

XEM INSTALLATION & OPERATION MANUAL

VERSION 2

XCHANGE ERV EXTERNAL MOUNT

XEM 500, XEM 900, XEM 1200, XEM 1700, XEM 2000, XEM 2500, XEM 3500,
XEM 4500, XEM 5000, XEM 6000, XEM 7000, XEM 8000

XEM - INSTALLATION & OPERATION MANUAL

EQUIPMENT APPLICATION

The XEM series is the standard heat recovery ERV solution for rooftop, ground level or plant room applications. Available with forward curved centrifugal fans or with EC Plug Fans, these ERV units utilize the Xchange plate heat exchanger to recover the energy from the exhaust air and transfer it to the incoming fresh air, resulting in significant energy savings. Both enthalpy and sensible heat exchange media are available.

Every proposed installation must be subject to an engineered design by a mechanical services consultant. Armcor Air Solutions is not responsible for performance of equipment in applications for which the equipment was not designed or specified.

SAFETY CONSIDERATIONS

WARNING

Improper installation, service, maintenance or use can cause explosion, fire, electrical shock or other conditions, which may cause personal injury or property damage and will void the warranty. Check with Armcor Air Solutions for any information required on this equipment.

DANGER

Electrical shock can cause personal injury or death. Before performing any work on this equipment, the electrical supply must be turned off to avoid the possibility of shock, injury or damage to the equipment. There may be more than one power supply circuit.

INSTALLATION BY AUTHORISED PERSONNEL

- Only trained and qualified personnel should install, repair or service heat recovery and/or air handling equipment.
- Installing and servicing equipment can be hazardous due to electrical and mechanical components.
- When working on equipment, observe precautions in all literature, tags and labels attached to or shipped with the unit. Follow all safety codes and guidelines. Wear work gloves, safety goggles and protective clothing.
- All work must comply with relevant SAA wiring rules and local authority codes. Installers must ensure that all statutory regulations and by laws have been addressed.
- Installers must ensure that the structures built to support the equipment have been suitably constructed for the purpose, all safety precautions have been applied prior to installation, and all preparation work has been suitably sized and installed for its purpose.

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LOCATION OF EQUIPMENT

It is important that the selected location for the equipment is suitable and can adequately accommodate the unit physical size, the unit weight and has safe and suitable access for correct operation and future maintenance requirements.

MINIMUM ACCESS REQUIREMENTS FOR MAINTENANCE

The unit must be mounted so that sufficient space is allowed for installation and service access. Maintenance personnel need to gain access to all parts of the unit and be able to remove components such as fans and filters via access doors as required.

Unless otherwise specified the following minimum access should be available:

- 800mm clearance for electrical connections

- 1200mm for all access doors on the unit or if no access door is provided 1200mm from the front of the unit.
 - Every proposed installation must be subject to an engineered design by a mechanical services consultant. Armcor Air Solutions is not responsible for installation of equipment in situations for which the equipment was not designed or specified.
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NOISE LEVELS

- Do not locate equipment adjacent to sleeping quarters unless background noise levels have been checked and permitted by the appropriate authority.
- It is recommended that rubber supporting or vibration absorbing pads be used to support the unit to minimise

any vibration being transmitted into the building structure. We recommend waffle pad to be used under the base frame and flexible couplings be fitted to the supply and return ducts to reduce any vibration transfer.

FRESH AIR INLET AND EXHAUST AIR OUTLET

- The location of the fresh air inlets must adhere to the Australian Standards 1668.2
- The fresh air intake should be positioned clear of any objects which could obstruct the airflow and be a minimum distance of 6 metres from any exhaust discharge ducts from this unit or any other adjacent equipment. Refer to Australian Standards AS 1668.2

- The fresh air inlet and exhaust air outlet should be fitted with a cowl or other suitable means of weatherproofing.
 - The exhaust discharge should be directed away from any openable windows.
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DRAINAGE

- Equipment should be installed with a positive fall to ensure water drains away freely through drain outlets. Drain lines must be as large as or larger than the fitting to which the line is being connected.
- All condensate drains must have a 'P' Trap Fitted and have a minimum fall of 20mm per metre length
- If drain lines are to be extended from the inside to the outside of the building they must be extended beyond walls of the building to eliminate the possibility of

damage caused by drain water running down the exterior surface of the building wall

- When a drain is exposed to freezing temperatures or subject to the formation of condensation, the drain should be insulated.

IMPORTANT: ALL UNITS LOCATED IN PLANT ROOMS MUST HAVE DRAIN TRAYS UNDER THE COMPLETE UNIT

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INSTALLATION INSTRUCTIONS

UNPACKING AND INSPECTION

- The unit should be inspected upon delivery for possible external damage incurred during transport. If damage is evident it should be noted on the freight docket and contact is to be made with the Armcor Air Solutions sales office. A claim should be lodged with the shipping company within 3 days if goods are damaged or incomplete. No Claims will be recognised after this date
- IF MAJOR DAMAGE IS APPARENT, DO NOT LIFT UNIT ON TO SITE WITHOUT PRIOR APPROVAL FROM ARMCOR. The unit was tested and inspected prior to packing and was in perfect condition at the time at time of despatch.
- Check unit rating plate to ensure the correct unit matches the job specifications.

UNIT HANDLING

- Protective crating or packaging and the pallets should not be removed until the unit is at the point of installation. When removing packaging or crating, be careful not to damage, scratch or dent the unit. After removal of packaging, all removable access panels should be opened to inspect for unit internal damage.

LIFTING WITH A CRANE

- SAFETY – when installing or working on equipment, always adhere to safety codes and guidelines. Wear safety goggles, work gloves, work boots and protective clothing.
- All external units are provided with substantial lifting lugs on each corner at the base frame. NOTE – All units should be lifted into position using SLINGS and not CHAINS. (Chains may damage exterior finish on the fan unit)
- Where units have to be craned into position, installers must check unit weight is within the safe tolerance of the working capacity of the crane.
- Prepare for lifting with spreaders as you would do with lifting air conditioning equipment.
- When lifting equipment never stand under the load.
- Beware of lifting equipment on to roof areas in windy conditions. Only lift when weather conditions are favourable.

LIFTING WITH A FORKLIFT

- Exercise extreme caution when lifting with a forklift. Do not exceed the height limit of the forklift and never allow the forklift forks to make contact directly with the bottom panel of the unit.
- Make careful consideration of the unit's centre of gravity and distribute the weight equally on both forks. Test load to see if the weight is equally distributed. Do this by lifting the unit a few centimetres off the ground level and checking stability before lifting any further or before transporting the unit.

SUSPENDING THE UNIT

- Before suspending the unit, check the supporting beams have sufficient load carrying capacity to support the weight of the unit. Equipment is supplied with brackets to support the unit.
- We recommend that all ceiling mounted units be suspended or supported with suitable mounting springs to eliminate the transmission of vibration.

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EQUIPMENT CONNECTIONS

DUCTWORK

- Air distribution ductwork must be designed to allow for the specified air flow without excessive pressure levels. The unit should be situated as close as possible to the point of use to prevent unnecessary long runs of ductwork.
- Sheetmetal ductwork is recommended for use with all Armcor Air Solutions equipment.
- Ducts should be insulated in accordance with BCA Section J-5
- Fan inlet conditions can affect the fan performance, particularly where duct bends cause a non-uniform flow and swirl at the inlet. To reduce losses due to fan systems effect, adequate length of straight duct between any elbow and the fan inlet should be provided or turning vanes used in the elbow.
- Poor fan outlet conditions will also affect the fan performance. We recommend a minimum of 1000mm of straight duct directly after the fan outlet.

FILTERS

- 50mm panel filters are a minimum recommendation for all equipment.
- Filters must be fitted to fresh air and/or return air. Where there is no provision for filters within the unit, the installing contractor is responsible to incorporate filters in the ductwork system external to the unit.
- It is recommended that temporary disposable filters are used during construction and commissioning
- Where a Heat Exchanger is incorporated in the equipment, warranty is void if filters are not fitted.

IMPORTANT: NEVER OPERATE A UNIT WITHOUT FILTERS FITTED TO THE RETURN AND FRESH AIR INTAKES.

ELECTRICAL REQUIREMENTS

- The power requirement and voltage are detailed on the equipment technical specifications (available on our website www.armcor.com.au) and are on the identification/serial no. plate attached to each unit.
- An electrical diagram is attached to the electrical box on the unit.

MAINS POWER SUPPLY AND FUSING

- A single phase power supply rated at 240v (+/- 5%) 50Hz or a 3 phase power supply rated at 415 volts is required to operate the unit within manufacturer's tolerance. Check the name plates for correct voltage.
- We recommend an isolator be mounted externally to the unit (not supplied) and a suitably sized circuit breaker mounted back at the distribution board to provide local isolation during service and maintenance periods.
- Main cables and control circuit wires are to be connected as per wiring diagram.
- All wiring must comply with relevant local wiring regulations.
- The units require a main circuit breaker or HRC fuse capable of handling the full load of the unit and selected in accordance with SAA Wiring Rules.
- All wiring is to be independently colour coded.
- Single phase fan motors are internally protected and there is no need for external overloads.

XCHANGE ERV

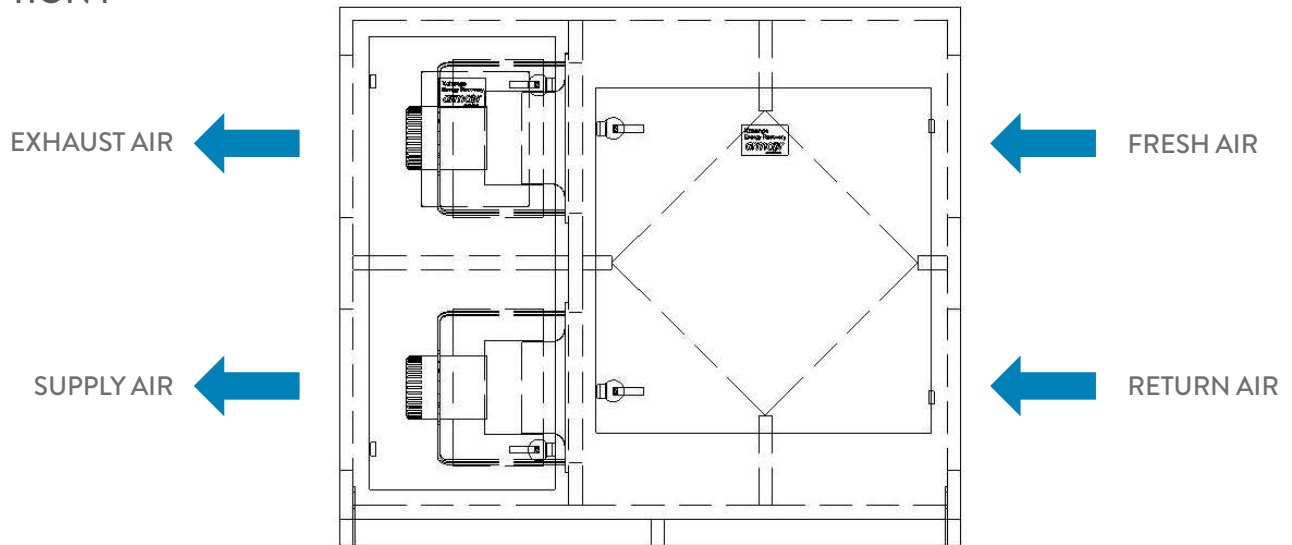
EXTERNAL MOUNT

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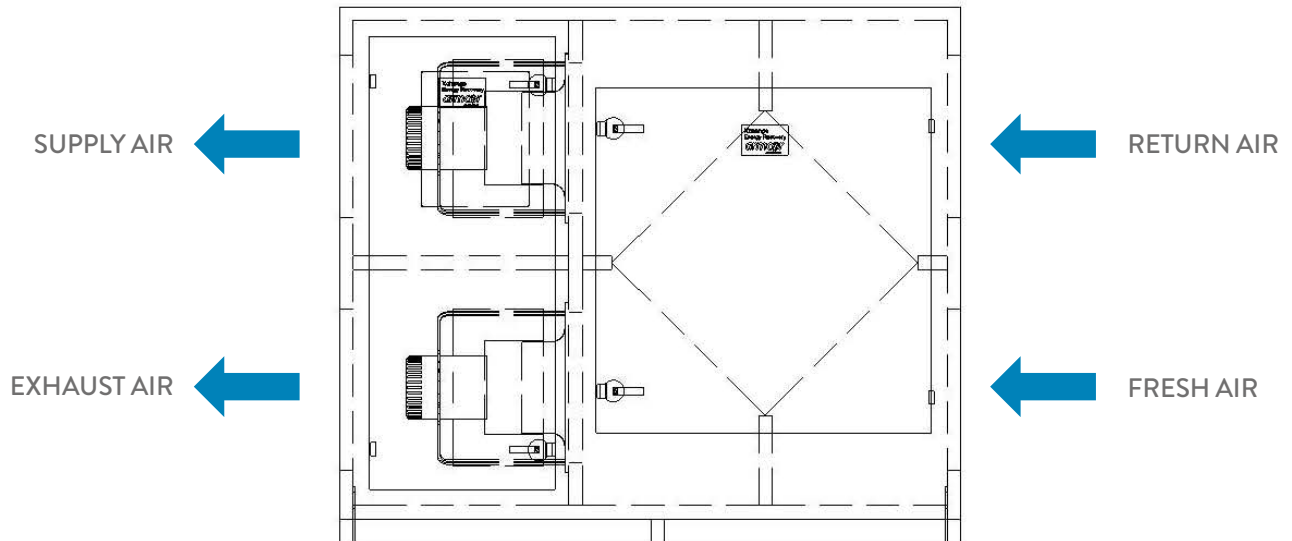
STANDARD EQUIPMENT LAYOUT

These diagrams show units with EC Plug Fans. These layouts are also available for units fitted with Certrifugal Fans

OPTION 1



OPTION 2



OPTION 1 AND 2 DO NOT REQUIRE ANY CHANGES TO THE FAN POSITIONS INSIDE THE UNIT.

- RETURN AIR** Air that is drawn from conditioned area.
- EXHAUST AIR** Ducted to outside the building or into the roof space if adequate ventilation is available.
- FRESH AIR** Use a fresh air cowl or grill to introduce fresh air.
- SUPPLY AIR** Connect to the Airconditioning system or directly into the conditioned area.

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MAINTENANCE SCHEDULE

GENERAL

- All Armcor equipment is designed for easy maintenance.
- Preventative maintenance programs will vary according to actual operating conditions and location and hours of usage by the client.
- Armcor Air Solutions are pleased to provide expert advice on special service maintenance requirements for particular installations.

IMPORTANT: Failure to carry out regular maintenance with a licensed and reputable service company may render warranty claims invalid, if faults have been caused by lack of proper maintenance. Armcor Air Solutions may request to see the maintenance schedule carried out.

MONTHLY MAINTENANCE SCHEDULES

- Monthly maintenance is usually focused on air filters and visual checks to monitor any operational deficiencies. The type of filter and frequency of cleaning should be addressed by the installing contractor to suit the customer's requirements.
- Filters should be inspected immediately after installation to confirm the frequency of cleaning needed for the particular location. Regular change/clean of filters is necessary to ensure normal operating conditions.
- Check condensate drain (if applicable) for free drainage

GUIDE TO HOW FREQUENCY ACCORDING TO USAGE IS ESTABLISHED

- **Disposable Corrugated Filters.** Ordinary disposable corrugated filters should last approximately one month in normal commercial use, or longer depending on usage.
 - **Cleanable Filters.** If filters are cleanable, they should be cleaned once a month and the filter media should be replaced every 12 months.
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THREE MONTHLY CHECKS MAINTENANCE SCHEDULES

- Repeat the monthly schedule.
 - Check blower wheels for dirt build-up and tightness on shaft.
 - Check all cabinet panels for correct fitting, alignment and seals, and clean cabinets as required. Ensure no insulation has been detached from the panels.
 - All electrical terminals should be checked for tightness. **IMPORTANT – Ensure the with main switch is turned off.**
 - Check and clean heat exchangers, heating/cooling coils, drain trays and outlets. (If applicable). Vacuum or brush clean as necessary.
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ANNUAL MAINTENANCE SCHEDULES

- Repeat monthly and three monthly checks.
- Check cabinet for any paint chips or abrasions and treat accordingly.
- Check and record the available voltage and amperage of each phase.
- Check and record the amperage of each motor against nameplate details.
- Check and record refrigerant gas pressures (if applicable)

XCHANGE ERV CEILING MOUNT

EXTERNAL MOUNT UNITS

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WARRANTY The Armcor Air Solutions Warranty Policy should be read in conjunction with the Terms and Conditions of Sale. These are available on our website - www.armcor.com.au.

WHAT THE WARRANTY POLICY COVERS

The standard Armcor warranty policy is a parts only warranty for a 12 month period. If any defect in your Armcor equipment is caused by FAULTY MATERIALS within the warranty period, starting from the date of original purchase it will be rectified or replaced without cost.

Additional labour warranty is available and must be purchased at the time of ordering in accordance with the warranty policy.

WHAT THE WARRANTY POLICY DOES NOT COVER

- Consequential damage
- Failure to start due to voltage conditions, blown fuses or other damage cause by inadequate or interrupted electricity supply
- Damage caused by accident, misapplication, abuse, alteration, tampering or servicing by anyone other than an authorized person
- Damage resulting from incorrect installation, commissioning or use other than in accordance with the installation and operating instructions issued by Armcor Air Solutions
- Damaged caused by using equipment being located in a corrosive atmosphere or by filter neglect
- Replacement of any worn drive belts if applicable
- Costs incurred for regular maintenance services
- The original service call costs in identifying a warranty claim
- Freight and travel charges for work performed or parts supplied outside of all capital cities in Australia
- Field wiring, refrigerant pipe run between units, the condensation drainpipe or other accessories
- Any warranty work performed by Armcor Air Solutions outside of Melbourne metro area will require the installing contractor to provide free of charge: Oxy/Acetylene Equipment, Dry Nitrogen, Vacuum Pump, Refrigerant Gas, Reclaim Bottles, Recovery Unit, and any other associated refrigerant tools.

THE WARRANTY WILL NOT APPLY IF;

- Any appliance plate is altered or removed
- Armcor Air Solutions has not be notified within 48 hours of any fault occurring which may require warranty work
- Any unauthorized modification has been made to the equipment or any part has be substituted or replaced with non-original items
- Regular service has not been carried out by an appropriate Armcor approved, licenced installer
- The unit is used other than for the heating and cooling of air for human comfort – unless approved by Armcor Air Solutions
- The system is installed in a mobile application (eg. caravan, boat, crane)

HOW TO MAKE A WARRANTY CLAIM

Complete a warranty form available on our website www.armcor.com.au and return the Armcor Warranty Request Form to: service@armcor.com.au

Contact us direct by phone on 1800 244 556 or email service@armcor.com.au

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PRE-START CHECK LIST

UNIT INSTALLATION AND CONNECTIONS	
Check that equipment is fully installed in accordance with the installation instructions	
Visually check that air flows will not be obstructed	
ELECTRICAL	
Visually check all field wiring	
Tighten all electrical connections including all factory wiring connections	
Ensure supply cable is correct size	
Check the required supply voltage is available on all phases	
Check overload settings are correct (if applicable)	
FILTERS	
Check that both the fresh air and return air have adequate filters before starting unit	
STARTING UNIT	
Check Fans and Air Flows	
Turn on all circuit breakers	
Make sure all dampers are open	
Turn on control circuit and activate fans	
Turn on supply fan, run and conduct an air balance (Fans do not require phase rotation)	
Turn on exhaust fan, run and conduct an air balance	
Check fan current draw for each fan individually	

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COMMISSIONING CHECKLIST

GENERAL		
Air Filters: Overall Size and Number		
Drain Pipe Traps and Vents fitted to Indoor Unit as per Installation Instructions		Y / N
Drain is Clearing Water Properly		Y / N
Check Vibration of Unit		OK / EXCESSIVE
Belt Tensioning Adjusted		Y / N
Paint Finish Checked and Repaired		Y / N
DUCTING		
Total Return Air Flow (Total of all inlets) (L/s)		
Total System external resistance (Pa) Measured downstream of fan outlets plus upstream of Coil (s)		
Estimate of Fresh Air Make Up (% or L/s)		
ELECTRICAL		
Supply Voltage		
Supply Unit Fan Motor Amps		
Exhaust Fan Motor Amps		
Total Unit Amps		
Thermostat Settings (°C)		
Thermostat Operating Correctly		Y / N
Contactors & Relays Operating Correctly		Y / N
All Terminals Checked for Tightness and Label signed		Y / N
EVAPORATIVE COOLING PADS		
Water Pump Operating Correctly		Y / N
Even Distribution of Water over Celdek Pad		Y / N
Sump Level is correct when unit is turned off		Y / N

FRESH AIR INDOORS

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