



Installation Manual

(Original Instruction)

**Scroll condensing unit
for medium temperature application**

JEHSCU0200M1
JEHSCU0200M3
JEHSCU0250M1
JEHSCU0250M3
JEHSCU0300M1
JEHSCU0300M3

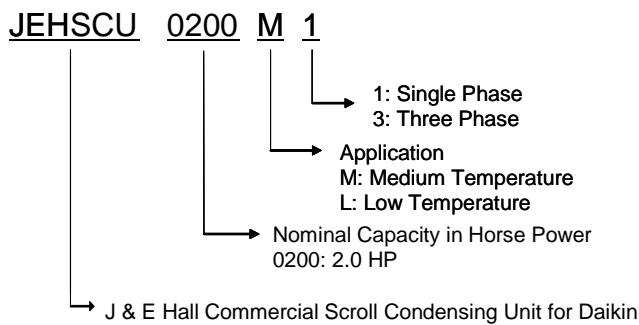
JEHSCU0350M3
JEHSCU0400M3
JEHSCU0500M3
JEHSCU0600M3
JEHSCU0680M3



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1. Nomenclature



2. Safety and Health

Important Note

Only a qualified refrigeration engineer who is familiar with refrigeration systems and components, including all controls should perform the installation and start-up of the system. To avoid potential injury, use care when working around coil surfaces or sharp edges of metal cabinets. All piping and electrical wiring should be installed in accordance with all applicable codes, ordinances and local by-laws.

General Information

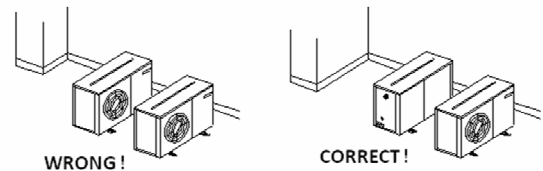
- Ensure the unit received is the correct model for the intended application.
- Ensure refrigerant, voltage, are suitable for the proposed application and environment.
- Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.
- The condensing unit is delivered with a nitrogen holding charge.
- The condensing unit contains moving machinery and electrical power hazards. May cause severe injury or death. Disconnect and shut off power before installation or service of the equipment.
- Refrigerant release into the atmosphere is illegal. Proper evacuation, handling and leak testing procedures must be observed at all times.
- Units must be earthed and no maintenance work should be attempted prior to disconnecting the electrical supply.

- The electrical covers and condenser fan guard must remain fitted at all times.
- Use of the condensing unit outside of design conditions and application for which units were intended may be unsafe and be detrimental to the unit, regardless short or long term operation.
- The condensing units are not designed to withstand loads or stresses from other equipment or personnel. Such extraneous loads or stress may cause failure/leak/injury.
- In some circumstances, a suction accumulator (not supplied) component may be required, it offers protection against refrigerant flood back during operation. It helps protect against off-cycle migration by adding internal free volume to the low side of the system.
- Test must be conducted to ensure the amount of off-cycle migration to the compressor does not exceed the compressor's charge limit.
- Wherever possible the system should be installed to utilize a pump down configuration.
- After installation, the system should be allowed to run for 3 – 4 hours. The oil level should be checked after 3 – 4 hours run time and topped up as necessary. The oil level should be visible at least ½ - ¾ up the compressor oil sight glass. For the details of the oil requirements, please refer to page 5 in the installation & commissioning section and page 5 in the service and maintenance section.

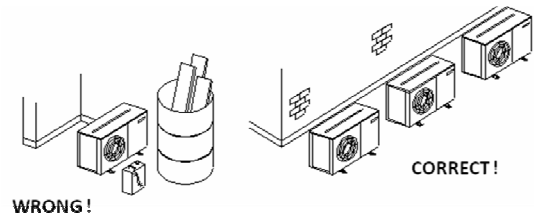
3. Installation & Commissioning

3.1 Unit site location

- In order to achieve maximum cooling capacity, the installation location for condensing unit should be carefully selected.
- Install the condensing unit in such a way so that hot air distributed by the condensing unit cannot be drawn in again (as in the case of short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



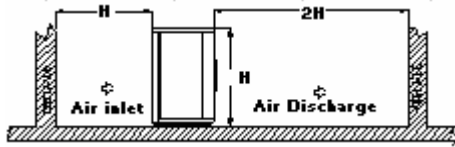
- Ensure that there is no obstruction of air flow into or out of the unit. Remove obstacles which block air intake or discharge.



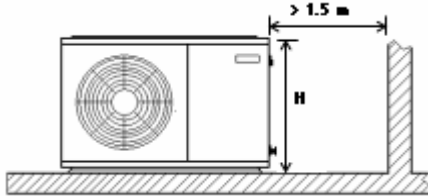
- The location must be well ventilated, so the unit can draw in and distribute plenty of air thus lowering the condensing temperature.
- To optimize the unit running conditions, the condenser coil must be cleaned at regular intervals.

3.2 Installation Clearance

- The installation location should allow sufficient space for air flow and maintenance around the unit.



- To allow sufficient space for doing service or installation.



3.3 Field Piping

Important Note

Line sizing should only be determined by qualified personnel. All local codes of practice must be observed in the installation of refrigerant piping

To ensure satisfactory operation and performance, the following points should be noted for field piping arrangements,

- Pipework routes must be as simple and as short as possible.
- Avoid low points on pipework where oil can accumulate.
- Correct line sizing will minimize the pressure drop and maintain sufficient gas velocity for proper oil return.
- Use only clean, dehydrated refrigeration grade copper tube with large radius elbows.
- Braze without over filling to ensure there is no excess solder into the tube.
- To prevent oxidation, blow nitrogen through pipework when brazing.
- Install insulation on all suction lines.
- Adequately support all pipe work at a maximum of 2 meter intervals.
- In vertical pipework, the use of U-trap and double suction risers is often required. These suction risers must always be fitted with a U-trap at the bottom and a P-trap at the top and never be higher than 4 meter unless a second U-trap system is fitted.
- Recommend piping length less than 25m. Additional oil might be required if piping length exceeds 20m or with many oil traps. Normally quantity of top up oil required should not exceed 2% of the total refrigerant charge.

3.4 Pressure testing

- When running a pressure test, always use an inert, dry gas such as Nitrogen
- The pressure differential between the high and low side should not exceed 30 bar (435 psig)
- Test pressures are :
 - 19 bar (275 psig) on the Low Side
 - 28 bar (405 psig) on the High Side

3.5 Leak detection

- Make sure that all manual valves are open
- Perform a leak test of the system using nitrogen mixed with the refrigerant to be used
- Do not use CFC for leak testing the condensing unit which will be used with HFC refrigerants

- The use of leak testing fluids is not recommended as this may interact with the lubricants own additives

3.6 Vacuum - moisture removal

Important Note

Moisture prevents proper functioning of the compressor and the refrigeration system

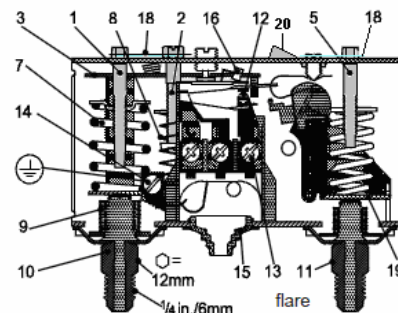
Air and moisture reduce service life and increase condensing pressure causing abnormally high discharge temperatures likely to destroy the oil's lubricating properties. The risk of acid formation is also increased by air and moisture and copper plating can be generated in this way. All these phenomena can be cause mechanical and electrical failure.

Important Note

Ensure that a good quality vacuum pump is used to pull a minimum vacuum of 250 microns (0.33 mbar)

3.7 Safety pressure switch settings

The pressure switch fitted to condensing units with auto reset for low pressure and manual reset for high pressure are **NOT** factory preset.



- | | |
|---------------------------------------|-------------------------|
| 1. Low pressure (LP) setting spindle | 12. Switch |
| 2. Differential setting spindle, LP | 13. Terminals |
| 3. Main arm | 14. Earth terminal |
| 5. High pressure (HP) setting spindle | 15. Cable entry |
| 7. Main spring | 16. Tumbler |
| 8. Differential spring | 18. Locking plate |
| 9. Bellows | 19. Arm |
| 10. LP connection | 20. Manual reset button |
| 11. HP connection | |

High pressure safety (Manual reset)

The high pressure safety switch is required to stop the compressor, should the discharge pressure exceed the values shown in the following table. The high pressure switch can be set to lower values depending on the application and the ambient conditions

Model	Series 2, 3	
	R404A	R134a
Cut Out (bar g)	28	23
Cut Out (psi g)	405	330

Setting procedure for KP 17B;

Remove the locking plate before setting. Set the stop pressure of high pressure side on the "CUT-OFF" scale by one rotation of the high pressure spindle ~ 2.3 bar. Clockwise turning of this spindle will cause the setting value larger. Lock the spindle with locking plate after setting.

High pressure controls can be manually reset by manual reset switch when the pressure is lower/ equal to the cut out pressure minus the differential pressure (4 bar/ 58 psi).

Low pressure safety (Auto reset)

The low pressure safety switch is recommended to avoid compressor operation at too lower suction pressure and vacuum condition. The low pressure safety cut should never be set below value as shown in the following table.

Model	Series 2, 3	
	R404A	R134a
Refrigerant	R404A	R134a
Application	M*	M*
Cut out (bar g)	1.0	0.6
Cut out (psi g)	14.5	9.0

Note: M : Medium temperature application

The low pressure cut off pressure is the setting of cut in minus the differential.

Setting procedure for KP 17B;

Remove the locking plate before setting. Set the start pressure on the "CUT-IN" scale by one rotation of the low pressure spindle ~ 0.7 bar. Clockwise turning of this spindle will cause the setting value larger.

Set the differential pressure on the "DIFF" scale by one rotation of the differential spindle ~ 0.15 bar. Clockwise turning of this spindle will cause the setting value smaller.

Lock the spindle with locking plate after setting.

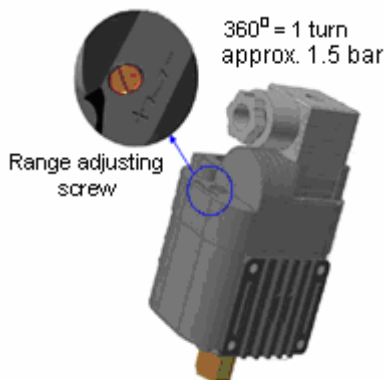
Important Note

There must be no more than 12 compressor starts per hour. A higher number reduces the service life of the compressor. If necessary, use an anti-short-cycle timer in the control circuit. Minimum a 2 minute runtime after each start of compressor and a 3 minute idle time after each stop & start are recommended. Only during the pump down cycle may the compressor run for much shorter intervals.

3.8 Fan speed controller setting

The fan speed controller controls the speed of the condenser.

It keeps the condensing pressure at a steady level by changing the speed of the fan according to the required condensing pressure.



XGE fan speed controller

Setting point can be increased by turning the adjusting screw clockwise. Setting point can be decreased by turning the adjusting screw counter clockwise. Adjustment should be

within the range indicated for the setting pointer. Factory setting is 19 bar.

Recommend setting for range setting pointer/ range adjusting screw as table below:

Refrigerant	R404A	R134a
Setting (bar)	19	10

The XGE fan speed controller is cut off mode setting initially.

3.9 Oil requirements

Medium temperature application

Model	Oil type	Oil Charge (L)
JEHSCU0200M1	Polyester oil (160PZ)	1.24
JEHSCU0200M3		1.24
JEHSCU0250M1		1.30
JEHSCU0250M3		1.36
JEHSCU0300M1		1.45
JEHSCU0300M3		1.45
JEHSCU0350M3		1.48
JEHSCU0400M3		1.36
JEHSCU0500M3		2.07
JEHSCU0600M3		1.89
JEHSCU0680M3		1.80

3.10 Commissioning of the Condensing Unit

Please make sure that all manual service valves are fully open when starting the system for the first time.

This includes external shut off valves as well as liquid receiver valve in the unit.

3.11 Compressor electrical wiring

Important Note

Compressor wiring for 3 phases modals must be controlled. Supply phase sequence L1, L2 and L3 will affect the compressor rotating direction and damage the compressor.

Service technician should be present at initial start-up to verify that the supply power is properly phased and that compressor is rotating in the correct direction.

Verification of proper rotation direction is made by observing that suction pressure drops and discharge pressure rises when the compressor is energized. Reverse rotation of a scroll compressor also results in substantially reduced current draw. Suction temperature will be high, discharge temperature will be low and the compressor may be abnormal noisy.

4. Checklist

- Ensure crankcase heater is energized minimum 12 hours prior to start up and permanently energized.
- Check all electrical connections.
- Check all electrical termination and circuits are correct.
- Check compressor oil level.
- Ensure the high low pressure controls are configured properly.
- Ensure fan motor and fan blades are installed properly.
- Observed the system pressures during the charging and initial operation process.
- Continue to charge the system until sight glass is clear. Make sure that high pressure is > 13.2 bar for R404A and > 7.9 bar for R134a when doing this charge adjustment operation.
- Check the compressor's discharge and suction pressure, ensure it's within operating range.
- Check condenser fan, ensure warm air blowing off the condenser coil.
- Check evaporator blower, ensure it's discharging cool air.
- Check suction superheat and adjust expansion valve to prevent liquid flood back to the compressor.

5. Service and Maintenance

Important Note

Warning! – Disconnect the mains electrical supply before servicing or opening the unit

Warning! – Ensure there is no refrigerant in refrigerant circuit before dismantle it

The condensing units are designed to give long life operation with minimum maintenance. However, they should be routinely checked and the following service schedule is recommended under normal circumstances:

The removal of the top, side and front panels ensures that all parts are accessible.

1. Compressor – Inspect at regular intervals
 - Check for refrigerant leaks on all joints and fittings.
 - Ensure that no abnormal noise or vibration is detected during test run.
 - Check the compressor oil levels and top up if required. The oil level should be ½ to ¾ way up the sight glass.
2. Condenser Fan Motor & Blade – Clean and inspect at regular intervals
 - Check for abnormal noise, vibration and fan imbalance.
 - Ensure that the fan motor is clean and spins freely.
 - Check that the condenser fan blade is clean and free from restriction.
 - Note: The Fan Motor is pre-lubricated and factory sealed so no maintenance is necessary.
3. Condenser Coil – Clean and inspect at regular intervals
 - Check and remove the dirt and debris between the fins using a suitable chemical coil cleaner.
 - Check and remove any obstacles which may hinder the airflow through the condenser coil.
4. Power Supply – Inspect at regular intervals
 - Check the running current and voltage for the condensing unit.
 - Check the electrical wiring and tighten the wires onto the terminal blocks if necessary.

Under normal circumstances:

- Clean condenser coil every three months
- Carry out leak test every month
- Examine electrical cables and enclosures each year

- Check and verify operation of all safety devices every three months, ensure crankcase heater is operational
- Check sight glass and operating conditions
- Check security of compressor mountings and the bolts that hold down the unit each year

6. Trouble Shooting

This troubleshooting guide describes some common condensing unit failure. Consult qualified personnel before any corrective actions are taken.

Failure	Possible Causes
Fan does not work	<ul style="list-style-type: none"> • Improper wiring • Fan motor faulty
Compressor does not start	<ul style="list-style-type: none"> • Improper wiring • Defective contactor or coil • System stopped as the trip of safety device. • Defective start/run capacitor • Compressor faulty
Insufficient cooling	<ul style="list-style-type: none"> • Low refrigerant charge • Condenser coil dirty • Obstacle blocking air inlet/outlet • Improper thermostat setting • Compressor rotating direction is incorrect

7. Specifications

Model	Series	Compressor			Electrical Data								Receiver	Connection		Dimensions			Weight (kg)	Sound pressure dB(A) at 1m ^c	
		Type	Swept volume m ³ /h	Oil Charge (L)	Power Input	Nominal Current ^a (A)		Starting Current ^a (A)		MFA ^b (A)		Airflow (m ³ /h)		Volume (Litre)	Suction (inch)	Liquid (inch)	Width (mm)	Depth (mm)			Height (mm)
						1 ^d	2 ^e	1 ^d	2 ^e	1 ^d	2 ^e										
JEHSCU0200M1	2	ZB15KQE-PFJ	5.9	1.24	230V/1~/50Hz	7.7	5.2	58	58	20	15	2620	4.6	3/4	3/8	1109	478	649	87.5	50.1	
JEHSCU0200M3	2	ZB15KQE-TFD	5.9	1.24	400V/3~/50Hz	3.1	2.51	26	26	15	15	2620	4.6	3/4	3/8	1109	478	649	87.5	50.1	
JEHSCU0250M1	2	ZB19KQE-PFJ	6.8	1.30	230V/1~/50Hz	9.6	6.24	61	61	25	15	2620	4.6	3/4	3/8	1109	478	649	89.5	51.2	
JEHSCU0250M3	2	ZB19KQE-TFD	6.8	1.36	400V/3~/50Hz	4.3	2.98	32	32	15	15	2620	4.6	3/4	3/8	1109	478	649	89.5	51.2	
JEHSCU0300M1	2	ZB21KQE-PFJ	8.6	1.45	230V/1~/50Hz	12.6	7.65	82	82	25	20	2620	4.6	3/4	3/8	1109	478	649	91.5	54.4	
JEHSCU0300M3	2	ZB21KQE-TFD	8.6	1.45	400V/3~/50Hz	4.5	3.46	40	40	15	15	2620	4.6	3/4	3/8	1109	478	649	91.5	54.4	
JEHSCU0350M3	3	ZB26KQE-TFD	9.9	1.48	400V/3~/50Hz	5.5	3.70	46	46	15	15	6050	7.6	7/8	1/2	1335	529	884	114	55.4	
JEHSCU0400M3	3	ZB29KQE-TFD	11.4	1.36	400V/3~/50Hz	7.0	4.36	50	50	15	15	6050	7.6	7/8	1/2	1335	529	884	121	53.5	
JEHSCU0500M3	3	ZB38KQE-TFD	14.4	2.07	400V/3~/50Hz	6.8	5.63	65.5	65.5	20	15	6050	7.6	7/8	1/2	1335	529	884	126	54.9	
JEHSCU0600M3	3	ZB45KQE-TFD	17.1	1.89	400V/3~/50Hz	9.7	5.67	74	74	20	15	5180	7.6	7/8	1/2	1335	529	884	128	59.5	
JEHSCU0680M3	3	ZB48KQE-TFD	18.8	1.80	400V/3~/50Hz	9.9	6.45	101	101	25	20	5180	7.6	7/8	1/2	1335	529	884	129	59.4	

^a Refer to condition: Outside ambient temperature= 32°C, Evaporation temperature = -10°C (medium temper ature application, R404A); 5°C (medium temperature application, R134a)

^b MFA = Maximum Fuse Amps

^c Sound pressure level measured according ISO 3744

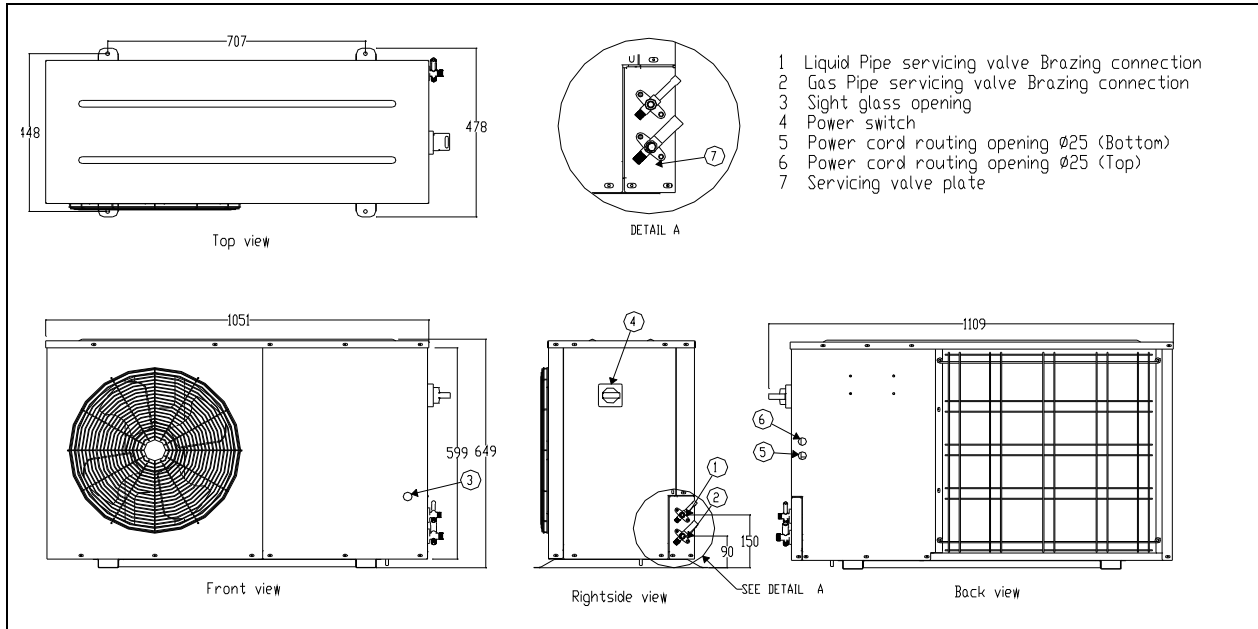
^d refer to condensing unit charge with R404A

^e refer to condensing unit charge with R134a

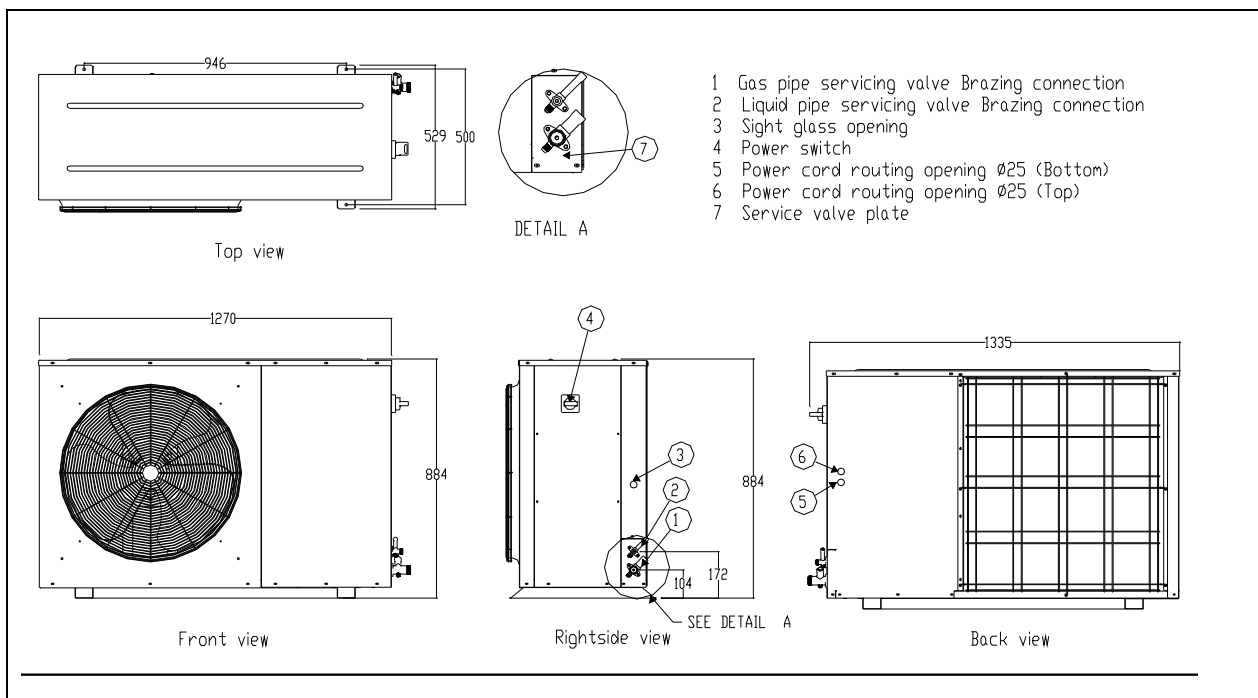
8. Outline Drawings

Series 2 (230V/1~/50Hz): Medium temperature: JEHSCU0200M1, JEHSCU0250M1, JEHSCU0300M1

Series 2 (400V/3~/50Hz): Medium temperature: JEHSCU0200M3, JEHSCU0250M3, JEHSCU0300M3



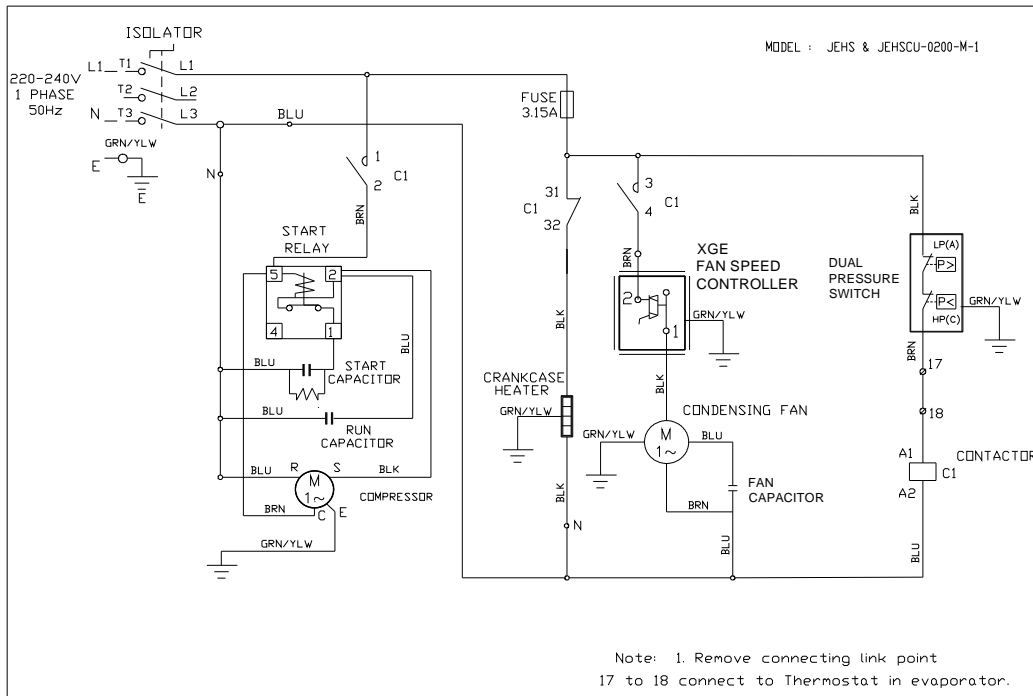
Series 3 (400V/3~/50Hz): Medium temperature: JEHSCU0350M3, JEHSCU0400M3, JEHSCU0500M3, JEHSCU0600M3, JEHSCU0680M3



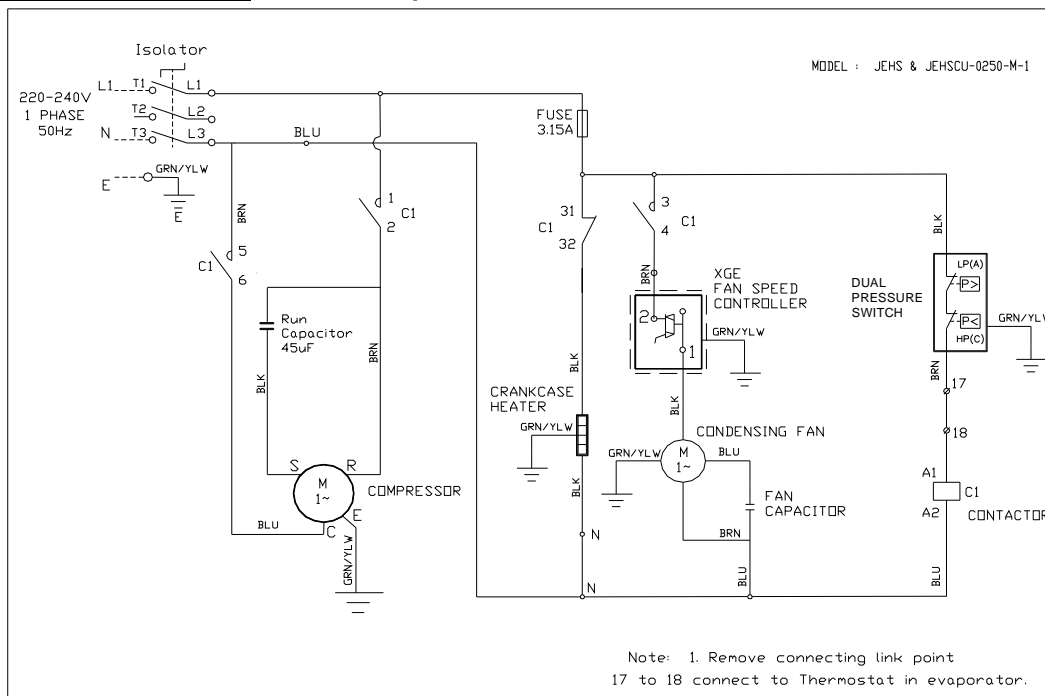
9. Electrical Data

Important Note: All wiring and connections to the condensing unit must be made in accordance to the local codes.

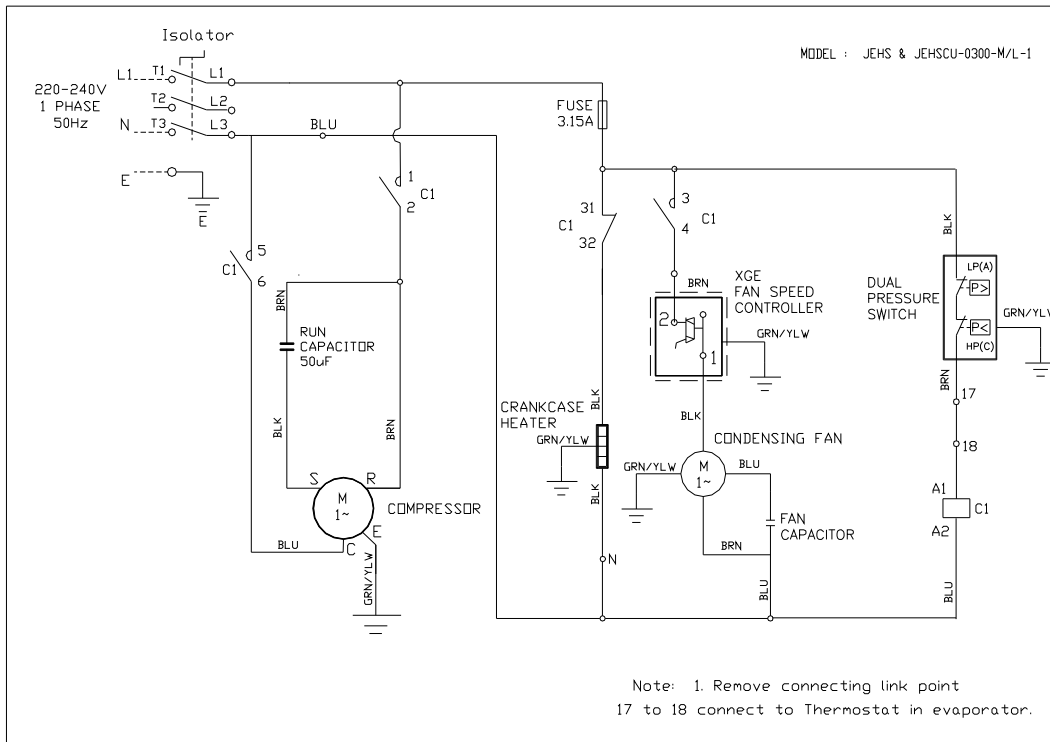
Series 2 (230V/1~/50Hz): Medium temperature: JEHSCU0200M1



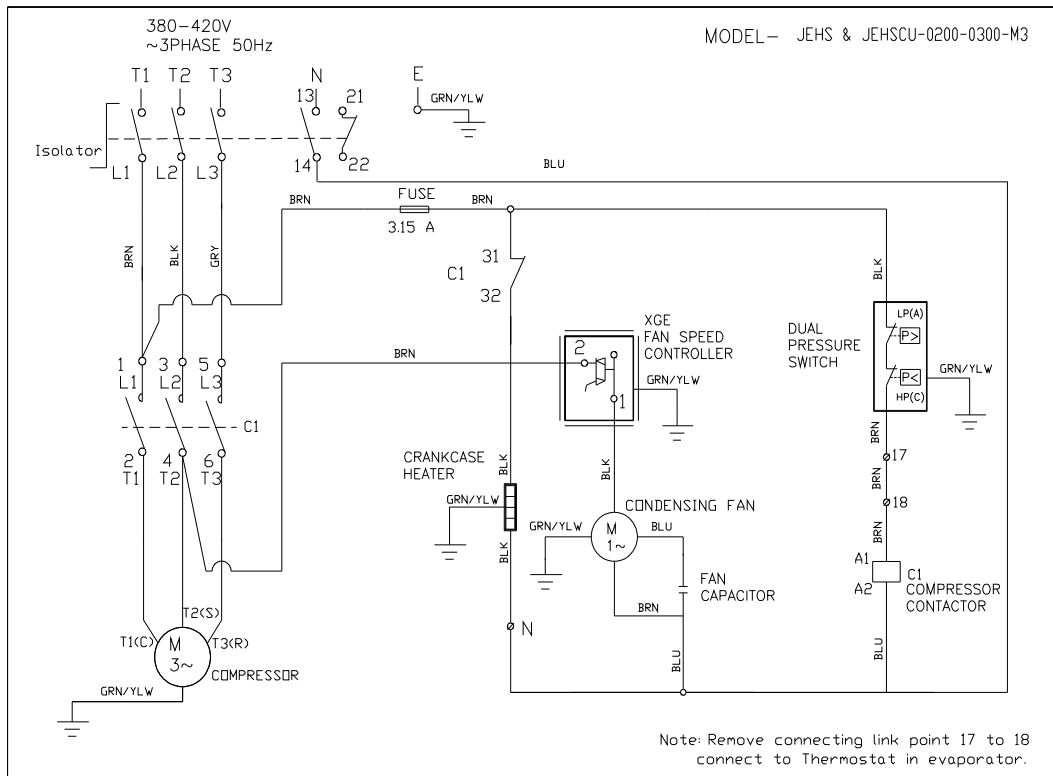
Series 2 (230V/1~/50Hz): Medium temperature: JEHSCU0250M1



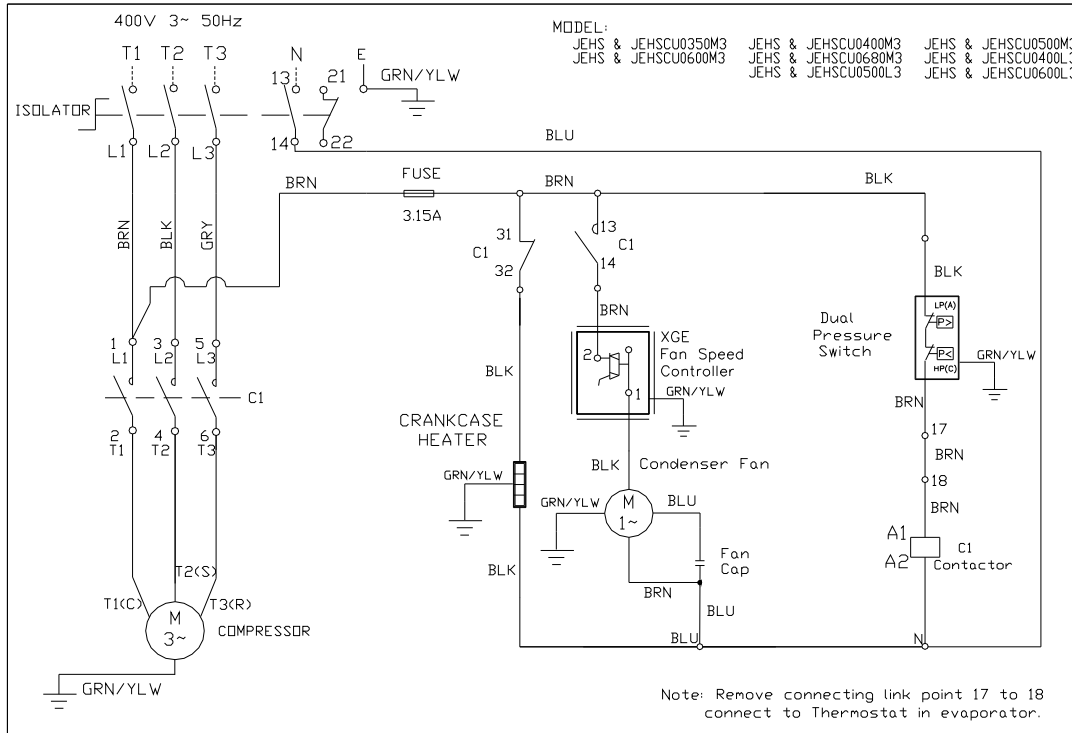
Series 2 (230V/1~/50Hz): Medium temperature: JEHSCU0300M1



Series 2 (400V/3~/50Hz): Medium temperature: JEHSCU0200M3, JEHSCU0250M3, JEHSCU0300M3





Series 3 (400V/3~/50Hz): Medium temperature: JEHSCU0350M3, JEHSCU0400M3,
JEHSCU0500M3, JEHSCU0600M3,
JEHSCU0680M3



10. Declaration of Conformity

J&E/DOC/001-10(0)

	<p>Declaration of Conformity Konformitätsbescheinigung Déclaration de Conformité Conformiteitsverklaring Declaración de Conformidad Dichiarazione di Conformità Overensstemmelseerklaring Declaração de Conformidade</p>
<p>J & E HALL REFRIGERATION SDN. BHD.</p> <p>LOT 10, JALAN PERUSAHAAN 8, KAWASAN PERUSAHAAN PEKAN BANTING, 42700 BANTING, SELANGOR DARUL EHSAN, MALAYSIA.</p>	
<p>declare under our sole responsibility that the products bescheinigen auf unsere eigene Verantwortung, daß die Produkten déclarons sous notre seule responsabilité que les produits verklaart onder onze uitsluitende verantwoordelijkheid de producten declaramos sobre nuestra sola responsabilidad que los productos dichiariamo sotto nostra sola responsabilità che i prodotti erklærer som eneansvarlige, at produktet declaramos sob a nossa responsabilidade exclusiva que os produtos</p>	
<p>COMMERCIAL REFRIGERATION CONDENSING UNIT Unidad que condensa comercial de la refrigeración Unité de condensation commerciale de réfrigération Commerciële condenserende koel-unit Kommerzielle kondensierende Maschine der Abkühlung Unità condensate commerciale di refrigerazione kale kondenseringseenheden til kommercielt brug Unidade de condensação de refrigeração</p>	
<p>Model Designations: Bauwörter-Beschreibungen: Désignations Modèles: Aanwijzingen Model: Designaciones Modelo: indicazioni di Modello: modelbenoegingen: Designações do modelo:</p>	<p>See Appendix I overleaf Sehen sie anhang I wesettig Voir l'annexe I au verso Zie ontweziende voor bylage I Ver el apéndice I a la vuelta Vedi overleaf l'appendice I se apendices I på bagsiden Ver Apêndice I verso</p>
<p>which this declaration relates is in conformity with the requirements of the following directives auf diese Bescheinigung sich beziehen, sind den Vorschriften der Normen entsprechend auxquels se réfèrent cette déclaration, sont conformes aux prescriptions des directives waarop deze verklaring betrekking heeft, in overeenstemming is/zijn met de eisen van de volgende richtlijnen a los cuales se refieren esta declaración, son conformes a las prescripciones de las directivas alla quale si riferisce questa dichiarazione, sono conformi alle prescrizioni delle direttive som denne erklæring vedrører, er i overensstemmelse med kravene fremsat i følgende direktiver que esta declaração está conforme os requerimentos das seguintes directizes</p>	
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<p>J & E HALL REFRIGERATION SDN. BHD General Manager</p>  <p>Teh Yeow Chong Issue Date: 12 January 2010</p>	



Declaration of Conformity

Konformitätsbescheinigung
Déclaration de Conformité
Conformiteitsverklaring
Declaracion de Conformidad
Dichiarazione di Conformità
Overensstemmelseserklæring
Declaração de Conformidade

J & E HALL REFRIGERATION SDN. BHD.

**LOT 10, JALAN PERUSAHAAN 8, KAWASAN PERUSAHAAN PEKAN
BANTING, 42700 BANTING, SELANGOR DARUL EHSAN, MALAYSIA.**

*Model Designations:
Baumuster-Bezeichnungen:
Designation Modelos:
Amdudingen Model:
Designaciones Modelo:
Indicazioni de Modello:
modelbetegnelse:
Designações do modelo:*

JEHSCU-0200-M-1
JEHSCU-0250-M-3
JEHSCU-0350-M-3
JEHSCU-0600-M-3

JEHSCU-0200-M-3
JEHSCU-0300-M-1
JEHSCU-0400-M-3
JEHSCU-0680-M-3

JEHSCU-0250-M-1
JEHSCU-0300-M-3
JEHSCU-0500-M-3

