

UNIFORCE MECHANICAL SMOKE VENTILATION SYSTEM



UNIFORCE MECHANICAL SMOKE VENTILATION SYSTEM FOR LOBBY PROTECTION

Overview

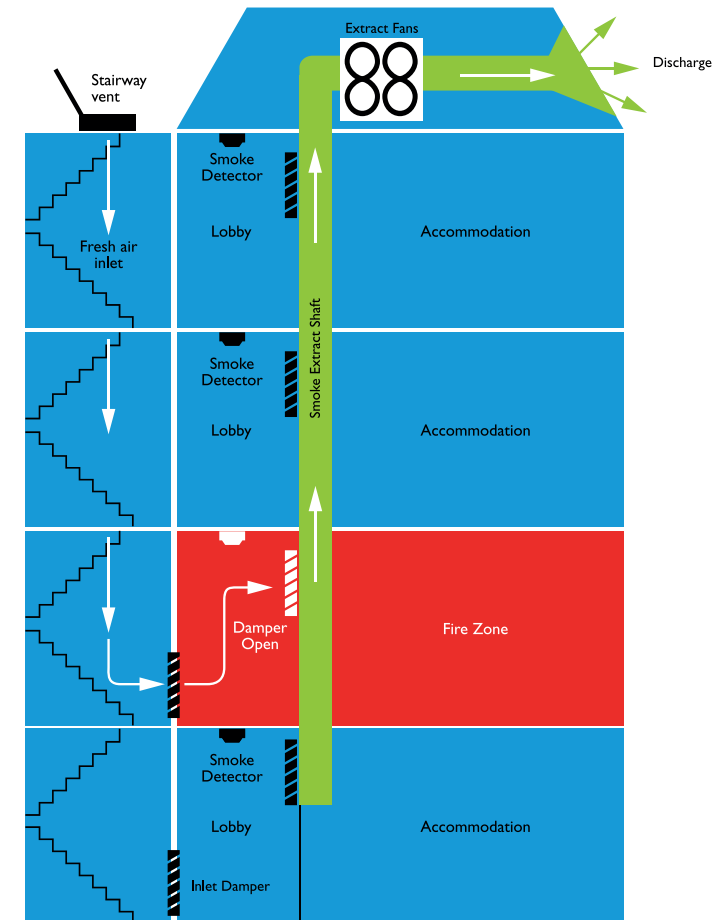
Uniforce is a fire engineered smoke control solution designed to extract smoke from the lobbies while fresh air is drawn in from the staircase to maintain suitable conditions both for means of escape and fire fighting. Extract is provided by run and standby axial flow fan units mounted on the roof and inlet air is via a roof mounted stairwell ventilator. A builder's work shaft connects each lobby and air is extracted from the lobby through a fire rated damper. The system operates automatically on detection of smoke from an addressable control system with manual overrides for fire fighting and maintenance use.

How it works

The system includes its own dedicated smoke detection installation that monitors the common corridors and on detection of smoke the automatic damper into the smoke shaft opens on the fire floor and at the same time the roof mounted extract fans start to remove smoke from the lobby. Fresh air is drawn into the lobby from the ventilator at the top of the stairwell. The fan can be ramped up to high speed to provide additional protection for fire fighting operations using the fireman's override switch.

Optional Daily Ventilation

Where specified the system can be used to exhaust heat from common corridors using a purpose designed automatic ventilation software programme that provides thermostatic control of corridors and ensures failsafe operation in fire conditions.



System schematic

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Specifications

Extract Fans

All fans are tested to the latest internationally recognised standard ISO5801 Part 1, installation category D for aerodynamic performance and BS848 Part 2 (1985) for acoustic performance. The adjustable pitch Aerofoil impeller gives the exact performance required, with a non overloading fan characteristic. The required duty will be ascertained by design calculation or cfd analysis as appropriate.

The impellers are all high pressure die cast to offer thin aerofoil sections for low generation of noise. The maximum pitch angles allow for speed control by frequency inverter. The motors are suitable for inverter speed control down to 20% of full speed. Fans are tested in compliance with high temperature test standard directive 89/106/EEC to EN 12101-3 and are rated to one off emergency operation at 300°C for 2 hours.

Fans are mounted in series and depending on the building constraints can be externally located or within the builders work shafts.

Lobby Vent Dampers

The Automatic of Lobby Ventilators shall have a smoke/fire resistance performance at least an ED30S fire door, in accordance with ADB 2006 Clause 2.6biii. For mechanical ventilation the damper and grille sets shall have a geometric free area not less than 0.6m². Dampers shall be actuated by 24v AC motorised actuators.

Stair Ventilator (AOV)

The stair will be ventilated by an automatic opening ventilator (AOV) having a geometric free area of 1.0m².

Control System

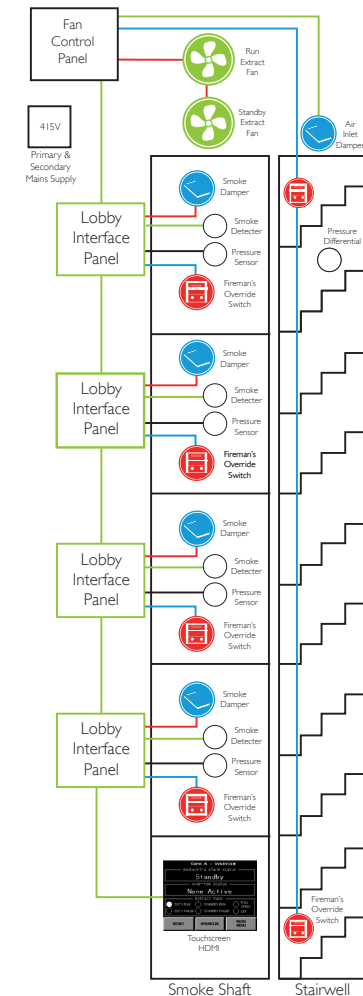
The control system will be an intelligent PLC based modular control system using an ASi (Actuator Sensor Interface) network for operation of field hardware and Ethernet communications network for the HMI user interfaces in the cores and fire control centre. The system can also be interfaced with the BMS system to provide status indication for fans i.e. running/failed, fan speed via a 0-10V signal and alarm/active location.

HMI Panel (where fitted)

The master control panel(s) will be a 5.7" HMI Touchscreen and shall comprise of an operator dialogue terminal housed in a brushed stainless steel flush mounted enclosure. The dimension of the HMI panel will be 300mm Wide x 300mm High. User facilities will allow the operator to access system configuration, maintenance and testing functions and provide Fireman's override facilities through the menu driven touch screen control interface.

Fireman's Override Switches (where fitted)

A 3 position tamperproof rocker type switch that can be used to manually open and close the ventilator on each floor and the stairwell ventilator.



Wiring schematic

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Specifications (continued)

Motor Control Centre

Extract fan control panels provide the control & monitoring of the extract fans, dampers, doors and stairwell AOV's through communications network. The panel is suitable for external wall mounting in IP55 enclosures nominal dimensions 1000mm H x 800mm W x 300mm D. Each extract fan control panel will accept two incoming 3 phase power supplies (by others) and provide automatic change over in the event of primary mains failure. Operation of the fans is to be monitored by current sensing so that in the event of fan failure the standby fan will be automatically started. All extract fans are inverter controlled by the extract fan control panel to reduce starting currents and allow for adjustment of volume flow rates to achieve the required extract rates at the point of extract within the corridors.

Interface modules

Addressable local interface units on each floor power the automatic lobby ventilators upon receipt of signals from the core PLC via the communications network. Each interface module is supplied with a single phase maintained supply from the main extract fan control panel. The smoke detectors, local override switches and pressure switches will be connected to the interface modules to relay the pressure readings within each lobby.

Smoke Detectors

Detection within the lobby is provided by ceiling mounted smoke detectors. Signals from the smoke detectors are received at the interface units located on each floor.

Electrical Wiring

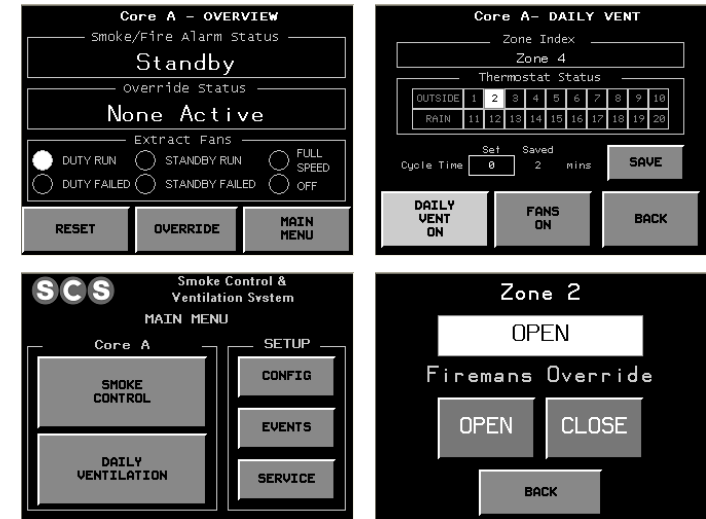
The electrical wiring for the system shall be provided in fireproof cable with a CWZ classification.

Power/Controls wiring	FP200 or equivalent
ASI Network	FP200 or Equivalent
Fan Cables	FP400 or equivalent
COMMS	Firetuf or Equivalent

And installed in accordance with the Electrical Wiring Regulations.

Builders Work Shaft

A builders work airtight shaft with a minimum internal free area of 0.6m² and an aspect ratio not exceeding 2:1 is required. The shaft shall be closed at the bottom and will rise vertically from the lowest level and terminating at roof level. The entire length of the chimney is to be a fire rated structure with a fire resistance of not less than 2 hours.



Touch Screen Displays

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What is included in your quotation:

Unless confirmed in writing, this is what we provide:

- Project management to our ISO9001 procedures, including provision of design drawings, method statements and risk assessments
- Field wiring, identification and testing
- All cables, junction boxes and flex outlet plates.
- Termination and connection of field wiring to position of control panels and field devices
- On completion of commissioning, we provide 1 day of demonstration to approving authorities
- Standard limited warranty period
- First year's maintenance of system to comply with requirements of fire safety legislation

Optional additional cost items:

- Electrical containment
- Power supplies
- Additional system demonstrations
- Smoke tests
- Collateral warranties

Attendances by others:

- Material off loading and safe storage
- External hoisting and positioning of roof-mounted equipment
- Welfare facilities
- Task lighting and 110V power
- Safe access equipment, hoisting, craneage or scaffolding

Builders work by others:

- Forming and weathering of staircore and smoke shaft upstands.
- Forming of smoke shaft to a tight construction in accordance with BS EN 12101-6
- Forming of openings at each level for lobby smoke dampers
- Forming of openings above ceiling for environmental dampers
- Load bearing roof for smoke extract fans and ancillaries
- Chasing out walls and making good