

Improved exhaust damper automation

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1. Introduction

Korea Atomic Energy Research Institute(KAERI) has a Pyro-processing Integrated Inactive Demonstration facility(PRIDE) for the development of pyro-technology. In essence, the PRIDE enable integrated pyro-systems testing at engineering scales using depleted uranium or surrogates for depleted nuclear fuels. The PRIDE must maintain an inactive (argon) atmosphere due to the characteristics of processes that take place in it, such as electrochemical reduction, electrochemical refining, and electrochemical smelting. In concentrating impurities at the facility, oxygen and moisture must be lower than 50 ppm.

This paper describes the work of improved exhaust damper automation in the PRIDE facility.

2. Main title

Exhaust fans and exhaust dampers were installed at completion of installation of the facility, but they opened and closed automatically at startup and shutdown of the exhaust fan on the main control system, making them uncomfortable.

Thus, improvements have been made to address this inconvenience and to increase the efficiency of the management of the exhaust system through the automation of the exhaust damper.

2.1. Configuration of exhaust System.

The PRIDE facility had two exhaust fans installed and an exhaust damper (operate as damper actuator), which was manually adjusted for open/close by each exhaust fan.

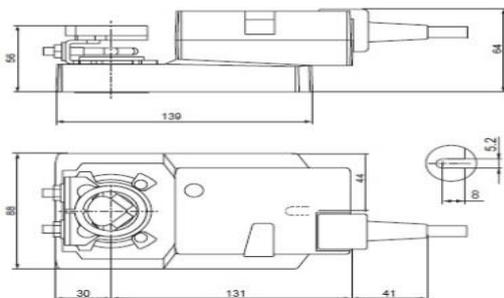


Figure. 1. Dimensions of actuator

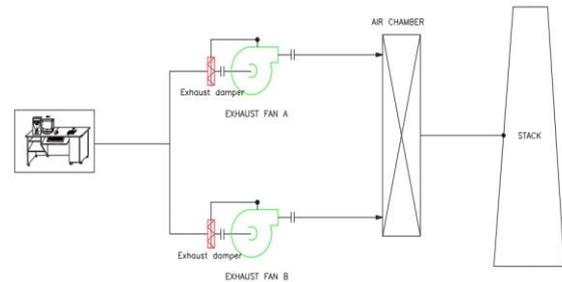


Figure. 2. Schematic of exhaust system

2.2. Contents of improvement

The main control system performs the manual exhaust damper automatically open/close according to the installation's exhaust fan startup selections.

- Carry out panel wiring and renovation (install relay 2 set)
- Provides a delay of 15 to 20 seconds for the damper to start the exhaust fan
- Perform program modification to ensure the damper is aligned with the fan on the main control system and to enable operation.



Figure. 3. Before improvement



Figure. 4. After improvement

3. Conclusion

This was a very simple but necessary task. The exhaust damper improvement will remove the disadvantage of having to manually switch the exhaust damper on or off when the exhaust system is running, and the exhaust system will operate on an increased efficiency of the exhaust fan via on the main control system. The improvement has been carried out smoothly and with main control system it is being useful to operate without malfunction of the exhaust fan and exhaust damper.

REFERENCES

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