



## **INSTRUCTIONS FOR THE REPLACEMENT OF THE FURNACE HEATER**

### **TUBE FOR THE NON-COMBUSTIBILITY TEST APPARATUS**

These instructions apply to replacement of the furnace heater tube for the non-combustibility apparatus supplied by FIRE Limited and previously by Heightfield Ltd. If the equipment was supplied by any other manufacturer some of the instructions may not be applicable and in such cases the instructions should be used only as a guide.

1. **Isolate the apparatus from the electrical power supply.**
2. Disconnect and remove the thermocouples.
3. Remove the perforated steel terminals guard.
4. Note the positions of the electrical connections so that they can be correctly re-connected on re-assembly.
5. Remove the terminal block nuts and washers. At this stage only the terminal screws will be protruding through the cylindrical furnace surround.
6. Note on which side of the apparatus the specimen insertion device damper is positioned (the guide rod will be on the opposite side).
7. Unscrew the damper tube support brackets and remove the damper assembly, complete with insertion device.
8. Unscrew the guide rod support brackets and remove the guide rod.
9. Remove the top cover frame.
10. Remove the top cover plate, complete with the top draught shield and its insulation collar (magnesium oxide may spill from the apparatus during this operation).
11. Remove the magnesium oxide insulating powder from the area around the furnace heater tube. It has been found that the most efficient and economical method of achieving this is to use a vacuum cleaner, the powder being collected in a clean bag so that it can be subsequently re-used. (Ensure that the vacuum tube is clean so that the powder is not contaminated).
12. Carefully lift the heater tube from its position in the groove in the bottom plate, at the same time tilt the tube so that the terminals clear the location holes in the cylindrical furnace surround. The heater tube can then be lifted, complete with terminals, from the apparatus.
13. Examine the top and bottom cover plates for cracks, scaling or other damage and replace any items which are seriously affected. If the cover plates are to be re-used ensure that the grooves are free from any deposits.

14. Remove any spilled magnesium oxide insulating powder from the conical draught stabiliser tube. The use of a vacuum cleaner is again recommended.
15. Insert a new heater tube into the apparatus. This is accomplished by carefully lowering the tube into position, suitably tilted so that the terminals of the tube are positioned adjacent to the holes in the cylindrical furnace surround. It may be of assistance if the terminals are compressed towards the tube but care must be taken to ensure that the terminals and the tube are not unduly stressed as this could lead to premature failure of the winding during its operation.
16. Locate the furnace tube in the groove in the bottom plate, again carefully compressing the terminals towards the tube.
17. Release the terminals and locate them into the locating holes in the cylindrical furnace surround.
18. Re-fit the terminal washers, nuts and terminal block to the protruding terminals, **ensuring that they are re-connected in an identical manner to the original connections.**
19. Re-fill the annular space between the furnace tube and the cylindrical furnace surround with magnesium oxide insulating powder. Ensure that the powder completely fills the space and that no air-gaps will be left when the remaining items are re-assembled. Gently compress the powder to prevent future settling.
20. Carefully re-assemble the remaining items, in reverse order, and reposition and re-connect the thermocouples.
21. Ensure that no gaps exist between the heater tube and the draught shield. Any gaps can be sealed with a small amount of fire cement which should be rubbed into the joint.
22. Re-connect the apparatus to the electrical supply.