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**PROBE CONDITIONING  
SYSTEM- P/N 13004  
FOR CONTINUOUS FURNACES  
WITH DELAY/PURGE TIMER  
INSTRUCTION MANUAL M-4514**



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## INTRODUCTION

Thank you for selecting **SSI P/N 13004** for your continuous furnace, probe maintenance application.

You lubricate critical machine parts on a regular basis if you want them to last. Your zirconia carbon sensor also requires regular maintenance. Buildup of carbon in the space between the zirconia sensing element and the sheath, and at the sensing point, will eventually adversely affect the proper operation of the probe. If carbon (soot) is allowed to accumulate to the extent that atmosphere cannot penetrate to the sensing surface, control is impossible. The 13004 is designed to prevent that from happening by periodically initiating a procedure to remove the carbon. It is intended for use with continuous furnaces only. (See P/N 13011 for batch furnaces, 13003 for generators.)

## SPECIFICATIONS

- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| ◆ Reference air flow- > 2scfh       | ◆ Dimensions- 12" x 12" x 6"      |
| ◆ Burnoff air flow- ~ 15scfh max.   | ◆ Weight- 17.4 lbs                |
| ◆ Burnoff time- 1 to 10 minutes     | ◆ Actuation- Cycle timer- 5 to 50 |
| ◆ Delay/purge time- 1 to 10 minutes | hours.                            |

## DESCRIPTION

The 13004 continuous probe conditioning box is designed for use with a continuous furnace. Although many such furnaces are equipped with programmable controls that could conduct probe conditioning on a regular basis, it has been our experience that this programming capability is seldom used. Existing burnoff systems that are designed to work with a programmable controller cannot be used as "stand alone" systems without significant modification. Further, most cannot provide adequate air for burnoff because they simply switch the output of low flow reference air pumps to the burnoff fitting without regard to adequate flow. The 13004 is also provided with a delay timer to allow the probe signal to return to normal before control is re-established. Fig. 1 shows the piping and wiring diagram of the 13004.

## **INSTALLATION**

The compact JIC box is provided with flanges, each having two 1/4" mounting holes. Locate the box to within about 6 feet of the sensor, if possible. Avoid locations close to a source of combustibles such as the vent pipe of an oil quench tank, or a natural gas fitting that could develop a leak. Because the reference air pump aspirates air from its immediate vicinity to pump to the probe reference air fitting, it is possible to experience a significant error in measurement due to reaction of the combustible with air inside the probe. The result is a low reading of percent carbon, which will cause the controls to add excess natural gas and overcarburize your work piece. A purge valve maybe is connected to power through terminals 1054 and 1055 as shown in Fig.1. This will accelerate the recovery by rapidly displacing the burnoff air with furnace atmosphere.

## **OPERATION**

With the system wired as illustrated in Fig. 1, and the power switch off, close the burnoff airflow valve. Set the upper (burnoff) time (T1) to about 5 minutes, and the lower (cycle) time (T2) to 12 hours. Set the delay timer (TR106) to 5 minutes. Record the initial probe millivolts, then close the power switch (SW-1) to start a cycle. Set the reference air flow to full scale, or slightly higher. Observe the probe temperature and O<sub>2</sub> millivolt reading, then increase the burnoff airflow until the millivolt reading is less than 200 millivolts, preferably close to zero. The temperature should be less than 50°F higher than it was initially. When the burnoff is complete, observe the probe millivolts and note the time to recover to within 2 millivolts of the initial reading. Set the delay timer, TR106, to this value. Repeat the burnoff by turning the power off, then on. Observe the performance and adjust flows and times to values that cause the probe millivolts to drop close to zero (or at least below 200mV) when the burnoff period is complete. The ultimate goal is to provide the shortest practical burnoff time so the process is not out of control for an appreciable period. If trim gas or air are added by motorized valves, and they are not spring return types, the control interrupt terminals (Fig.1) can be used to interrupt power to the motors so that control is maintained during burnoff. For time proportioning control with solenoid valves, simply supply the power to the valves through the control interrupt terminals 1051 and 1053. When all flow and time parameters have been set observe the operation for a day or two to make sure all is correct. Refer to your **GOLD PROBE™** instruction manual for a complete description of the probe conditioning operation.

## **THANK YOU**

We think you will be delighted with the performance of your probes once you have installed this engineered conditioning system. If you have any questions, suggestions or problems, your **GOLD PROBE™** team is only as far as your phone. Call us at 1-800-666-4330. We listen. And we respond.

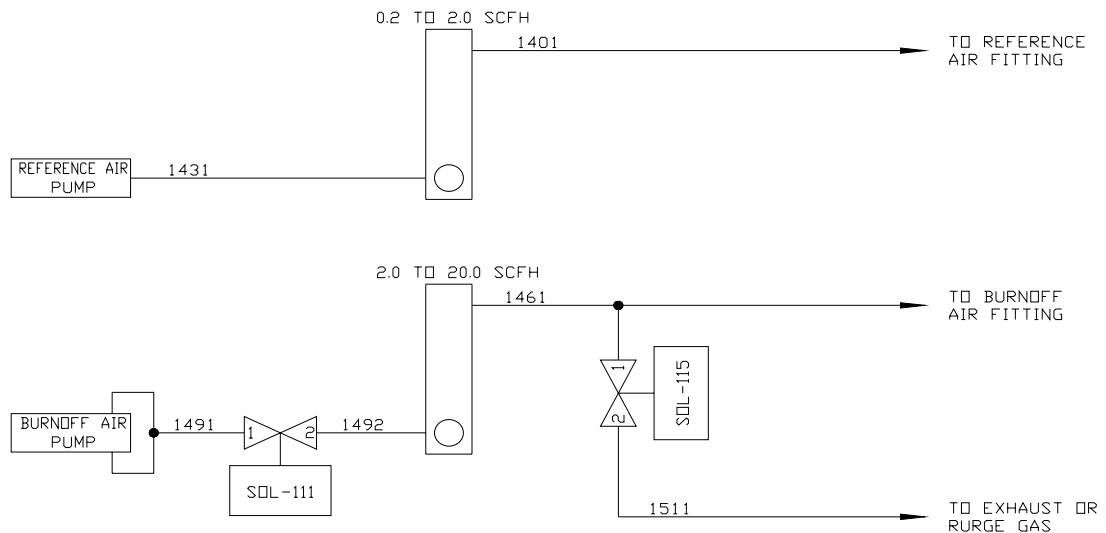
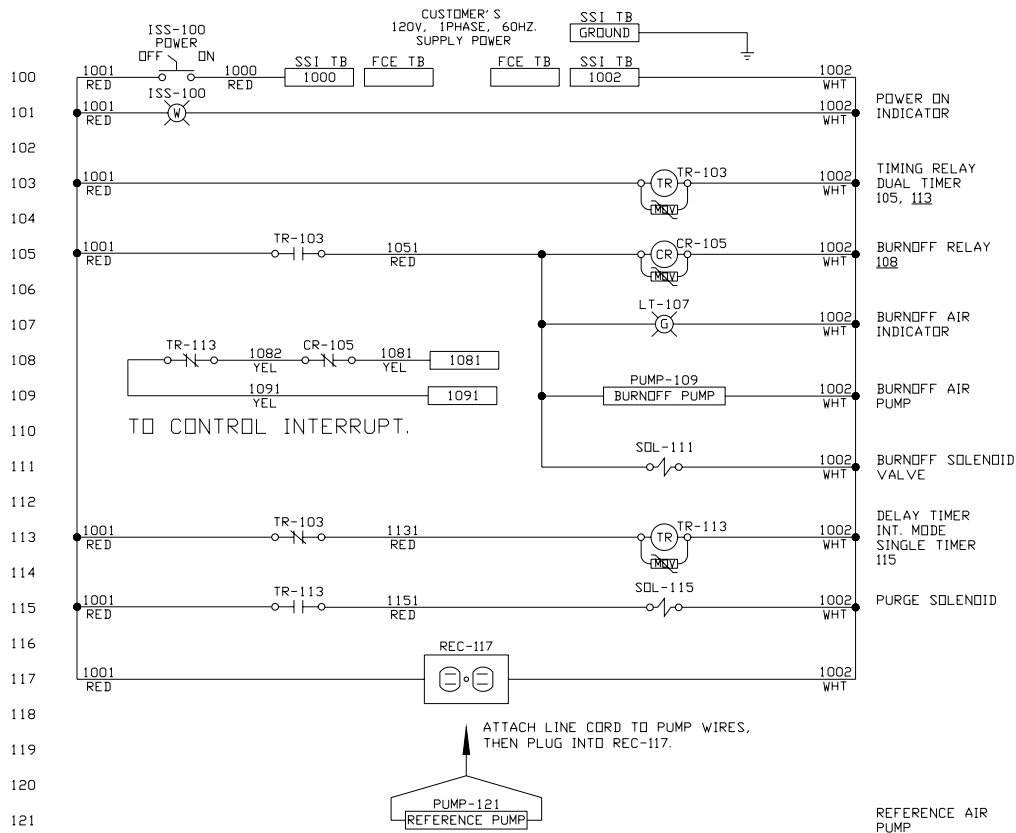


FIG. 1

## **Revision History**

<b>Rev.</b>	<b>Description</b>	<b>Date</b>
A	Initial Release	04-24-2001
B	Added Revision History	07-11-2001
C	Revised Drawing on Page 3	11-06-2002
D	SSi Address Update, General Update	04-12-2005

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