



INSTALLATION OPERATION AND MAINTENANCE INSTRUCTIONS FOR EXHEAT INDUSTRIAL IMMERSION HEATERS (INCLUDING FLAMEPROOF)

Please read these instructions thoroughly before installation and ensure they are passed on to the end-user.

1.0 GENERAL

- 1.1 All work should be carried out by suitable qualified personnel.
- 1.2 Heaters must be handled with care and stored in dry conditions.
- 1.3 Adequate withdrawal space must be provided to allow the removal of the heater assembly.
- 1.4 Carefully remove all protective packaging and visually inspect unit for any transit damage.
- 1.5 All prevailing rules, regulations and bylaws in force at the time and place of installation must be observed.
- 1.6 Heaters must only be immersed in the fluid they are designed to heat.
- 1.7 The introduction of alternative fluids even in small concentrations for purposes such as sterilising may cause serious damage to the heater and will invalidate the warranty.
- 1.8 Any modification not carried out by Exheat Limited or its approved agent will invalidate certification and warranty.
- 1.9 Precautions must be taken to prevent damage to enclosure seals.
- 1.10 For flameproof heaters reference must be made to IEC / EN 60079-17.
- 1.11 All electrical testing must be carried out in a non-hazardous area.
- 1.12 Precautions must be taken to prevent damage to machined surfaces and threads of flameproof enclosures.
- 1.13 Any special conditions for safe use detailed on the hazardous area certification for flameproof heaters must be complied with.

2.0 INSTALLATION

- 2.1 The heater should be securely fixed in position and all terminal connections checked for tightness before energising.
- 2.2 The heater must be installed horizontally unless it has been specified and manufactured for use in a vertical orientation.
- 2.3 The installed orientation of horizontally mounted heaters must be such that any thermostats or other temperature sensors are uppermost.
- 2.4 Sealing gaskets must be undamaged.
- 2.5 The terminal box must not be used for tightening heater into tank or vessel.

3.0 ELECTRICAL SUPPLY CONNECTION

- 3.1 Refer to wiring diagram (inside the cover – non-flameproof heaters only).
- 3.2 The cable entry is positioned on the side of the terminal box.
- 3.3 Before connection ensure that the supply corresponds with that specified on the rating label.
- 3.4 Ensure that the sizes and types of cables to be used are suitably rated for the load and temperature of the unit.
- 3.5 Each heater must be protected by a suitably rated over current device.
- 3.6 Cables must enter the terminal box via a suitable cable gland to maintain the IP rating and be fitted by a qualified person.
- 3.7 For flameproof heaters, cables must enter the heater terminal box via ATEX certified Ex d (for ATEX certified heaters) or IECEx certified Ex d (for IECEx certified heaters) cable glands (not supplied) and be fitted by a qualified person.
- 3.8 The cover (and body – where applicable) of FP and RF series terminal boxes are unscrewed after slackening a locking grub screw using a 3mm A/F hex key. When re-fitting ensure that the 'o' ring seal is in good condition and correctly located. The main cover threads **MUST** be kept clean and free from any debris at all times.
- 3.9 The installer or end user must connect to the Exheat supplied terminals within the terminal box - **DO NOT** connect to or disturb factory fitted heating element wiring.

4.0 EARTH CONNECTION

4.1 WARNING – these heaters MUST BE EARTHED.

4.2 An internal earth connection is provided inside the terminal box.

4.3 An external earth connection (flameproof heaters only) is located adjacent to one of the terminal box cable entries.

5.0 OPERATION

5.1 Ensure that the active section of all the heating elements are fully immersed in the fluid to be heated at all times whilst energized.

5.2 Heat is transferred by means of electric heating elements.

5.3 Control of the heater is facilitated by thermostats, thermocouples or RTD's and reference should be made to the wiring diagram (inside the cover – non-flameproof heaters only) to ensure that these are correctly connected and set prior to energising the heater.

5.4 Where a manual reset thermostat or cut-out is installed, the terminal box cover will have to be removed to enable a reset to be carried out.

6.0 MAINTENANCE

6.1 All prevailing site safety regulations shall be adhered to at all times.

6.2 Any damage or faults should be notified to Exheat Limited immediately

6.3 Equipment must be fully isolated from the electrical supply before and whilst any work is being carried out.

6.4 Before and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases present.

6.5 Replacement of core type heating elements may be carried out without removing the heater by disconnecting the element and withdrawing it from its tube – **CAUTION:** hazardous area core heaters must **NOT** be energised with any core elements missing from their respective tubes.

6.6 For flameproof heaters reference should be made to IEC / EN60079-17 (especially table 1) in addition to the following recommendations.

6.7 Any replacement parts required must be obtained directly from Exheat. The use of any other parts will void any certification and warranty.

6.6.1 3 Monthly

- a. Generally inspect the equipment for external damage or leaks.

6.6.2 6 Monthly

- a. Isolate the electrical supply and remove the cover (after releasing locking grub screw using a 3mm A/F hex key – flameproof heaters only).
- b. Check that the terminal box is clean and dry internally.
- c. Check that the electrical terminals are intact and secure.
- d. Check that the heating element insulation resistance is at least 2 megohm.
- e. Check the continuity of all heating elements.
- f. Refit cover with new gasket or 'o' ring if required (and re-tighten locking grub screw – flameproof heaters only).
- g. Check that earth continuity is maintained between all exposed conductive material and main structure.

6.6.3 Annually

- a. Carry out all 3 monthly and 6 monthly checks as above.
 - b. Check for element failure or low insulation resistance.
- 6.7 Only Exheat Ltd or its approved agent to carry out rod type element replacement in flameproof heaters otherwise the certification will be invalidated.
- 6.8 If heaters are being left unused for a period greater than 3 months, carry out 6 monthly maintenance before energizing.

6.9 IR Low Insulation / Earth Leakage Prevention

- 6.9.1 Heaters must be handled carefully and stored in a clean and dry environment.
- 6.9.2 The storage period should not exceed 12 months.
- 6.9.3 The silica gel bags must remain within the terminal box and replaced as required.
- 6.9.4 The cable entries must be plugged at all times.
- 6.9.5 The terminal box lid must be replaced immediately after any installation work has been carried out.

6.10 Removal and Replacement of Ceramic Core Type Heating Elements (core-type heaters only)

- 6.10.1 Replacement of this type of heating element may be carried out without removing the heater assembly from its tank or vessel and without draining it down.
- 6.10.2 Isolate the electrical supply and remove the cover (after releasing locking grub screw using a 3mm A/F hex key – flameproof heaters only).
- 6.10.3 Disconnect electrical connections and remove cables to heater (single core flameproof heaters only).
- 6.10.4 Slacken base locking grub screw then unscrew and remove terminal box body (single core flameproof heaters only).
- 6.10.5 Release clamps securing heating element.
- 6.10.6 Carefully withdraw heating element from its tube.
- 6.10.7 Check element tube is clean and dry internally.
- 6.10.8 Carefully fit replacement heating element through a new sealing gasket and into tube whilst preventing it from bending and protecting it from mechanical shock.
- 6.10.9 Re-assemble heater and re-connect wiring (reverse of 6.9.2 to 6.9.5 above).
- 6.10.10 Carry out 6 monthly checks as above.

7.0 Marking

7.1 RFA... Type:

 II 2 G (ATEX certified heaters only)

Ex d IIC T6 to T3

7.2 RFA... Type (Externally adjustable version):

 II 2 G/D(ATEX certified heaters only)

Ex d IIC T6 to T3

Ex tD A21 IP6X T...°C

7.3 RFA-C... Type:

 II 2 G (ATEX certified heaters only)

Ex d IIC T6

7.4 FP... Type:

 II 2 G/D (ATEX certified heaters only)

Ex d (or de) IIC T6 to T1

Ex tD A21 IP66 T...°C

8.0 Certification references:

8.1 RFA... Type LCIE 99 ATEX 6006 X

8.2 RFA-C... Type LCIE 99 ATEX 6011 X

8.3 FP... Type LCIE 01 ATEX 6056 X
IECEX LCI 06.0006X

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(As amended by 92/31/EEC & 93/68/EEC

94/9/EC (ATEX Certified Flameproof heaters only)

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