

# RESPIRATORY CARE

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### Comparison of Auto Peep Readings and Measurements on SIX Ventilators

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**Background:** Auto peep, also called intrinsic peep, in positive pressure ventilation is the residual pressure left in the lung at the end of exhalation caused by air trapping. Most ventilators produce an auto peep measurement but we were curious as to how they compared to an external manometer reading.

**Method:** We tested a total of six ventilators: the Viasys Avea, Drager Evita XL, Drager Evita 4, Maquet Servo i, Puritan Bennett 840, Puritan Bennett 7200. On each ventilator we used the same circuit, test lung, and manometer. The ventilators were set up in pressure control mode with an inspiratory pressure of 25cmH<sub>2</sub>O, 0 set PEEP, and inspiratory time 1.5 seconds. Only the respiratory rate was varied in the testing. Peep was read from each unit at the same time it was manually measured with the Puritan manometer. Each set of tests were performed a minimum of three times until the results were at least duplicated, if not triplicated, for legitimacy.

**Results:** The ventilators ranked, in order of percent difference from the manometer readings: Maquet Servo I with a total percent difference from the manometer reading of 7%, Drager Evita 4 of total percent difference of 9.3%, Drager Evita XL total percent difference of 9.7%, Puritan Bennett 840 total percent difference of 11.6%, Viasys Avea with a total percent difference of 12.5%, and Puritan Bennett 7200 with total percent difference of 13.6%.

Ventilator	Rate	Total Peep-Vent	Total Peep-Mano	% Diff.	Ventilator	Rate	Total Peep-Vent	Total Peep-Mano	% Diff.
Viasys Avea	30	15	17	12%	PB 7200	30	18	20	10%
	25	13	14	7%		25	13	15	13%
	20	7	9	22%		20	7	9	22%
Drager Evita XL	30	18.8	21	10%	Drager Evita 4	30	18.9	21	10%

	25	14.4	15	4%	25	14.1	15	6%
	20	7.7	9	14%	20	8.7	10	13%
Servo i	30	19	20	5%				
	25	13	14	7%				
	20	8	9	11%				
PB 840	30	18	20	10%				
	25	13	15	13%				
	20	7.9	9	12%				

**Conclusion:** Comparing the six ventilators using the analog manometer, the Maquet Servo i produced the closest measurement of peep between its electronic interface and the mechanical manometer with an average difference of only 1 cmH<sub>2</sub>O. The other five ventilators, showed slightly greater but probably clinically insignificant differences between the manual and electronic interface readings, producing disparities of no more than 2.2 cmH<sub>2</sub>O between the two readings.

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