



What to do if the Tafonius piston moves on its own or there is unusual piston movement

Scope: This document applies to all models of Tafonius

Date: 13 December 2018

Tafonius uses a Pressure Servo system to control the piston movement. Pressure is sensed at the Y-piece from the elbow connector and the long clear plastic tubing that runs back inside the machine. Inside the machine this tubing connects with a very sensitive electronic pressure sensor.

Effects associated with either fluid in the sensing line or an incorrect Pressure Sensor Offset are:

- Piston moves to the top or bottom of the cylinder on its own
- Piston will not initialise and reports an error
- Piston moves in response to raising/lowering the Y-piece

There are 2 main causes for the above to happen:

- 1) There is fluid in the pressure sensing line
- 2) The Pressure Offset is incorrect

1) Fluid in the pressure sensing line - this usually causes unexpected erratic movements of the piston and spontaneous breathing or ventilation is not as smooth as normal. Also, the piston moves in response to raising/lowering the Y-piece

If the Y-piece is angled down from the patient's head or if it is upside down it is possible for condensate to run into the pressure sensing tube. Because the tubing is blind-ending it is not easy for fluid to accumulate in the tubing but occasionally it does occur. On inspection, bubbles of fluid can usually be seen inside the tubing at points along its length.

Test for fluid in the pressure sensing line:

- Have the machine turned on and in normal resting/servo mode
- Remove the stopper from the Y-piece
- Raise the Y-piece as high as you can and see if the piston moves up
- Lower the Y-piece as low as you can and see if the piston goes down

If you get movement when raising or lowering the Y-piece then there is fluid in the pressure sensing line.



To clear out the pressure sensing line: disconnect it at both ends (from the machine and from the Y-piece). Use a 50 ml syringe or air pressure line to blow down the tubing and clear it out. Blow from the machine end towards the Y-piece. If you use a 50 ml syringe, you will usually hear the fluid gurgling and coming out at the end of the tubing.

When the line is clear, reconnect the tubing and repeat the above test. If there is no movement when the Y-piece is raised/lowered then the fluid has been cleared. If there is still movement, repeat the flushing to remove all fluid. If after repeated flushing there is still movement, then it is likely that fluid is still in the tubing inside the machine. If this is the case:

- Turn the machine OFF
- Open the back door, or if this is Junior lift up the front cover.
- Locate where the tubing enters inside the machine and follow it to the point where it first connects to a plastic connector.
- Disconnect it from that connector and then flush the tubing backwards with air, away from the pressure sensor and out to the panel connection. If you flush it the other way, you risk spraying fluid onto the electronics.
- Reconnect the tubing to the connector and repeat the above tests

2) The Pressure Offset is incorrect - this usually causes continuous movement of the piston, either up or down and will be seen when the stopper is not fitted to the Y-piece. With the Y-piece fitted the piston will move to create either a small positive or negative pressure and then stop.

The Tafonius Servo system uses a sensitive pressure sensor to measure the airway pressure at the Y-piece. Comparisons are made with the current atmospheric pressure and if the measured pressure exceeds the atmospheric pressure the piston is moved up. If the measured pressure is less than the atmospheric pressure, the piston is moved down. The reference against which the comparisons are made is called the Pressure Offset and is factory set. Sometimes this Offset may get changed inadvertently by the user during initialisation if they enter the Pressure Sensor Offset routine.

If the resting Pressure Sensor Offset is changed then the normal atmospheric pressure will look like either a slight positive or slight negative pressure and so the piston will move accordingly.

Test for an incorrect Pressure Sensor Offset:

- Have the machine turned on and in normal resting/servo mode
- Fill the machine to about the mid-point
- Remove the Y-piece stopper
- If the piston moves either up or down on its own, then the Pressure Sensor Offset is incorrect and needs to be reset. To do this, see the document ***"Resetting the Pressure Sensor Offset in Tafonius.pdf"***