

Setting Target Volume (TgV) on the Breas Vivo 50 Ventilator

Target Volume (TgV) is a Pressure mode of ventilation in which a desired (target) tidal volume along with a minimum and maximum pressure limit are set by the clinician in order to ensure the patient receives an appropriate level of ventilation. For every breath the delivered volume is compared to the set TgV and the delivered pressure for the next breath is adjusted accordingly depending on the difference between the Vt delivered and set TgV.

In a straight Pressure mode (PC or PS) of ventilation (without TgV) the peak inspiratory pressure (PIP) is controlled and consistent but the resulting tidal volume delivered to the patient is variable and is dependent on several factors including the patient's lung compliance and airway resistance. Since it is possible for the patient's lung compliance and/or airway resistance to change without notice, close monitoring is required to ensure the patient is not being over or under ventilated when in the Pressure (PC or PS) mode.

The TgV setting defines the tidal volume that the Vivo 50 will aim for while ventilating the patient in the Pressure Control or Pressure Support mode. To achieve the preset volume (TgV) the Vivo 50 will adjust the inspiratory pressure between two adjustable limits: "Min Pressure" and "Max Pressure."

When Target Volume is active the mode field on the Vivo 50 display will indicate "(TgV)," e.g., PSV (TgV), PCV (TgV), PCV (A+TgV). TgV can be set to "OFF" or to either a minimum of 100 ml up to a maximum of 2500 ml. Setting resolution is in 10 ml increments when the volume setting is < 500 ml, and in 50 ml increments when the volume is >500 ml.

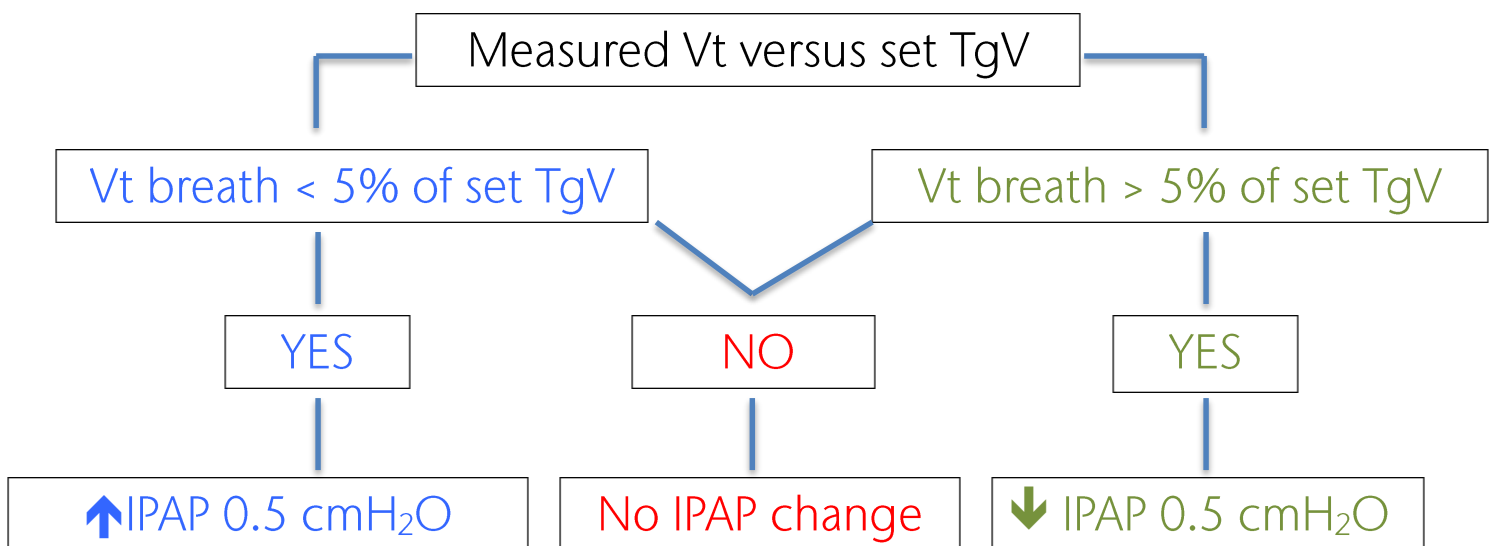
Max Pressure: the "Max Pressure" setting is only active when TgV is activated. It is the maximum pressure to which the Vivo 50 will adjust in order to achieve the TgV. If the desired TgV is not achieved at that pressure the Vivo 50 will continue to ventilate the patient at the Max Pressure and an alarm will sound to alert the clinician to this event (the Low Vt or Low MV alarms must be set appropriately in order for an alarm to trigger in this situation). The maximum setting is 50 cmH₂O and is set in increments of 0.5 cmH₂O when below 10 cmH₂O, and set in increments of 1.0 cmH₂O when above 10 cmH₂O.

Min Pressure: the "Min Pressure" setting is only active when TgV is activated. It is the minimum pressure to which the Vivo 50 will adjust in order to achieve the TgV. If the desired TgV is not achieved at that pressure the Vivo 50 will continue to ventilate the patient at the Min Pressure and an alarm will sound to alert the clinician to this event (the High Vt or High MV alarms must be set appropriately in order for an alarm to trigger in this situation). NOTE: it is possible to exceed the TgV at the set Min Pressure so it is important that the clinician set the Min Pressure value appropriately. The minimum setting is 4 cmH₂O and the maximum setting is 50 cmH₂O and is set in increments of 0.5 cmH₂O when below 10 cmH₂O and increments of 1.0 cmH₂O when above 10 cmH₂O.

Although it might seem logical to set a wide range of pressure between Min Pressure and Max Pressure (e.g., Min of 4 and Max of 20) to ensure the TgV is delivered, this practice is not recommended because when an active circuit is used a leak in the system may result in an increase flow rate which the Vivo 50 could interpret as the target tidal volume being achieved and result in the patient actually being under-ventilated. The clinician should avoid the temptation to always set the Min Pressure at 4 cmH₂O. It is recommended to set the Min Pressure at a starting point of ~10 cmH₂O below the Max Pressure to start with and monitor the tidal volume delivery and observe for High Vt and Low Vt alarms, then adjust the limits accordingly if need be.

In order to ensure the patient is not over or under ventilated it is recommended to use the Vivo 50 EtCO₂ monitor and to set the High EtCO₂ and Low EtCO₂ alarms appropriately.

Vivo 50 Target Volume Algorithm



Setting TgV on the Vivo 50:

1. Press “MODE” button (located at the bottom left side of the screen) then use the navigation keys to select a Profile (1 - 3) if Profiles are “Active,” or proceed to step 2 below if Profiles are not “Active.”
2. Use the down navigation key to select the Ventilation Mode and the “+” or “-“ key to select, “Pressure.”
3. Use the down navigation key to select either “Support” (for Pressure Support mode) or “Assist/Control” (for Pressure Control mode).
4. Press the button under the “Next” prompt (located at the bottom right side of the screen).
5. Use the down navigation key to select “Target Volume” and press the “+” navigation key to activate TgV.
6. Press the “+” navigation key to set the desired volume (TgV).
7. Use the down navigation key to select, “Max Pressure” and use the “+” or “-“ key to set the desired maximum pressure.
8. Use the down navigation key to select, “Min Pressure” and use the “+” or “-“ key to set the desired minimum pressure - set the Min Pressure ~10 cmH₂O below the Max Pressure.
9. Use the navigation keys to set PEEP, Breath Rate, Insp. Time, Rise Time, and Insp Trigger.
10. Press the button under the “Next” prompt (located at the bottom right side of the screen) - this will take you to the Alarm settings menu.
11. Use the navigation keys to set the alarms to appropriate levels.
12. If SpO₂ and/or EtCO₂ monitoring is being used be certain to set the high and low alarm for each appropriately. EtCO₂ monitoring is the best method to detect inadequate ventilation (hyper or hypoventilation) of the patient.
13. Confirm settings.
14. Monitor the patient during ventilation for several minutes to confirm that the Min Pressure and Max Pressure are set appropriately.

Height in cm	Ideal Body Weight (BMI = 24)	TgV @ 8ml/kg
150	55 kg	440 ml
155	59 kg	470 ml
160	61 kg	490 ml
165	64 kg	510 ml
170	68 kg	540 ml
175	73 kg	580 ml
180	77 kg	620 ml
185	82 kg	650 ml
190	86 kg	690 ml
195	90 kg	720 ml

Ideal Body Weight in lbs	Ideal Body Weight in kg	7 ml/kg	8 ml/kg Vt
30	14	95 ml *	109 ml
35	16	111 ml	127 ml
40	18	127 ml	145 ml
45	20	143 ml	163 ml
50	23	159 ml	181 ml
55	25	175 ml	200 ml
60	27	191 ml	218 ml
65	29	206 ml	236 ml
70	32	222 ml	254 ml
75	34	238 ml	272 ml
80	36	254 ml	290 ml
85	39	270 ml	308 ml
90	41	286 ml	327 ml
95	43	302 ml	345 ml
100	45	318 ml	363 ml
125	57	397 ml	454 ml
150	68	476 ml	544 ml
175	79	556 ml	635 ml
200	91	635 ml	726 ml
225	102	714 ml	816 ml
250	113	794 ml	907 ml
275	125	873 ml	998 ml
300	136	953 ml	1088 ml

* Minimum TgV setting on the Vivo 50 is 100 ml

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Breas Medical AB/2015/MAR-1356-v.1