

Application**brief**

Eclipse Product: Igniton Transformers
Submitted by: RonChampion of CCSI
Application: Heat Treating
Description:



Application & Equipment:

Continuous Belt Heat Treat Furnace equipped with 22 radiant tube burners with the older Webster and Dongan ignition transformers. The original control scheme energized the gas solenoid valves from a temperature control. Auxiliary switches in the air butterfly valve actuator started the spark igniters at the low position and shut them off at high.

The Problems:

The ignition system was unreliable, the transformers would burn out, and the Rajah connectors would melt. The timing of the heat demand signal with respect to the actuator position often caused the tube to backfire, the igniters were fouling, and sometimes the ignition stayed on continuously. Ambient air temperature at the transformer location easily reached 145°F. The ignition transformers were mounted directly to a steel bracket with a 6” standoff from the furnace wall. The conducted heat from the furnace wall caused the transformer mounting plate temperature to rise above 165°F. The high ambient temperatures and the internal heat generated from continuous ignition caused the ignition transformers to fail repeatedly. A predictable result since the Webster/Dongan transformer’s maximum temperature rating is 120°F. These conditions also melted the standard black plastic Rajah connectors on the burner spark igniter and the ignition wire would harden and crack.

The Solution:

The transformers were replaced with the Eclipse Data 841, p.n.10002304, ignition transformer. The control method was changed to use a contact from customer’s existing temperature controller. At furnace temperatures below 1450°F, the contact closes to provide ignition. This continuous-duty transformer has superior construction using the highest quality materials for both insulation and temperature properties. A rating of 194°F and the additional air space provided by the p.n.20580 brackets insure a long lifetime. The new complete cable assembly (p.n. 20581) added convenience and saved time. The silicone boot for the spark plug provided the desired improvement over the plastic Rajah connector.

Ron said an additional unexpected benefit was that the mounting bracket alignment matches the old transformer pattern, so he did not have to drill any new holes.



One challenge in the replacement was caused by the difference in the input wiring. The old transformers had seal-tight conduit directly fastened to the transformer case. The new transformer has a molded 3-wire power cord. Ron mounted a small 2-way conduit box with a ¼" cord grip on one of the conduit outlets. The existing seal-tight conduit attached to the other outlet and the wire connections were made inside. After determining the procedure, it only took 12 minutes per location to replace each transformer.

When prompted for a disadvantage of the new transformer, Ron replied that the HV terminal is recessed and requires a special connector. Customers may need to stock a spare cable assembly or the connector terminals. Otherwise in an emergency situation, he envisions that the customer would strip the wire and insert it into the transformer outlet and possibly secure it with electrical tape.

Results:

Since the installation in January of 2003, the customer has had no problems. The maintenance people reported that with the previous system they have always had problems within three months. The maintenance crews are thrilled about not having to light the burner manually. Due to this success, they will be changing out the next 20 on their other furnace.



Eclipse Combustion

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