

Check list for ICU staff: Usage of anaesthesia devices for long-term ventilation

This check list is meant to give medical staff a short overview about what to observe when using an anaesthesia machine for long term ventilation.

- Using anaesthesia machines for long term ventilation is not included in the “Intended Use” as stated in the Instructions for Use and therefore is an “Off Label” use
- The user has to weigh the risks of this Off Label use against the benefit for the patient. Dräger cannot and may not generally recommend long term ventilation on anaesthesia machines.
- This check list does neither substitute the Instructions for Use nor the device training
- This check list is only valid for Dräger anaesthesia machines that are currently available for sale.
- The paper “COVID-19: Usage of Dräger anaesthesia devices for long-term ventilation” as the more detailed document has to be observed and prevails
- In general, the usage of ICU ventilators is preferable for long term ventilation compared to using anaesthesia machines

Basics:

1. Staff must have been introduced to working with the machine and must know the functions of an anaesthesia machine
2. An experienced anaesthesia user (e.g. OR nurse) has to be in reach 24/7. In case of problems ask for help in time
3. Before connecting a patient verify readiness of machine and accessories according to point 13
4. A separate emergency ventilation bag must be available at all times. It has to be used in case of problems to assure patient ventilation
5. For NIV-like modes preferably stay with the ICU ventilator.
6. Remove the anaesthetic agent dosage devices (vaporizers or DIVAs). Smallest amounts of anaesthetic agent may cause malignant hyperthermia, also among the staff.
7. Make sure that no N₂O is connected.
8. The mode Man/Spont must only be used after an adequate introduction of staff
9. Usage of modes “Ext. fresh gas outlet”, “Pause”, “Monitoring” is not recommended
10. In volume controlled modes leakages will not be compensated automatically. In this case pressure controlled modes should be preferred.
11. A lack of fresh gas may be caused by large leakages and can be identified by an empty manual breathing bag. In this case take immediate action: Reduce leakages, increase fresh gas flow. Removing the manual breathing bag in this case allows room air to be taken in.
12. Stay in reach of the anaesthesia machine
 - The alarm management is designed such that a user is always in reach (<4m)
 - Turn alarm sound level to 100%
 - Alarm messages will disappear from the screen when the alarm condition is gone
 - Check alarm history for missed past alarms
13. Check accessories regularly, at least once every 12 hours
 - Check the CO₂ absorber. An exhausted absorber can be identified by rising inspiratory CO₂, an insp. CO₂ high alarm or by a colour change of the soda lime (less than 1/3 of the

substance is still white). Despite the high fresh gas flows the soda lime vessel shall always be connected to the machine

- Check the water trap of the gas analyser. If more than half full, take it out and use a single use syringe (without needle) to draw the water out of the blue connector. Re-insert the water trap. Change if necessary
 - Check the hoses. Remove the water regularly. If possible, use hoses with water traps; empty those regularly. If possible, use a large manual breathing bag (3l).
 - Change wet or soaked filters. Use only mechanical filters, if possible in combination with passive humidification (HME) close to the patient (Y-piece).
14. Follow your hospital guidelines for infection prevention
 15. The sample gas line must always be connected. This is important for the FiO₂ and etCO₂ measurement.
 16. Check the measured values for etCO₂ and FiO₂. Because of re-breathing, the measured FiO₂ might differ from the set O₂ concentration in the fresh gas.
 17. The manual breathing bag on the device shall always be well filled and move synchronously with the breaths
 18. Nebulised drugs or aerosols may not be used with anaesthesia machines

When actually starting a case:

1. Check the correct fit of breathing hoses, the manual breathing bag and the sample gas line. Perform a short device check before connecting the patient
2. Set the fresh gas flow to approx. 1,5 times the anticipated minute volume
3. Check the alarm sound to be on 100%
4. Adjust the alarm limits appropriately for the patient. Of special importance are: FiO₂ low, MV high / low, etCO₂ high / low, insp. CO₂ high
5. Adjust Pmax when using volume controlled modes
6. Turn the APL valve to “Spont” or to the appropriate PEEP level
7. Make sure that a separate manual ventilation bag is available.

Regular test after 24 hours (72 hours latest)

1. After 72 hours a full device test is due to assure proper functioning, e.g. for the flow / volume measurement. This test may take up to 8 minutes and should be done by an experienced member of the OR team. The patient must be disconnected prior to the test.
2. During the test, sufficient patient ventilation has to be guaranteed, e.g. with another ventilation device or a manual ventilation bag