OMRON Electronic Components Europe

Press Release

# Ventilation and Comfort Control in the Post-COVID Workplace

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**Hoofddorp, Netherlands, Thursday, 26 August 2021** – Employers across Europe are starting to think about bringing their teams back into the office environment. Yet, after a year of lockdowns and health warnings, it's natural that many employees will feel anxious or apprehensive about returning to shared workspaces. As they do, their safety of course is paramount, but at the same time issues like carbon footprint and costs have not disappeared.

A great example of an issue that straddles both the 'old' and the 'new' normal is ventilation. A well ventilated space reduces the risk of transmitting COVID and other viruses – but also improves worker comfort leading to greater willingness to return to office working and productivity. At the same time, the costs are too great to be ignored. Deploying the latest sensor technologies can ensure that ventilation systems operate at the optimum efficiency, generating the greatest effect for the minimum energy input and hence the lowest carbon and economic footprint.

## Ventilation

Ventilation, clearly, is based on maintaining the right air flow through a space. Too little, and the room quickly feels airless and can develop odours. Too much, and it becomes too draughty and expensive to heat.

Fans can be a low cost and efficient way of providing adequate ventilation, but some form of air velocity control is needed not least to ensure that the regulations for ventilation are being complied with. For example, in the UK, the Building Regulations stipulates the provision of adequate mechanical ventilation rates. Sensors such as the OMRON D6F-V MEMS Flow Sensor can improve efficiency by monitoring the exact air rate which is extracted by the fans. This sensor uses a unique flow path structure for high-performance flow rate measurement. The compact sensor element measures mass flow directly, and most models for air measurement are protected by a unique dust segregation system to avoid long-term performance degradation in contaminated environments. To help improve air quality further, these devices can also be used to detect clogged filters in ventilation and air-conditioning systems, thereby improving reliability and efficiency.

Air conditioning systems too need careful monitoring to ensure that peak performance is maintained. The difficulty is that many conventional airflow sensors aren't accurate at the very low flows normally encountered in an air conditioning system. OMRON's D6F-PH sensors overcome this issue by using MEMS technology to create a micro miniature heating element in between two thermopiles (Figure 1). The sensor measures flow by the shift in the resulting hot spot. Temperature difference between the two thermopiles is directly proportional to the mass flow across the sensor chip.


*Figure 1: OMRON D6F MEMS Air Flow Sensor*

Such accurate maintenance of pressure enables OEMs to maximise the performance of HVAC systems, especially variable air volume (VAV) systems where the dumper can regulate the airflow in ducts and thus achieve noiseless and efficient control. Embodied in devices like the new OMRON D6F-PH, this offers better accuracy than conventional differential pressure sensors - especially in low flow conditions. The standard range features units capable of measuring flows from zero to over 200l/minute.

## Thermal sensors

Heating and ventilation systems use a lot of energy. With most employers phasing the return to the office, clearly many spaces like meeting rooms will see lower levels of use. Accurate people detection systems allow heating and ventilation systems to be throttled back when a space is empty, and their output scaled appropriately to the occupancy when it is in use. Temperature measurement sensors are much more effective than movement sensors for this purpose. Not only are they more reliable at detecting the presence of people, but they can also be used to monitor the background temperature and confirm the effectiveness of the system. In the context of a room, thermal sensors need a wide field of view, so that they can detect the presence and location of people in a space accurately and reliably.

For example, OMRON D6T Thermal Sensors (Figure 2) are based on an infrared sensor which measures the surface temperature of people and objects without touching them. It achieves this by using a thermopile element, which absorbs radiated energy from the target object. The state-of-the-art MEMS thermopile is integrated with a custom designed sensor ASIC that bundles a signal processing microprocessor and algorithm into a tiny package. As a result, the sensor is reputed to offer the highest signal-to-noise ratio (SNR) in the industry. For HVAC applications, the D6T 32x32, a wide-angle version of the device based on 32 x 32 elements, provides a view across 90.0° by 90.0°. This equates to a field of view measuring 3.6m x 3.6m at 2m distance, so allows people to be detected in a wide space. When applied efficiently, such thermal sensors can not only control energy consuming services, but also monitor movements around the building and occupancy ratio for a better usage of office space.

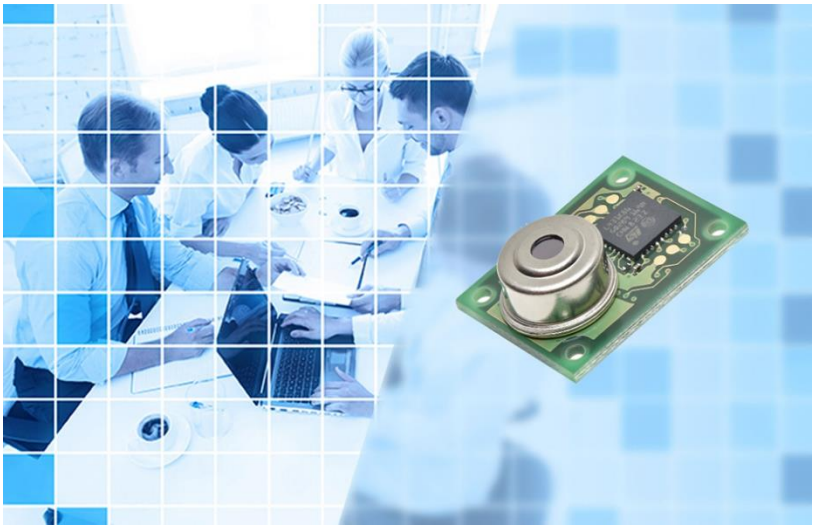

*Figure 2: OMRON D6T Thermal Sensors are based on an infrared sensor which measures the surface temperature of people and objects*

**Air quality measurement**

Maintaining a comfortable office environment is a matter of juggling many factors. In addition to temperature and air flow, parameters like humidity, light level, UV, barometric pressure and air quality (including the presence of volatile organic compounds (VOC)) are all significant. The best solution is to employ a multi-purpose environmental sensor, which makes it very easy to deliver a wide range of measurement functions from just one small component. This will save development time by providing numerous options that can be tailored to the user's needs. It communicates via a USB interface or a standard wireless protocol like BTLE. These sensors offer easy to interpret data that can then be analysed, stored on the cloud and used to set parameters and make real-time adjustments.

For example, the OMRON 2JCIE offers multiple sensors in one unit that has a built-in memory and connectivity through beacon communication (Figure 3). The sensor can accumulate data for approx. 3 months (based on a communication frequency of once every 5 mins) and connect to multiple devices, such as smartphones, via Bluetooth 5.0. The 2JCIE Environmental Sensors are cloud compatible with no need for additional hardware. Bespoke threshold values can be set to provide alerts that notify the user of any abnormal sensor readings.


*Figure 3: OMRON's 2JCIE offers multiple sensors in one unit that has a built-in memory and connectivity through beacon communication*

**Conclusion**

The technologies described in this article are not new – but are receiving much greater focus in the post-COVID world. The benefits of returning to the office are too great to ignore. Many appreciate the social aspects of office life, and not all have a home environment that is conducive to productive work. At the same time, the perceived risks of

returning to the workplace need to be counterbalanced by recognition of the new safety concerns, as well as by making office spaces as welcoming and comfortable as possible. All this needs to be achieved at an affordable cost to the employer and to the environment. Sensor technologies such as MEMS air flow sensors, thermal sensors and all-in-one environmental sensors can work together to provide a workplace that is safe, comfortable and affordable for all.

**About OMRON Electronic Components Europe**

OMRON Electronic Components Europe is a leader in electromechanical PCB relays, as well as a leading supplier of components such as micro switches, MOSFET relays, DIP switches, photomicrosensors and connectors. OMRON has a strong portfolio of innovative technologies including MEMS based pressure, flow and thermal measurement sensors, human face and gesture recognition modules, vibration and tilt sensors.

OMRON Electronic Components Europe strongly supports its customers in Western and Eastern Europe, Russia and the CIS through 8 regional offices, a network of local offices and partnerships with specialist, local, regional and global distributors.

OMRON Electronic Components Europe is a subsidiary of the OMRON Corporation, recognised worldwide as a leader of high quality, high technology electrical and electronic control equipment and component products.

**About OMRON Corporation**

OMRON Corporation is a global leader in the field of automation based on its core technology of "Sensing & Control + Think." OMRON's business fields cover a broad spectrum, ranging from industrial automation and electronic components to social infrastructure systems, healthcare, and environmental solutions. Established in 1933, OMRON has about 28,000 employees worldwide, working to provide products and services in around 120 countries and regions. In the field of industrial automation, OMRON supports manufacturing innovation by providing advanced automation technologies and products, as well as through extensive customer support, in order to help create a better society.

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