Leak are not uncommon during mechanical ventilation of neonates due to the use of uncuffed cuffs. IRV was measured with a TSI Certifier and pressures were measured with DP 103-30-871 and MP 45-32-871 (Validyne Engineering). Each pressure transducer was connected to a CD19A carrier demodulator (Validyne Engineering). The carrier demodulators were evaluated in PRVC mode.

The Servo-i was tested in PRVC mode with RR 30, Ti 0.3, Ti Rise 5, PEEP 5, Inspiratory pressure 7 above PEEP which resulted in the desired Vt of 6.25 ml. We did not use a "Y" sensor. We also observed that the Servo-i had a smoother looking flow versus time waveform graphic compared to the Avea.

We found that the PEEP levels in the inspiratory and expiratory limbs of the Avea never dropped as low as the Servo-i, and were higher in the inspiratory limb (these differences were less when bias flow was set at 1). With leaks up to 75 percent, the Avea ventilator was able to deliver measured tidal volumes (Vt) and MAP levels during mechanical ventilation of a simulated infant (Vt target of 5 ml/kg).

Sensitivity was set to avoid auto-triggering. Avea settings: PC mode, RR 30, Ti 0.3, Ti Rise 5, PEEP 5, Inspiratory pressure 7 (above PEEP), tube compensation off and a hot wire flow sensor was used.

We performed all required pre-use tests and then connected each ventilator to the respiratory simulator. Each ventilator was set to the same PC or PRVC mode, with RR 30, Ti 0.3 sec, PEEP 5, Tube compensation off, sensitivity set to avoid auto-triggering. Avea settings: PC mode, RR 30, Ti 0.3 sec, PEEP 5, Tube compensation off.

Leaks were created by adjusting a bias flow of 1, 3, or 5 LPM so that we might determine the effect of these variables. Using these settings, we created 0, 25, 50, and 75 percent leaks and collected data (every 30 ms) for at least two minutes; leaks were created by adjusting a bias flow of 1, 3, or 5 LPM so that we might determine the effect of these variables. We did note that the ventilators calculated very different values for the same circuit's pressure waveforms. We also observed that the Servo-i had a smoother looking flow versus time waveform graphic compared to the Avea.

We found that the PEEP levels in the inspiratory and expiratory limbs of the Avea never dropped as low as the Servo-i, and were higher in the inspiratory limb (these differences were less when bias flow was set at 1). With leaks up to 75 percent, the Avea ventilator was able to deliver measured tidal volumes (Vt) and MAP levels during mechanical ventilation of a simulated infant (Vt target of 5 ml/kg). Sensitivity was set to avoid auto-triggering. Avea settings: PC mode, RR 30, Ti 0.3, Ti Rise 5, PEEP 5, Inspiratory pressure 7 above PEEP which gave us a Vt of 6.25 ml. We did not use a "Y" sensor. We also observed that the Servo-i had a smoother looking flow versus time waveform graphic compared to the Avea.

We found that the PEEP levels in the inspiratory and expiratory limbs of the Avea never dropped as low as the Servo-i, and were higher in the inspiratory limb (these differences were less when bias flow was set at 1). With leaks up to 75 percent, the Avea ventilator was able to deliver measured tidal volumes (Vt) and MAP levels during mechanical ventilation of a simulated infant (Vt target of 5 ml/kg). Sensitivity was set to avoid auto-triggering. Avea settings: PC mode, RR 30, Ti 0.3, Ti Rise 5, PEEP 5, Inspiratory pressure 7 above PEEP which resulted in the desired Vt of 6.25 ml. We did not use a "Y" sensor. We also observed that the Servo-i had a smoother looking flow versus time waveform graphic compared to the Avea.

We found that the PEEP levels in the inspiratory and expiratory limbs of the Avea never dropped as low as the Servo-i, and were higher in the inspiratory limb (these differences were less when bias flow was set at 1). With leaks up to 75 percent, the Avea ventilator was able to deliver measured tidal volumes (Vt) and MAP levels during mechanical ventilation of a simulated infant (Vt target of 5 ml/kg). Sensitivity was set to avoid auto-triggering. Avea settings: PC mode, RR 30, Ti 0.3, Ti Rise 5, PEEP 5, Inspiratory pressure 7 above PEEP which resulted in the desired Vt of 6.25 ml. We did not use a "Y" sensor. We also observed that the Servo-i had a smoother looking flow versus time waveform graphic compared to the Avea.