

LEV-CO Type 2 Fume and Dust Extraction System

General Specification

Lev-co manufactures and distributes local exhaust fume and dust extraction systems. Apart from effective contaminant removal, one of our major objectives is the minimization of energy consumption, for both economic and environmental reasons. One of the key methods by which this objective is achieved is by the use of Variable Frequency Drives (VFDs) to control the operation of fan motors.

The fan motor is invariably an AC induction motor, which may be single- or three-phase dependent on power. Such a motor may be operated in a variable-speed/constant-torque manner by driving it with a source of variable frequency and voltage. These two parameters bear a fixed relationship for any given motor; for example, a motor rated for operation at 575 volts and 60Hz has a V/Hz characteristic of $575/60 = 9.583\text{V/Hz}$. If it is a two-pole motor, it also has a full rated speed of 3600RPM. Thus, it can be driven at any selected speed by applying a voltage and frequency along the 9.583V/Hz curve, with the resultant speed being 60RPM/Hz. Thus, half-speed (for example) is achieved at a voltage of 287.5V and 30Hz, and 90% speed at 517.5V and 54Hz. (Motor slip is ignored.)

The benefits of using a VFD are the ability to gently ramp motor speed up and down at start and stop, thereby minimizing motor stresses and extending motor life, as well as eliminating heavy startup surge currents and their attendant wasteful energy costs. Motor speed may also be adjusted to obtain desired extraction performance, reduce noise, or to deliberately reduce energy consumption during periods when peak demand charges are in effect.

In a Lev-co Type 2 system, a pressure sensor in the main duct downstream of the fan allows the VFD to actively control motor speed as a function of duct (negative) pressure. This permits constant, effective exhaust at a target duct pressure no matter how many dampers are open or (within limits) the state of filters. A MANUAL/ OFF / AUTO switch permits the user to override pressure sensing and run the system at a fixed (maximum) speed. Start interlocks are provided for damper open sensing switches, AMUs, etc.

Systems may be supplied from 240VAC single phase up to 600VAC 3-phase sources, with motor powers from 1 to 120HP available. Available options include fused disconnect, fire detection system interlock and shaker- or sequenced solenoid-type filter cleaning.