

Comprehensive Air Flow  
Control Solution for Laboratories



SMAYLAB®



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## Application

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SMAYLAB universal air ventilation solution is suitable for all kinds of rooms where there are requirements to maintain proper room pressure regimes (positive or negative room pressures). Thanks to combining SMAY products for air flow controls and implementing proven technologies that are used in modern laboratory ventilation systems, a solution has been developed that is applicable to any air-flow control concept adopted by the designing engineer.

In particular, these solutions are used in the following types of premises:

- lab rooms,
- isolation rooms in hospitals, operating rooms,
- production facilities, where according to the technological process used there must be a controlled level of air contamination (GMP areas).

## Construction

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A component part of the solution is a system for controlling air flow in the fume cupboard fully compliant with PN-EN-14175 providing a high level of safety and comfort for the user. The system ensures the maintenance of the designed air velocity on the open fume cupboard sash regardless of the degree of its opening.

Additionally, by using different shapes of the control panels it makes easy to install into the framework of most fume cupboards available on the market. The system consists of a stainless steel or PPs VAV box with a fast-acting actuator, an air flow sensor, high precision fume cupboard sash opening potentiometer, a microcontroller, and a static pressure differential transducer as well as the monitoring and control panel. Proposed systems are suitable for all types of laboratory exhausts and they can be easily installed in new or existing fume cupboard exhaust.

## Function

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The basic functions of the air flow control system in the fume cupboards are:

- signaling operating modes of the fume cupboards (audible and visual alarms),
- the ability to mute audible alarm by the operator,
- ON/OFF additional pushbutton switch for lights in the fume cupboard,
- the pushbutton bypassing the air flow control on the fume cupboard,
- sash open too high - warning visual signal,
- maximum and minimum air flow control bypass pushbutton switch,
- a serial port for easy system air flow calibration,
- an air flow or air velocity on the open sash display,
- a seamless communication with the central facility management system (BMS).

## Special execution

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In custom build option with the use of an automated fume cupboard sash the operator can close or open the sash remotely. In addition, the system is equipped with a foot switch for easy raising a sash without using hands.

After defined period of time on fume cupboards not being used with sashes open the system in combination with BMS can remotely bring them to minimum position thus generating additional energy savings while ensuring a high level of safety and comfort.

**The SmayLab system can be used in explosive proof areas according to ATEX 94/9/EC group II, zones 1 and 2 and 21 and 22.**

## BMS

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Another very important aspect is the condition for the comprehensive air flow management in the area served to maintain the designed room pressures (positive or negative room pressures). The proposed SMAYLAB solutions can intelligently manage air flows in order to maintain designed parameters - to maintain pressure regimes in the rooms served, and to monitor and control temperature and humidity, and also they can monitor other components of the system such as filter loads, room lighting, alarming, etc.

## Simplyfy

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SMAYLAB laboratory systems are designed for rooms where there must be maintained positive pressures (clean rooms) and negative pressures (contaminated rooms), in which there is a risk of migrating biological, chemical or mechanical (germs, dust, vapors, gas mixtures, etc) contaminants outside of the controlled zones.

Positive pressure rooms (clean rooms) are used to secure the premises against migration of mechanical, biological or chemical agents to maintain their cleanliness requirements. Typically, such systems are used in hospitals (isolation rooms, operating and surgical rooms), in laboratories and production plants (such as pharmaceutical plants, cosmetics factories and various scientific research facilities).

Negative room pressure is an [isolation](#) technique used in [hospitals](#) and medical centers to prevent cross-contaminations from room to room.

## Modular and Complementarity

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SMAYLAB system due to its modular construction is a flexible solution that can be used in any solution proposed by the HVAC system designer. In addition, our company provides a full cooperation from the very beginning, i.e. selection of the system concept, its development as well as start-up and calibration on site and training of final users and maintenance staff. We provide a full warranty service on our solution.

Below on the schematic there is an example system architecture showing a laboratory maintained at negative room pressure. The solution includes the air flow control systems on fume cupboards, local technology exhausts, chemical storage cabinets under the assumption of any number of these units. In order to maintain the designed negative room pressure value the room controller summarizes all the air volume exhausted from the room, and based on that controls the air supply flow through VAV boxes to maintain the room pressure thus ensuring a high level of safety and comfort for users.

Additionally, the system can monitor the pressure in the room, temperature, humidity and the number of air changes as well. The system has got an option to monitor other room devices if necessary. This solution can operate autonomously or can be integrated with the BMS. SMAYLAB solutions due to its simple and user-friendly method of control can be quickly adapted to any changes in the configuration of laboratory equipment. System architecture shown in the schematic is just an example of a system that can be built using the components of the SMAYLAB solution.

SMAYLAB is the perfect choice for air flow regulation in lab rooms fully adjusted to customer's requirements provided by a single manufacturer.

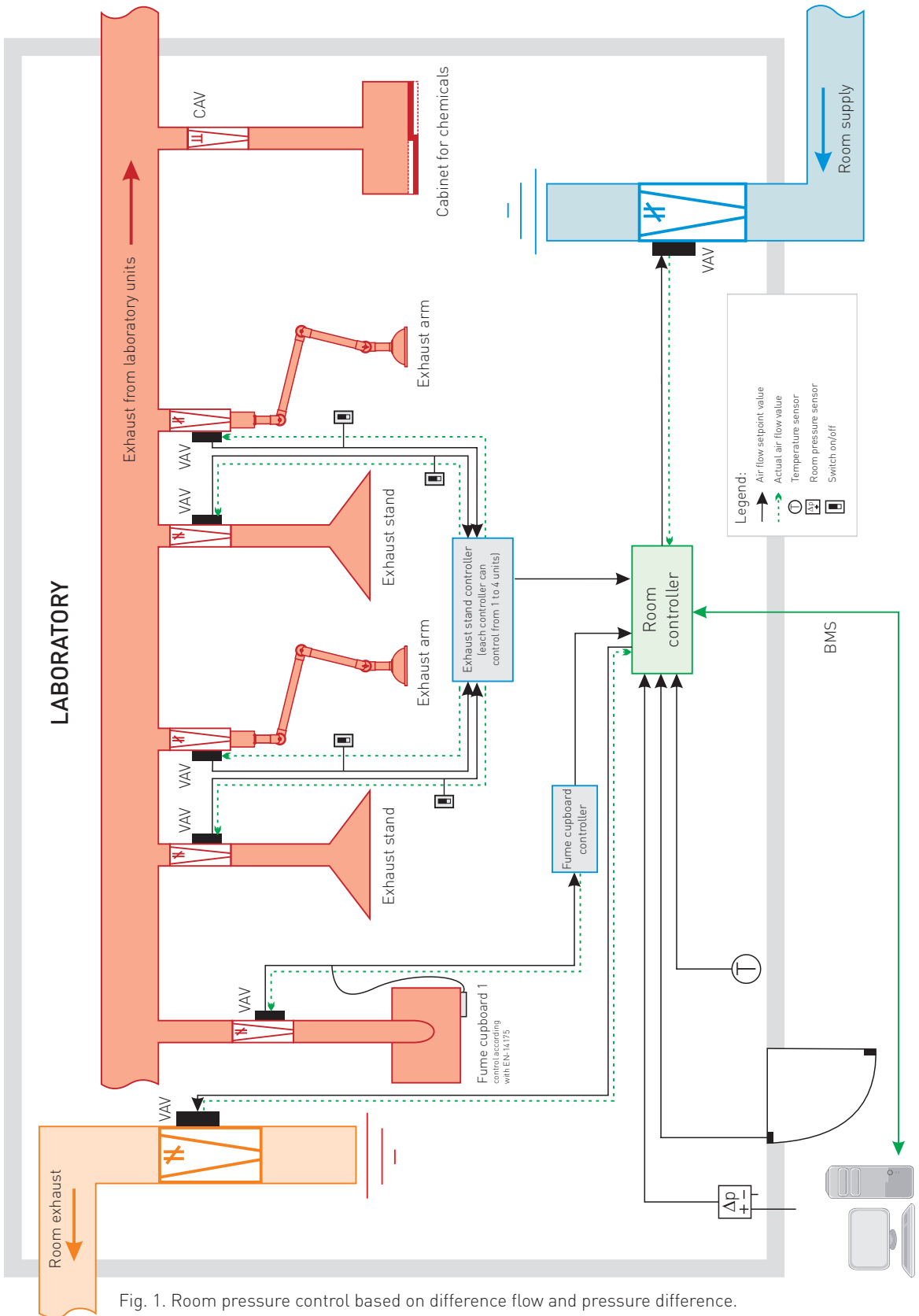


Fig. 1. Room pressure control based on difference flow and pressure difference.

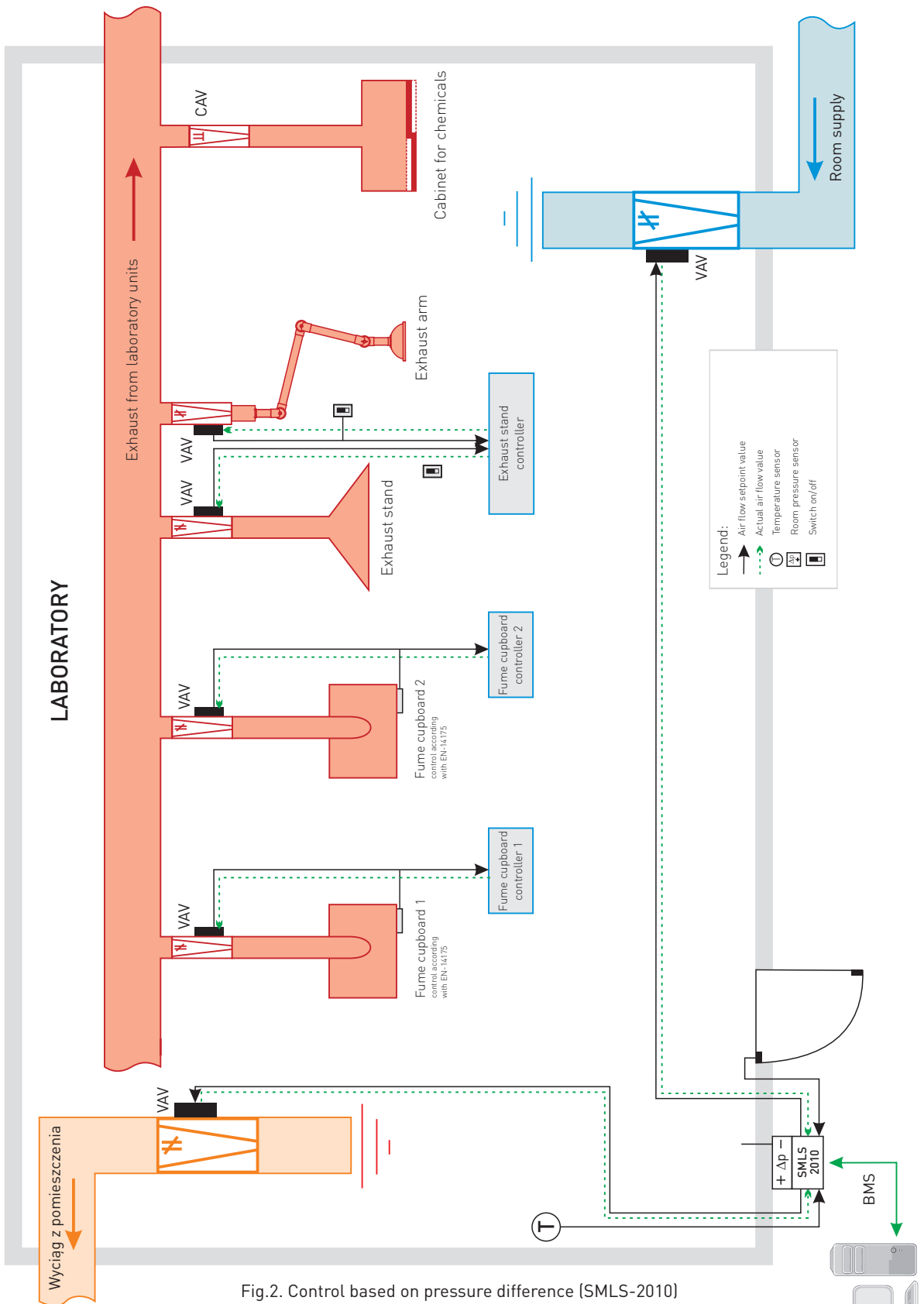


Fig.2. Control based on pressure difference (SMLS-2010)

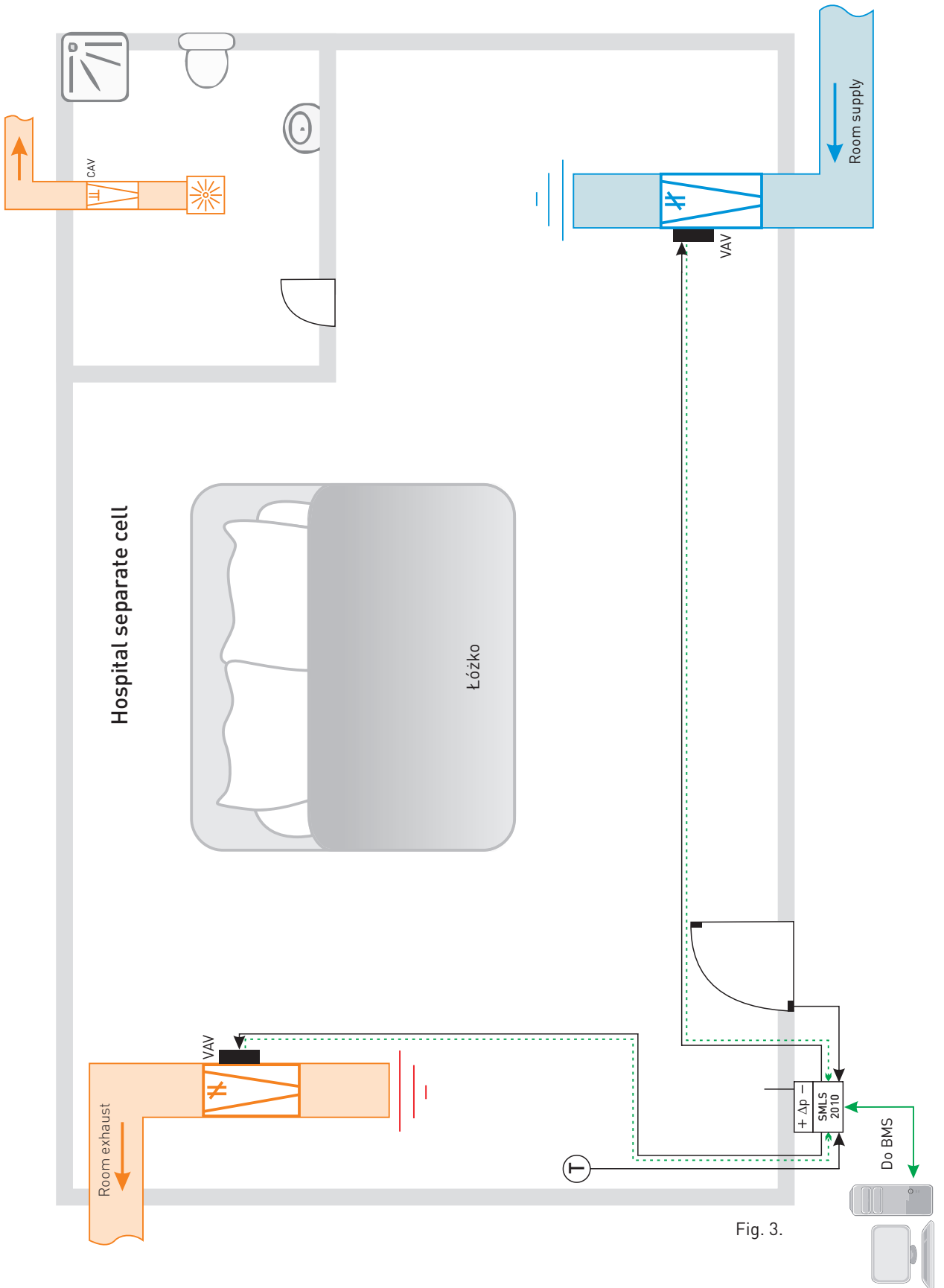


Fig. 3.