KIRBY CENTURION HANDBOOK

Units 15 to 45hp

***THANK YOU** FOR CHOOSING THE KIRBY CENTURION CONDENSING UNIT.*
TO ENSURE TROUBLE FREE INSTALLATION, AND COMMISSIONING, PLEASE REFER TO THE CONTENTS OF THIS HANDBOOK.

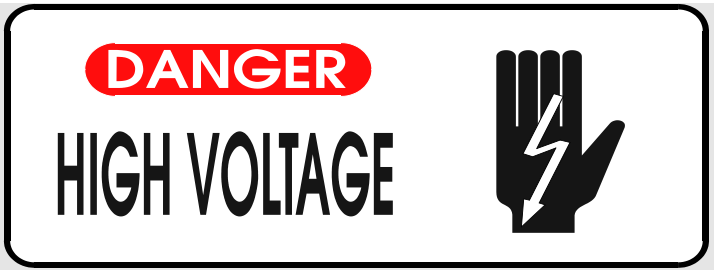
Polar Pack

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

CONTENTS

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

End User Notes



General Notes

Kirby Centurion 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 guidelines.
Kirby Centurion condensing units are supplied with a main isolation switch on the front panel. To ensure safety, electrical control components cannot be accessed while the isolation switch is on. The switch is pad-lockable in the "OFF" position.

Under no circumstances should anyone other than a qualified person attempt to gain access to the interior of the unit without first ensuring electric power is disconnected.

Kirby Centurion condensing units have been designed for use in an outdoor or indoor environment. They are not suitable for mobile or explosion-proof applications.

Auto Start-Up

Kirby Centurion condensing units may start automatically without any warning. The unit is fitted with a fan speed controller as standard, fans will rev up and down, even turn on and off on demand in response to variations in condensing pressure. Please see "Installation Instructions" for further details.

Auto Reset

Kirby Centurion 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.

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.

Warnings and Safeguards

KIRBY is very conscious of safety issues when designing and manufacturing these 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 the possibility of material damage can be assumed.**

Important Notes

- **Do NOT remove access panels without isolating power.**
- **All controls are 230/240V.**

No Smoking

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

Warning – Electrical Hazard

A qualified Electrician must carry out all electrical work. All field wiring must conform to the requirements of the equipment and all applicable National and Local Codes.
Always isolate the power to the unit before checking and / or diagnosing the units. Never work on any electrical item without isolating or disconnecting the power supply.

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.

Caution – Refrigerant Type

All units are designed to work effectively with fluorocarbon refrigerants including R404A, R507A, R407F/R448A/R449A, and R134a/R450A/R513A.. Under no circumstances can a refrigerant such as Ammonia, Hydrocarbon, Water or Glycol be used in this product.

Please refer to the relevant technical literature for any limitations on applications with different refrigerants.

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

Caution – Lubricant Oil Type

All compressors are charged with PolyolEster (POE) oil. POE can be used with HCFC refrigerants, such as R22, and HFC refrigerants, such as R404A, R507A, R407F/R448A/R449A, and R134a/R450A/R513A. Use ONLY POE oil, do NOT mix POE with other oils, when using HFC and HFC based refrigerants.

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.

Warning – Qualified Personnel

All units may only be installed, commissioned, decommissioned and serviced by licensed 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.

Personal Protective Equipment

Heatcraft Australia 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.

Warning – Lifting of Unit

The Condenser assembly on all units includes brackets with lifting holes that CAN ONLY BE USED FOR LIFTING THE CONDENSER. These are identified with signs stating DO NOT LIFT HERE. These bracket locations MUST NOT be used to lift the complete condensing unit.

The compressor end of the unit is to the left looking from the front (isolation switch) side. Forks should be placed toward the correct lifting point as shown on the unit when lifting. Slings can be placed through the mounting feet but care must be taken to adjust the lengths appropriately to account for the weight distribution.

Refer to lifting details in the Installation Instructions

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

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.

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.

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 and consequences.

Condenser fans are fitted with internal thermo-contact motor protectors, which are incorporated into the fan control circuit. Fans may switch off due to excessive motor temperature. Always check the control circuit if fans are not operating as expected.

Dorin (and Copeland in special built units) reciprocating semi-hermetic compressors used in Centurion condensing units are fitted with **Thermistor motor protection** and electronic control circuit break modules. Always check the thermistor module switch position if a compressor does not restart as expected.

NEVER apply 240V across thermistor terminals. Maximum test Voltage = 3V.
The thermistor control module is a "Fail-Safe" design. The control contact opens when power to the module is cut, and closes when power is returned only if the thermistors signal correct operating conditions. The thermistors should never be disconnected from the module, and the module should never be bypassed, when the unit is in operation.

In addition to the above, thermal over-current protection is fitted to the compressor contactor(s), and phase failure protection is set up as a standard configuration.

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

HP/LP alarm to pin 5- delay with memory function and light

Compressor contactor K1 Thermal Overload N/O 97-98 to pin 8 (start delay without memory or light).

Compressor restart will be delayed by 15 minutes when activated by these 2 fault conditions.

Restarting the MP15 (toggle Circuit Breaker CB1 Off/On) will re-initialize the MP15 timer.

Please refer to your KIRBY sales representative for details.

Caution – Internal Pressure Relief (IPR) Valve

Some types of compressors include an IPR valve. The IPR valve will open when the discharge pressure exceeds the suction pressure by a certain value, which is set by the compressor manufacturer. When it has opened, the compressor sump will become warm and the compressor will trip out on the motor protector. The unit may take 2 to 3 hours to reset and restart automatically if this happens.

Copeland compressors (special built units) over 50m3/hr displacement have an IPR valve.

Dorin compressors do NOT have an IPR valve.

Do NOT assume that a compressor that is running, but not pumping, is faulty.

Stop the compressor and allow the pressures to balance, and then start the compressor again.

PURPOSE

Kirby Centurion condensing units are standard OEM products including all "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 surrounding atmosphere where the units are installed.

Kirby Centurion condensing units are intended for installing in a typical ventilated indoor or outdoor environment (Refer to the General Arrangement Drawing section for details) with the condensing temperature no greater than 58°C for Dorin and Copeland compressors and compressor return vapour temperature no greater than 20°C.
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.

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 45°C.

AS/NZS5149.2 INFORMATION. DORIN COMPRESSOR UNITS			MAX AMB	UNIT DATA		
				PS	PSS	Refrig
ALL CC COMPRESSORS, INCL VSD MODELS			45	3050	2000	A1: R404A/R407F/R448A/R449A
ALL CS COMPRESSORS, INCL VSD MODELS			45	3050	2000	A1: R404A/R407F/R448A/R449A/R134a/R513A/R450A
		EXCEPT				
		PPS 373 MHA1-2	45	3050	2000	A1: R134a/R450A/R513A
		PPS492MHA1-2	45	3050	2000	A1: R134a/R513A/R450A
		PPS740LMA1-2	45	3050	2000	A1: R404A/R407F/R448A/R449A

Please refer to the relevant technical literature for any limitations on applications with different refrigerants.

Medium / High temperature range condensing units are typically designed, for primary refrigerant R404A, to be used in commercial cool room applications ranging from –35°C to +5°C or +10°C for Dorin CC compressors. For R407F/R448A/R449A, and R134a/R450A/R513A usage, please refer to other sections of this booklet for control setting information and limitations, etc.
Low / Medium temperature range condensing units are designed, for primary refrigerant R404A, to be used in commercial freezer room applications ranging from -35°C to -5°C saturated suction temperature for Dorin CS compressors. For R407F/R448A/R449A and R450A/R513A usage, please refer to other sections of this booklet for control setting information and limitations, etc. This range is NOT suitable for product pull down requirements with R404A and similar refrigerants. For R22 refrigerant operation contact Kirby for more information.

Please refer to the specific sales data sheet for standard Kirby Centurion 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, or call our national telephone number 13 23 50 or go on-line with smart@ccess for your nearest available information resources.

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.

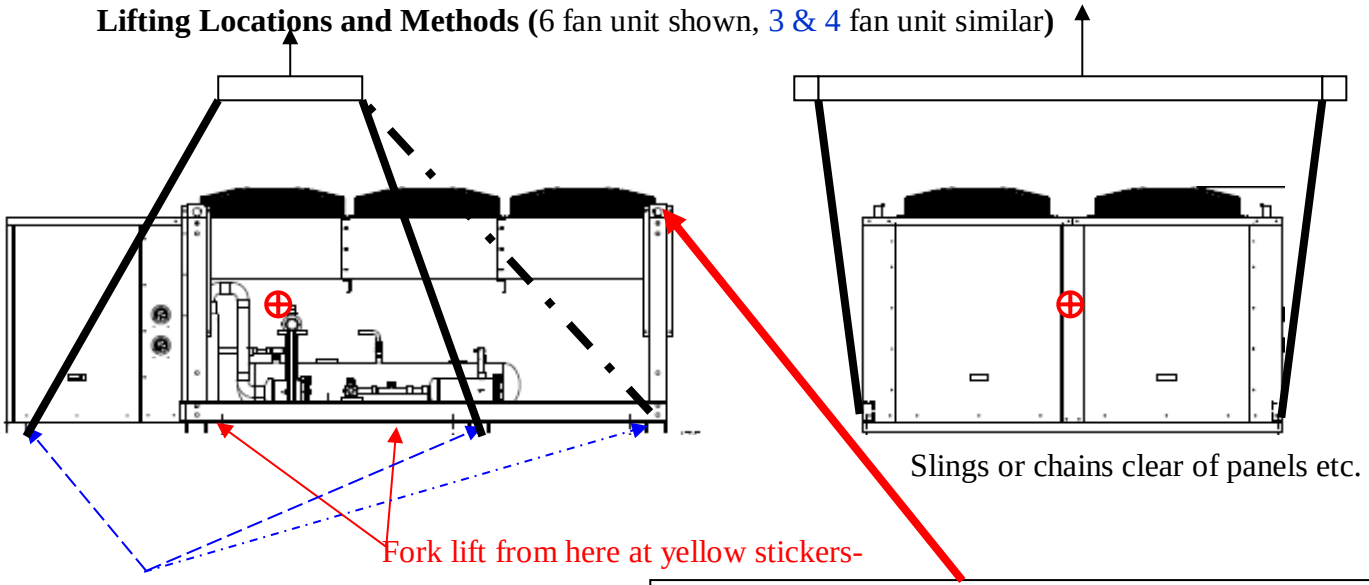
Unpacking of Unit

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 local Heatcraft branch.**

Warning – Lifting of Unit

The Condenser assembly on ALL units includes brackets with lifting holes that CAN ONLY BE USED FOR LIFTING THE CONDENSER. These are identified with signs stating DO NOT LIFT HERE. These bracket locations MUST NOT be used to lift the complete condensing unit.

Lifting Locations and Methods (6 fan unit shown, 3 & 4 fan unit similar**)**



⊕ = approximate centre of gravity.

The unit MUST NOT be lifted from the condenser leg brackets. These brackets are only suitable for the lifting the condenser on its own.

Installation Location (Refer to the General Arrangement Drawing section)

If the unit is to be located in close proximity to a wall or similar obstruction, the minimum distance from the coil face or unit sides to the obstruction shall comply with the general arrangement drawing. The unit shall be mounted on a horizontal plane surface.
The liquid sight glass is located on the front rail (isolation switch side) under condenser.
Connection of gauges can be achieved from the compressor compartment of the unit, refer to the section on pressure settings for more detail.

It is particularly important for the units to allow sufficient unobstructed vertical air-discharge space above the unit to prevent warm air recirculation to the condenser.

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 Kirby Centurion condensing units 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. KIRBY can provide a software program to assist in the calculation of pipe sizes.

Horizontal suction lines shall slope towards to the units to allow the oil 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 for technical support.

Electrical Connection

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

Both the mains supply and the control cabling must be brought into the electric box section from the side or underside of the electrical compartment. The cables should be passed though 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 relevant standards and / or codes, such as. AS/NZS3000. Control circuit is 240 volts. Terminals are supplied for connection of control circuit (Refer to Wiring Schematic inside electrical box cover).

The fitted isolation switch is pad-lockable in the "OFF" position. The door is interlocked in the "ON" position. This interlock may be defeated by depressing a small countersunk pin on the bevelled edge, close to the "OFF" label.

Warning – Electrical Hazard

Only qualified personnel should attempt to bypass the interlock. Caution must be exercised when working on the unit if the interlock is bypassed.

Lubrication

Kirby Centurion compressors use PolyolEster (POE) oil. KIRBY approves the use of POE oil for Kirby Centurion semi-hermetic reciprocating compressors.
H41 "CC" and "CS" compressors, H5 and H6 "CC" compressors use POE46 oil. H5 and H6 "CS" compressors use POE32 oil.

OIL LEVELS:

Copeland Semi- Hermetic Compressors: The oil level should be maintained at the mid-point of the sightglass.
Dorin Reciprocating Semi-Hermetic Compressors: Refer to the indicator on the sight glass.

Caution - Notes on POE Oils

Use only POE oil with HFC and HFO blend refrigerants. Do NOT mix POE oil with other oils when using HFC and HFO blend refrigerants (eg R404A, R448A). Small quantities of other oil types may be mixed with POE oil when using HCFC refrigerants (eg R22).

Compressor Starting

All standard Kirby Centurion condensing units use Dorin Part Winding Start compressors. Standard wiring and settings allow for Part Winding Start with unloading only.
Dorin compressors are 50/50 winding ratios and require pre-unloading (pressure equalisation) before starting. Pre-unload for 5-10 secs, and then the second winding delay is 0.5 to 1 second
Copeland compressors are 2/3: 1/3 winding ratio and may be started with a start by-pass. Second winding delay is 0.5 to 0.7 seconds.
With Part Winding Start is used with an unloaded start bypass line and solenoid, the in-rush current on start-up can be reduced by as much as 20% from the DOL start.

Maximum compressor starts per hour
Copeland reciprocating semi-hermetic compressors = 15
Dorin reciprocating semi-hermetic compressors = 15

System Holding Charge

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 Heatcraft branch. 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 (µmHg) prior to commissioning.

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 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.

An additional LP control can be fitted for pump down cycle; in this case the LP control acts as a control device. Please contact your Kirby representative for part number and details.

Centurion condensing units are equipped with high and low side gauges next to the electrical compartment. If service gauges are necessary, access points are located on the compressor rotolock valve, base valve, discharge and / or suction lines depending on the model of the unit. They can be accessed from the compressor compartment access panel.

Fan Speed Control

A fan speed controller is fitted as standard to all Kirby Centurion condensing units.

The factory setting is suitable for R404A medium temperature applications for most units. For R407F/R448A/R449A some adjustment may be needed due to slightly higher condenser KTD's expected. Units rated on R134a only, and for R134a/R450A/R513A refrigerant on other models, please refer to the setting instructions below. The operating principle is as follows-

- The controller varies the supply voltage to the condenser fan motor from 30% to at least 95% over the proportional condensing pressure band which is factory fixed at 4 Bar.
- The full voltage set point (FVS) is adjustable from 8-28bar, and is set by Heatcraft at 19 Bar for R404A medium temp. By turning the setting screw clockwise, the pressure setting increases. Turn anti-clockwise to decrease the pressure setting. The set point can be seen on the range setting pointer.

- The cut-off point is defined at 30% supply voltage to the fan motor, at factory setting this is 15±1 Bar depending on actual load and / or power supply.
- When the condensing pressure reduces to the minimum speed condition, the factory setting of "Min Speed" on the change-over switch ensures that the fans continue to run at this speed regardless of how low the pressure goes below the minimum. Alternatively, the change-over switch can be set in the field to "Cut-Off", in which case the controller will cut power to the fans and the fans will stop. The fans will then restart at low speed when the pressure rises. For details, please refer to the manufacturers' product specification.
- Factory set point for primary refrigerant R404A is 19 Bar(g) for M/T and 14 Bar(g) for L/T units. KIRBY recommends 16 Bar(g) for R22 and 10 Bar(g) for R134a units.

-  **Warning – Setting for Other Refrigerants**

It is the installer's responsibility to set the control correctly for use with refrigerants other than R404A.

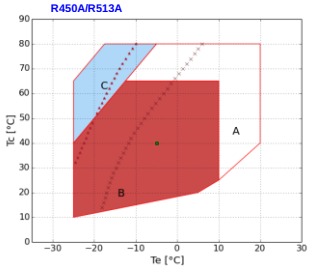
CAPACITY CONTROL FOR DORIN H41, H5 & H6 SERIES COMPRESSORS

Dorin H41, H5 and H6 compressors are 4 and 6 cylinders with 2 and 3 discharge heads. When capacity control is in operation, one discharge head is disabled by blocking the suction gas from entering the cylinders. Due to less refrigerant flow, thus less cooling effect to the electric motor, the running discharge head becomes hotter and the inactive head continually has reciprocating mechanical motion, thus heating up over time. Hence the following protection features have been implemented during capacity control operation.

- Fit a head cooling fan to reduce the temperature of compressor heads.
- Limit compressor operating range. (Refer to charts below)
- Limit compressor continuous operating time to 2 - 3 hours. Then a 3 - 5 minutes operation at full capacity is necessary to cool the compressor down before the next capacity control operation.

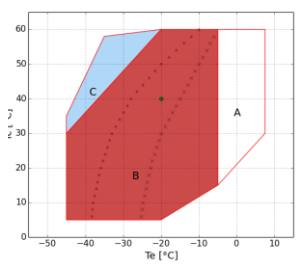
Please be aware of limits to compressor operating range with capacity control as noted below.

R134a H41/5
R450A/R513A



A = "CC" models only
B = Standard application
C = Head cooling fan or max superheating 20K
× = Min Te 50%
* = Min Te 50% Head cooling fan or max superheating 20K
• = Dew temperature

R404A- H41/5



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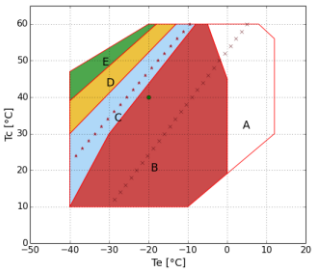
R407F- H41/5



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D = Head cooling fan + max superheating 30K (head cooling
E = Head cooling fan + max superheating 20K (head cooling
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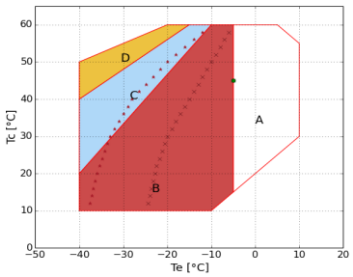
R448A/R449A- H41/5



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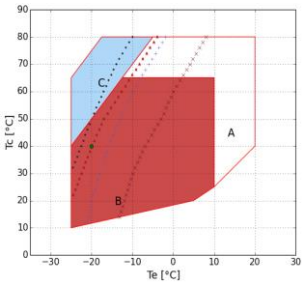
R134a/R513A/R450A H6



B = Standard application
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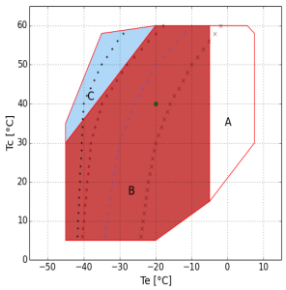
+ = Min Te 33% Head cooling fan or max superheating 20K
• = Min Te 66% Head cooling fan or max superheating 20K
• = Dew temperature

R404A - H6



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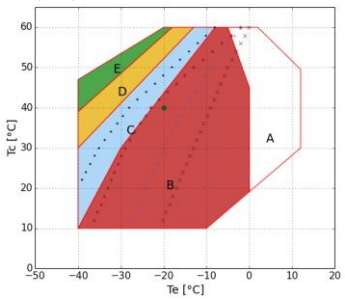
R407F- H6



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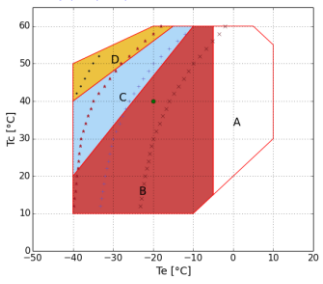
R448A/R449A- H6



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General Commissioning & Decommissioning Guide

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.

Refrigerant charging shall be in liquid form at the high-pressure side of the system such as condenser or liquid receiver. If the refrigerant charging must be carried out through the suction side of the compressor, charge in vapour form only. It is important to apply the good engineering practice when charging any zeotropic refrigerant, such as R404A/R407F/R448A/R449A/R450A:

- Initially charge the refrigerant in liquid form at the high side of the system with the compressor not running.
- When the system pressure is stabilized, start the compressor & slowly charge the refrigerant into the suction line through a gauge manifold or a throttling valve to allow it to vaporize before entering the compressor.
- 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.

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.

If fitted, ensure that the 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.

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.

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

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

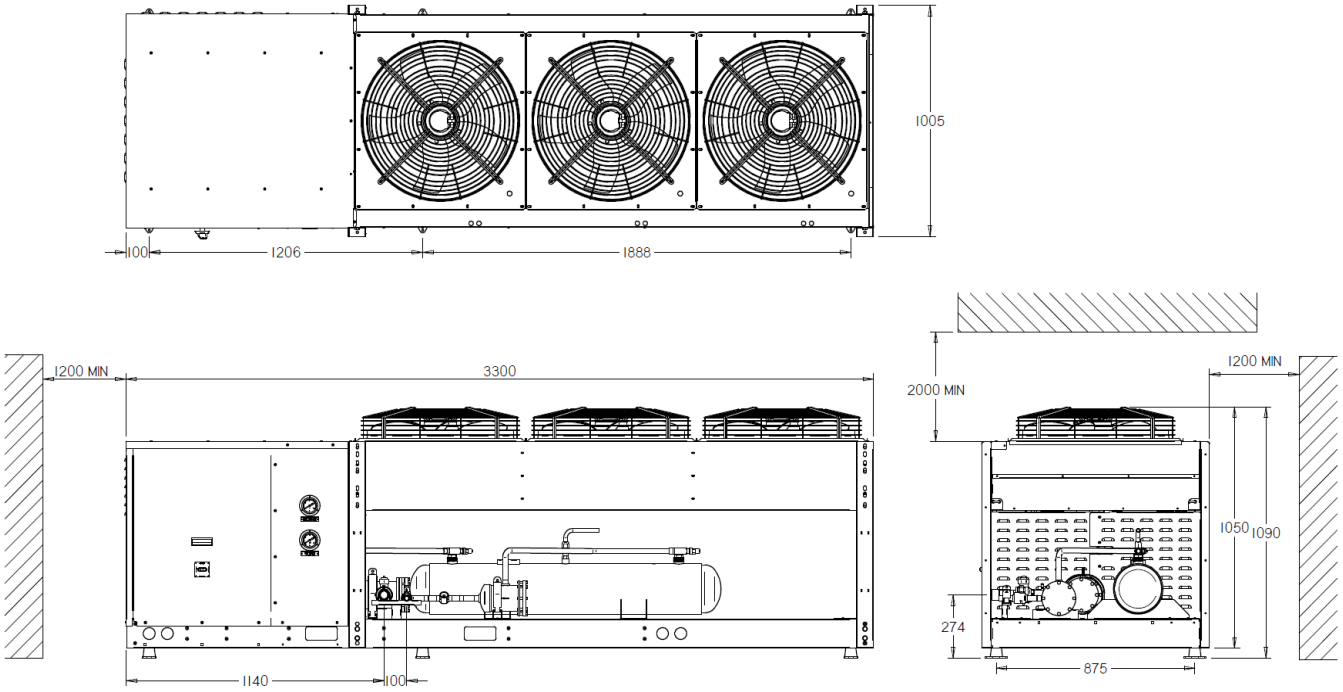
Important Notes

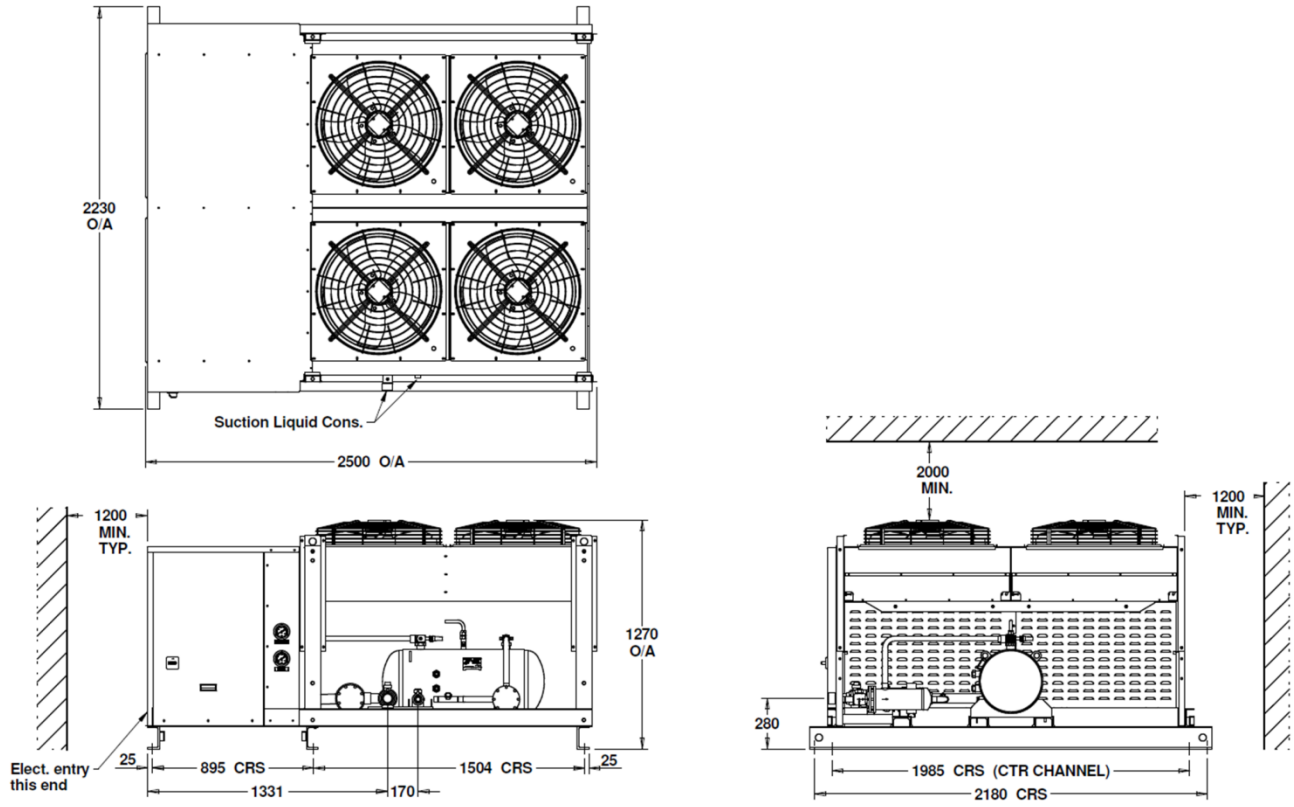
To ensure Kirby Centurion condensing units operate efficiently and for a long working life, always obtain genuine replacement parts from your local KIRBY Wholesale Branch. Genuine replacement parts are covered by the warranty. Refer to the Standard Terms & Conditions of Sale in the Price Guide for warranty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

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

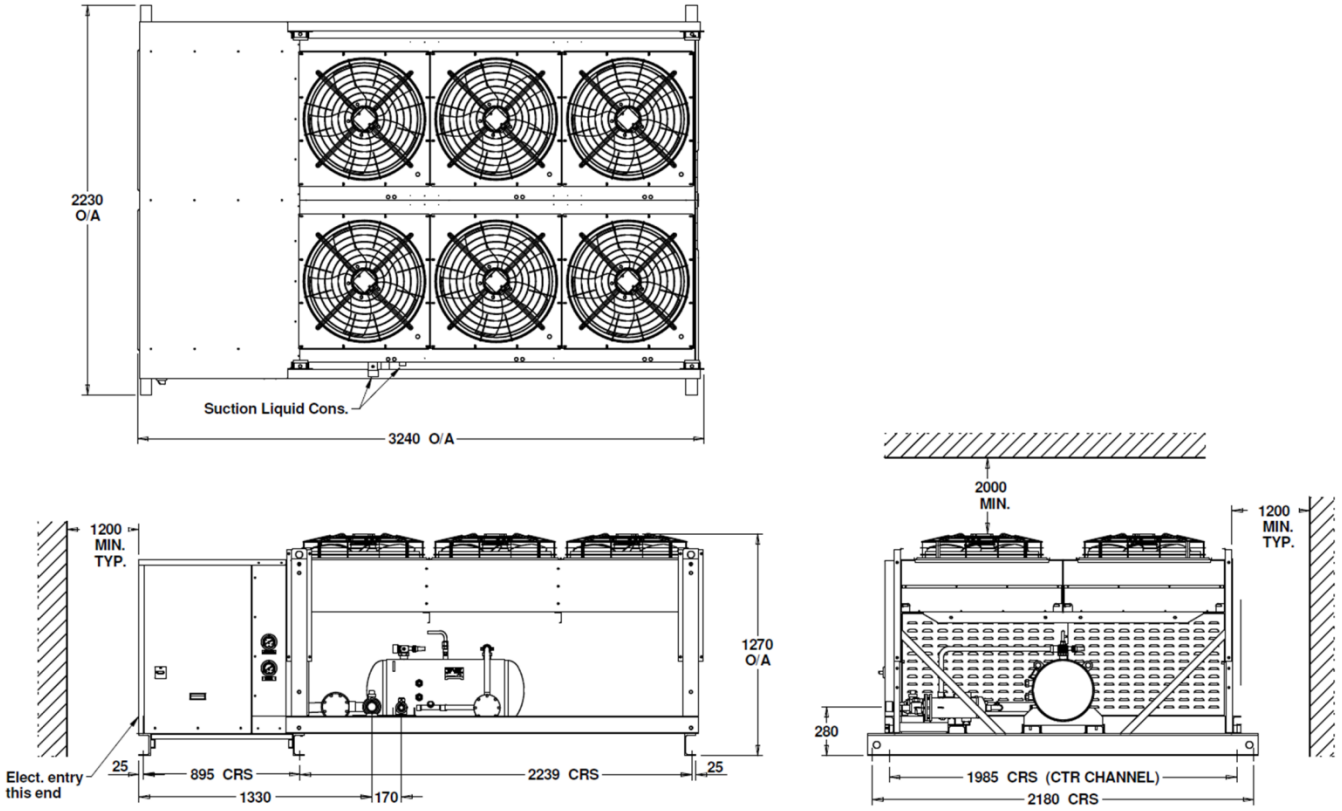
KIRBY is dedicated to providing safe products and protecting the environment by complying with all applicable national laws and regulations governing environmental protection. New and used refrigerants cannot be vented into atmosphere. Reclaim all used refrigerants. Environmental regulations are constantly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

General Arrangement Drawings





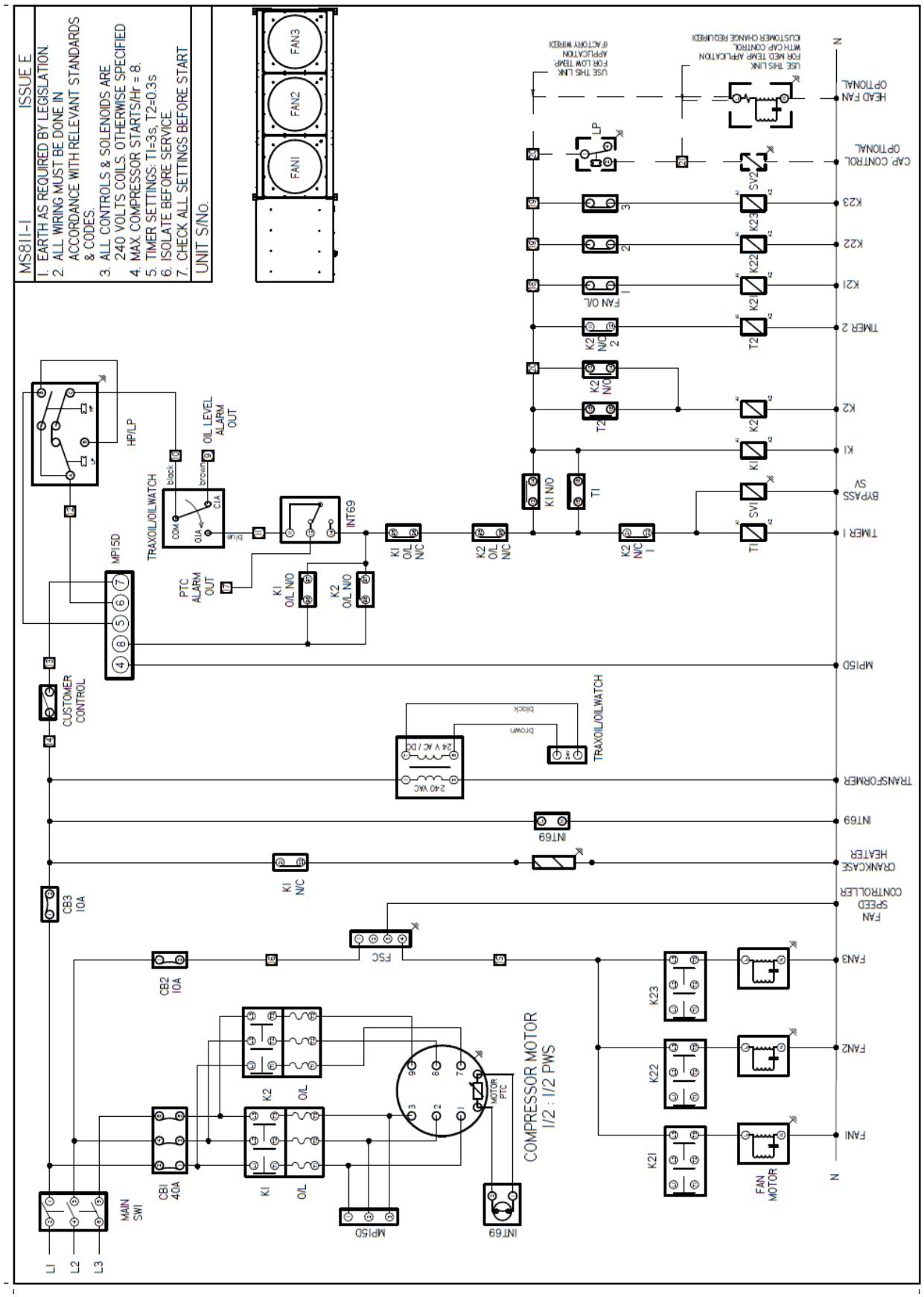
Drawings are representative only. Please refer to the actual unit for more details



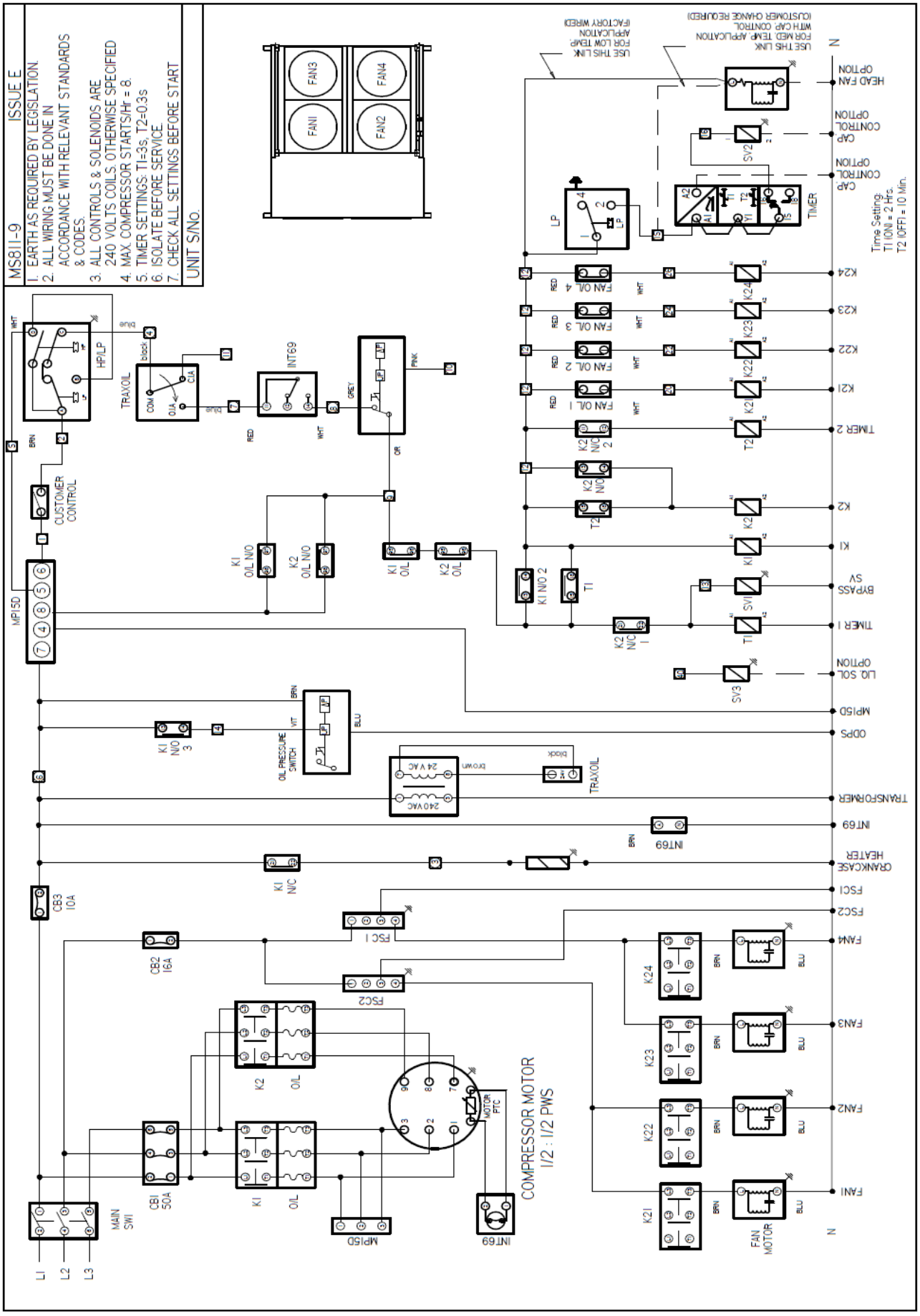
UNIT	DIMENSIONS						APPROX.		
MODEL	OVERALL			MOUNTING			WEIGHT		SHIP'G
	HEIGHT	WIDTH	DEPTH	A	B	C	NET	GROSS	VOL.
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)	(kg)	(m3)
PPS332LMHA1-4	1,090	1,005	3,300	1,890	1,210	950	500	550	5.50
PPS421LMA1-4	1,090	1,005	3,300	1,890	1,210	950	560	610	5.50
PPS 477 LMA1-4	1,090	1,005	3,300	1,890	1,210	950	570	620	5.50
PPS 373 MHA1-4	1,090	1,005	3,300	1,890	1,210	950	570	620	5.50
PPS 491 LMHA1-2	1270	2230	2500	1504	895	2180	920	970	8
PPS 551 LMHA1-2	1270	2230	2500	1504	895	2180	920	970	8
PPS 747 LMHA1-2	1270	2230	3240	2239	895	2180	1070	1120	10.8
PPS 825 LMHA1-2	1270	2230	3240	2239	895	2180	1080	1130	10.8
PPS 543 LMA1-2	1270	2230	2500	1504	895	2180	920	970	8
PPS 740 LMA1-2	1270	2230	3240	2239	895	2180	1070	1120	10.8
PPS 803 LMA1-2	1270	2230	3240	2239	895	2180	1070	1120	10.8
PPS 950 LMA1-2	1270	2230	3240	2239	895	2180	1090	1140	10.8
PPS 492 MHA1-2	1270	2230	2500	1504	895	2180	920	970	8

Electrical Schematic:

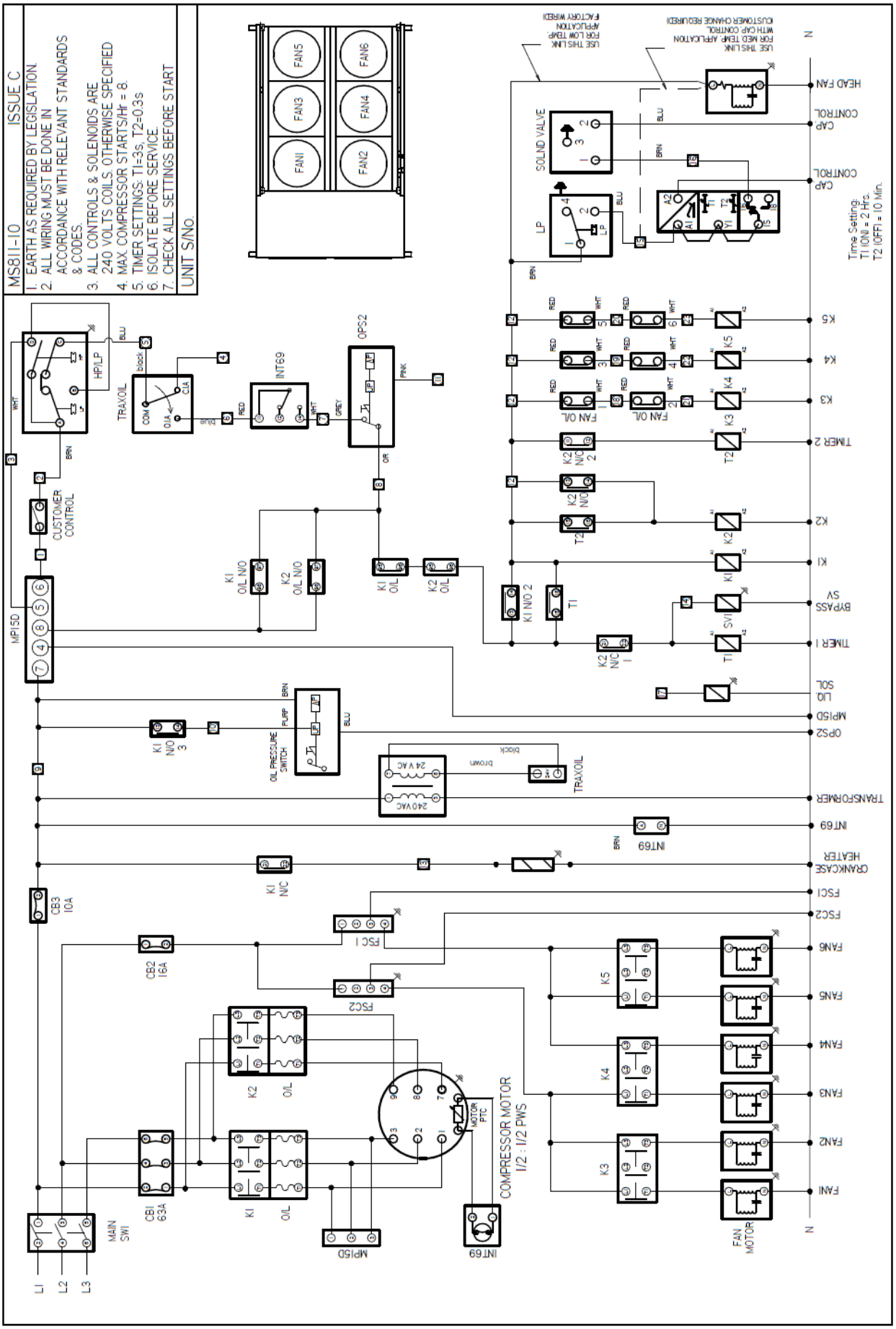
MS811-1 : CENTURION 3 FAN UNIT



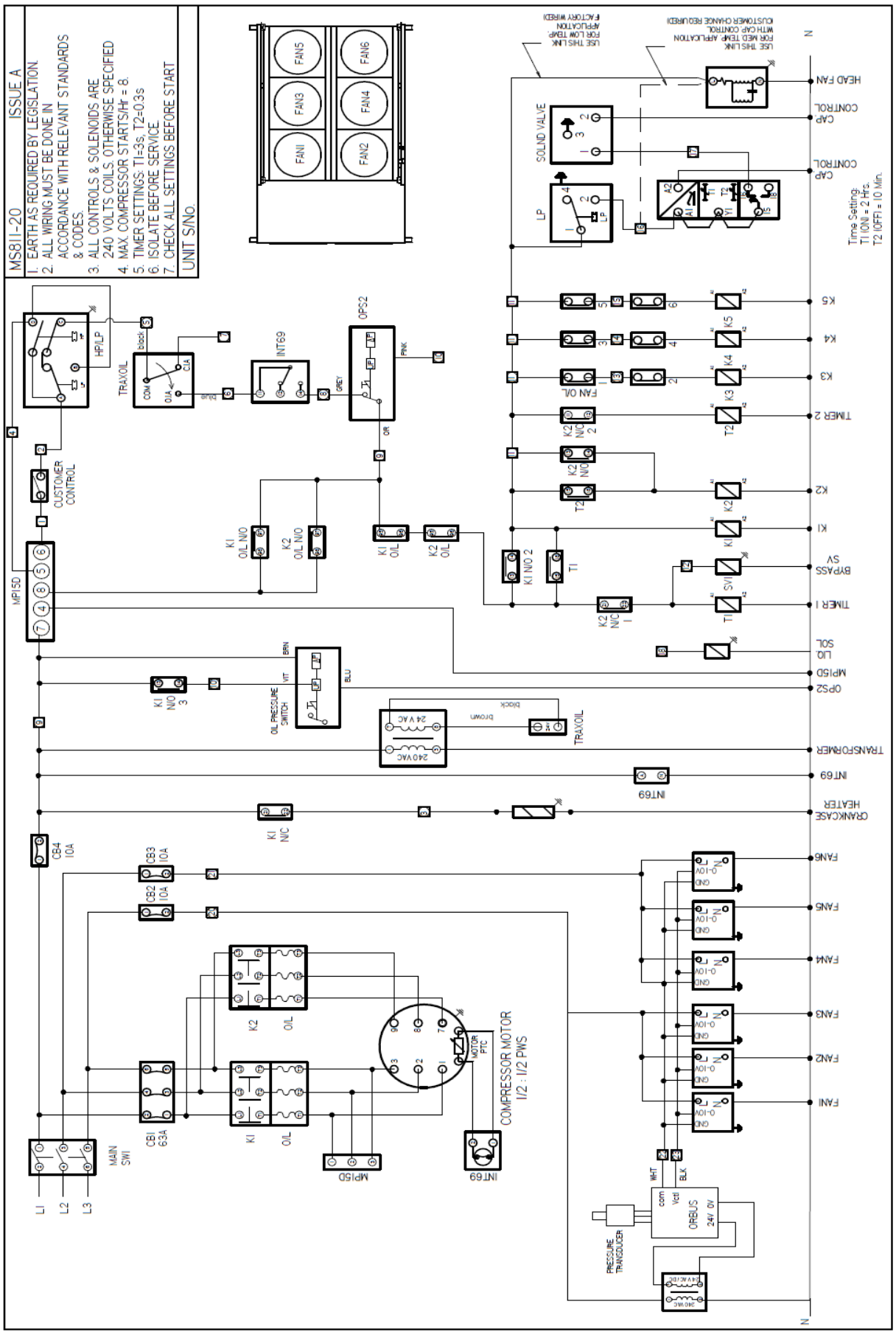
MS811-9: CENTURION 4 FAN UNIT



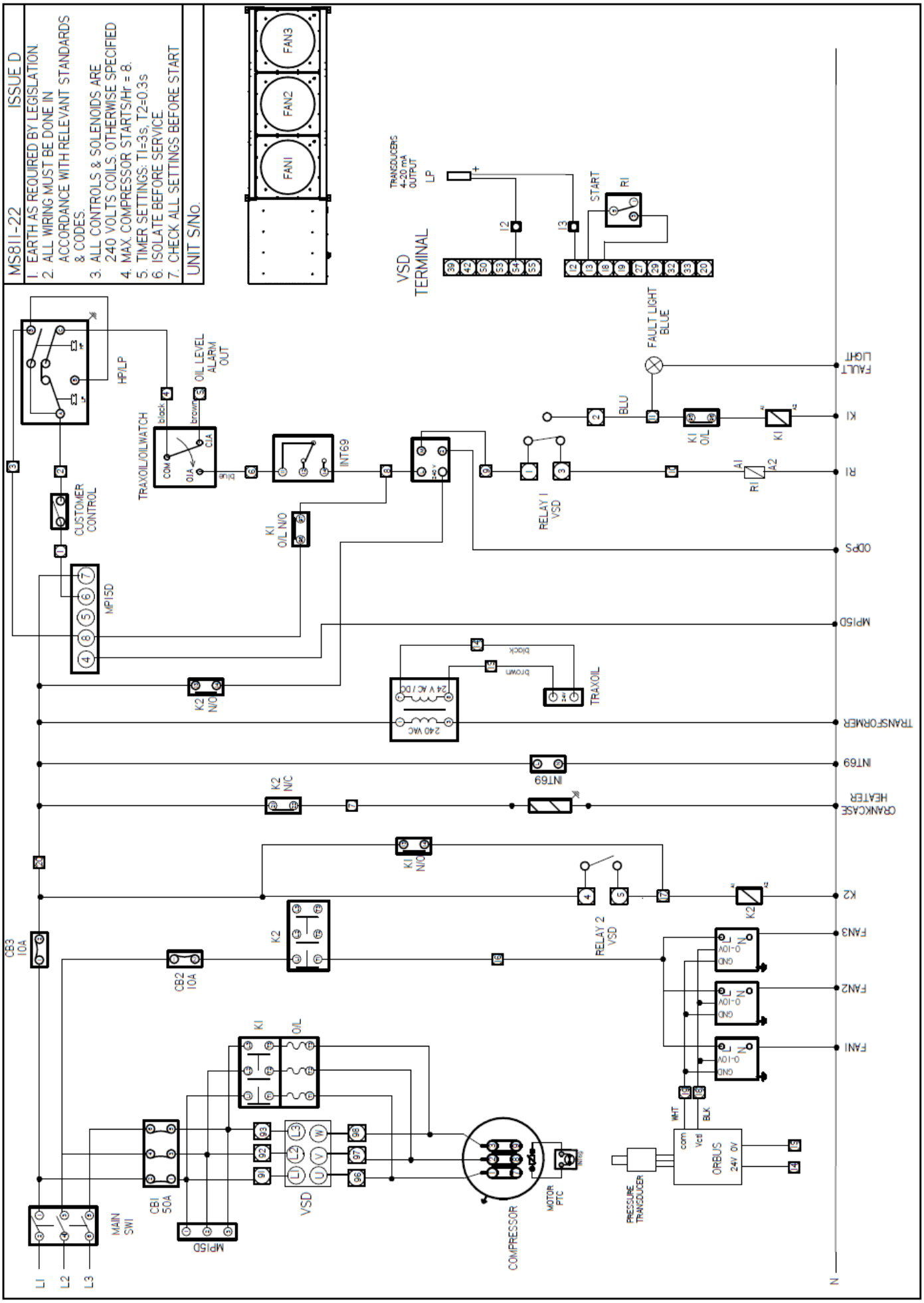
MS811-10: CENTURION 6 FAN UNIT



MS811-20: CENTURION WITH EC FAN AND ORBUS (6 FAN UNIT)



MS811-22: CENTURION WITH VSD AND EC FAN+ORBUS



COMMISSIONING NOTES

UNIT SERIAL NUMBER

INSTALLATION/COMMISSIONING DATE(S)

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