



LEV Airflow Indicator

User Installation & Operation Guide

The LEV Monitor

The LEV airflow indicator has been designed to provide continuous monitoring, at regular intervals, of individual extraction points in a Local Extract Ventilation (LEV) system. At a glance, personnel working in hazardous industries can be reassured that their extract system is working correctly and that their safety has not been compromised by malfunction or blockage. The indicator is simple to fit, simple to set up and simple to use. HSG258, published by the Health and Safety Executive, is a set of guidelines compiled in the form of a compact book, intended to minimise the number of people who, every year, are endangered by exposure to hazardous airborne contaminants, in the form of dust, mist, fume, vapour or gas. Whilst many contaminants are obvious in the danger they present, other materials that are completely safe in solid form become dangerous and even life-threatening when inhaled as a dust.

HSG258 outlines the planning, design, supply and maintenance of LEV equipment, and recommends best practice towards achieving a continued maximum safety environment for workers. Paragraph 74 of the guide states that 'The employer should require indicators to be fitted to show that the system is working properly. The Indicator has been specifically designed to address the monitoring requirements of Local Extract Ventilation (LEV) systems. It allows operators to comply with the requirements of HSG258 and the COSHH regulations.



Principle of Operation

The Airflow indicator operates by monitoring the static pressure in the extract duct. The sample tube from the unit is fitted to the duct, close to the point of extract, using an extended grommet or tapped hosetail. Firstly, the extract system (LEV) is set up to ensure a safe working environment, using dampers, fan speed controllers and bypasses. This process is continued until every extract point in the system is working safely and within the guidelines for the material being extracted. The calibration mode is then selected on the Chevron airflow indicator, using a simple magnetic actuator. This 'normalises' the Chevron to the conditions now observed, and continuous periodic monitoring commences.

The Airflow indicator samples the negative static pressure in the duct every 15 seconds, and updates the display accordingly.



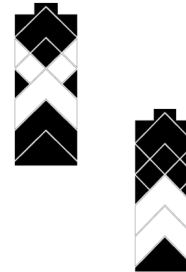
Whilst the static pressure in the duct stays adequate for safe air removal, the Airflow indicator shows this, continuously moving, display.

If the negative static pressure within the duct drops by more than 20%, the Airflow indicator recognises this as an unsafe condition. This triggers a series of flashes of the LED below the display, after which the display



changes to the graphic shown, flashing on and off approximately twice per second. Thereafter, the red LED below the display flashes approximately every 5 seconds.

The Airflow indicator is powered by 2 'AA' size batteries, and is designed to run for a minimum of 14 months between battery changes. When the batteries need changing, the display will change to one of the forms shown on the right.



The batteries can be easily changed after the removal of the rear cover using a cross-head screwdriver.

Installation and Set-up

1. The Airflow indicator should be fitted in a position clearly visible to the machine or process operator, so that he or she can easily see that the LEV is providing adequate protection. The unit can be mounted using the hand strapping and buckle supplied, self-tapping screws or simple cable ties.

2. Once a suitable position has been found, a monitoring point should be determined. This should be close to the point of entry of air into the duct, on a parallel-sided part of the duct, but preferably no closer to the entry point than one diameter of a rounded duct, one side of a square duct, or the longest side of a rectangular duct. **NB No damper or closure mechanism should be between this point and the air entry point.** The duct should be drilled 7mm at this point. The supplied extended grommet should be fitted to the end of the Airflow indicator tube. Alternatively, where appropriate, the duct can be drilled and tapped, and a hosetail fitting used to connect the Airflow indicator tube to the duct.

3. Cut the attached tubing to connect to the duct (hose-tail or grommet), to enable the Airflow indicator to be connected to the monitoring point. Avoid unnecessary loops of tube and excessive tension

(which can pull the tubing from the Airflow indicator or the monitoring point). Secure the tube if necessary with cable ties or similar securing method.

4. Once the Airflow indicator has been installed, it needs to be set up to monitor for optimum extract performance. This can only be done once the LEV system has been correctly set up and balanced to achieve adequate flow into every branch of the system. This balancing, damping and fan-speed variation (where possible) must maintain, at least, the minimum recommended airflow velocity for the heaviest particles to be removed for the entire route of that particle's journey, as well as adequate velocities for all other particles for their separate journeys.

Calibration

Once the above has been achieved and documented, The Airflow indicator can be set up as follows:-

Hold a magnet to the right of the LED hole, approximately 10mm to the right of the LED, until the LED illuminates continuously. When this happens, move the magnet away from the Airflow indicator and wait until the LED starts to flash. Once more, hold the magnet in the above position until the LED illuminates continuously. Now take the magnet away again. The website www.monitair.co.uk has a useful video showing how this is done.



This concludes the Airflow indicator set up. The negative pressure in the duct at this time is stored in memory, and used as the 100% point, against which all further sampling is compared.