



Use of Air Conditioning systems (Permanent & Temporary) & Desk Fans during COVID-19 Pandemic

Definitive guidance with regards to the use of these units is not available due to a number of institutes and organisations all taking slightly differing views on the issue and by virtue of the emerging evidence base to work from.

It has been generally established and agreed that there needs to be good ventilation maintained to provide sufficient fresh air to work places.

The HSE guidance (see below), appears to consider the risk low for recirculating cooling units serving a single space.

Air conditioning

The risk of air conditioning spreading coronavirus (COVID-19) in the workplace is generally considered extremely low as long as there is an adequate supply of fresh air and ventilation.

You can continue using most types of air conditioning system as normal. But, if you use a centralised ventilations system that removes and circulates air to different rooms it is recommended that you turn off recirculation and use a fresh air supply.

You do not need to adjust air conditioning systems that mix some of the extracted air with fresh air and return it to the room as this increases the fresh air ventilation rate. Also, you do not need to adjust systems in individual rooms or portable units as these operate on 100% recirculation. You should still however maintain a good supply of fresh air ventilation in the room.

This is backed by the current NHS COVID-19 ventilation FAQ note with respect to the above:-

14 – Heatwave Planning - Can I use portable air conditioning in Covid-19/Covid-19 suspect area?

- Portable air conditioning, as such, is not a problem in these environments. In fact, where there is poor air circulation within a volume, it may be beneficial to move air towards mechanical extract
- Portable air conditioning should not be directed towards doors, driving air into other rooms, nor should its pipework impede fire doors
- Portable air conditioning should be used with the advice of your Water Safety Group (HTM 04) cognisant of the risk of legionella. PPMs should be conducted on the device, including daily emptying of the reservoir, which must be recorded.
- Do not use portable air conditioning that incorporates humidifiers.

Finally the latest guidance from SAGE Environmental Modelling Group (07/08/2020)

Several commentators have suggested that recirculating air conditioning units pose a risk for transmission. It is possible that these units (and other flow devices such as fans) could maintain droplets in the air for longer and propel them greater distances. However, the underlying issue in many spaces is most likely to be one of poor fresh air ventilation. Air conditioning units can mask issues of poor ventilation by cooling a space that would otherwise overheat due to the lack of fresh



air and may lead to the closure of windows. As such, it is likely that using air conditioning units in well-ventilated spaces does not significantly influence the risk of transmission. Further research to confirm the influence of air conditioning units on different sizes of respiratory particles would be valuable.

Desk or Portable Fans

These units do not provide any fresh air and can mask poor ventilation issues.

The units are difficult to keep clean and could increase the time that airborne particles remain in the air by creating air currents within a confined space. That said they are considered by most institutes to represent a low risk and may offer a cost effective solution if deployed appropriately. They should not be used in healthcare critical care environments under any circumstances.

Fixed, Temporary, or Mobile Air Conditioning

In the majority of critical healthcare areas where environmental conditions require to be controlled, remote heating and cooling is achieved with the use of a central air handling plant which provides conditioned air to the clinical area whilst retaining the mechanical plant outside the immediate area, for ease of hygiene and maintenance. However if these remote units fail or during periods of high ambient air temperatures some critical areas may require supplementary or temporary cooling solutions to maintain a safe and suitable patient or clinical environment. In such circumstances and as a last resort mobile air conditioning (AC) units could be considered as a short term option. Current guidance does not recommend these types of unit for critical care areas, however if the risk of excessive heat is considered to outweigh the potential microbiological risks they can offer a temporary solution.

Temporary or mobile air conditioners may be installed in non-clinical areas, but they should be positioned to ensure that cold draughts are avoided. The control settings should ensure that the external elements of the units are always above dew-point. Manufacturers of these devices can provide specific advice on the siting and design limits of their equipment. It must be remembered that these units only recirculate air, and therefore, a fresh air supply of at least 20% of the room air change rate, or that required by the Building Regulations, or 10 L/s/person – whichever is the greatest – should be provided.

Guidance & Background

As stated above the use of portable air conditioning is not considered appropriate for critical care areas, however in emergency situations they may offer the only practical solution to an immediate and urgent need and as such there is a need to minimise the potential increase in clinical and estates related risk.

HTM 03-01 Part A

2.51 Recirculated room air affects indoor air quality and may increase the risk of healthcare-associated infection (HCAI). Split units should therefore not be used in critical care areas.

2.52 The units should be easily accessible for cleaning and maintenance.



HTM 03-01 Part B - Split and cassette air-conditioning units & Portable room air-conditioning units

5.27 These units incorporate internal recirculation air filters and a drainage system to remove condensate from the cooling coil. The systems should be inspected and cleaned every three months.

5.28 Portable units are sometimes kept in-store or hired-in to cope with temporary local situations giving rise to excessive temperatures. They typically incorporate internal recirculation air filters and a drainage system to remove condensate from the cooling coil. The infection control team must be consulted before these types of unit are deployed.

5.29 The units should be inspected and thoroughly cleaned before being taken into use. Units that are to be used in areas containing immunocompromised patients will, unless new, need to be fumigated before use.

5.30 All portable units should be inspected and cleaned every week that they remain in use.

5.31 Units that have been used in isolation rooms or areas containing infective patients will need to be fumigated before being used in other locations, or returned to store or to the hirer.

5.32 Units employing an internal water reservoir and wick to promote evaporative cooling must not be used in healthcare premises.

Clinical Risk Assessment

As advised within the HTM 03-01 guidance prior to the deployment of these types of unit the Infection Prevention Control Team and Clinical leads for the area should undertake and record an assessment of risk from both the use and potential impact of not utilising a portable AC unit. If no other practical solution is available then a portable AC unit can be considered as a temporary solution.

Estates Assessment

In addition to the clinical assessment the Estates team will need to undertake an assessment of where and how any portable unit can be located. Areas to assess will include electrical load and capacity, location of both the internal (evaporator) unit to ensure that air discharge does not interfere with any other ventilation systems or equipment, pipework or ducting route to the outside (condensing) unit, condenser unit location and heat dispersion potential, condense drainage options and routes.

Location / Access to the unit

Both the clinical and Estates risk assessment should consider the physical location of the cooling unit to minimise anyone being directly within the outflow air path to avoid both draughts and to maintain a clear zone at the point of discharge. The unit should be clearly labelled to discourage touching or moving the unit unless during cleaning/maintenance works and then it must be put back into the agreed / specified location within the risk assessment. If an adjustable fan speed is available on the unit the risk assessment should specify a maximum setting to minimise air currents within the breathing zones of staff. If to be located in waiting areas or similar avoid access to seating directly below or in front of air discharge grilles.



Maintenance Standards

These types of unit require frequent inspection and checking to both ensure appropriate performance and minimise infection risks and maintain good hygiene standards.

User Daily checks and cleaning

The clinical area users should inspect and check the unit of correct operation daily including a wipe down of external surfaces with a damp, clean cloth and ensure that no signs of leakage are present. Any issues or concerns should be reported immediately to the Estates department. The location and general position and condition should be noted and records should be kept of all daily inspections and cleaning.



Use in areas of infectious or immune-compromised patients

If the units are located in areas where patients may be transient and have either potentially infectious or neutropenic conditions then a thorough clean of both internal and external surfaces should be done between each patient. The extent and nature of the cleaning should be agreed by the IPC team, however will usually follow the same criteria as the weekly estates inspection and servicing (see below).

Estates Weekly Inspection and Servicing

EXTENT OF WORK TO BE INCLUDED

- Check operation of the system in both heating and cooling modes
- Check operation of all functions of the controller
- Examine and clean external surfaces of all motors, compressors, fans, finned heat exchangers, grilles and louvers.
- Check and clean or renew air filters as necessary
- Spray indoor heat exchanger with Biocide cleaner
- Clean and flush all condensate and drain lines.
- Check operation of the condensate pump, if fitted.
- Check interconnecting pipework.
- Check electrical connections
- Record the ambient temperature in the vicinity of the condensing (outside) unit.
- Check all covers are secure.

Ventilation breakdowns and repairs

Any potential contamination risk associated with extract ductwork, fans and filters is likely to be very low. The ventilation system acts to dry out any droplets that are drawn out of a room and if these droplets settle on ductwork or fan surfaces they will very quickly desiccate and are likely to be inactive. Notwithstanding this it is advised that enhanced precautions should be taken by maintenance staff when working on such systems both as a precautionary measure and to provide re-assurance to those undertaking the work.

If a breakdown or internal inspection is required to an extract system from a potentially contaminated area then the following issues should be considered;

- Minimise the tools taken into the area during any period when a system is 'opened up' for maintenance or inspection.
- Following work being completed old or redundant materials / components should be bagged and removed as clinical waste.
- Tools used during the work should be washed / disinfected where practical or wiped down with alcohol based steri-wipes or similar.
- Minimise the number of workers in the immediate area of the work, whilst maintaining safe working conditions and staffing levels (two man working may be necessary if working at height or if moving and handling issues exist).
- All staff should wear appropriate PPE and dress, remove, and dispose of it as detailed below.



Other maintenance activities not directly relating to extract ventilation maintenance such as fire damper drop testing, or ductwork cleanliness inspections will need to be managed so as to ensure that no potential contaminated extract ductwork is opened accidentally. Smoke and fire dampers on extract systems will need to be assessed to ensure routine fire alarm testing does not interrupt or involve extract ductwork ventilation system operation, if being used for isolation protection.

The precautions and method statement detailed above should be adapted / applied to all maintenance staff working in areas where potentially or known infectious patient are or have been located whether working on ventilation systems or any building / estates related element / equipment.

Filter changing

General filters will not be of a grade that is designed to capture all particles, but will capture some and should be treated carefully. Prior to opening up a unit to remove a general filter a disposal bag should be available. The unit should be switched off and any backflow dampers allowed to close (or if manual – closed) prior to opening up the filter access door. The filter should be removed carefully to minimise the release of any dust/contamination on the filter surfaces and placed directly into the disposal bag. The filter frame should be cleaned ideally with a HEPA filter vacuum cleaner or wiped down with and alcohol based steri-wipe, the used wipes should also be disposed of in the filter disposal bag.

Once clean the new replacement filter can be installed, the unit re-assembled and the fan switch on, once any manual dampers have been re-opened.



Essential Elements for the Estates Risk Assessment for DX / Split Air Conditioning

System Details		Risk Rating (1-5)
Area Served	Comments / Responses	
Patient / Service Type (<i>i.e. office / IT Hub room / Critical Care / etc.. details of patient risk profile</i>)		
Unit make and type		
Cooling or combined heating & Cooling		
Size / Kw load / performance of unit		
Type of refrigerant used and capacity		
Location of Evaporator (internal) unit (<i>airflow discharge position</i>)		
Does the discharge airflow directed directly over patient area?		
Is the area served with other mechanical ventilation?		
Does the area have openable windows? If so is unit interlocked with window opening?		
Location of Condenser (external) unit		
Can waste heat be readily dispersed without impacting on other areas?		
Installation		
Is unit easily accessible? (<i>use of ladders / access platforms / disruption to clinical activity</i>)		
Filters present? (<i>If so type and rating</i>)		
Are filters clean?		
Are filters disposable or washable?		
Drip tray present? (<i>Correctly installed / slope to drain</i>)		
Condensate pump present?		
Length of drainage run to point of discharge		
Point of discharge to outside or drain connection		
Point of discharge safe? No risk of spray or droplet formation		
Drain clear and not pooling or storing waste water?		
Has a risk based approach (such as Healthcare Associated Infection System for Controlling Risk in the Built Environment (such as HFN 30) been implemented for the installation of any equipment?		

Is there a requirement for anti-ligature measures to be considered and mitigated?		
Maintenance		
Unit subject to regular servicing? <i>(quarterly cleaning and inspection as a minimum)</i>		
Is the unit subject to monitoring through BMS/set-point limits?		
Cleaning		
Has a risk based approach (such as Healthcare Associated Infection System for Controlling Risk in the Built Environment (such as HFN 30) been implemented for the cleaning and maintenance of any equipment?		
Unit(s) subject to regular external cleaning to manufacturers and IPC requirements?		
Is there excessive build-up of lint or other material? Has this been removed?		
Have all filters been cleaned in accordance with manufacturers and IPC recommendations.		

All of the details provided are used to establish a risk rating (ideally on a low/medium/high risk basis)

If clinical need outweighs other identified risks then details of mitigation and justification can be recorded to provide details of how the risks can be managed.

The risk assessment should be subject to regular (at least annual) review to ensure it remains accurate and current.

Assessment can be used for both L8 statutory legionella risk assessment and to inform clinical needs assessment.

In the majority of circumstances the use of DX split systems should be considered as a short term solution for all clinical areas and not a permanent alternative to a ducted air conditioning system.