



INFINITY FLUIDS  
EXPERTISE: HEATERS, CONTROLS, SYSTEMS, ENGINEERING

Infinity Fluids Corp.  
Worcester, MA  
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*Thank You for choosing IFC for all of your heating and control requirements.*  
**Please Read Before Operating any Infinity Heaters:**  
*(If you do not read the whole page, please just read the underlines.)*

*The Infinity CRES Heaters are a patented design allowing for the most efficient and cost effective mode of heating moving fluids. As with all fluid and circulation heaters a few precautions should be observed to assure the safe operation and long life of the element.*

**•If insulating an Infinity or any Electric heater, NEVER use flammable material.** *Fire may occur in the event of unforeseen events during operation. Ceramic fiber insulation and metal shrouding is acceptable.*

**•When mounting Infinity's or any electric heater, NEVER use plastic or polymeric materials, or any flammable material.** *Fire may occur in the event of un-foreseen events during operation. Ceramic and metal mounts are acceptable.*

**•When using any of Infinity's Heaters to heat flammable or explosive materials,** *ensure the element terminals are mounted within a Explosion Proof Head and all explosion proof standards are observed and implemented by licensed personnel. The elements must be fully submerged with NO AIR / O2 trapped within the element housing when heating a liquid. When heating flammable or explosive gases the **Element housing must be fully purged of all Air / O2 prior to powering elements.** There must be a solid ground and a fail safe ground fault interrupt device inline with the control contactor circuit to cut power to heater array in the event of arcing within the heater. ALWAYS ensure proper grounding of element at the housing and the terminal enclosure.*

**•When cleaning heater,** *ensure heater is not energized prior to introduction of interior cleaning agent. Use of acidic, basic and chelating materials are all acceptable within Infinity standard heaters during off cycles. When necessary heater element array may be removed for physical cleaning and inspection, ensure heater terminals are properly locked out from service prior to servicing any electric heater.*

#### **WATER/LIQUID HEATERS**

- *When installing Infinity CRES heater components into process, ensure correct connector fittings are used and mate properly before operating the process. It is acceptable that the coil come in contact with the housing body or pipe as long as the body or pipe is properly grounded that is accepting the element.*
- *For flowing media heaters must be mounted in a vertical position or in an orientation such that air cannot build up in housing.*
- *Heaters are to be primed and submerged prior to any power being applied to the heaters.*
- *When using CRES heaters in a single-pass/in-line mode, units should use solid state power switching devices such as Solid State Relays (SSRs) or SCRs. For accurate and safe control, the cycle time must be set to 0.2 seconds or fastest possible settings available on PID controller or PLC-PID Loop.*
- *There must be fluid flow prior to powering on the element. If the element is turned on prior to media flow then damage or failure to element could occur*
- *The end of the heater with the thermocouple represents the outlet of the heater, the side opposite the thermocouple is the liquid inlet. If operated opposite to these positions then heater failure is likely to occur.*
- *The Red Leads on type K and J thermocouples is the Negative, Yellow and White (respectively) are positive.*
- *Many Infinity CRES heaters are sold without control systems from Infinity. If you are using your own control unit, please contact Infinity about proper operation and settings for your PID loop. 888-565-8137.*

#### **AIR/GAS HEATERS**

- *When installing Infinity CRES heater components into process, ensure correct connector fittings are used and mate properly before operating the process. It is acceptable that the coil come in contact with the housing body or pipe as long as the body or pipe is properly grounded that is accepting the element.*

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www.infinityfluids.com  
Technically Advanced Heaters



- Heaters should be mounted in a vertical position or in an orientation such that air natural heated air movement rises toward the thermocouple sensor. The higher the operating temperature the more important this requirement becomes.
- Air or Gas flow must be present at all times of heater operation. Flow switches or valve/blower interlocks can help achieve this requirement..
  - When using CRES heaters in a single-pass/in-line mode, units should use solid state power switching devices such as Solid State Relays or SCRs. For accurate and safe control, the cycle time must be set to 0.2 seconds or fastest possible settings available on PID controller or PLC-PID Loop. Temperatures above 800° F require the use 20°F/min ramp to set-point and an analog control loop with phase angle SCR power controller.
- There must be air/gas flow prior to powering on the element. If the element is turned on prior to media flow then damage or failure to element will occur
- The end of the heater with the thermocouple represents the outlet of the heater, the side opposite the thermocouple is the air/gas inlet. If operated opposite to these positions then heater failure is likely to occur.
- The Red Leads on type K and J thermocouples is the Negative, Yellow and White (respectively) are positive.
  
- Many Infinity CRES heaters are sold without control systems from Infinity. If you are using your own control unit, please contact Infinity about proper operation and settings for your PID loop. 888-565-8137.

#### **QUARTZ AIR/GAS HEATERS**

- Heaters should be mounted in a vertical position or in an orientation such that air natural heated air movement rises toward the thermocouple sensor. The higher the operating temperature the more important this requirement becomes.
- Air or Gas flow must be present at all times of heater operation. Flow switches or valve/blower interlocks can help achieve this requirement.
- CONTROLLED RAMP TO SETPOINT < 20°F/minute, ensure controlled temperature increase, not to exceed 20°F/Minute. Quartz is an excellent thermal insulator and the heat from the active heating mass lags 20-30 seconds after powering. Please ensure the PID control loop is properly tuned to ensure safe and accurate approach to temp.
- When using CRES heaters in a single-pass/in-line mode, units should use solid state power switching devices such as Solid State Relays or SCRs. For accurate and safe control, the cycle time must be set to 0.2 seconds or fastest possible settings available on PID controller or PLC-PID Loop.
- There must be air/gas flow prior to powering on the element. If the element is turned on prior to media flow then damage or failure to element will occur
- The end of the heater with the thermocouple (if provided) is the outlet of the heater, the side opposite the thermocouple is the air/gas inlet. If operated opposite to these positions then heater failure is likely to occur.
- The Red Leads on type K and J thermocouples is the Negative, Yellow and White (respectively) are positive.
- Many Infinity CRES heaters are sold without control systems from Infinity. If you are using your own control unit, please contact Infinity about proper operation and settings for your PID loop. 888-565-8137.

#### **HEATER QUALIFICATIONS AND QUALITY PROCEDURES**

- Unless otherwise noted the heater circuit will maintain a power output of +/-10% of actual required levels.
- The heater mechanical requirements will be as required by product drawings supplied by IFC tech dept.
- The dielectric constant unless otherwise noted will be twice the required voltage minimum, with a failure rate being determined at 5mA leakage to ground.

#### **STANDARD TROUBLE SHOOTING**

- If heater is not heating fluid, ensure wiring to the control loop is correct by using the supplied wiring diagram.



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- Check that the resistance between the heater terminals is a fixed whole number while measuring across the contacts. Measurements of kOhms or MOhms indicates that the heater is failed.
- If the heater is tripping circuit breakers or blowing fuses, measure resistance to ground by placing one end of the ohm meter on one leg of the heater terminal and the other on the heater ground. A MOhm value or unregistered value is good. Very low ohm reading indicates that the heater is grounded and should immediately be removed from service.

**PLEASE READ THE FOLLOWING AND BE SAFE USING INFINITY HEATERS OR ANY ELECTRIC HEATER**

*\*ALWAYS ENSURE PROPER EARTH GROUND DURING OPERATION OF ANY INFINITY HEATER.*

*\*NEVER USE HEATER IN PRESENCE OF FLAMMABLE MATERIALS/SURROUNDINGS. THE HEATER/SHORUD/ELECTRICAL ENCLOSURE CAN GET VERY HOT IN MANY APPLICATIONS AND CAN CAUSE BURNING OF PERSONNEL OR COULD START A FIRE IF WITHIN RANGE OF FLAMMABLE MATERIALS.*

*\*IN THE EVENT THERE IS FLAMMABLE PRODUCT ON OR NEAR HEATER, ENSURE PROPER DISTANCE FROM OTHER FLAMMABLE MATERIALS AS TO NOT PRECIPITATE A LARGER FIRE AND ENSURE ALL SAFETY PRECAUTIONS TO ALLOW MATERIAL TO SAFELY EXTINGUISH ITSELF IN EVENT OF FIRE.*

*\*IF SUPPORTS ARE USED TO MOUNT AN INFINITY HEATER MAKE SURE THE MATERIALS USED TO SUPPORT THE HEATER ARE NOT FLAMMABLE AND ARE MECHANICALLY SUFFICIENT TO HOLD HEATER IN PLACE IN THE EVENT OF CATASTROPHIC FAILURE EITHER DUE TO THE HEATER OR ANOTHER SURROUNDING COMPONENT FAILURE.*

*\*IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THE HEATER IS RUN IN A SAFE MANNER WITHOUT THE POTENTIAL TO OVERHEAT, ELECTRICALLY FAIL OR MECHANICALLY FAIL. DEVICES LIKE FLOAT SWITCHES, FLOW SWITCHES, OVER TEMPERATURE SWITCHES, PRESSURE SWITCHES, GROUND FAULT INTERRUPT SWITCHES ETC ARE PROPERLY IMPLEMENTED PRIOR TO THE OPERATION OF ANY UNIT.*

*\*ELECTRICAL AND PLUMBING PROFESSIONALS AND COMMON SENSE SHOULD BE USED TO IMPLEMENT ANY INFINITY HEATER. ALWAYS LOOK FOR FAILURE POTENTIALS AND ENSURE IF A FAILURE OCCURS PROPER SAFE GUARDS ARE IN PLACE, INCLUDING FIRE EXTINGUISHING SYSTEMS, WARNING LABELS FOR HOT SURFACES, LABELS FOR PROCESS OUTLETS AND INLETS, PROPERLY LOCATED AND DIRECTED VENTS AND PRESSURE RELIEFS ETC.*

*\*IF YOU HAVE ANY QUESTIONS AT ALL ABOUT SETTING UP OR OPERATING AN INFINITY HEATER SAFELY, PLEASE CONTACT INFINITY (888-565-8137 OR SALES@INFINITYFLUIDS.COM), SOMEONE WILL BE HAPPY TO ASSIST AND PROVIDE FAIL SAFE RECOMMENDATIONS OR LOCATIONS WHERE THE FAIL SAFE DEVICES CAN BE PURCHASED.*

**If you have any questions regarding the use or installation of your new heater, please call our technical department at 888-565-8137, they will be happy to assist in any way they can. All Infinity products are warranted for 6 months following the shipment of the units. Please contact us immediately if you have any concern/problem with any IFC product, it will promptly and courteously be handled. Thank you again for choosing Infinity Fluids Corporation for all of your heating and controls projects.**

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