

## Working towards a net zero NHS



The Medclair MDU is an innovative solution which collects residual nitrous oxide from exhaled air and subsequently converts it in harmless gas.

- Converts 99% of exhaled N<sub>2</sub>O into harmless Nitrogen and Oxygen
- Self supporting system with low noise level and minimum energy consumption
- Mobility combined with ease makes it suitable for various healthcare settings
- Facilitates a healthy work environment for healthcare professionals

### A complete mobile solution

BPR Medical's Ultraflow™ analgesic demand valve creates a closed system for scavenging gases and helps integrate the Medclair MDU technology. Its unique patented exhalation valve diverts contaminated breath away from the handset, virtually eliminating the risk of cross-infection.

Our collaborative approach with Medclair has already supported the UK's first climate-friendly gas and air labour at Newcastle's Royal Infirmary in September 2021.

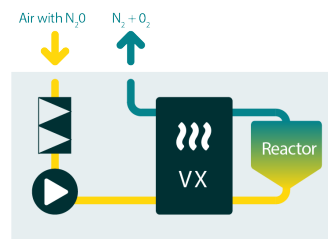


*"Mitigating nitrous oxide emissions alongside thorough evaluation of how we can reduce our waste is hugely important to us as an organisation. Nitrous oxide, while a safe and clinically useful medicine, has almost 300 times the global warming effect of carbon dioxide and we can't ignore that. This destruction technology offers us an opportunity to address this issue head on and we look forward to breaking new ground with the mobile units the minute they arrive! Both MedClair and bpr medical have been a huge support throughout this journey and our teams have learned so much already about what this will offer"*

**Dr Emma Evans**  
Consultant Anaesthetist  
St George's University Hospitals  
NHS Foundation Trust

## How it works

- The exhaled breath containing nitrous oxide is collected via the Ultraflow demand valve into the MDU
- A catalytic process in the reactor breaks down nitrous oxide ( $\text{N}_2\text{O}$ ) at high reaction temperatures into oxygen ( $\text{O}_2$ ) and nitrogen ( $\text{N}_2$ )
- The hot purified air is led into the heat exchanger, where the heat is recycled to warm up the incoming exhaled air. The cooled harmless purified air is released into the atmosphere
- An integrated control system monitors the process and can be read remotely via a web interface
- The reaction that converts  $\text{N}_2\text{O}$  to  $\text{O}_2$  and  $\text{N}_2$  is virtually self-sustaining. Once at operating temperature, there is almost no power required to maintain the reaction temperature



The NHS is responsible  
for around

**4%**

of UK's carbon emissions

Anaesthetic gases  
account for

**5%**

of NHS carbon emissions

Operating one MDU is  
potentially equivalent to  
removing

**275**

cars from UK roads

## Reliability and monitoring

The MDU is constructed with few moving parts and components, this gives it a high degree of reliability and a long product lifespan.

The MDU has an integrated control system that continuously monitors several parameters including temperature and gas flows, it stops automatically if overloaded.

On delivery, the device is set up for remote monitoring, and it is easy to connect the unit to Medclair's technician for remote monitoring.

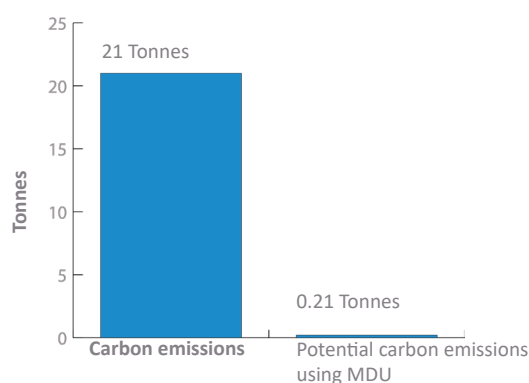
Discover more



## Potential impact - a significant reduction in carbon emissions

We recently analysed data from a dental department within an NHS Trust who were using 22 x 100%  $\text{N}_2\text{O}$  cylinders per year (each containing 1.800 litres of  $\text{N}_2\text{O}$ ).

The graph (right) demonstrates the comparison of the total carbon emissions over a one year period vs the potential carbon emissions by using an MDU unit.



**Developing a business case** - get in touch with our team to discover how we can support your business case in working towards a net zero NHS