SHOWN IN BROKEN LINES TO BE COMPLETED BY CUSTOMER



NOTE POSITION OF SPARK PLUG FOR PROPER IGNITION

ROUND POT FURNACE WITH 890 CONTROL BOX

VENTING REQUIREMENTS

JOHNSON FURNACES

1. POT FURNACES, FORGES, AND MELTING FURNACES

SINGLE UNITS OR MULTIPLE INSTALLATIONS

FOR EXHAUST HOODS APPROXIMATELY 6'6" to 7' ABOVE FLOOR, THE EXHAUST FAN SHOULD BE SUFFICIENT TO PROVIDE A 200 FPM FACE VELOCITY AT THE HOOD.

2. OVEN TYPE FURNACES (INCLUDES OVEN FORGES)

A. SINGLE INSTALLATIONS

FOR SINGLE INSTALLATIONS THE VENT REQUIREMENTS SHOULD REDUCE FLUE GAS TEMPERATURE TO 500° OR BELOW. FOR CPM REQUIREMENTS DIVIDE BTU INPUT OF THE FURNACE BY 225. (APPLICABLE WHERE THE VENT HOOD IS 6" to 8" ABOVE EXHAUST OPENINGS)

B. FOR SINGLE OR MULTIPLE INSTALLATIONS WHEN SINGLE EXHAUST HOOD IS 6'6" to 7' ABOVE FLOOR PROVIDE FOR A 200 FPM FACE VELOCITY.

FOR MAXIMUM SERVICE FROM STEEL POTS

1. Carry a neutral or slightly reducing flame at all times. A short tail of flame should be visible from the stack of the furnace when you have a reducing flame.
2. While the pot is cooling down, see that all openings are closed. If left open, currents of air circulate through the furnace, forming a scale of oxide on the pot. Under no circumstances, use the air line to accomplish more rapid cooling of the furnace.
3. Infiltration of cyanide or other salts into the combustion chamber should be prevented. At the temperatures found in the combustion chamber, the salts will decompose and attack both pot and furnace lining. If there is a tendency for the salts to seep or splash into the combustion chamber, this can be overcome by placing a ring of dry, powdered fire clay under the flange of the pot when it is placed in service.
4. Should a salt pot accidentally give out in the furnace, spilling its contents into the combustion chamber, see that all of the salt is cleaned out before installing a replacement and resuming operation.
5. Remove all sludge or sediment from the pot at least once a day and even more often if the furnace is being operated continuously. If allowed to remain, it acts as a heat insulator, causing local over-heating and premature failure of the pot.
6. Never force the furnace in bringing the bath up to temperature or in an attempt to speed up production. See that flue gas temperature is at a minimum. Forcing the fire results in excessive combustion chamber temperatures, shortening the life of the pot and of the furnace lining.
7. Turn the pot around each day so that a different part is exposed to the hottest gases. (For round pots only)
8. Remove the pot from the furnace at regular intervals and thoroughly clean the inner surface.
9. While carrying a slightly reducing atmosphere reduces scale formation to a minimum, a thin scale will continue to form on the outside of the pot. Hammer this off, for, if allowed to remain, it materially lessens the heat conductivity of the container.
10. Proper operating conditions are extremely important for satisfactory pot life. Be sure to have a tail of flame visible from the furnace stack opening. Follow furnace venting instructions.