



**KINGTEC**  
TECHNOLOGIES

**Kingtec technologies (heyuan) co., ltd.**

Address: No.1 Rexking Rd, Pearl Development Zone, Heyuan City, Guangdong China.

Tel: +86-762-2286018 Fax: +86-762-3831889

[www.kingtec.com.cn](http://www.kingtec.com.cn)



**KINGTEC**  
TECHNOLOGIES

# T135 / T235 / T355 SERIES

## Transport refrigeration unit operation manual

K10098 (07-11)

# FOREWORD

**Thank you for buying Kingtec brand K series truck refrigeration units.**

Honored customer, Kingtec Group is a professional manufacturer and supplier of truck refrigeration unit, walk-in cooler equipment, bus air conditioner, railway train and subway air conditioner, and commercial air conditioner. Kingtec refrigeration and air conditioning products are sold all over China and South East Asia. Kingtec has passed ISO 9001 quality control certification. The company has strong engineering team, up-to-date manufacturing equipment, perfect testing means, and scientific and modern enterprise management in developing, manufacturing, and sales high quality Kingtec products, and serving customers, which satisfy their needs and requirement.

Honored customers, Kingtec formally notice you that please carefully read this manual before unit operation. If you have any questions, please contact Kingtec dealers or Kingtec as soon as possible that we can serve you very soon.

# CONTENTS

<b>Unit general description</b>	<b>01</b>
<b>Condenser assembly picture</b>	<b>02</b>
<b>Evaporator assembly picture</b>	<b>02</b>
<b>T135 / T235 / T355 main technical parameter</b>	<b>03</b>
<b>Unit work principle and system cycle diagram</b>	<b>04</b>
<b>T135 / T235 / T355 work principle</b>	<b>05</b>
<b>T135 / T235 / T355 installation</b>	<b>07</b>
<b>Installation procedure</b>	<b>13</b>
<b>Recommended perishable product transport temperature</b>	<b>14</b>
<b>Loading notice</b>	<b>15</b>
<b>Common troubleshooting</b>	<b>16</b>

## UNIT GENERAL DESCRIPTION

T135 / T235 / T355 series split type direct drive unit series are specially designed and manufactured for small size refrigeration vehicles suitable for 4 to 16m<sup>3</sup> truck box volumes and inside temperature 15 to -20°C application, has following characteristics:

Split unit with new unique appearance design, reasonable parts arrangement easy to install and operate.

Import compressor especially for transport refrigeration, using environment friendly refrigerant R134a or R404A.

Heat exchanger coil using inner screw grooved copper tube and waved Aluminum fins has long life and high performance.

Control and safety parts are all internationally famous brand, reliable and accurate.

Automatic microprocessor controller has functions of temperature display; temperature setting, automatic temperature control, and hot gas defrost etc.

Every unit is checked and test run before rolling out from factory.

## CONDENSER ASSEMBLY PICTURE



T135 Condenser assembly

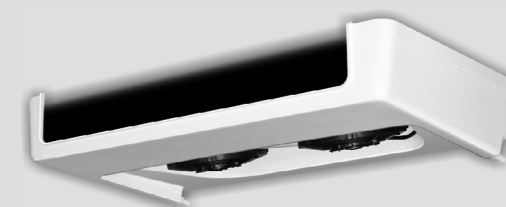


T235 / T355 Condenser assembly

## EVAPORATOR ASSEMBLY PICTURE



EVK200C  
Evaporator assembly (apply tot135 refrigeration unit)



EVK300C  
Evaporator assembly (apply to T235 / T355 refrigeration unit)

# T135 / T235 / T355 MAIN TECHNICAL PARAMETER

Unit models		T135(E)-134	T135(E)-404	T235(E)-134	T235(E)-404	T355(E)-134	T355(E)-404
Application temperature (°C)		15~-20					
Type		Split direct drive					
Suitable box volume (m <sup>3</sup> )		4~10	7~14	6~16	9~16	8~18	10~20
Refrigeration capacity (W)	0°C	1950	2030	2510	2630	3600	4150
	-18°C	980	1090	1220	1390	1800	2200
Compressor	Model	SD5H11	SD5H11	SD5H14	SD5H14	TM16A	
	Type	Swash plate					
	Displacement cc	108	108	140	140	162	
	Refrigerant oil	XP-3PAG	RL32H	XP-3PAG	RL32H	XP-3PAG	RL32H
Condenser	Type	Roof mount					
	Fan	Axial flow fan					
	Voltage	DC12V / DC24V					
Evaporator	Type	Roof mount inside box					
	Fan	Axial flow fan					
	Voltage	DC12V / DC24V					
Throttling type		TXV w / outside balance					
Refrigerant		R134a	R404A	R134a	R404A	R134a	R404A
Refrigerant charge (kg)		1.2	1.0	1.4	1.2	1.5	1.3
Defrosting type		Hot gas					
External dimensions	Evaporator unit assembly mm	1035 x 570 x 140		985 x 565 x 180		1020 x 660 x 215	
	Condenser unit assembly mm	810 x 680 x 195		1010 x 680 x 180		1060 x 730x 230	
Unit current	12V	25.5A	25.5A	35A	35A	36.3A	36.3A
	24V	12.9A	12.9A	18.4A	18.4A	19.4A	19.4A
Weight (kg)	Evaporator unit assembly	22		25		26	
	Condenser unit assembly	18	18	26	26	35	

## Note:

1. Box volumes listed above is for reference, and actual volumes should be decided by box insulation and sealing, application inside and outside box temperatures, the kind of transport perishable products etc.
2. Kingtec reserves the right to change above specification without pre-notice.
3. Contact Kingtec for application and special requirement.

## UNIT WORK PRINCIPLE AND SYSTEM CYCLE DIAGRAM

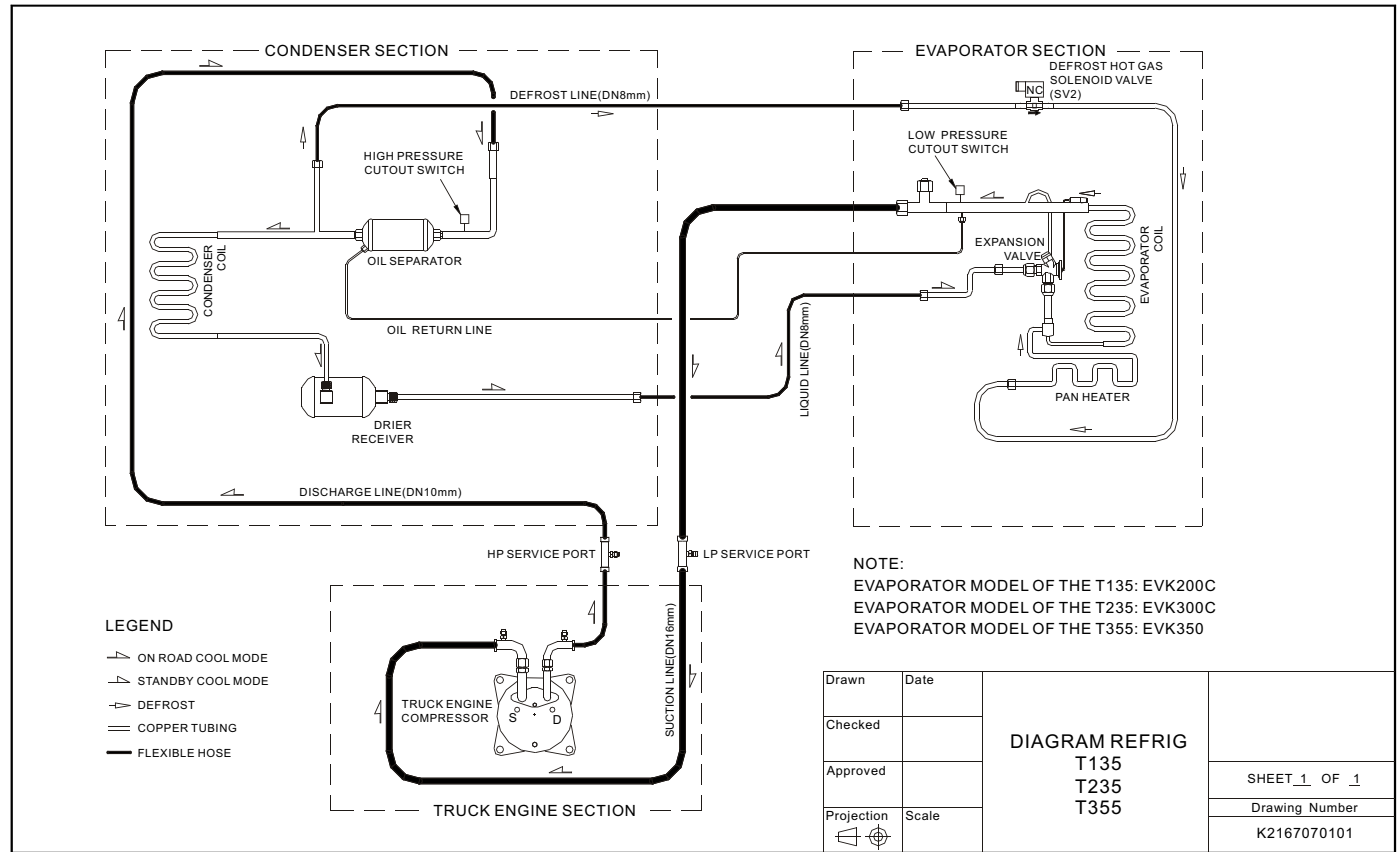
### Refrigeration principle:

The compressor driven by truck engine (S/B engine), then discharges high temperature high pressure refrigerant gas to condenser. And the gas condenses in the air-cooled condenser, changes to liquid, and flows into receiver. Then the liquid passes filter-drier which removes water and impurity in the fluid and thermo-expansion valve (TXV) which reduces liquid pressure. Then, the fluid flows through evaporator and evaporates, and absorbs heat from and reduces temperature of air inside truck box. Finally, the gas refrigerant sucks back to complete the refrigeration cycle. The refrigeration system in this way and therefore reduce the truck box inside air temperature. When the inside temperature near to set temperature, compressor clutch is open, compressor stops working. Otherwise when air temperature inside truck box rise up to higher than set temperature, compressor clutch closes, compressor starts to work.

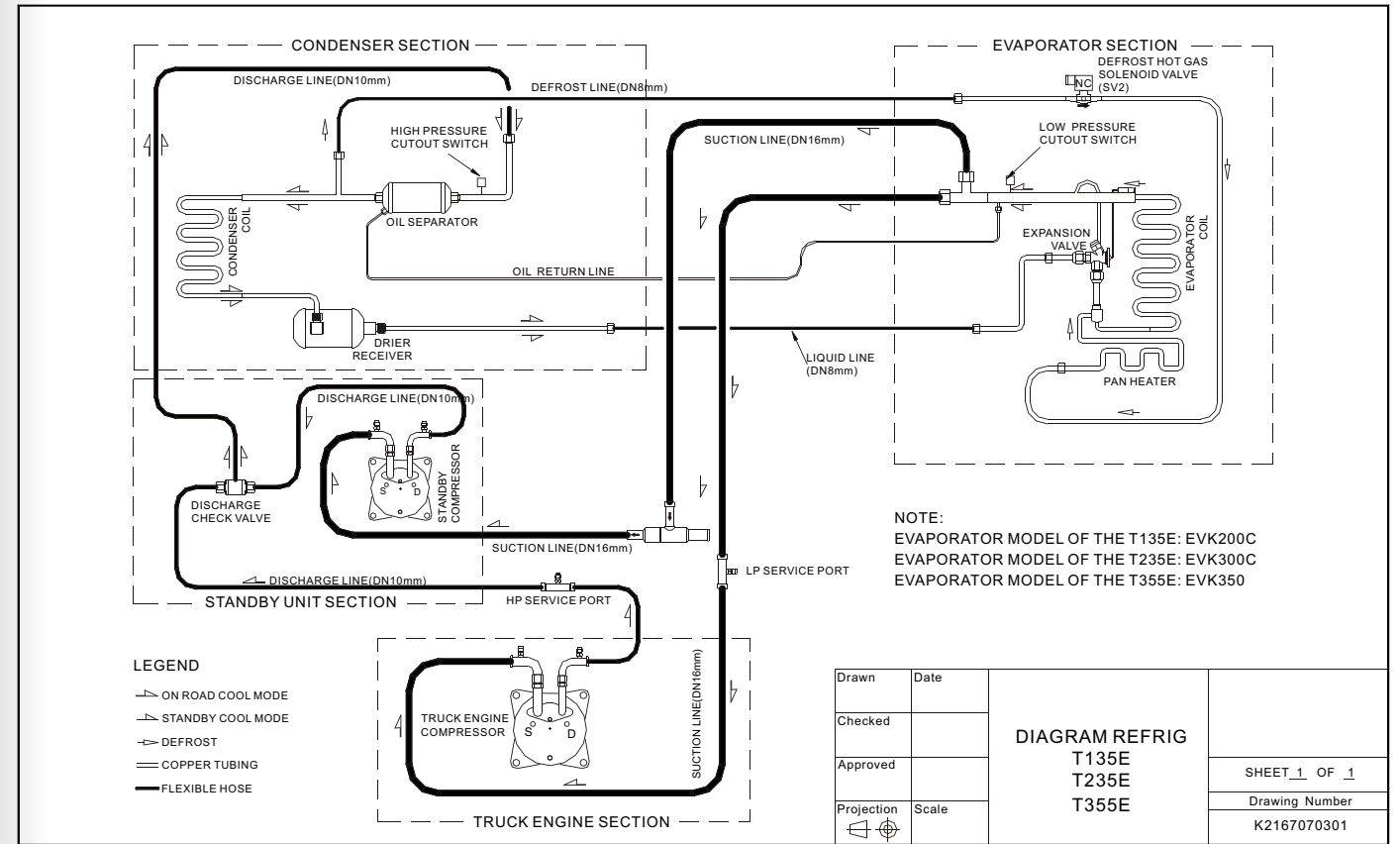
### Defrost principle:

During defrost, defrost valve is open, most high temperature gas refrigerant flows into defrost tube in water pan and evaporator coils to melt frost icing on evaporator coils. Refrigerant flows back to compressor by suction line. After defrost, the defrost valve close, system starts to refrigeration cycles.

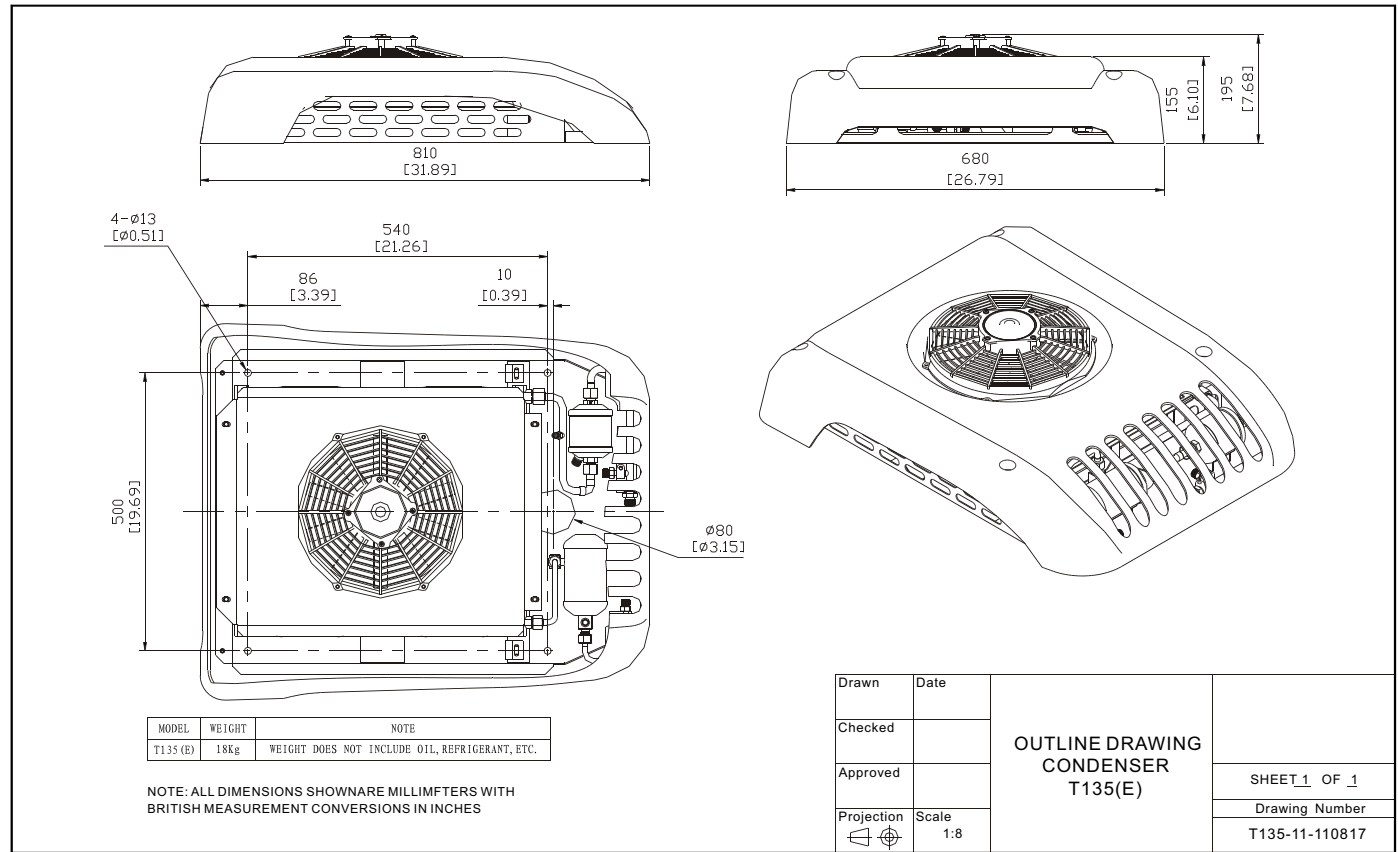
# T135 / T235 / T355 WORK PRINCIPLE



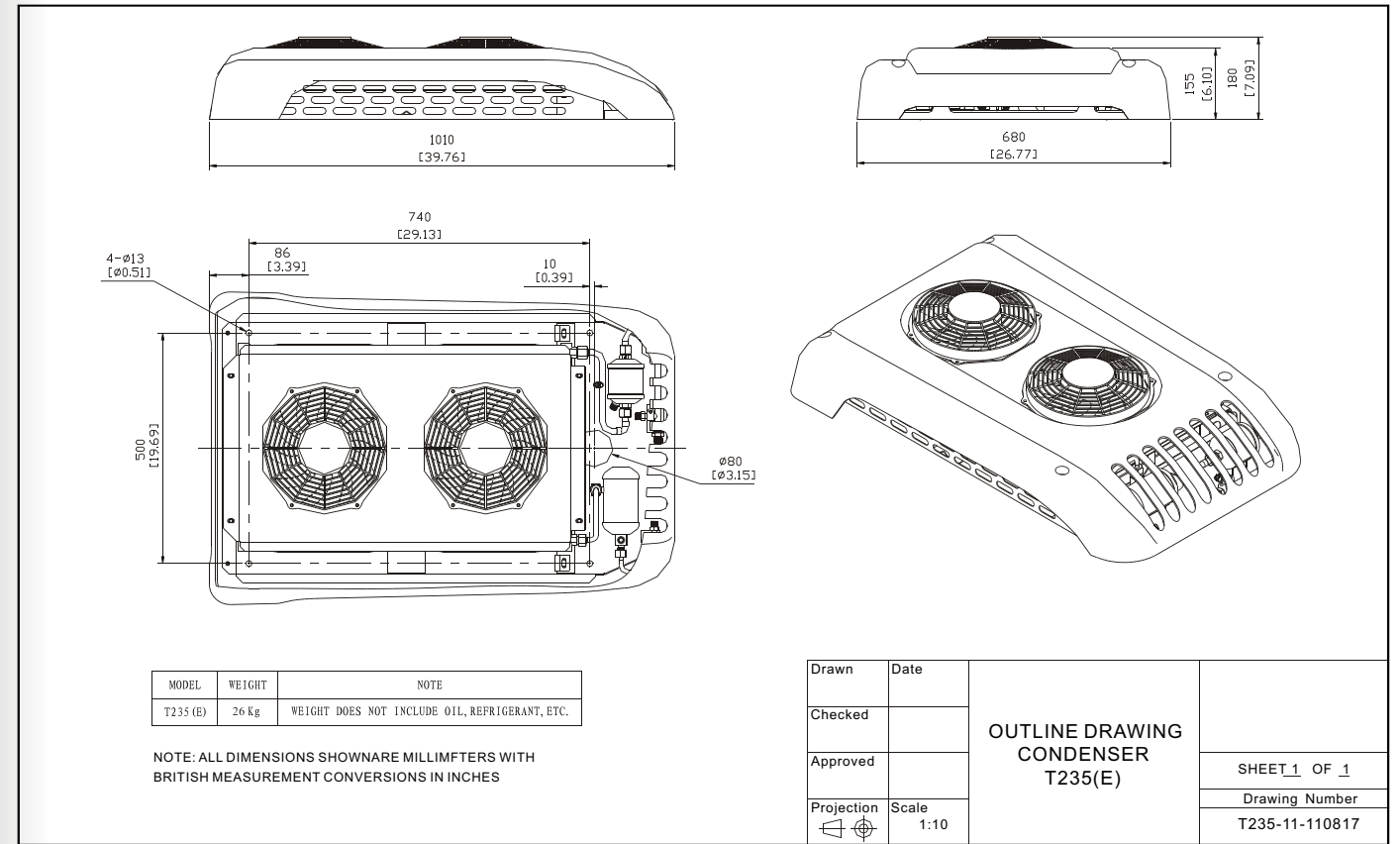
# T135 / T235 / T355 WORK PRINCIPLE



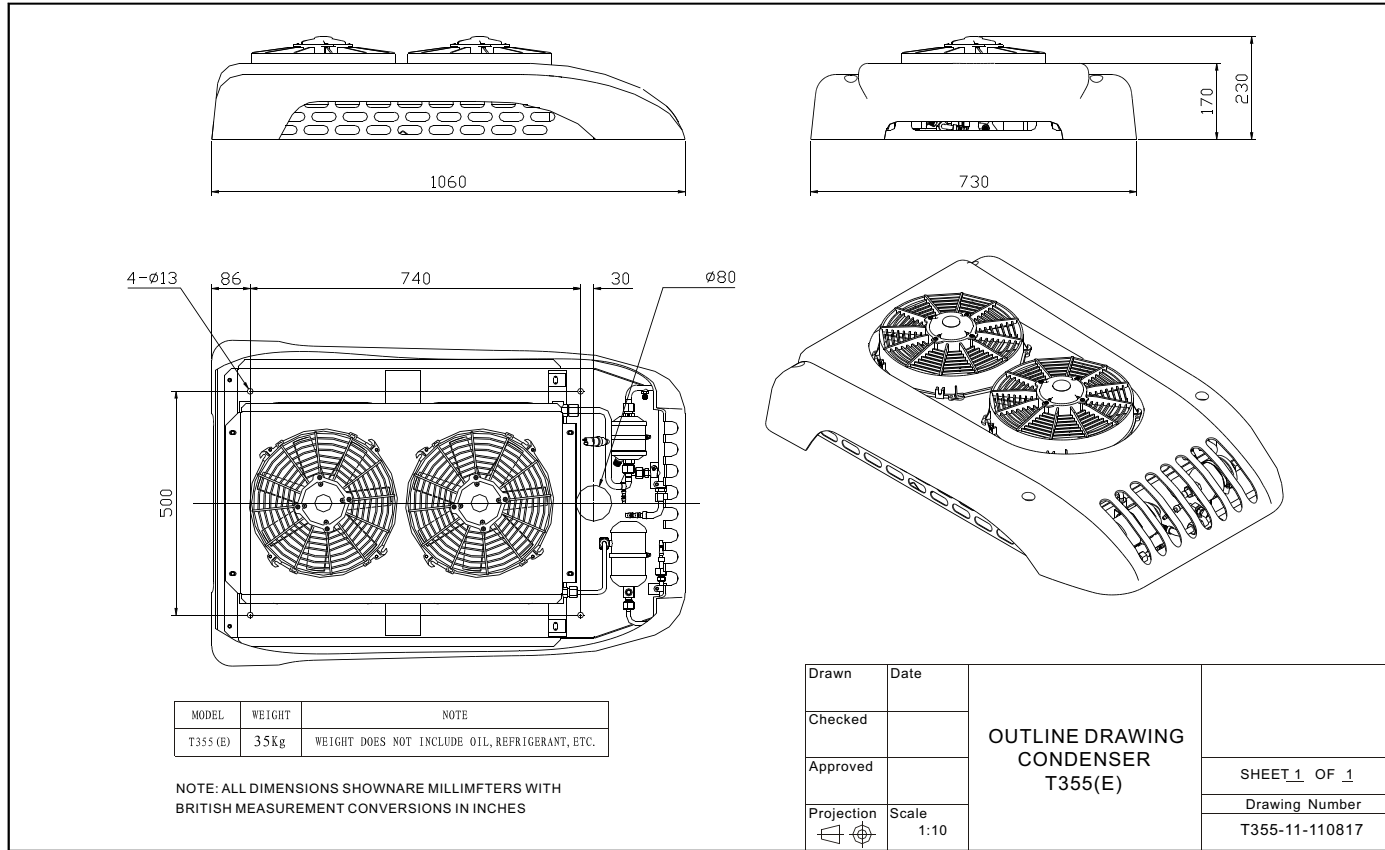
# T135 / T235 / T355 INSTALLATION



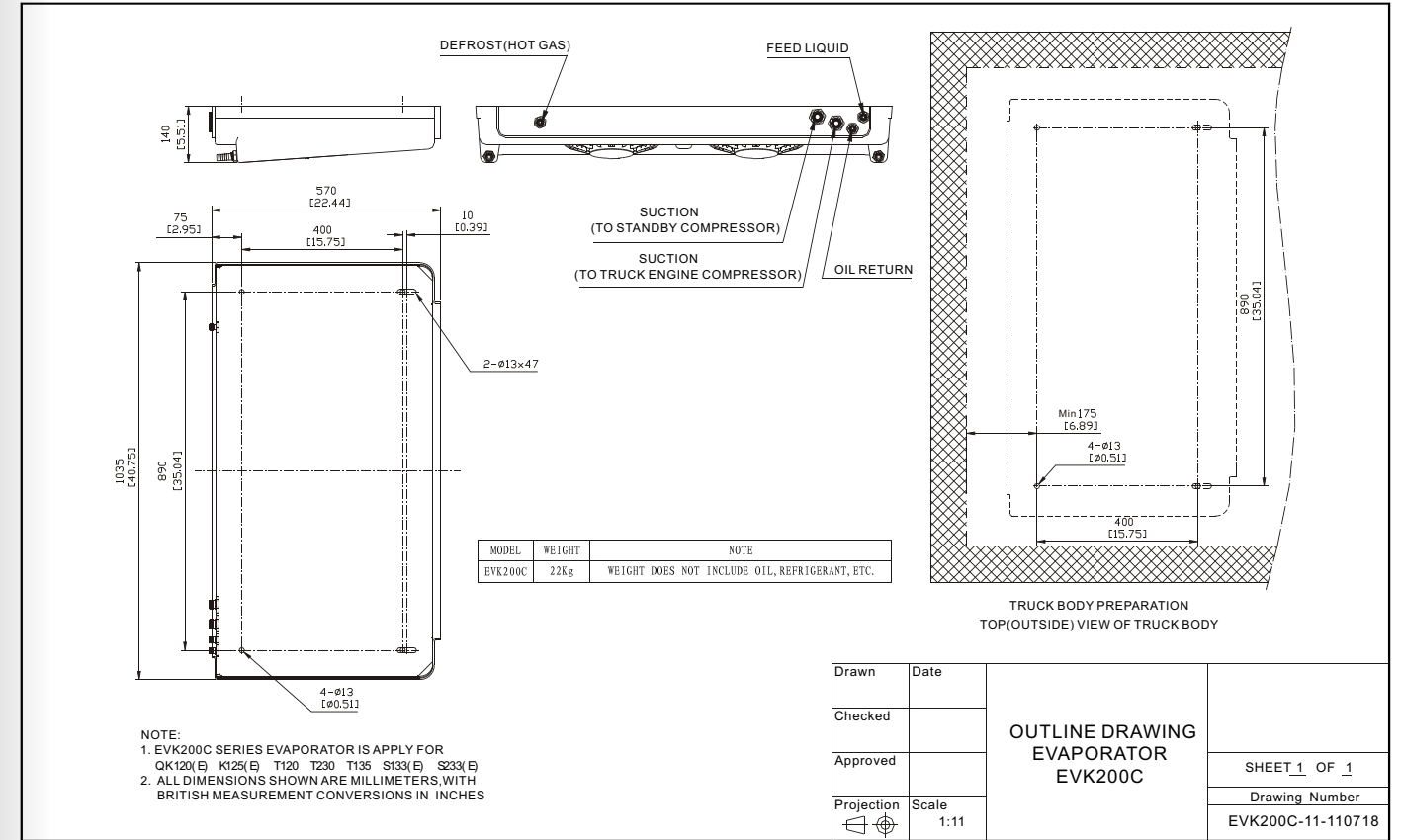
# T135 / T235 / T355 INSTALLATION



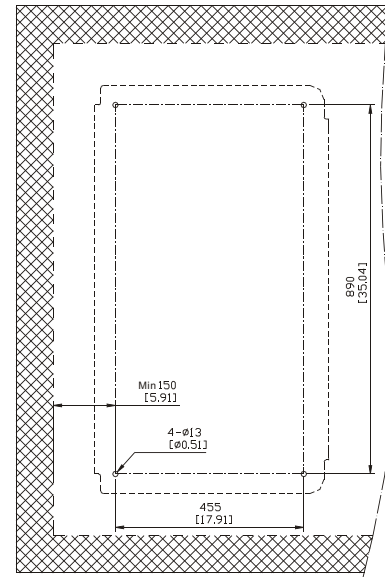
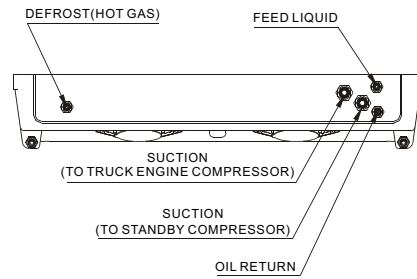
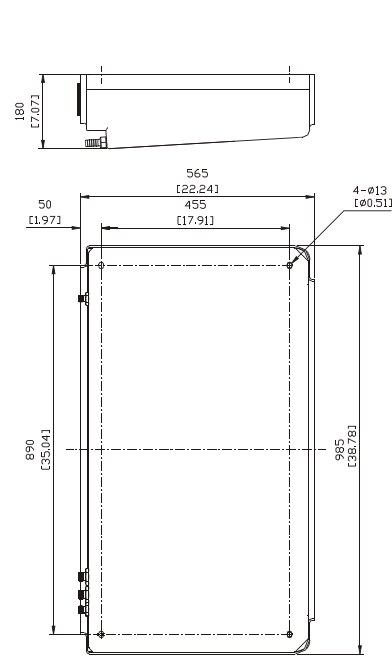
# T135 / T235 / T355 INSTALLATION



# T135 / T235 / T355 INSTALLATION



# T135 / T235 / T355 INSTALLATION



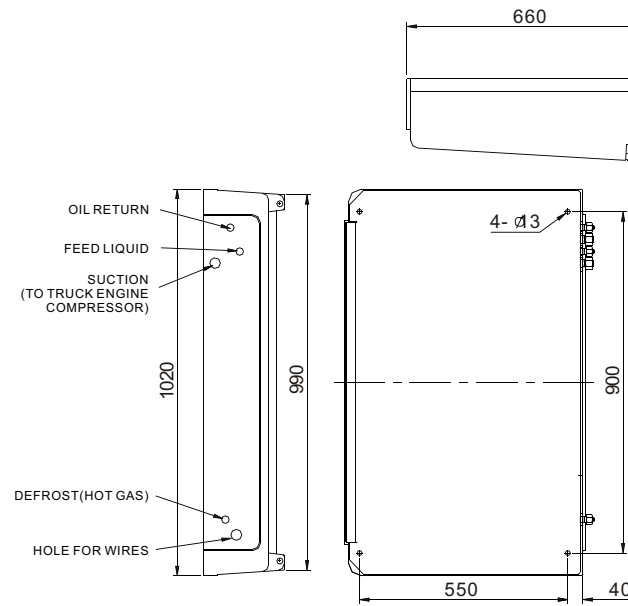
MODEL	WEIGHT	NOTE
EVK300C	25 kg	WEIGHT DOES NOT INCLUDE OIL, REFRIGERANT, ETC.

TRUCK BODY PREPARATION  
TOP (OUTSIDE) VIEW OF TRUCK BODY

NOTE:  
1. EVK300C SERIES EVAPORATOR IS APPLY FOR QK290, K290-3, K290S, T235, S293(E) AND K295 UNITS  
2. ALL DIMENSIONS SHOWN ARE MILLIMETERS, WITH BRITISH MEASUREMENT CONVERSIONS IN INCHES

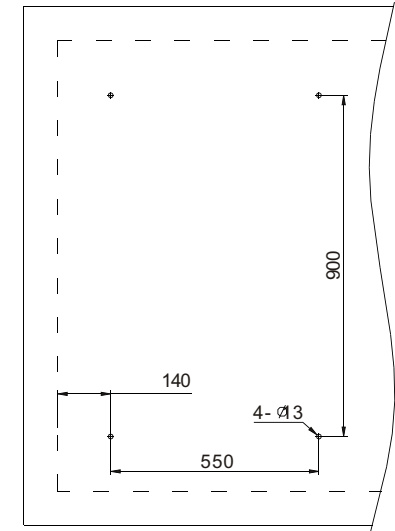
Drawn	Date	<b>OUTLINE DRAWING EVAPORATOR EVK300C</b>	
Checked			SHEET <u>1</u> OF <u>1</u>
Approved			Drawing Number
Projection	Scale 1:11		EVK300C-11-110718

# T135 / T235 / T355 INSTALLATION



MODEL	WEIGHT	NOTE
EVK350	26 kg	WEIGHT DOES NOT INCLUDE OIL, REFRIGERANT, ETC.

NOTE:  
1. EVK350 SERIES EVAPORATOR IS APPLY FOR T355(E), MK358(E) UNITS  
2. ALL DIMENSIONS SHOWN ARE MILLIMETERS, WITH BRITISH MEASUREMENT CONVERSIONS IN INCHES

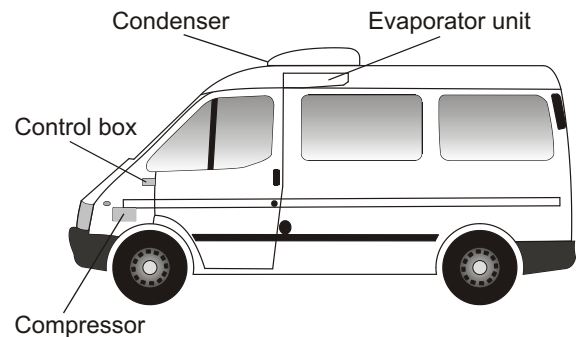


TRUCK BODY PREPARATION  
TOP (OUTSIDE) VIEW OF TRUCK BODY

Drawn	Date	<b>OUTLINE DRAWING EVAPORATOR EVK350</b>	
Checked			SHEET <u>1</u> OF <u>1</u>
Approved			Drawing Number
Projection	Scale 1:11		EVK350-11-110718



## INSTALLATION PROCEDURE



**T135 / T235 / T355**  
Installation schematics



**Note: Unit should be installed by professionals. If there are any problems in installation, please contact Kingtec.**

1. Remove unit condenser assembly cover, uses bolts in spare part kits to fix the condenser assembly to truck box body wall or roof (see installation schematics for position). Note that the installation height must not be higher than truck box.
2. Use bolts n spare part kits to fix the evaporator to truck box body inside.
3. Install compressor and accessories.
4. Use connectors, o-rings, and rubber hose connect system separate assemblies and parts together (drill holes or opening on the truck box body for passing through hoses).
5. Install control box, wiring electric harness. Note unit application voltage and electric poles.
6. Fix rubber hose and electric harness.
7. Use Nitrogen to test refrigeration system sealing. The system should be charged to 3.5 MPa and can keep the pressure for 5 min. To check leakage. Be sure no leak on every connecting points.
8. Use vacuum pump to vacuum the refrigeration system to lower than 0.67 Mbar.
9. Charge the refrigeration system to prescript refrigerant and weight.
10. Run engine, commission the unit, keep watch its operation at lease 2 hours.

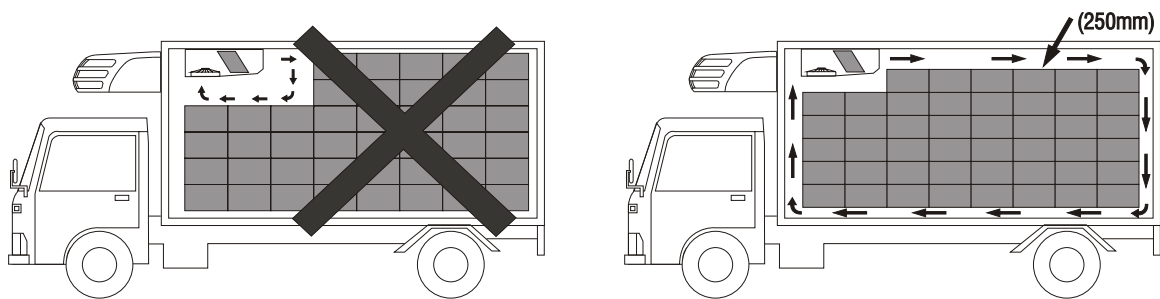
## RECOMMENDED PERISHABLE PRODUCT TRANSPORT TEMPERATURE

Below are recommended perishable products transport temperature for you reference. Actual set temperature depends on special transport and store provisions and conditions.

TRANSPORT PRODUCTS	SET TEMPERATURE
· Ice and ice cream	-20°C
· Deep frozen products	-18°C
· Organ, transplant organ	-18°C
· Sea food	-18°C
· Butter, cream	-14°C
· Eggs, offal, poultry, and quarry	-12°C
· Meat	-10°C
· Fresh seafood and meat	+2°C
· Dairy products	+3°C
· Fresh fruits and vegetables	+5°C
· Banana	15°C

## LOADING NOTICE

1. Transport refrigeration unit is only for keeping transport product at its temperature. Please low product to its required temperature before loading.
2. User can set truck box temperature at the transport products required.
3. Low truck box air temperature to required set value and defrost once before loading.
4. Products should keep 150 mm from front wall, 200 mm from roof, and leave rooms on floor when loading for air return flow. (Wood pallets or Aluminum channel is suggested)
5. User should clean condenser air side periodically to ensure its heat exchange efficient.
6. Please shut down unit immediately if abnormal situation appears, and restart the unit only fix the malfunction.



## COMMON TROUBLESHOOTING

ITEMS	TROUBLE PHENOMENA	POSSIBLE REASONS	DISPOSALS
1	Unit dose no cooling Compressor dose no work	Clutch Loss belt Compressor Electricity	Repair / change Tighten / change Repair / change Check / repair
2	Unit runs w/o cooling or w / weak cooling	Compressor valve , System pressure, Loss belt, Box body insulation or Door air leak, Blocked evap. Air flow	Repair See item 3 Tighten Repair See item 4
3	System pressure abnormal: High condensing pressure, Low suction pressure, High suction pressure	Very dirty condenser, Condenser fan, Air in system, Over charged System dirty / ice block inside, Refrigerant leak, Txv, Heavy frost evaporator Compressor valve, Defrost solenoid	Clean, Repair, Discharge off & recharge, Discharge the extra Repair, Check / repair, Repair / change Defrost Chang Erepair / change
4	Blocked evaporator	Heavy frost coil, Evaporator fan	See item 5 Repair / change
5	Abnormal defrost cycles: Auto start defrost fault, Auto start but no defrost	Electricity, Electricity, Defrost solenoid, Clutch, Compressor	Check / repair Check / repair Repair / change Repair Repair
6	Controller malfunction	Incorrect parameter setting, Sensor, Wiring, Control box	Re-setting, Repair / change Check / repair Repair / change