

Enclosure Climate Control Unit Assembly Instructions

工业控制柜制冷机安装说明书 (ECC系列产品)

ECC225
ECC320
ECC500
ECC680
ECC825
ECC1100
ECC1500
ECC2000
ECC2500
ECC3200
ECC4300



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

中文

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4. 安全与注意
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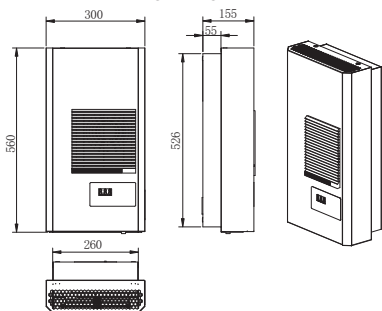
1. 应用场合

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。ECC冷却单元特别适合温度在40°C至55°C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。

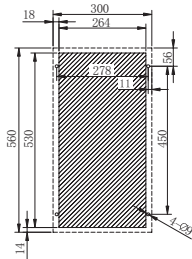
2. 技术参数

项目	ECC225			ECC320		
	ECC225	ECC225P	ECC225Q	ECC320	ECC320P	ECC320Q
订货号	30200509	30200518	30200527	30200510	30200519	30200528
制冷功率W (L35L35)	225			320		
制冷功率W (L35L50)	180			260		
消耗功率W (L35L35)	202			258		
消耗功率W (L35L50)	253			322		
冷媒	R134a/60g			R134a/70g		
环境温度°C	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	300x560x155			300x560x155		
重量Kg	18	19	18	19	20	19
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

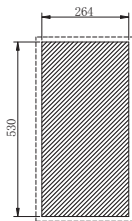
ECC225/320/225Q/320Q外形图:



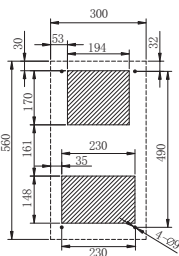
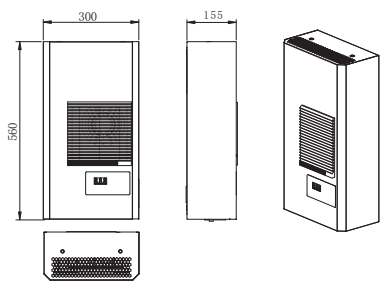
ECC225/320安装开孔图:



ECC225Q/320Q安装开孔图:

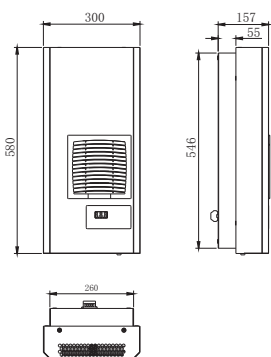


ECC225P/320P外形图和安装开孔图:

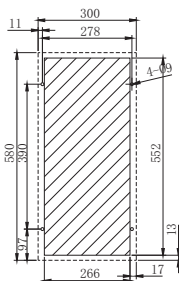


项目	产品型号		
	ECC500	ECC500P	ECC500Q
订货号	30200575	30200576	30200577
制冷功率 W (L35L35)	500		
制冷功率 W (L35L50)	400		
消耗功率 W (L35L35)	304		
消耗功率 W (L35L50)	380		
冷媒	R134a/100g		
环境温度 °C	20-55		
额定电压 V	230		
额定频率 Hz	50Hz		
电压范围 V	220-240		
外形尺寸 WxHxDmm	300x580x157		
重量 Kg	25	26	25
防护等级	IP54		
噪音等级	55dB(A)		
安装方式	半内嵌安装	外挂式安装	无螺钉

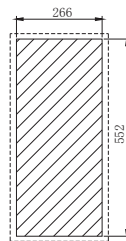
ECC500/500Q外形图:



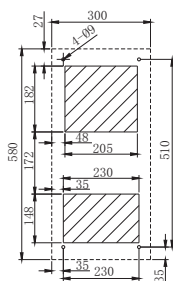
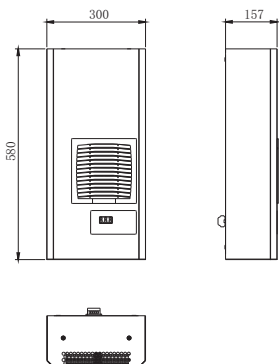
ECC500安装开孔图:



ECC500Q安装开孔图:

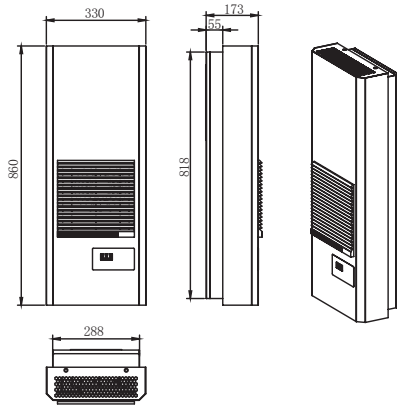


ECC500P外形图和安装开孔图:

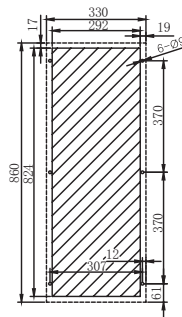


项目	产品型号	ECC680			ECC825		
		ECC680	ECC680P	ECC680Q	ECC825	ECC825P	ECC825Q
订货号		30200511	30200520	30200529	30200512	30200521	30200530
制冷功率W (L35L35)		680			825		
制冷功率W (L35L50)		540			620		
消耗功率W (L35L35)		331			368		
消耗功率W (L35L50)		414			460		
冷媒		R134a/300g			R134a/360g		
环境温度°C		20-55			20-55		
额定电压V		230			230		
额定频率Hz		50Hz			50Hz		
电压范围V		220-240			220-240		
外形尺寸WxHxDmm		330x860x173			330x860x173		
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

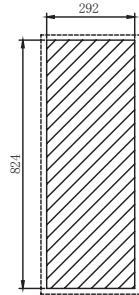
ECC680/825/680Q/825Q外形图:



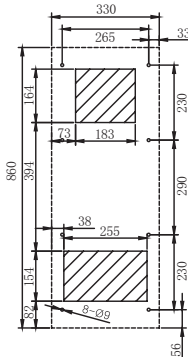
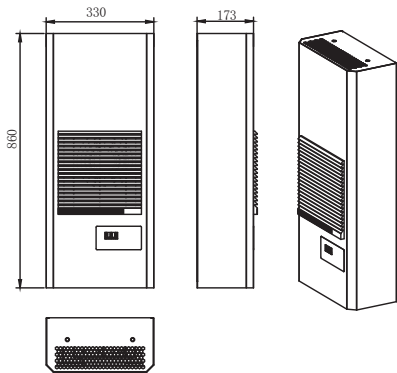
ECC680/825安装开孔图:



ECC680Q/825Q安装开孔图:



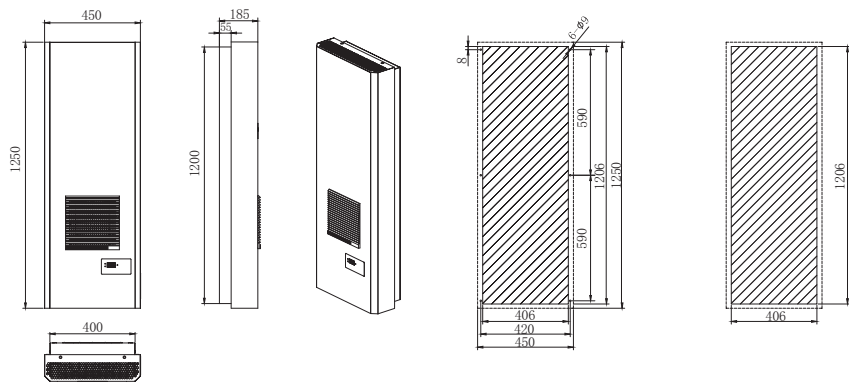
ECC680P/825P外形图和安装开孔图 :



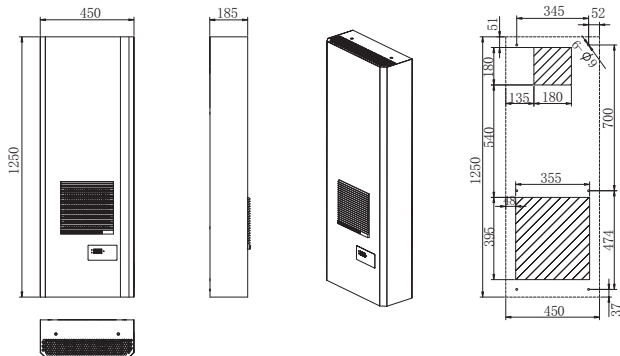
项目	产品型号	ECC1100			ECC1500		
		ECC1100	ECC1100P	ECC1100Q	ECC1500	ECC1500P	ECC1500Q
订货号		30200513	30200522	30200531	30200514	30200523	30200532
制冷功率W (L35L35)		1100			1500		
制冷功率W (L35L50)		850			1200		
消耗功率W (L35L35)		515			589		
消耗功率W (L35L50)		644			736		
冷媒		R134a/430g			R134a/550g		
环境温度°C		20-55			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		450x1250x185			450x1250x185		
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

ECC1100/1500/1100Q/1500Q 外形图：

ECC1100/1500安装开孔图： ECC1100Q/1500Q 安装开孔图：



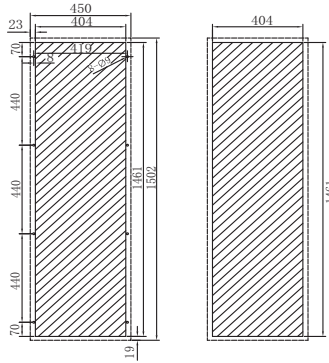
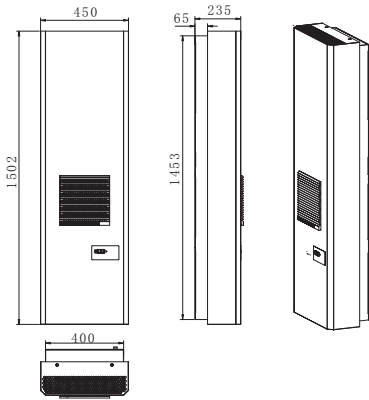
ECC1100P/1500P外形图和安装开孔图：



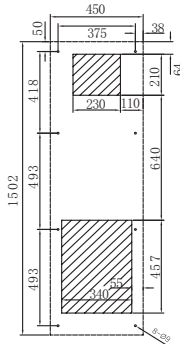
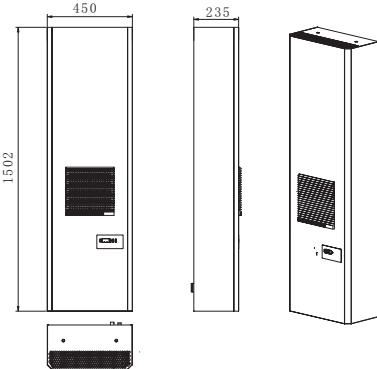
项目	产品型号	ECC2000			ECC2500		
		ECC2000	ECC2000P	ECC2000Q	ECC2500	ECC2500P	ECC2500Q
订货号		30200515	30200524	30200533	30200516	30200525	30200534
制冷功率W (L35L35)		2000			2500		
制冷功率W (L35L50)		1500			2000		
消耗功率W (L35L35)		828			957		
消耗功率W (L35L50)		1035			1196		
冷媒		R134a/1050g			R134a/1126g		
环境温度°C		20-55			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		450x1502x235			450x1502x235		
重量Kg		65	66	65	67	68	67
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

ECC2000/2500/2000Q/2500Q外形图：

ECC2000/2500安装开孔图： ECC2000Q/2500Q安装开孔图：



ECC2000P/2500P外形图和安装开孔图：

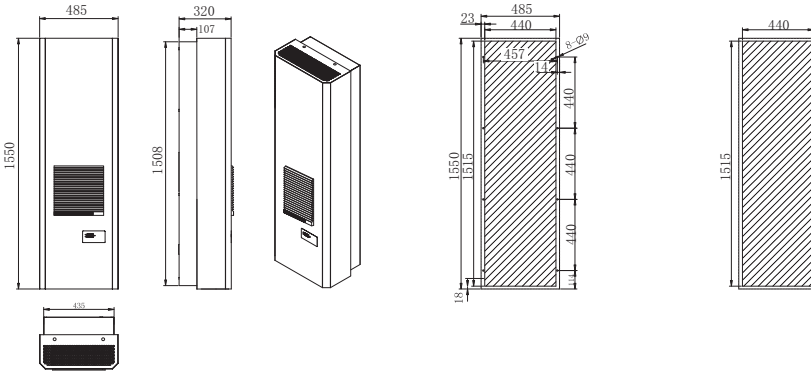


项目	ECC3200			ECC4300		
	ECC3200	ECC3200P	ECC3200Q	ECC4300	ECC4300P	ECC4300Q
订货号	30200517	30200526	30200535	30200536	30200537	30200538
制冷功率W (L35L35)	3200			4300		
制冷功率W (L35L50)	2500			3400		
消耗功率W (L35L35)	1049			1380		
消耗功率W (L35L50)	1311			1725		
冷媒	R134a/1200g			R134a/1300g		
环境温度°C	20-55			20-55		
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	485x1550x320			485x1550x320		
重量Kg	71	72	71	73	74	73
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

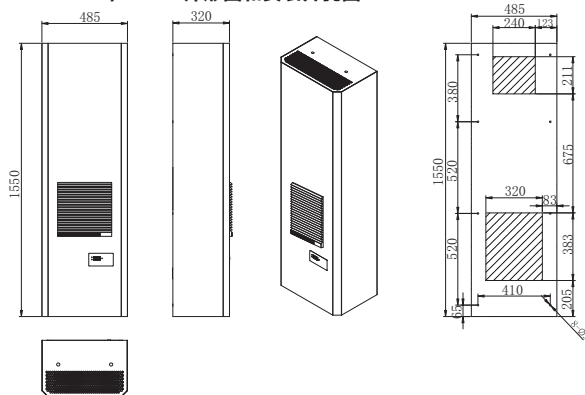
ECC3200/4300/3200Q/4300Q外形图：

ECC3200/4300安装开孔图：

ECC3200Q/4300Q安装开孔图：



ECC3200P/4300P外形图和安装开孔图：



3. 安装方式

ECC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：

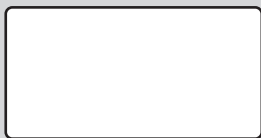
- ◆ 制冷机在灰尘大、油性或者毛绒的环境务必及时清理过滤网，否则会影响制冷机性能。
- ◆ 制冷机内循环入风口需安装到控制柜体的上部。
- ◆ 控制柜外的温度不能超过55摄氏度，但短暂的高温并不影响制冷机运作。
- ◆ 包装应完好，如果发现制冷机有油渍，极有可能是泄漏制冷剂，包装的任何损坏都有可能引起制冷机的故障。
- ◆ 控制柜必须达到IP54，如果控制柜有漏洞或缝隙，冷凝水可能会持续产生。
- ◆ 制冷机之间或制冷机与墙壁距离不小于200mm。
- ◆ 在控制柜内部，制冷机入风和出风口不可有障碍物阻塞。制冷机需水平安装、使用，最大倾斜角度不大于2°
- ◆ 维护及送电必须由专业人员操作。
- ◆ 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。

特殊电压请参照相关手册安装使用。

6. 操作说明



注意

在灰尘大、油腻或有毛绒的环境，务必及时清理过滤网，(雷子克建议一个月清理二次)否则会影响制冷机的性能。

CAUTION

Under the condition of heavy dust, oil or dense fluff, make sure the filter is regularly cleaned(twice per month is suggested); Otherwise the unit performance will be affected.

电气柜环境控制的领先制造商
leading manufacturer of enclosure climate control units

热线:800-888-1990 400-779-8809
HTTP://WWW.LEIZIG.COM

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“r.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。
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

在主页面，按“SET”键，进入设置页面，显示为第一个设置参数，可按“UP”和“DOWN”切换设置参数，在当前设置参数页面，按“SET”则进入参数设置状态，设置参数的设置代码数值闪烁，按“UP”和“DOWN”增加或减小参数数值，设置完成后按SET确认，此时可按“UP”和“DOWN”选择其他参数。在 [厂家复位] 页面(显示r.00)，按“DOWN”键则退出参数设置返回主页面；

设置参数	显示	单位	范围	缺省	备注
制冷温度	5.35	°C	28~40	35	压缩机开启温度（不建议客户调整）
制冷回差	d.03	°C	1~9	3	当柜内温度小于制冷温度一制冷回差，关闭压缩机。
内风机启动点	F.15	°C	0~35	15	当柜内温度大于此值，则内风机开。
高温报警点	L.60	°C	10-99	60	当柜内温度大于设定值报警，小于设定值-5度故障自动复位。
厂家复位	R.00	-	0~1	0	当此值设置为1时，复位所有参数设置。

6.4 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。

6.5 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

6.6 控制逻辑

◆ 内风机

机组通电后如果满足启动内风机的条件，系统会自动延时5~10秒钟(随机值)启动内风机。

内风机启动条件：柜内温度 \geq [内风机启动点](缺省15度，可设置)；

内风机停止条件：柜内温度 $<$ [内风机启动点15]-2度(缺省12度)。

◆ 外风机控制逻辑

外风机和压缩机延时联动,压缩机启动后5秒钟启动外风机,压缩机关闭后5秒钟关闭外风机。

◆ 压缩机控制逻辑

内风机启动10秒钟后检测柜内温度是否满足启动压缩机的条件：

压缩机启动条件：柜内温度 \geq [制冷温度35](缺省35度，可设置)；

压缩机停止条件：柜内温度 $<$ [制冷温度]-[制冷回差3](缺省32度)。

 压缩机启停还需要满足如下条件：

- ◆ 满足压缩机最小运行时间和最小停机时间的要求

6.7 故障检测及保护


◆ 压缩机保护

压缩机最短停机时间为3分钟，压缩机停止后最少要3分钟才能重新启动

◆ 故障检测及动作

故障报警时，显示故障代码

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	EEI	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

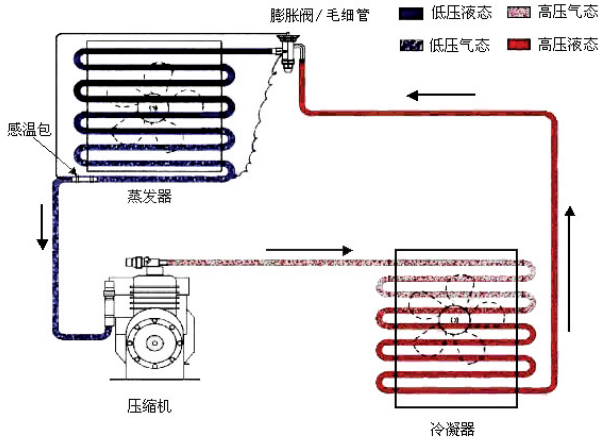
 故障复位后压机延时1分钟重新开启，且需满足压缩机停机时间大于压缩机最短停机时间(3分钟)。

◆ 查询故障代码

有新故障产生时，数码管跳转至显示故障信息。重新查询当前故障时，在主页面按“▲+SET”键，即可查询当前未复位的第一个故障信息。按“▲”或“▼”键可循环查看机组存在的故障，再按“▲+SET”键则退出故障查询页面。

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。

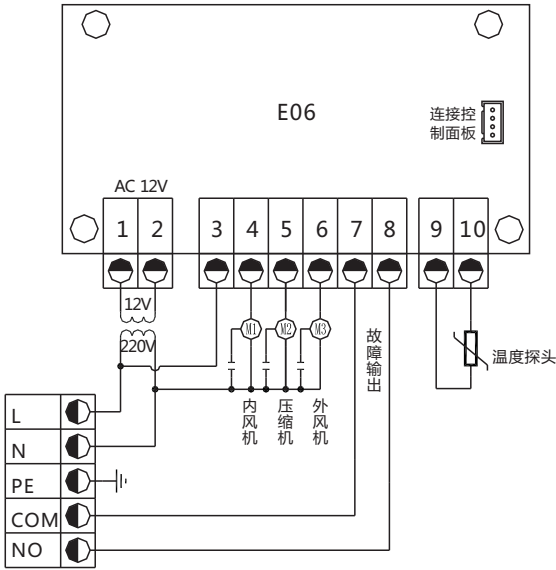
9. 质量保证

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。

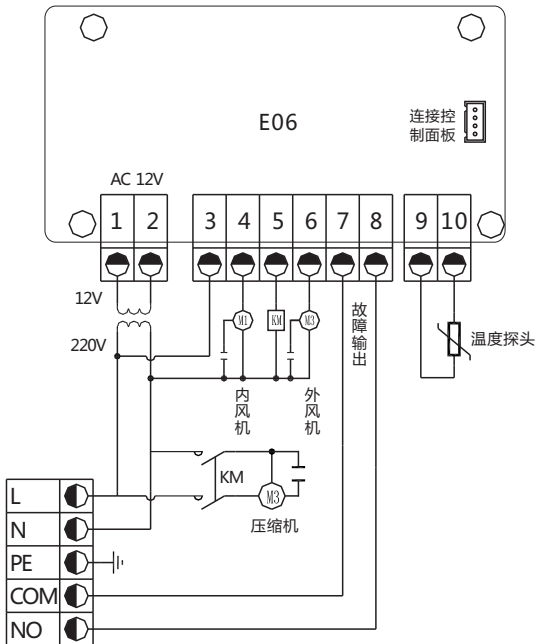
制冷机只能用于控制柜的冷却，如果被错误连接电源，或违规操作（参照使用说明书），雷子克无责任承担任何的损失。

10. 电气原理图

10.1 ECC225/320/500/680/825,230V电路图



10.2 ECC1100/1500/2000/2500/3200/4300,230V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)

Content

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3. Assembly
4. Safety and caution
5. Electrical connection
6. Regular operations
7. Working principle
8. Maintenance/care
9. Quality warranty
10. Electrical schematic diagram
11. Common faults and troubleshooting

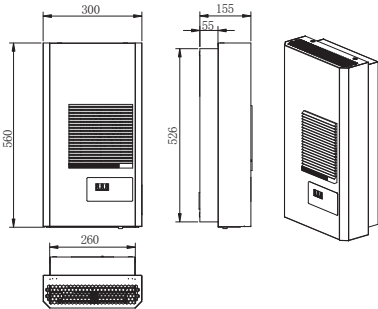
1. Application

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°C to 55°C, with the effect surpassing other heat dissipation items such as air/air heat exchanger and filter fan unit.

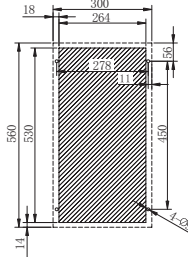
2. Technical data and cutout drawing

col. / Model#	ECC225			ECC320		
	ECC225	ECC225P	ECC225Q	ECC320	ECC320P	ECC320Q
ID#	30200509	30200518	30200527	30200510	30200519	30200528
cooling output W(L35L35)	225			320		
cooling output W(L35L50)	180			260		
power consumption W(L35L35)	202			258		
power consumption W(L35L50)	253			322		
refrigerant	R134a/60g			R134a/70g		
Ambient temperature(°C)	20-55			20-55		
rated voltage(V)	230			230		
rated frequency(Hz)	50Hz			50Hz		
Range of operation(V)	220-240			220-240		
Dimension WxHxD(mm)	300x560x155			300x560x155		
weight (Kg)	18	19	18	19	20	19
Protection category	IP54			IP54		
Noise level	55dB(A)			55dB(A)		
Fitting	semi-recessed	external	boltless	semi-recessed	external	boltless

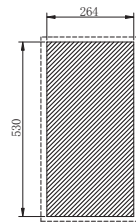
ECC225/320/225Q/320Q dimension drawing:



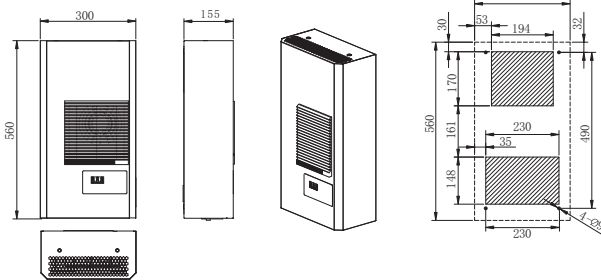
ECC225/320 cutout drawing:



ECC225Q/320Q cutout drawing:

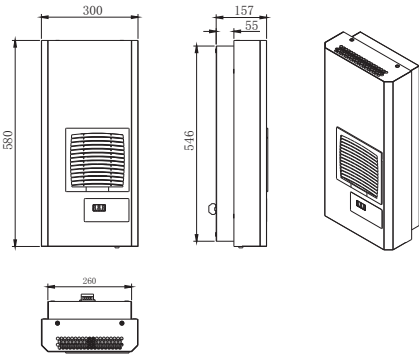


ECC225P/320P dimension drawing & cutout drawing :

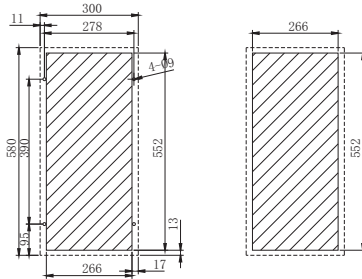


col. Model#	ECC500		
	ECC500	ECC500P	ECC500Q
ID#	30200575	30200576	30200577
cooling output W(L35L35)	500		
cooling output W(L35L50)	400		
power consumption W(L35L35)	304		
power consumption W(L35L50)	380		
refrigerant	R134a/100g		
Ambient temperature(°C)	20-55		
rated voltage(V)	230		
rated frequency(Hz)	50Hz		
Range of operation(V)	220-240		
DimensionWxHxD(mm)	300x580x157		
weight (Kg)	25	26	25
Protection category	IP54		
Noise level	55dB(A)		
Fitting	semi-recessed	external	boltless

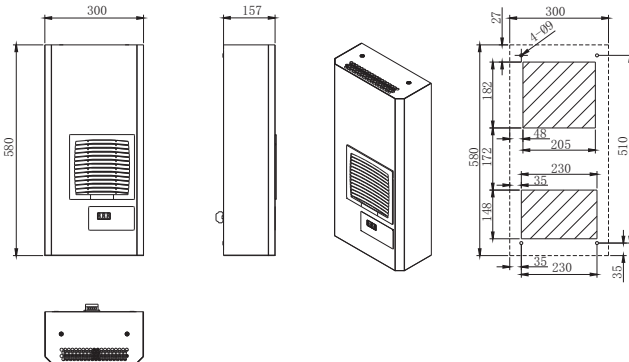
ECC500/500Qdimension drawing:



ECC500cutout drawing: ECC500Qcutout drawing:

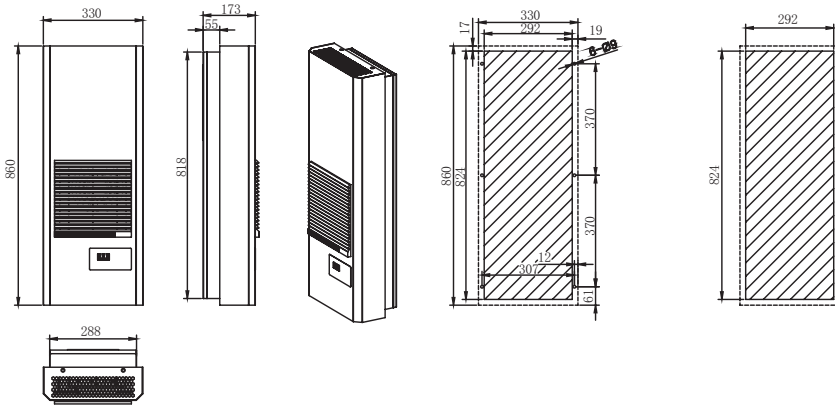


ECC500P dimension drawing & cutout drawing :

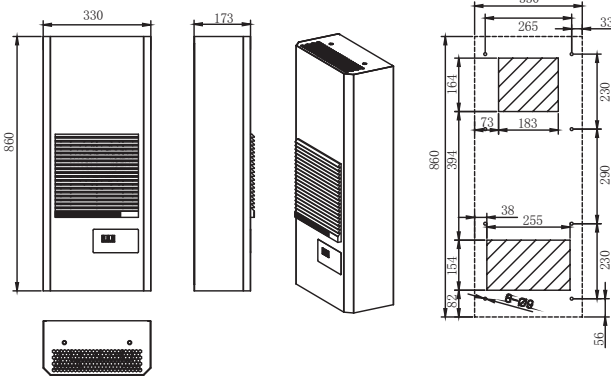


col.	Model#	ECC680			ECC825		
		ECC680	ECC680P	ECC680Q	ECC825	ECC825P	ECC825Q
ID#		30200511	30200520	30200529	30200512	30200521	30200530
cooling output W(L35L35)		680			825		
cooling output W(L35L50)		540			620		
power consumption W(L35L35)		331			368		
power consumption W(L35L50)		414			460		
refrigerant		R134a/300g			R134a/360g		
Ambient temperature(°C)		20-55			20-55		
rated voltage(V)		230			230		
rated frequency(Hz)		50Hz			50Hz		
Range of operation(V)		220-240			220-240		
DimensionWxHxD(mm)		330x860x173			330x860x173		
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

ECC680/825/680Q/825Q dimension drawing: ECC680/825 cutout drawing: ECC680Q/825Q cutout drawing:

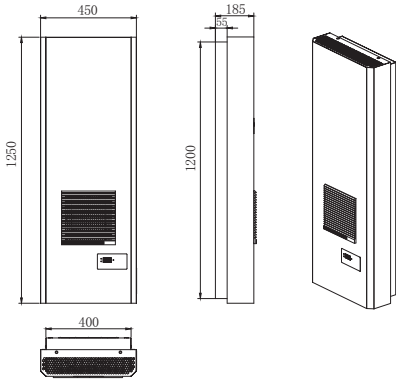


ECC680P/825P dimension drawing & cutout drawing :

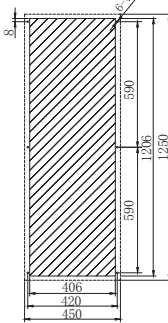


col.	Model#	ECC1100			ECC1500		
		ECC1100	ECC1100P	ECC1100Q	ECC1500	ECC1500P	ECC1500Q
ID#		30200513	30200522	30200531	30200514	30200523	30200532
cooling output W(L35L35)		1100			1500		
cooling output W(L35L50)		850			1200		
power consumption W(L35L35)		515			589		
power consumption W(L35L50)		644			736		
refrigerant		R134a/430g			R134a/550g		
Ambient temperature(°C)		20-55			20-55		
rated voltage(V)		230			230		
rated frequency(Hz)		50Hz			50Hz		
Range of operation(V)		220-240			220-240		
DimensionWxHxD(mm)		450x1250x185			450x1250x185		
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

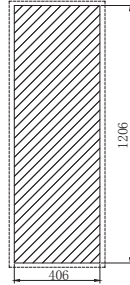
ECC1100/1500/1100Q/1500Q dimension drawing:



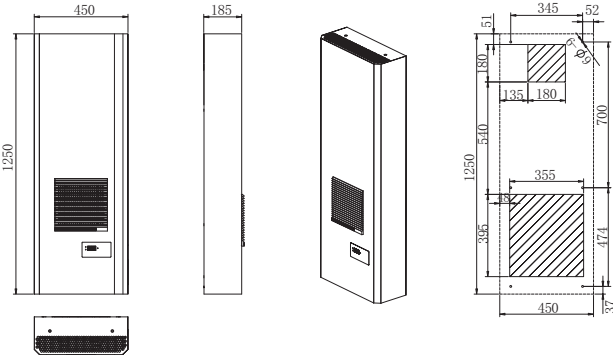
ECC1100/1500 cutout drawing:



ECC1100Q/1500Q cutout drawing:

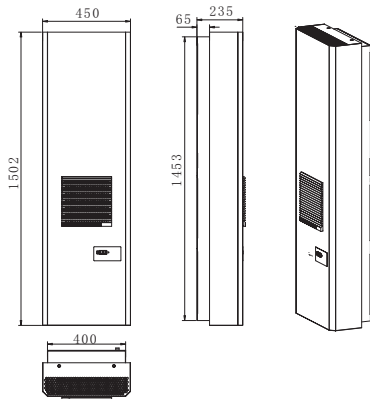


ECC1100P/1500P dimension drawing & cutout drawing :

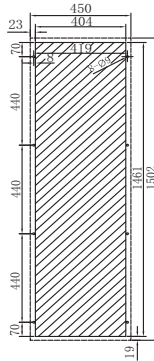


col.	Model#	ECC2000			ECC2500		
		ECC2000	ECC2000P	ECC2000Q	ECC2500	ECC2500P	ECC2500Q
ID#		30200515	30200524	30200533	30200516	30200525	30200534
cooling output W(L35L35)		2000			2500		
cooling output W(L35L50)		1500			2000		
power consumption W(L35L35)		828			957		
power consumption W(L35L50)		1035			1196		
refrigerant		R134a/1050g			R134a/1126g		
Ambient temperature(°C)		20-55			20-55		
rated voltage(V)		230			230		
rated frequency(Hz)		50Hz			50Hz		
Range of operation(V)		220-240			220-240		
DimensionWxHxD(mm)		450x1502x235			450x1502x235		
weight (Kg)		65	66	65	67	68	67
Protection category		IP54			IP54		
Noise level		58dB(A)			58dB(A)		
Fitting		semi-recessed	external	boltless	semi-recessed	external	boltless

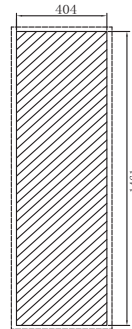
ECC2000/2500/2000Q/2500Q dimension drawing:



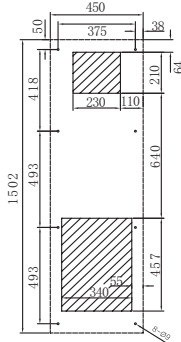
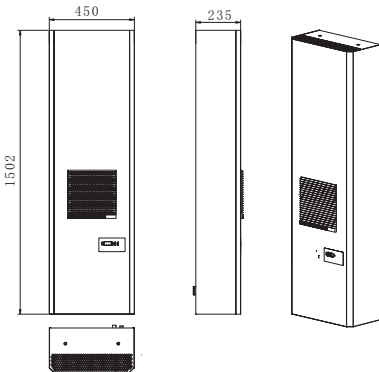
ECC2000/2500 cutout drawing:



ECC2000Q/2500Q cutout drawing:

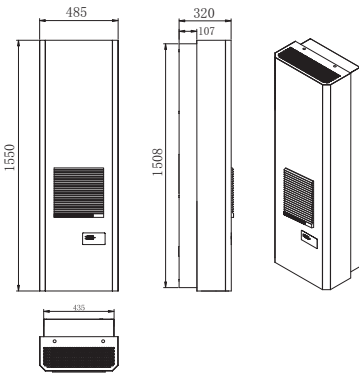


ECC2000P/2500P dimension drawing & cutout drawing :

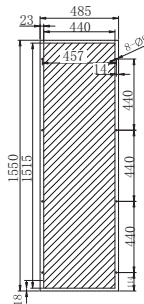


col.	Model#	ECC3200			ECC4300		
		ECC3200	ECC3200P	ECC3200Q	ECC4300	ECC4300P	ECC4300Q
ID#		30200517	30200526	30200535	30200536	30200537	30200538
cooling output W(L35L35)		3200			4300		
cooling output W(L35L50)		2500			3400		
power consumption W(L35L35)		1049			1380		
power consumption W(L35L50)		1311			1725		
refrigerant		R134a/1200g			R134a/1300g		
Ambient temperature(°C)		20-55			20-55		
rated voltage(V)		230			230		
rated frequency(Hz)		50Hz			50Hz		
Range of operation(V)		220-240			220-240		
Dimension WxHxD(mm)		485x1550x320			485x1550x320		
weight (Kg)		71	72	71	73	74	73
Protection category		IP54			IP54		
Noise level		60dB(A)			60dB(A)		
Fitting		semi-recessed	external	boltless	semi-recessed	external	boltless

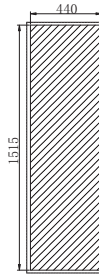
ECC3200/4300/3200Q/4300Q dimension drawing:



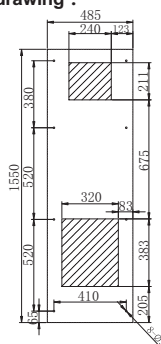
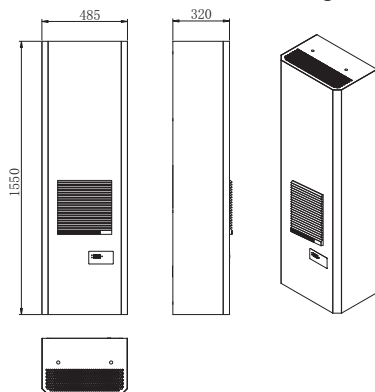
ECC3200/4300 cutout drawing:



ECC3200Q/4300Q cutout drawing:



ECC3200P/4300P dimension drawing & cutout drawing :



3.Assembly

Each model of ECC series item is devised with 3 fitting methods: semi-recessed complete 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
- ◆ 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 frequency 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



注意

在灰尘大、油腻或有毛绒的环境，务必及时清理过滤网，(雷子克建议一个月清理二次)否则会影响制冷机的性能。

CAUTION

Under the condition of heavy dust, oil or dense fluff, make sure the filter is regularly cleaned(twice per month is suggested); Otherwise the unit performance will be affected.

电气柜环境控制的领先制造商
Leading manufacturer of enclosure climate control units

热线:800-888-1990 400-779-8809
HTTP://WWW.LEIZIG.COM

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°C ~ 99.9°C

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".
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

In the main interface , press"SET" to enter setting options and it shows the first parameter, shift"UP" and "DOWN" to set it, press another "SET" to get the exact setting process once the codes begin flashing , then press "UP" or "DOWN" to increase or decrease the value , finally press again "SET" to confirm, and press "UP" or "DOWN" to do other settings. In the "factory reset" (), press "DOWN" to quit the setting and get back to the main interface.

Parameter to set	Display	Unit	Range	Default	Remarks
refrigerating temperature	5.35	°C	28 ~ 40	35	the starting temperature of compressor (adjustment is not suggested)
refrigerating temp. difference	d.03	°C	1 ~ 9	3	the inside temperature is lower than refrigerating temperature-difference, the compressor is stopped.
internal fan startup	F.15	°C	0 ~ 35	15	the inside temperature rises over the value, internal fan is started.
overtemperature alarm	L.60	°C	10-99	60	The inside temperature rises over the setpoint, it alarms and lower than 5 celcius, the fault resets.
Factory reset	R.00	-	0 ~ 1	0	in case the value is 1,all parameters are reset.

6.4 Power on/off

In event the interior fan's 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's starting condition is met, the fan will delay for 10 s to activate the compressor.

6.5 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

6.6 Logic control

◆ Internal circuit fan

System automatically delays 5-10s (random) to start up the internal circuit fan in case the condition of internal fan activation can be met after electrifying;

condition of its activation : inside temperatre \geq [fan starting](defalut 15 celsius,settable);

condition of its stoppage : inside temperature < [fan starting 15]-2 celsius(default 12 celsius).

- ◆ **logic control of external circuit fan**

external fan and compressor delay to coordinate, after 5 s of compressor activation, external fan is started; while the fan is halted after 5 s of compressor stoppage.

- ◆ **compressor of external circuit fan**

after 10 s of internal fan activation, system checks if the inside temperature can be met to start up the compressor :

condition of its activation : inside temperature \geq [refrigerating temperature] (default 35 celsius, settable) ;

condition of its halt : inside temperature < [refrigerating temperature] - [difference 3] (default 32 celsius).

condition of compressor activation/halt:

- ◆ The shortest operation time and halt time of compressor should be met.


6.7 Fault detection and protection

- ◆ **Compressor protection**

the shortest halt time of compressor is 3 min. and it must be re-initiated for fault detection and actions after at least 3 min.

- ◆ The fault codes appears in case of malfunction alarms

Fault	Code	Delay	Duration	Reset	Remarks
enclosure temperature capillary fault	EE I	0 s	2 s	auto	alarm, compressor halt
Overtemperature alarm	EHE	0 s	2 s	auto	alarm

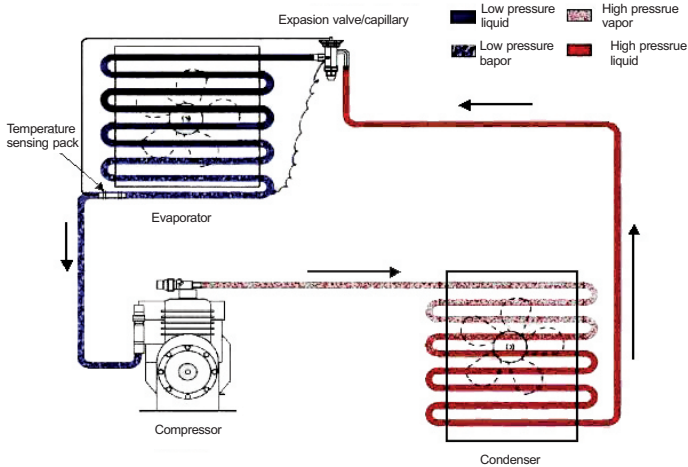
 The compressor will restart in 1 min. delay after the reset of compressor and the downtime of compressor is larger than the shortest halt time(3 min.)

- ◆ **Fault codes lookup**

in case of new fault, the Nixie tubes get to show the relative information; press "▲+SET" in the main interface to look up the first malfunction in record when the reset is not proceeded, press "▲" or "▼" to repeatedly find the other faults in queue, press "▲+SET" to quite the fault lookup interface.

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.

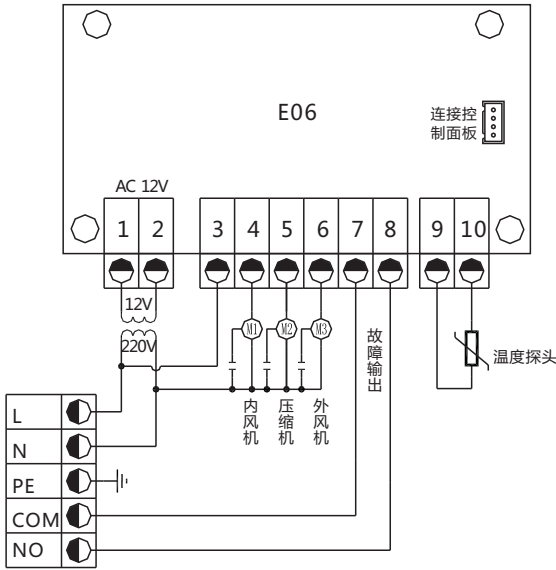
9. Quality warranty

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.

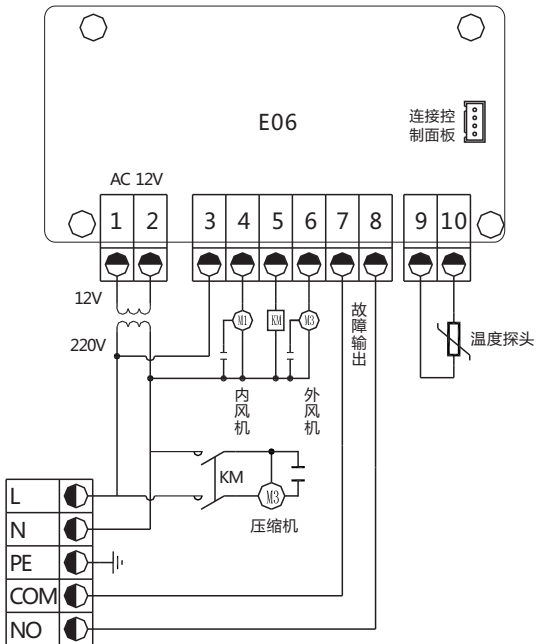
The product is only limited to the purpose of cooling down the enclosure; otherwise Leizig shall take on no responsibility for the losses caused by any misconnection to power or incorrect operations (see regular operations). Electrical circuit drawings.

10. Electrical diagram

10.1 ECC225/320/500/680/825,230V diagram :



10.2 ECC1100/1500/2000/2500/3200/4300,230V 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 contactor if they are burnt out	Replace the contactor
	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 dirt	check the dirt 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 manufacturer
	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, 热交换器核心体)



■ 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)



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