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Spare Fusing Lamp ready to Work While Printing

HP INC

Spare fusing lamp ready to work while printing

Overview of the system

The idea shown below for a 3D printing with fusing lamps, is placing an extra lamp in fusing module, but not an extra power controller to reduce cost of the system, which will start working when any of the lamps is blown while working.

Which are the problems that this system solves?

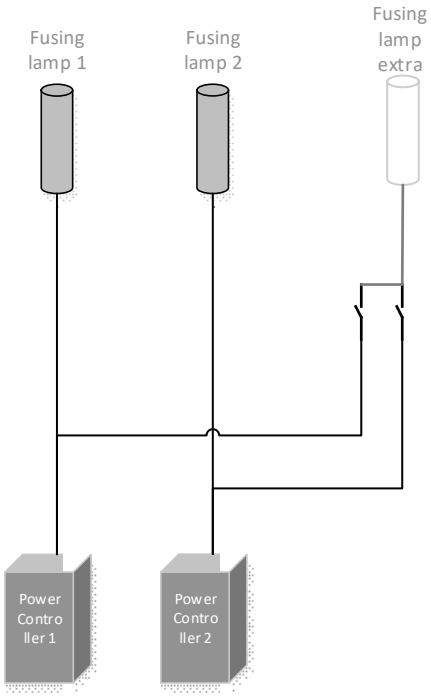
The presented solution solves following problems:

- Possibility to finish a job even when a fusing lamp is blown.
- Reduce interventions on printer due to fusing lamp issues.
- Increase Finished Job Rate with a controlled cost increase
- Possibility to have an extra power on fusing when no lamps are blown, improving part quality or speed.

How does the system work?

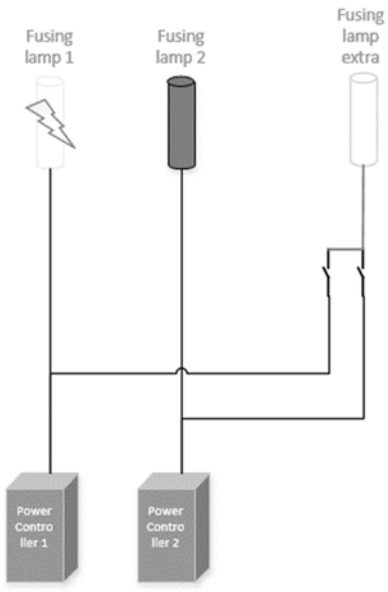
In MultiJet Fusion technology, some fusing lamps are used to deliver energy to the print area for melting printed material. These fusing lamps can be blown while printing, and this could produce to stop printing, and making that the rest of the job will not be possible to be printed.

For having an accurate power control, each lamp is powered by a unique power controller. Placing an extra lamp will allow to be switched on when one of the other lamp is blown. For reducing costs, instead of placing an extra power controller, the solution is to re direct output of current power controllers to the spare lamp using a relay. A schematic can be seen below.



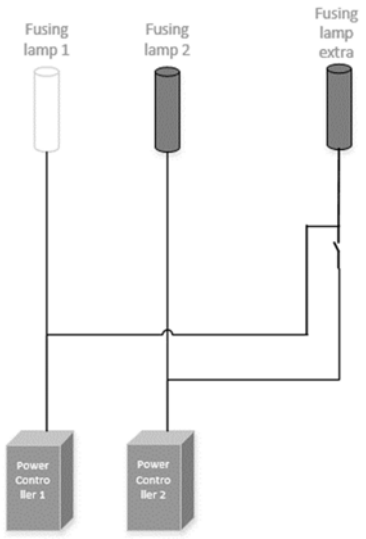
During normal circumstances, where two fusing lamps are switched on, the relays are open and the third fusing lamp is switched off.

Below can be seen what happens when “Fusing Lamp 1” is blown, so only one fusing lamp is working properly, but not enough energy to supply to the print bucket.



When this situation happens, power controller will send information to the general controller, indicating that no electrical current is being supplied to the lamp, because there is an “Open circuit”. This means

that the fusing lamp is blown. The general controller will then switch on the corresponding relay that is connected to the power line of the fusing lamp blown to activate the “Fusing lamp extra”, maintaining the performance of the fusing system, and allowing to continue printing without stopping the job.



This solution is cheap as there is no need for an extra power controller to control extra fusing lamp.

This solution is explained with two active fusing lamps, but it can be scalable to a higher number of fusing lamps

What are the advantages?

- Increase finished job rates in case of blown lamp, because there is a spare fusing lamp ready to start working.
- Reduced cost increase of the system because an extra Power Controller is not needed
- Option to be used the spare lamp in standard jobs as extra power if needed, allowing faster fusing cycle time, reducing printing time.
- Option to continue working in case of not having maintenance lamps stock.

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