Manufactured by Heatcraft Australia Pty Ltd ACN 000 056 717

KIRBY TITAN HANDBOOK

For Units 4 - 16 HP

***THANK YOU** FOR CHOOSING THE HEATCRAFT KIRBY TITAN 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.

CONTENTS

End User Notes

General Notes

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

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

Auto Start-Up

Kirby Titan 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 Titan 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

Heatcraft Australia 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.**
- **Do NOT operate unit with access panels removed due to the presence of rotating equipment.**
- **Do NOT operate unit with access panels removed as there will be no air flow over the condenser.**
- **All controls are 230/240V.**

No Smoking

Heatcraft Australia 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, R507, R22, R407C and R134a. Under no circumstances can a refrigerant such as 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. 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, R507, R407C and R134a. Use ONLY POE oil, do NOT mix POE with other oils, when using HFC 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 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.

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.

Caution – Lifting of 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.

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.

Danfoss Maneurop reciprocating hermetic compressors, and external rotor motor fans, are fitted with inherent internal line break 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.

Dorin reciprocating semi-hermetic compressors 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), MP15 phase failure protection and Thermistor INT69 (Dorin compressor only) is set up as a standard configuration.

The MP15 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 Heatcraft sales representative for details.

Caution – Internal Pressure Relief (IPR) Valve

Some hermetic 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.

Danfoss "Maneurop" compressors 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 Titan condensing units are standard OEM products of Heatcraft Australia 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 Titan 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 60°C for Maneurop compressors, 57°C for Dorin 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 Heatcraft before installing in this environment.

STANDARD DESIGN CONDITIONS

Medium / High temperature range condensing units are typically designed, for primary refrigerant R404A, to be used in commercial cool room applications ranging from -25°C to +10°C saturated suction temperature for Maneurop compressors, and –35°C to +10°C for Dorin compressors. R507/R404A and R22 are recommended refrigerants. For R134a usage, please refer to other sections of this booklet for control setting information 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 compressors. R507 or R404A are the recommended refrigerants.

Please refer to sales data sheet CL247 for standard Kirby Titan 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 Heatcraft Australia local branches, or call our national telephone number 13 23 50 for your nearest available information resources.

Installation Instructions

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.**

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 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 inside the left hand side (2-fan units) or centre (3-fan units) fan compartment (looking from the front).
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 Titan condensing units manufactured by Heatcraft Australia 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. Heatcraft 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 from Heatcraft Australia 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 of the unit. 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, eg. AS3100. 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 – HIGH VOLTAGE 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 Titan compressors use PolyolEster (POE) oil. Heatcraft Australia approves the use of POE oil for both Kirby Titan hermetic and semi-hermetic reciprocating compressors.

OIL LEVELS:

Maneurop Hermetic Compressors: The oil level should be maintained at the mid-point of the sight glass.
Dorin Reciprocating Semi-Hermetic Compressors: The oil level should be maintained between the levels indicated on the compressor sight glass during operation.

Caution - Notes on POE Oils

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

Compressor Starting

DOL START (MTZ73 – MTZ160, H403 - H751)

All compressors are 380-420V 3Ph 50Hz STAR connected motors for Direct-On-Line starting. Care should be taken to establish starting requirements for the larger compressors due to high in-rush current.

PART WINDING START (H1001 – H1601)

All compressors are 380-420V 3Ph 50Hz STAR (standard) connected PART WINDING START (optional) motors with 50/50 winding ratios for Direct-On-Line or Part Winding starting.

For DOL starting, the terminal links are placed across the terminal pairs to connect the windings in parallel.

For Part Winding Start, the links are removed and a supply line is fitted to each terminal. When 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.

Heatcraft offer a PWS option kit with unloading fully wired (engineered to order)

Maximum compressor starts per hour

Maneurop reciprocating hermetic compressors = 12
Dorin reciprocating semi-hermetic compressors = 8

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 500 microns (μmHg) prior to commissioning.

Pressure Settings

Kirby Titan condensing units have a maximum operating pressure of 32 Bar(g) determined on pressure vessels (such as liquid receivers). Thus any pressure relief device setting must be 32 bar(g) or lower.
Pressure limiting device settings such as the HP control must be 29 Bar(g) or lower in accordance with AS1677.2 that the pressure limiting device setting is no greater than 0.9 times the maximum operating pressure.

In general, Heatcraft Australia recommends 60°C condensing temperature for Maneurop, and 57°C for Dorin as the maximum operating condition on R404A & R22. The corresponding saturation pressures for the respective refrigerants shall be regarded as HP cut-out points for safety protection purpose. For Dorin, approximately 28 Bar(g) for R404A, 23 Bar(g) for R22, and 16 Bar(g) for R134a, are acceptable. For Maneurop, approximately 28 Bar(g) for R404A, 28 Bar(g) for R22, and 23 Bar(g) for R134a, are acceptable.

Heatcraft Australia 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 nearest Heatcraft representative for part number and details.

Access points for gauges 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 either from the compressor compartment access panel. Gauge lines can be run through holes in the base, and the access panel re-fitted to prevent air bypass.

Fan Speed Control

A fan speed controller is fitted as a standard item to all Kirby Titan condensing units from 4 – 16 hp**.**
The factory setting is suitable for R404A on medium temperature applications. For low temperature applications and other refrigerants, please refer to the setting instructions below.

- The controller varies the supply voltage to the condenser fan motor from 45% (1Ph 50Hz) or 35% (3Ph 50Hz) 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.

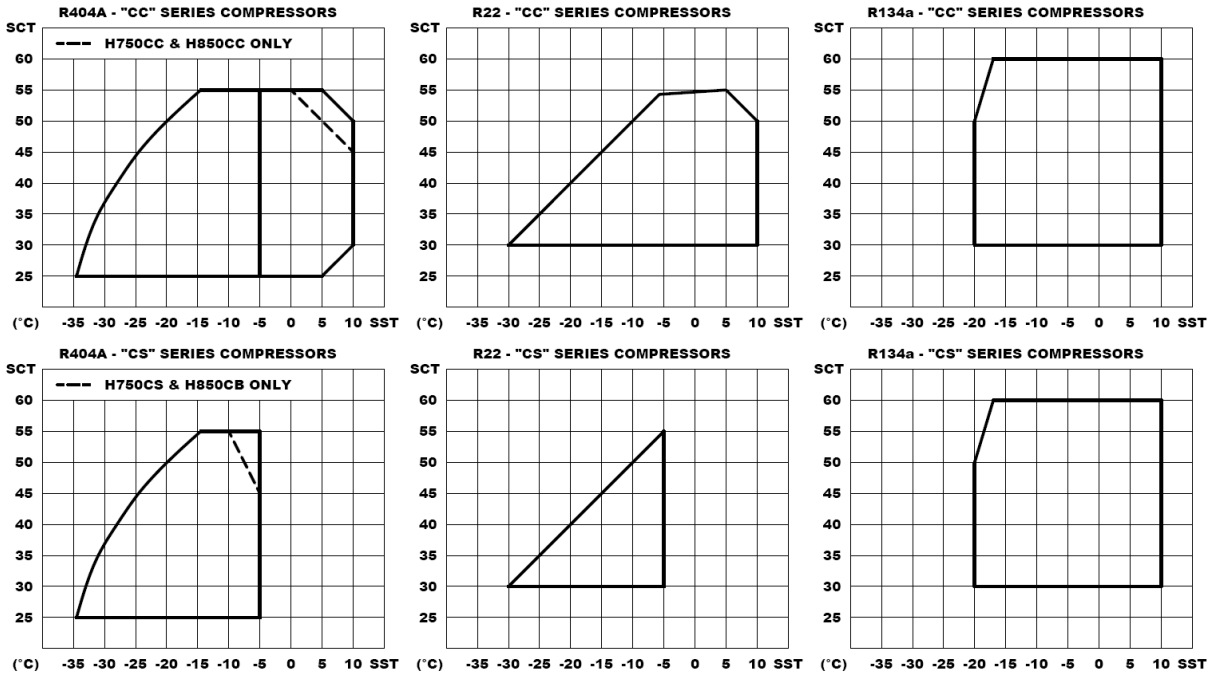
- The cut-off point is defined at 45% (1Ph) or 35% (3Ph) supply voltage to the fan motor, at factory setting this is 15±1 Bar depending on actual load and / or power supply.
- When the condensing pressure reduces to the minimum speed condition, the factory setting of "Min Speed" on the change-over switch 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.
- Heatcraft factory set point for primary refrigerant R404A is 19 Bar(g) for M/T and 14 Bar(g) for L/T units. Heatcraft Australia 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 (Dorin H450 – H1600)

Dorin H34/35 & H4/41 compressors are 4 cylinders with 2 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 expands & recompresses the gas that remained in the discharge head, thus heating it up over time. Hence it is recommended to have the following protection features implemented during capacity control operation.

- A head cooling fan has been fitted to reduce the temperature of compressor heads. Refer to the section of "General wiring schematic with options (Dorin)" for the "Head Cooling Fan" kit.
- A timer has been fitted to limit compressor continuous operating time to 2 hours. Then a 10 minute operation at full capacity is activated to cool the compressor down before the next capacity control operation.
- If problems are still experienced, limit compressor operating range as noted below.



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, like R404A:

- 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.

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**. Heatcraft 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 Heatcraft Branch for all refrigerants that Kirby Titan condensing units are approved for, and for oils and other materials as needed.

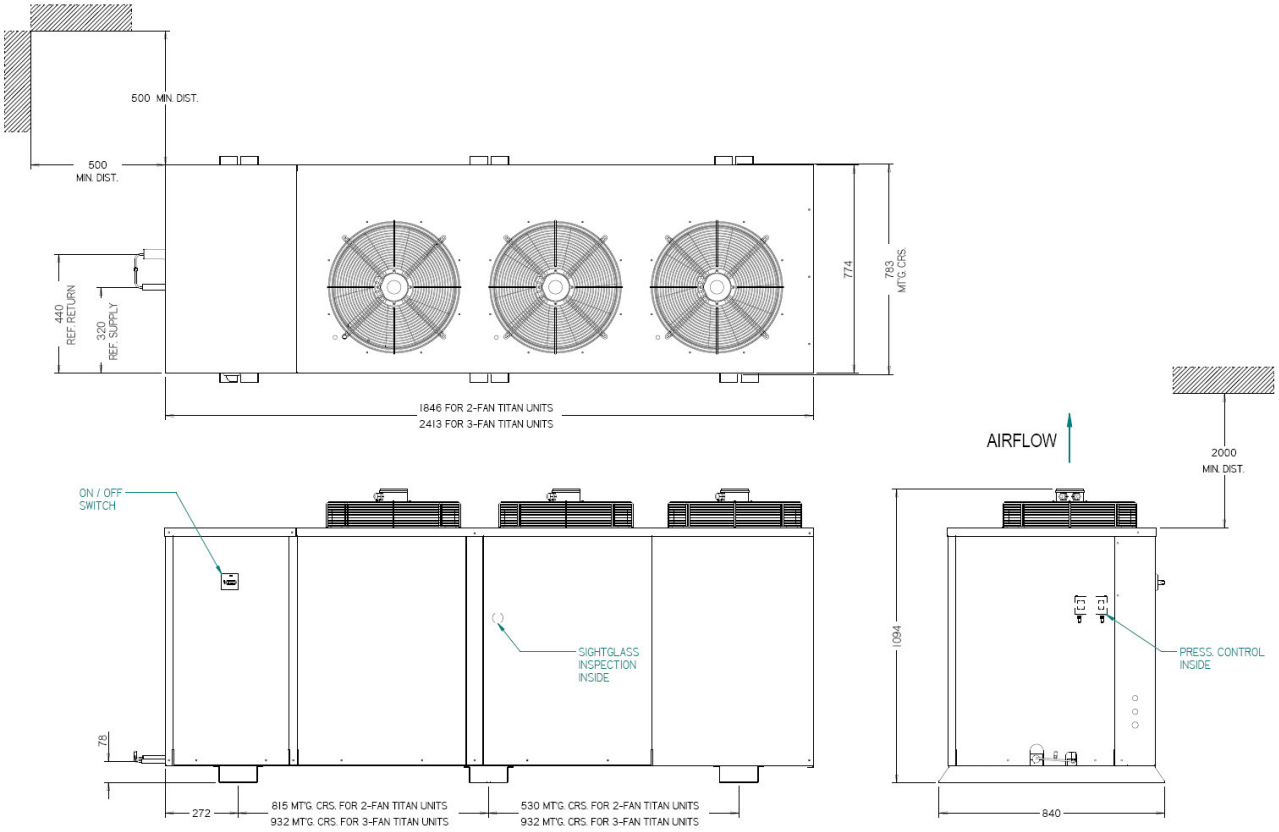
Important Notes

To ensure Kirby Titan condensing units operate efficiently and for a long working life, always obtain genuine replacement parts from your local Heatcraft 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.

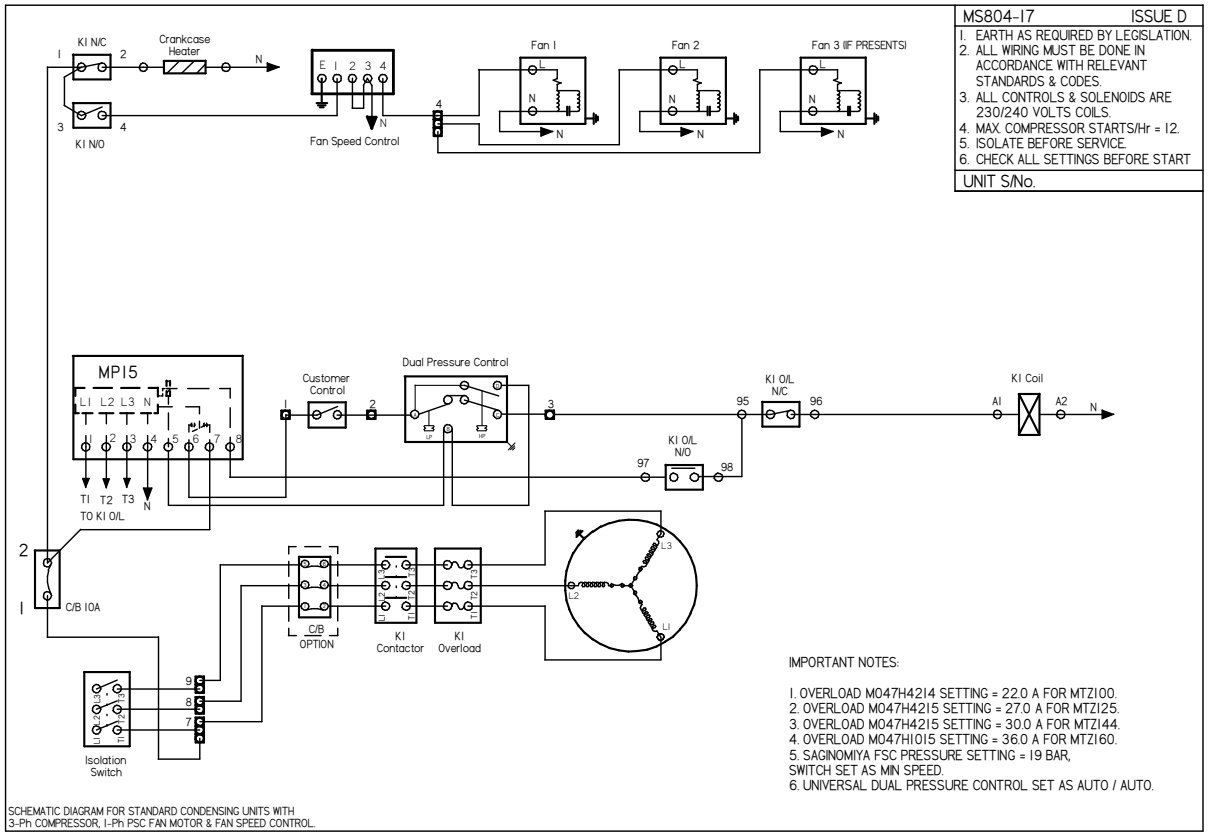
Continuous product improvement is our company policy. Heatcraft Australia reserves the right to make changes in product specifications and/or this instruction manual without notice.

Heatcraft Australia 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. EPA regulations are constantly updated. Ensure your refrigerant handling procedure complies with the relevant regulations.

General Arrangement Drawing



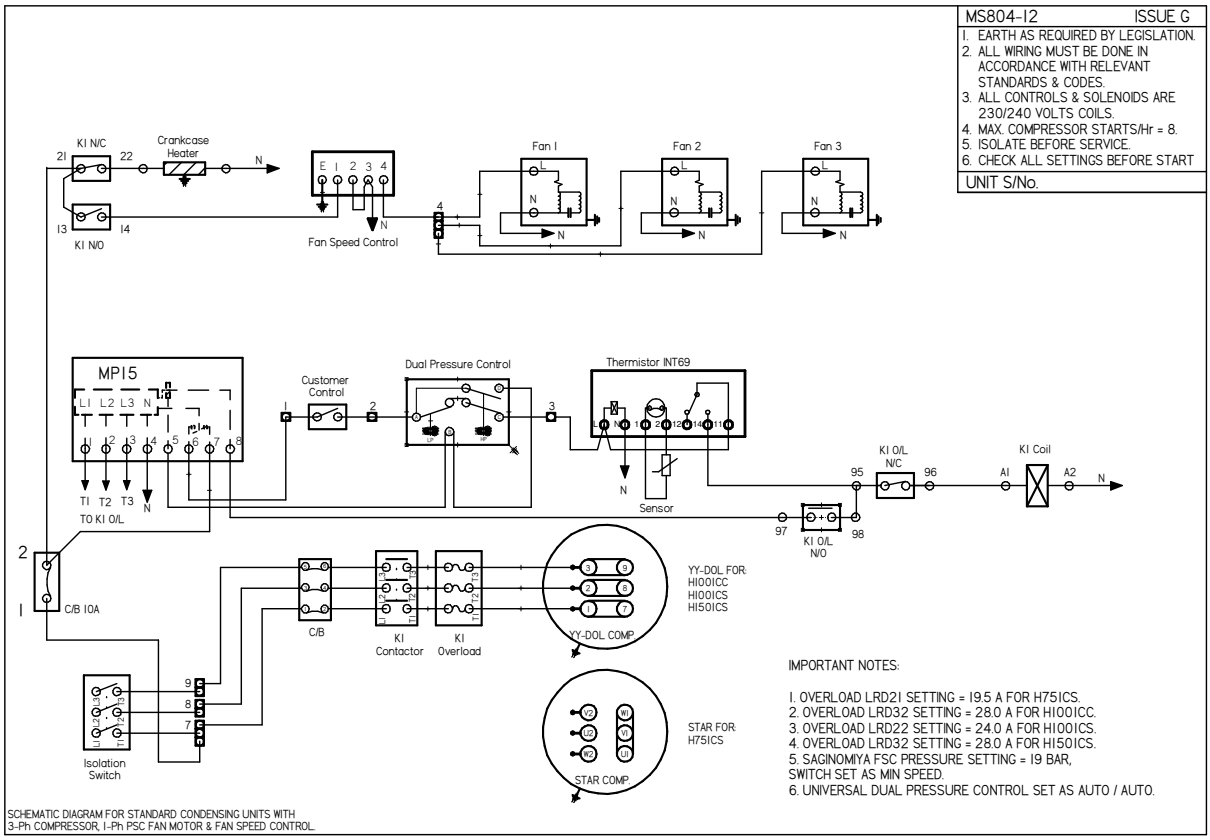
General Wiring Schematic for Standard Units (Maneurop)



NOTE:
This general wiring schematic is indicative to following standard Titan condensing units with respective Maneurop compressors and various quantity of single phase PSC type condenser fans. It may have insignificant differences to the one attached to individual unit at the back of electrical access panel.

- "PPH 131 MH A1-2" - MTZ73, with 2 x Ø450mm fans.
- "PPH 153 MH A1-2" - MTZ81, with 2 x Ø450mm fans.
- "PPH 170 MH A1-2" - MTZ100, with 2 x Ø450mm fans.
- "PPH 217 MH A1-2" - MTZ125, with 2 x Ø450mm fans.
- "PPH 251 MH A1-2" - MTZ144, with 3 x Ø450mm fans.
- "PPH 283 MH A1-2" - MTZ160, with 3 x Ø450mm fans.

General Wiring Schematic A for Standard Units (Dorin)



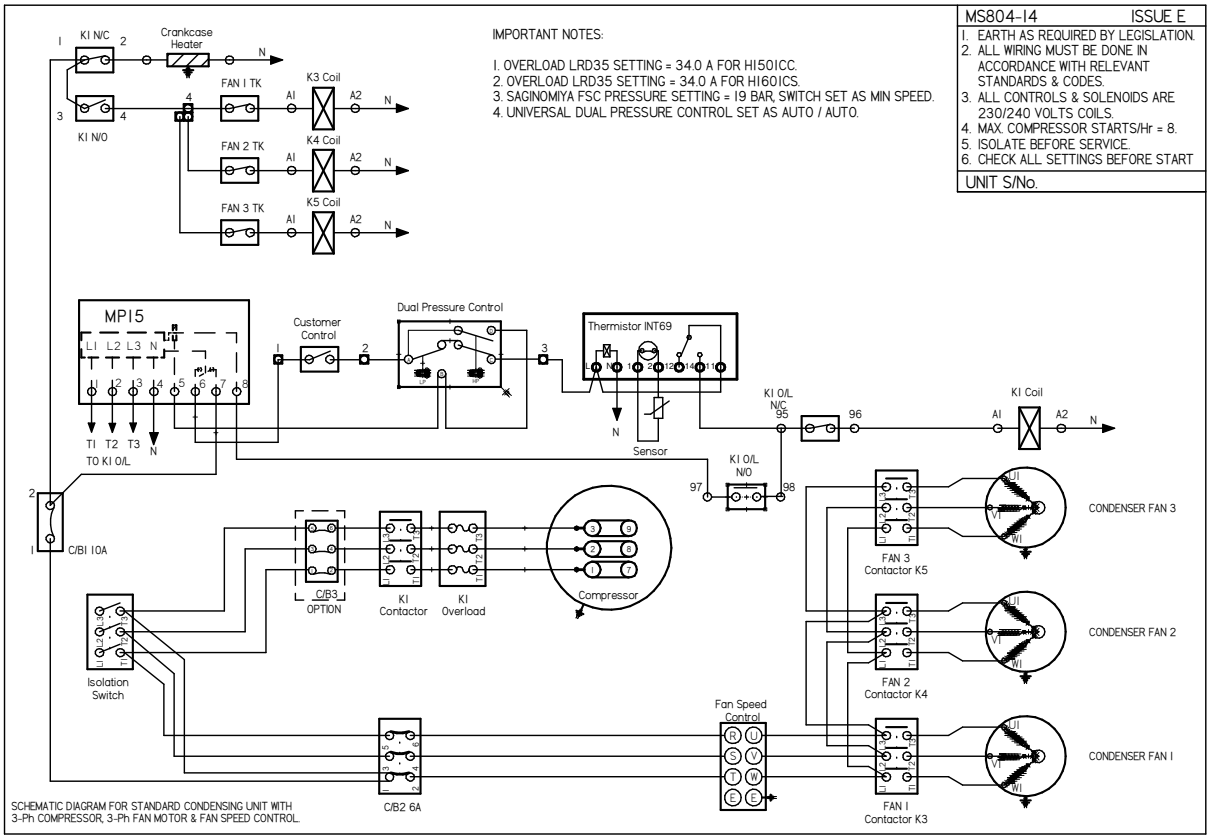
NOTE:

This general wiring schematic is indicative to following standard Titan condensing units with respective Dorin compressors and various quantity of single phase PSC type condenser fans. It may have insignificant differences to the one attached to individual unit at the back of electrical access panel.

- "PPS 124 LM A1-2" - H403CC, with 2 x Ø450mm fans.
- "PPS 149 LM A1-2" - H503CC, with 2 x Ø450mm fans.
- "PPS 152 LM A1-2" - H550CC, with 2 x Ø450mm fans.
- "PPS 152 LMH A1-4" - H551CC, with 2 x Ø450mm fans.
- "PPS 178 LM A1-2" - H700CC, with 2 x Ø450mm fans.
- "PPS 178 LMH A1-4" - H701CC, with 2 x Ø450mm fans.
- "PPS 205 LMH A1-4" - H751CC, with 2 x Ø450mm fans.
- "PPS 212 LM A1-2" - H750CC, with 2 x Ø450mm fans.
- "PPS 242 LM A1-2" - H750CS, with 3 x Ø450mm fans.
- "PPS 242 LM A1-4" - H751CS, with 3 x Ø450mm fans.
- "PPS 264 LMH A1-2" - H1000CC with 3 x Ø450mm fans.
- "PPS 289 LMH A1-4" - H1001CC with 3 x Ø450mm fans.
- "PPS 328 LM A1-2" - H1000CS with 3 x Ø450mm fans.
- "PPS 328 LMH A1-4" - H1001CS with 3 x Ø450mm fans.
- "PPS 370 LM A1-2" - H1500CS with 3 x Ø450mm fans.
- "PPS 370 LM A1-4" - H1501CS with 3 x Ø450mm fans.

1001CC TO BE REPLACED WITH 1201CC

General Wiring Schematic B for Standard Units (Dorin)



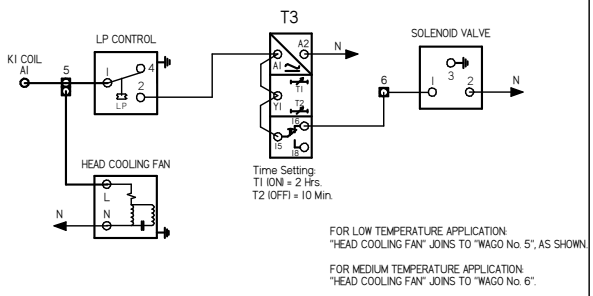
NOTE:

This general wiring schematic is indicative to following standard Titan condensing units with respective Dorin compressors and various quantity of three phase condenser fans. It may have insignificant differences to the one attached to individual unit at the back of electrical access panel.

- "PPS 338 LMH A1-2" - H1500CC, with 3 x Ø500mm fans.
- "PPS 338 LMH A1-4" - H1501CC, with 3 x Ø500mm fans.
- "PPS 411 LM A1-2" - H1600CS, with 3 x Ø500mm fans.
- "PPS 411 LM A1-4" - H1601CS, with 3 x Ø500mm fans.

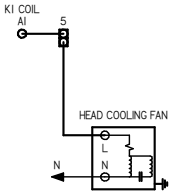
General Wiring Schematic for Options

"KP541-6", "KP541-6F", "KP541-7" & "KP541-7F"
KIT - CAPACITY CONTROL SOLENOID + TIMER+LP CONTROL + HEAD COOLING FAN



REFER "SK699-18" FOR INSTALLATION INSTRUCTION.

"KP541-1", "KP541-1F"
"KP541-2" & "KP541-2F"
KIT - HEAD COOLING FAN



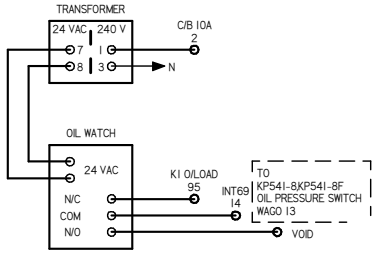
REFER "SK699-19" FOR INSTALLATION INSTRUCTION.

MS804-16 ISSUE F

1. EARTH AS REQUIRED BY LEGISLATION.
2. ALL WIRING MUST BE DONE IN ACCORDANCE WITH RELEVANT STANDARDS & CODES.
3. ALL CONTROLS & SOLENOIDS ARE 230/240 VOLTS COILS.
4. MAX. COMPRESSOR STARTS/Hr = 8.
5. ISOLATE BEFORE SERVICE.
6. CHECK ALL SETTINGS BEFORE START

UNIT S/No.

"KP541-3" & "KP541-3F"
KIT - OIL WATCH + 24 VAC TRANSFORMER



REFER "SK699-20" FOR INSTALLATION INSTRUCTION.

"KP541-4", "KP541-4F", "KP541-5" & "KP541-5F"
KIT - PWS FOR DORIN H4 / H41 COMPRESSORS

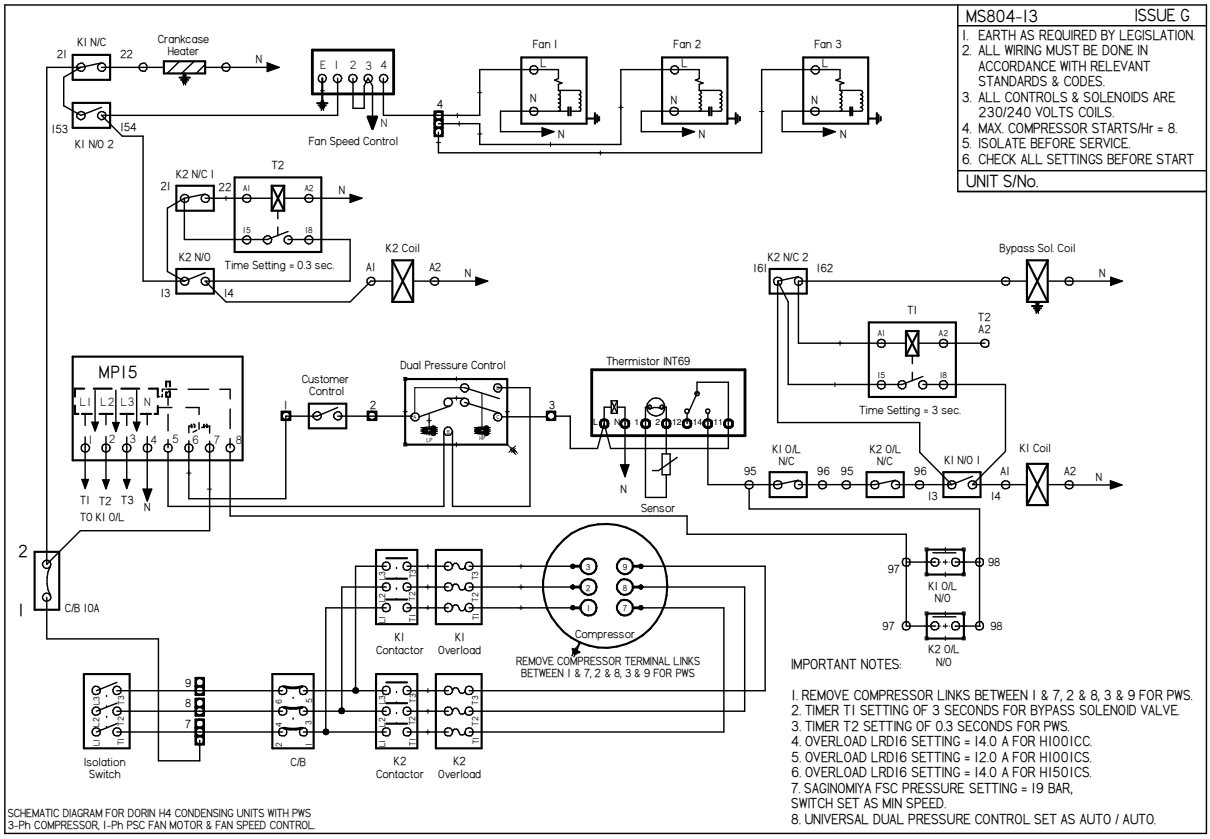
REFER "MS804-13" FOR DORIN COMPRESSORS WITH 1PH FANS, SUCH AS,
HI000CC/HI001CC
HI000CS/HI001CS
HI500CS/HI501CS

REFER "MS804-15" FOR DORIN COMPRESSORS WITH 3PH FANS, SUCH AS,
HI500CC/HI501CC
HI600CS/HI601CS

REFER "SK699-21" FOR INSTALLATION INSTRUCTION.

UNIT	COMPRESSOR	-1, -1F	-2, -2F	-3, -3F	-4, -4F	-5, -5F	-6, -6F	-7, -7F
PPS 124 LM A1-2	H403CC/HTCR			√				
PPS 149 LM A1-2	H503CC/HTCR			√				
PPS 152 LM A1-2	H550CC		√	√			√	
PPS 152 LMH A1-4	H551CC		√	√			√	
PPS 178 LM A1-2	H700CC		√	√			√	
PPS 178 LMH A1-4	H701CC		√	√			√	
PPS 205 LMH A1-4	H751CC		√	√			√	
PPS 212 LM A1-2	H750CC		√	√			√	
PPS 242 LM A1-2	H750CS		√	√			√	
PPS 242 LM A1-4	H751CS		√	√			√	
PPS 264 LMH A1-2	H1000CC	√		√	√			√
PPS 289 LMH A1-4	H1001CC	√		√	√			√
PPS 328 LM A1-2	H1000CS	√		√	√			√
PPS 328 LM A1-4	H1001CS	√		√	√			√
PPS 338 LMH A1-2	H1500CC	√		√	√			√
PPS 338 LMH A1-4	H1501CC	√		√	√			√
PPS 370 LM A1-2	H1500CS	√		√		√		√
PPS 370 LM A1-4	H1501CS	√		√		√		√
PPS 411 LM A1-2	H1600CS	√		√		√		√
PPS 411 LM A1-4	H1601CS	√		√		√		√

General Wiring Schematic for Options - PWS

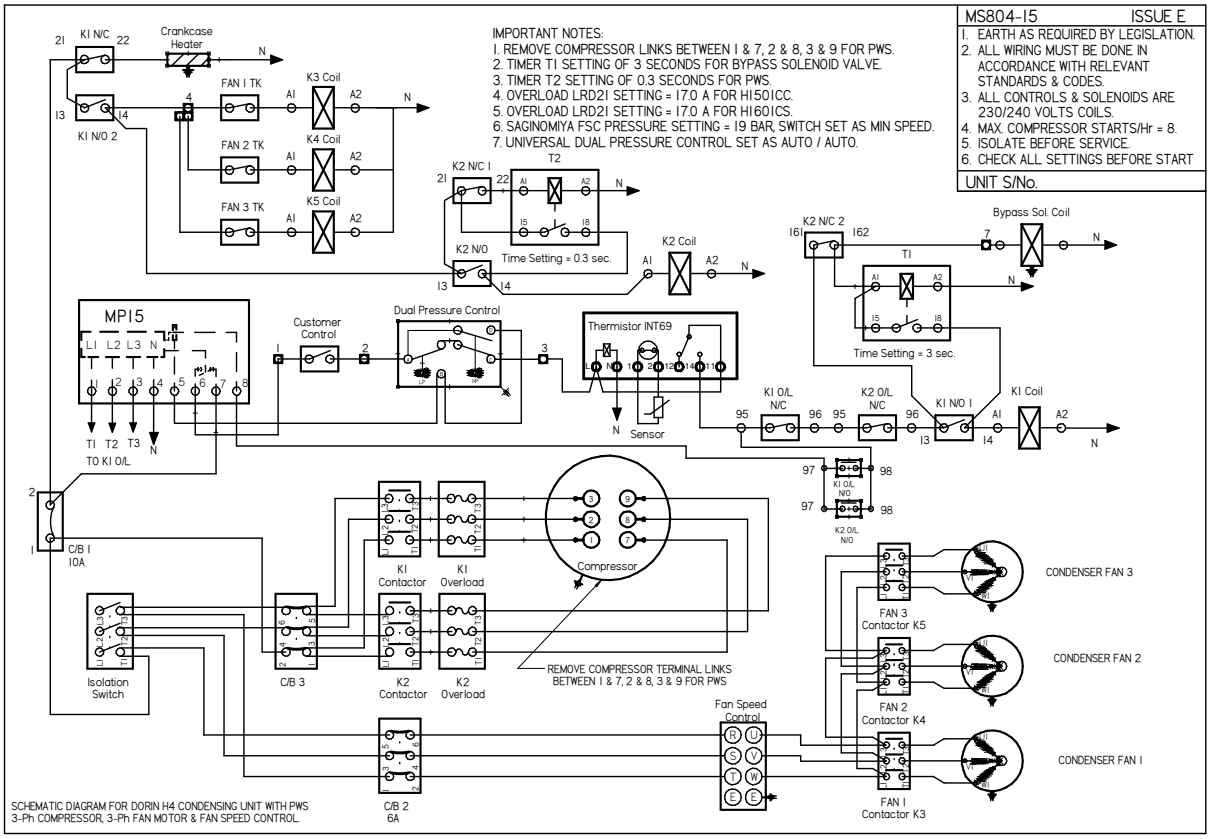


NOTE:

This general wiring schematic is indicative to following optional PWS Titan condensing units with respective Dorin compressors and various quantity of single phase PSC type condenser fans. It may have insignificant differences to the one attached to individual unit at the back of electrical access panel.

- "PPS 264 LMH A1-2" - H1000CC with 3 x Ø450mm fans.
- "PPS 289 LMH A1-4" - H1001CC with 3 x Ø450mm fans.
- "PPS 328 LM A1-2" - H1000CS with 3 x Ø450mm fans.
- "PPS 328 LM A1-4" - H1001CS with 3 x Ø450mm fans.
- "PPS 370 LM A1-2" - H1500CS with 3 x Ø450mm fans.
- "PPS 370 LM A1-4" - H1501CS with 3 x Ø450mm fans.

General Wiring Schematic for Options - PWS

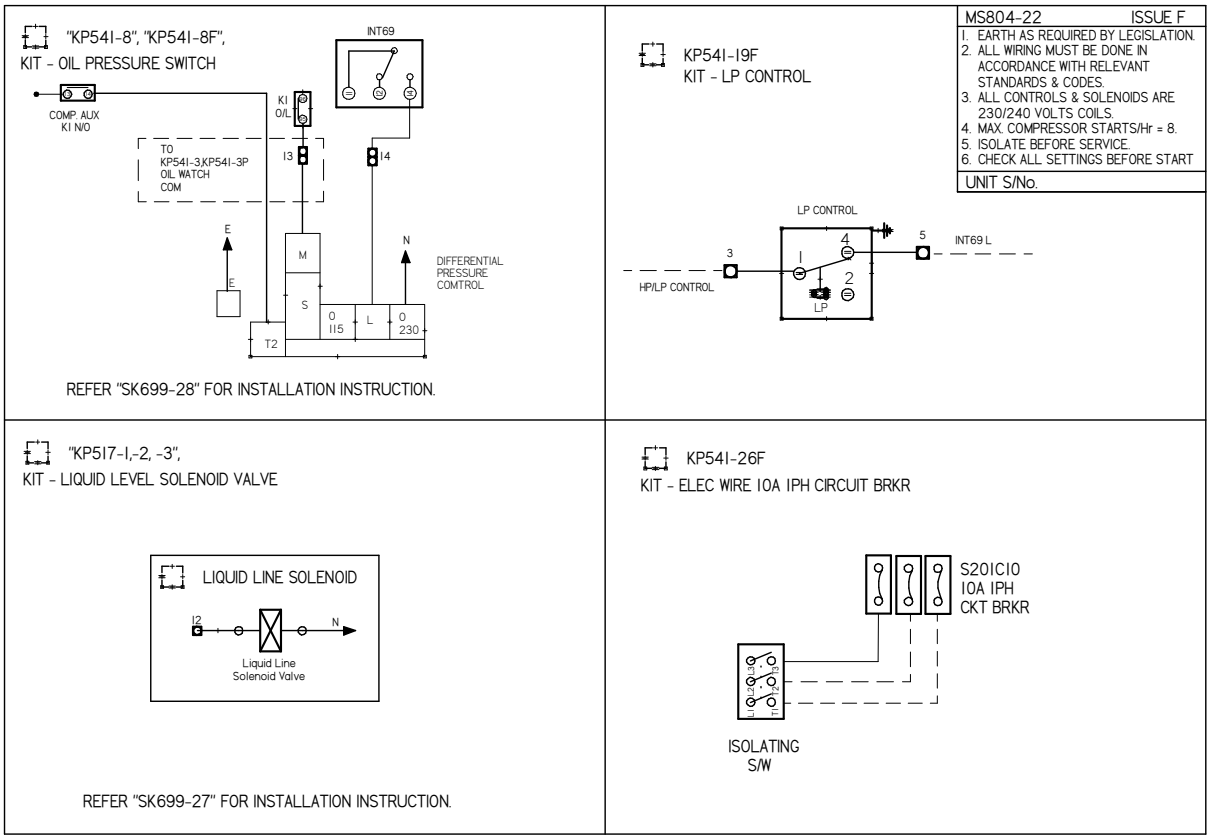


NOTE:

This general wiring schematic is indicative to following optional PWS Titan condensing units with respective Dorin compressors and various quantity of three phase condenser fans. It may have insignificant differences to the one attached to individual unit at the back of electrical access panel.

- "PPS 338 LMH A1-2" - H1500CC, with 3 x Ø500mm fans.
- "PPS 338 LMH A1-4" - H1501CC, with 3 x Ø500mm fans.
- "PPS 411 LM A1-2" - H1600CS, with 3 x Ø500mm fans.
- "PPS 411 LM A1-4" - H1601CS, with 3 x Ø500mm fans.

General Wiring Schematic for Options on TITAN



NOTE:
This wiring schematic is indicative to following standard Titan condensing units with respective Dorin compressors and various quantity of condenser fans. It may have insignificant differences to the one attached to individual unit at the back of electrical access panel.

2-FAN UNITS:
PPS 124 LM A1-2 (H403CC/HTCR)
PPS 149 LM A1-2 (H503CC/HTCR)
PPS 152 LM A1-2 (H550CC)
PPS 152 LMH A1-4 (H551CC)
PPS 178 LM A1-2 (H700CC)
PPS 178 LMH A1-4 (H701CC)
PPS 205 LMH A1-4 (H751CC)
PPS 212 LM A1-2 (H750CC)

3-FAN UNITS:
PPS 242 LM A1-2 (H750CS)
PPS 242 LMH A1-4 (H751CS)
PPS 264 LMH A1-2 (H1000CC)
PPS 289 LMH A1-4 (H1001CC)
PPS 328 LM A1-2 (H1000CS)
PPS 328 LM A1-4 (H1001CS)
PPS 338 LMH A1-2 (H1500C)
PPS 338 LMH A1-4 (H1501CC)
PPS 370 LM A1-2 (H1500CS)
PPS 370 LM A1-4 (H1501CS)
PPS 411 LM A1-2 (H1600CS)
PPS 411 LM A1-4 (H1601CS)

COMMISSIONING NOTES

UNIT SERIAL NUMBER

INSTALLATION/COMMISSIONING DATE(S)