



Technical Letters

How To Properly Install Cartridge Heaters

LOOSE FITS

- Loose fits result in poor heat transfer, higher internal temperatures in the cartridges heater and shorter heater life. The importance of drilling and reaming holes accurately cannot be over emphasized. Where operating conditions and temperatures dictate, some users have even silver soldered cartridge heater into grooves or holes to maximize heat transfer.

HEATER REMOVAL

- After many hours of high temperature operation in a tight fitting hole, cartridge heaters will oxidize and sometimes become difficult to remove from the hole. (A fit of 0.004" or less can cause difficulty with heater removal.) To simplify replacement the holes should be drilled all the way through the block whenever possible. This will enable the customer to drive the heater out with a hammer and drive rod.

BE CAREFUL WITH LUBRICANTS

- If graphite or other lubricant is being used to facilitate insertion and removal of the cartridge heater, be sure that these conductive materials do not touch the lava end plug.

PROTECT FROM CONTAMINATION AND OTHER DAMAGE

- Leads and heaters should be protected from spray, dropping or abrasion. A heater that would otherwise give many months of satisfactory service can easily be put out of operation if the leads or the heater are contaminated or damaged in some way. Oil left in drilled holes can also cause trouble.

TEMPERATURE CONTROL

- In order to protect the cartridge heater from overheating, the temperature control point should be located within 12mm (½") of the heater under severe operating conditions. With low watt density heaters and high conductivity metal parts being heated this factor is less critical. Use of time proportioning electronic temperature control will prolong heater life by reducing on-off cycling of the heater which results in wire "fatigue" and premature failure.

LEAD WIRE CONSIDERATION

- Where leads are exposed to temperatures over 260°C (500°F), ceramic bead insulation is recommended. Or, cartridge heaters can be ordered with additional unheated sections at the lead end in order to extend the leads into a cooler zone. Fiberglass tape, which is a relatively high temperature material usually has low temperature adhesive and should be avoided as supplementary insulation on cartridge heater leads. These adhesive materials can melt, overheat and carbonize which then makes them electrically conductive. We have found from analyzing many field failures that this has been a common cause of premature heater failure.



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