

Compact regulator for oxygen system devices with piezo technology

# Improved quality of life

Around 600 million people worldwide are afflicted with chronic obstructive pulmonary disease (COPD). Mobile oxygen system devices improve the mental and physical ability of patients as well as their quality of life. Japanese company Musashi Medical Laboratory supplies easy-to-operate regulators in smartphone format for these oxygen system devices, thus significantly improving comfort and handling for patients. Compact piezo valves from Festo provide for quiet oxygen supply.



As compact as a smartphone:  
Musashi Medical Laboratory's IVY  
flow regulator for oxygen conservers  
can be held conveniently in the hand  
for operation and fits in any shirt or  
trouser pocket.



Handy and quiet: the flow regulator IVY can be easily carried and fixed directly on the body.

**P**atients with COPD suffer from shortness of breath because the damaged lung is no longer capable of filtering enough oxygen out of the air. Consequently, many of them depend on long-term oxygen therapy. Mobile oxygen system devices such as oxygen conservers supply patients with adequate amounts of oxygen.

#### Improved convenience

Musashi Medical Laboratory took a new approach to designing the oxygen conserver: they separated the flow regulator – with the brand name IVY – from the oxygen bottle so that it can be held conveniently in the hand for operation. Its size and weight are comparable to those of a smartphone, and it can be comfortably carried directly on the patient’s body in a shirt or trouser pocket.

The regulator is compact and light, not least of all due to Festo’s proportional valve VEMR which regulates the supply of oxygen via the tubing. A further advantage of the piezo valve is that its switching

operations are inaudible. Even error messages, which are usually indicated by an acoustic signal, are less unpleasant because initially the regulator simply vibrates.

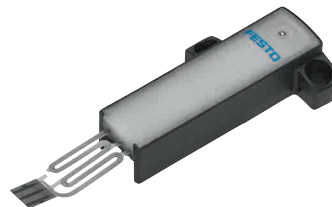
#### Greater efficiency

The device is matched to the patient’s respiratory rate. A sensor ensures that the regulator detects inhalation. The right amount of oxygen is then mixed with the respiratory air. During inhalation, the sensor detects a pressure drop and transmits a signal to the regulator which in turn opens the proportional valve VEMR. Oxygen then flows from the oxygen bottle – not uninterruptedly as with other devices, but only for as long as the patient is inhaling. As soon as inhalation has been completed, the valve shuts off the supply of oxygen. Oxygen consumption is thus much more efficient. The oxygen bottle doesn’t have to be refilled as often. The patient’s range of action is increased as a result. And what’s more, thanks to the energy-efficient piezo valve, the device’s operating time is considerably extended before the battery has to be recharged.



Foto: Musashi

Lightweight and quiet: The oxygen converter produced by Musashi Medical Laboratory uses piezo technology from Festo. Thus the flow regulator's switching operations are nearly inaudible.



Proportional valve VEMR: oxygen-compatible piezo technology with proportional characteristics is energy efficient, noiseless, light and compact.

### Piezo proportional characteristics

With piezo technology oxygen can be administered to patients gently instead of jerkily. "This is much more pleasant for the patient", explains Tokuyama San, Managing Director of Musashi Medical Laboratory and adds: "We're very pleased to be the first company in Japan to be able to make use of a piezo valve in a medical device, which provides the patient with significant advantages." Musashi Medical Laboratory received an innovation award for this device in the MEDTEC fair 2016 in Tokyo.

**About Festo:**

Festo AG is a global player and an independent family-owned company with headquarters in Esslingen am Neckar, Germany. The company supplies pneumatic and electrical automation technology to 300,000 customers of factory and process automation in over 40 industries. Our products and services are available in 176 countries.

With about 18.700 employees in over 250 branch offices in 61 countries worldwide, Festo achieved a turnover of around €2.64 billion in 2015. Each year around 8 % of this turnover is invested in research and development. In this learning company, 1.5 % of turnover is invested in basic and further training. Yet training services are not only provided for Festo's own staff – Festo Didactic SE also supplies basic and further training programmes in the field of automation technology for customers, students and trainees.