Motor Error/Safe Mode

Check Has the valve been reset (i.e. powered off, then on)?

Yes

No

Is the front electronics enclosure closed?

Yes

Close door fully against valve body

No

Are the valve internals free of debris and clean?

Yes

Remove valve internals and thoroughly clean

No

Are the O-Rings/Seals in good condition & not preventing the spool travel?

Yes

Remove valve internals & check O-rings/Seals to ensure they are smooth; if not, replace

No

Is the motor operational? (i.e. is it able to turn/drive gears?)

Yes

No

Replace motor

Is the magnetic rotor attached to the motor operational?

Yes

No

Is the valve free of any leaks coming out of bottom of valve?

Yes

No

Ensure all wires are not pinched & plugs are connected; if needed replace cable loom

Are supply pressures nominally equal (within 5psi)?

Yes

Equalize pressures

No

Are all cables/wiring & connectors ok?

Yes

Replace Ele. Housing

No

Is the valve PCB operational and ok?

Yes

Replace Ele. Housing

No

Is the valve PSU operational and ok?

Yes

Replace Ele. Housing

No

Issue addressed or Contact Factory @ 269-279-3602

Key:

PSU = Power Supply
PCB = Printed Circuit Board

GDA = Gear Drive Assembly
**PCB Error**

- **Check:** Has the valve been reset (i.e. powered off, then on)?
  - No → Reset the valve by powering down & then powering back on
  - Yes → Check if the software/firmware version 9 or greater?
    - No → If has BrainScan, replace Ele. Housing
    - Yes → Ensure all cables/wires & connectors ok?
      - No → Ensure all wires are not pinched & plugs are connected; if needed replace cable loom
      - Yes → Is the valve PCB operational and ok?
        - No → Replace Ele. Housing
        - Yes → Is the valve PSU operational and ok?
          - No → Replace Ele. Housing
          - Yes → Issue addressed or Contact Factory @ 269-279-3602

- **Thermistor Error**

- **Check:** Has the valve been reset (i.e. powered off, then on)?
  - No → Reset the valve by powering down & then powering back on
  - Yes → Check if all cables/wires & connectors ok?
    - No → Ensure all wires are not pinched & plugs are connected; if needed replace cable loom
    - Yes → Are the thermistors operational and ok?
      - No → Replace cable loom
      - Yes → Is the valve PCB operational and ok?
        - No → Replace Ele. Housing
        - Yes → Issue addressed or Contact Factory @ 269-279-3602

**Key:**
- PSU = Power Supply
- GDA = Gear Drive Assembly
- PCB = Printed Circuit Board
**Battery Error**

- **Check**
  - Has the valve been reset (i.e. powered off, then on)?
    - No:
      - Reset the valve by powering down & then powering back on
    - Yes:
      - Have the batteries been replaced within last year?
        - No:
          - Replace Batteries
        - Yes:
          - Are all cables/wires & connectors ok?
            - No:
              - Ensure all wires are not pinched & plugs are connected
            - Yes:
              - Is the valve PCB operational and ok?
                - No:
                  - Replace Ele. Housing
                - Yes:
                  - Is the valve PSU operational and ok?
                    - No:
                      - Replace Ele. Housing
                    - Yes:
                      - Issue addressed or Contact Factory @ 269-279-3602

**Display Issues**

- **Check**
  - Has the valve been reset (i.e. powered off, then on)?
    - No:
      - Reset the valve by powering down & then powering back on
    - Yes:
      - Is the lighting/brightness sufficient?
        - No:
          - Adjust brightness via POT adjustment screw on PCB
        - Yes:
          - Is the display numerals/characters ok?
            - No:
              - Replace display & keep original to allow for a spare in event heat affects again
            - Yes:
              - Issue addressed or Contact Factory @ 269-279-3602

**Key:**
- PSU = Power Supply
- GDA = Gear Drive Assembly
- PCB = Printed Circuit Board

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Temperature Control Issues

Check

- Has the valve been reset (i.e. powered off, then on)?
  - No
    - Reset the valve by powering down & then powering back on
  - Yes
    - Has the valve been re-calibrated?
      - No
        - Calibrate valve
      - Yes
        - Does the valve control under minimum demand?
          - No
            - Isolate recirculation; create sufficient demand (10gpm min.) & check performance
          - Yes
            - Does the system have sufficient recirculation flow (10gpm min.)?
              - No
                - Check recirculation pump rating; ensure is capable and running at min. of 10gpm; if not, increase pump size
              - Yes
                - Are supply pressures nominally equal (within 5psi)?
                  - No
                    - Equalize pressures
                  - Yes

- Does the system have sufficient recirculation loop temperature loss (2deg min)?
  - Yes
    - Does the recirculation pump run continuously without an Aquastat?
      - No
        - Remove aquastat; recirculation pump should run continuously
      - Yes
        - Is there adequate supply water temperatures (hot & cold supply)?
          - No
            - Ensure hot water supply is > than valve setpoint (min. 2deg F) & cold water supply is < than valve setpoint (min. 2deg F)
          - Yes
            - Are the valve internals free of debris and clean?
              - No
                - Remove valve internals and thoroughly clean
              - Yes
                - Are the O-Rings/Seals in good condition & not preventing the spool travel?
                  - No
                    - Remove valve internals & check O-rings/Seals to ensure they are smooth; if not, replace
                  - Yes
                    - Is the spool lock nut on the drive shaft tight preventing any spool slop?
                      - No
                        - Tighten lock nut to 80-90 in-lb
                      - Yes
Temperature Control Issues Cont’d

Are there strainers in the system & if so are they clean?

Yes

No

Install strainers on ALL supply lines & remove basket (not just blow down) to clean

Is the valve installed/piped according to installation instructions?

Yes

No

Re-pipe to ensure installed per instructions

Are the checkvalves installed holding correctly?

Yes

No

Replace checkvalves

Is the valve installed in a single temperature loop/system (i.e. no high temp kitchen loops)?

Yes

No

Ensure there are no cross-connections w/ any higher/lower temp loops

Issue addressed or Contact Factory @ 269-279-3602