

LEE TECH TALK

TECHNICAL APPLICATION NEWS BRIEF

LEE CONTROL VALVES PROVIDE NUMEROUS BENEFITS FOR PORTABLE AND CART-BASED METABOLIC MONITORS

The Challenge

Indirect calorimetry is an indispensable technique utilized in various clinical settings. This measurement method uses metabolic testing to quantify energy expenditure by measuring O₂ consumed and CO₂ produced (i.e. VO₂ exchange). Metabolic testing is also used in sports medicine to optimize athletic performance and prevent injury. While metabolic monitoring instruments are typically cart-based devices, there is an increased demand for wearable devices that can monitor athletes in the conditions and environments of their sports. The challenge to measure VO₂ exchange without affecting athletes' movements requires portable monitoring systems with miniature solenoid valves that are rugged, reliable, and consume very little power.



The Solution

The Lee Company's extensive offering of miniature 2-way and 3-way control valves are ideal for metabolic monitor designers looking for solenoid valves to feed sensors, mix gases, and vent to atmosphere. Several standard options for drive voltage, seal material, and mounting are available to facilitate easy integration into new and existing platforms. Though small in size, our High Density Interface (HDI™) valves offer many advantages, including ultra-low power consumption, minimal leakage, and extremely long cycle life. The Lee Company's new genvi™ solenoid valves take high flow capacity to the next level for applications where leakage, power, and reliability cannot be sacrificed.

The Benefits

The compact size, light weight, and ultra-low power consumption of Lee's HDI valves enable portable monitors to be minimally obtrusive and offer full freedom of movement during performance testing. The HDI's high flow capacity allows for fast system venting and feeding of O₂ and CO₂ sensors, which is important in breath-by-breath gas sampling as athletes near their peak rate of respiration. Systems utilizing mixing chambers achieve greater measurement accuracy with HDI valves due to their low leakage. HDI valves have an outstanding pedigree of long service life in varied and extreme conditions, which makes them well suited for use by top athletes engaged in strenuous activity.

Potential Applications

In medical and research environments, HDI valves are used in larger cart-based systems where, in addition to the functions performed in portable monitors (such as venting and gas sampling), they also support O₂ and CO₂ sensor calibration. Benchtop, cart-based, and cabin systems would all benefit from the exceptionally high flow capacity of the new genvi valve, which allows for shorter cycle times, thus improving efficiency and the patient experience. Pulmonary function testing devices, from basic spirometry to body plethysmography, are often integrated with metabolic cart-based monitors. These sophisticated systems can achieve exceedingly accurate sensor readings with genvi valves thanks to their impressively low leakage.

Lee HDI and Genvi Solenoid Valves

Features like extensive cycle life, high flow capacity, minimal leakage, and low power consumption make HDI and genvi control valves crucial components for wearable and cart-based metabolic monitors. The Lee Company offers exceptional application and technical support, which are second to none. This makes selecting a control valve from The Lee Company a wise choice for any designer involved in the development of metabolic monitoring devices.

THE LEE COMPANY

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