

VM3COP50.18 Set up and Service for Tom Thumb Resuscitation Unit Valves



Adjustable valve



Precision valve

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This manual is intended to provide information to help qualified maintenance personnel service and repair the Tom Thumb Infant resuscitation units – adjustable and precision valves. Basic engineering knowledge and the ability to follow technical instructions are assumed, as are knowledge of oxygen flow rates and the characteristics of operational pressures.

The equipment needed to service the Tom Thumb valves are laid down in this service manual. In addition, a calibrated manometer will be required for test and calibration of the units. Diagrammatic representations of disassembly and re-assembly are shown in this service manual.

Servicing personnel must be aware of the potential clinical implications of incorrectly serviced equipment.

Introduction

Service of the Tom Thumb resuscitation unit – adjustable and precision valves.

The Tom Thumb has been designed to require minimal service with very few replaceable items. The accuracy of the pressure gauge, adjustable valve and precision valve should be checked at least every 12 months or when the gauge at zero pressure reads outside the black band.

It is recommended that all O-rings should be replaced every year.

The adjustable valve has no user replaceable parts or parts that should suffer from wear. Adjustment by the user is not recommended as specialist tools are required to dismantle and reset. Should the user require in-house servicing of the adjustable valve, then full service kits are available from Viamed.

Setting of the adjustable valve pressure when carried out in accordance with the relevant procedure will ensure accuracy to ± 1 cmH₂O.

The precision valve is factory pre-set and sealed. Adjustment by the user is not recommended as specialist tools are required to dismantle and reset. Should the user require in-house servicing of the precision valve, then full service kits are available from Viamed.

The precision valve pressure may have been set at manufacture to 20, 30, 40 & 50 cmH₂O to a tolerance of ± 1 cmH₂O, dependent on customer requirements. Setting of the precision valve, when carried out in accordance with the relevant procedure, will ensure accuracy to ± 1 cmH₂O.

If the setting of either the adjustable valve or the precision valve is proven to be outside the required tolerance it is recommended that the Tom Thumb be returned to Viamed for servicing. Both valves require specialist tooling to dismantle and reset.

Servicing: Adjustable valve

Important: Use only oxygen-compatible grease and adhesive during assembly of Tom Thumb adjustable valves. Do not use or allow organic greases to enter the Tom Thumb or accessories. Ensure all parts are clean before assembly.

Tools required:	7/8 A/F spanner 20-35mm pin spanner Collar insertion tool 3.0*0.5mm flat blade screw driver Pick
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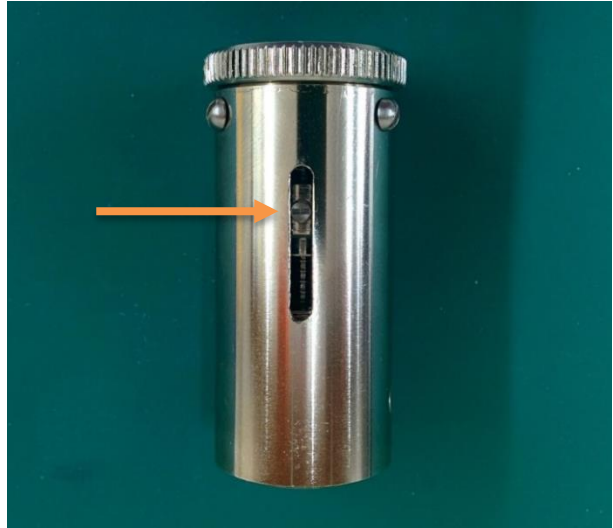
- 1) Unscrew the adjustable valve seating and remove any residual adhesive, if present.



- 2) Remove the valve seat and spring from the valve body. Using an isopropyl solution, clean the seat and spring.



- 3) Remove the centre screw from the internal stop.



- 4) Unscrew the three side screws from the adjustable valve body.



- 5) Remove the valve adjuster, with the internal stop, from the valve body.



- 6) Unscrew the adjustable valve internal stop from the adjustable valve screw and clean it. Re-grease the thread of the adjustable valve screw. Screw on the internal stop to $\frac{3}{4}$ of the way down the adjuster thread.



- 7) Remove adjustable valve collar and remove any residual adhesive.

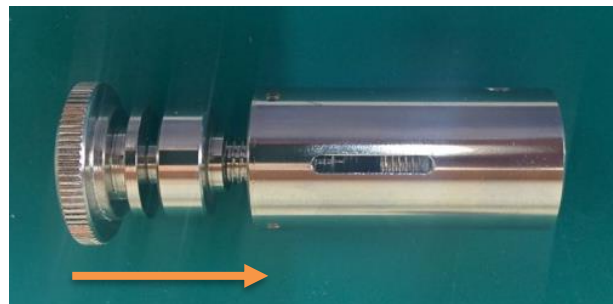


- 8) Screw in the adjustable valve collar into the threaded end of the valve body, until visible through the slot in the body.

This is the starting point at which set up this valve. It could be necessary to make small incremental adjustments to the position of this collar to achieve the desired output.



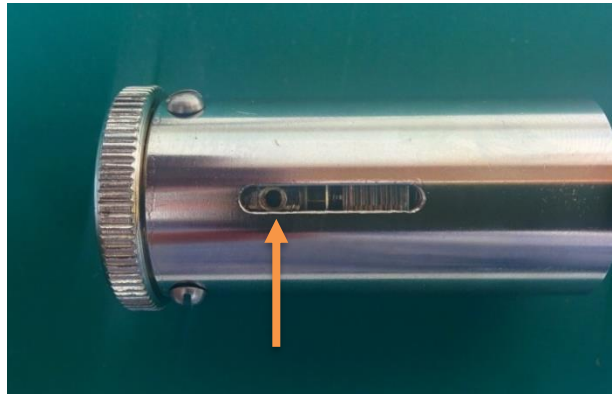
- 9) Insert the valve adjuster and internal stop in to the adjustable valve body.



- 10) Screw the side screws into the adjustable valve body.



- 11) Turn the adjuster until the threaded hole in the internal stop is visible through the slot in the valve body.



- 12) Screw in the centre screw until flush with the valve body.



- 13) Place the open end of the spring over the adjuster thread.

Insert the valve spring into the valve body and over the adjustable valve screw leaving the shaped end visible.



- 14) Lightly grease the spindle of the valve seat and insert through the spring. Ensure that the spindle engages with the hole in the adjustable valve screw.



- 15) Screw on the adjustable valve seating.



- 16) Ensure the unit is clean prior to assembly with the Tom Thumb.



Servicing: Precision valve

Tools required:	7/8 A/F spanner 20-35mm pin spanner Flat blade screw driver
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Important: Use only oxygen-compatible grease and adhesive during assembly of Tom Thumb adjustable valves. Do not use or allow organic greases to enter the Tom Thumb or accessories. Ensure all parts are clean before assembly.

- 1) Unscrew the valve seating from the precision valve body and remove any residual adhesive.



- 2) Remove the valve seat.



- 3) Remove the spring and any residual adhesive from the precision valve body, if present.



- 4) Remove valve adjustable screw and any residual adhesive, if present.



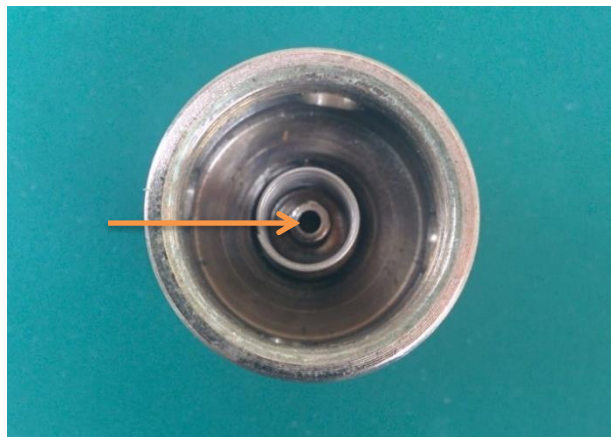
- 5) Screw in the adjustable screw



- 6) Lightly grease the spindle of the valve seat and replace the spring.



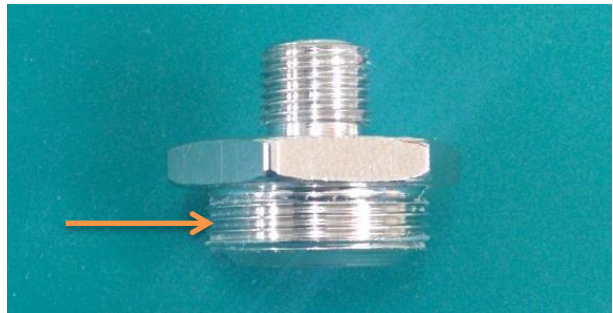
- 7) Place the valve seat on top of the spring. The spindle will need to go through the hole at the bottom.



- 8) The valve seat should sit on top of the spring with the spindle in the hole at the bottom.



- 9) Apply oxygen compatible adhesive to the large thread of the valve seating.



- 10) Screw on the valve seating on the precision valve body. Ensure the unit is clean prior to assembly with the Tom Thumb.



- 11) Place an O ring (part number 0330214) over the thread. The older version of the Tom Thumb does not have a recess for the O ring, where this is the case use PTFE tape. Ensure the unit is clean prior to assembly with the Tom Thumb.



Setup: Adjustable valve

Important: Use only oxygen-compatible grease and adhesive during assembly of Tom Thumb adjustable valves. Do not use or allow organic greases to enter the Tom Thumb or accessories. Ensure all parts are clean before assembly.

Tools required:	7/8 A/F spanner 20-35mm pin spanner Collar insertion tool 3.0*0.5mm flat blade screw driver Pick Service test cover for use with Tom Thumb (P/N:0360010) Calibrated digital manometer Tom Thumb calibration / test & Q.A. sheet (for reference setup values)
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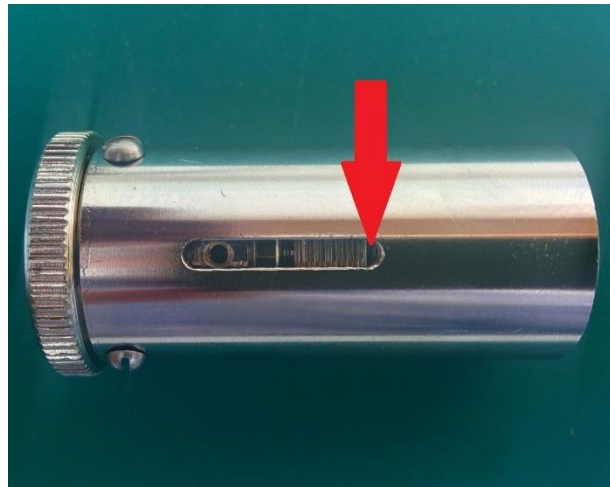
- 1) Using the collar adjustment tool, insert the collar into the valve body.



- 2) Rotate the collar until a small gap can be seen between the bottom of the collar and the bottom of the adjustment slot.

This is a starting point for the valve setup and may need to be reset several times before the desired outlet pressure is achieved.

NB: Lowering the collar will raise the outlet pressure, and raising the collar will lower the outlet pressure.



- 3) Insert the spring and valve seat.

NB: The valve seat should move freely on the spring.



- 4) Affix the valve base.



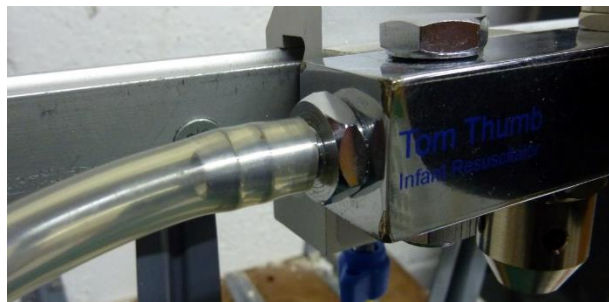
- 5) Place and O ring (part number 0330214) over the thread. Ensure the valve is clean before affixing it to the Tom Thumb block.



- 6) Screw the adjustable valve into the valve body.



- 7) Connect the Tom Thumb inlet port, via Oxygen tubing, to a flowmeter capable of delivering 10lpm, which is connected to supply of air or Oxygen.



- 8) Connect the outlet port to a T piece.
- 9) Using Oxygen tubing, connect the T piece to a manometer, leaving the remaining T connection open.



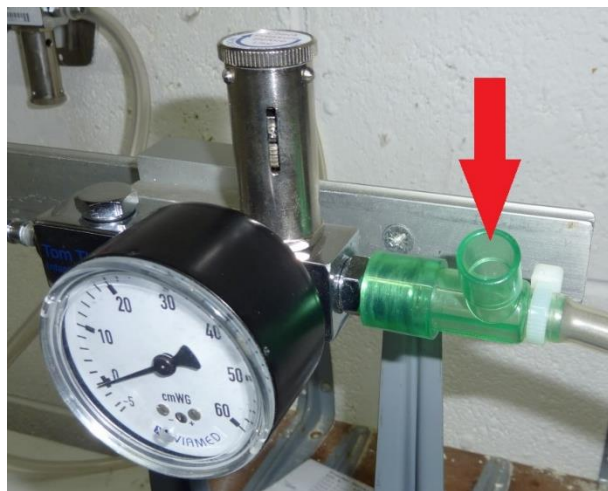
- 10) Using the control on top of the adjustable valve, set the valve to minimum.



- 11) Open the gas supply to allow a flow of 10lpm.

Using your thumb, cover and release the port on the manometer tubing several times. The gauge needle should move.

When covered, note the value on the Tom Thumb gauge and record on the test sheet (<8 cmH₂O).



- 12) Cover the precision valve with the service test cover (part number 0360010) or use a finger and thumb to cover both the holes. This will prevent the precision valve from releasing pressure, ensuring that the readings will be from the adjustable valve alone.



- 13) Set the adjustable valve to maximum.



- 14) Supply the Tom Thumb with gas at 10lpm. Record the reading displayed on the manometer on the test sheet.

If the manometer will only read in millibar then it may be necessary to convert the reading to cmH₂O.

$$1 \text{ cmH}_2\text{O} = 0.98 \text{ mbar}$$



- 15) Use the Tom Thumb calibration / test & Q.A. sheet for reference values.

If the reading does not meet the reference values, then the valve collar will need to be re-adjusted. Disassemble and repeat from step 2.

Setup: Precision valve

Important: Use only oxygen-compatible grease and adhesive during assembly of Tom Thumb adjustable valves. Do not use or allow organic greases to enter the Tom Thumb or accessories. Ensure all parts are clean before assembly.

Tools required:	Flat blade screw driver Calibrated digital manometer Tom Thumb calibration / test & Q.A. sheet (for reference setup values)
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- 1) The precision valve does not need to be removed for setup.



- 2) The flow from the adjustable valve will need to be stopped to prevent any interference when setting up. This may be done by blocking the two holes and slot by covering it with your fingers. Alternatively, the adjustable valve could be replaced with a blanking bolt.



- 3) Connect the Tom Thumb inlet port, via Oxygen tubing, to a flowmeter capable of delivering 10lpm, which is connected to supply of air or Oxygen.
- 4) Using Oxygen tubing, connect the manometer the Tom Thumb outlet.
- 5) Supply the Tom Thumb with gas at 10lpm. Note the reading on the manometer. If the manometer will only read in millibar then it may be necessary to convert the reading to cmH₂O.
- 6) 1cmH₂O = 0.98mbar



- 7) Use the Tom Thumb calibration / test & Q.A. sheet for reference values.
- 8) If the reading does not meet the reference values, then the valve setup will need to be performed or repeated.
- 9) Adjustments to the limit of the precision valve are made by turning the slotted screw on the bottom of the valve. Small adjustments are advised. Turning the screw clockwise will increase the limit. Turning the screw anti-clockwise will lower the limit.



- 10) Once the valves have been setup the unit should be tested and the QA

information logged.

Tom Thumb Calibration/Test & QA Sheet

Description.	Tom Thumb.	Time & Date of Calibration / Test.	
Model.		Time & Date of QA.	
Serial No.		Serial no. : O ₂ flowmeter.	
		Serial no. : Air flowmeter.	

Do not start QA check within 1 hour of the calibration / test. Labelling is to be attached after calibration / test.

Record the manometer reading in millibars below, ensuring the Tom Thumb meets the limits specified.

Test Equipment	Test	Specification	Reading		P/F
			Cal	Q.A.	
Snoop liquid.	Check all ports / connections for leaks.	No bubbling.			
CE ____	Adjustable Valve: @ 10 lpm	Minimum: <8 cmH ₂ O.			
CE ____	Adjustable Valve: @ 10 lpm.	Maximum: 42.1 ± 1 mbar			
CE ____	Precision Valve: @ 10 lpm.	Maximum: 44.1 ± 1 mbar			
CE ____	Pressure Gauge Test. @30cmH ₂ O	Pressure: 29.4 ± 1 mbar			
Visual check.	Gauge cannot be removed without tools.				
Visual check.	Gauge appears straight.				
Visual check.	All adjustable settings are set to a minimum.				
Visual check.	Labels are attached.	CE label.			
		Serial No. label.			
		Tom Thumb label			

Calibration:

Q.A check :

Signed:

Signed: