TOM THUMB RESUSCITATION UNIT TT480 VM3COP50.19

SERVICING MANUAL

Introduction

This manual is intended to provide information to help qualified maintenance personnel service and repair the Tom Thumb Infant Resuscitation Unit; TT480. General 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 is laid down in this Service manual. In addition, a calibrated manometer will be required for test and calibrate the unit.

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.

Service and calibration of units, to a flow of 10 lpm, does not imply operational usage at this rate. Operational flow rate should be determined, at the time of usage, within the scope of individual organisations' resuscitation protocols, up to the maximum of 10 lpm.

Servicing of the TT480 Tom Thumb resuscitation unit.

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 hoses be checked every 3 months for damage and possible degradation. The hoses should be replaced, regardless of condition, every 4 years (maximum).

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. The valve can be serviced using the adjustable valve service manual.

Setting of the adjustable valve pressure, when carried out in accordance with the adjustable valve procedure, will ensure accuracy to ± 1 cmH_20.

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. The valve can be serviced using the precision valve service manual.

The precision valve release pressure will have been set at manufacture, depending on customer requirements, to a tolerance of ± 1 cmH_20. Setting of the precision valve, when carried out in accordance with the precision valve procedure, will ensure accuracy to ± 1 cmH_20.

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

The Tom Thumb pressure gauge is accurate to ± 0.5 cmH_20 subject to a reading within the black band at zero pressure. If the gauge is removed a single-use gauge seal (diamond copper washer) part no.0330212 must be replaced.

Do not re-use the original Gauge seal (Diamond Copper Washer).

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

Tools required.	7/8 A/F spanner 5/8 A/F spanner 3mm Allen key 5mm Allen key Pick

Parts list.		
Qty.	Description.	Part No.
If req'd	Body block	0330201
1	Gauge seal (Diamond copper washer)	0330212
If req'd	Pressure gauge	0330193
1	Thick O-ring – 1/16 section	0330213
6	Thin O-ring – 1/16 section	0330214
If req'd	Flowmeter blocking bolt & nut	0330206
If req'd	Precision valve	0330210
If req'd	Blanking bolt	0330296
If req'd	Adjustable valve	0330211
If req'd	15mm outlet	0330209
If req'd	Serial number label	0390030
If req'd	Spacer block	0330191
If req'd	Rail clamp	0330190
If req'd	M4x10mm hex drive bolts	0330216
If req'd	Tom Thumb front label	0390015
If req'd	Adjustable valve label	0390010
as req'd	Oxygen-compatible grease	0330220
as req'd	Oxygen-compatible adhesive	0330237

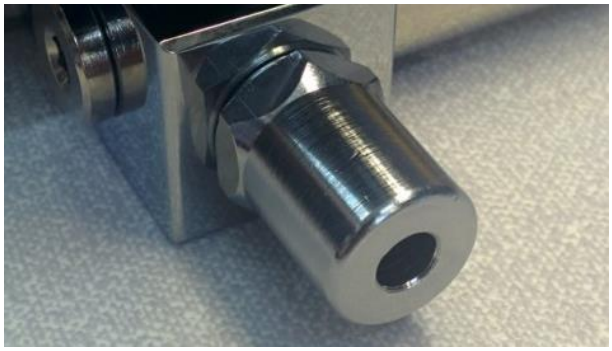
1) Unscrew the blanking bolt from the right hand threaded hole in the bottom face of the body block.

2) Ensure the port and threads are free of foreign matter. Replace the thin O-ring (P/N 0330214).

3) Unscrew the 10mm inlet from the left-hand face of the body block.

4) Ensure the port and threads are free of foreign matter. Replace the thin O-ring (P/N 0330214).

5) Unscrew the 15mm outlet from the right-hand face of the body block.

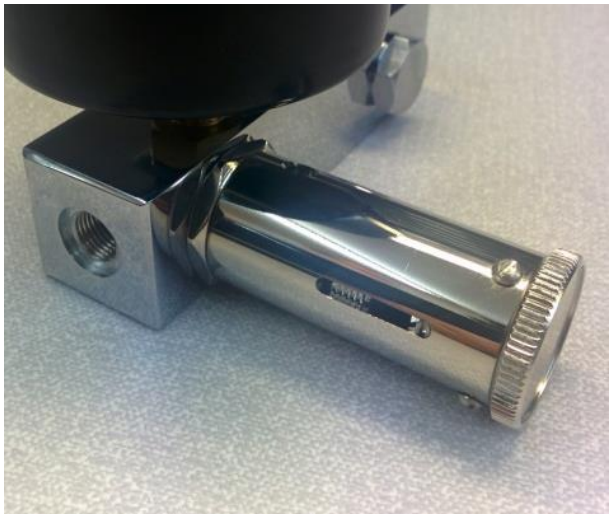


6) Ensure the port and threads are free of foreign matter. Replace the thin O-ring (P/N 0330214).

7) Unscrew and remove the precision valve.

8) See valve servicing manual to service this valve. Ensure the port and threads are free of foreign matter. Remove the thin O-ring and replace with a new O-ring (P/N 0330214).

9) Unscrew the adjustable valve from the right hand threaded hole on the top face of the body block.



10) See valve servicing manual to service this valve. Ensure the port and threads are free of foreign matter. Replace the thin O-ring (P/N 0330214).

11) Unscrew the Flowmeter blocking bolt and nut from the left hand non-threaded hole in the body block.

12) Ensure the port and threads are free of foreign matter. Replace the thin O-ring (P/N 0330214) and the thick O-ring (P/N 0330213).

13) If pressure gauge can be removed without spanner, or the pressure gauge is not straight, then unscrew the pressure gauge.

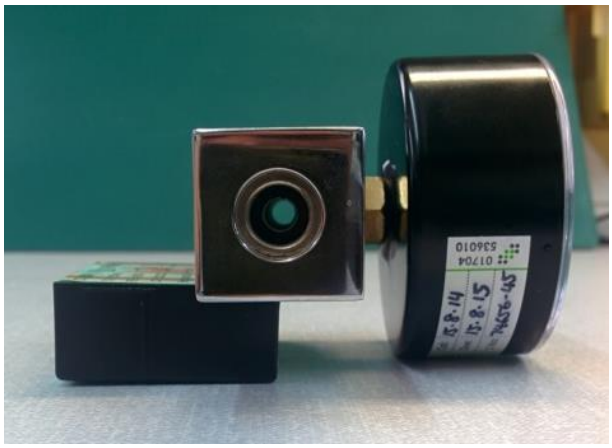
14) Ensure the port and threads are free of foreign matter.

15) Insert a new gauge seal (diamond copper washer) into the single threaded hole on the label side of body block.

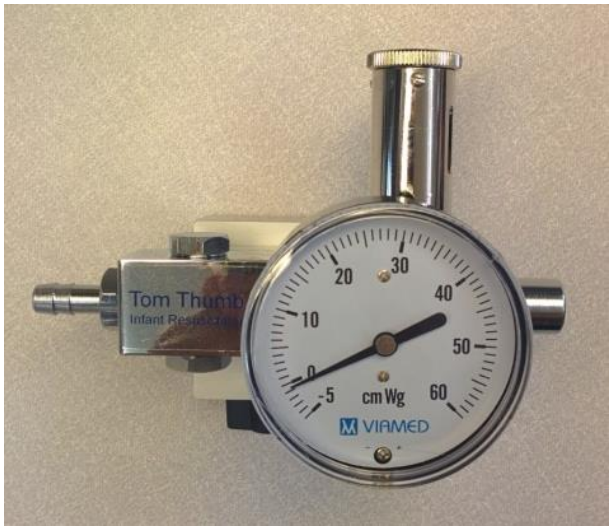
16) Screw in the pressure gauge and use the 5/8 AF spanner to tighten. The gauge should appear straight in comparison to the block and not able to be removed without the aid of tools.

17) The body block should now be free of components, except for the front gauge and mounting bracket.

18) Ensure the body block is free of foreign matter.

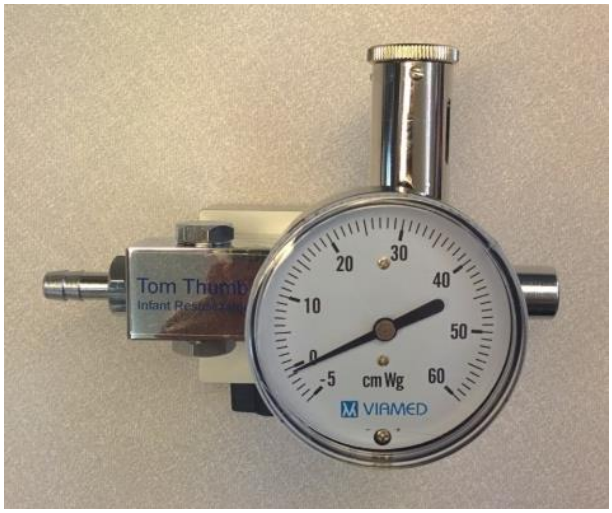


19) With all the O-rings replaced, the unit can be reassembled.



Testing and calibration of the TT480

1) Check the TT480 for damage.



2) Set the adjustable valve to minimum (fully counter clockwise).

3) Connect the inlet to the oxygen supply at a pressure of 4 bar.

4) Connect the digital manometer (on 0-100.0 mbar range) with T piece adapter to the Tom Thumb outlet.

5) Set the flow of oxygen to 10 lpm.

6) Check all mechanical connections between parts for leaks. Use Snoop fluid and check for bubbling.

7) Check the minimum pressure out.

8) Using your thumb, cover the T piece adapter port.

9) Check the TT pressure gauge is less than 8.0 cmH2O.

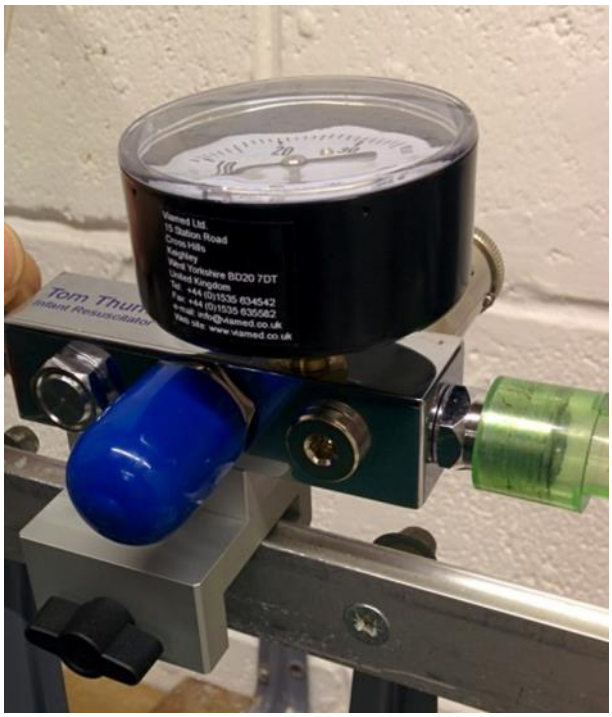
10) Check that the digital manometer reading is less than 7.8 mbar.

11) Record the values on the Tom Thumb Calibration / Test & QA Sheet.

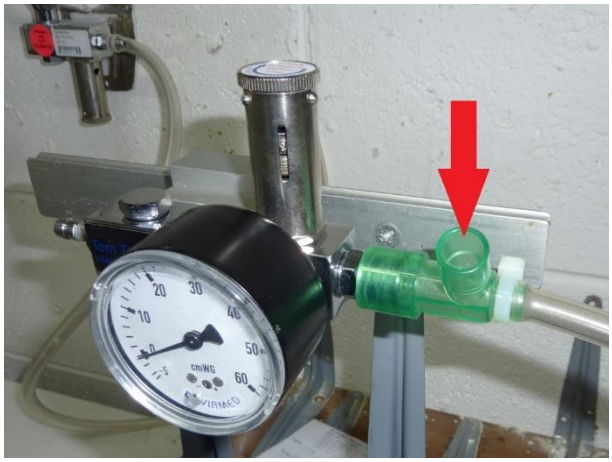
Set up of the adjustable valve:

1) Set the adjustable valve control to maximum (fully clockwise).

2) Use a precision valve isolating cover, pictured in blue, to prevent the precision valve from releasing pressure.



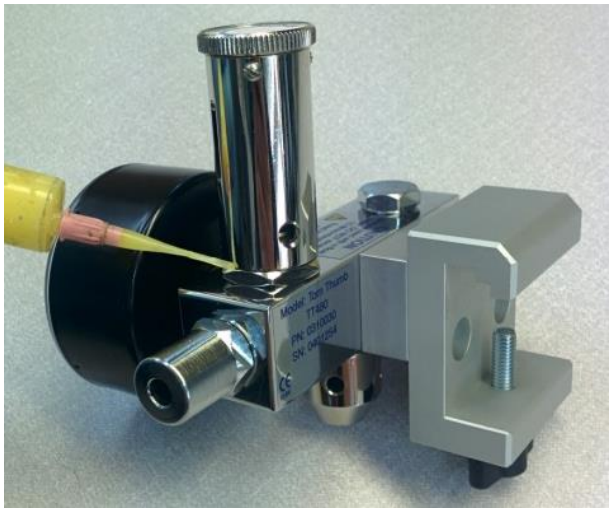
3) Using your finger or thumb, cover the T piece adapter port.



4) Take a reading from the digital manometer, which should read 42.1±1 mbar. Record the value on the Tom Thumb Calibration / Test & QA Sheet.

   If the specified readings cannot be achieved, then it will be necessary to dismantle the valve and adjust the valve collar. This requires small incremental adjustments to be made and is a trial and error process that could take several attempts before the desired result is achieved.

5) Slightly unscrew the adjustable valve and apply oxygen compatible adhesive to the exposed threads. Retighten the adjustable valve using the 7/8 A/F spanner.

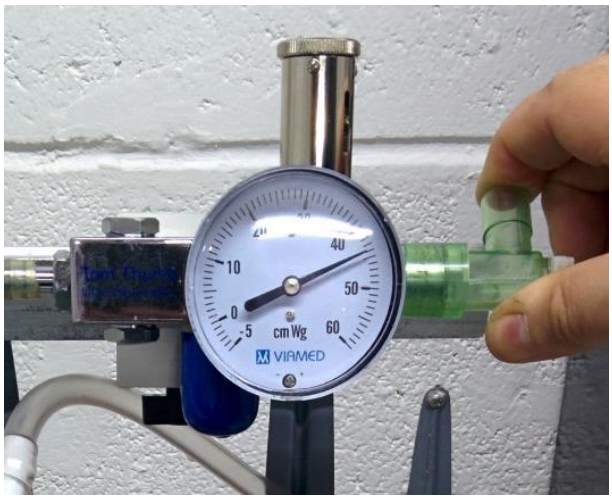


6) Check that TT pressure gauge needle does not stick.

   Release and cover the T piece adapter port several times.

   Ensure that TT pressure gauge returns to 43±1 cmH2O.

   It is important to remove the precision valve isolating cover before setting up the precision valve. Damage to the gauge may occur if the cover is not removed.



Set up of the precision valve:

1) Slightly unscrew the precision valve adjustable screw and apply Oxygen-compatible thread-lock to the exposed threads. Screw into the precision valve body until flush.

2) Cover the holes in the adjustable valve and the T piece adapter port. Carefully adjust the precision valve screw in quarter turns to achieve a reading on the TT pressure gauge of 45±1 cmH2O (clockwise adjustment on precision valve screw to increase). Record the digital manometer reading on the Tom Thumb Calibration / Test & QA Sheet.

3) TT pressure gauge accuracy check: Cover the T piece adapter port and set the pressure to 30 cmH2O on the TT pressure gauge. Ensure a reading of 28.4 – 30.4 mbar on the digital manometer and record the values on the Tom Thumb Calibration / Test & QA Sheet.

4) Turn the flowmeter and adjustable valve to minimum. Disconnect from oxygen supply and disconnect the digital manometer.

5) Clean the Tom Thumb with isopropyl alcohol. Replace labels as necessary.

TOM THUMB CALIBRATION / TEST & Q.A. 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_2O.			
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_2O	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:** ……