

TECHNICAL BULLETIN

COOLFLOW™ PUMP BUBBLE DETECTION ERROR

INTRODUCTION

There are two Bubble Error codes that are produced by the COOLFLOW™ Pump: bF and bu.

bF = Bubble Detector Self Test Failure.

Upon start up & periodically a self-test is run on the Bubble Detectors. This error code is generated if the test fails. This indicates that the detectors are not functioning.

bu = Air Bubble Detected

This is a failure that occurs when the Bubble Detectors are functioning properly. This code indicates that there are bubbles in the tubing or that the system is detecting some problem with the tubing set and is interpreting it as bubbles.

We have found that certain conditions may lead to false bubble error codes:

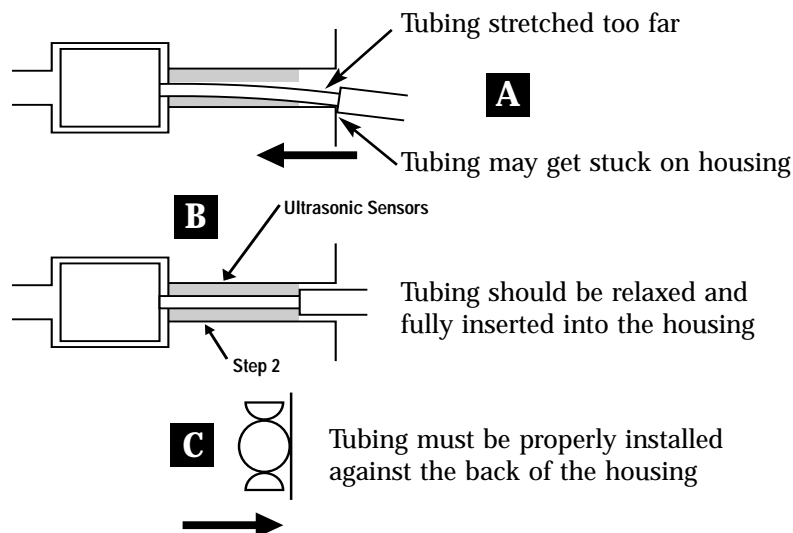
CAUSES/CORRECTIVE ACTIONS

❖ bF failure code causes:

- Defective Assembly
 - Corrective Action
 - Reboot system.
 - If problem persists contact the Service Center for repair.

❖ bu failure code causes:

- Wet tubing
 - Corrective Action
 - Ensure tubing set exterior is dry. Ensure sensor is also dry.
- Tubing stretched too far
 - Corrective Action
 - Gently stretch tubing and insert into assembly. **Item A**
- Improper insertion of tubing
 - Corrective Action
 - The smallest diameter of the tube must be completely inserted into the ultrasonic sensor assembly. **Item B**
 - Release tension on tubing and ensure that the tubing relaxes and sits all the way into the assembly.
 - Ensure tubing assembly is relaxed in housing.
 - Ensure tubing set is properly inserted against back of housing. **Item C**



COOLFLOW™ PUMP “bu” ERROR TROUBLESHOOTING TABLE

Observed Condition	Possible Cause	Possible Solution
<p>During mid-operation of the pump (i.e. tubing set installed and pump operation started successfully) the LED display signals “bu” and the pump head stops.</p>	<p>Air was detected in the tubing line by one of the bubble detectors. The pump will stop within 3 seconds of detecting the air.</p>	<p>Open the stopcock to air, directing flow away from the patient. Examine the tubing for trapped air and use the “> > >” button to purge the air from the system. Once the air is purged, close the stopcock to air. Be sure to check for wet tubing, dirty tubing, or improper installation of the tubing in the sensors.</p>
	<p>The in-flow and/or out-flow tubing line has been pulled or tugged during operation.</p>	<p>Because of design specifications for the bubble sensors, they are very sensitive to movement of the tubing within the sensor. Any movement in tubing within the sensor can simulate a change in media and trigger a “bu” alarm. Once the pump is in operation, be watchful of the in-flow and out-flow tubing lines. Be sure to keep them relaxed.</p>
<p>Immediately upon starting the pump, the LED display signals “bu” and the pump head stops.</p>	<p>When the tubing set was installed, the tubing was stretched in order for it to fully seat into the bubble detectors. The initial movement of the pump head, at start-up, allows the tubing through the sensors to migrate to its relaxed condition. This slight movement in tubing triggers a “bu” alarm.</p>	<p>Without opening the pump access door, push both the in-flow and out-flow tubing lines towards the bubble sensors allowing the stretched tubing to return to its relaxed condition. Purge the system with the “> > >” button for approximately 15 seconds.</p> <p>NOTE: This should always be done when initially installing the tubing set if the tubing is stretched in order to fully seat it into the bubble sensors.</p>



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