

Induction Heating

Heat Treatment of Drilling Tips for Rock Hammers

**Q**

Question

How can you control the staying time of drilling tips in the induction heater?

A

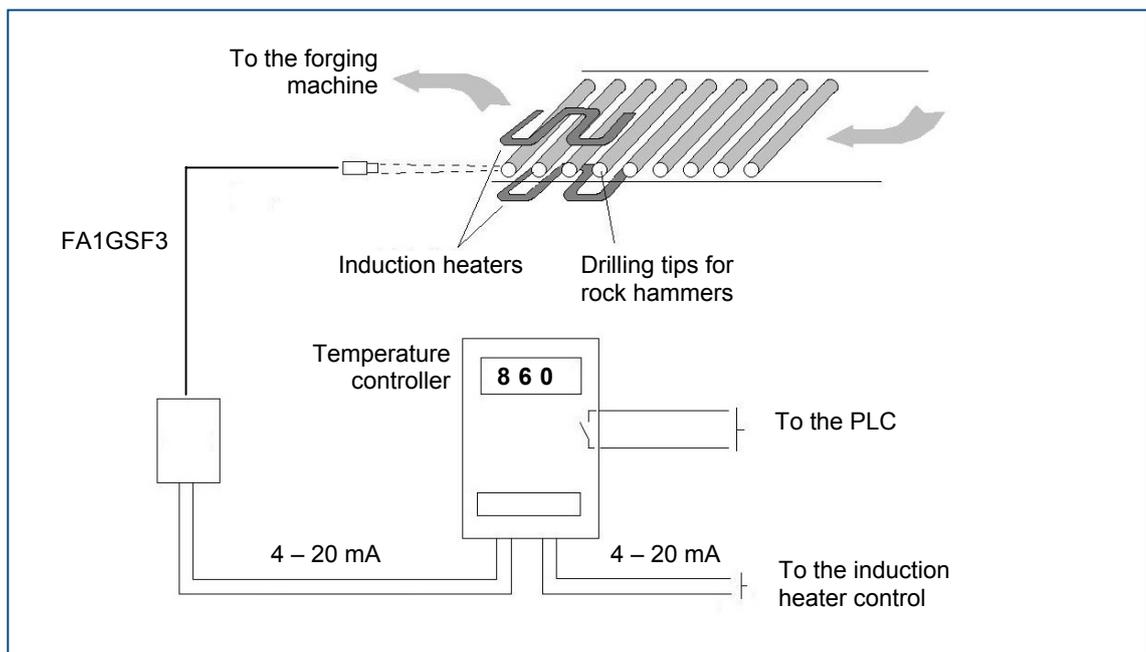
Answer

Situation Analysis

The forging line for rock hammer drilling tips is formed by a conveyor that feeds the stainless steel tips to an induction heater, a mechanical arm, and a forging machine. The mechanical arm picks-up the steel tip and put it into the forging machine that gives it the required form (e.g. a flat chisel). The target steel tip temperature after leaving the induction heater is at 860°C.

The steel tips are heated up by a pre-defined, constant staying time. As the steel tips diameter changes with the various tip models, the final temperature after leaving the induction heater varies from batch to batch.

The final steel tip temperature needs to be measured to give an input to a PLC, that controls the mechanical arm, to allow the steel tip to be sent to the forging machine.



A

Answer

Solution and Improvements

The problem was solved by using the Raytek glass fibre sensor FA1G connected to an electronic temperature controller. The choice of the glass fibre type is due to the presence of strong electromagnetic fields due to the inductive heating.

The sensor FA1G is installed in axes with the steel tips, so that it always measures the temperature of the first steel tip. The measured temperature scaled to a 4 to 20 mA signal is output to a temperature controller.

When the measured temperature reaches the threshold value of 860°C, a relay contact of the temperature controller inputs the PLC and allow the steel tip to be picked-up and forged. If, for any reasons, the steel tip is not promptly picked-up by the mechanical arm, the temperature controller, with regulating setpoint at 900°C, reduce the heating power avoiding an overheating of the steel tip.

Raytek Product

Marathon RAYFA1GSF3

Accessories

Benefits

- Optimised heating time
- Increased line productivity
- Improved and consistent product quality

References

- ARESI SPA - Italy

www.raytek.com
for up-to-the-minute features


A Fluke Company