

- ❶ Manifold body with all porting and interconnections inside
- ❷ Proven Humphrey 320 Series poppet
- ❸ Unique custom piston enabled reliable operation down to 5-7 PSIG
- ❹ Manifold placement in air stream for efficient cooling

In-Home Oxygen Therapy O₂ Concentrator *Increased Flow Rate 20% due to Custom Valve Assembly*



MEDICAL
SIC:3842

THE CUSTOMER'S PRODUCT

- O₂ concentrator for in-home oxygen therapy.
- Simultaneously fills portable bottles while supplying the patient.

THE REQUIREMENTS

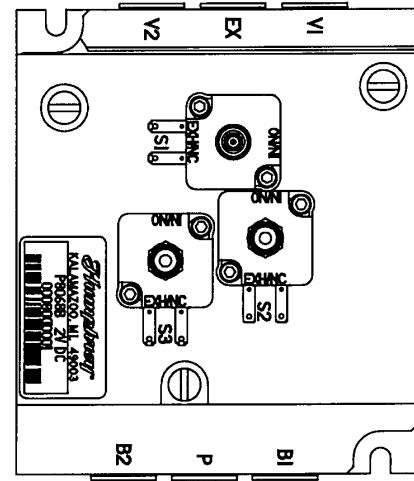
- New design must not be larger than the existing unit.
- Higher flow to allow some of the O₂ to be routed into an additional positive displacement pump that boosted the pressure for bottle filling.

THE HUMPHREY ENGINEERED SOLUTION

- Larger diameter piston operating on the proven Humphrey 320 Series valve.
- 20% higher flow rate at less than 30 PSIG pressure.
- Pilot operated, low current consumption Mizer series solenoid valves generate minimal heat.
- O₂ compatibility

THE SOLUTION

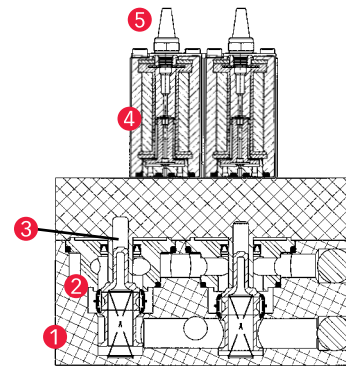
Humphrey's Engineered Solutions team applied creative logic to the problem of creating a low pressure pilot valve with a high flow rate. The solution was to design a larger diameter piston operating on the proven Humphrey 320 Series valve – a pilot operated, low current consumption Mizer series solenoid valve that generates minimal heat. Working closely with the customer's engineers enabled Humphrey to locate the manifold in the air stream for maximum cooling.



THE PROCESS

The company was aware of Humphrey's wide range of experience providing solutions for other manufacturers of oxygen concentrators. Contacting Humphrey, the customer laid out the problem: Their new unit would have the additional function of filling portable bottles and that required more than just a circuit/system of standard valves. Given the size and weight restrictions, the manifold would be "wedged" into an extremely tight space where heat could create operational problems. The valve, itself, had to be a low wattage, low pressure pilot valve having a high flow output.

Humphrey established the engineer-to-customer engineer team to explore all aspects of the new design. The peer-to-peer relationship enabled both companies to concentrate of their core competencies. This allowed Humphrey to explore several approaches, finalizing on the optimal one – a custom-designed piston/poppet valve and low current consumption solenoid valve.



- 1 Redesigned manifold resulted in 20% higher flow rate than existing design
- 2 Proven poppet design requires no lubrication – not affected by impurities in the air
- 3 Unique custom piston enabled reliable operation down to 5-7 PSIG
- 4 Low current consumption solenoid to reduce heat
- 5 Bronze cone-shaped mufflers/silencers

Humphrey