

Installation Manual

KX-600K



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1、 Installation Instruction

Protective Equipment



Safety first



Recommendations



- Always use adequate personal protective equipment before doing anything on this unit.
- Technicians must wear the proper PPE in right way, including full body harness with two hooks in the waist, safety cap, safety glasses and safety shoes.

- Disconnect the vehicle battery:--Remove the battery ground(-);Then disconnect the positive battery(+).
- Check the grip brake of truck to ensure it being launched in safe.
- Pull out the key.
- Put safety tag on the steering wheel.

- Drain hose from the evaporator to the outside must have an angle to insure water to be drained out.
- A descent of 100mm minimum must be applied between evaporator drain water hoses and the hoses inside the body

1、 Installation Instruction

Installation steps



- Technicians must wear the proper PPE in right way, including full body harness with two hooks in the waist, safety cap, safety glasses and safety shoes.
- Check the grip brake of truck to ensure it being launched in safe.
- Pull out the key.
- Put safety tag on the steering wheel.

2、 Check fitting kit to make sure all parts and drawing are present

Before installation



1. Unpack the box contents in your warehouse.

KEEP THE DOCUMENT DELIVERED WITH THE UNIT

2. Unpack the box

3. Check the box content corresponds to the bill of material on the packaging.

- Condenser
- Evaporator
- Mounting kit
- Cab command

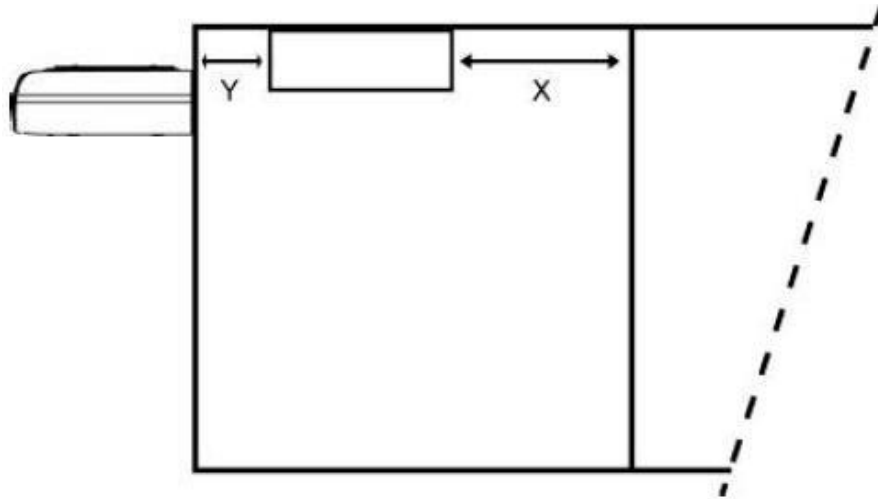


Note

In the event of abnormality (missing, damaged part or part number etc), fill in the form “Advance warning, DOA, Claim” and contact Zhengzhou Kaixue Cold Chain Co., Ltd.

3、 Preparation before condenser and evaporator installation

Before installation

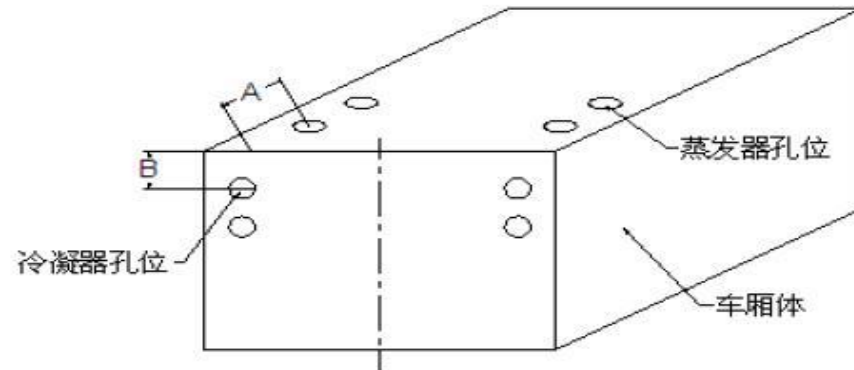


Model	X	Y
KX-600K	1500mm	150mm

- Take care not to obstruct the air intakes on the evaporator section and the ventilation ducts.
- For any mobile partition installation, contact our Technical Department or refer to the attached chart.

3、Preparation before condenser and evaporator installation

Before installation

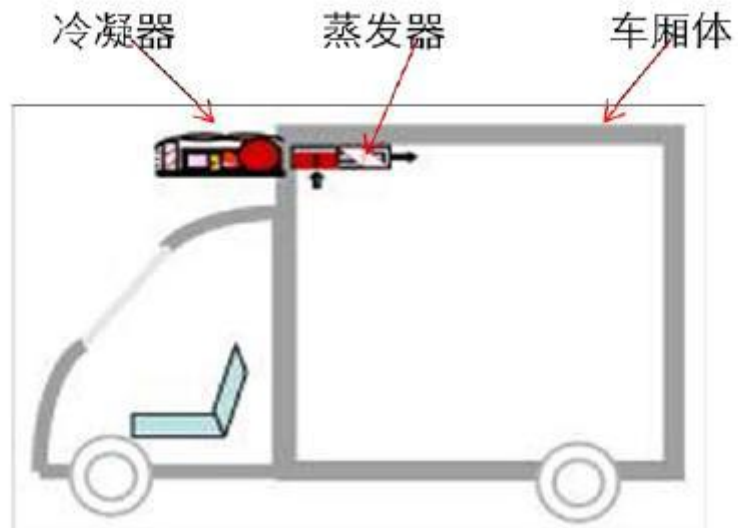


The left figure shows the holes location for condenser and evaporator installation, A is the distance from the hole to the outside of front body, B is the distance from the hole to the outside of top body.

Model	A	B
KX-600K	350~540mm	140~260mm

3、 Preparation before condenser and evaporator installation

Box: preparation



Recommendations

Before box preparation and unit installation start, protect the vehicle roof and the refrigeration box floor (cover, cardboard...). And there should be the embedded bracket inside the box.

RECOMMENDATIONS

Install condenser on the top of the cab, and in front of the box.

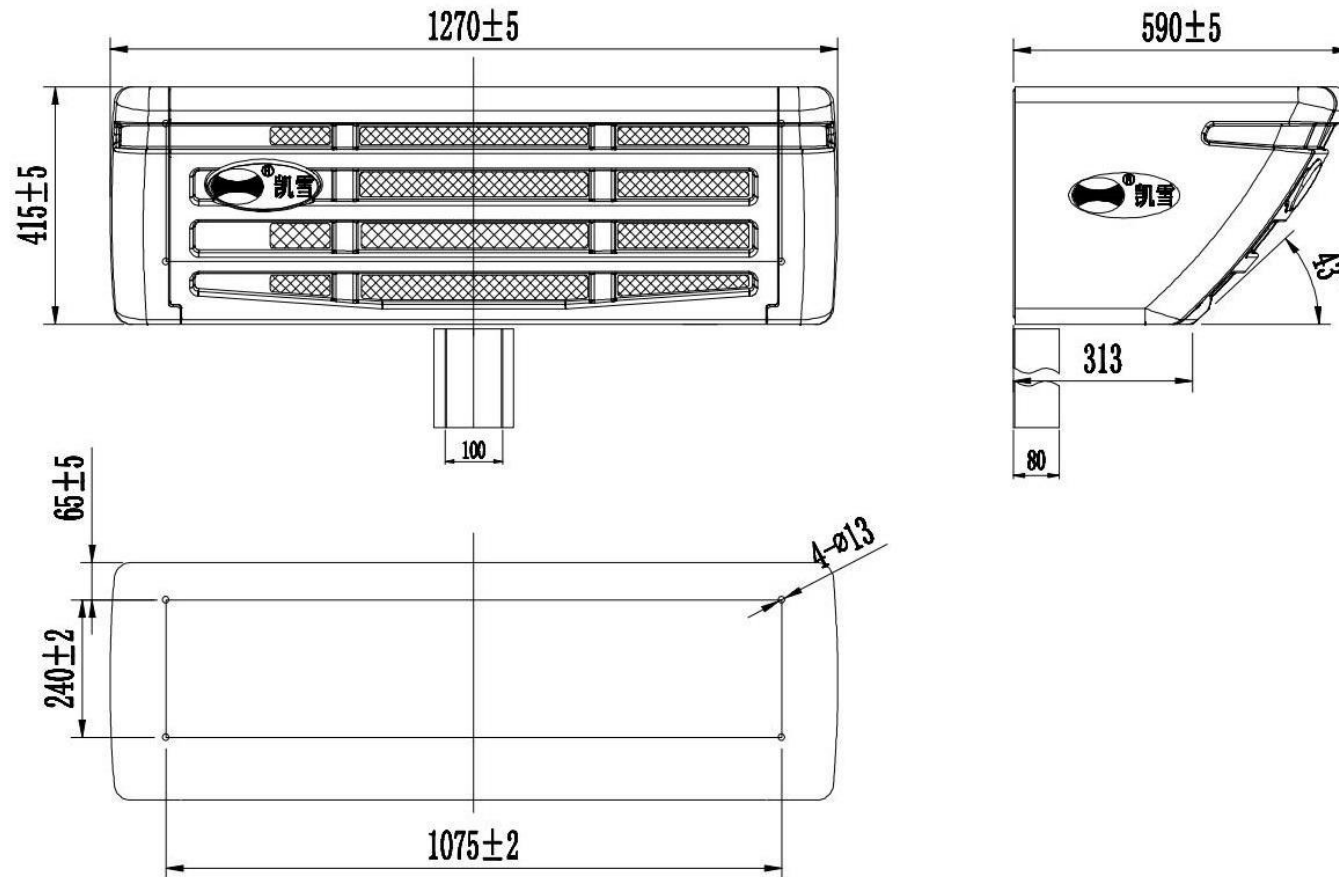
Install evaporator on the top of the box.

CAUTION: Seal the holes when complete the unit installation.

The complete installation is as shown.

3、Preparation before condenser and evaporator installation

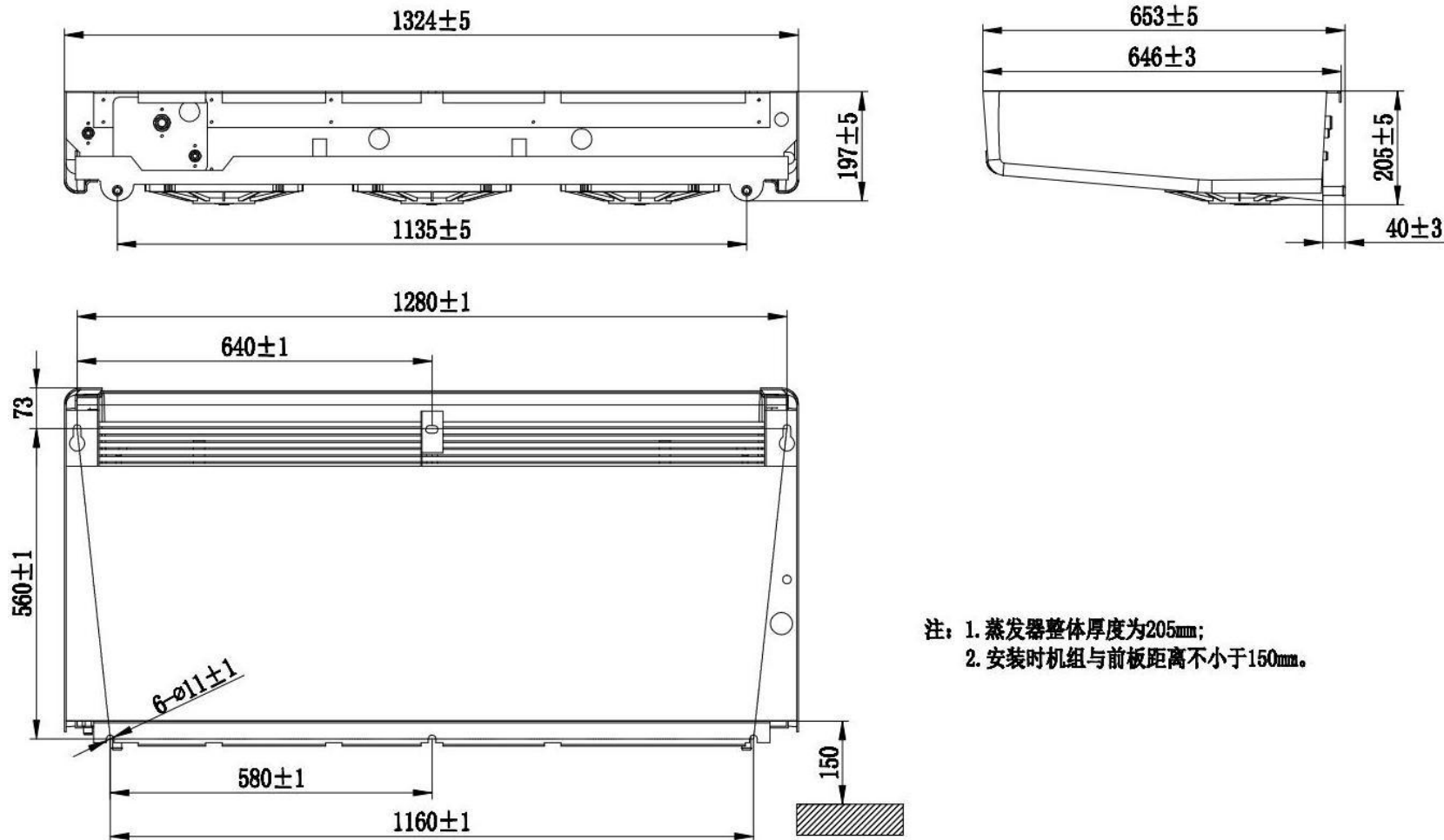
KX-600K condenser installation drawing



前厢外板孔距尺寸图

3、Preparation before condenser and evaporator installation

KX-600K evaporator installation drawing



- 注：1. 蒸发器整体厚度为205mm；
 2. 安装时机组与前板距离不小于150mm。

3.1、 Condenser installation

Box: drilling-nosemount



1. Unpack condenser, route harness, remove the two side panels and covers.
2. Adjust solenoid valve in the vertical tube direction to facilitate installation.

3.1、 Condenser installation

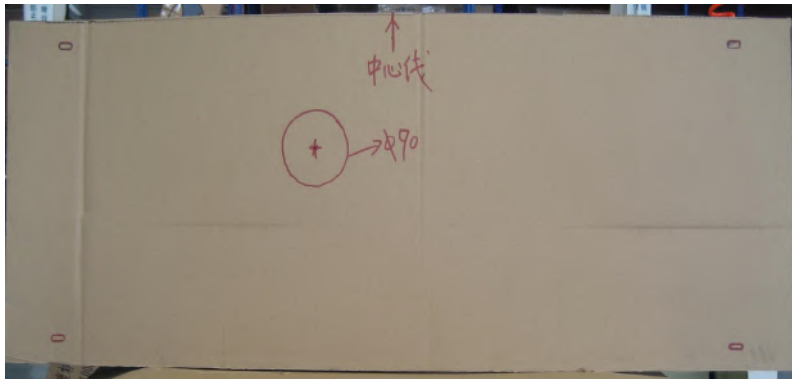
Box: drilling-nosemount



Insure holes location of the box, make the top of condenser as the same height as box as possible, allow enough space for lifting cab and not contact with condenser.

3.1、 Condenser installation

Box: drilling-nosemount



1. Condenser mounting dimensions are as shown.
2. Condenser fixing holes is $\text{Ø } 15 \text{ mm}$, and note that gaskets are used both in and out of the box.
3. Reserve location of hole $\text{Ø } 90 \text{ mm}$ for hoses and harness, as figure 2 shown.
4. Condenser is installed in the middle of the body.
5. If needed, use the fixing material adapted to reinforcement done by the bodybuilder.

■ Reinforcement must be needed, if any other requirements, please contact Carrier agency.

3.1 Condenser installation

Box: drilling



1. Drilling holes inside the box, which can be used to connect wires, refrigerant hoses, drain hoses.

2. Drain hoses can use the above holes to the outside of the



RECOMMENDATIONS

- A descent of MINIMUM 10 cm must be applied between the drain water hoses and the hoses inside the body to help to drain water out.
- Both connecting holes and drainage holes must be drilled down-up from outside of the

3.1 Condenser installation

Box: drilling-nosemount



1. Lift condenser, fix it on the front of the box by the location of holes.
2. Tighten the screws with nuts, install the skins, and complete installation.

3.2、 Evaporator installation

Box: drilling- evaporator installation



1. Unpack the evaporator; remove the cover on both sides of the evaporator.
2. Find the installing holes on the rear of the evaporator.

3.2.1、 Drilling

Box: drilling-evaporaor installation



1. Evaporator installation: ceiling mounting.
2. Insure holes location on the top of the box by the mounting holes of evaporator.
3. Evaporator mounting holes is \varnothing 15mm, \varnothing 10mm bolts are recommended.
4. Evaporator installed in the middle of the body.
5. If needed, use the fixing material adapted to reinforcement done by the bodybuilder.

■ Reinforcement must be used, if any other requirements, please contact Kaixue(SuperSnow) agency.



NOTE

- Let a **minimum space of 150 mm** between the box wall and the rear of the evaporator.

3.2.1、 Drilling

Box: drilling-evaporator installation



- If body reinforced, install the insert using the adapted tool (manual or pneumatic)

3.2.2、 Fix evaporator

Box: drilling-evaporator installation



1. Using the adapted tool, put the evaporator fixed to the holes previously drilled.

2. Check the minimum distance between the rear of the evaporator and the box.

3. Install evaporator side plates.

NOTE: When installed, a shield should be installed in the fan blade side in the inlet, to avoid the harm

4、 Hose and clamp installation

Hose: stocking



Recommendations

- For a good functioning of refrigeration circuit, refrigeration hoses must be clean and dry.
 - Hoses must be stocked in a dry area, with less variation in temperature as possible and sheltered from moisture.
 - The two ends **MUST ABSOLUTELY** been blocked with tight caps to avoid any internal damages or condensation until their connection into the circuit.
-
- To fit hoses and electrical harnesses, use as much as possible RSGU clamps.
 - To protect hoses and electrical harnesses, use adequate rubber funnels to avoid cutting with metallic corners.

4、Hose and clamp installation

Hose: preparation

1



2



3



4



5



6



1.Tools required.

2.Cut the hose at the right length with appropriate tool.

3.Remove the hose cover.

4.Put POE oil on the connector on fitting.

5.Widen hose clearance with adapted tool before to insert.
double-click clamp.

6.Insert double-click clamp on the hose.

4、 Hose and clamp installation

Hose: preparation



1.Lubricate the fitting.

2.Insert connector in the hose.

3.Crimp the double-click clamp with appropriate crimping tool.

4.Example of a good preparation

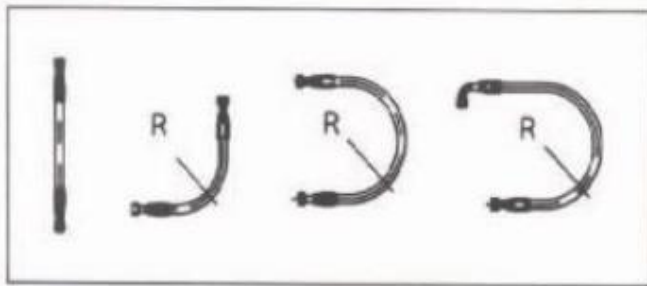
- The clamp gauge (arrow) is set between the hose and the fitting stop. The clamp bands are perpendicular with the fitting and hose.

5、 Refrigeration line, defrost drain hoses and electrical cables installation

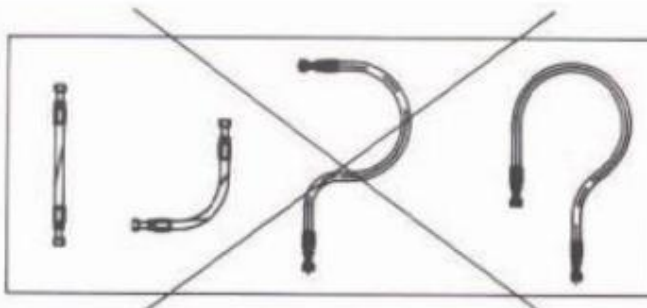
Hose: mounting

1

OK



NOT OK



1. Do not twist or curve the hose.
2. Keep enough length to avoid length variation when the pipes are under pressure.
3. Pipes length can vary between -2% to +4%.
4. Using elbows and fittings make easier installations, assist accessibility and increase hoses/pipes life.
5. Always insure that minimum radius is respected. Provide a radius as big as possible to avoid constriction.

5、 Refrigeration line, defrost drain hoses and electrical cables installation

Unit: refrigeration hoses connection



1. Run refrigeration hoses inside the vehicle body.

2. Run the drain water hoses inside the vehicle body.

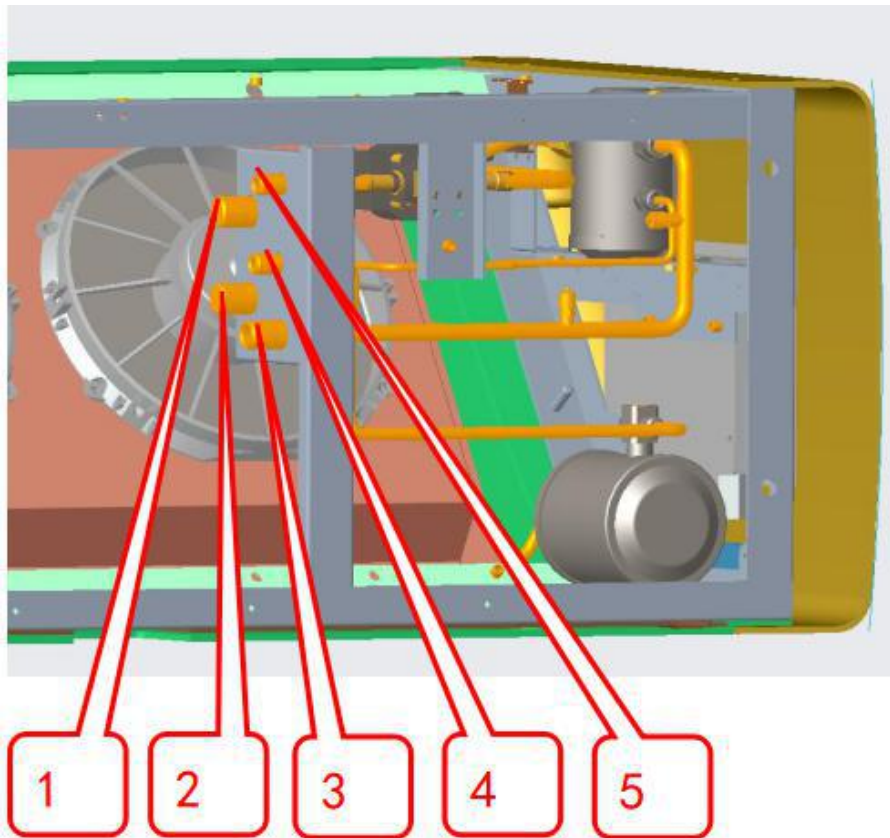


RECOMMENDATIONS

- Always mark the hot gas line (both sides of the hose) in order to avoid the confusion with the liquid line hose.
- Remove caps from the hoses JUST before connecting in order

5、 Refrigeration line, defrost drain hoses and electrical cables installation

Unit: Condenser connection refrigeration hoses



RECOMMENDATIONS

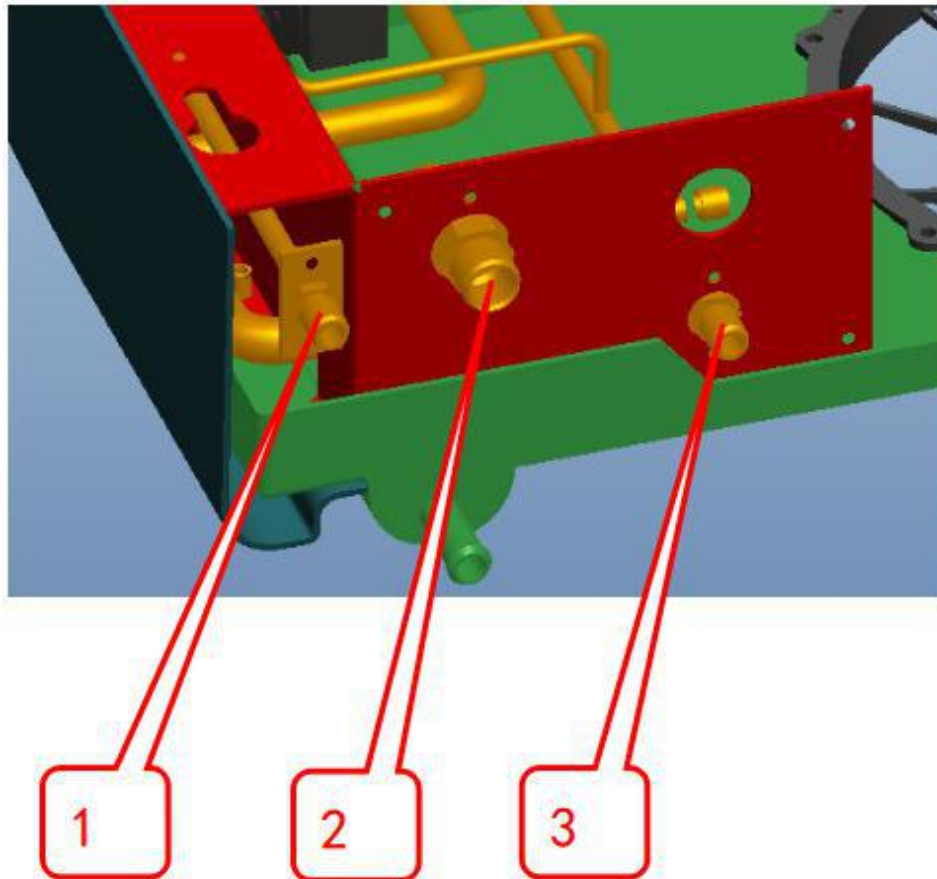
- Always check O-ring is still in place. If O-ring is missing, put a new one in place.

Condenser has 5 outlets, 2 outlets to compressor, 3 outlets to evaporator, connection is as shown:

1. Road suction line (evaporator 2)
2. LP line (to road compressor LP)
3. HP line (to road compressor HP)
4. Liquid line (evaporator 3)
5. Defrost line (evaporator 1)

5、 Refrigeration line, defrost drain hoses and electrical cables installation

Unit: Evaporator connection refrigeration hoses



RECOMMENDATIONS



■ Always check O-ring is still in place. If O-ring is missing, put a new one in place.

3 lines to condenser:

1. Hot gas defrost line

2. Suction line

3. Liquid line

5、 Refrigeration line, defrost drain hoses and electrical cables installation

Unit: refrigeration hoses



1. Refer to the above connection, connect condenser, evaporator and compressor accordingly.
2. Clamp all hoses properly.

5、 Refrigeration line, defrost drain hoses and electrical cables installation

Unit: battery cable connection



1. Run the cab cable and hoses through the box.
2. Connect motors of evaporator.
3. Maintain all cables with plastic tie-wraps.

5、 Refrigeration line, defrost drain hoses and electrical cables installation

Evaporator: drain water hoses



1. Install drain hoses.

RECOMMENDATIONS

- A descent of MINIMUM 10 cm must be applied between the drain water hoses and the hoses inside the body to help to drain water out.

2. Connect the drain hoses.

3. Fix the drain hoses at the right position.

4. Insulate the drain tubes at evaporator side.

5. After connecting completion, block the gap of connection holes with silicon or plasticine.

6、 Charge compressor oil

Compressor oil charge



Unit model	KX-600K
Road compressor model	QP16
Refrigerant	R404A
Compressor/ml	200
Oil separator/ml	80
System charge volume/ml	250

Before compressor installation, please make sure:

- 1.The compressor is always under the nitrogen pressure protection when remove the cover.
- 2.If there is no cover or the no nitrogen pressure protection, must use brand new POE oil instead of the oil come together with compressor.

□ Charging

□ Choose one way to charge the excess oil into system:

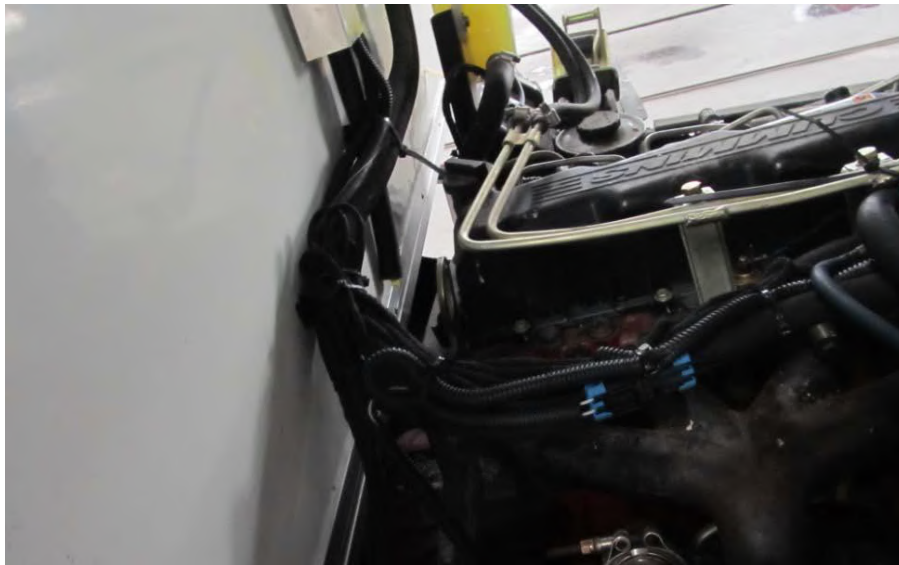
- 1.Suck the oil into low pressure side during vacuum
- 2.Charge the high pressure pipe before the oil separator

3.Charge into the oil separator(no more than 200ml)

□ During testing, let the units run with a low speed for 10 minutes to achieve good lubrication effect

7、 Mount compressor mounting kit & compressor(optional)

Compressor: connection



MANDATORY BEFORE ANY ELECTRICAL OPERATION:



- **DISCONNECT THE VEHICLE BATTERY:** Remove the battery ground (-), the positive battery (+) and lock-out.

Compressor is separate from evaporator and condenser, need connect it use a hose

1. Move along hoses and battery harness to the compressor and vehicle battery.
2. Attach regularly the harness with plastic tie-wraps and base tie-wraps onto the chassis.
3. Insulate the hole with silicon.

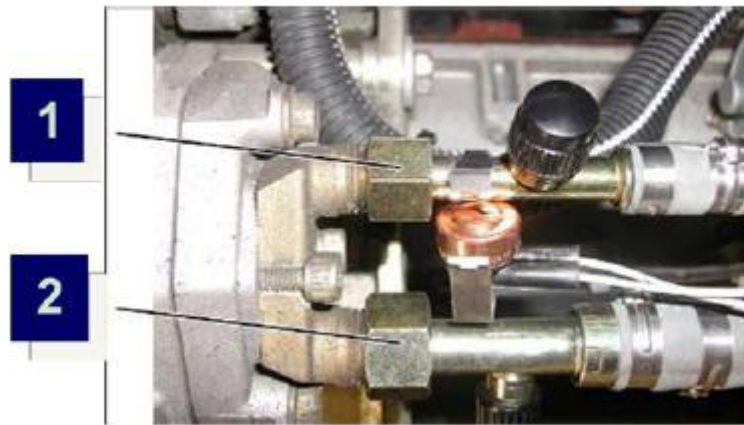
RECOMMENDATIONS



- Protect or move the harness away from metallic corners of the chassis.
- Avoid connecting the harness to/or in contact with heating source.
- Avoid connecting the harness to parts that may cause vibrations.
- Do not secure the unit harness to the vehicle harness or piping
- Avoid drilling the vehicle frame.

7、Mount compressor mounting kit & compressor(optional)

Compressor: connection



The compressor is away from evaporator and condenser, installed in the side of vehicle engine, connected with engine by belts, and connected with evaporator, condenser by hoses.

1. Connect the DISCHARGE HOSE.

2. Connect the SUCTION HOSE.

7、 Mount compressor mounting kit & compressor(optional)

Compressor: connection

1



2



RECOMMENDATIONS



■ Carefully place correctly the thermostat in order to have a good contact with the exhaust pipe, and wrap the thermostat with insulation materials.

1 Install injection thermostat on the compressor High pressure line with the clamp.

2 Protect thermostat with insulation foam and fix it with plastic tie-wraps.

7、 Mount compressor mounting kit & compressor(optional)

Compressor: connection

1



2



1. Maintain all hoses and wires with plastic tie-wraps.

2. Route the suction and discharge hoses smoothly to avoid oil storage.

8、 Check leak and evacuate system

Leak checking



□ Requirements

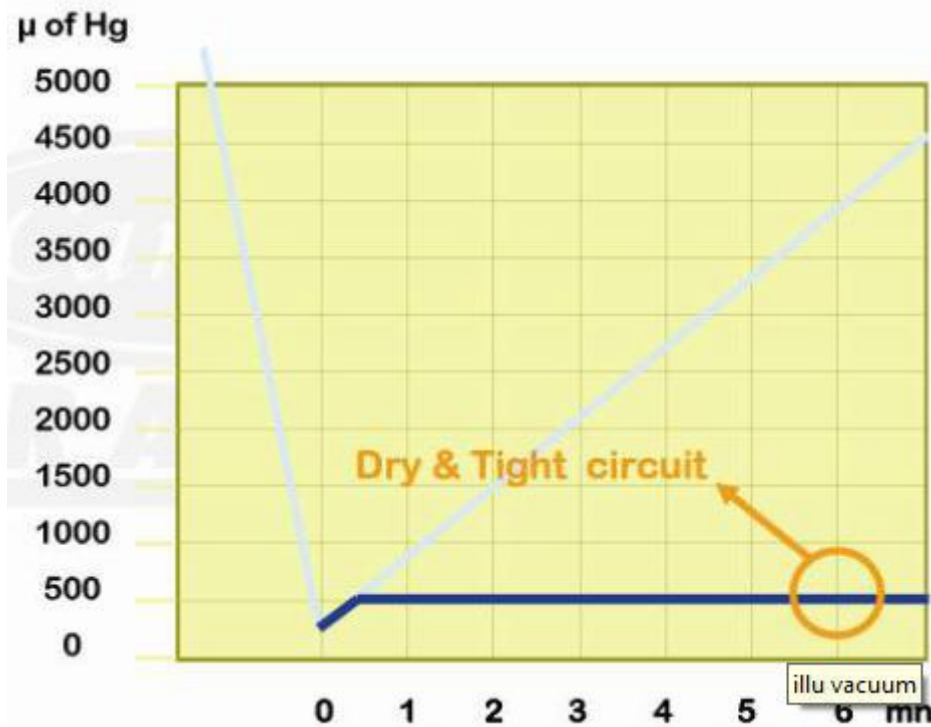
- 1 Vacuum pump
- 1 Manifold gauges (4 connections)
- 1 Vacuumeter

□ Check gas leak

1. Install manifold gauges on the compressor side.
2. Connect the vacuum pump to the manifold gauges.
3. Start the vacuum pump and vacuum for 15 min: to remove the air in the circuit.
4. After 15mn, stop the vacuum pump.
5. Connect the nitrogen to the manifold gauges.
6. Put 15 bar (219 psi) in the circuit, maintain the pressure for 2hrs
7. Use bubbles water on all refrigeration fittings
8. No bubbles formation means that the circuit is tight.

8、 Check leak and evacuate system

Unit vacuum



□ System vacuum

- Remove the nitrogen.
- Start the vacuum pump.
- Apply "Triple evacuation" process (refer to refrigeration training module)
- Stop the vacuum pump.
- Check if vacuum is complete with vacuumeter. (refer to refrigeration training module)

9、 Check and charge refrigerant

Refrigerant charge



Model	KX-600K
R404A	2.8kg

REQUIREMENT

- 1 manifold gauges (4 connections)
 - 1 refrigerant cylinder
 - 1 scale - minimum precision requested: 5%
- Attention: R0404 must be liquid state when charge**
1. Install the manifold gauges on "Free Schrader" fitting located inside the condenser on the high pressure line.
 2. Place refrigerant cylinder on scale. Connect charging line from cylinder to manifold.
 3. Purge charging line at inlet manifold.
 4. Note the weight of refrigerant cylinder. **The unit must be stopped during this operation.**
 5. Open liquid valve on refrigerant cylinder and allow the liquid refrigerant to flow into the unit until the correct weight of refrigerant has been added as indicated by weight scale.
 6. When refrigerant cylinder weight (scale) indicates that the correct charge has been added, close the manifold valves

10、 Install cab control and connect electrical

Driver cab: preparation



RECOMMENDATIONS



■ Before drilling the floor, check the location of fuel tank, harness and/or tubes.

1. Drill a hole in the cab floor (behind driver or passenger seat – depends on battery location).

RECOMMENDATIONS



■ Protect the hole (ex: armored hose) to avoid harness & hoses damage.

2. Run the cab command and ignition cable to the dashboard.

10、 Install cab control and connect electrical

Cab ignition connection



NOTE: For cab IGNITION KEY harness fitting, refer to the vehicle mounting kit instructions.

- Connect the ignition switch line to the vehicle dashboard
- Connect the white wires to fuse(1A)
- Refer to the corresponding mounting kit instruction to connect the DC12V/DC24V ignition live

10、 Install cab control and connect electrical

Cab ignition connection



- Fit the cab command (in specified location)

RECOMMENDATIONS



- Take care not to pierce any harness or noses within the dashboard.
- If the cab command is built into the dashboard, fit it as far as possible from the heating ducts.
- Maximum temperature of exposure: 70°C (158°F)
- The cab command **MUST NOT** be located behind the screen (T° too high and obstruction of windscreen).

10、 Install cab control and connect electrical

Battery: connection

1



2



- 1、 Clean the battery terminals before installation.
- 2、 Connect the harness as figure 1 shown.
- 3、 After installation, brush butter on terminals to prevent rust.

NOTES: Figure 2 shows the incorrect connection, this situation must be avoided.

- Install the fuse holder as closed as possible from the 12 VDC or 24 VDC battery.
- Cut the battery harness to the required length.

10、 Install cab control and connect electrical

Battery: connection

1



2



3 4



1. Install right fuse in the fuse holder
2. Install protection cap on the fuse
3. Connect unit ground (-) to the vehicle chassis.
4. Re-connect the ground (-) of the vehicle battery.

Remark:All wires must be pressed tightly

11、 Check and adjust CPR(only suitable for unit with CPR)

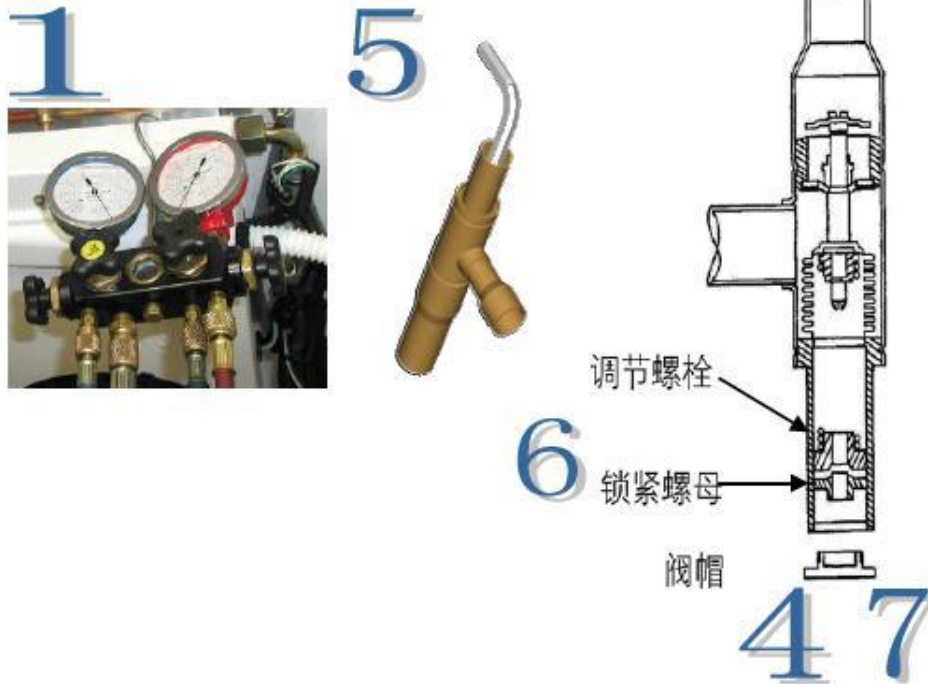
Commissioning: adjusting CPR



- The CPR (Compressor Regulation) valve is a device designed to regulate the flow of refrigerant returning to the compressor from the evaporator, this ensures correct capacity for the unit.
- The Compressor Regulation valve also reduces the load on the compressor during start-up & whilst in operation which is why it is important it is correctly set-up on commissioning.
- **Adjustment has to be done:**
 - Road operation
 - Heat or defrost mode
 - Compressor speed at 2400 rpm

11、 Check and adjust CPR(only suitable for unit with CPR)

Commisioning: adjusting CPR

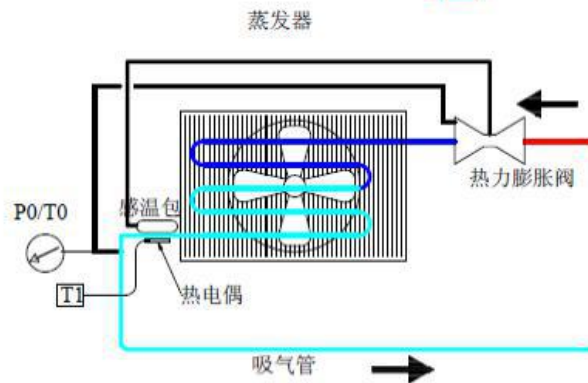
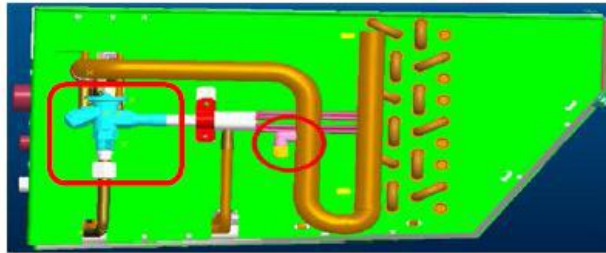


CPR Adjust	KX-600K
R404A	2.2bar

1. Connect manifold to CPR fitting.
2. Start the unit in Heating or Defrost mode.
3. Check compressor speed: 2400 rpm.
4. Remove CPR cap.
5. Adjust CPR to get gauge pressure value with hexagonal socket head wrenches (n°8) :
 - To raise the suction pressure : turn the setting screw clockwise
 - To lower the suction pressure: turn the setting screw counter clockwise.
6. When the setting has been adjusted, tighten the jam nut securely against the setting screw to prevent any movement of the setting screw due to vibrations in the unit.
7. Replace the cap.

12、 Check and adjust expansion valve superheat

Commissioning: TXV adjustment



1. Connect manifold to evaporator outlet fitting.
2. Install a sensor on the expansion valve bulb location.
3. Run the unit on **COOLING** mode.

PO: Evaporator outlet pressure;

TO: The corresponding saturation temperature of PO

T1: Temperature in expansion thermal bulb

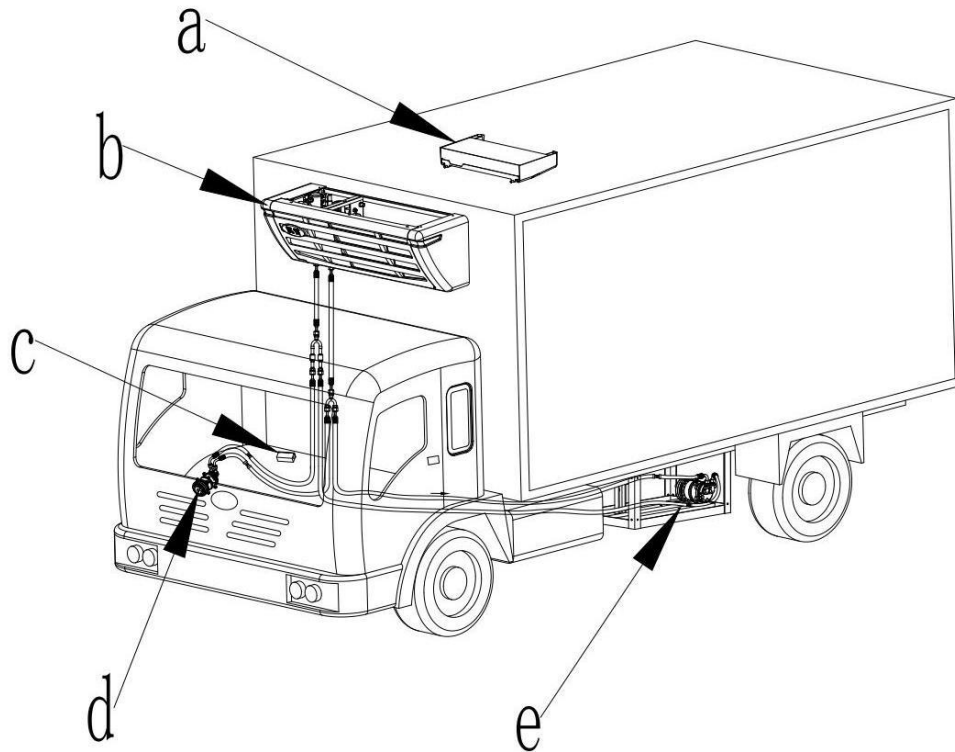
Superheat=T1-T0

4. Correct superheat:

- Turn anti-clockwise to increase flow & decrease superheat
- Turn clockwise to decrease flow and increase superheat.

TXV adjustment	KX-600K
	8°C at box temp. 0°C (14.4°F at box T° : 32°F) 4°C at box temp. -20°C (7.2°F at box T° : -4°F)

13、 Installation overview



a.Evaporator

b.Condenser

c.Controller

d.compressor

e.Pipes & hareness



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