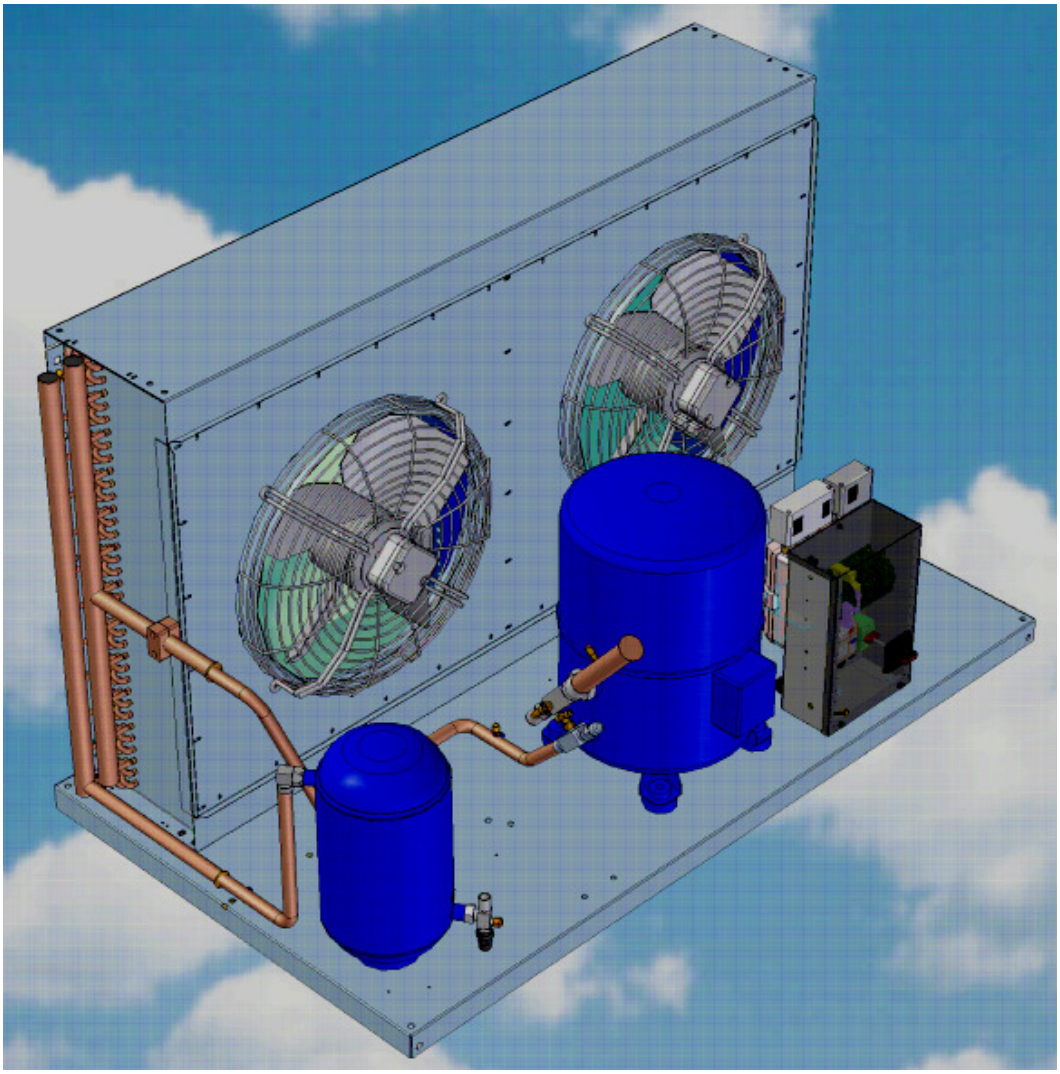
INSTALLATION MANUAL
"COMMANDER BLUE" HIGH AMBIENT AIR COOLED CONDENSING UNITS

Maneurop hermetic compressors- capacity from 7.8 to 28.2kW (76 – 271 cc/rev) MEDIUM TEMP 3.2 to 12.8Kw (68 – 271 cc/rev) LOW TEMP

THANK YOU FOR CHOOSING A KIRBY "COMMANDER BLUE" CONDENSING UNIT

TO ENSURE TROUBLE FREE INSTALLATION AND COMMISSIONING, PLEASE REFER TO THE CONTENTS OF THIS HANDBOOK.



IMPORTANT INFORMATION-
REFER TO THE SECTIONS ON "WARNINGS AND SAFEGUARDS", AND "INSTALLATION INSTRUCTIONS" BEFORE ATTEMPTING TO COMMISSION THIS CONDENSING UNIT.

Kirby Condensing Units are manufactured under a quality system certified as complying with ISO9001:2015 by an accredited certification body

CONTENTS

1. Warnings and Safeguards

Kirby HVAC&R is very conscious of safety issues when designing and manufacturing our products, but it is essential that the end user, installer or service personnel also exercises care when working with the units.

Warning	**This indicates contents for which, if disregarded, the possibility of human death or severe injury can be assumed.**
Caution	**This indicates contents for which, if disregarded, the possibility of human injury or of material damage can be assumed.**

1.1 General Notes

Air Cooled Condensing units fall under the requirements for commercial electrical equipment as per regulatory guidelines. Installation and major service of this unit must be carried out by a licensed contractor and in accordance with local regulatory requirements.

Kirby "Commander Blue" High Ambient Air Cooled Condensing Units have been designed for use in an indoor environment and must be adequately protected against adverse weather conditions if installed outdoors. Kirby makes no claim as to the protection rating for the component parts other than that stated by the part manufacturer, nor any for the protection rating of the electrical box.

1.2 Warning Electrical Connection

All electrical connections must be carried out by a licensed electrical contractor and in accordance with the relevant regulations.

Under no circumstances should access to the electrical box or components be attempted without first disconnecting the power supply to the unit.

Both the mains supply and the control cabling must be brought into the electric box section from the side of the unit. The cables should be passed through the glands provided before being run to the terminals (Refer to wiring schematic inside electrical box cover). Refer to the name plate for all the information regarding voltage and current for the unit.

Mains supply cabling must be in accordance with the latest edition of AS/NZS 3000.

Control circuit is 240 volts. Terminals are supplied for connection of control circuit (Refer also to wiring Schematic inside electrical box cover).

An isolation switch that cuts all power supplied to the unit must be installed in close proximity to the unit.

Control circuit is 240 volts. Terminals are supplied for connection of control circuit (Refer also to wiring Schematic inside electrical box cover).

1.3 Caution Auto Start and Reset

Condensing unit and/or components may start automatically without any warning. The unit is fitted with a fan speed controller. Fan(s) will rev up and down, or turn on and off in response to variations in condensing pressure. Please see "Installation Instructions" for further details.
Condenser fans and compressors are thermally protected. When tripped, these components will not operate. Once sufficiently cooled however, the component will automatically reset and may operate without warning.
The unit is equipped with a High/Low pressure switch as standard. The switch is either a universal selectable auto or manual reset or fixed auto/auto-reset type on both high and low sides. If universal switch used then it is set to auto/auto at the factory. Please check the unit regarding the appropriate pressure switch..

1.4 Caution Maneurop DOL Start Compressors

Maneurop MTZ & NTZ compressors utilise Direct-On-Line (DOL) Start Motors. Starting of larger models may affect the power supply sufficiently to cause problems for other equipment in the vicinity. Should such problems occur, refer to your local Kirby sales outlet for advice on available options that may provide solutions.

1.5 Personal Protective Equipment

Kirby recommends as a secondary safety precaution that all personnel working with the unit wear appropriate Personal Protective Equipment (PPE) such as gloves, eyewear and footwear.

- Compressor and the pressure line piping may reach temperatures that may cause burning if touched.
- In case of a leak of refrigerant avoid eye and skin contact.

1.6 Evacuation of Refrigerant

If the refrigerant needs to be removed from the system, it must not be released into the atmosphere. Federal regulations require the use of suitable recovery equipment to reclaim the refrigerant for re-use, or for recovery and destruction at an authorised destruction facility. It is illegal to intentionally vent refrigerant gas to atmosphere, and only licensed persons may remove refrigerant from the system.

1.7 No Smoking

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

1.8 Caution – Unit Pressurized

All units are pressurised with dry air or Nitrogen gas. Care must be taken to discharge the pressurized gas prior to installing or commissioning the equipment.

1.9 Caution – Refrigerant Type

All units are designed to work effectively with fluorocarbon refrigerants including R404A/R407F/R448A/R449A and R134a/R450A/R513A. Under no circumstances can a refrigerant such as R410A, R32, pure HFO gases, R744 (CO2), R717 (Ammonia), Hydrocarbon, Water or Glycol be used in this product.

Refrigerant can be harmful if it is inhaled and/or makes contact with exposed skin. Refrigerant must be used and recovered responsibly, only by a licensed tradesperson. Extreme care must be taken when handling refrigerant, as personnel injury or death may occur.

1.10 Caution – Lubricant Oil Type

All compressors are charged with PolyolEster (POE) oil. POE can be used with HFC refrigerants, and HFC/HFO blends, such as described above. Use ONLY POE oil, do NOT mix POE with other oils, when using HFC and HFC/HFO blend refrigerants.

1.11 Caution – Sharp Edges

All units are manufactured with sheet metal and in this process all care is taken to ensure the edges are concealed. Avoid contact with sheet-metal edges and the coil fins. They can be sharp and are a potential personal injury hazard. Please take care when accessing in or around the unit.

1.12 Warning – Qualified Personnel

All units may only be installed, commissioned, decommissioned and serviced by qualified and trained personnel (refrigeration mechanics and/or electricians) who have sufficient knowledge in this type of equipment. It is the purchaser's responsibility to co-ordinate with qualified personnel as required.

1.13 Caution – High and Low Temperatures

Compressor housing and discharge line temperatures may reach 150°C due to failure of system components. Wiring and other materials which could be damaged by these temperatures should not come into contact with the housing or discharge line.

Moreover, even in normal working operation, the unit can generate very high (may exceed 100°C) and very low (below -40°C) temperatures on compressor housing and tubing surfaces resulting in the possibilities of severe contact burns. Special caution must be taken when working around the unit.

1.14 Caution – Deep Vacuum

Do NOT operate compressors in deep vacuum conditions as this can cause electrical failure. Compressors should never be used to evacuate refrigeration or air conditioning systems.

1.15 Caution – Motor Protection

WARNING: Do not insert any object into operating fans. Ignoring this warning may result in personal injury and/or severe equipment damage.

Danfoss Maneurop reciprocating hermetic compressors, and external rotor motor fans, are fitted with various types of motor protection. After opening, the protector may not reset for several hours until the motor cools sufficiently. Do not assume that the motor has suffered an open circuit failure without first allowing it to cool.

A contactor and thermal over-current protection is fitted to the compressor (refer page 8), and phase failure protection is also fitted as standard. Please refer to your Kirby sales representative for details.

1.16 PURPOSE

“”Commander Blue” High Ambient Air Cooled condensing units are standard OEM products of Kirby HVAC&R Pty Ltd including “high”, “medium”, and “low” temperature application ranges. They are designed for continuously supplying and receiving the refrigerant to and from the evaporator(s), and rejecting the heat extracted from the cold space to the surrounding atmosphere where the units are installed.
“Commander Blue” High Ambient condensing units are intended for installation in a typical indoor or weather protected outdoor environment (Refer to the General Arrangement Drawing section for details) with the condensing temperature no greater than 60°C and compressor return vapour temperature no greater than 20°C. Some application conditions require return gas superheat to be limited to less than certain values, please refer to the relevant technical literature (Kirby “CL” file) and/or on-line resources.
They are not intended for environments that may have harmful, corrosive or flammable atmospheres. Marine environments are considered corrosive; please consult Kirby before installing in this environment.

1.17 Standard Design Conditions

MAXIMUM ALLOWABLE PRESSURES (PS, PSS)

Maximum allowable pressure (PS, PSS) is based on the design pressure or maximum allowable pressure of the lowest rated component in the system.

MAXIMUM AMBIENT

Maximum ambient condition is based on calculated maximum condensing pressure for various permitted refrigerants. Calculations have been verified by testing sample units of each unit range.
Maximum ambient condition is 46°C.

AS/NZS5149.2 INFORMATION.	MAX AMB °C	UNIT DATA		
		PS kPag	PSS kPag	Refrigerant
ALL MTZ COMPRESSORS	46	3000	2500	A1: R404A/R407F/R448A/R449A/R134a/R513A
ALL NTZ COMPRESSORS	46	3000	2500	A1: R404A

LMH APPLICATION ("MTZ" compressors)
LMH range condensing units are typically designed, for primary refrigerant R404A, to be used in commercial cool room applications ranging from–25°C to +5°C. Product pull-down requirements may be accommodated by this range.
Maximum ambient condition is 46°C. If conditions exceed the maximum temperatures for any significant length of time, system shut-down may occur.
For R407F/R448A/R449A, and R134a/R450A/R513A usage, please refer to other sections of this booklet for any limitations and control setting information etc.

LM APPLICATION (NTZ compressors)
LM range condensing units are designed, for primary refrigerant R404A only, to be used in commercial cool room or freezer room applications ranging from -40°C to -10°C saturated suction temperature. This range is NOT suitable for product pull down requirements.

Minimum saturated condensing temperature for all models is 30°C

For R22 refrigerant operation contact Kirby for more information.

Please refer to the specific technical data sheet for standard "Commander Blue" High Ambient condensing unit configurations, options offered and other detailed information such as capacity variations for other refrigerants.

For special design requirements (non standard conditions and/or refrigerants), please inquire with your local representatives and/or Kirby local branches, go on-line with smart@ccess, or call our national telephone number 13 23 50 for your nearest available information resources.

2.  Installation & Commissioning Instructions

2.1 General Instructions

This product must be installed and maintained in accordance with the following:
- AS/NZS5149 – Parts 3 & 4 (as applicable)
- AS4041 – 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
- AIRAH DA12- Energy Efficient Coolrooms
- 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.

2.1.1 Lifting of unit

Units may have one end heavier than the other; caution must be taken when loading / unloading. The compressor is the heaviest part of the unit. Units with compressors placed off centre should have forks placed toward the compressor end when lifting.

Slings may be placed under the base but care must be taken to adjust the lengths appropriately to account for the weight distribution and ensure secure location..

Always take care to ensure a proper weight balance before lifting and moving unit.

2.1.2 Unpacking of Unit

When unpacking, check for any damage to packing material or the unit itself, which may affect the unit's performance. **If any such damage is evident, please contact your Kirby branch.**

2.1.3 Location and securing of Unit

If the unit is to be located in close proximity to a wall, or in a confined passageway, please refer to dimensional drawing for minimum distances to walls, etc, to ensure proper airflow and access to unit. Unit must be securely fastened to a hard and level surface to prevent it from falling/ tipping over.

It is particularly important to allow sufficient unobstructed space around the unit to prevent warm air recirculation to the condenser.
The liquid sight glass is located to the front left hand side of the unit (viewed from the compressor side). Sufficient room should be allowed to the front to view the sight glass in operation.

2.1.4 System Holding Charge Caution: Unit is Pre Pressurised

The system as supplied is pressurised at the factory with dry air or Nitrogen gas.
If the system is not pressurised on delivery, please contact your Kirby branch.

Remove the gas charge in an appropriate manner. Care must be taken to release the pressure before attempting to gain access to any part of the refrigeration system.
The unit should be evacuated to a pressure of **200 microns or less** prior to charging and commissioning.

2.1.5 Pressure Settings

PRESSURE RELIEF VALVES (Where required)
High Side- Pressure relief valves must be selected based on the system PS. The maximum allowable pressure of the pressure vessel may not determine the PRV setting if it is not the lowest rated system component. Please note the condensing unit may NOT be the lowest rated component in the system.
Low Side (where applicable)- Pressure relief valves must be selected based on system PSS. Please note that the low side of the condensing unit may NOT be the lowest rated component in the system.
HP CONTROL SETTING
Compressor HP (where fitted)- Setpoint must be equal to or less than 90% of the compressor PS.
Unit HP- Setpoint must be equal to or less than 90% of the PRV setting (where fitted), or less than or equal to Unit PS if no PRV fitted.
Please note this setting may not be adequate to protect other parts of the system with a lower PS rating. If required the Unit HP may be set to less than or equal to the system PS.
Note when setting the HP control- Consideration must also be given to the type of refrigerant used and the maximum ambient temperature to ensure compliance with AS/NZS5149.2 and avoiding nuisance tripping.

Kirby also recommends the LP switch to be used as a safety protection device. Depending on the application and compressor, LP cut-in and differential points should be set with the following considerations:

- Set the cut-out points at 3–5 K below the respective minimum design saturated suction temperatures (Refer to the Standard Design Conditions section for saturated suction temperature ranges).
- Set the differential to no more than 2 Bar.
- The cut-out pressure shall be in the positive pressure region.
- When the unit is installed in a cold ambient, the cut-out pressure shall be lower than the pressure corresponding to the ambient temperature.

Compressor manufacturer's recommendations- All refrigerants = 0.2bar(g) minimum.
For pumpdown operation, Kirby recommends that a second LP switch should be used.

2.1.6 WARNING- Auto Reset & Motor Protection

Fans and compressors are thermally protected. When tripped, these components will not operate. Once sufficiently cooled however, the component will automatically reset and may operate without warning.

Maneurop 3 phase compressors are equipped with an internal line break overload. This is an auto reset type.

Standard compressor contactors are equipped with thermal overload relays which are factory set to AUTO reset. The function may be changed to MANUAL reset by use of a switch on the overload. Please refer to the manufacturers information for details.

The N/O contact 97-98 on the thermal overload is connected to the phase failure control start delay trigger (without memory or light).. The fault signal will cause a 15 minutes start delay.

350mm and 450mm single phase fans are equipped with an internal line break thermal overload. This is an auto reset type. 500mm single phase fans have a control circuit break overload wired into the compressor control circuit.

When tripped, the compressor and fans will switch off. Once cooled, the overload will reset, and if the fault has not cleared, the unit will cycle on the fan overload. Eventually the HP switch may switch off the unit.

The unit is equipped with a High/Low pressure switch as standard. The standard switch may be a "universal" reset or "auto/auto" type. Factory setting is for auto reset on both high and low sides.

The phase failure control is a solid state motor protector for 3 phase motors with adjustable start delay, anti short cycle timer and fault memory. Refer SP308-1 for details.

The phase failure module start delay function has been utilised as follows-

The tripped signal is connected to the memory trigger connection. This signal will cause a 15 minutes start delay with memory function and light.

The LP switch should not be used for pump down.

Compressor restart will be delayed by 15 minutes when activated by these 2 fault conditions. Reset the Safety circuit MCB to avoid the 15 min delay on the module.

2.1.7 High Compressor Temperature

Compressor housing and discharge line temperatures may reach 150°C due to failure of system components. Wiring and other materials which could be damaged by these temperatures should not come into contact with the housing or discharge line.

2.1.8 Deep Vacuum

Do not operate compressors in deep vacuum conditions as this can cause electrical failure. Compressors should never be used to evacuate refrigeration or air conditioning systems.

2.1.9 Lubrication

Maneurop compressors use PolyolEster (POE) oil. OEM specification is type 175PZ oil.
Kirby approves the use of 175PZ POE oil for Maneurop hermetic reciprocating compressors.

OIL LEVELS:

The oil level should be maintained at the mid-point of the sight glass.

Caution - Notes on POE Oils

Use only POE oil with HFC and HFC/HFO blend refrigerants. Do NOT mix POE oil with other oils when using these refrigerants. Small quantities of other oil types may be mixed with POE oil when using HCFC refrigerants (eg R22).

2.1.10  Routine Maintenance of Unit

Condenser;

Condenser should be cleaned at 3 monthly intervals.

System operation;

System operation should be checked every 6 months. Checks should include

- Operating conditions such as condensing and evaporating temperatures, compressor discharge temperature, superheat and sub-cooling, etc.
- Refrigerant charge, oil level and quality
- Electrical connections, current draw and voltage level, etc.

Compressor and the pressure line piping may reach temperatures that may cause burning if touched!

2.1.11 Crankcase Heater

Maneurop compressors are factory wired with a 35W/200-600V solid state self-regulating crankcase heater. A crankcase heater protects against off-cycle migration of refrigerant by maintaining the crankcase at a higher temperature than surrounding components. The heater is wired to be active when the compressor is off. The heater will not offer protection against continuous liquid floodback. The effectiveness of a crankcase heater can be checked by measuring the oil temperature (sump temperature) with system off, which should be at least 10K above ambient temperature. The ideal oil temperature in operation should be between 50ºC and 70ºC. Checks must be made to ensure that the appropriate oil temperature is maintained at all ambient conditions.

2.1.12 Wiring of Units

Please refer to electrical diagrams for suggested wiring of "Commander Blue" units in Section 4 "Schematic Wiring Diagrams". The diagrams reflect a fully optioned unit wired by Kirby. Other wiring requirements and the overall system wiring is the responsibility of the installer.

2.2 REFRIGERATION PIPING

Refrigeration piping work shall be carried out professionally by qualified refrigeration mechanics in accordance with applicable national and local regulations and in conformance with good engineering practices required for the proper operation of the refrigeration system.

All condensing units manufactured by Kirby are supplied clean and internally charged with dry air or nitrogen to prevent oxidation and ingress of moisture or foreign matter. Care shall be taken during installation of the piping to prevent entrance of foreign matter or moisture by minimising the time that the piping is uncapped.
The interconnecting refrigeration pipe size is not necessarily the same size as the outlet on the unit. The pipe sizes shall be selected/calculated based on the best compromise of minimizing refrigerant pressure drop and refrigerant velocity to ensure efficient oil return A selection program is available ON-LINE to assist in the calculation of pipe sizes.
Horizontal suction lines shall slope towards to the units to allow the oil to return freely to the compressor by gravity. A 1:100 slope is considered sufficient. The use of oil trap and double risers may be necessary on vertical sections. Suction line piping shall be insulated to minimise the superheat effect to the vapour.
If in doubt during the installation, please consult with your local sales representatives and/or application engineers from Kirby for technical support.

2.3 COMPRESSOR STARTING

All "Commander Blue" High Ambient condensing units use Direct-On-Line starting compressors. Care should be taken to establish starting requirements for the larger compressors due to high in-rush current.

Maximum compressor starts per hour
Maneurop reciprocating hermetic compressors = 12

2.4 FAN SPEED CONTROL

A fan speed controller is fitted as standard to "Commander Blue" High Ambient condensing units.
. It is a Saginomiya brand controller- it may be a **XGE-4CC30" (4A) or RGE-Z1Q4-5 (8A)** depending on unit model. These controllers vary the supply voltage to the condenser fan motor from 45% to at least 95% over the proportional condensing pressure band (EPB). For Settings please refer to the table.
The set point (FVS) is defined at 95% supply voltage, and the cut-off point is defined at 45% supply voltage to the fan motor.
When the condensing pressure reduces to the cut-off condition, the XGE-4CC30 controller will cut off the supply to the fan and the fan will stop. The fan restarts at low speed when the pressure rises.
The RGE-Z1Q4-5 controller can be set to "Cut Off" on the switch provided, for control as noted above, or to "Min Speed" (factory setting), this ensures that the fans continue to run at this speed regardless of how low the pressure goes below the minimum.

MODEL	Factory FVS (Barg)	FVS RANGE (Barg)		EPB (Bar)	ADJUSTMENT		
		MIN	MAX	(Fixed)	UP	DN	BAR/TURN
XGE-4CC30	1.9	10	25	6	CW	ACW	1.5
RGE Z1Q4-5	1.9	8	28	4	CW	ACW	View on pointer

For more details, please refer to Saginomiya product specifications.

Each installation should be assessed on its own particular conditions, and verified by the installing technician. Minimum condensing temperature for all models is 30°C.

Warning – Setting for Other Refrigerants

It is the installer's responsibility to set the control correctly for use with other refrigerants.

2.5 GENERAL COMMISSIONING AND DE-COMMISSIONING GUIDE

2.5.1 Warning – Commissioning

Refrigeration system commissioning shall be carried out professionally by qualified refrigeration mechanics in conformance with good engineering practices required for the proper operation of the refrigeration system.

After all installation and electrical work is completed, the entire refrigeration system must be leak tested. After satisfactory testing of the refrigeration system, then refrigeration lines shall be insulated as necessary. The insulation located in outdoor environments shall be protected from UV exposure.

Before charging the refrigerant, the entire refrigeration system shall be evacuated by connecting a good, high vacuum pump to both the high-pressure side and low-pressure side service valves or ports.
It is important to apply good engineering practice when charging any refrigerant, but in particular blended and/or zeotropic refrigerant, such as R404A/R407F/R448A/R449A/R450A, require proper procedures to be observed:

- Initially charge 60 to 80% of the expected refrigerant charge in liquid form into the liquid receiver with the compressor not running (after evacuation to the correct pressure). If the refrigerant charging must be carried out through the suction side of the compressor, charge in vapour form only
- When the system pressure has stabilized, start the compressor & slowly charge the remaining refrigerant quantity into the suction line in liquid form through a gauge manifold or a throttling valve to allow it to vaporize before entering the compressor. If the system is fitted with an accumulator, it is preferable to charge upstream of the accumulator.
- After initial running of the system, check the refrigerant charge condition at the sightglass and add any required refrigerant in the suction side as noted above, or remove excess refrigerant into an approved reclaim cylinder.

Kirby is dedicated to providing safe products and protecting the environment by complying with all applicable national laws and regulations governing safety and environmental protection. New and used refrigerants cannot be vented into atmosphere. Reclaim all used refrigerants. Ensure your refrigerant handling procedure complies with the relevant regulations.

Double check all field wiring connections and factory terminations. Factory connections can vibrate loose during shipment. Ensure correct fan motor rotation, airflow is induced from coil side and forced out of fan motor side.

Ensure that the compressor crankcase heater has been energised for a minimum 12 hours before initial start-up and / or after prolonged shutdown periods.

After the successful start up of the system, generally check:

- Current draw and voltage levels.
- Suction superheat settings and discharge temperatures.
- Abnormal refrigeration piping vibrations.
- Oil level and refrigerant charge.

2.5.2 Warning – Decommissioning

In order to remove the unit from its mounting place, the following procedures need to be carried out professionally by qualified personnel. Failure to do so may result in personal injury or death, property damage by fire or explosion. Discharge of refrigerant to atmosphere is illegal and may result in heavy fines by relevant regulatory authorities.

- Pump down the entire refrigerant charge into the liquid receiver or appropriate container such as reclaim cylinder, and shut related valves. **All reclaimed refrigerant that is not re-used must be taken to an approved refrigerant recycling or destruction facility**. Kirby Branches will accept the used refrigerant.
- Disconnect the power supply. Remove all necessary field electrical wiring and related components, leaving the earth wire to the last.
- Care must be taken when disconnecting the refrigeration piping because of unbalanced pressure between the unit and ambient. There may be a small amount of refrigerant trapped in the oil, the pressure rise in the system will boil and vaporise the refrigerant resulting in a potential personal injury hazard.
- Cut and solder seal the refrigeration liquid line and suction line pipe connections.
- Remove the unit from its mounting place. Adequate equipment must be provided as per lifting notes.

2.6 Material Safety Data Sheets – M.S.D.S.

These are available from your nearest Kirby Branch for all refrigerants that Commander Blue condensing units are approved for, and for oils and other materials as needed.

2.7 Important Notes

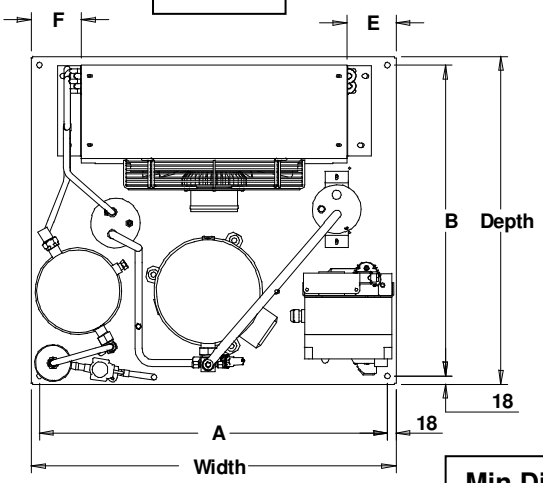
To ensure Commander Blue condensing units operate efficiently and for a long working life, always obtain genuine replacement parts from your local Kirby Wholesale Branch. Genuine replacement parts are covered by the warranty. Refer to the Standard Terms & Conditions of Sale in the Price Guide for warranty statements.

Continuous product improvement is our company policy. Kirby reserves the right to make changes in product specifications and/or this instruction manual without notice.

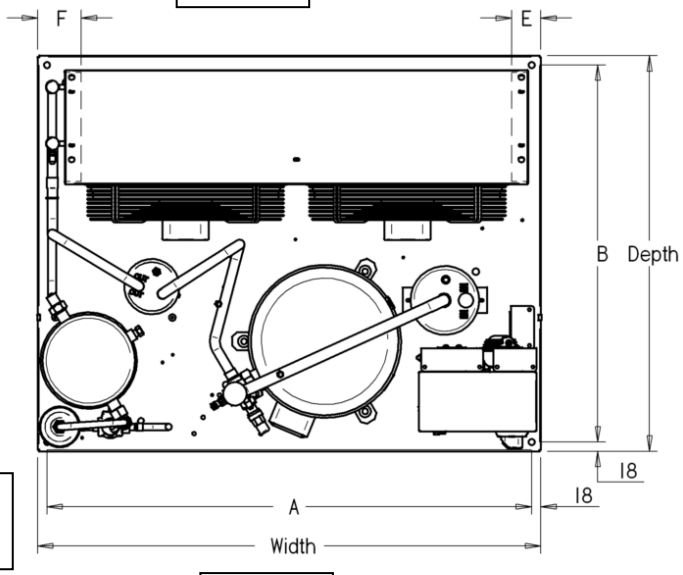
Kirby HVAC&R is dedicated to providing safe products and protecting the environment by complying with all applicable national laws and regulations governing safety and environmental protection. New and used refrigerants cannot be vented into atmosphere. Reclaim all used refrigerants. EPA regulations are constantly updated. Ensure your refrigerant handling procedure complies with the relevant regulations.

3. *Dimensional Drawings*

Base B

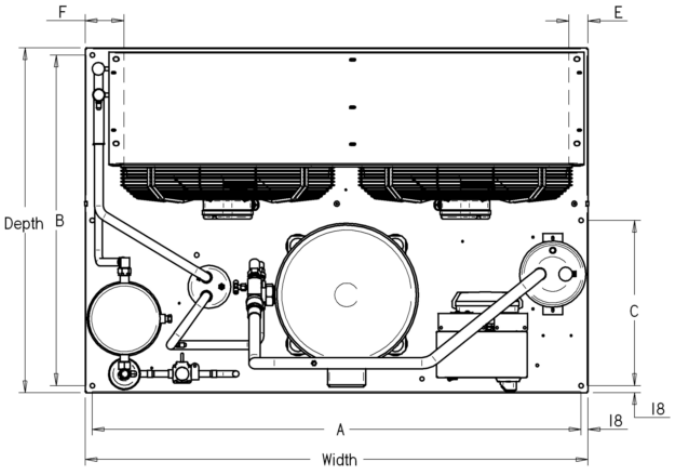


Base C



Min Distance to walls = 600mm

Base D



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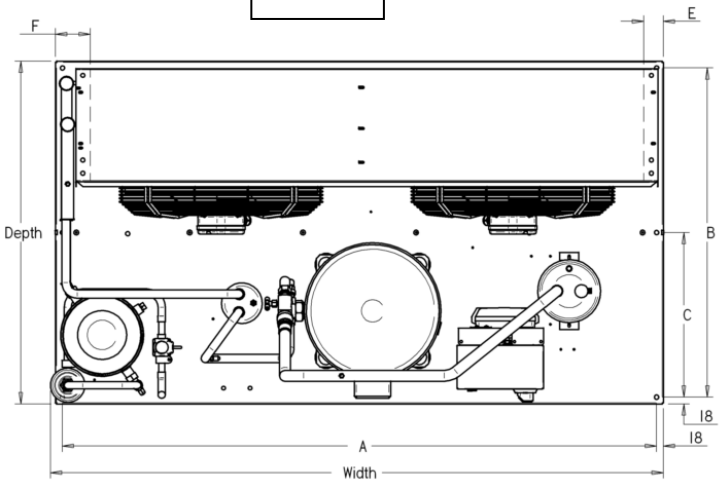


Drawings are indicative only- units may differ slightly in layout from above

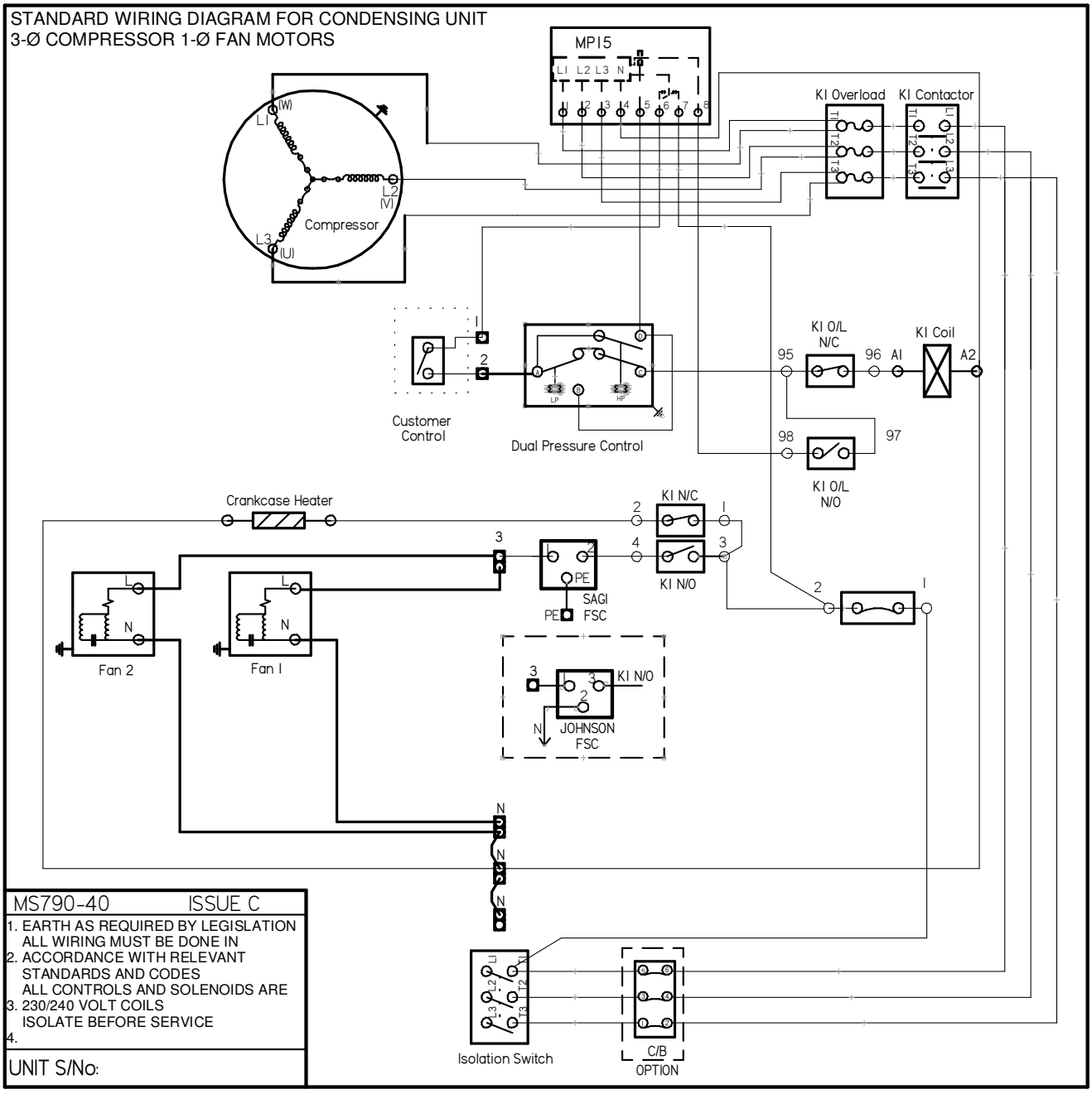
MODEL	BASE	DIMENSIONS								
	TYPE	H (Height)	W (Width)	D (Depth)	A ctrs	B ctrs	C ctrs	E	F	G
PCH078MHA1-2	C	655	770	980	944	734	n/a	145	93	35
PCH093MHA1-2	C	655	770	980	944	734	n/a	57	85	35
PCH103MHA1-2	D	670	870	1270	1234	834	417	48	98	50
PCH120MHA1-2	D	670	870	1270	1234	834	417	48	98	50
PCH140MHA1-2	D	825	870	1270	1234	834	417	48	98	50
PCH156MHA1-2	D	925	870	1270	1234	834	417	48	98	50
PCH175MHA1-2	D	925	870	1270	1234	834	417	48	98	50
PCH221MHA1-2	D	925	870	1270	1234	834	417	48	98	50
PCH256MHA1-2	E	975	910	1610	1574	874	437	52	92	50
PCH282MHA1-2	E	975	910	1610	1574	874	437	52	92	50
PCH032LA1-2	B	555	710	790	944	734	n/a	145	93	35
PCH040LA1-2	C	655	770	980	944	734	n/a	145	93	35
PCH061LA1-2	D	670	870	1270	1234	834	417	48	98	50
PCH094LA1-2	D	925	870	1270	1234	834	417	48	98	50
PCH128LA1-2	D	925	870	1270	1234	834	417	48	98	50

4. Schematic Wiring Diagrams

4.1 General Diagram for Maneurop Air Cooled Condensing Units – DOL start, direct off-cycle control, 350mm & 450mm fan.

Warning **Electrical 415 Volt ± 10%**

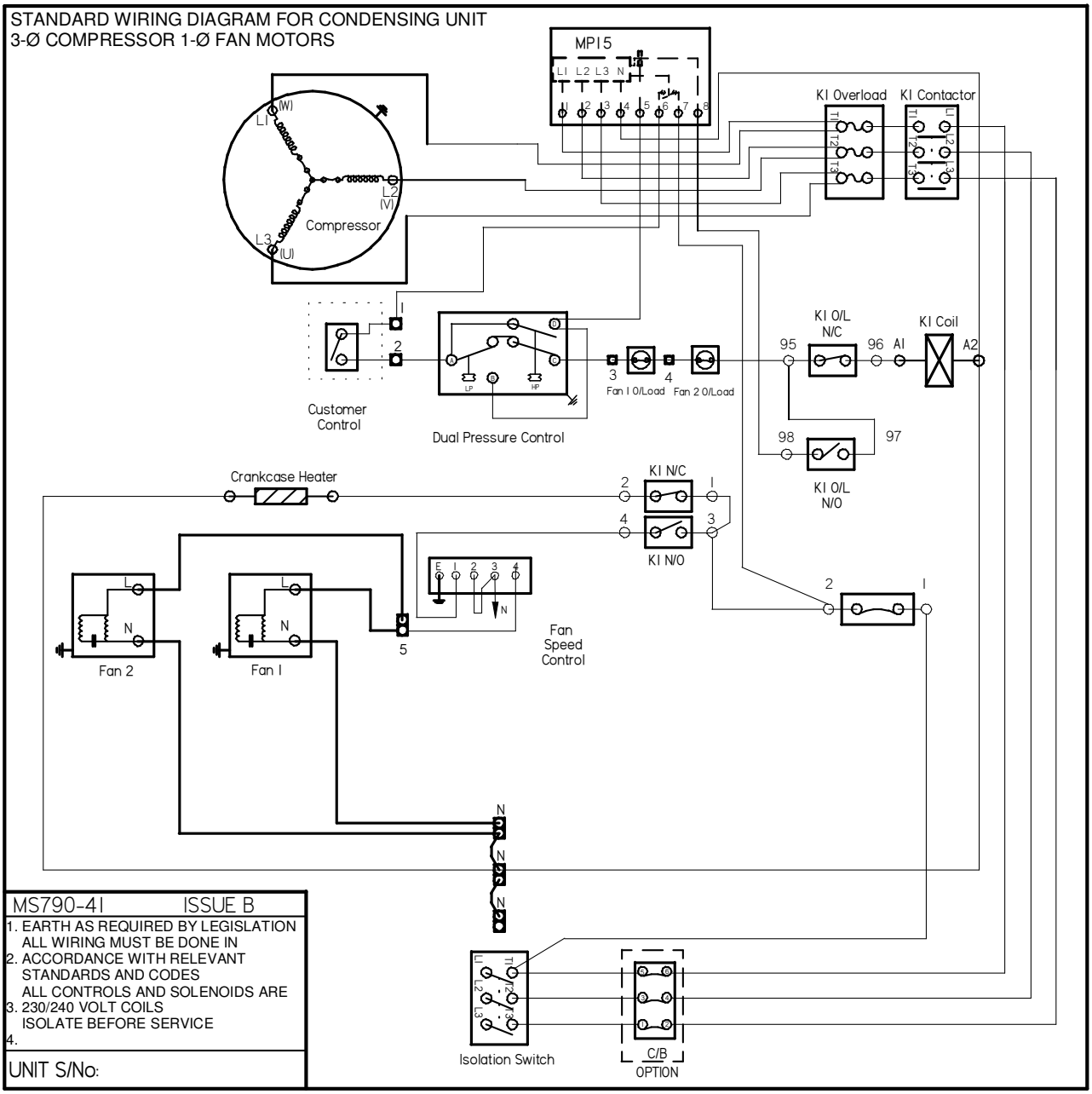
PLEASE NOTE: DO NOT USE THE SAFETY LP FOR PUMP DOWN, LP TRIP WILL ACTIVATE 15 MINUTES START DELAY



4.2 General Diagram for Maneurop Air Cooled Condensing Units – DOL start, direct off-cycle control, 500mm twin fan.

Warning **Electrical 415 Volt ± 10%**

PLEASE NOTE: DO NOT USE THE SAFETY LP FOR PUMP DOWN, LP TRIP WILL ACTIVATE 15 MINUTES START DELAY



COMMISSIONING NOTES

UNIT SERIAL NUMBER

INSTALLATION/COMMISSIONING DATE(S)

KIRBY
A BEIJER REF Company

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