

Pressure regulated volume control

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Pressure regulated volume control

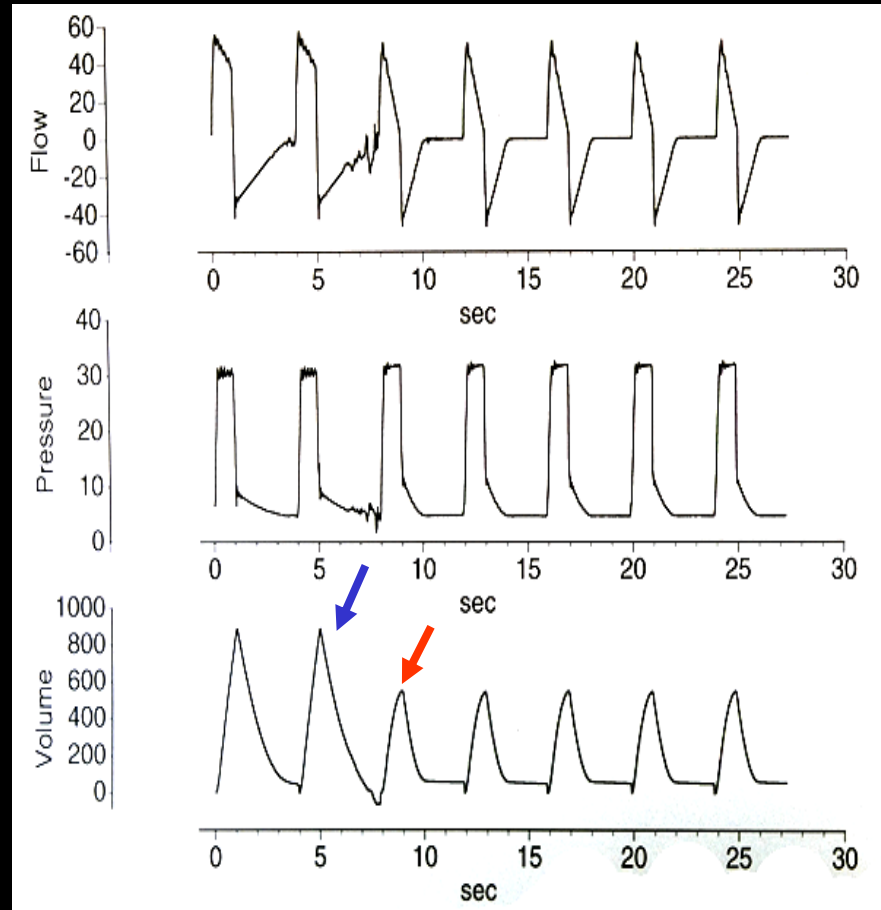
PRVC – Siemens 300, Maquet Servo*i*, Viasys Avea

Autoflow – Drager Evita 4/XL

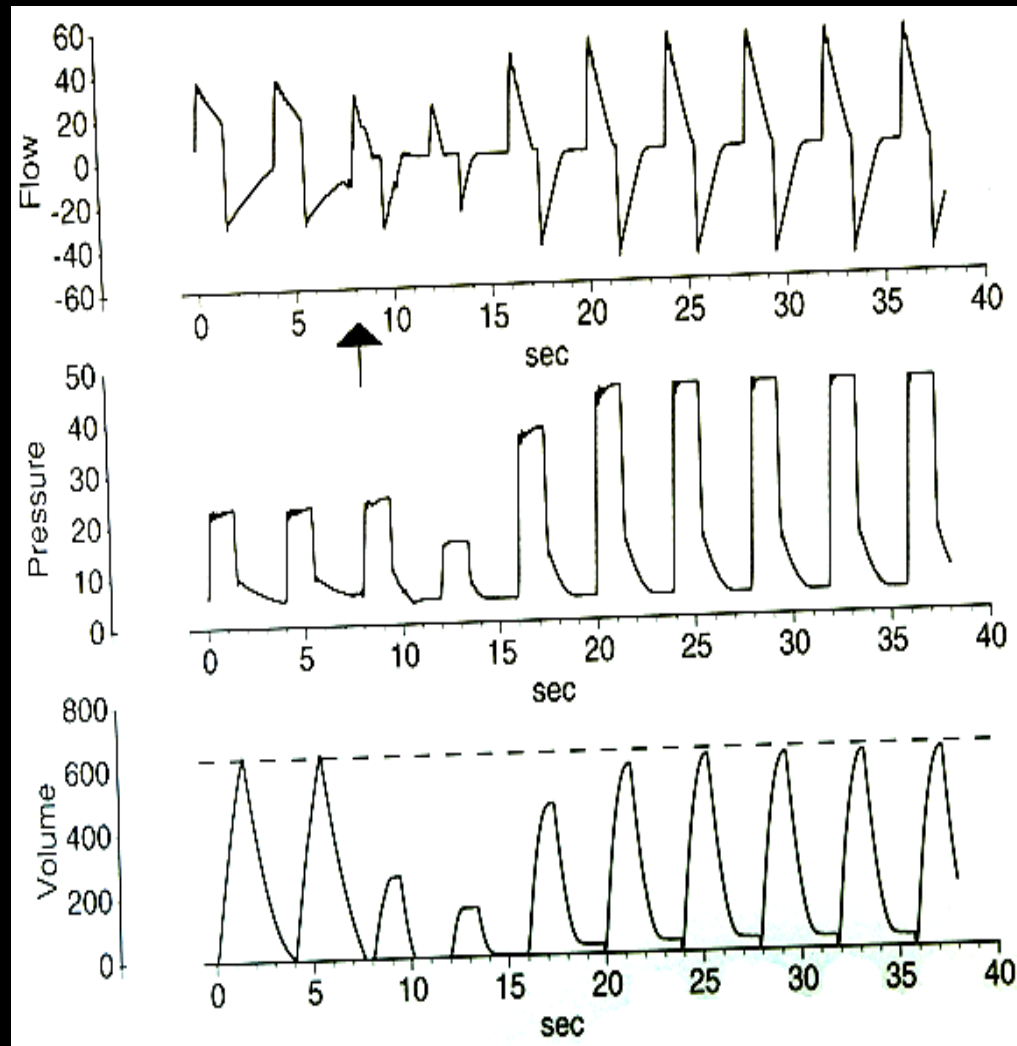
Adaptive pressure ventilation – Hamilton Galileo

Variable pressure control – CPC Venturi

Compliance Changes During Pressure Controlled Ventilation



PRVC Automatically Adjusts To Compliance Changes



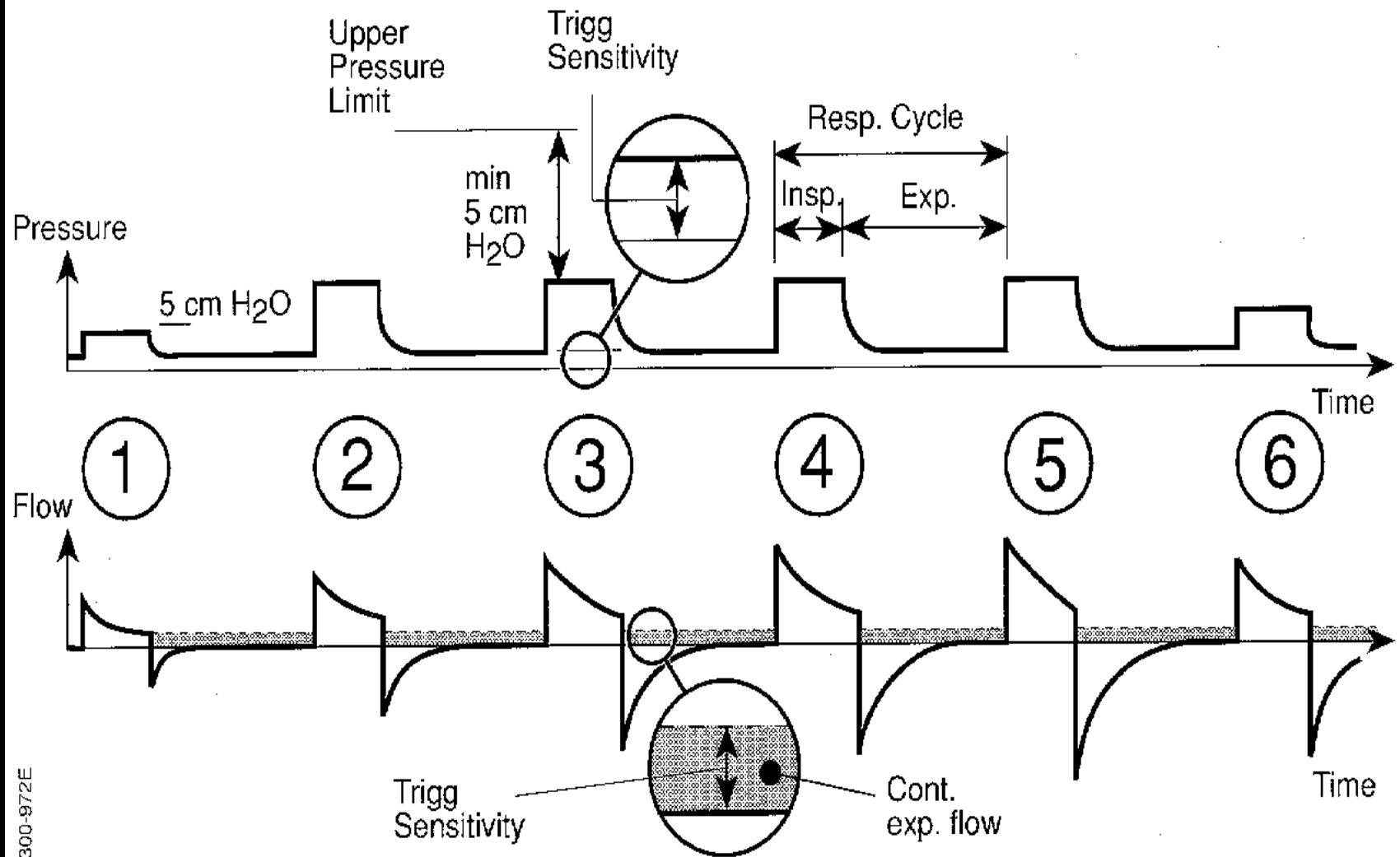
PRVC

- assist pressure control
- Set TV is “targeted”
- Ventilator estimates volume/pressure relationship each breath
- Ventilator adjusts level of pressure control *breath by breath*

Pressure Regulated Volume Control

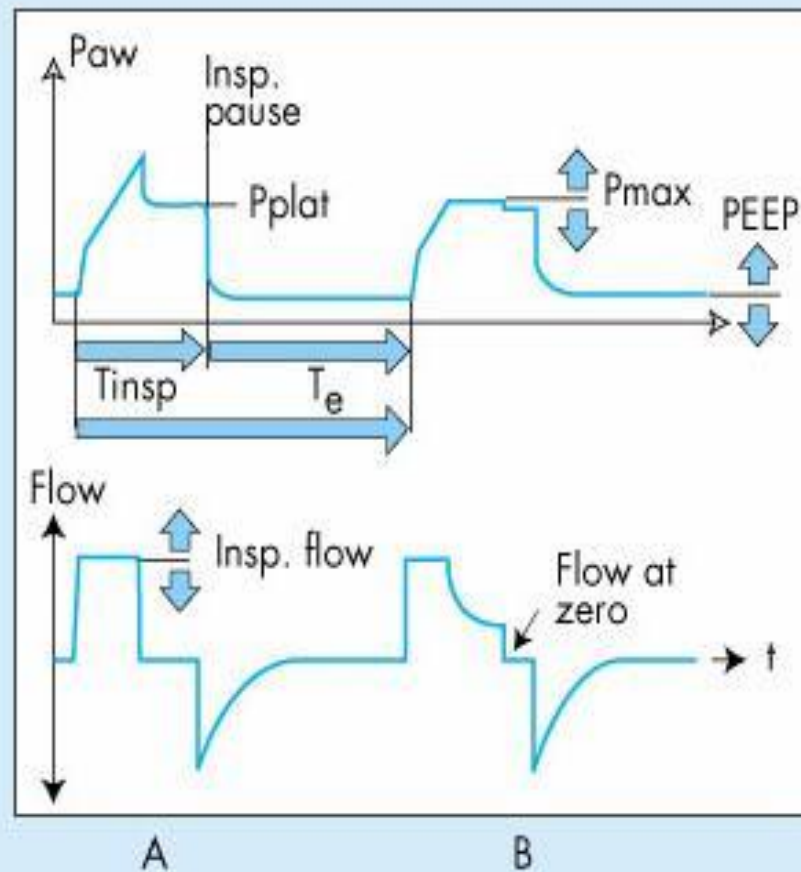
- First breath = 5–10 cm H₂O above PEEP
- V/P relationship measured
- Next 3 breaths, pressure increased to 75% needed for set Tidal Volume
- Then up to ± 3 cm H₂O changes per breath
- Time ends inspiration

Pressure Regulated Volume Control



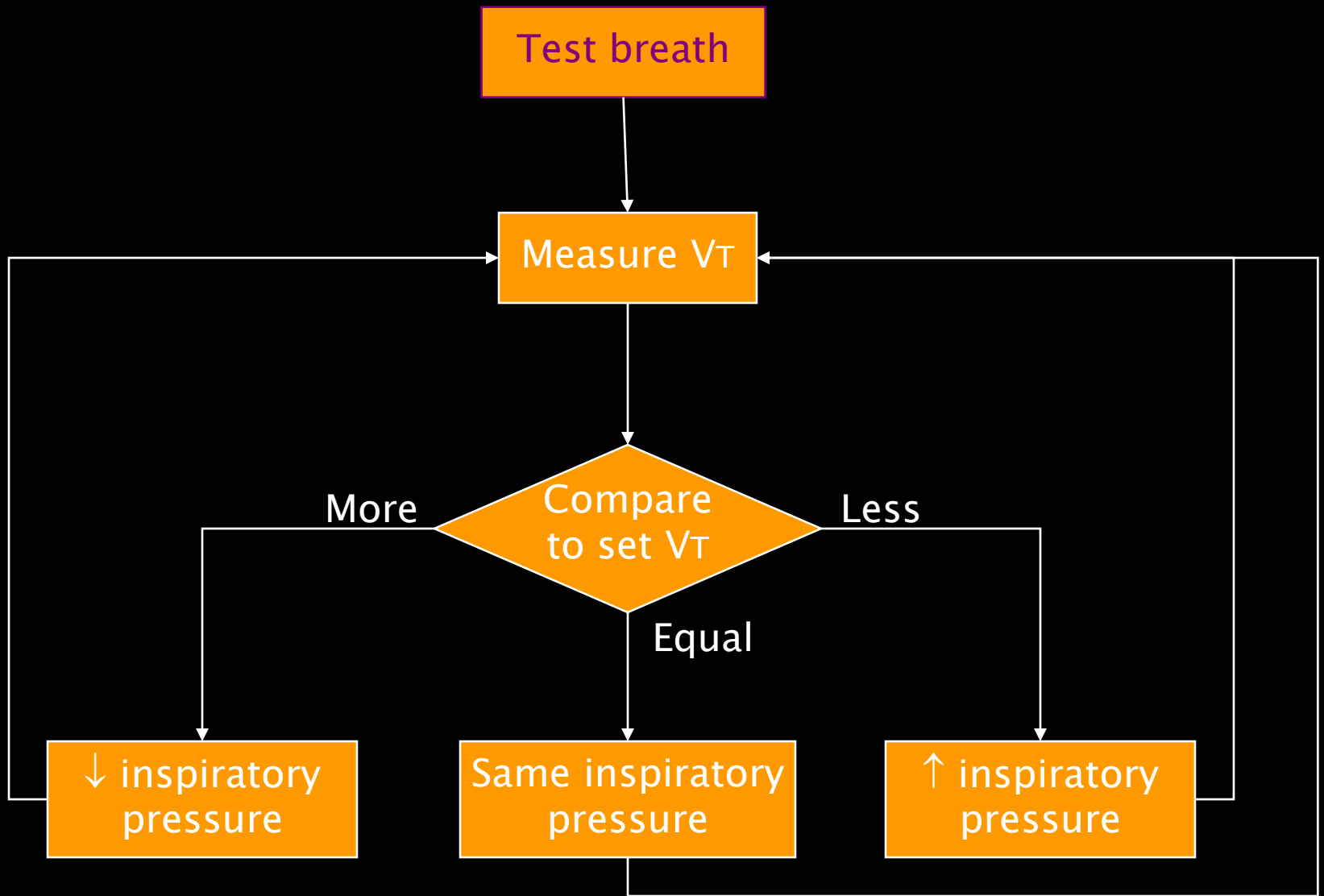
Drager's AutoFlow

- First breath uses set V_T & I-time
 - $P_{plateau}$ measured
- $P_{plateau}$ then used
- V/P measured each breath
- Press. changed if needed (+/- 3)
- Then similar to PRVC



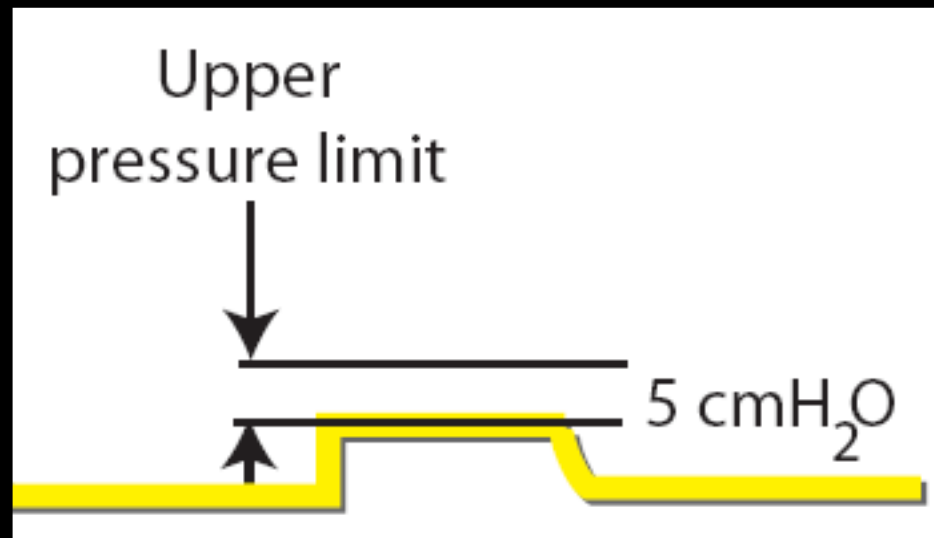
Pressure Regulated Volume Control

- Like PC but
- Constant pressure during each breath
- variable pressure from breath to breath
- Time is cycling method
- delivered Tidal Volume can vary from set



PRVC

- Set
 - Minimum respiratory rate
 - Target tidal volume
 - Upper pressure limit
 - Maximum delivered pressure = 5 cm H₂O below pressure alarm limit





PRVC

Automode

Admit patient

Nebulizer

Status

Regulation pressure limited



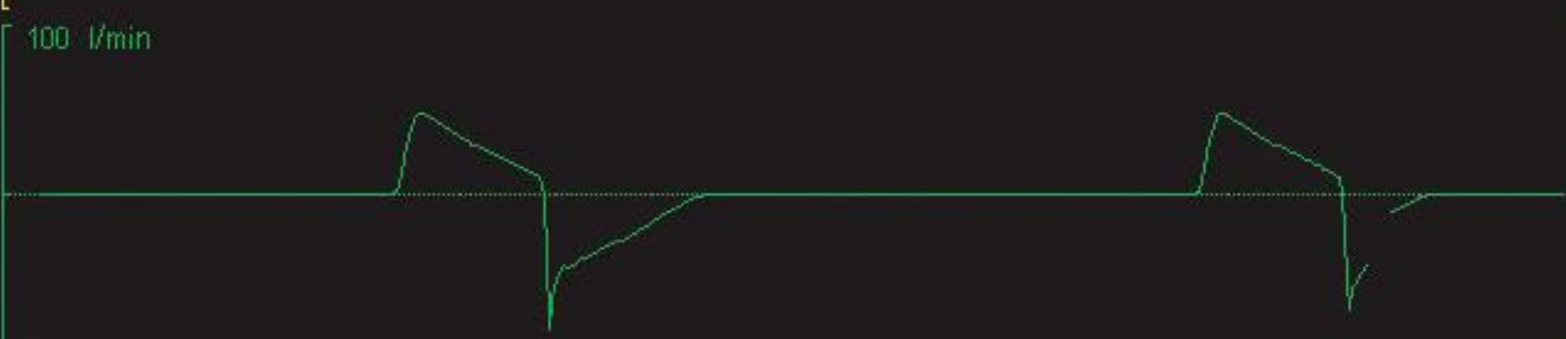
09-20 17 08



Ppeak (cmH₂O) **30** 35

Pmean (cmH₂O) **11**

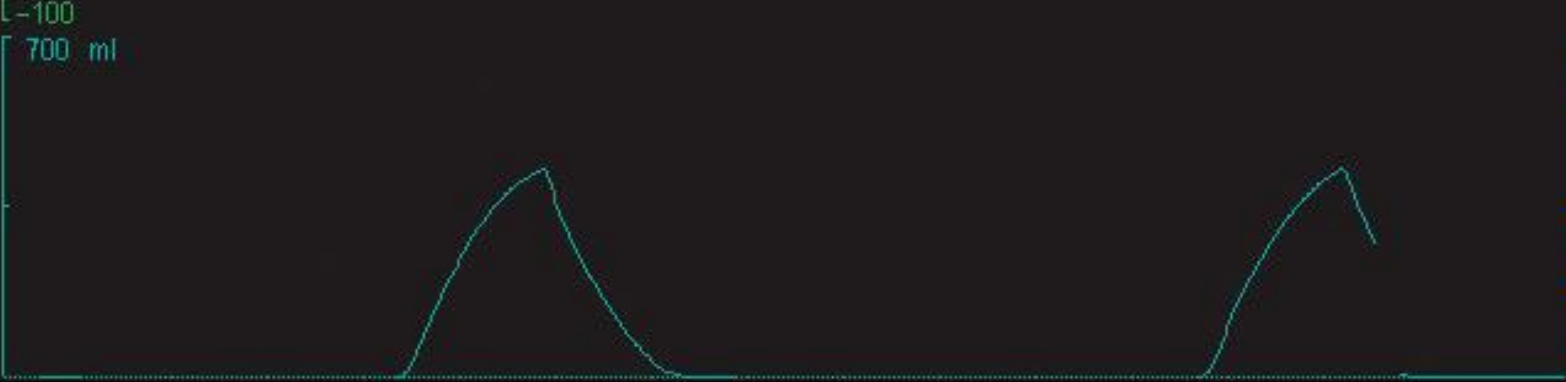
PEEP (cmH₂O) **8**



RR (b/min) **12** 30

O₂ (%) **40** 45

I:E **1:4.5** 35



MVe (l/min) **5.4** 40.0

VTi (ml) **432** 2.5

VTe (ml) **442**

Additional settings

O₂ conc. **40** %

PEEP **8** cmH₂O

Resp. Rate **12** b/min

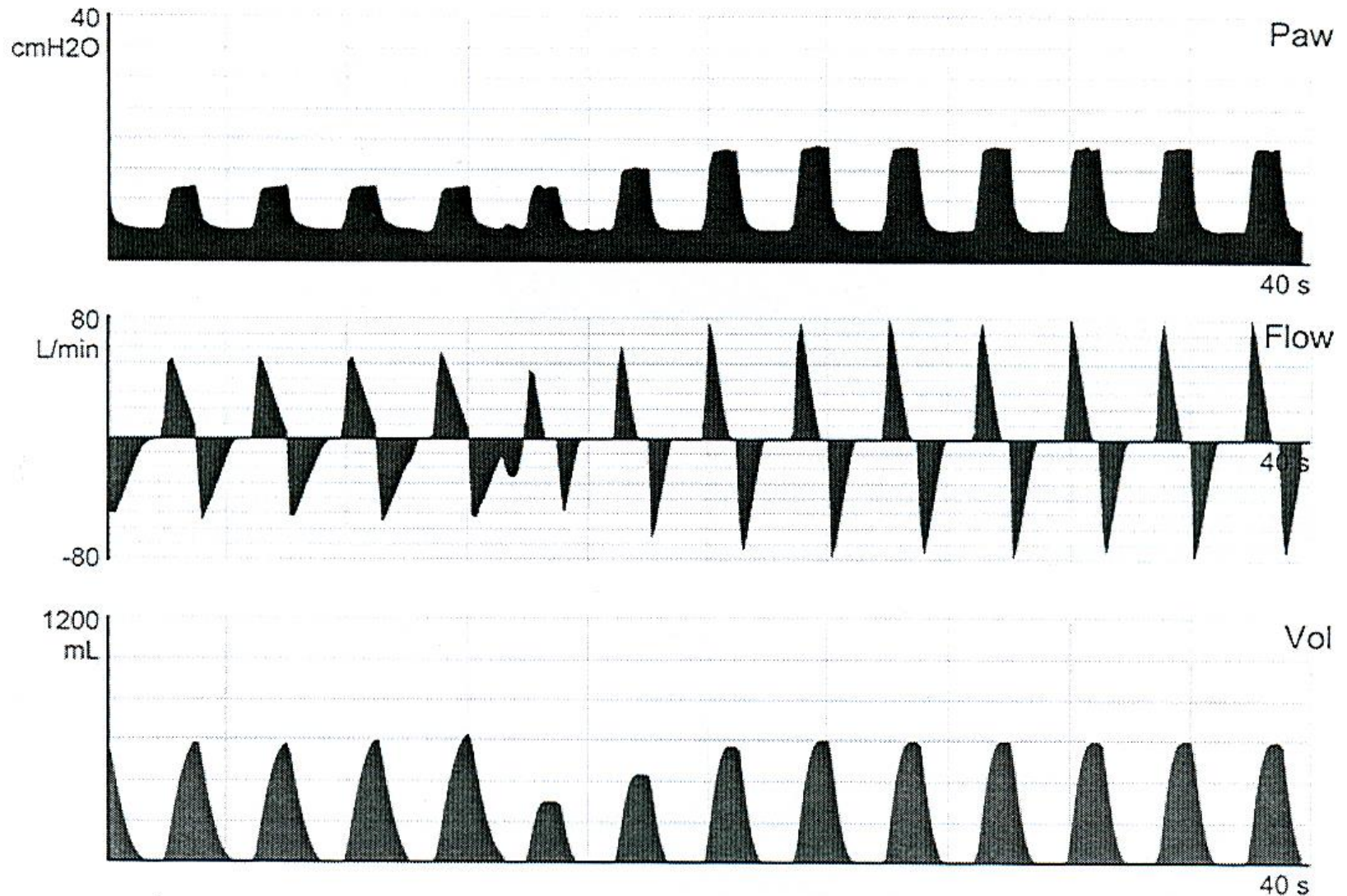
Tidal Volume **500** ml

Additional values

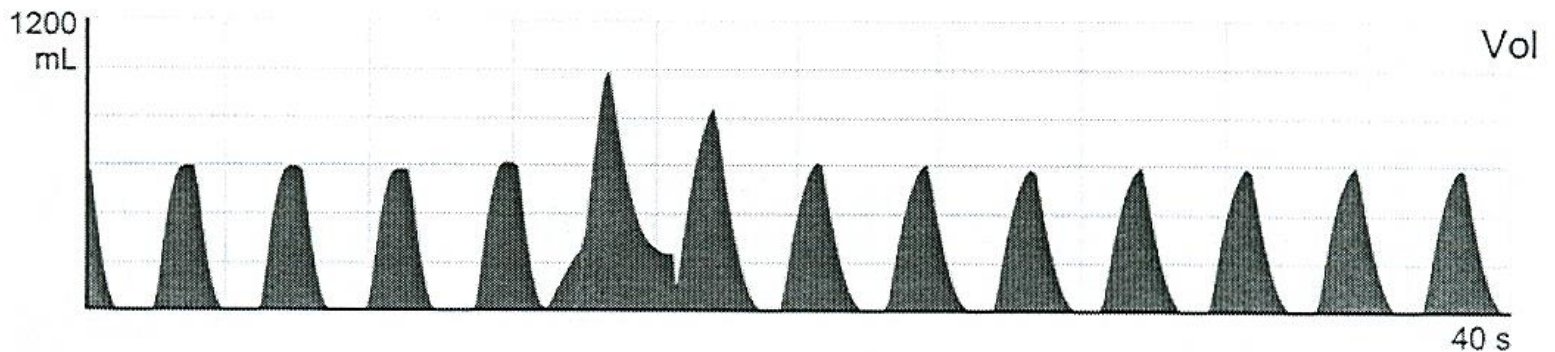
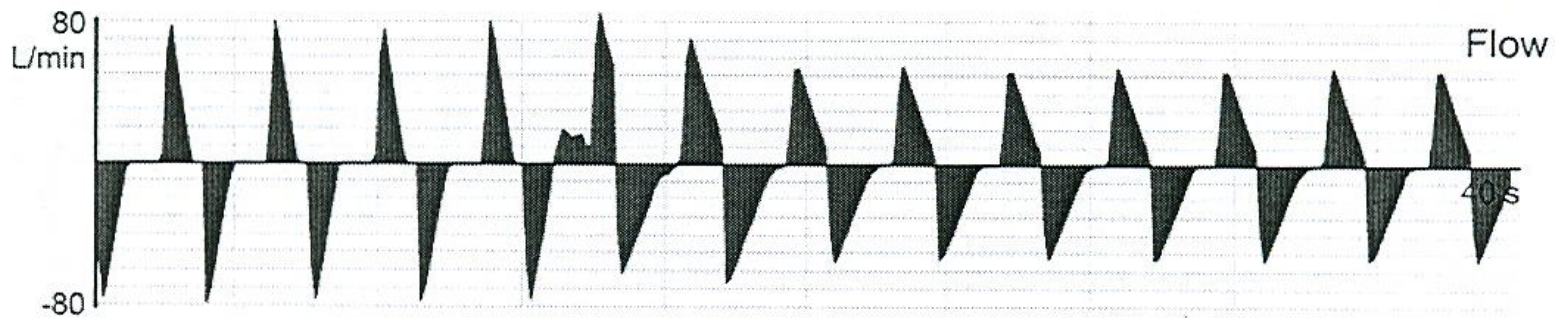
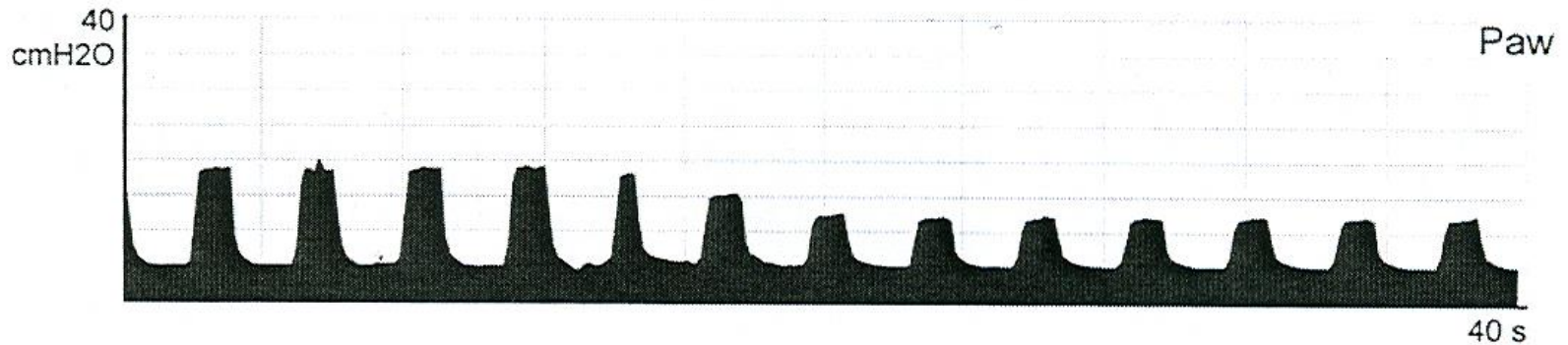
Advantages

- Decelerating inspiratory flow pattern
- Pressure automatically adjusted for changes in compliance and resistance within a set range
 - Tidal volume guaranteed ?
 - Limits volutrauma ?
 - Prevents hypoventilation ?

Decrease in compliance



Increase in compliance

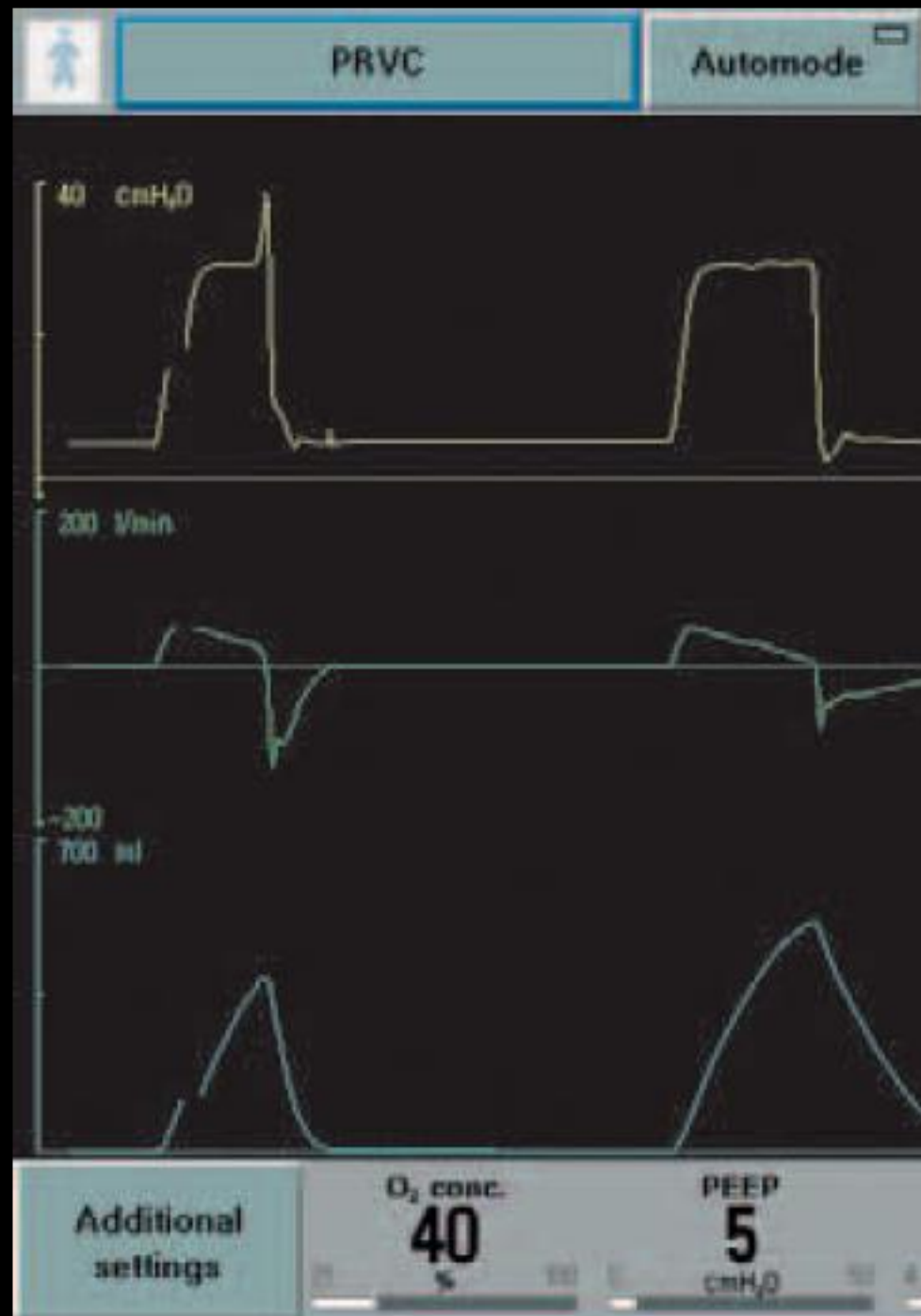


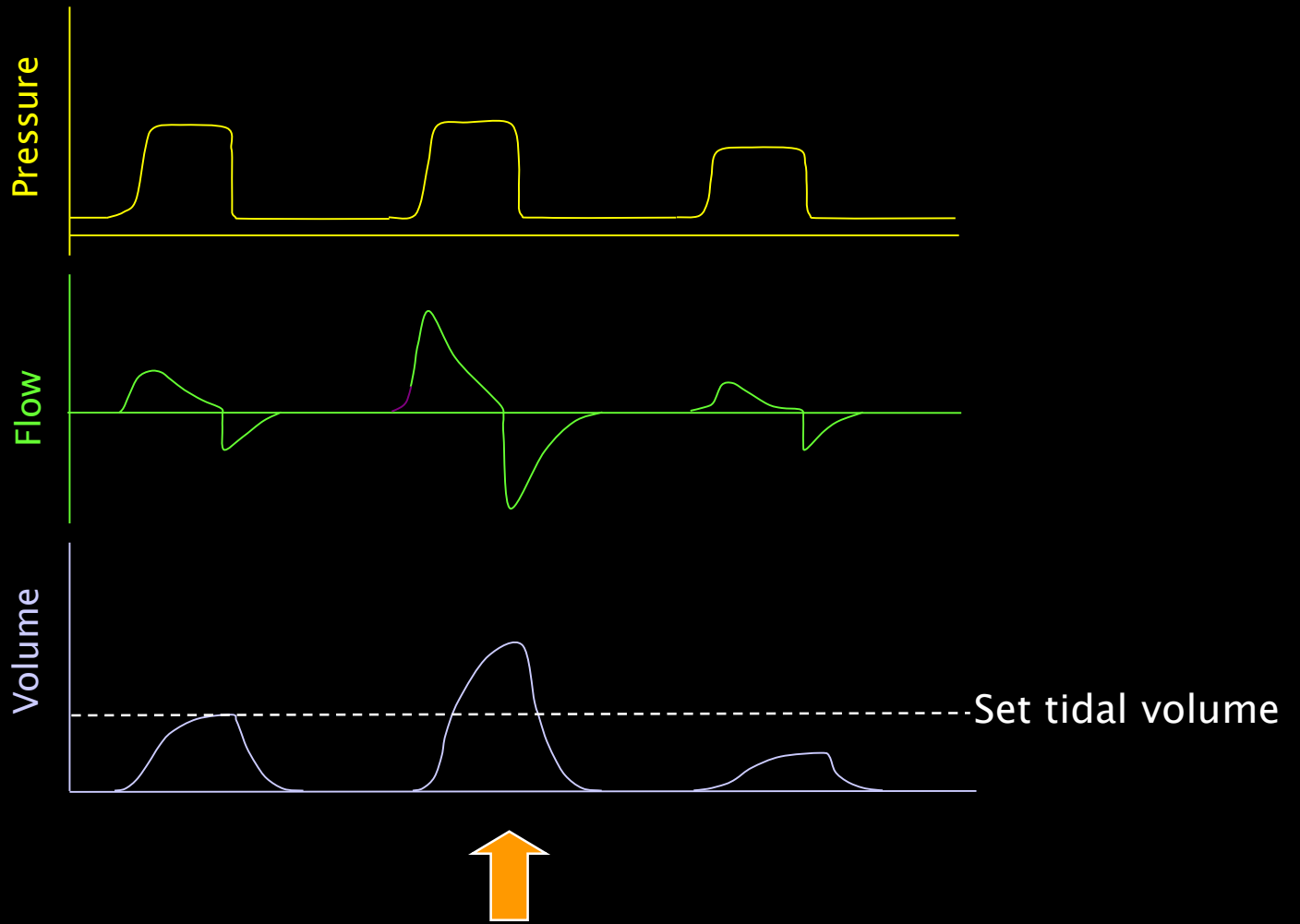
PRVC

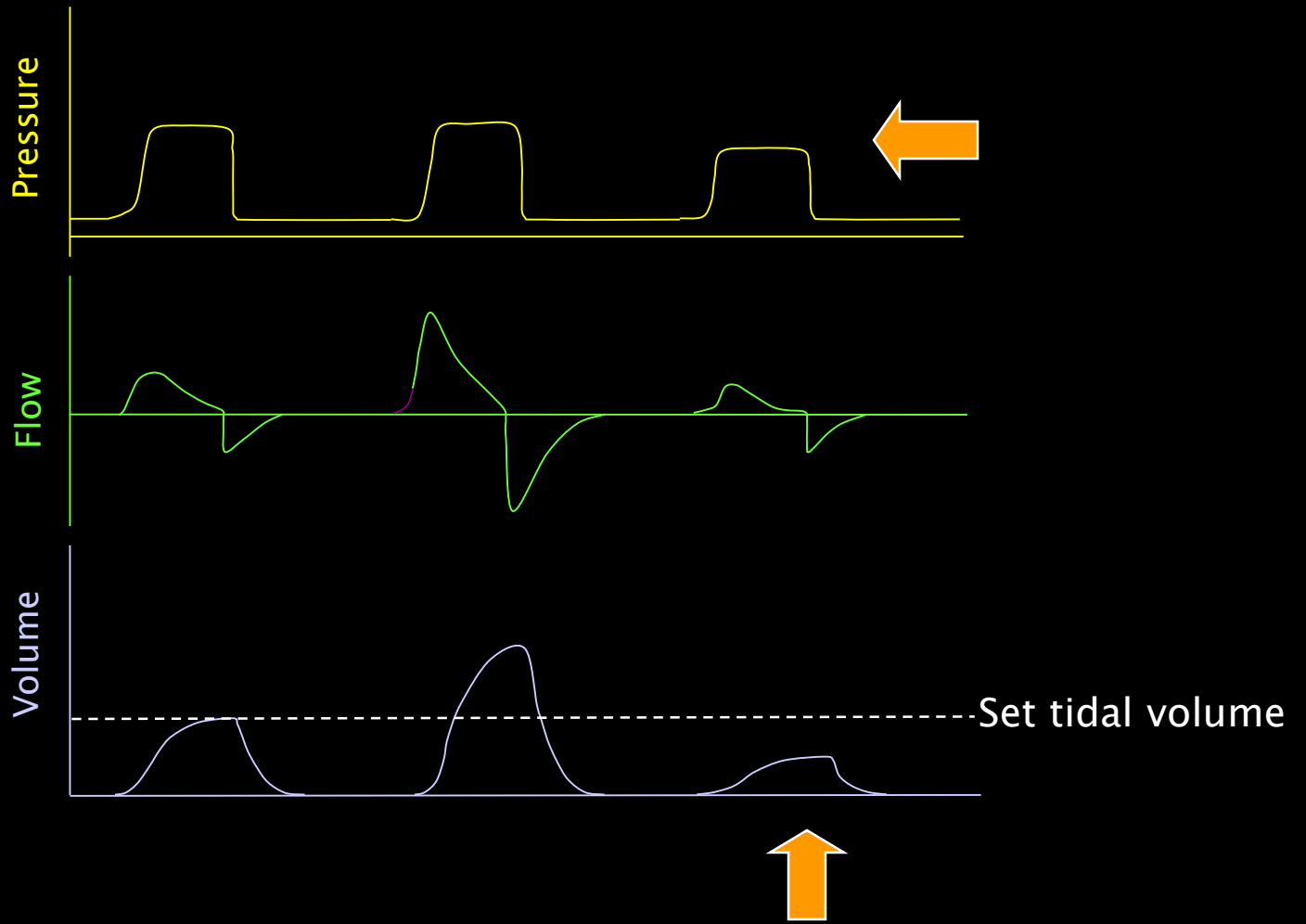
- The SERVO-i will restart with the start-up sequence should one of the following criteria occur:
- if the delivered V_t is 50% less than the set V_t ,
or
- when the Upper pressure limit is exceeded during 3 consecutive breaths

- If the measured inspired Tidal Volume is more than 1.5 times higher than the set Tidal Volume, the breath is interrupted
- the next breath is delivered with 25% reduced pressure compared with the previous breath.

If the patient suddenly coughs during an inspiration, and if the pressure reaches the set Upper pressure limit, then the ongoing inspiration will be cut off and the next breath is delivered with the same pressure as the previous breath.







Disadvantages

- Pressure delivered is dependent on tidal volume achieved on last breath
 - Intermittent patient effort \Rightarrow variable tidal volumes

PRVC is not recommended when there is a leakage in the patient's breathing circuit.