



Risk assessment and method statement

Air conditioning and HVAC RAMS

Air conditioning and ventilation installation. Pre-filled with typical hazards, controls and sequence: edit it for this site.

PROJECT

SITE ADDRESS			
ACTIVITY		RAMS REFERENCE	
Air conditioning and ventilation installation			
CONTRACTOR CARRYING OUT THE WORK		PRINCIPAL CONTRACTOR	
PREPARED BY	APPROVED BY	REVISION	DATE

Revision record

Reissue and rebrief when the sequence, the programme, the team or the conditions change. If you would have written it differently had you known, it needs a new revision.

REV	DATE	WHAT CHANGED	BY

THE WORK

The activity, the place and the people

Pre-filled for this kind of work. Make every line specific to this site: this sequence, this access, these people, this weather.

Scope of the activity

What is being done, and what is not included.

MHSWR REGULATION 3(1)

Installation of [split, VRF or packaged air conditioning units, condensers, ductwork and ventilation fans] at [address] to the drawings, including brackets and frames, refrigerant pipework, condensate, pressure testing, evacuation, charging and commissioning. Electrical connection by [electrician]. Not included: [list any exclusions].

Location and access

Where on site, how people and materials get there, and the restrictions.

Site access via [gate]. Roof access by [route], with edge protection on [elevation]. Plant lifted by [crane or hoist] from [area] under the lift plan. Materials and cylinders stored at [area]. Working hours [08:00 to 17:00].

Programme and interfaces

When the work runs, and who else is working nearby.

CDM REGULATION 15(2)

START DATE

DURATION

WORKING HOURS

INTERFACES WITH OTHER TRADES

Electrician for the supply and controls; builder for openings and frames; [trade] for fire stopping where pipes and ducts pass through fire-separating walls and floors. Other trades kept clear of lifts and pressure tests.

Documents this RAMS relies on

Drawings and specification [ref]; maker's installation instructions; asbestos register or survey [ref]; lift plan [ref]; F gas certificates and company certification; refrigerant records; hot work permit where required.

The team, and their competence

CDM REGULATION 8

ROLE	NAME	CARD, TICKET OR TRAINING NEEDED	CONTACT
Refrigerant engineers		An F gas certificate for the category of work, held by each person who handles refrigerant.	
The company		F gas company certification where the work is done for other businesses, renewed every 3 years.	
Electrical connection		A competent electrician working to BS 7671.	
Lifting		A competent person plans each lift, with a trained crew and a supervisor on the day.	
Access equipment		PASMA training for mobile towers and IPAF for MEWPs.	
Asbestos		Asbestos awareness training for everyone liable to disturb it.	

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METHOD STATEMENT

The sequence of work

The order the team will work in on the day, with the controls built into each stage. If the sequence changes on site, revise the RAMS and brief it again.

STAGE	WHAT IS DONE, AND HOW	CONTROLS AT THIS STAGE	BY
Before the day	Survey the unit and plant positions, pipe and duct routes, roof access, edges and rooflights, lifting needs and the electrical supply. Check the asbestos information and confirm the refrigerant.	Lift plan for any crane lift; asbestos information checked; RAMS approved by the principal contractor or client.	Contracts manager
Arrival and briefing	Sign in, attend the induction, then brief the team on this RAMS, the access equipment, the hot work rules and the emergency arrangements. Check gauges, hoses, cylinders and tools.	Briefing signed against this revision; F gas certificates and access equipment cards checked.	Supervisor
Set up access and the area	Erect towers or position MEWPs, fit edge protection on the roof, and barrier the areas below the work.	Access chosen by the work at height hierarchy; fragile surfaces covered or fenced off.	Supervisor
Lift plant into position	Lift condensers and plant to the roof or wall position by crane, hoist or lifting aids, and fix them to frames or brackets.	Lift plan followed; exclusion zone below; lifting equipment examined and in date.	Lift supervisor
Ductwork and indoor units	Fix hangers and brackets, assemble and lift ductwork, and mount indoor units and fans. Where ductwork crosses fire-separating walls or floors, fit the dampers and fire stopping specified.	Extraction for drilling; ceiling voids checked for services and asbestos before work.	Engineers
Pipework and brazing	Run refrigerant pipework and condensate, then make the joints. Braze only with nitrogen flowing through the pipe and the hot work precautions in place.	Hot work permit where required; heat mat and extinguisher at each joint; fire watch after the last joint.	Engineers
Pressure test and evacuate	Pressure test with oxygen-free nitrogen to the test pressure the maker sets, hold it to prove the joints, then release the gas outside and evacuate the system.	Written test procedure; regulator and relief valve fitted; people kept clear while under pressure.	Engineers
Electrical connection	The electrician isolates the supply, connects the power and controls, and tests the work to BS 7671.	Supply locked off and proved dead; certificate issued for the electrical work.	Electrician
Charge and commission	Charge with the specified refrigerant and quantity, commission to the maker's instructions and check for leaks. Label the system and record the charge.	F gas certified engineer; refrigerant record completed; nothing vented.	F gas engineer
Hand over and clear the site	Show the client how to use the system, hand over the records and instructions, and remove waste, cylinders and packaging.	Refrigerant records copied to the operator; recovered refrigerant returned for recycling, reclaim or destruction.	Supervisor

CDM REGULATION 15(2): PLAN, MANAGE AND MONITOR THE WORK

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LIKELIHOOD

SEVERITY

5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5
	1	2	3	4	5

RISK ASSESSMENT

Hazards, controls and the risk that remains

Each significant hazard rated before and after its controls, as likelihood times severity. The ratings are typical: check them for this site.

1 to 4 low 5 to 12 medium 15 to 25 high

HAZARD	WHO COULD BE HARMED, AND HOW	RISK BEFORE	CONTROLS	RISK AFTER	BY
Falls fitting units and ductwork at height	Engineers fixing indoor units, ductwork, hangers and brackets at high level.	3 x 5 = 15 High	- Ductwork sections and brackets assembled at floor level and lifted into place where practicable. - Podium steps, mobile towers or MEWPs chosen ahead of ladders, with PASMA training for towers and IPAF for MEWPs. - Ladders only for short, low-risk tasks, checked before use and secured.	1 x 5 = 5 Med	Supervisor
Falls from roofs and roof edges	Engineers setting out and fixing condensers, fans and plant on flat and pitched roofs.	3 x 5 = 15 High	- Edge protection or scaffold in place before work near an unprotected edge; work restraint where collective protection cannot be fitted. - Roof reached by a fixed or secured route, and plant sited away from edges where the design allows. - Work stopped in high winds, heavy rain or ice.	1 x 5 = 5 Med	Supervisor
Fragile roofs and rooflights	Engineers crossing roofs to reach plant, near rooflights and fragile sheeting.	3 x 5 = 15 High	- Fragile surfaces identified in the survey and avoided wherever reasonably practicable, as WAHR regulation 9 requires. - Where crossing cannot be avoided, staging, covers or guard-rails, with warning notices at the approach.	1 x 5 = 5 Med	
Lifting plant onto roofs and frames	Engineers, the lifting crew and anyone below while condensers and plant are lifted into place.	3 x 5 = 15 High	- Each lift planned by a competent person, supervised and carried out safely, as LOLER regulation 8 requires, with a lift plan for crane lifts. - Lifting equipment and accessories thoroughly examined, with the reports in date. - Exclusion zone below the lift, barriered, with nobody under the load.	1 x 5 = 5 Med	Lift supervisor
Refrigerant release and frostbite	Engineers connecting, charging or recovering refrigerant, and people nearby.	3 x 4 = 12 Med	- Refrigerant work only by engineers holding the F gas certificate category for the work. - Gauges, hoses and the recovery machine checked before use; refrigerant recovered into a suitable cylinder, never vented. - Gloves and eye protection when connecting hoses, and no skin contact with liquid refrigerant.	1 x 4 = 4 Low	F gas engineer
Flammable refrigerants such as R32	Engineers and occupants where a system uses a flammable refrigerant.	2 x 5 = 10 Med	- Refrigerant type read from the unit label before work, and flammable refrigerants handled to the maker's instructions and BS EN 378. - No sources of ignition near the work, and a leak detector suited to the refrigerant. - A system is never charged with a refrigerant it was not designed for.	1 x 5 = 5 Med	F gas engineer
Toxic fume from heated refrigerant	Engineers brazing or cutting pipework that still holds refrigerant, and others nearby.	2 x 4 = 8 Med	- Refrigerant recovered before any joint is heated or cut. - Pipework purged with nitrogen before brazing, and the area ventilated. - Safety data sheet checked for decomposition products; work stops if refrigerant is found in the circuit.	1 x 4 = 4 Low	
Fire from brazing	Engineers and the building, from torch flame near ceiling voids, insulation, timber and dust.	3 x 5 = 15 High	- Flared or press-fit joints used instead of brazing where the system design allows. - Hot work permit where the site requires one, combustibles moved or protected, and a heat mat and extinguisher within reach. - Fire watch set by the permit, with the void and the far side of the wall checked after the last joint.	1 x 5 = 5 Med	Engineer

MHSWR REGULATION 3(6): WITH FIVE OR MORE EMPLOYEES, RECORD THE SIGNIFICANT FINDINGS

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RISK ASSESSMENT, CONTINUED

More hazards, and those specific to this site

HAZARD	WHO COULD BE HARMED, AND HOW	RISK BEFORE	CONTROLS	RISK AFTER	BY
Nitrogen pressure testing	Engineers and others nearby if a joint, hose or fitting fails under test pressure.	3 x 4 = 12 Med	- Written safe system of work for each test, with a relief valve against over-pressure, as HSE guidance GS4 sets out. Oxygen-free nitrogen through a pressure regulator. - Pressure raised in stages, held at each, and never above the test pressure the maker sets. - People kept out of the area while the system is under pressure; gas released slowly and vented outside.	1 x 4 = 4 Low	Engineer
Lack of oxygen from nitrogen	Engineers in plant rooms, ceiling voids and risers where test or purge gas can build up.	2 x 5 = 10 Med	- Test and purge gas vented outside, and the space ventilated during the work. - Cylinders kept out of small enclosed rooms; any confined space entered only under a safe system of work. - Oxygen never used to purge, test or freshen the air.	1 x 5 = 5 Med	
Gas cylinder handling	Engineers moving and storing nitrogen, refrigerant and brazing gas cylinders.	3 x 3 = 9 Med	- Cylinders stored upright and secured, away from heat, and moved on a trolley. - Valves closed and regulators removed before a cylinder is moved. - Recovery cylinders within their test date and never filled beyond the limit marked on them.	1 x 3 = 3 Low	
Electric shock from supplies and controls	Engineers connecting, testing or servicing units, fans and controls.	3 x 5 = 15 High	- Supply isolated at a lockable device, locked off and proved dead before work, as EAWR regulations 12 and 13 require. - Electrical connections made and tested by a competent electrician to BS 7671. - Inverter units left to discharge for the time the maker sets before covers come off.	1 x 5 = 5 Med	Electrician
Fans and moving parts	Engineers servicing air handling units, fan coils, extract fans and condensers.	2 x 4 = 8 Med	- Unit isolated and the fan left to stop before panels or guards are removed. - Guards and panels refitted before the unit is restarted.	1 x 4 = 4 Low	
Manual handling and sharp ductwork	Engineers lifting and fixing ductwork sections, units and condensers.	4 x 3 = 12 Med	- Duct lifters, hoists or two-person lifts for heavy units and long sections. - Cut-resistant gloves for sheet metal ductwork, hangers and fixings. - Route checked and cleared before each lift.	2 x 3 = 6 Med	
Dust and noise from drilling and coring	Engineers drilling fixings and coring walls for pipework and condensate, and people nearby.	4 x 3 = 12 Med	- On-tool extraction or water suppression for core drilling. - FFP3 or other suitable RPE, face-fit tested, where extraction alone does not control the dust. - Hearing protection where the noise assessment calls for it.	2 x 3 = 6 Med	
Asbestos in older buildings	Engineers drilling, lifting ceiling tiles or removing old plant in buildings built or refurbished before 2000.	3 x 5 = 15 High	- Asbestos register or refurbishment survey checked before work; materials it does not cover are presumed to contain asbestos until sampled. - Work stops and the area is left if suspect material is found or disturbed. - Asbestos awareness training for everyone liable to disturb it.	1 x 5 = 5 Med	
Hidden cables and services	Engineers drilling ceilings and walls for brackets and pipe routes near cables, pipes and sprinkler mains.	3 x 4 = 12 Med	- Existing services checked against the drawings, and a cable detector used before drilling. - Pipe and duct routes agreed with the other trades before fixing starts.	2 x 4 = 8 Med	
Working in occupied buildings	Occupants, staff and the public below or near the work.	3 x 3 = 9 Med	- Work area barriered, with tools, materials and hoses kept off walkways. - Noisy and dusty work timed with the occupier, and heating, cooling and ventilation interruptions agreed in advance.	1 x 3 = 3 Low	

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EQUIPMENT

Plant, equipment and PPE

Plant and equipment

Each item, the checks and certificates it needs, and who may operate it.

PUWER 1998, LOLER 1998

ITEM	CHECKS AND CERTIFICATES	OPERATOR COMPETENCE
Refrigerant gauges and hoses	Checked for damage and leaks before use.	F gas engineer
Recovery machine and cylinders	Checked before use; cylinders in test date and not overfilled.	F gas engineer
Nitrogen cylinder, regulator and relief valve	Regulator and relief valve checked before each test.	Trained engineer
Brazing torch and gas	Hoses and valves checked before use; cylinders upright and secured.	Trained engineer
Vacuum pump and leak detector	Checked before use and calibrated where the maker requires.	F gas engineer
Towers, MEWPs and lifting gear	Pre-use checks; thorough examination reports in date.	PASMA, IPAF or trained

Personal protective equipment

PPE is the last line of defence, after the controls above. Specify the type, not just the item.

PPE AT WORK REGULATIONS 1992

ITEM	NEEDED	TYPE AND SPECIFICATION
Safety helmet	☒	To site standard
Safety footwear	☒	Safety boots with toe protection
High-visibility clothing	☒	To site standard
Gloves	☒	Refrigerant-handling and cut-resistant gloves
Eye protection	☒	Glasses for refrigerant; goggles for brazing
Hearing protection	☐	
Respiratory protection Type, and face-fit tested	☒	FFP3, face-fit tested, for drilling dust
Harness or restraint Anchor points identified	☒	Where restraint is used on a roof or MEWP

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CONTROLS

Substances, permits, emergencies and the environment

Hazardous substances		Each substance and its COSHH assessment.
COSHH 2002, REGULATION 6		
SUBSTANCE	COSHH ASSESSMENT REFERENCE	CONTROLS
Refrigerant [type]	Safety data sheet ref	Certified handling only; recovered, never vented; gloves and eye protection
Brazing rods and flux	COSHH assessment ref	Use as the safety data sheet directs; ventilation; avoid breathing the fume
Compressor oil	COSHH assessment ref	Gloves; spills cleaned up at once; waste oil kept for licensed disposal
Silica dust from core drilling	COSHH assessment ref	On-tool extraction or water suppression; FFP3 RPE, face-fit tested

Permits and plans

PERMIT OR PLAN	NEEDED	REFERENCE
Hot work permit	☒	
Permit to work	☒	
Permit to dig or break ground	☐	
Confined space entry	☐	
Lift plan	☒	
Temporary works design	☐	

Emergency and rescue

First aid, fire, and how someone is rescued.
The rescue plan belongs in the RAMS, not after it.

For a large refrigerant leak, leave and ventilate the area, and keep ignition sources away if the refrigerant is flammable. For refrigerant on the skin or in the eyes, follow the first aid on the safety data sheet and get medical help. Rescue plan for anyone stranded at height. First aider and kit on site, and the nearest accident and emergency department named on the briefing.

Environment and neighbours

Dust, noise, vibration, waste, spills and hours of work.

Refrigerant recovered, never vented, and returned for recycling, reclaim or destruction. Waste oil, old units and metal separated for licensed disposal or recycling. Packaging removed from site. Noise from drilling kept to agreed hours.

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REFRIGERANT RECORD

Refrigerant and pressure test record

One line for each system: the refrigerant, the pressure test, the charge, and any gas added or recovered. Keep it with this RAMS and pass a copy to the operator for their F gas records.

SYSTEM AND LOCATION	REFRIGERANT AND FACTORY CHARGE	NITROGEN TEST PRESSURE AND HOLD	GAS ADDED (KG)	GAS RECOVERED (KG)	ENGINEER AND CERTIFICATE NUMBER	DATE AND NOTES
Office 2, ceiling cassette and roof condenser	R32, [kg]	[bar], held [time]	[kg]	None	[Name], [certificate]	[Date], system labelled
Server room, wall unit replaced	R410A, [kg]	[bar], held [time]	[kg]	[kg] from the old unit	[Name], [certificate]	[Date], recovery cylinder [ref]

REGULATION (EU) NO 517/2014 AS IT APPLIES IN GREAT BRITAIN, ARTICLES 3, 6 AND 8; HSE GS4 (FOURTH EDITION)

BRIEFING RECORD

Briefed before the work starts

Each person signs against this revision, on the day, before starting. Anyone joining later is briefed before they join the work. When the RAMS is revised, everyone is briefed again.

BRIEFED BY

REVISION BRIEFED

DATE AND TIME

A SIGNATURE AGAINST A REVISION, ON A DATE, BEFORE THE WORK STARTED, IS HOW A BRIEFING IS EVIDENCED

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