

Engineered to Save Lives

KNF pumps help COVID-19 patients to regain their breathing capacity

National authorities worldwide have ordered measures to contain the COVID-19 pandemic, but this is not enough. Every day, thousands of people around the world continue to get infected. Therefore, hospitals have been under extreme pressure to prepare themselves for a large number of corona patients who require intensive medical care. As the number of infections continues to rise, so does the need for life-saving medical equipment.

Our pumps are an integral part of medical applications. Learn more about how KNF pumps are being used to support the recovery of COVID-19 patients in the following blog post.

The beating heart in ventilators

Respiratory distress is one of the most feared symptoms caused by COVID-19. Until a vaccine or medical therapy has been developed, ventilators are a vital treatment for critically ill patients. When their lungs are severely inflamed due to the infection, oxygen cannot reach the small air passages (alveoli) in the lungs when breathing. This is when COVID-19 patients become dependent on a mechanical ventilator that forces oxygen under pressure into the lung passages.

With our pump being the main component in many ventilators, KNF is a Tier 1 supplier to leading ventilator manufacturers. As the heart of the ventilator system our N838.0 multi-head diaphragm gas pump provides compressed and clean air to patients with breathing difficulties. Powered by a speed controlled BLDC motor the pump moves air through a filter, accumulator and regulator, in order to clean and prepare it before being provided to the patient.

To meet the growing needs of ventilator manufacturers during the pandemic, we have increased production of certain pump types by up to ten times the usual output.

Helping lungs to recover in respiratory dialysis

The supply of oxygen through a ventilator is not enough when a severely affected lung is no longer able to transfer the oxygen into a patient's bloodstream or to exhale life-threatening levels of carbon dioxide. When oxygen levels can't be maintained, doctors may consider

taking additional actions, such as Extracorporeal CO₂ removal (ECCO₂R), in order to save the patient's life.

ECCO₂R is a form of respiratory dialysis in which venous blood is taken from the patient and passed through an artificial external lung where carbon dioxide is extracted, and oxygen is being introduced directly into the blood before being pushed back into the patient's body. This gives the lung the opportunity to recover whilst facilitation of protective ventilation or intubation is not required. ECCO₂R is also being used when weaning patients off a ventilator in order to help their lungs gain back strength to support breathing without external help.

Our multi-headed NMP850.0 diaphragm gas pump contributes to such systems by pulling oxygen through the exchange membranes and hydrophobic filter, ensuring a safe and clean oxygen supply to the blood.

Providing breath samples for capnography

Especially with patients that are unconscious or unable to express themselves due to severe breathing difficulties, medical staff rely on medical equipment to learn more about their health status. In severely infected COVID-19 patients, monitoring of their breath is crucial in order to draw a diagnosis regarding their lung function.

Capnography is a monitoring tool used in anesthesia or intensive care. It provides information on concentration or partial pressure of exhaled carbon dioxide (CO₂) in the respiratory gases. This enables medical staff to assess a patient's lung performance and to take life-saving measures if needed. In order to assess the breath, a side stream sample is pulled of the expelled air from the patient's breathing circuit or ventilator. This requires a compact and leak tight vacuum source.

KNF micro diaphragm gas pumps are frequently used for pulling this sample and transferring it through tubing to a sensor located in a remote monitor. KNF diaphragm pumps being used in capnography monitoring are in the range of NMP03 up to NMP015, using a speed controlled BLDC. Learn more about our pumps [here](#).

How can we support you?

Medical devices can help save lives of COVID-19 patients. Clean and reliable performing components are a prerequisite for their best possible treatment. At KNF we understand and anticipate the needs of our customers in the medical industry.

All KNF diaphragm pumps provide oil-free operation, with pure media transfer, are leak-tight, highly efficient and can be customized. They are available with options tailored for specific application requirements related to size, motor, control, voltage, chemical resistance, safety, vibration, noise and temperature resistance. Contact our KNF experts to discuss your needs.