

Chimney fan systems

For SE-ducts, U-ducts or shunts
in multi-storey buildings

exodraft

Challenging government guidelines

Local Authorities and Housing Associations are required by 'Approved Document L1B – Conservation of fuel and power in existing buildings', issued in 2006, to install condensing boilers when boilers have to be replaced. However, this is at odds with the well-documented safety issues arising from attaching a number of independently controlled gas condensing boilers to a common flue – otherwise known as a SE-duct or U-duct – in multi-storey blocks of flats.

Britain has thousands of tower blocks whose flats are fitted with ageing gas boilers and water heaters that are vented to a common flue. Replacing them with condensing boilers would be acceptable if the draught in the common flue could be guaranteed always to be sufficient to prevent an accumulation of combustion gases in the flue or, worse still, in the boilers and their ducting.

Unfortunately, experience in some new-build apartment blocks where government guidelines have been followed has shown that, if a significant number of independently controlled gas condensing boilers are connected to a central flue, some will repeatedly cut out as a direct result of inadequate flue draught.

Alternatively, where installation of a condensing boiler is expected to be difficult, an assessment can be carried out to see if a non-condensing boiler would be accepted as reasonable provision in the circumstances.

This assessment procedure is set out in the "Guide to the Condensing Boiler Installation Assessment Procedure for Dwellings" published by the Office of the Deputy Prime Minister.



Guaranteed and cost effective solution



Until now, housing authorities trying to follow government guidelines when replacing boilers in existing tower blocks have had a stark and almost impossible choice:

- Individual flues for each boiler – impractical in stressed structures which would be weakened by holes in the walls.
- District heating – a vast and usually impractical investment.
- Installing non-condensing boilers as per the “Guide to the Condensing Boiler Installation Assessment Procedure for Dwellings”, but these types of boilers are no longer available in the market.
- Conversion from gas to electric heating - another vast and usually impractical investment.

The better way is the **exodraft** chimney fan system

Extensive research and development enables **exodraft**, with more than half a century’s experience of controlled chimney draught, to offer a system that meets the challenges posed by condensing boilers in tower blocks and provides a guaranteed controlled draught that eliminates the risk of accumulation of combustion products.

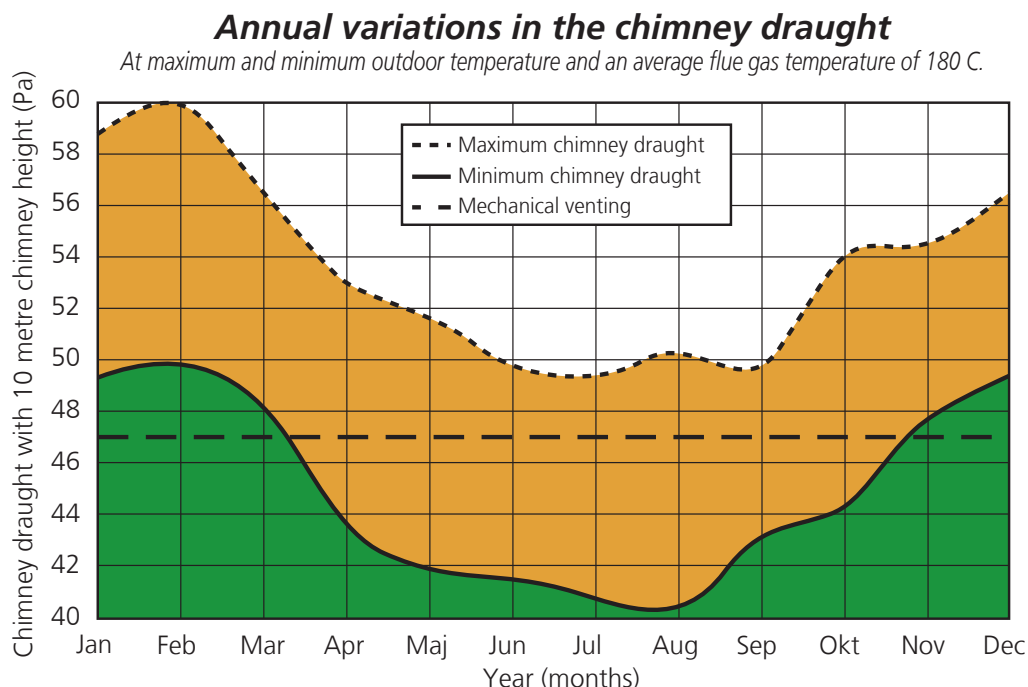


The chimney fan itself is mounted at the top of the flue, on the roof of the tower block, to control the draught in the flue and maintain it at the most fuel-efficient and energy-efficient level possible. Electronic controls sense the fluctuating flow of gases in the flue as the number of boilers firing rises and falls, and control the speed of the fan, and thereby the upward flow of flue gases, appropriately to conditions in the flue.

Safety can be assured by devices that shut off the gas supplies to the boilers if the draught in the flue should become inadequate, or by an electrical signal to the boilers’ controllers.

The system enables developers, contractors, local authorities and housing associations to meet government guidelines, regardless of whether the tower block is a stressed structure.

More challenges ...



Natural chimney draught is never constant

Natural chimney draught is constantly affected by outdoor temperature, barometric pressure, wind speed, wind direction and local conditions, such as nearby buildings or trees.

On top of that, the chimney draught changes as boilers start up or shut down. Multiple boiler installations that rely on natural draught must have a flue that is calculated for peak loads, with all boilers firing. Usually, only some of the boilers are firing at any one time, resulting in inadequate chimney draught which causes condensation and loss of boiler efficiency.

Catch 22

The catch 22 is that the focus on energy conservation and insulation has introduced further factors affecting the draught in the wrong way. Better insulation means boilers fire less frequently, which reduces chimney

temperature and the rate at which combustion products rise.

Low fluegas temperature means less buoyancy and thus less effective chimneys or flue. Ineffective chimneys that are relied upon to discharge carbon monoxide to the atmosphere are a potential hazard.

exodraft systems overcome it all

The **exodraft** system ensures the correct constant negative pressure at the boiler outlets, regardless of heat load and influences of weather conditions and surrounding topography.

The constantly optimised flue draught maintains boiler efficiency, reduces energy consumption and also reduces CO₂ emissions.

The benefits of the chimney system for multi-storey buildings



Keeping buildings safe and buildings operational

- The only system that guarantees safe evacuation of combustion products
- Fail-safe operation in accordance with all relevant British Standards
- Constantly controlled pressure in entire flue system
- The only purpose-designed system
- 3-year warranty against mechanical failure
- 10-year warranty against corrosion



No risk to the structure

- Stressed structures not compromised
- No need for strengthening or alterations to the structure
- Utilising an existing duct



Your customers' operating costs reduced

- The only system that guarantees the energy efficiency of heating appliances
- Guaranteed boiler efficiency through optimised boiler output
- Savings of up to 30 % on heating costs
- Modulating fan speed keeps running costs very low
- Cast aluminium fans ensure long life and low maintenance cost



Free choice of replacement boilers

- Constant controlled flue draught equally effective for any boiler type
- Occupants or housing authorities can select best condensing boiler option available without worrying about the flue



Limited investment

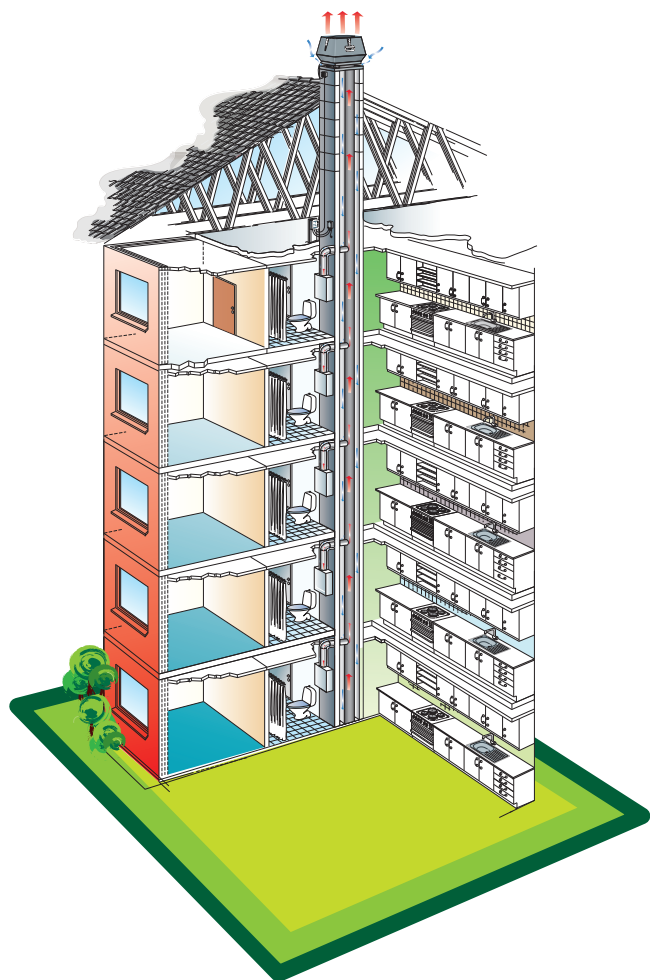
- Investment in installation is very low.
- No related building alteration costs
- Little maintenance is needed.



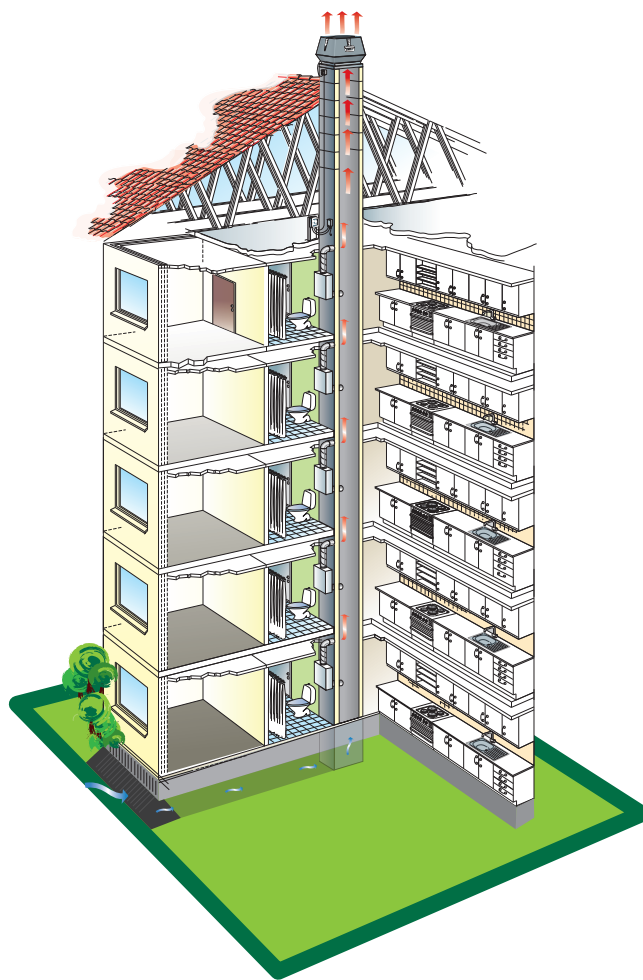
Reduced plumbing and condensation

- Constant control of flue draught reduces plume
- Condensation reduced or eliminated
- Existing concrete ducts can generally be used without risk
- Constant air movement helps keeping the ductwork dry

The chimney draft system



The **exodraft** system is controlled by an **exodraft** EBC24 controller, developed for controlling modulating boiler operations. The EBC24 is installed between the chimney fan and the highest boiler or water heater. The controller monitors the draught inside the duct and modulates the speed of the fan to maintain a constant draught.



The system is guaranteed to fail-safe as set out in BS 5440: Part 1 (2008) and BS 6644 (2005). The design of the optimum system components for each individual duct system is calculated using design software developed by **exodraft** in accordance with DIN 4705 and/or EN 13384.

The components of the chimney draft system

exodraft chimney fans RSV



exodraft fans are specially designed and manufactured to withstand flue gas temperatures of up to 200 °C continuously and to operate in a dirty environment. The unit is made in diecast aluminium with a grey paint finish, which makes it light, mechanically strong and extremely resistant to corrosion. The motor is a temperature-resistant, sealed asynchronous motor with lifetime-lubricated ball bearings. This ensures a long service life, high efficiency and low noise levels. The fan unit is hinged and can be opened for service and inspection of the flue.

The chimney fans are installed on top of the duct. The vertical discharge column provides a good efflux velocity away from the building.

exodraft EBC24 control unit



The **exodraft** automatic control unit EBC24 has an XTP sensor which monitors the chimney draught and supervises the fail-safe function. The unit is easy to install and commission. The display indicates the actual chimney draught as well as the value pre-set during commissioning, and the unit provides a variety of variable settings for the control of the system.

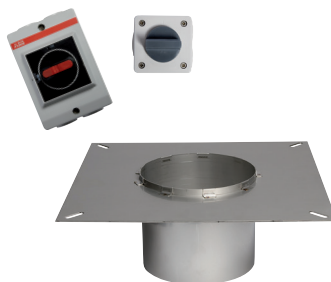
An external input option makes possible input from a pressure switch or alarm sensor and an alarm contact can be connected to a building management system. A built-in alarm log makes it easy to recognize the location of any problems in the system. All electrical inputs and outputs are connected to amber LEDs, which make commissioning and fault-finding straightforward. The fail-safe system of the EBC24 conforms with BS5440 and BS 6644.

EBC24EU01 Controls for indoor installation.

EBC24EU02 Controls for outdoor installation.

The Frequency converter FRK is used for variable speed control of 3 phased motors in connection with EBC24.

Accessories



It is legally required that an isolation switch is fitted in the immediate vicinity of the fan, so that the fan can be disconnected for servicing or cleaning of the flue.

If the fan is to be installed on a steel chimney, stainless steel flanges can be used. The spigot of flange FR is inserted into the flue and the fan and flange assembly is located on the top of the chimney. The range includes flanges to suit any model of fan and most flue IDs. For multiple fan installations a plenum box can be used.

For further information on the **exodraft** automation system EAS for SE- & U-ducts, please contact **exodraft** Ltd.

exodraft's extensive product range is based on more than 50 years of experience and knowledge in the field of combustion and chimney draft technology. Our products are known for high safety and quality and we're helping to set the standards and requirements for draft technology.

exodraft products are all fully documented in accordance with current national and international standards and are sold in more than 40 countries – to small domestic fireplaces in private homes to larger commercial and industrial boiler installations.

How do you ensure that the system is safe?

The system constantly measures the draught in the duct system and will always modulate according to the heat load and external conditions that normally affect draught. Should it not be possible to maintain the commissioned level of draught in the system, the **exodraft** controller will automatically cut off the gas supply, or shut down the boilers, as specified in BS5440:2005.

What if the power to the fan is cut off?

With the fan not running, the system will be unable to maintain adequate flue draught and the controller will automatically either cut off the gas supply or shut down the boilers, as above.

Does the system require specific makes of boilers?

No. The **exodraft** system will operate with any make or specification of boiler.

What is the energy consumption of the system?

It varies according to the model of fan installed but the energy requirement is always very limited. If the fan was running constantly at full speed, which it never is, the consumption would be between 40 W and 160 W.

How does the system affect the energy efficiency of the boilers?

The **exodraft** system constantly maintains optimum draught in the flue, which guarantees, other things being equal, that the efficiency of the individual boilers will always be at its highest. The **exodraft** system actually keeps boiler efficiency at its peak, day after day.

What happens to the fan in very windy weather?

Nothing. The fan will definitely stay in place and the effect that the wind would otherwise have on the draught in the flue is cancelled out by the modulation of the fan.

Is the fan noisy?

No. The high engineering quality, perfect balance and top-quality bearings of the fan ensure that it is extremely quiet when operating and it is, in any case, at the top of the flue, well away from living areas.

What is the investment?

The exact cost varies slightly according to the design of the SE-duct, but the investment will normally be between £ 3,000-5,000 per system, installed and commissioned.

If installed on condensing appliances, what happens to the plume?

The amount of plumbing will be dramatically reduced. In many instances there will be none at all, but this obviously depends on the specific design.

How long will the system last?

The first systems were installed early in the 1980s on tower blocks in Europe. Many of these are still in full use.

Do you guarantee that it will work for us?

Yes. We guarantee that any system designed by **exodraft** will work. We offer a six-month money-back guarantee should the system not meet your exact requirements. We also offer a 3-year warranty against mechanical failure and a 10-year warranty against corrosion.

Do you offer chimney fan solutions for other types of heating applications?

Yes. We have system solutions for fireplaces and stoves, single and multiple boilers, bakeries and many other applications.

Check out our website for more information on system solutions or to attend one of our CPD seminars.



For more information visit www.exodraft.co.uk

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The logo for exodraft. It features the word 'exodraft' in a large, bold, black font. A red swoosh underline starts under the 'e' and extends under the 't'.