



Induction Heating

Heat Treatment of Drilling Tips for Rock Hammers

Q

Question

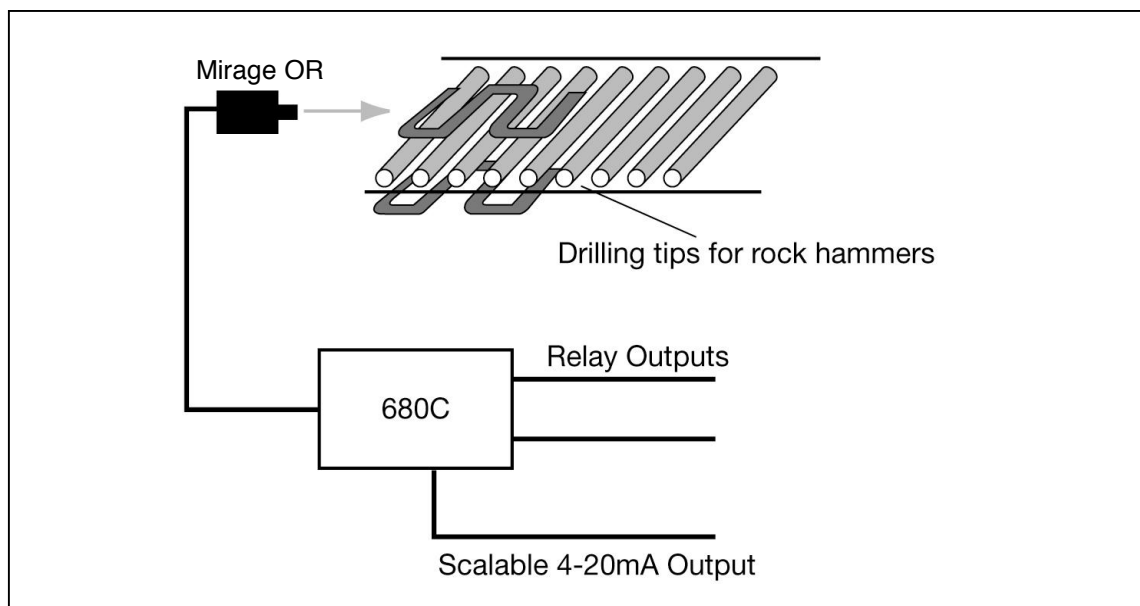
How can you control the staying time of drilling tips in the induction heater?

A

Answer

Situation Analysis

The forging line for rock hammer drilling tips is formed by a conveyor that feeds the stainless steel tips into an induction heater, a mechanical arm, and a forging machine. The mechanical arm picks up the steel tips and puts it into the forge and it is forged into the desired shape (e.g., a flat chisel). The target steel temperature at the exit of the heater is 860°C (1580°F). The steel tips are heated by a pre-defined heating cycle. As the steel tips change in size, the cycle time is reset. The infrared sensor provides a linear 4-20 mA output that is interfaced with a PLC for closed loop control.



A

Answer

Solution and Improvements

The problem can be solved with an Ircon Mirage OR two-color infrared thermometer. The Mirage OR thermometer has a two point on/off controller and a linear 4-20 mA output that can be interfaced with the PLC. The sensor has thru-the-lens focusable optics, making it very easy to aim the sensor to see the tips at the exit of the induction coils. The sensing head can be backed away from the coil, so there is no interference with the inductive field.

The Ircon indicator controller has a two point on/off controller as an optional feature. When the target temperature reaches the desired temperature of 860°C (1580°F), a signal is sent to the PLC, which starts the cycle of putting the tip into the forge and making the part. A second relay is set at 900°C (1652°F), which will shut off the heater, if the temperature gets too high.

Ircon Product

Mirage

MR-OR 05-16C-0-1-0-1-0

MR-OR 05-25F-0-1-0-1-0

Accessories

- AA-3 Air Purge
- SB-1 Swivel Base

Benefits

- Optimized Heating Time
- Increased Line Productivity
- Improved and Consistent Product Quality
- Reduced Scrap
- Eliminated Damage to Forging Die