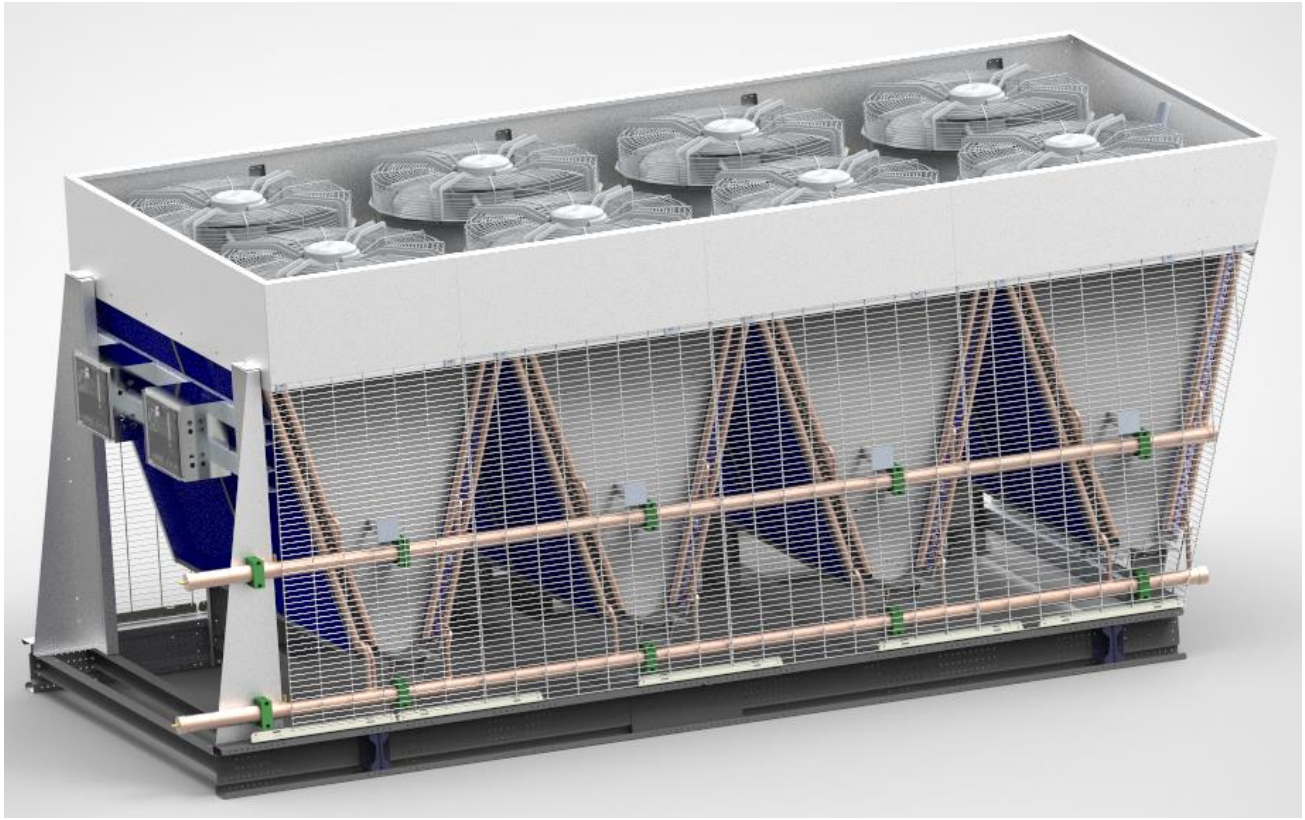
CXW Installation

Manual

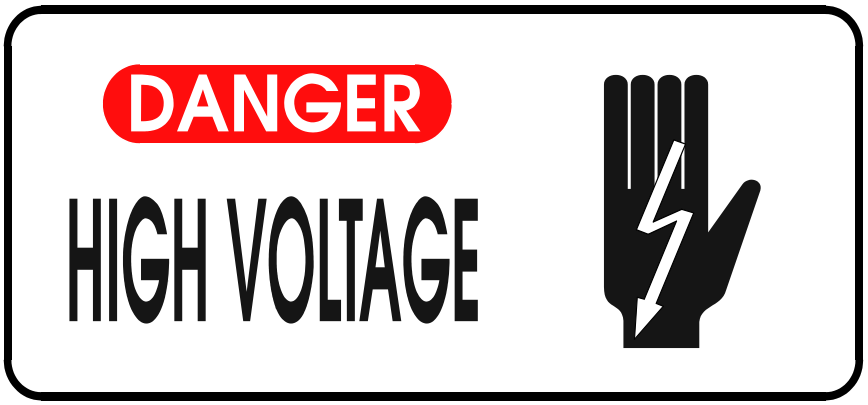


Introduction

The information contained in this booklet will provide the necessary information to safely transport, lift, install commission and service the CXW Condenser as per Kirby requirements.

This manual should be kept in a dry place for a period of at least ten years, for possible future reference. Read carefully and thoroughly all the information contained this manual. Pay particular attention to the user instruction that appears and the heading "Warning" or "Caution". Failure to do so could result in damage to the machine, person or property.

If you have any concerns regarding the performance and use of this unit, please contact your local outlet on 13 23 50.



Contents page

Page numbers

A Important safety information and instructions – retain for future use.

SAFETY PRECAUTIONS FOR ALL CXW Units.

Kirby is very safety conscious when designing and manufacturing these products, but it is essential that the end user, installer or service personnel also exercise care when working with or on the unit.

Warning	This indicates contents for which the possibility of human death or severe injury can be assumed in case of handling under disregard of this indication.
Caution	This indicates contents for which the possibility of human injury or the possibility of material damage can be assumed in case of handling under disregard of this indication.

Warning – Transportation, Lifting & Installation Precautions

Refer to Section 1 of this booklet.

Warning- Stand unit on flat and level ground

The CXW unit with the skid must be placed on flat and level ground with a suitably hard surface to bear the weight of the unit.

The CXW unit:

DANGER **Moving Machinery**

CXW Units have components that may start up automatically. All electrical items must be isolated before any service or repairs are carried out.

No Smoking

Kirby recommends No Smoking within a distance of 15 metres of the CXW Unit.

Warning – Weight

The weight of CXW units will vary from model to model. Please check page –15- for the correct packaged gross weight (shipping weight).

Warning – Electrical Hazard

Qualified personnel must carry out all electrical work.
Always isolate the power to the unit before checking, diagnosing, removing and replacing the fan assemblies. Never work on any electrical item without isolating or disconnecting the power supply.

Caution – CXW Unit Pressurised

In the manufacturing of this product it is essential to pressurize and test the heat exchanger coil. This unit is shipped with some pressure within it. Please take care when unsealing the unit to fit the pipe and line connections.

Caution – Refrigerant Type

The CXW is designed for use with fluorocarbon refrigerants; under no circumstances can Ammonia based gas, Hydrocarbon based gas, Water* or Glycol* be used in this product.
Refrigerant type: HCFC, HFC, HFO/HFC blends
(*For Water and Glycol application on CXW dry cooler model, please refer to Kirby)

Caution – Sharp Edges

The CXW is manufactured with sheet metal and in this process all care is taken to ensure the edges are concealed. In some circumstances this cannot occur.
The aluminium fins of the heat exchanger have sharp edges and can cause severe cuts if contacted carelessly.
Please take care when accessing in or around the CXW.

Warning – Qualified Personnel

CXW's may only be installed, commissioned and serviced by qualified and trained personnel.

Personal Protective Equipment

Kirby recommends as a secondary safety precaution that all personnel working in and around the CXW wear appropriate Personal Protective Equipment (PPE).

Installation Instructions.

This product must be installed and maintained in accordance with the following:

- AS/NZS5149:2016 – Parts 3 & 4 (as applicable)
- AS4041:1998 – Pressure Piping
- Refrigerant Handling Code of Practice, Part 2
  Useful information-
- Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 (and amendments) and Regulations 1995
- AIRAH, DA19 – HVAC&R Maintenance
- CIBSE Code M - Commissioning Management

NOTE- There may be other applicable Codes and Standards that must be considered. It is the responsibility of the Installer and Owner to ensure all requirements are considered and complied with.

Standard Design Conditions

CXW condensers are designed to operate with a maximum operating pressure of 3650KPag, with a maximum KTD of 18K, and a minimum of 5K (please refer to the relevant technical data literature for more specific recommendations). Special circuiting may be needed to achieve specific conditions outside of these limits- please refer to your Kirby representative.

Motors must NOT be subject to air-over-motor temperatures greater than allowed by the fan manufacturer(s). Please refer to the relevant technical literature.

APPROVED REFRIGERANTS-
R404A, R507A, R407F, R448A, R449A, R134a, R450A, & R513A are approved for use in all CXW remote condensers.
MAXIMUM WORKING PRESSURE-
CXW models have a maximum working pressure of 3650kPag.

Standard condensers cannot use Ammonia (NH_3) or CO2 as refrigerant.

For special design requirements (non-standard conditions and/or refrigerants such as Glycol, etc.), please inquire with your local representatives and/or Kirby local branches.

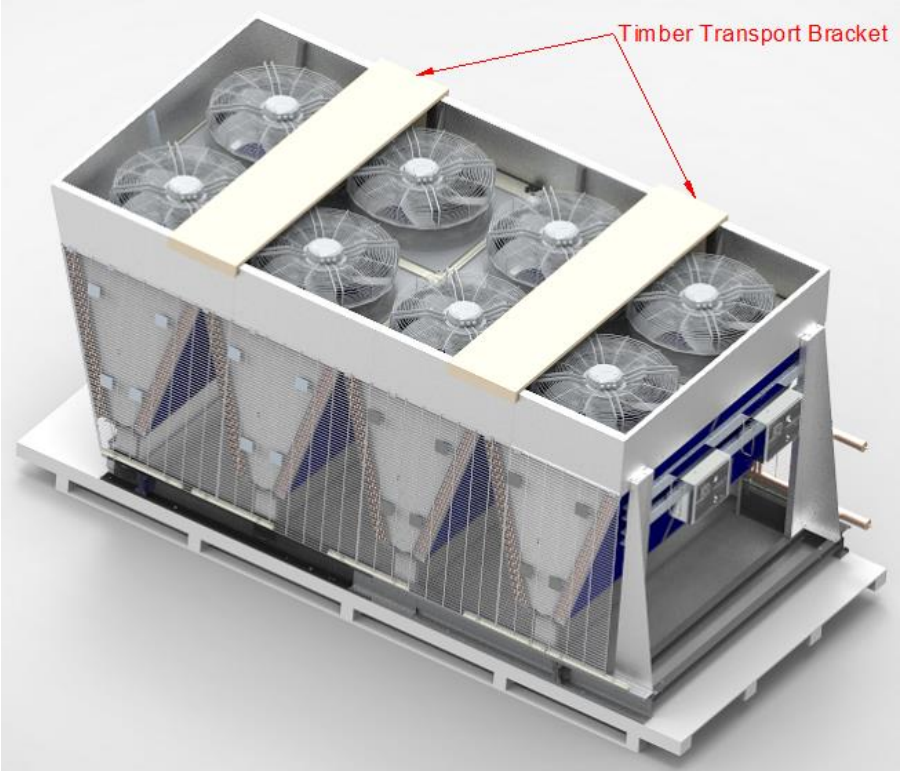
MAXIMUM ALLOWABLE PRESSURE (PS/PSS)

UNIT DATA	
PS (kPag)	**PSS** (kPag)
3650	**n/a**

1 Transportation, Lifting & Installation:

1.1 Transportation:

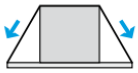
All units are supplied with 2 X sets of Timber transport bracket. During transportation, if chain/slings are used on top of the unit, chain/slings must use these timber brackets to ensure no damage occurs to fans or sheet metal panels on the unit.



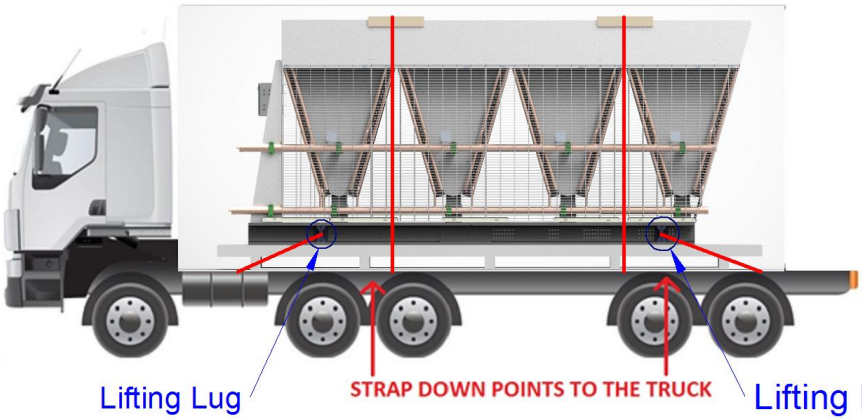
If shipping by truck, ensure appropriate restrain method based on type of vehicle and weight of the unit. For direct restraint by attaching the load directly to vehicle, suitably rated webbing straps or chains can be attached to lifting lugs of the unit to attach load directly to vehicle

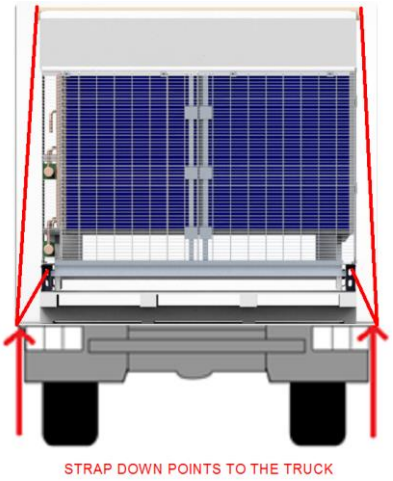
If tie down restraint method is used, tie-down lashings need to be pre-tensioned to create the clamping force. Tie-down lashings are most effective if they are vertical and tight. The more a lashing is angled away from the load, the less the clamping force.

TIE-DOWN ANGLE EFFECT

	APPROX. ANGLE	TIE-DOWN ANGLE EFFECT	TIE-DOWN EFFECTIVENESS
	90°	1.00	100%
	60°	0.85	85%
	45°	0.70	70%
	30°	0.50	50%
	15°	0.25	25%

The lower the lashing angle, the more lashings are required to give the same clamping force.



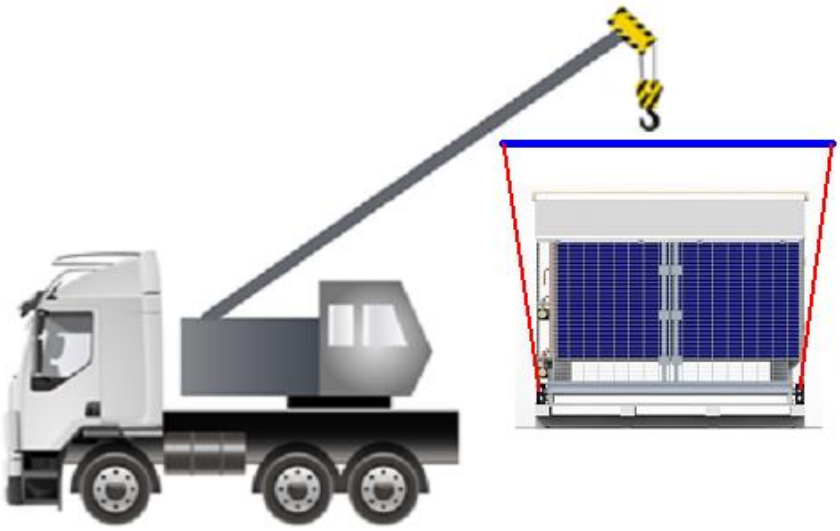


1.2 Unloading from means of transportation: -

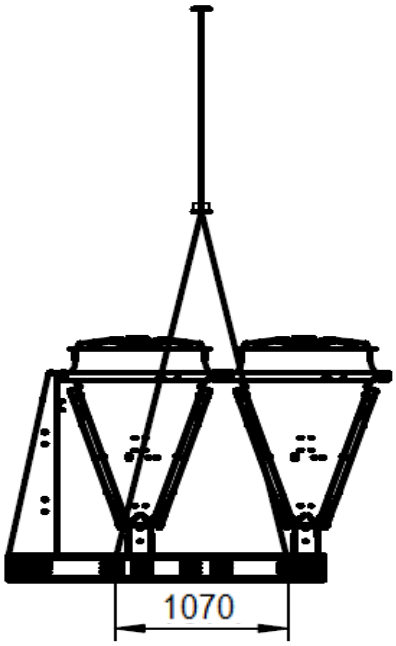
Due to the size and weight of the CXW it is essential that it is unloaded with suitable material handling equipment. Only crane lifting is recommended which has a safe working load suitable for the weight of the CXW Unit. Forklift is not recommended to use for CXW series condenser.

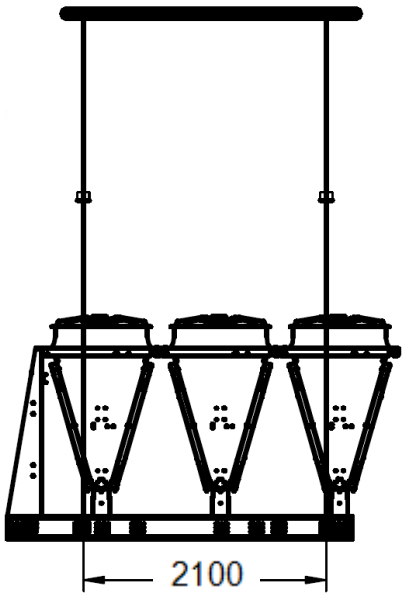
Crane method (Refer Section 1.3 for lifting points)

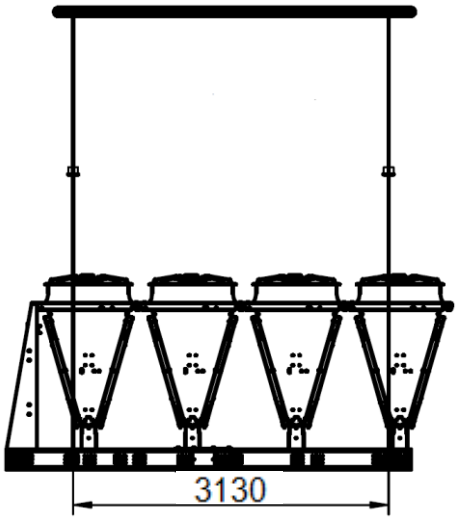
- Use suitable lifting equipment that is able to safely load/unload the CXW unit from the means of transportation.
- Refer pictures in “Recommended lifting points for crane lifting” section for the designated CXW unit lifting points. **Do Not** lift the CXW unit by any lifting points other than those specified (All lifting equipment used must have a safe working load suitable for the weight of the unit.)
- Use of a spreader bar is recommended in most cases. If spreader bar & chains are used, width of spreader bar must be greater than width of the unit. Proper lifting equipment such as long slings must be used at minimal angle to unit.

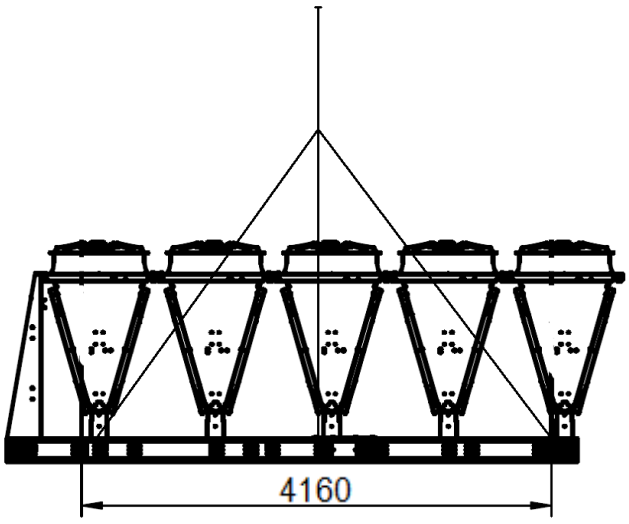


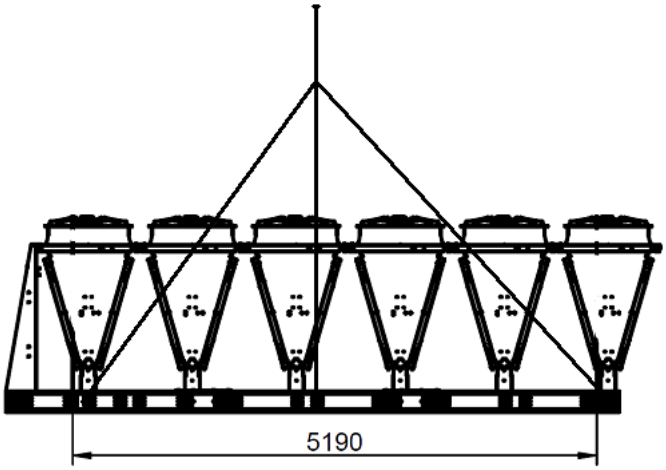
1.3 Recommended lifting points for crane lifting:

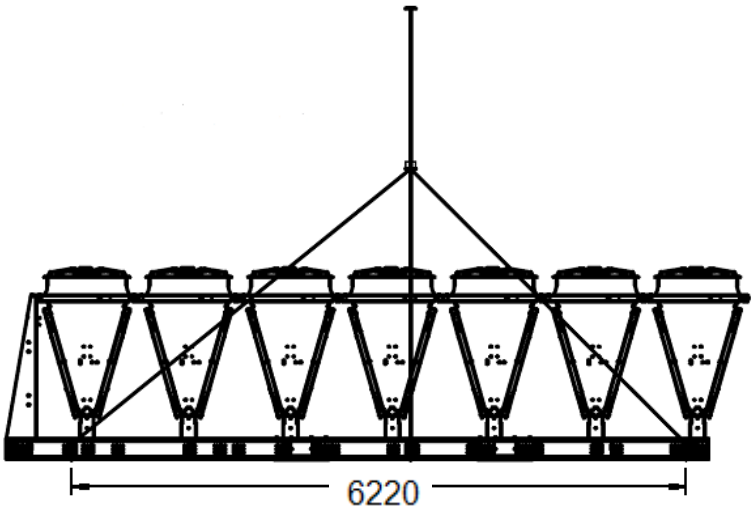


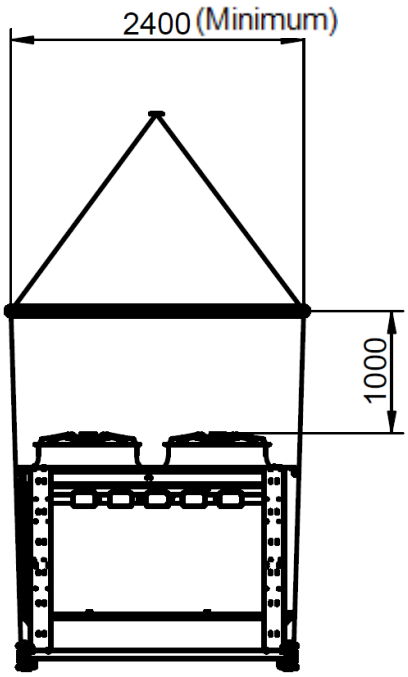










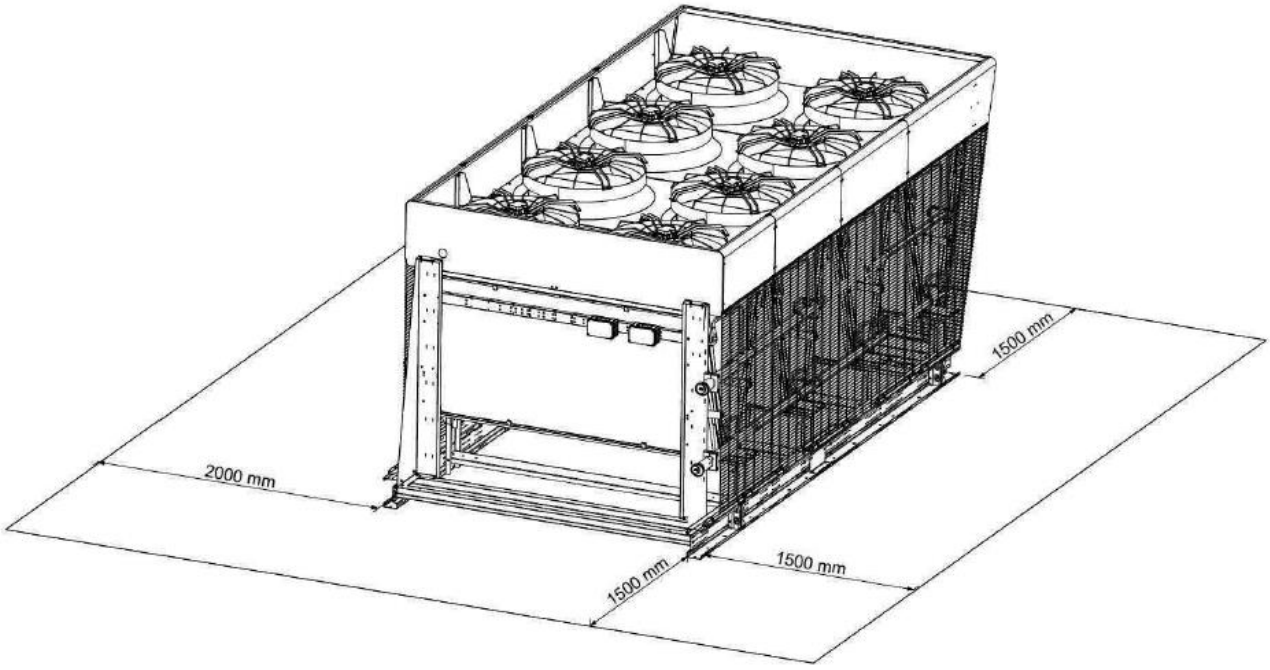


1.4 Installation: -

1. Place unit on a levelled surface before attempting to lift the unit. Attach appropriate lifting equipment to unit as mentioned above. Please refer section 1.3 for recommended lifting points.
2. Remove pallet/skid screws from all places and remove skid. Skid must be removed by suitable equipment to prevent the skid from falling.
3. Position the unit where it needs to be installed.
4. Appropriately rated Embleton mounts or heavy duty pad mounts are recommended to use underneath the CXW unit sheet metal base. Please make sure total weight rating of installed Embleton mounts or heavy duty pad mounts are minimum of 1.2 times the total weight of the unit.
5. Please see section 1.5 for recommended installation clearance from any hard surface of site or from another CXW unit on site.

1.5 Recommended installation clearance:

Please see below recommended clearance dimension for CXW range remote condenser.

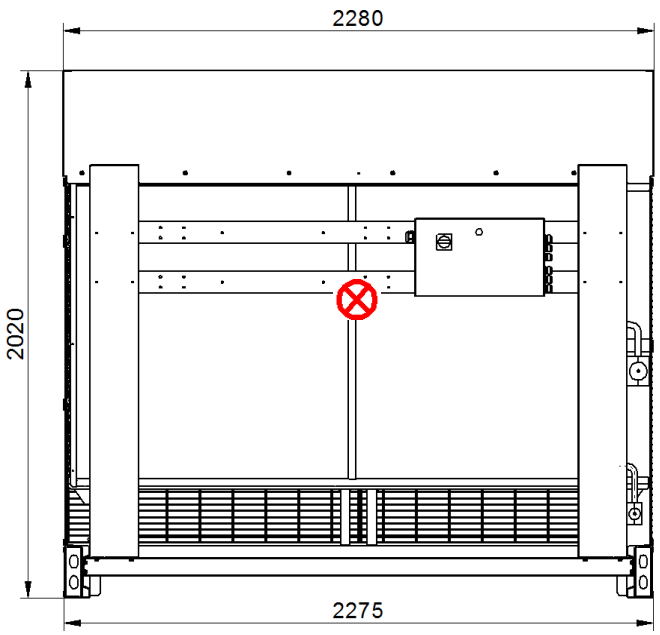


This recommended installation clearance is applicable from any hard surface of installation site or from another CXW unit on site.

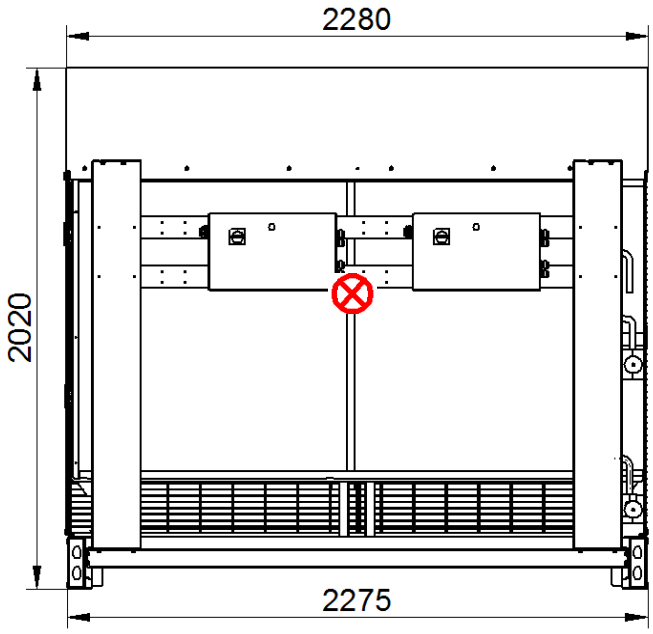
Installation Instruction:

- If the unit is to be located in close proximity to a wall or similar obstruction, the minimum maintenance distance for the major components of the unit shall be complied with. The unit shall be mounted on a level horizontal surface.
- Make sure that the installation site is far enough away from high heat sources to prevent temperature increases due to heat radiation.
- Install the units as close as possible to the power supply for easy connection.
- Additional support may be needed if the unit is installed on a frame or on plinths.

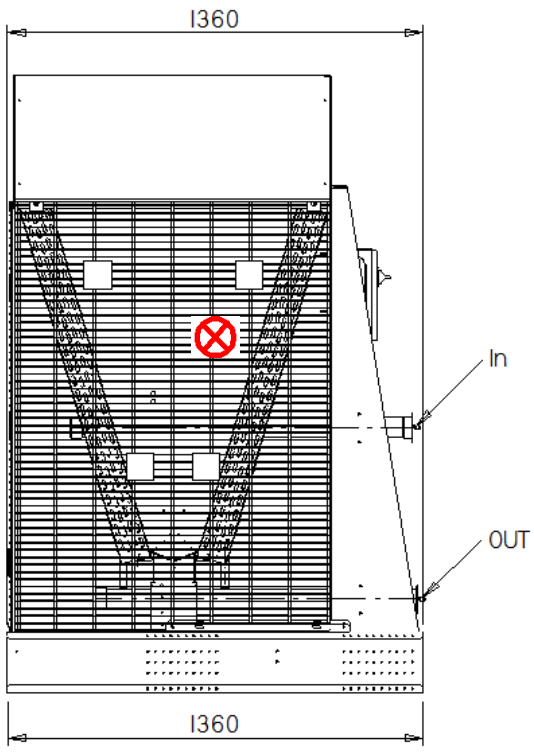
2 Unit Dimensions and Refrigerant Connections



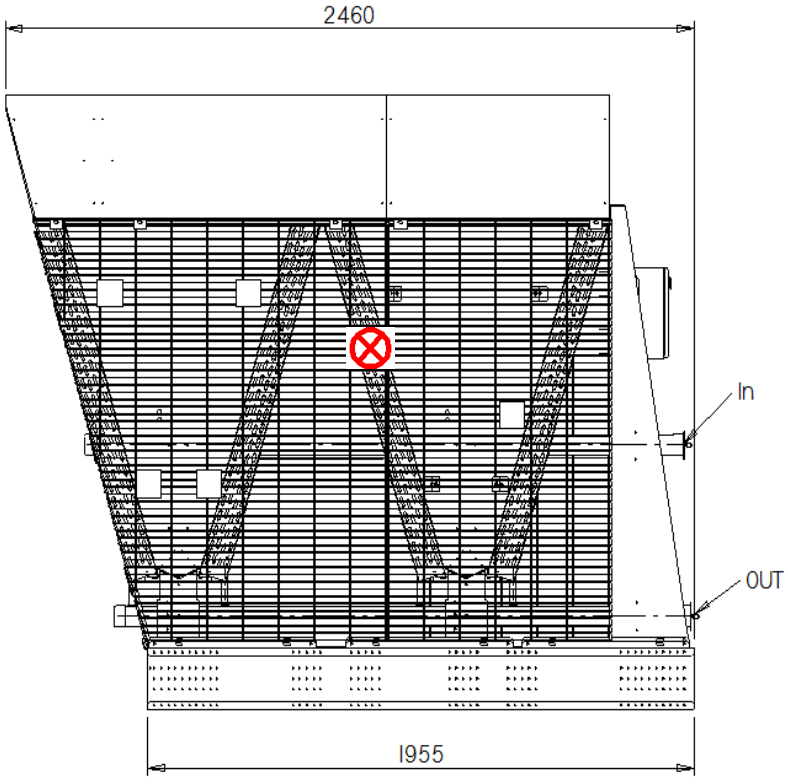
1V, 2V, 3V



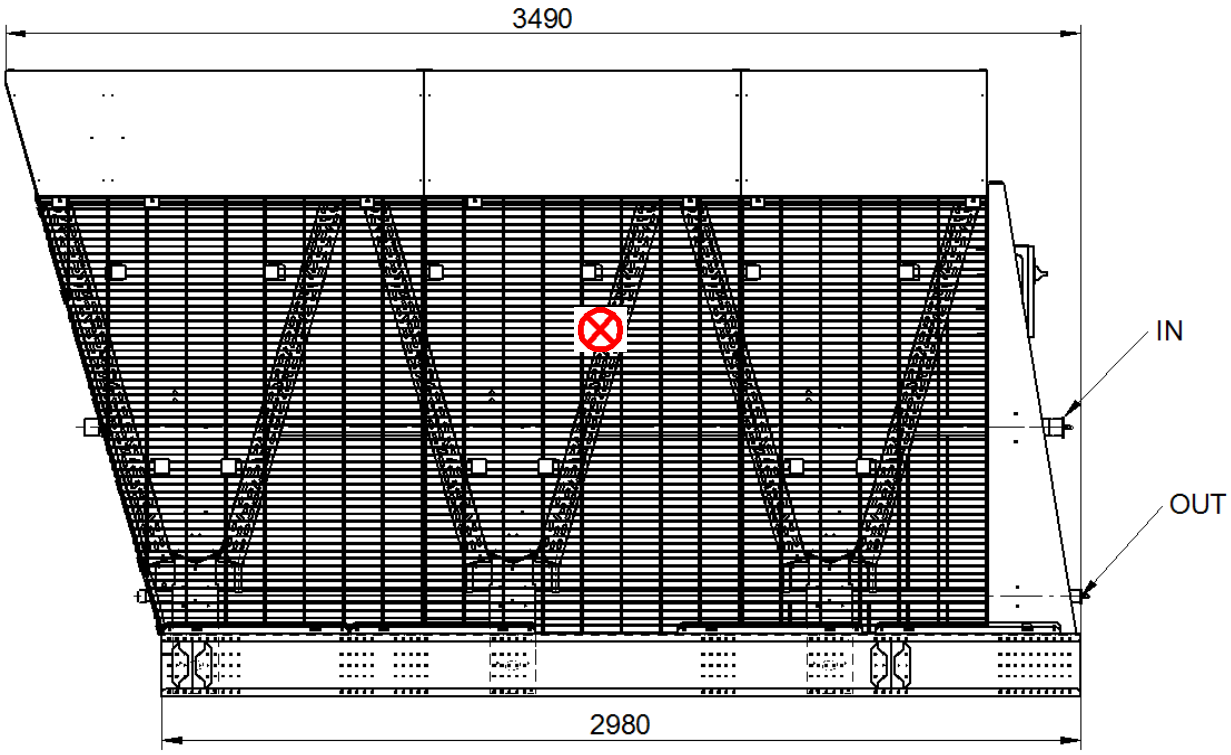
4V, 5V, 6V, 7V



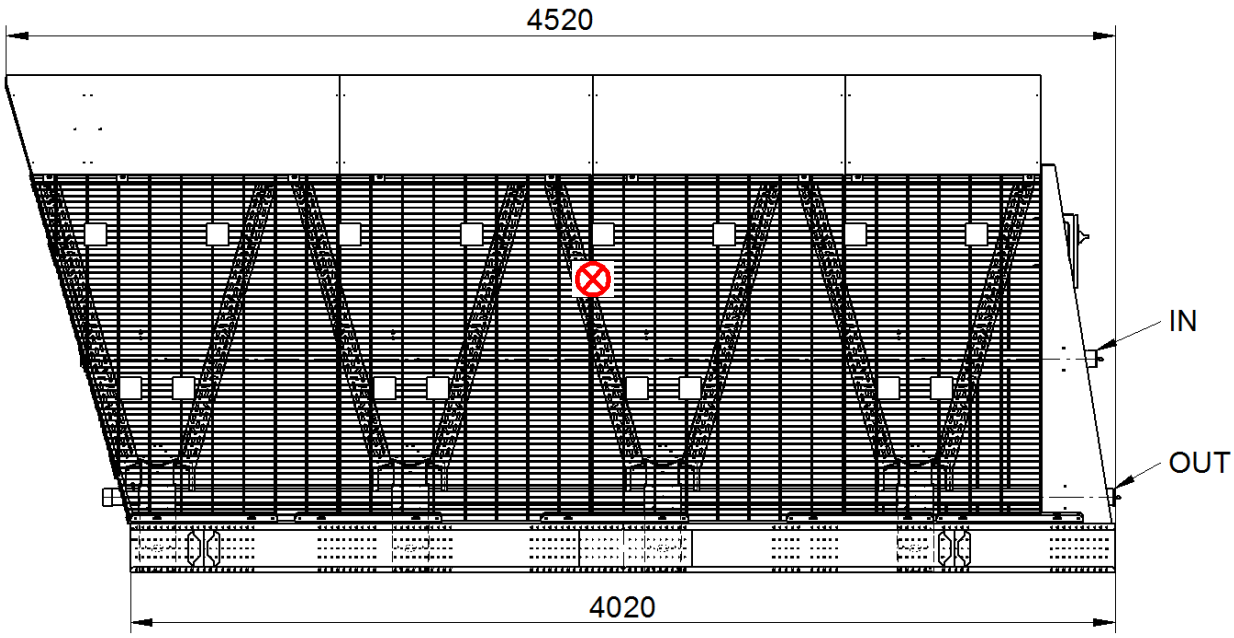
1V



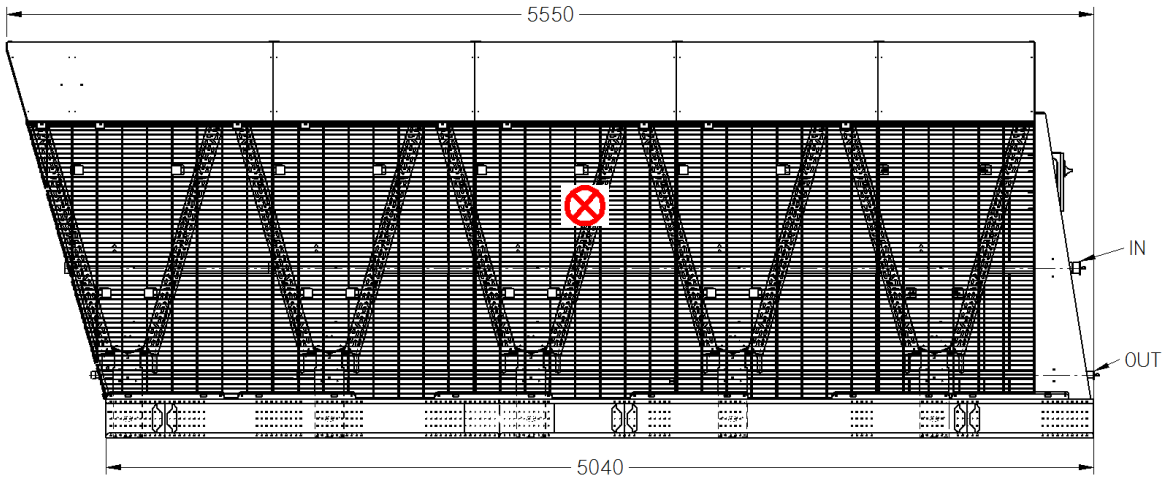
2V



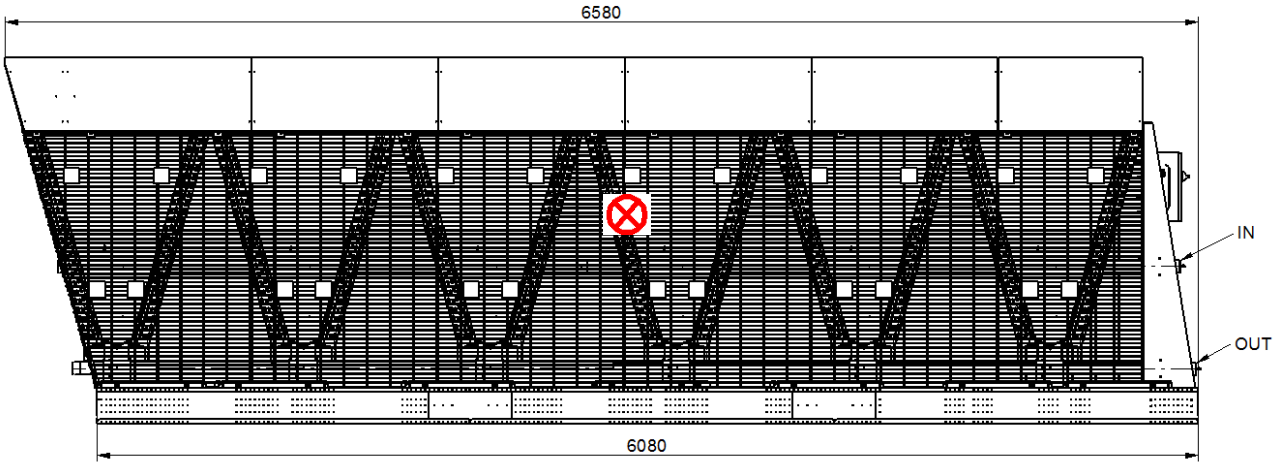
3V



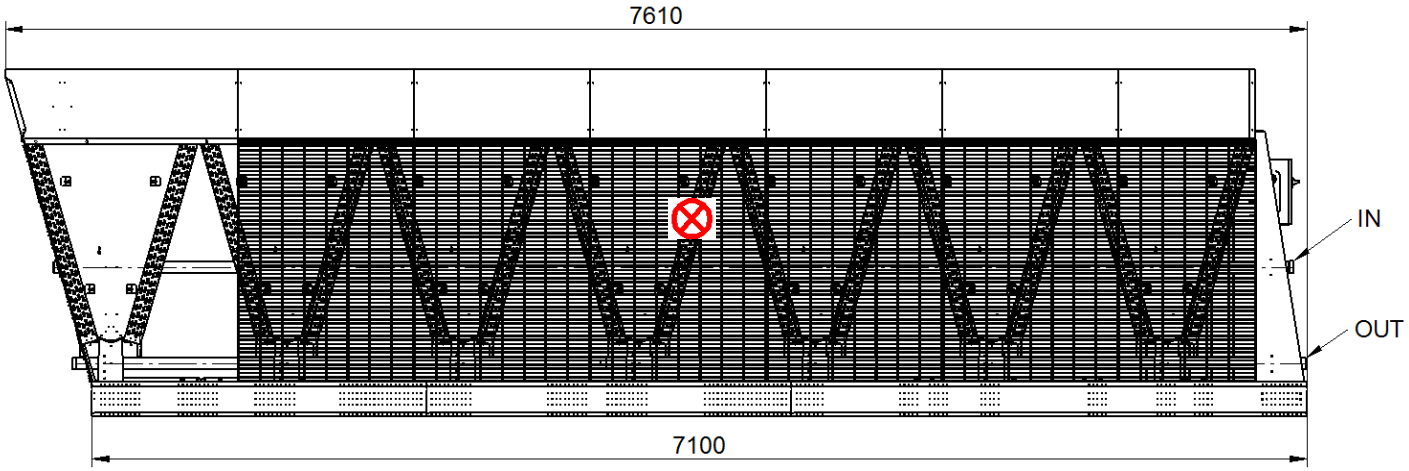
4V



5V



6V



7V

⊗ **= Represents approximate centre of gravity of the unit**

CXW Range Dimension & Weight Table

Model No.	No. of Fans	WIDTH mm	HEIGHT mm	LENGTH mm	GAS INLET (Inch)	LIQ OUTLET (Inch)	DRY WEIGHT (Kg)	SHIPPING WEIGHT (Kg)
CXW-1V-3R	2	2280	2020	1360	2-1/8"	2-1/8"	580	630
CXW-1V-4R	2	2280	2020	1430	2-1/8"	2-1/8"	650	700
CXW-2V-3R	4	2280	2020	2460	2-1/8"	2-1/8"	860	925
CXW-2V-4R	4	2280	2020	2460	2-1/8"	2-1/8"	970	1035
CXW-3V-3R	6	2280	2020	3490	2-1/8"	2-1/8"	1140	1220
CXW-3V-4R	6	2280	2020	3490	2-1/8"	2-1/8"	1290	1370
CXW-4V-3R	8	2280	2020	4520	2-5/8"	2-5/8"	1420	1515
CXW-4V-4R	8	2280	2020	4520	2-5/8"	2-5/8"	1610	1705
CXW-5V-3R	10	2280	2020	5550	2-5/8"	2-5/8"	1700	1810
CXW-5V-4R	10	2280	2020	5550	2-5/8"	2-5/8"	1930	2040
CXW-6V-3R	12	2280	2020	6580	2-5/8"	2-5/8"	1980	2105
CXW-6V-4R	12	2280	2020	6580	2-5/8"	2-5/8"	2250	2375
CXW-7V-3R	14	2280	2020	7610	2-5/8"	2-5/8"	2260	2400
CXW-7V-4R	14	2280	2020	7610	2-5/8"	2-5/8"	2570	2710

** Unit with heat reclaim option have weight 20Kg more than listed dry weight in this table.

3 Electrical Connections

UNITS WITH EC FANS

All CXW units are fitted with EC (electronically commutated) fan. For units fitted with EC variable speed fans please refer to wiring information supplied with each unit.

Wiring of EC fans is dependent on control methods and programming requirements.

** CXW standard units are fitted wiith EBM AXIBLADE EC fan (Part no. W3G800KU2105)

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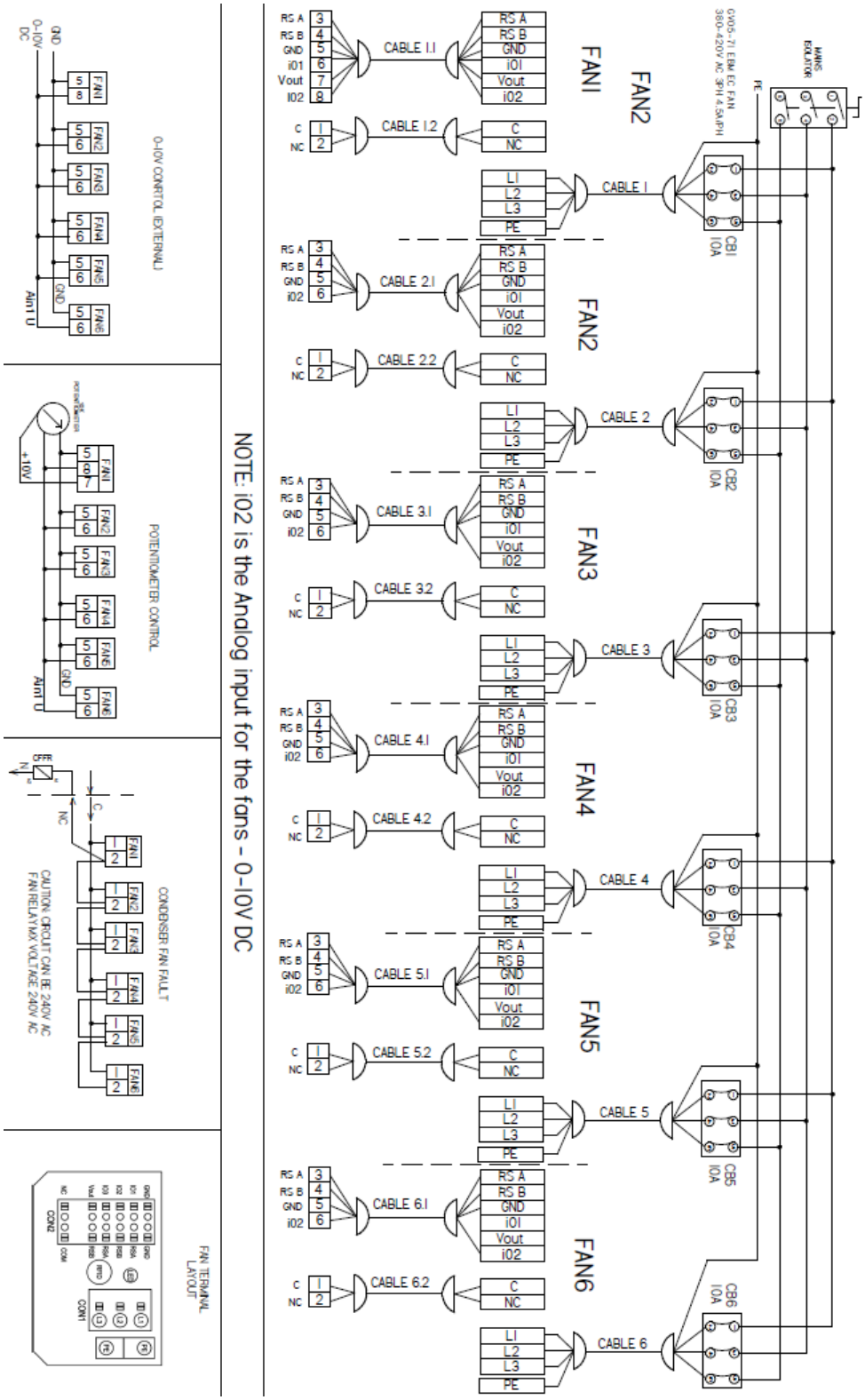
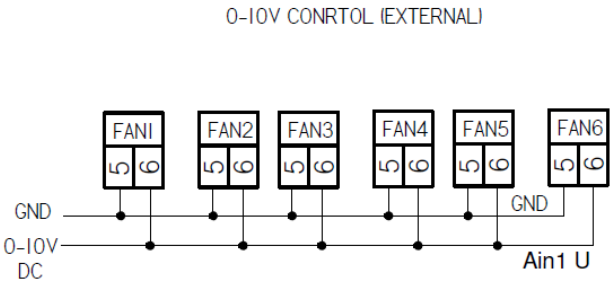
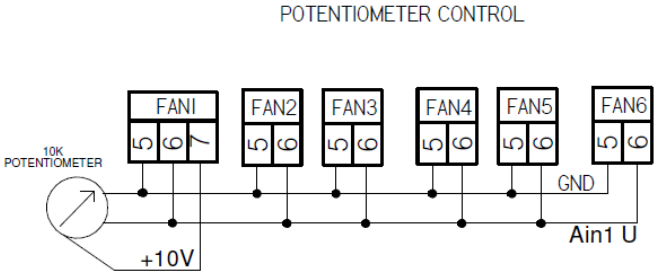
CXW WITH EBM AXIBLADE EC FAN (W3G800KU2105):



FAN CONTROL AND FAULT WIRING:





ANALOG INPUT (0-10V) : CONNECT BETWEEN AinIU & GND

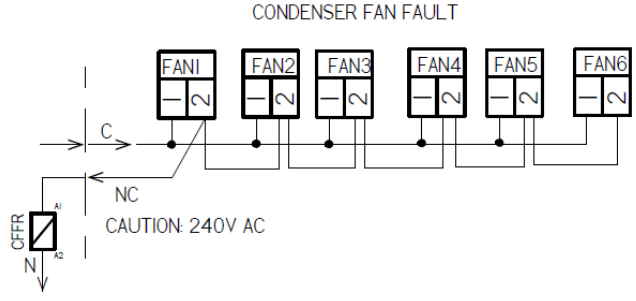
POTENTIOMETER CONTROL - CONNECT 10K ohm THREE LEG POTENTIOMETER BETWEEN +10V , GND & AinIU
(USE +10V FROM FAN 1 - KEEP FAN 1 POWERED ON ALL TIME TO USE +10V)

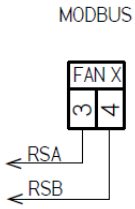
TO CONTROL ALL FANS SIMULTANEOUSLY CONNECT THE AinIU IN SERIES AND GND IN SERIES

RSA (MODBUS +) RSB (MODBUS -)

TERMINAL 3 (RSA), 4(RSB), 5 (GND) 6 (AinIU), 7 (+10v), 8 (DinI)
TERMINALS 7 & 8 FOR FAN 1 ONLY

FAN HEALTH ALARM COM & NC - NORMALLY CLOSED WITH 415V AC





5 Motor maintenance

Regular inspection and cleaning are necessary to prevent imbalance due to ingress of dirt. Achieve smooth running by carrying out periodic maintenance to limit amount of dirt.

If a fan is stationary for long periods in a humid atmosphere, it should be switched ON for minimum of two hours every month to remove any moisture that may have condensed within the motor.

Maintenance operation is only to be performed by trained service personnel.

Please follow all safety regulations and the relevant WHS requirements to carry out any maintenance and service work.

6 Start up

Warning **Electrical**

Installation Checklist

- Verify that the incoming voltage, amperages and connections match the rating plate
- Tighten all field and factory wiring connections.
- Check rotation of fans

7 Cleaning

A coil which is kept clean, ensures full benefit of the coil thermal efficiency, reduces the effects of corrosion, and increases the lifetime of the fan assemblies.

Cleaning, if done improperly (for instance, using the wrong spray angle or excessive pressure), can damage coils by bending the fins or even breaking them. Only personnel trained in the proper use of the necessary equipment should do it.

Proper condenser cleaning involves before-and-after measurements of the temperature difference across the coil to verify the effectiveness of the cleaning. These measurements should be included in a report to the owner or supervisor.

Caution

Condenser fins are sharp and can bend easily. Condenser tubing gets hot enough during normal operation to burn your hand. Use care and do not touch the tubing.

For the cleaning of coils, wash with water and do not use strong alkaline cleaners or do mechanical cleaning of fins. Any minor fin repairs should be done with suitable fin comb.

8. Piping requirements

All connecting pipework should be designed to place minimum loads on the headers and with adequate flexibility to prevent stress from being transferred from the header pipes to the coil tubing.
It is recommended to allow some movement in a structure such as a remote condenser to dissipate the energy of applied loads (such as high winds) effectively and greatly reduce the possibility of catastrophic failure of both the unit itself *and the structure on which it is placed*.

Pipe Sizing-
All connecting pipework must be sized according to proper refrigeration practice to minimize pressure drops and ensure correct liquid flow from the liquid drain line to the receiver. Proper regard for elevation changes and bends must be made.
It is also essential to design pipework for the maximum and minimum refrigeration loads expected for the system operation.
As it is not possible to detail the numerous possibilities for piping configurations in this document, Kirby recommends referral to the numerous literature titles available regarding pipe design should there be any questions regarding the design of connecting pipework or refer to your Kirby technical representative.

COMMISSIONING NOTES

UNIT SERIAL NUMBER

UNIT INSTALLATION/COMMISSIONING DATES

KIRBY
A BEIJER REF Company

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