Leizig™ 雷子克
Enclosure Climate Technologies

Enclosure Climate Control Unit Assembly Instructions

工业控制柜制冷机安装说明书

(5FCC系列产品)

5FCC680
5FCC825
5FCC1100
5FCC1500
5FCC2000
5FCC2500
5FCC3200
5FCC4300

机 柜 环 境 控 制 的 领 先 制 造 商
leading manufacturer of enclosure climate control units

中 文

内容

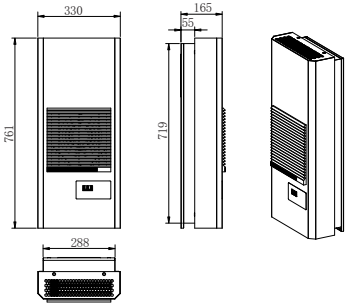
1. 应用场合

工业控制柜制冷机通过把控制柜内的空气冷却同时把柜内热量驱散出柜外，从而保护控制柜内的电气元件在可控的范围内运行。制冷机同时具有除湿功能，保证控制柜内有理想的温度和湿度。5FCC冷却单元特别适合温度在40℃至55℃范围内使用，可以达到其它散热产品如空气/空气热交换器、风扇和过滤器单元达不到的效果。

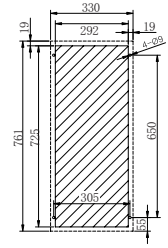
2. 技术参数

项目 \ 产品型号	5FCC680			5FCC825		
	5FCC680	5FCC680P	5FCC680Q	5FCC825	5FCC825P	5FCC825Q
订货号	30200360	30200366	30200556	30200200	30200452	30200557
制冷功率W（L35L35）	680			825		
制冷功率W（L35L50）	540			620		
消耗功率W（L35L35）	331			368		
消耗功率W（L35L50）	414			460		
冷媒	R134a/300g			R134a/360g		
环境温度℃	20-55			20-55		
额定电压V	230			230		
额定频率Hz	50Hz			50Hz		
电压范围V	220-240			220-240		
外形尺寸WxHxDmm	330x761x165			330x761x165		
重量Kg	37	38	37	39	40	39
防护等级	IP54			IP54		
噪音等级	55dB(A)			55dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉	半内嵌安装	外挂式安装	无螺钉

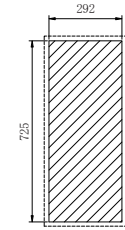
5FCC680/825/680Q/825Q外形图:



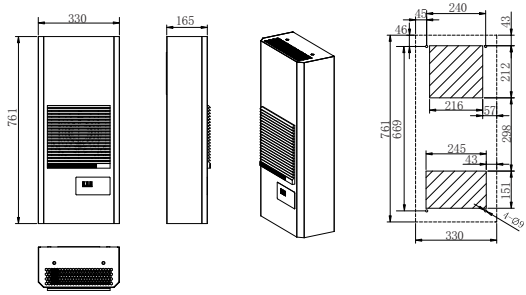
5FCC680/825安装开孔图:



5FCC680Q/825Q安装开孔图:

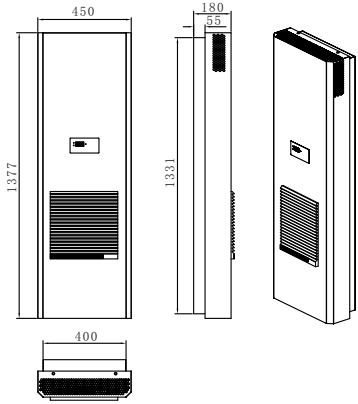


5FCC680P/825P外形图和安装开孔图：

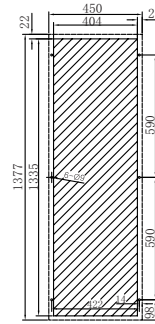


项目 \ 产品型号	5FCC1100			5FCC1500		
	5FCC1100	5FCC1100P	5FCC1100Q	5FCC1500	5FCC1500P	5FCC1500Q
订货号	30200361	30200367	30200558	30200362	30200368	30200559
制冷功率W（L35L35）	1100			1500		
制冷功率W（L35L50）	850			1200		
消耗功率W（L35L35）	515			589		
消耗功率W（L35L50）	644			736		
冷媒	R134a/430g			R134a/550g		
环境温度℃	20-55			20-55		
额定电压V	230			230		
额定频率Hz	50Hz			50Hz		
电压范围V	220-240			220-240		
外形尺寸WxHxDmm	450x1377x180			450x1377x180		
重量Kg	53	54	53	55	56	55
防护等级	IP54			IP54		
噪音等级	58dB(A)			58dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉	半内嵌安装	外挂式安装	无螺钉

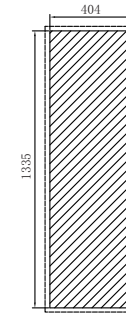
5FCC1100/1500/1100Q/1500Q 外形图：



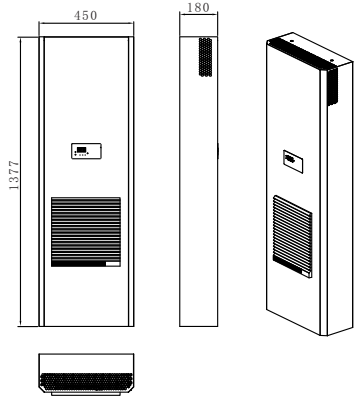
5FCC1100/1500安装开孔图：

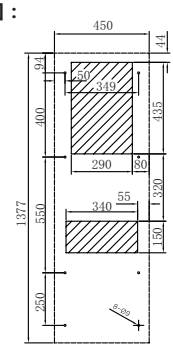


5FCC1100Q/1500Q 安装开孔图：



5FCC1100P/1500P外形图和安装开孔图：

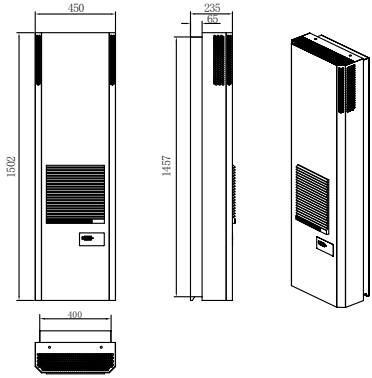




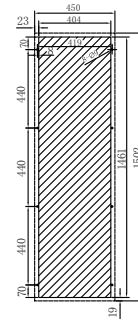
项目 \ 产品型号	5FCC2000					
	5FCC2000	5FCC2000P	5FCC2000Q	5FCC2000-380	5FCC2000P-380	5FCC2000Q-380
订货号	30200363	30200369	30200560	30200377	30200381	30200561
制冷功率W（L35L35）	2000			2000		
制冷功率W（L35L50）	1500			1500		
消耗功率W（L35L35）	828			828		
消耗功率W（L35L50）	1035			1035		
冷媒	R134a/1050g			R134a/1120g		
环境温度℃	20-55			20-55		
额定电压V	230			380		
额定频率Hz	50Hz			50Hz		
电压范围V	220-240			370-390		
外形尺寸WxHxDmm	450x1502x235			450x1502x235		
重量Kg	65	66	65	75	76	75
防护等级	IP54			IP54		
噪音等级	58dB(A)			58dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉	半内嵌安装	外挂式安装	无螺钉

项目 \ 产品型号	5FCC2500					
	5FCC2500	5FCC2500P	5FCC2500Q	5FCC2500-380	5FCC2500P-380	5FCC2500Q-380
订货号	30200375	30200374	30200562	30200378	30200379	30200563
制冷功率W（L35L35）	2500			2500		
制冷功率W（L35L50）	2000			2000		
消耗功率W（L35L35）	957			957		
消耗功率W（L35L50）	1196			1196		
冷媒	R134a/1126g			R134a/1250g		
环境温度℃	20-55			20-55		
额定电压V	230			380		
额定频率Hz	50Hz			50Hz		
电压范围V	220-240			370-390		
外形尺寸WxHxDmm	450x1502x235			450x1502x235		
重量Kg	67	68	67	77	78	77
防护等级	IP54			IP54		
噪音等级	58dB(A)			58dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉	半内嵌安装	外挂式安装	无螺钉

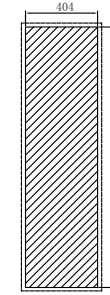
5FCC2000/2500/2000Q/2500Q外形图：



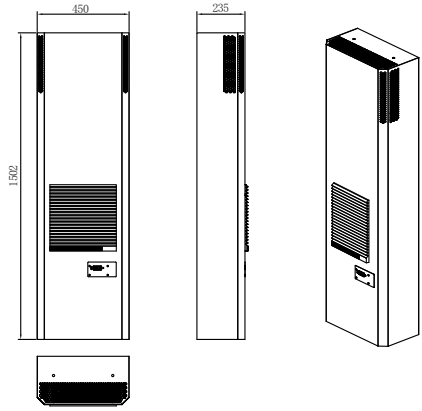
5FCC2000/2500安装开孔图：

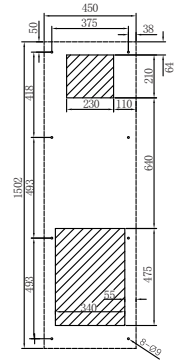


5FCC2000Q/2500Q安装开孔图：



5FCC2000P/2500P外形图和安装开孔图：

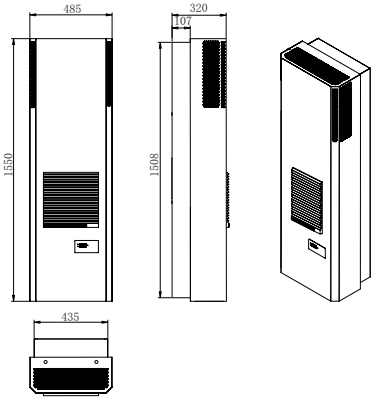




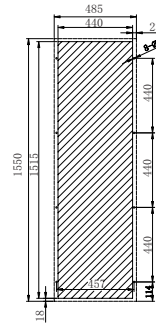
项目 \ 产品型号	5FCC3200					
	5FCC3200	5FCC3200P	5FCC3200Q	5FCC3200-380	5FCC3200P-380	5FCC3200Q-380
订货号	30200364	30200370	30200564	30200380	30200453	30200565
制冷功率W（L35L35）	3200			3200		
制冷功率W（L35L50）	2500			2500		
消耗功率W（L35L35）	1049			1049		
消耗功率W（L35L50）	1311			1311		
冷媒	R134a/1250g			R134a/1400g		
环境温度°C	20-55			20-55		
额定电压V	230			380		
额定频率Hz	50Hz			50Hz		
电压范围V	220-240			370-390		
外形尺寸WxHxDmm	485x1550x320			485x1550x320		
重量Kg	71	72	71	81	82	81
防护等级	IP54			IP54		
噪音等级	60dB(A)			60dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉	半内嵌安装	外挂式安装	无螺钉

项目 \ 产品型号	5FCC4300					
	5FCC4300	5FCC4300P	5FCC4300Q	5FCC4300-380	5FCC4300P-380	5FCC4300Q-380
订货号	30200553	30200554	30200566	30200498	30200555	30200567
制冷功率W（L35L35）	4300			4300		
制冷功率W（L35L50）	3400			3400		
消耗功率W（L35L35）	1380			1380		
消耗功率W（L35L50）	1725			1725		
冷媒	R134a/1300g			R134a/1570g		
环境温度℃	20-55			20-55		
额定电压V	230			380		
额定频率Hz	50Hz			50Hz		
电压范围V	220-240			370-390		
外形尺寸WxHxDmm	485x1550x320			485x1550x320		
重量Kg	73	74	73	83	84	83
防护等级	IP54			IP54		
噪音等级	60dB(A)			60dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉	半内嵌安装	外挂式安装	无螺钉

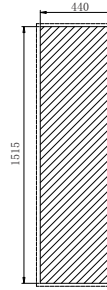
5FCC3200/4300/3200Q/4300Q外形图：



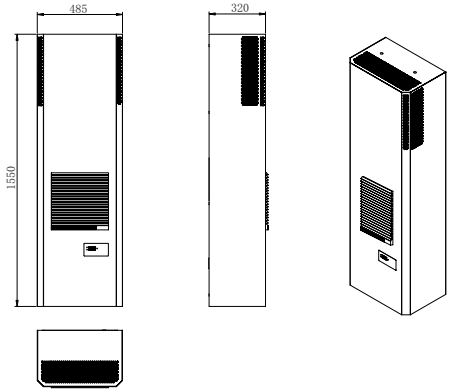
5FCC3200/4300安装开孔图：



5FCC3200Q/4300Q安装开孔图：



5FCC3200P/4300P外形图和安装开孔图：



3.安装方式

5FCC系列产品每种型号都设计有半内嵌、外挂（后缀中带P）和无螺钉快速安装（后缀中带Q）三种安装方式，客户可根据需要选择。

4.安全与注意

安全提示：制冷机为精密电气，搬运务必轻放，严禁倒置，严禁倾斜存放

注意事项：

- 制冷机在灰尘大、油性或者毛绒的环境务必及时清理过滤网，否则会影响制冷机性能。
- 制冷机内循环入风口需安装到控制柜体的上部。
- 控制柜外的温度不能超过55摄氏度，但短暂的高温并不影响制冷机运作。
- 包装应完好，如果发现制冷机有油渍，极有可能是泄漏制冷剂，包装的任何损坏都有可能引起制冷机的故障。
- 控制柜必须达到IP54，如果控制柜有漏洞或缝隙，冷凝水可能会持续产生。
- 制冷机之间或制冷机与墙壁距离不小于200mm。
- 在控制柜内部，制冷机入风和出风口不可有障碍物阻塞。制冷机需水平安装、使用，最大倾斜角度不大于2°
- 维护及送电必须由专业人员操作。
- 为避免冷凝物的形成，建议采用门位开关，保证当控制柜门打开时，制冷机关闭。
- 控制柜内部电气元件的热释放不能超过制冷机可用制冷功率，否则会出现制冷机长期运作。
- 不可用任何方式修改制冷机。

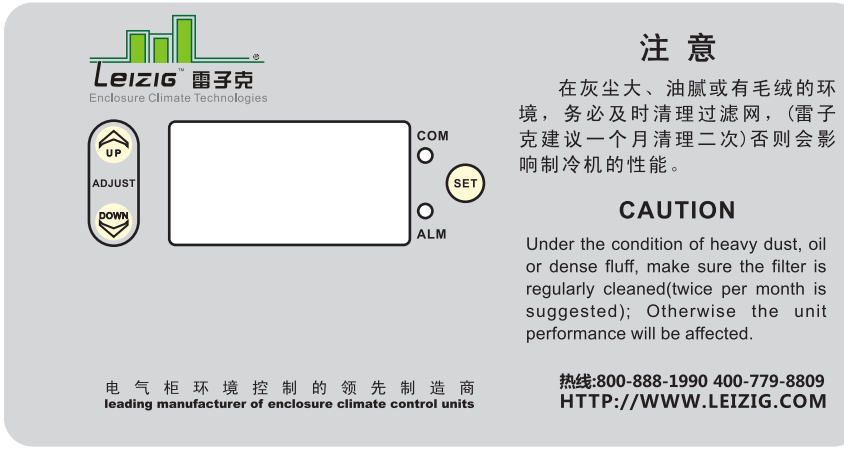
5. 电气联接

电压与频率必须与制冷机的铭牌相匹配，在制冷机电气联接前端不可有其他的温度控制，制冷机上回路电保护元件应与制冷机额定功率相吻合，在安装时参考相关说明。

三相制冷机建议采用马达保护器。

特殊电压请参照相关手册安装使用。

6. 操作说明



控制面板如上图所示

面板指示灯

COM #通讯指示灯

ALM #故障指示灯

按键

设定置 SET

向上键 UP

向下键 DOWN

6.1 按键说明

按键	意义	功　能
SET	设置	用户参数设置功能，短按一次为查看状态，此时可按“UP”按顺序查看各个设置值，当显示最后一个设置选项时，再按一次“DOWN”键，即返回主页面；查看设置值时再短按一次“SET”即进入设置状态，此时设定值闪烁，按动“UP” 或“DOWN”键可增加或减少设定值，再短按一次“SET”键可使设定值立即生效并返回查看状态。
UP	增加	1、在设定参数时，短按此键值递增1，长按此键不放，值快速递增。 2、在查看故障页面，有多个故障时，按“UP”上翻进行查看系统存在的故障。

DOWN	减小	在设定参数时，短按此键值递减1，长按此键不放，值快速递减。
UP+SET	—	查看故障功能：组合键按一次进入查看故障，无故障时，显示“n.55”；有故障时：数码管显示第一个故障代码，有多个故障时，按“UP”下翻进行查看系统存在的故障。再按下“UP+SET”退出故障查询页面，并返回主页面。
SET+UP+DOWN	自检	在开机读秒期间按组合键进入自检
SET+DOWN	—	开机读秒时，同时按组合键时进入制冷温度上下限范围设置
无按键	—	如果不在主页面并30秒内无按键和系统无故障时则系统自动返回主页面。

6.2 显示说明

控制板上有三个数码管指示当前室内温度,显示范围-20℃～99.9℃

机组状态	**显　示**
上电读秒	上电读秒时三个数码管从999～000倒数10秒，提示正在上电，倒数后显示当前柜内温度；远控点短接时，系统关机时数码管闪烁“OFF”，提示正在关机。
设置时	在设置页面，第一位数码管显示设置代码，后二位数码管显示当前设置参数的值。
故障时	弹出故障显示页面，并显示第一个故障代码。

6.3 参数设置

1. 在温度显示界面，按SET键,出现下面图案,进入制冷温度设定选项,缺省值为35, 在按一下SET键,第一个字母闪烁，表示可以对设置值进行设置，通过增加键和减少键进行调整.数据范围为(28-40). 在按一下SET键,退出设置值调整。

2. 温度显示界面，按SET键,在按下减少键，出现下面图案,进入制冷回差设定选项,缺省值为3, 再按SET键,第一个字母闪烁，表示可以对设置值进行设置，通过增加键和减少键进行调整.数据范围为(1-9). 在按一下SET键,退出设置值调整

注：如果10秒内未有任何操作，则放弃当前设定并返回温度显示界面。

6.4 故障报警

根据系统设置，各故障点常闭表示故障点如果和该排插座的DCOM(公共端)形成回路则表示正常，如果断开则表示故障。没有用到的故障点，请将其短接，以免引起不必要的报警。故障报警时，故障指示灯点亮,蜂鸣器发出报警声。故障消音可按增加键。

故障	代码	推迟时间	持续时间	复位操作	备注
柜内温度探头故障	EE1	0秒	2秒	自动	报警、停压缩机
热管温度探头故障	EE2	0秒	2秒	自动	报警、停压缩机
高温报警	EHt	0秒	2秒	自动	报警
热管超温	Ed5	0秒	2秒	自动	报警、停压缩机

注：故障复位后压机延时1分钟重新开启，且需满足压缩机停机时间大于[压缩机最短停机时间]；通信故障时，屏记忆通信故障前的屏显示页面

6.5 开关机

机组通电后如果满足启动内风机的条件，系统会自动延时5～15秒钟（随机值）启动内风机，若满足压缩机机开启条件，则在内风机启动后延时10秒启动压缩机。

6.6 自检功能

在开机读秒期间按组合键进入自检，自检时每个继电器通断30秒钟，自检完成后进入正常使用的流程。

自检顺序：

1、开机读秒按“UP”+“DOWN”+“SET”键，系统进入自检，开启内风机；

2、内风机运行30秒后，开启压缩机；

3、30秒后，关压缩机，开启外风机；

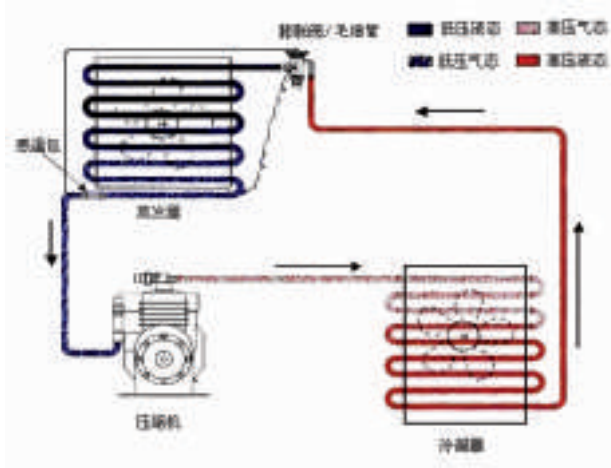
4、30秒后，关外风机，开启故障继电器；

5、30秒后，全关，退出自检，进入温控开启相应设备。

⚠ **内风机在自检期间一直开**

7. 工作原理

制冷机采用相变制冷原理，从压缩机内排出的高温高压气态制冷剂进入冷凝器，被强制冷却为高压中温的液态制冷剂，经毛细管或膨胀阀节流后变成低温低压的液态制冷剂，进入到蒸发器，通过相变吸收控制柜内的热量后变成气态再进入压缩机，往复循环保证控制柜的可靠工作环境



8. 维护保养

作为免维护的制冷机，制冷机在出厂前已经过严格的测试，所有的性能参数都通过相应认证，风机采用滚珠轴承，寿命达到三万小时。只有在灰尘大的环境才建议用过滤网，并建议一个月清理至少两次。

长期不使用时请切断电源。

在维护，保养时务必切断电源。

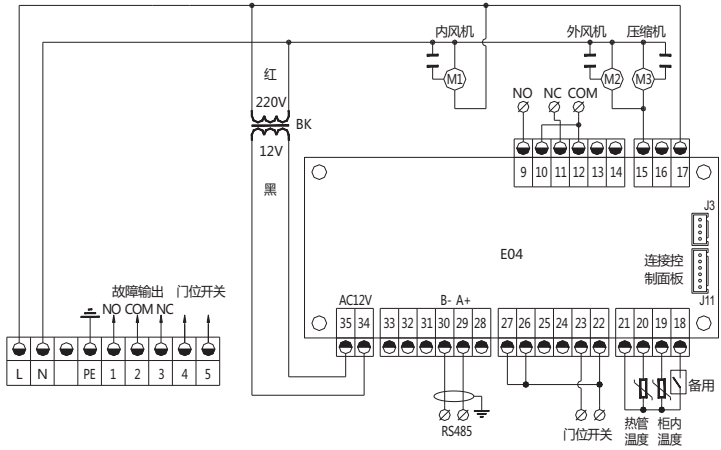
9. 质量保证

雷子克所有制冷机在正常使用下（参照4. 安全提示），拥有十五个月的免费维护，在质保期内，返还的制冷机会在厂里或现场免费维修。

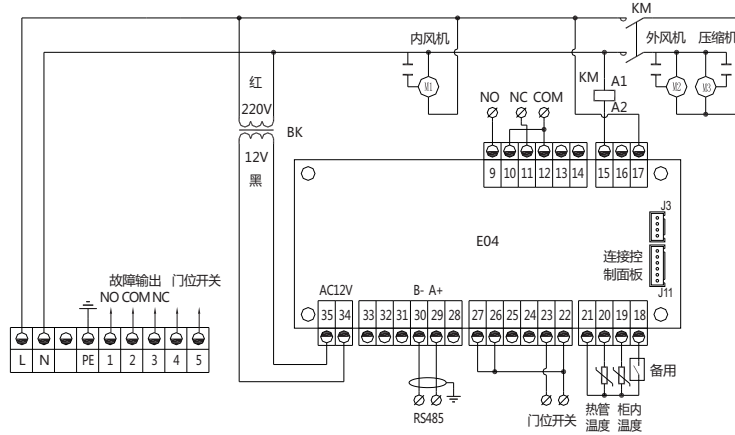
制冷机只能用于控制柜的冷却，如果被错误连接电源，或违规操作（参照使用说明书），雷子克无责任承担任何的损失。

10. 电气原理图

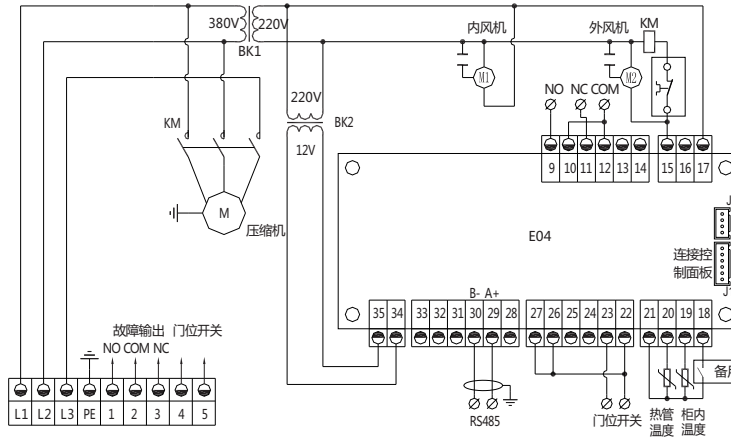
10.1 5FCC680/825，230V AC/50 Hz电路图：



10.2 5FCC1100/1500/2000/2500/3200/4300，230V AC/50 Hz电路图：



10.3 5FCC2000/2500/3200/4300，380V AC/50 Hz电路图：



11. 常见故障分析及解决措施

故障现象	故障原因	检查方法	解决方法
压缩机无法启动	电源电压不正常	检查电源电压是否符合该机组的标准	调整供电电源 电压及输出的容量
	接触器故障	检查接触器线圈是否烧坏	更换接触器
	温控器失灵	把温控器温度值调到最低.然后检查触点是否接通	如果不能接通，进行更换；如果能接通可调整温控器的精准度
	过热保护器烧坏	检查是否接通	不能接通进行更换
	电容老化	检查电容是否有充放电能力	更换电容
	控制板出现程序错误	通过观察显示板可以判断出（显示错乱代码）	查明原因后更换
系统高压报警	冷凝器过脏	检查冷凝器内部铜管是否太脏	清洗冷凝器
	系统内有不凝结的气体	检查排气温度及压力是否正常	重新抽真空 加注冷媒
	冷凝风机过滤网脏堵	检查过滤网是否堵塞	清洗过滤网
	冷凝风机不启动	检查风机（电容）是否烧坏	进行更换
压缩机及两风机都正常运行但不制冷	系统冷媒泄漏	对系统进行检漏	检漏 ，补漏 ，保压， 抽真空， 充注冷媒后试机（请与厂家联系）
	系统脏堵	检查干燥过滤器外部是否结冰	更换干燥过滤器 保压 抽真空 充注冷媒后试机请与厂家联系）
空调启动后导致空气开关跳闸	断路器故障（使用不当）	检查断路器容量是否使用过小	选用的断路器容量电流要比空调的运行电流大1.5倍
	压缩机故障	检查压缩机绕组绝缘 对地绝缘是否损坏	请与厂家联系
	冷凝风机故障		
	蒸发风机故障	检查风机绕组绝缘 对地绝缘是否损坏	
制冷效果差	冷凝风机过滤网脏堵	检查过滤网是否堵塞)	清洗过滤网
	系统泄漏	1.使用检漏仪进行检漏 2.可用测量电流判断	请与厂家联系
	系统脏堵	检查干燥过滤器外部是否结冰	更换干燥过滤器 保压 抽真空 充注冷媒后试机请与厂家联系）

English

Content

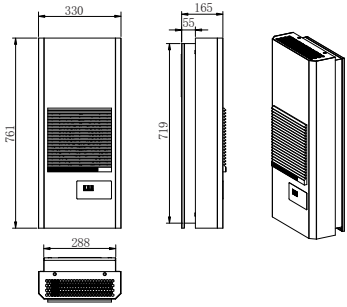
1. Application

Enclosure cooling unit is specifically designed to cool the outdoor cabinet. It protects the inside costly components sensitive to temperature by dispersing heat load out of the cabinet and is particularly suitable for the condition under the temperature range from 35℃ to 55℃, with the effect surpassing other heat dissipation items such as air/air heat exchanger and filter fan unit.

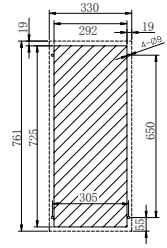
2. Technical data and cutout drawing

Model# / col.	5FCC680			5FCC825		
	5FCC680	5FCC680P	5FCC680Q	5FCC825	5FCC825P	5FCC825Q
ID#	30200360	30200366	30200556	30200200	30200452	30200557
cooling output W(L35L35)	680			825		
cooling output W(L35L50)	540			620		
power consumption W(L35L35)	331			368		
power consumption W(L35L50)	414			460		
refrigerant	R134a/300g			R134a/360g		
Ambient temperature℃	20-55			20-55		
rated voltageV	230			230		
rated frequencyHz	50Hz			50Hz		
Range of operationV	220-240			220-240		
DimensionWxHxDmm	330x761x165			330x761x165		
weight Kg	37	38	37	39	40	39
Protection category	IP54			IP54		
Noise level	55dB(A)			55dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

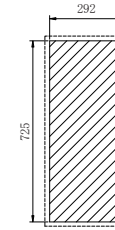
5FCC680/825/680Q/825Q dimension drawing:



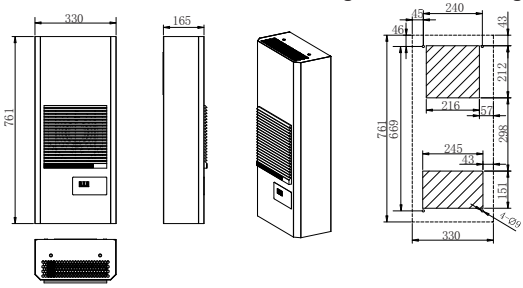
5FCC680/825 cutout drawing:



5FCC680Q/825Q cutout drawing:

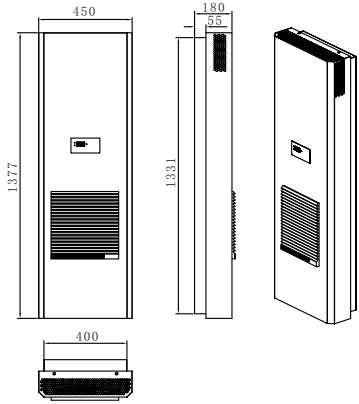


5FCC680P/825P dimension drawing & cutout drawing :

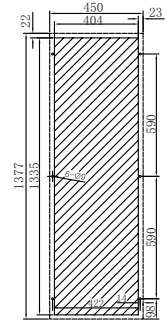


col. \ Model#	5FCC1100			5FCC1500		
	5FCC1100	5FCC1100P	5FCC1100Q	5FCC1500	5FCC1500P	5FCC1500Q
ID#	30200361	30200367	30200558	30200362	30200368	30200559
cooling output W(L35L35)	1100			1500		
cooling output W(L35L50)	850			1200		
power consumption W(L35L35)	515			589		
power consumption W(L35L35)	644			736		
refrigerant	R134a/430g			R134a/550g		
Ambient temperature℃	20-55			20-55		
rated voltageV	230			230		
rated frequencyHz	50Hz			50Hz		
Range of operationV	220-240			220-240		
DimensionWxHxDmm	450x1377x180			450x1377x180		
weight Kg	53	54	53	55	56	55
Protection category	IP54			IP54		
Noise level	58dB(A)			58dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

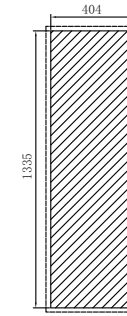
5FCC1100/1500/1100Q/1500Q dimension drawing:



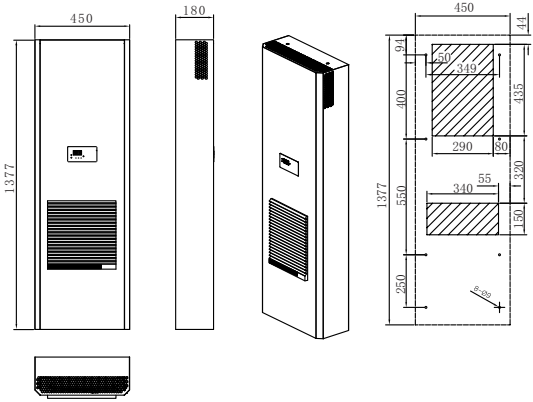
5FCC1100/1500cutout drawing :



5FCC1100Q/1500Q cutout drawing :



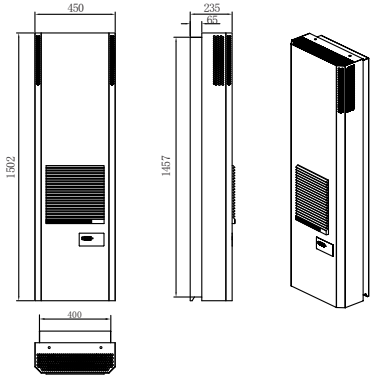
5FCC1100P/1500P dimension drawing&cutout drawing:



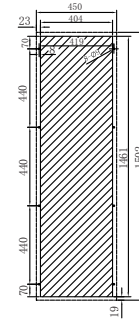
Model# / col.	5FCC2000					
	5FCC2000	5FCC2000P	5FCC2000Q	5FCC2000-380	5FCC2000P-380	5FCC2000Q-380
ID#	30200363	30200369	30200560	30200377	30200381	30200561
cooling output W(L35L35)	2000			2000		
cooling output W(L35L50)	1500			1500		
power consumption W(L35L35)	828			828		
power consumption W(L35L50)	1035			1035		
refrigerant	R134a/1050g			R134a/1120g		
Ambient temperature°C	20-55			20-55		
rated voltageV	230			380		
rated frequencyHz	50Hz			50Hz		
Range of operationV	220-240			370-390		
DimensionWxHxDmm	450x1502x235			450x1502x235		
weight Kg	65	66	65	75	76	75
Protection category	IP54			IP54		
Noise level	58dB(A)			58dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

Model# / col.	5FCC2500					
	5FCC2500	5FCC2500P	5FCC2500Q	5FCC2500-380	5FCC2500P-380	5FCC2500Q-380
ID#	30200375	30200374	30200562	30200378	30200379	30200563
cooling output W(L35L35)	2500			2500		
cooling output W(L35L50)	2000			2000		
power consumption W(L35L35)	957			957		
power consumption W(L35L50)	1196			1196		
refrigerant	R134a/1126g			R134a/1250g		
Ambient temperature°C	20-55			20-55		
rated voltageV	230			380		
rated frequencyHz	50Hz			50Hz		
Range of operationV	220-240			370-390		
DimensionWxHxDmm	450x1502x235			450x1502x235		
weight Kg	67	68	67	77	78	77
Protection category	IP54			IP54		
Noise level	58dB(A)			58dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

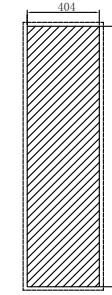
5FCC2000/2500/2000Q/2500Q dimension drawing: :



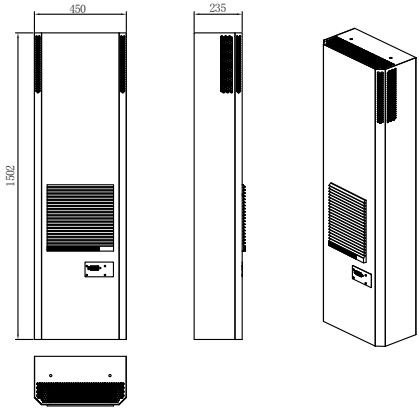
5FCC2000/2500 cutout drawing:

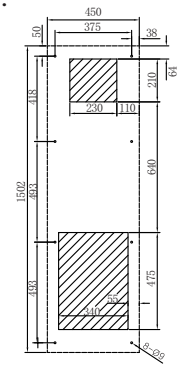


5FCC2000Q/2500Q cutout drawing:



5FCC2000P/2500Pdimension drawing&cutout drawing: :

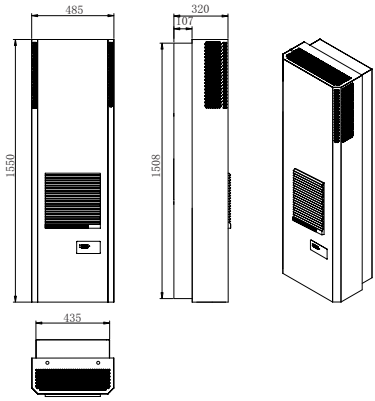




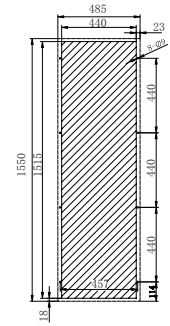
Model# / col.	5FCC3200					
	5FCC3200	5FCC3200P	5FCC3200Q	5FCC3200-380	5FCC3200P-380	5FCC3200Q-380
ID#	30200364	30200370	30200564	30200380	30200453	30200565
cooling output W(L35L35)	3200			3200		
cooling output W(L35L50)	2500			2500		
power consumption W(L35L35)	1049			1049		
power consumption W(L35L50)	1311			1311		
refrigerant	R134a/1250g			R134a/1400g		
Ambient temperature℃	20-55			20-55		
rated voltageV	230			380		
rated frequencyHz	50Hz			50Hz		
Range of operationV	220-240			370-390		
DimensionWxHxDmm	485x1550x320			485x1550x320		
weight Kg	71	72	71	81	82	81
Protection category	IP54			IP54		
Noise level	60dB(A)			60dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

Model# / col.	5FCC4300					
	5FCC4300	5FCC4300P	5FCC4300Q	5FCC4300-380	5FCC4300P-380	5FCC4300Q-380
ID#	30200553	30200554	30200566	30200498	30200555	30200567
cooling output W(L35L35)	4300			4300		
cooling output W(L35L50)	3400			3400		
power consumption W(L35L35)	1380			1380		
power consumption W(L35L50)	1725			1725		
refrigerant	R134a/1300g			R134a/1570g		
Ambient temperature℃	20-55			20-55		
rated voltageV	230			380		
rated frequencyHz	50Hz			50Hz		
Range of operationV	220-240			370-390		
DimensionWxHxDmm	485x1550x320			485x1550x320		
weight Kg	73	74	73	83	84	83
Protection category	IP54			IP54		
Noise level	60dB(A)			60dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

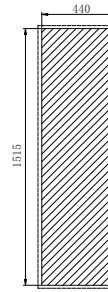
5FCC3200/4300/3200Q/4300Q dimension drawing:



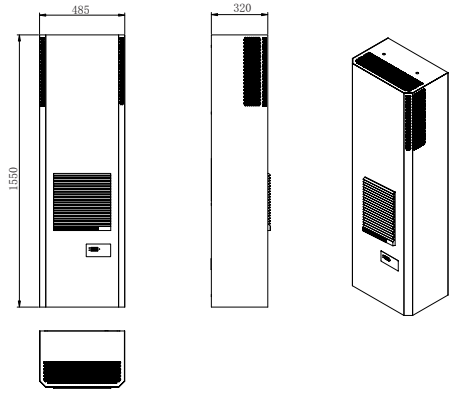
5FCC3200/4300 cutout drawing:



5FCC3200Q/4300Q cutout drawing:



5FCC3200P/4300 Pdimension drawing&cutout drawing:



3.Assembly

Each model of 5FCC series item is devised with 3 fitting methods: semi-recessed compelte external mounting or boltless with fast clip(ending Q) on request.

4.Safety and caution

Safety warning:cooling unit is a kind of precise electrical device, thus please put in down gently, do not bottom it up or recline it in transportation and storage

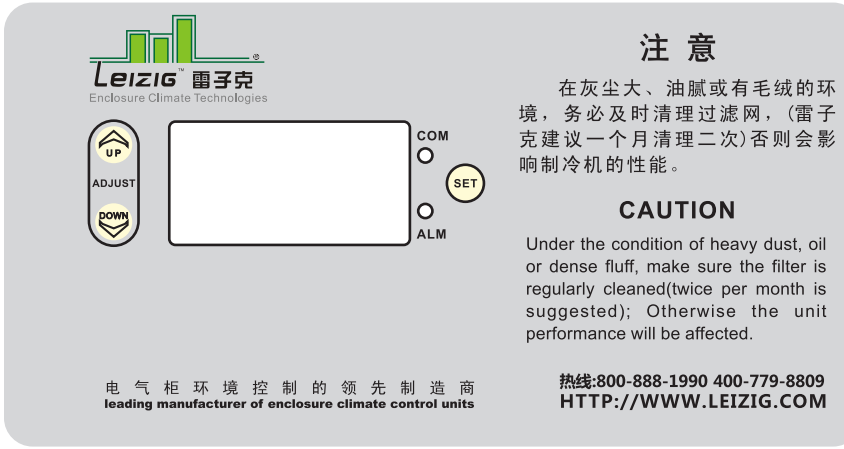
Cautions :

- Clean the filter mesh regularly in the dusty, oily or plush environment; otherwise the performance may be impacted.
- The inlet opening of cooling unit should be located on the top of enclosure.
- The temperature surrounding the enclosure shall not exceed 55 degree Celsius and transient high temperature will not affect the function of cooling unit.
- The packaging shows no signs of damage. Oil stains or damaged packaging is an indication of refrigerant loss and of leakage in the unit system. Any damage to the packaging may be the cause of subsequent malfunctions.
- The protection grade of enclosure must be up to IP54; the condensate may form in case of any gaps or openings at the enclosure walls.
- The distance between 2 units or that away from the wall should not be less than 200 mm.
- Air inlet and outlet are not obstructed inside enclosure.Units should only be fitted horizontally in the specified position. Max. deviation from true Horizontal: 2°
- Maintenance and power transmission must be operated by the professional person
- To avoid an increase on condensation， a door operated switch should be used which will switch off the cooling unit when the enclosure door is opened.
- The heat loss load from inside components should not exceed the rated cooling capacity of the unit.
- The customer must not modify the design or configuration of cooling unit in any way

5. Electrical connection

The voltage and frequent in use must match the data stated in the rating plate of cooling unit; Motor protector is suggested for the 3-phase cooling unit; for special voltage, refer to the assembly instruction for details.。

6. Regular operations



See the control panel at above picture

Panel indicator lights

COM **#** Communicating indicator light

ALM **#** Fault indicator light

Keys

Set key SET

Increase(Incr.) or turn up Key UP

Decrease(Decr.) or turn down key DOWN

6.1 Key-press guidance

Symbol	Role	Function
SET	Set	For user's parameter setting，check the status by a short press and press "UP" to look up the set value; When the display is for the last selection， repress "DOWN" to revert to the main menu; In the course of set value reading，another short press of "SET" gets into setting process，when the setting value is flashing， press "UP" or "DOWN" to increase or decrease the value， then validate it and return to lookup status by a short press of “SET” again.
UP	Incr.	1、.In setting interface， a short press makes the value increased progressively 1 by 1 and a long press gets the rapid increment. 2、 In the interface of fault lookup， press "UP" to leaf through the defaults with the system

DOWN	Decr.	In setting interface,a short press makes the value decreased progressively 1 by 1 and a long press it rapidly diminished
UP+SET	—	A lookup of default: press the combined keys once to look up the fault; if there is no fault， the interface displays"n.55"; if the malfunction occurs， the Nixie tubes read the 1st code; in case of many defaults，press "UP" orderly to check all the breakdowns ; then press "UP+SET" to quit the and turn to the main interface.
SET+UP+DOWN	Self diagnosis	Enter into the self-diagnosis by pressing the combined keys in the period of startup countdown
SET+DOWN	—	Enter into the self-diagnosis by pressing the combined keys in the period of startup countdown.
No press	—	The system will return to the main interface if there is no operation on the keys in 30 s and no faults found

6.2 Display guidance

The 3 Nixie tubes on the control panel indicates the present indoor temperature,within a range from-20℃~99.9℃

Use condition	Display
Countdown of electrification	The 3 Nixie tubes of a range from 999 to 000 count down by 10s to reveal the unit is being electrified， then it enters into the display of current "Cabinet inside temperature"; if the remote control points are short circuited， it will show the unit is closing down.
Setting	In the setting interface， the 1st Nixie tube displays the setting codes， the next 2 digits of tubes display the current values to set.
Fault	The fault interface pops up and displays the first fault code.

6.3 Parameter setting

1. In the temperature readout interface， press "SET" toget the cooling temperature setting option as right picture shows， the default value is 35， repress once "SET"， the first letter flickers to denote the setting is available， then adjust the value (ranging from 28 to 40) through the key “UP” or “DOWN”; press “ SET” another time to quit the value adjustment.

2. In the temperature readout interface， press "SET" and subsequently “DOWN” to get the setting option of the cooling return differential， the default value is 3， repress once "SET"， the first letter flickers to denote the setting is available， then adjust the value (ranging from 1 to 9) through the key “UP” or “DOWN”; Press “SET” another time to quit the value adjustment

N.B. : If no any manipulation occurs within 10 seconds， it will quit the current setting and get back to the temperature display interface.

6.4 Failure alarm

In accordance with the system setting， the point in N.C. indicates the failure point; If the return circuit can be formed between the DCOM(common port) of the plug and the point， it will run in no problem; on the contrary， the disconnection means failure. For the points in no use， short-circuit it to avoid the unwanted alarms. In case of fault， the indicator light is on and there is alarm from the speaker. Press “UP” to mute it.

Fault	Code	Delay	Duration	Reset	Remarks
Inside enclosure tempe -rature probe fault	EE1	0 s	2 s	Auto.	Alarm,Compressor halt
Heat pipe temperature probe fault	EE2	0 s	2 s	Auto.	Alarm,Compressor halt
High temperature Alert	EHt	0 s	2 s	Auto.	Alarm
Heat pipe over -temperature	EdS	0 s	2 s	Auto.	Alarm,Compressor halt

N.B. : The compressor will restart in 1 min. delay after the reset of compressor and the downtime of compressor is larger than the shortest halt time. In case of communication malfunction,he display will keep in memory the interface before the fault.

6.5 Power on/off

In event the interior fan starting condition is met after powering on， the system will automatically delay for 5~15s(random value) to activate the fan; in event the compressor starting condition is met， the fan will delay for 10 s to activate the compressor

6.6 Self-diagnosis

Press the combined keys for Self-diagnosis during the starting countdown and the relay will connect/disconnect to power for 30 s， then enter into the normal operation process.

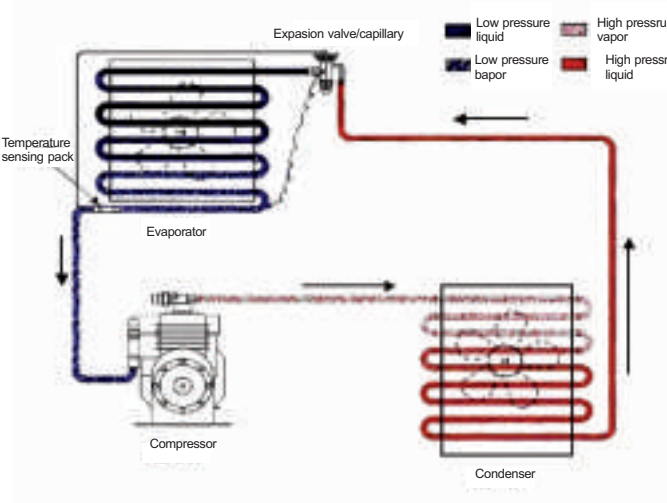
Self-diagnosis sequence：

1、In the starting countdown step, press ″SET″+″UP″+″DOWN″ keys to get the system selfchecking and activate the exterior fan.；
2、30 s later after interior fan operation， start compressor；
3、30 s later， stop compressor and start exterior fan；
4、30 s later，stop fan，start the fault relay；
5、30 s later，stop all，quit the self-diagnosis，enter the temperature control and activate the relative devices。

⚠ Internal fan is always on in self-diagnosis

7. Working principle

The cooling unit applies the theory of phase-transition cooling this way: the gaseous refrigerant is expelled out of the compressor, in high temperature and high pressure, enters into condenser，cooled forcibly and liquefied in modest temperature and still high pressure， then goes through the throttling devices such as capillary or expansion valve to become liquid in lower temperature and lower pressure when it flows into evaporator， afterwards， it returns to the condenser by phasechange absorbing the heat of inside enclosure. This reciprocating circulation guarantees the reliable working environment.



8. Maintenance/care

As the maintenance-free cooling device， the unit has been strictly tested before ex. Factory and all performance passed the international certification. The fan of ball bearing has a lifespan up to 30，000 hour. The filter mesh is recommended to use in case of dense dusts and clean at twice every month.

Turn off the power if the cooling unit is kept long not for use.

The power must be switched off in the period of maintenance/care.

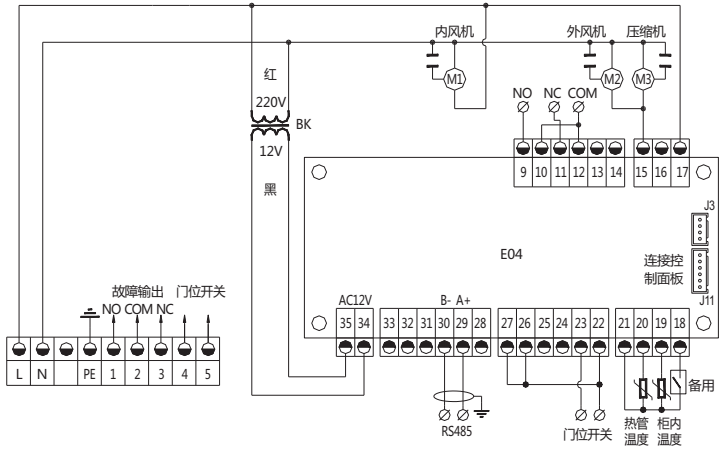
9. Quality warranty

All the cooling units in normal use（Refer to 4. Safety notes）shall be granted with a year of free maintenance. During the valid warranty， the faulty unit will be returned to factory or handled on the site for repairs.

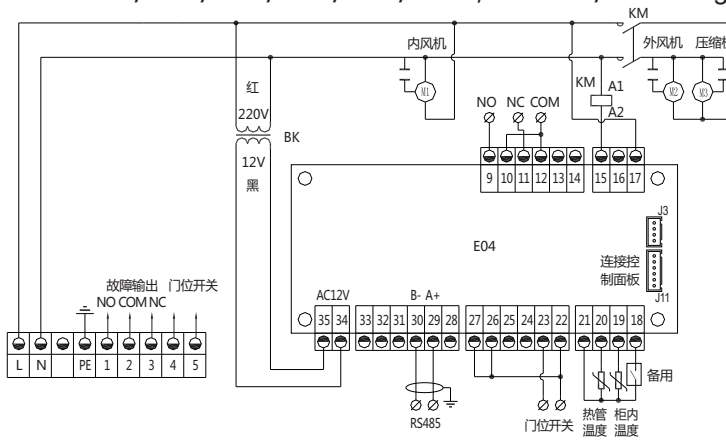
The product is only limited to the purpose of cooling down the enclosure; otherwise Leizig shall take on no responsibility for the losses caused by any misconnection to power or incorrect operations（see regular operations）. Electrical circuit drawings.

10. Electrical diagram

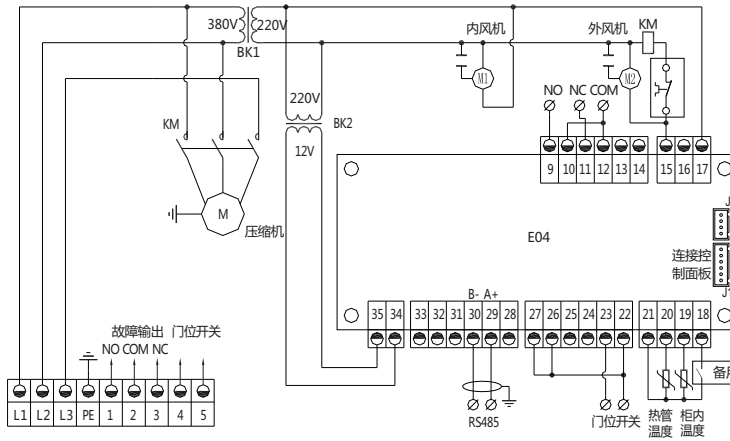
10.1 5FCC680/825，230V AC/50 Hz diagram：



10.2 5FCC1100/1500/2000/2500/3200/4300，230V AC/50 Hz diagram：



10.3 5FCC2000/2500/3200/4300，380V AC/50 Hz diagram：



11. Common faults and troubleshooting

Faults	Probable cause	Diagnosis method	Troubleshooting
Compressor not working	abnormal voltage	check if the power matches the stated standard	Adjust the capacity of mains power supply, voltage and output
	contacter fault	check the coils of contacter if they are burnt out	Replace the contacter
	thermostat malfunction	adjust the thermostat to the lowest and check if contact can be connected	replace it in case of disconnection; or adjust its accuracy in case of connection
	overheat protector burnout	check if it can be connected	replace it in case of disconnection
	capacitor aging	check if capacitor has electro -discharging ability	replace the capacitor
	Program error on control panel	observe the display panel for the error codes	replace it after cause clarification
System high pressure alarm	condenser dirts	check the dirts in the inner copper tube of condenser	clean the condenser
	incondensable air in system	check if outlet temperature and pressure is normal	refill the refrigerant after vacuumization
	condenser fan' filter mesh dirt blockage	check if the filter mesh is clogged	clean the filter mesh
	condenser fan no startup	check if the fan(capacitor) is burnt out	replace the capacitor
Compressor +2 fans working but not cooling	Refrigerant leakage	system leakage inspection	test and mend the leakage, pressurize and vacuumize it and contact manufacturer for commissioning it after refrigerant refilling.
	dirt blockage	check if the filter dryer is iced up	replace filter dryer, pressurize and vacuumize it and contact manufacturer for commissioning it after refrigerant refilling.
air switch tripping after AC startup	breaker malfunction (wrong use)	check if the breaker is too small in fuse capacity	The capacity of breaker selected should be 1.5 of AC working current
	compressor malfunction	check if the insulation of compressor coils and earthing are damaged	Contact the manufactuer
	compressor fan malfunction		
	evaporator fan malfunction	check if the insulation of fan and earthing are damaged	
Weak cooling	condenser fan filter mesh dirt blockage	check if the filter mesh is clogged	clean the filter mesh
	system leakage	1. test the leakage 2. measure the current	Contact the manufacturer
	system dirt blockage	check if the filter dryer is iced up	replace filter dryer, pressurize and vacuumize it and contact manufacturer for commissioning it after refrigerant refilling.

6 大系列产品

■ **通风系列**
（过滤风扇，出口过滤器）

■ **制冷系列**
（工业电气柜制冷机，屏柜制冷器，半导体制冷器）

■ **热交换系列**
（气气，水气，水水，热交换器核芯体）

■ **加热系列**
（屏柜加热器，机舱加热器，温/湿/温湿度控制器）

■ **照明系列**
（控制柜照明系统，机舱照明系统）

■ **再冷却系统**
（再冷却系统，变流器冷却系统）

客户支持热线：

800-888-1990
400-779-8809

HTTP://WWW.LEIZIG.COM

LEIZIG™ 雷子克
Enclosure Climate Technologies

中国厂址：
中国・广州・白云・人和・江人三路383号・雷子克工业园
Tel: +86 20 61139230/86456175
Fax: +86 20 86450613/86456193
Pos: 510470

印尼分公司 PT.LEIZIG Indonesia
Add：Ruko gunung Sahari B3 Jalan gunung Sahari raya no.7 B3
Kel.Gn Sahari utara Kec.Sarah besar Jakarta pusat ;
Tel：+62 21 62307778 Fax：+62 21 6242305

香港分公司 LEIZIG (HONG KONG) CO.,LIMITED
香港新界葵涌昌路26-38號豪华工业大厦23楼B07室
Flat B07 Floor23,Hover Industrial Building,NO.26-38 Kwal Cheong Road,N.T,HONG KONG.

沈阳办事处
沈阳市和平区南京南街1甲联营大厦12楼1203A室 邮编:110001
Tel: 024-23286090 Fax: 024-23286879

北京办事处
北京市朝阳区东三环南路58号富顿中心C座1111室 邮编:100022
Tel: 010-58674648 Fax: 010-58673438

上海办事处
上海市宝山区一二八纪念路878弄968号万达广场1号楼815 邮编:200435
Tel: 021-51098893 , 50496986 Fax: 021-50496987

武汉办事处
武汉市武昌区武珞路456号新时代商务广场310房 邮编:430077
Tel: 027-87739759 / 87739760 Fax: 027-87739736

重庆办事处
重庆市江北区观音桥建新南路1号中信大厦23-6 邮编:400020
Tel: 023-67851609 Fax: 023-67852033

福州办事处
福建省福州市台江区五一中路75号友精大厦15F1212 邮编:350000
Tel: 0591-83324546 Fax:0591-83325725

南宁办事处
南宁市新民路4号华星时代广场雅仕阁1816号 邮编:545000
Tel: 0771-2022453 Fax: 0771-2022453

广州办事处
广州市天河区林和西路167号 威尼国际酒店829 邮编:510610
Tel: 020-61135589 Fax: 020-86450775

深圳办事处
深圳市南山区桃园路1号西海明珠商务公寓E座1603 邮编:518052
Tel: 0755-61280133 Fax: 0755-86193119