Single Phase Unit Reefer Container

Maintenance Manual

I. Safety notice

01、Do NOT put finger, stick or any foreign matters into the shell of the condensing fan.

02、Do NOT touch the discharging pipe of the compressor during operation because of its high temp.

03、Do NOT open the circuit of the refrigerant otherwise it may cause the leakage of it.

04、Only professionals can adjust the valves on the copper pipes.

05、Do NOT step onto the RU(Reefer Unit) or put anything on it.

06、Do NOT touch the electrical components by wet hands.

07、Electric cabinet and some RU parts are AC 220V power supply. Only professionals can disassemble, repair and modify the RU.

08、One must shut down the power during checking and maintenance.

09、This RU is for storage in static state only, not applicable to operate during transportation.

II. RU Specification

2.1 Main parts specification

Items		Value	Notice
Unit Voltage	V	208~230	10% deviation allowable
Frequency	Hz	60	
Phase (PH.)		1	
Refrigerant	kgs/lbs	3.1/6.84	R404A
Oil		POE	
Compressor	A	MCC=21	
Condensing fan	A	0.86	2ea/unit
Evaporator fan	A	0.46	2ea/unit
Net weight	Kgs/lbs	180/397	

2.2 Evaporator cooling capacity specification

Return air to evaporator coil inlet	230V, 1 Phase 60Hz Power		
	Net Cooling Capacity		Power consume
	60Hz Capacity Btu/hr	60Hz Capacity Kw	60Hz Power Kw
10.0C/50F	14370	4.212	2.907
1.7C/35F	14060	4.12	2.902
-17.8C/0F	8850	2.594	2.191
-29C/-20F	5100	1.495	1.627
The above data are based on the system net cooling capacity in a 30C/86F ambient air temperature by R-404A.			

2.3 Evaporator heating capacity specification

	230V, 1 Phase 60Hz Power		
	Watts	Kcal/hr	BTU/hr
Heating capacity	1800	1550	6140

2.4 Evaporator air flow specification

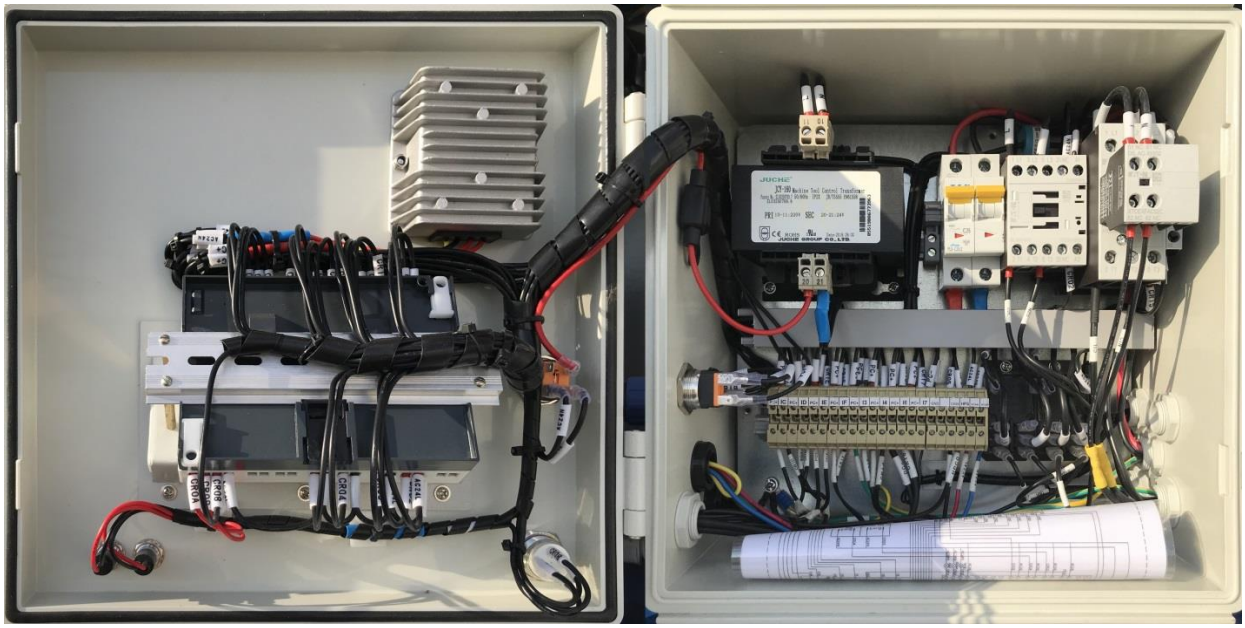
External static pressure(water column)	230V, 1 Phase 60Hz Power	
	cum/hr	ft/min
0mm(0in.)	3500	2053
4mm(0.16in) Evaporator actual airflow	2488	1460
5mm(0.2in.)	2200	1290

2.5 Alarm Specification

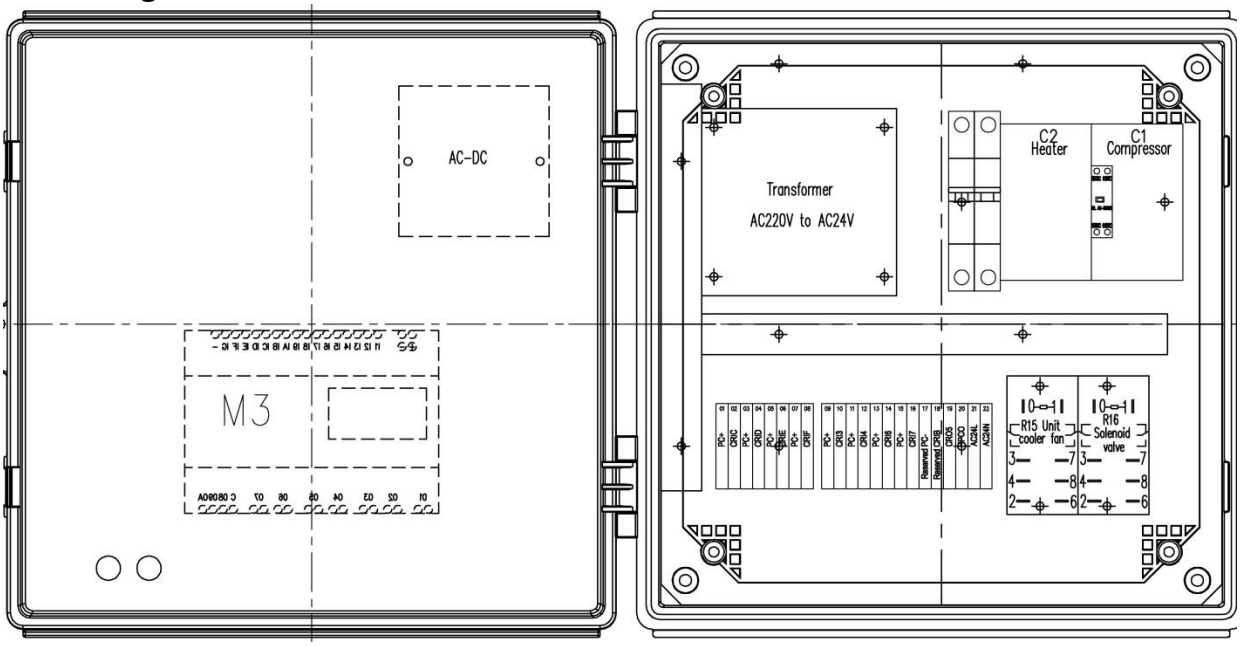
Err code	Detail	Status, Explain or Reason	Alarm Clear
ERR01	HTCO(High Temp Cut Off) occurred	RU will stop then auto reset for 3 times If alarm remains, need to manually reset.	※Tap button A&OK at the same time in alarm page manually
ERR02	HPCO(High Pressure Cut Off) occurred		
ERR03	LPCO(Low Pressure Cut Off) occurred		
ERR06	Cooling mode failure.	RU will stop since supply air temp did not fall down after refrigeration started.	
ERR07	Supply sensor failure.	ERR08 will stop the RU Other alarms will not stop the RU and they are caused by open circuit or short circuit of the temperature probe	Auto reset when hardware fault recovers
ERR08	Return sensor failure		
ERR09	Evaporator sensor failure		
ERR10	Ambient temp. sensor failure.		
ERR13	Current switch failure	RU will not stop Current Switch remains “on” position during refrigeration	Same with※
ERR14	Evaporator fin temp too low	RU will not stop	Auto clear when evap. Fin temp recovers
ERR15	Temp. doesn't reach SP(Setting Point) in 5hours	RU will not stop	Auto clear when temp reach SP

III. Control box specification

3.1 Photo of the control box



3.2 Drawing of the control box

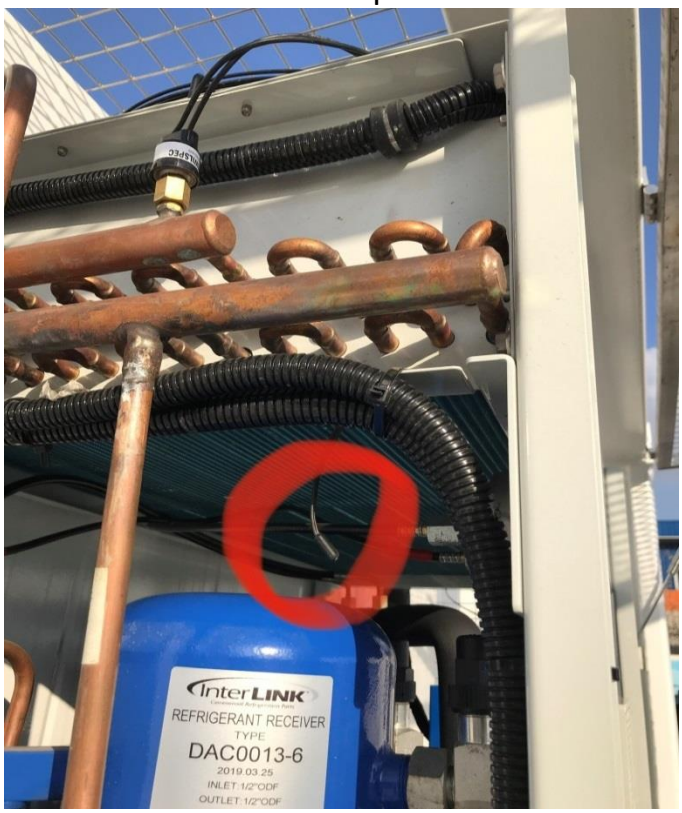


3.3 Electrical parts list

Electrical parts list		
Name	**Model**	**Order No.**
Main Electrical box	P303018	2.20.0161
Controller windows	PWW-08	2.20.0162
Remote socket	ST1212P	2.20.0090
Remote plug	ST1210-6	2.20.0094
Self-reset button	V12	1.53.0003
Locking press button	V12	1.53.0005
2nd Electrical box	S152016	2.20.0170
Breaker-Main	PL9-C25/2	1.46.0037
Contactor-Heater	DILM15-01C	1.46.0034
Contactor-Compressor	DILM25-10C	1.46.0035
Secondary contactor for compressor heater	DILAC-XHI02	1.46.0036
Current switch	>30A on,<30A off	1.55.0051
Power relay-cooler fan & solenoid valve	CR-72CQTAA	1.46.0030
Transformer	JCY-160VA	1.91.0554
Voltage regulator module	A2424	1.91.0521
Logic controller	CROUZT M3 88974161	1.44.0034
Indicator green	FL1M-12FM-1G24V-10-075/20	2.03.2048
Indicator red	FL1M-12FM-1R24V-10-075/20	2.03.2047
Thermostatic expansion valve in cooler	068Z3409	1.70.0214

IV. Thermo sensor & switch position

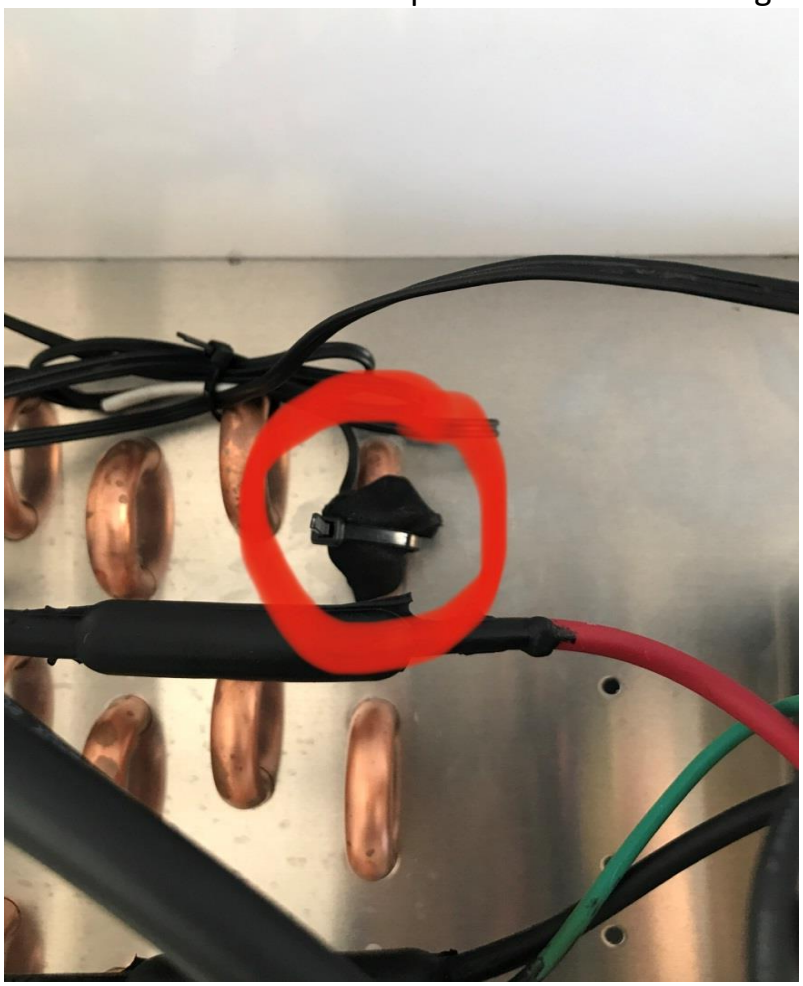
Ambient thermo sensor position-CDU left side



Supply air thermo sensor position-air cooler right fan

Return air thermo sensor position-back of air cooler right side

Unit cooler thermo sensor position-in air cooler right wiring box



Door switch position-right door lining top

V. RU logic

COMPRESSOR START MODE

The current switch will detect the current value of compressor. When compressor gets started, if the rotor of the motor get locked, it leads to large current which detected by the current switch, the compressor will start at intervals.

DEFROST:

a) Electric heating defrost.
b) Start defrost:
   A. Time accumulation: Accumulated by running hours
   B. Intellectualized judgment: Detecting evaporator coil and room temp, the RU will start defrost automatically.
c) Stop defrost: evaporator coil temp achieve the aim or sufficient defrost time.
d) Manual defrost: To enter into B4 interface to defrost manually.

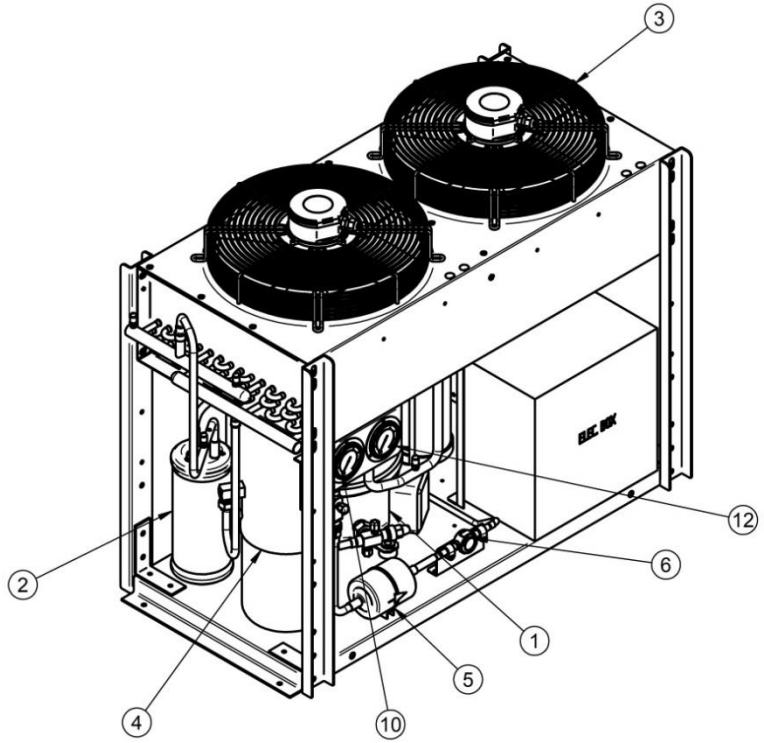
Mode	SP range (℉)	Control range (℉)	Moving parts
Cooler	17.6~68	+1.8~-1.8	EF, continuous running CF, interval running COMP, interval running SOV, interval running
Heater	17.6~68	-3.0 ~0.4	EF, continuous running HT, interval running
Freezer	-30~17.5	+1.8~-1.8	EF, interval running CF, interval running COMP, interval running SOV, interval running

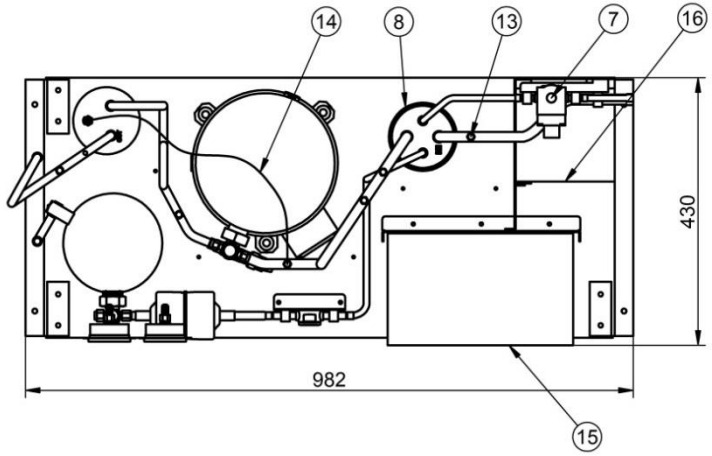
Revision

Spec. Item	Description	Date	Designer

Annex A: Condensing unit specification

序 号	日 期	修改内容	ECN编号	校 对
1				
2				
3				
4				





8	Suction accumulator		16	2nd electrical box	
7	Solenoid valve		15	Main electrical box	
6	Sight glass		14	Oil return pipe	
5	Filter		13	Schrader vlavae	
4	Liquid receiver		12	High pressure gauge	
3	Air cooled condenser		11	High pressure switch	
2	Oil separator		10	Low pressure gauge	
1	Compressor		9	Low pressure switch	
序号	名称	备注	序号	名称	备注

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材料:
装配图

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江苏省无锡市新加坡工业园新都路12号，百尔制冷（无锡）有限公司
邮编：214028 电话：0510-85282020

设计 DESIGN		表面处理 FINISH	
校对 CHECKED		零件号 PART No	BBK0965
批准 APPROVED		比例 SCALE	
日期 DATE		质量 Mass	
面积 Surface area		体积 Volume	

name:
名称:
压缩冷凝机组

A3
DWG NO. 图纸号: BBK0965
第 1 页 共 1 页
版本号 Ver A

Annex B: Unit cooler specification

序号	日期	修改内容	ECN编号	校对
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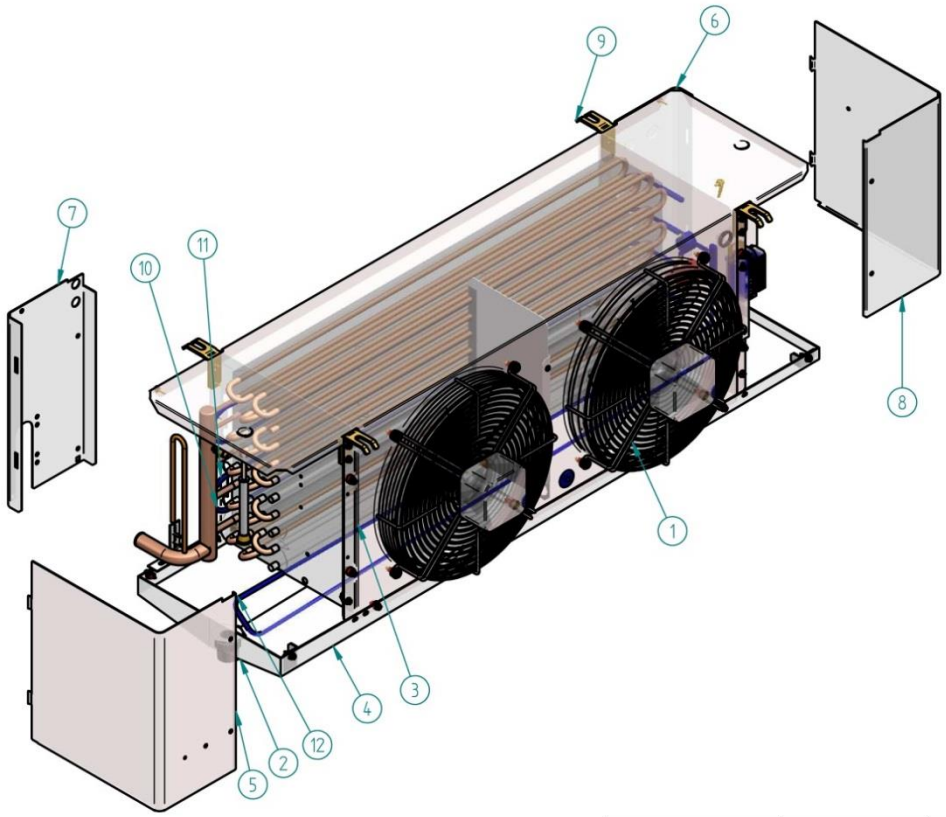
2				
3				
4				



ITEM	DESCRIPTION	QUANTITY
1	Fan-Motor Assy	2
2	Drain Connector	1
3	Fan Panel	1
4	Drain Pan	1
5	Header Side Panel	1
6	Wiring Side Back Panel	1
7	Header Side Back Panel	1
8	Wiring Side Panel	1
9	Bracket	4
10	COIL ASSY	1
11	Coil Defrost Electrical Heater	2
12	Drain Pan Defrost Electrical Heater	1

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除非特殊需要，否则：
1、所有标注尺寸均以mm为单位
2、注意绘图比例
3、去除所有尖角
4、未注折弯及切角均为90°
5、其他未注尺寸公差按GB-T 1804-m的要求

Material:
材料:

设计 DESIGN	表面处理 FINISH
校对 CHECKED	零件号 PART No.
批准 APPROVED	比例 SCALE
日期 DATE	下一零部件 NEXT ASSY

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邮编：214028 电话：0510-85282020

name: BLT027-NZC Assembly
名称:

A3 | DWG NO. BLT027-NZC 图纸号: | 第 1 页 共 1 页 | 版本号VER: A

Annex C: Refrigerant circuit diagram

序 号	日 期	修改内容	ECN编号	校 对
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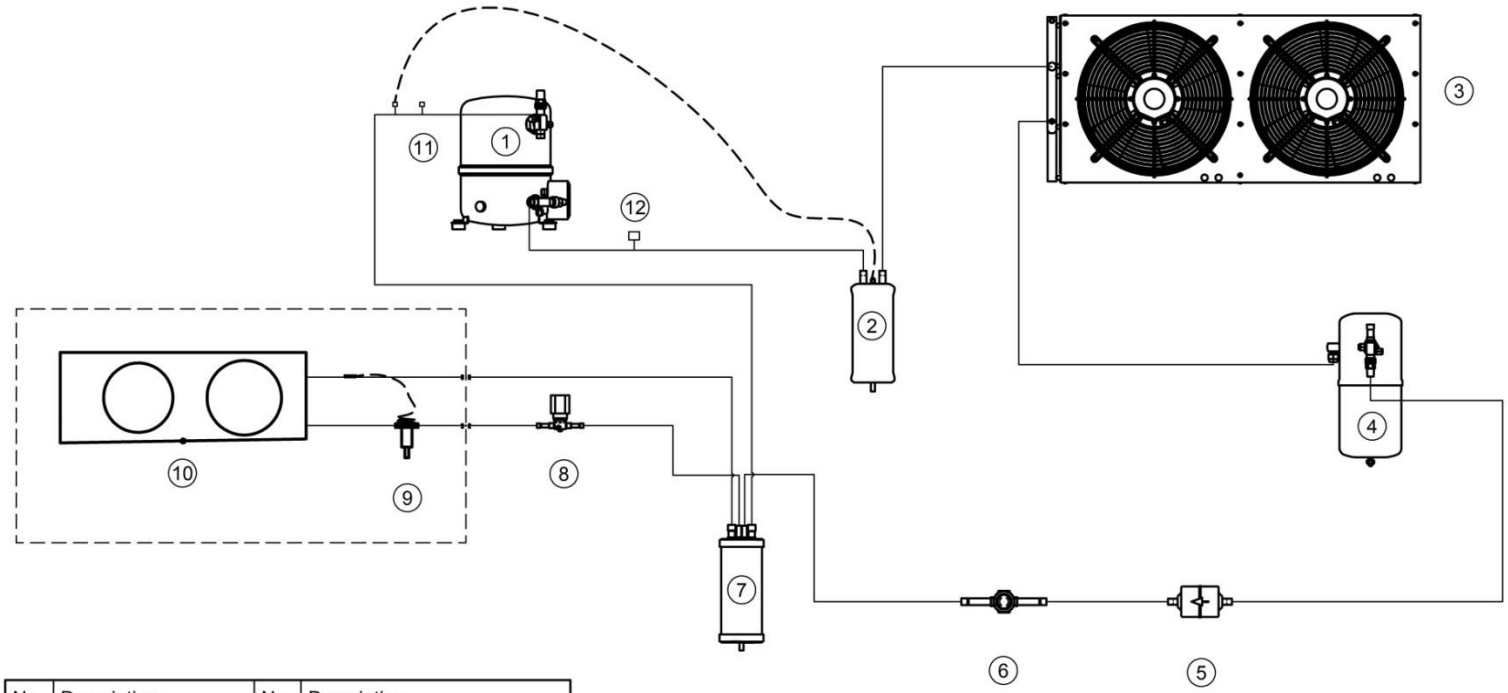
2				
3				
4				



No.	Description	No.	Description
1	Compressor	7	suction accumulator
2	Oil separate	8	Solenoid valve
3	Condensor	9	Expansion valve
4	Liquid receiver	10	Evaparator
5	Filter	11	Comp. LP switch connetor
6	Sight glass	12	Comp. HP switch connetor

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Material:
材料:

设计 DESIGN	表面处理 FINISH
校对 CHECKED	零件号 PART No.
批准 APPROVED	比例 SCALE
日期 DATE	质量 Mass
面积 Surface area	体积 Volume

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邮编：214028 电话：0510-85282020

name: Condensor unit cooling system PID
名称:

A3 DWG NO. 图纸号: BBK0965
第1 页 共 1页
版本号 Ver

Annex D: RU circuitry diagram