发行编号 Publish No.：	LGETA-130702-1468
发布日期 Publish Date:	Jul. 5th,2013
版 本 号 Edition No.：	REV.0
修订日期 Modify Date:	--

LG Electronics Inc.

压缩机承认规格书

COMPRESSOR SPECIFICATION SHEET

型号(MODEL)： QP325KCA

客　户(CUSTOMER)： Tili

审核 （Checked By）：

审定 （Approved By）：

供 方(SUPPLIER): LG Electronics Inc.

销售经理(Sales Manager) ：

技术经理(Engineering Manager)： S. M. Byun

承认 LGETA 压缩机 S.E.室 担当 审查 承认 制作日期 2013年7月10日 发行编号 备注

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LGETA压缩机 机 密 技术资料专用

LG电子(天津)电器有限公司

Air Conditioning Compressor Division (Tianjin) LG Electronics Inc.

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0.变更历史（Revision History）

日期 Data	版本号 Rev. No	变更内容 Rev. description	制作人 Write

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1.额 定 规 格(Specification)

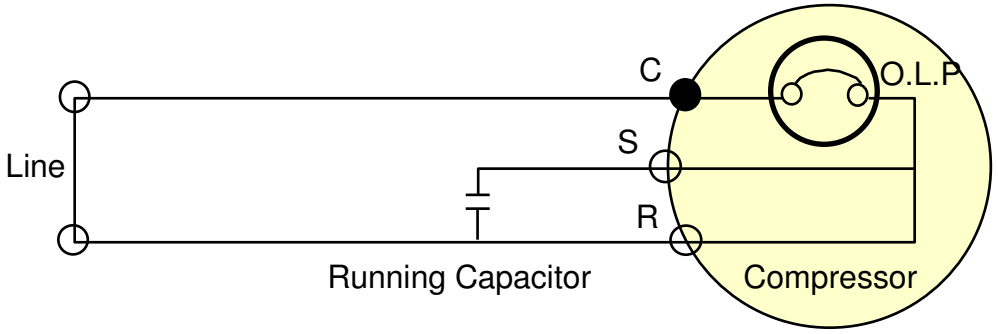
1.1 压 缩 机(Compressor)

1	压缩机型号名 Compressor Model Name	QP325KCA
2	压缩机类型 Compressor Type	密封电动机-压缩机 Hermetic Motor Compressor
3	压缩方式 Compression Type	旋转式(滚动转子式) Rotary Type (Rolling Piston Type)
4	应用 Application	单冷/冷暖空调 Refrigeration system (Cooling & Heating)
5	制冷剂 Refrigerant	R22
6	认证类型 Safety Approval	-
7	冷冻机油/注油量 Oil / Oil Charging Amount	SUNISO 4GSI or NM56M / 700 cc ± 10cc
8	排气量 Displacement	32.5 ㎤ / rev
9	喷涂 Painting	Black Color Paint
10	净重(含油) Net Weight (Including Oil)	21.3 kg
11	吸气管内径 Suction Tube I.D	Φ 12.8 mm
12	排气管内径 Discharge Tube I.D	Φ 9.7 mm

1.2 电 机(Motor) Safety

1	电机类型/启动类型 Motor Type / Starting Type	单相感应电机/PSC Single Phase Induction Motor / PSC	
2	电极/额定输出 Pole / Rated Output	2极(POLE) / 2,300[W]	
3	电源 Power Source	单相 (1 PH) 208~230V ~ 60Hz	
4	额定转速 Rated Revolution	3,491 rpm	
5	绝缘等级 Insulation Class	E 级(CLASS)	
6	绕线电阻(75℃) Winding Resistance (at 75℃)	主绕组(Main)	1.14± 7 % [Ω]
		副绕组 (Sub)	2.24 ± 7 % [Ω]
7	堵转电流（A） Locked Rotor Ampere	68 A	

1.3 接线方式（Wiring diagram）



※ 确保与端子正确连接
Make Sure to connect right way same with the wiring diagram.

1.4 电气零件（Electrical Component）

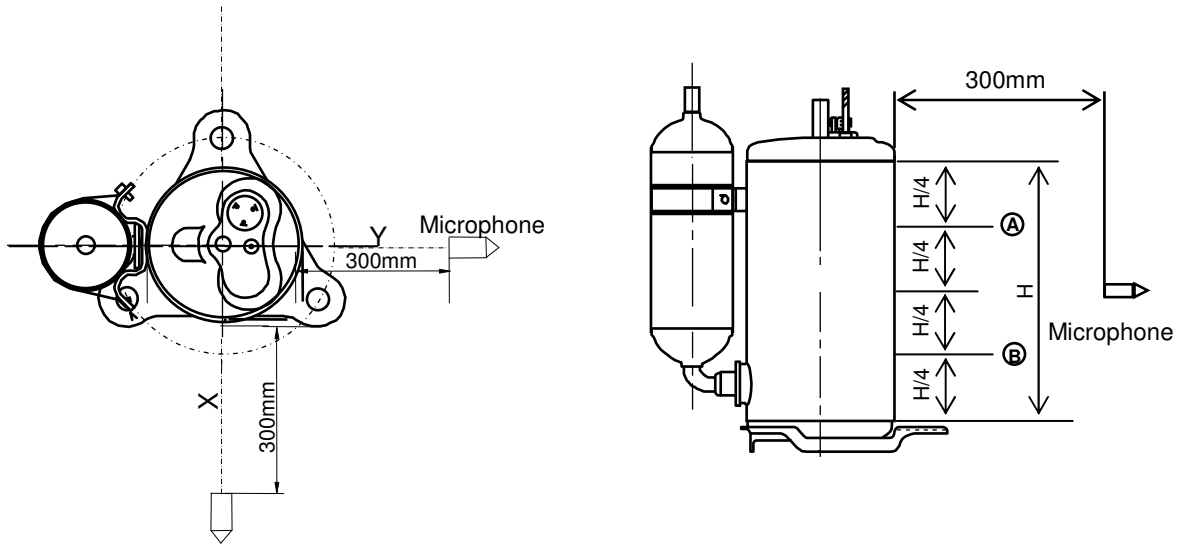
运转电容 Running Capacitor	50MFD / 400 VAC
过载保护器 Over Load Protector	Internal

1.5 性 能(Performance)

电 压 Voltage	at 220 V
制冷量 Cooling Capacity (95%↑)	23,700 Btu/h
	6,946W
输入功率 Power Input (105%↓)	2,257 W
E.E.R (95%↑)	10.5 Btu/W·h
COP (95%↑)	3.08W/W
工作电流 Running Current	10.5 [A]
噪音 Noise (Sound Pressure Level)	70 dB (A) ↓
振动 Vibration / 加速度 Acceleration	150μm / 2,000 gal ↓

1.6 噪音振动（Noise & Vibration）

噪音振动测量点Noise & Vibration Measuring Points



- 噪音振动测量点Measuring points for specification approval
  - 噪音Noise : 2 points (X , Y)
  - 振动Vibration : 2 points (A , B)

- 振动测量需与压缩机接触

Compressor vibration is measured by a vibration meter which is contacted compressor A ~ B at load condition

- 测量工况Test Condition :
  - Standard Condition (Ps/Pd = 5.34 / 20.86 (kgf/cm^{2}G))
    (Return Gas: 18.3℃)

1.7 最低启动电压（Minimum Starting Voltage）

冷启Cold Start - 温度Temp. Condition : 35℃ - 平衡压Balanced pressure : Pd – Ps ≤ 0.5 kgf/㎠	176 Volts Max.

1.8 电压范围（Voltage Range）

标况at Standard Condition	187 ~ 253 Volts
过负荷at Overload Condition	198 ~ 242 Volts

☞ 测试条件Test Conditions

	标况 Standard Condition	过负荷 Overload Condition
冷凝温度 Con. Temp (℃)	54	65
蒸发温度 Eva. Temp (℃)	7	13
回气温度 Return Gas. Temp (℃)	35	25
环境温度 Ambient Temp (℃)	35	43

1.9 其他（Others）

泄漏强度压力 Leak Tight Pressure	高压端 High Pressure Side	28 kg/cm²G
	低压端 Lower Pressure Side	- kg/cm²G
液压强度压力 Hydrostatic Strength Pressure	高压端 High Pressure Side	155 kg/cm²G
	低压端 Lower Pressure Side	50.6 kg/cm²G
绝缘电阻 (采用 DC 500V Mega测试仪) Safety Insulation Resistance (with 500V D.C Mega Tester)		50 MΩ Min.
耐电压 Safety Withstand Voltage		1,800V 下 1分钟 (2,200V 下 1秒钟)泄漏电流小于5mA at 1,800V - 1 min.(2,200 V- 1 sec.) Leakage Current is less than 5㎃.
残余水分量/残余污物量 Residual Moisture / Residual Impurities		最大100mg / 最大 70mg 100 ㎎ Max./ 70 ㎎ Max.

*) 每一项都是单独测量Each part was measured separately

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2. 部 件 清 单（Delivered Parts List）

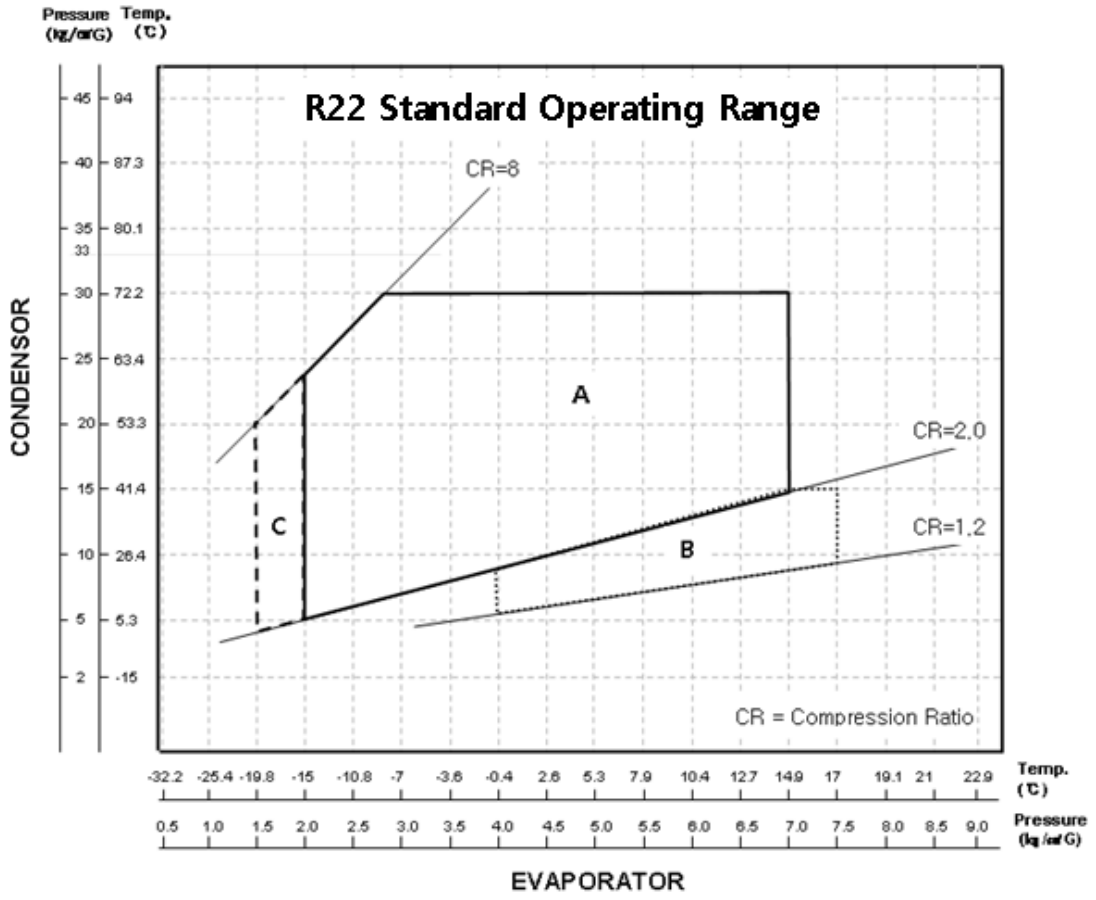
部 件 名 Parts Name	类 型（型号） Type (Model)	数 量 Quantity	部件图纸号码 (LG) Parts Dwg. NO.(LG)	提 供 Supply	
压缩机(COMPRESSOR ASSY)	QP325KCA	1	-	(YES)	NO
过载保护器(O.L.P)	内置	1	-	(YES)	NO
接线保护盒(COVER TERMINAL)	-	1	3550UTL005A	(YES)	NO
保护盒衬垫(GASKET)	-	1	4986UTL004B	(YES)	NO
六角法兰螺母(NUT,DRAWING)	-	1	1NZZUTL001A	(YES)	NO
平垫圈(WASHER DRAWING)	-	1	1WZZUTL001A	(YES)	NO
防振胶垫(GROMMET)	-	3	4022UTL005A	(YES)	NO
安装螺钉(BOLT,DRAWING)	-	3	1BZZUTL003B	YES	(NO)
垫圈(WASHER DRAWING)	-	3	1WZZUTL002D	YES	(NO)
安装螺母(NUT DRAWING)	-	3	1NZZUTL002A	YES	(NO)
螺栓护套(HOUSING,BOLT)	-	1	MEK47325901	YES	(NO)

※参考附录（附件图） Refer to Attachments (Accessory Parts Drawings.)

3.使 用 界 限 (Operating Limit)

3.1 运转范围（Operation Range）

排气压力[kg/cm²G] Discharge Pressure	28 Max
吸气压力[kg/cm²G] Suction Pressure	2.0 ~ 7.0
排气温度[℃] Discharge Temp.	115 MAX
电机绕组温度[℃] Motor Coil Temp.	130 MAX



Area A : 正常运转区域Normal Operating Zone

Area B : 高密度流速区High Density Flow Zone
-运转时间需低于3分钟Running time less than 3 minutes.

Area C : 低压力区（除霜&重启）Low Pressure Zone(defrosting & re-starting)
-运转时间需低于3分钟Running time less than 3 minutes.
-需要检查液回流Should be checked liquid back

3.2 使用界限Application Limit

制冷剂充注量限制 Refrigerant Charge Limit	单冷系统[Cooling System] Max 1,400g 充注量取决于油稀释率&储液器K值 (Charge limit depends on Oil Dilution Rate *note 1 & accumulator 'K')
液态制冷剂回流 Liquid Refrigerant Back	系统设计时应考虑确保液态冷媒不回流至压缩机撞击噪音，电流增加，振动不良发生，缩短压缩机寿命。System should be designed not to allow the liquid to go back to compressor which cause knocking noise , current increase or undesirable vibration and make short compressor life time.
温度差Δ T : Temp. Difference	Δ T = 外壳底部温度Case Bottom Temp.－ 冷凝温度Condensing Temp. 必须保证It must be kept Δ T ≥ 5℃
运行压差 Pressure Difference in Operating	运行压力差必须大于等于5.0㎏f/㎠，但启动三分钟内 The Pressure difference in operating shall be 5.0㎏f/㎠ or more, but 3 minutes starting excluded.
断续运行 ON/OFF Operation	每次循环最少运行6分钟Each cycle should be at least 6 minutes 启动时间：至少3分钟，停止时间：至少3分钟 (ON Time : at least 3 minute , OFF Time : at least 3 minutes)
启动压差 Pressure Difference at Starting	当启动时，排气压力与吸气压力需要到达平衡When starting, discharge pressure is balanced with suction pressure. (Pd – Ps ≤ 0.5 ㎏f/㎠)
运行倾斜角度 Tilt in Operation	压缩机运行允许的倾斜角度低于5°。The allowable tilt of the compressor in operation shall be 5° or less.
系统储液器 System Accumulator	储液罐可容纳整个系统50%的冷媒，K值应大于0.6（冷暖系统）或0.4（制冷系统） The Accumulator volume should be enough to cover 50% of maximum system refrigerant volume. Ratio coefficient 'K' should be over 0.6(heating system) or 0.4(cooling system) $K = \frac{\text{储液罐体积（压机+系统）} \times \text{冷媒密度}}{\text{冷媒充注量}}$ $K = \frac{\text{Volume of Accum.(Comp+System)} \times \text{Specific gravity of Refrigerant}}{\text{Charged Weight of Refrigerant}}$ ※ 压缩机储液罐有效容积=527㎤ ※ 冷媒密度（R22）=1.25g/㎤ (at 20℃) ※ Effective volume of compressor accumulator = 527 ㎤ ※ Specific gravity of refrigerant (R22) = 1.25g/㎤ (at 20℃) 如果K值未达到建议值，冷媒系统需检查储液罐液回流现象If coefficient "K" does not meet recommendation, refrigerant system must check liquid back phenomenon at accumulator.
反转保护 Protecting Reverse Operation	压缩机必须在与频率一致的适当电压下运行，不允许有反转发生。反转可以通过保持正确的相电压供应来避免。The compressor must be operated by proper voltage in accordance with the frequency without reverse revolution condition. The reverse revolution condition can be avoided by just keeping right order of phase supplied power source.

3.2 使用界限Application Limit

频率范围 Frequency Range	额定频率±2% Rated Frequency ±2%
管压 Pipe Stress	不允许给排气管和吸气管任何强制外力。管路设计应力在起停时300kgf/cm2以下，运转时150kgf/cm2以下。 Don't allow any force on discharge & suction pipe . The piping stress must be less than 300㎏f/㎠ at starting and stopping. And less than 150㎏f/㎠ at running.
油面 Oil Level	必须确认我司提供的视镜压缩机油面水平。在任何工况下油面水平必须保持在指导线水平以上。指导线参见注释2. It must be checked oil level by the compressor with sight glass we supply. And oil level must be kept over guide line level **note 2. at any condition.
保护装置 Protection device	在过压、高温条件下制冷系统必须带有压缩机保护装置，控制器带有泵体堵转监测探头。 当异常过负荷导致开机启动运转失败时，控制器必须能在电机烧毁之前切断压缩机电源。 Refrigeration system must has the compressor protection device like over pressure, high temperature, sensing locked pump in the controller. When starting & running fail by abnormal overload, controller must be able to cut off power of compressor before motor burn out.
	应该安装地线接头来防止电气意外。 An earth terminal should be installed to prevent electrical accidents.
Pump down refrigerant	若pump down时间太长，压缩机会因过度的温度上升或低润滑性而导致损坏。 Pump down 过程界限 时间：小于30秒 吸气压力：不可以在低于1 ㎏f/㎠G状态下运转， 另外，在关闭维修阀前，建议压缩机运转5分钟以上 If pump down time is too long, compressor can be damaged due to excessive temperature increase or poor lubrication. Guideline of pump down process. - Time : less than 30 seconds - Suction Pressure : It should not run under below 1㎏f/㎠G. And before closing a service valve, compressor running for more than 5 minutes is recommended.

※ 如果超过规定的制冷剂气体充注量，双方应该就此事进行讨论来确定压缩机规格（储液罐体积，冷冻油量）以及空调系统规格（外接加热器，油分离器，附加储液罐等）

※ If gas charge amount of refrigerant specified is exceeded, both parties should discuss the matter to determine compressor specification. (accumulator volume, lubricating oil amount) and system specifications (crank case heater, oil seperator , additional accumulator, etc)

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3.3 运行限制（Process Limit）

使用规定的制冷剂和油 Use defined Refrigerant and oil	使用过程中禁止使用不符合规定的HCFC制冷剂和不同种类混合的油。 Any process in where the HCFC's refrigerant or the different kind of oil against the defined. Compressor oil are mixed should be avoided.
避免损坏性操作 Avoid Damage running	避免对性能及信赖性有不良影响的保护器检查的运行操作 The running operation that inspection and the protector inspection that affect a damage to the function and durability of the compressor should be avoided
室内的模拟操作 Running dummy indoor	当室外机在室内做模拟运行时，保证油的注入量 When the outdoor unit is operated with the indoor dummy unit, the discharged oil should be recovered enough
防止管路氧化 Prevent oxidation in pipe	使用干燥的氮气清洁压缩机系统，防止管路的氧化 Always purge the system and the compressor with the dry nitrogen in order to prevent oxidation of the piping
制冷剂注入 Charging Refrigerant	确保制冷剂从系统的高压端（冷凝器出口）注入。如果液态制冷剂被吸进压缩机产生液体压缩就会破坏排气阀，润滑效果的可靠性和信赖性也会迅速下降。 When charging refrigerant into the cycle, make sure that refrigerant always be filled from the higher pressure side (condenser exit) of the cycle. If liquid refrigerant is sucked in to the compressor liquid compression occurs, The discharge valve is damaged, lubrication effectiveness degenerates and reliability drops noticeably
避免在真空状态操作 Avoid Vacuum running	不要在真空状态运行压缩机。再者，在真空状态的压缩机不允许使用高电压。会导致绝缘退化，引发触电的危险。 Do not operate the compressor in a vacuum state. Furthermore do not apply high voltage to a vacuum state compressor. There is a danger that insulation could degenerate, causing electric shock
避免空气压缩 Avoid Air compression	当制冷剂循环泄露的情况，不要压缩空气。如果压缩机在空气混入的情况运行，由于压缩机内的空气被加热和加压可能发生爆炸 Do not compress the air including the case of leakage in the refrigeration cycle. If compressors run with air mixed, inside the compressor is heated and pressurized , which may cause an explosion
生产线上快速装配压缩机 Promptly Assemble compressor in line	从压缩机吸排气管移除胶塞后，10分钟之内装配完成。如果空气进入了压缩机，会影响压缩效率 After removing rubber plugs from compressor tubes, Promptly use the compressor. And do not leave in the atmosphere for 10 minutes over. If Air gets into the compressor , accelerating degeneration of the inside of the cycle or compressor
接线 Wiring	压缩机接线，请参考压缩机规范手册及说明 Wires connected to the compressor, follow the compressor specification manual and instructions
存储温度 Storage temperature	-10℃ ~ 65℃

*** Note 1. 油稀释率 OIL Dilution rate**

$$\frac{\text{油重（Oil Weight）}}{\text{制冷剂重（Refrigerant Weight）} + \text{油重（Oil Weight）}} \geq 0.22(\text{Heating}) \text{ or } 0.20(\text{Cooling})$$

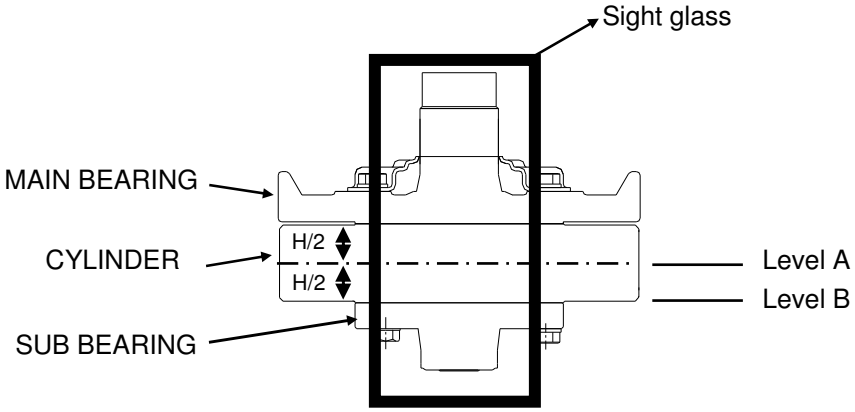
※ Specific Gravity of 4GSI = 0.92 (at 20℃)

[Unit]

☞ 油重Oil Weight : [g]

☞ 制冷剂重Refrigerant Weight : [g]

**** Note 2. 油面基准线Oil Level Guide Line**



A面以上Over Level A : 静止状态Steady state at any condition.

B面以上Over Level B : 运行三分钟最低位置
Minimum level of transition period within 3minutes

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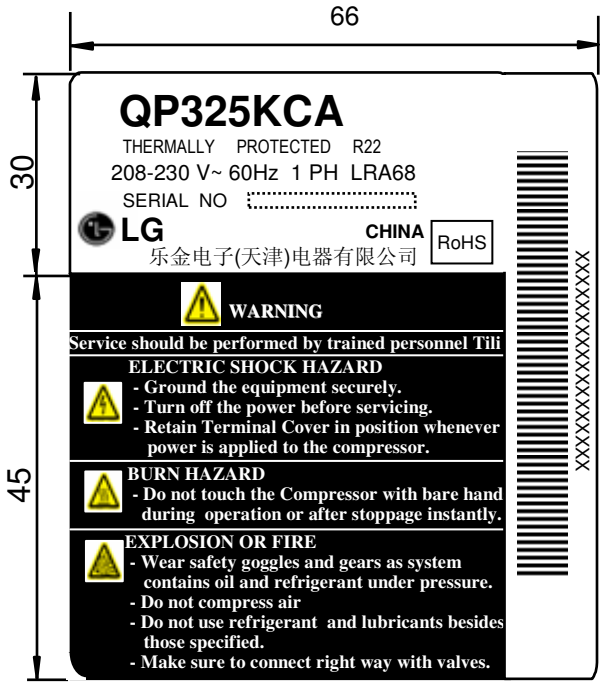

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附页
Attachment

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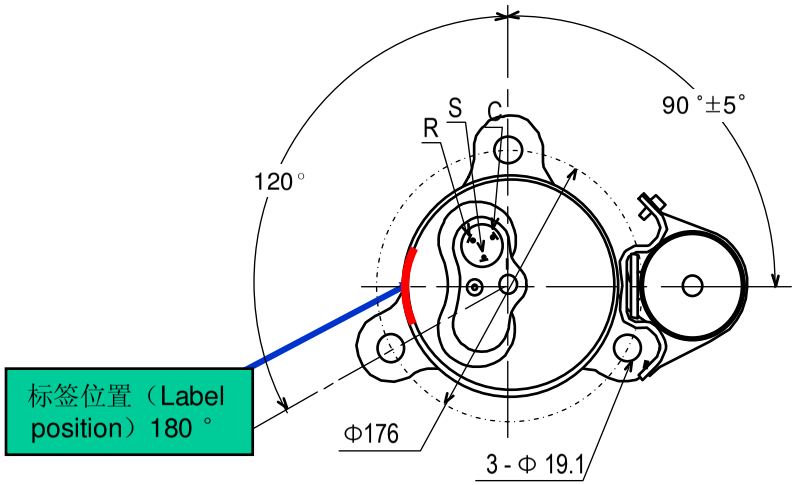
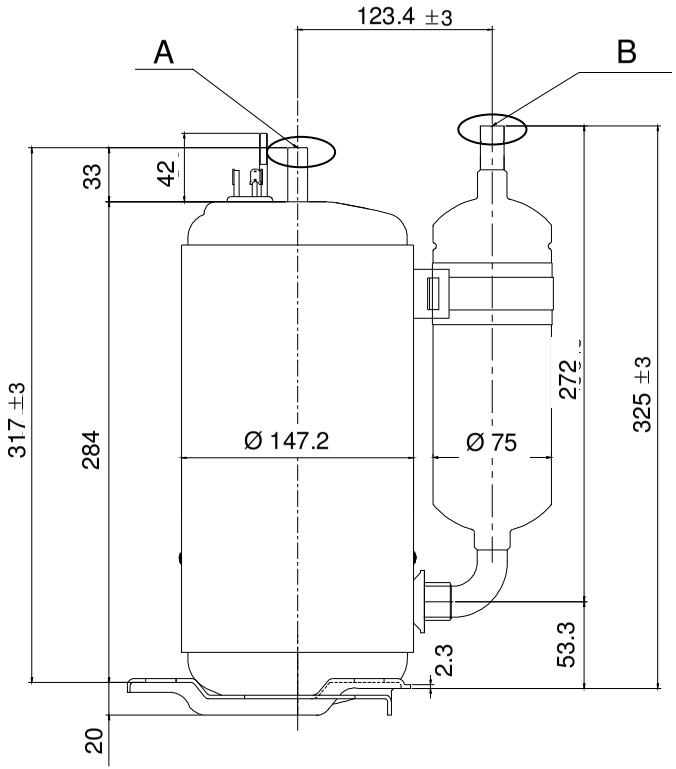
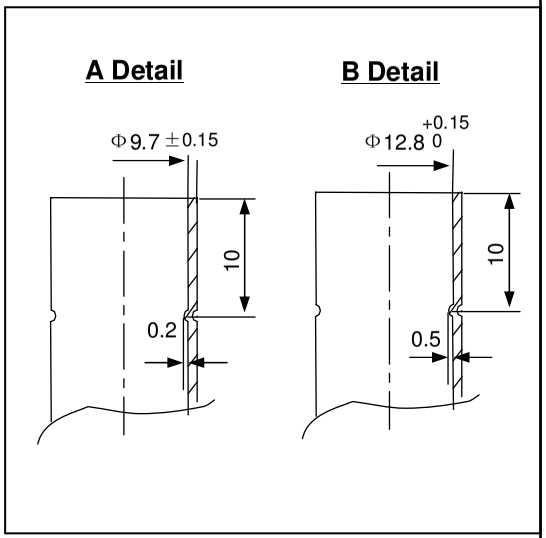




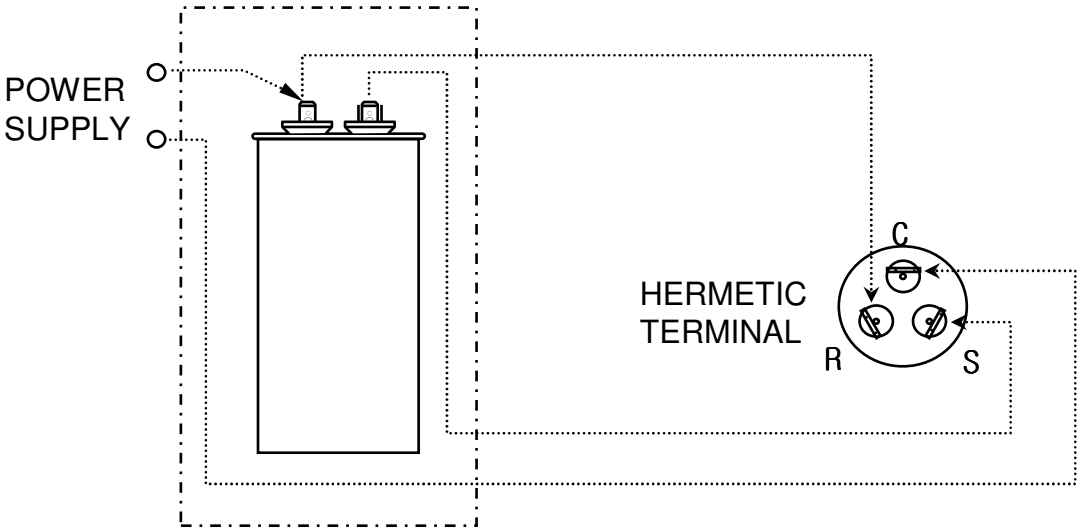


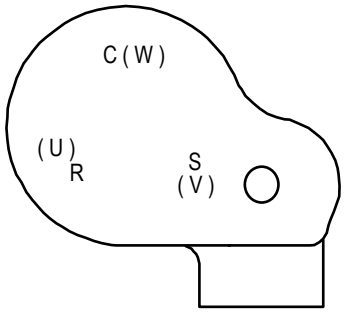
注释（Remark）：

1. 喷涂 PAINTING: 黑色(电泳涂装) BLACK PAINT（ELECTRO DEPOSITION）
2. 冷冻机油 OIL ：SUNISO 4GSI or NM56M 700±10cc.
3. 干燥后充氮气 NITROGEN CHARGED AFTER DEHYDRATION

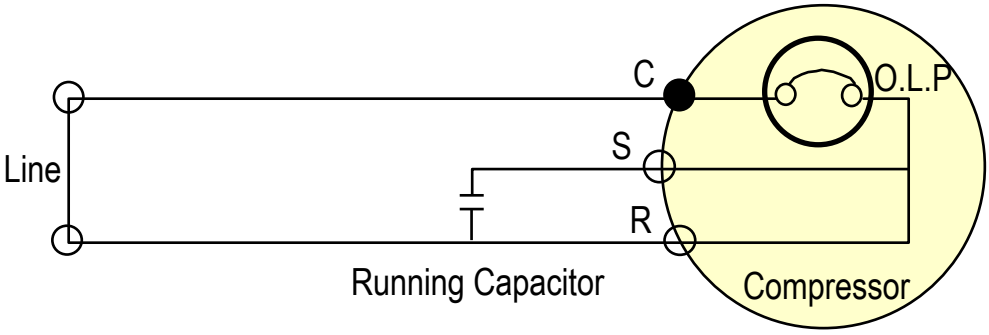
UNIT	mm	SCALE	N/S	PART NAME	COMPRESSOR OUT-LINE
DES. ENGR.		CHF. ENGR.			
2013.07.05 Z.C.CHEN		2013.07.05 Byun Sangmyung		P/NO.	QP325KCA
LG Electronics(Tianjin) Appliance Co.,Ltd.		CUSTOMER Tili			

Wiring diagram





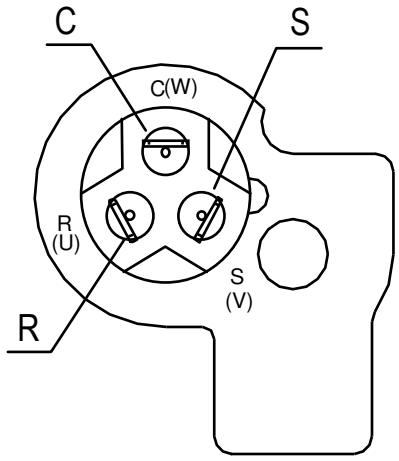
Cover Terminal

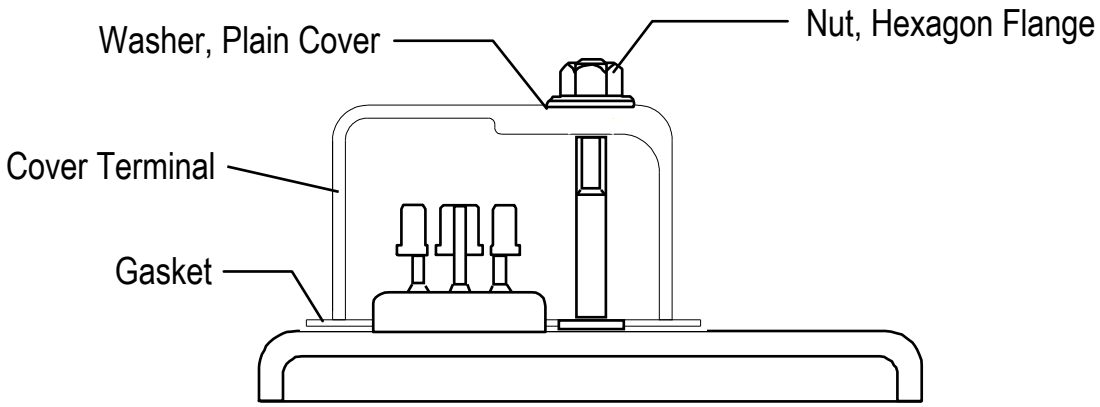


※ C.S.R 为接线端子盖上的标识符

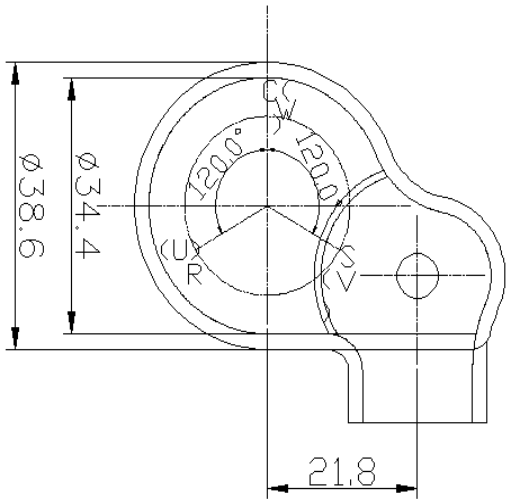
C,S,R Mark Embossed on Cover Terminal

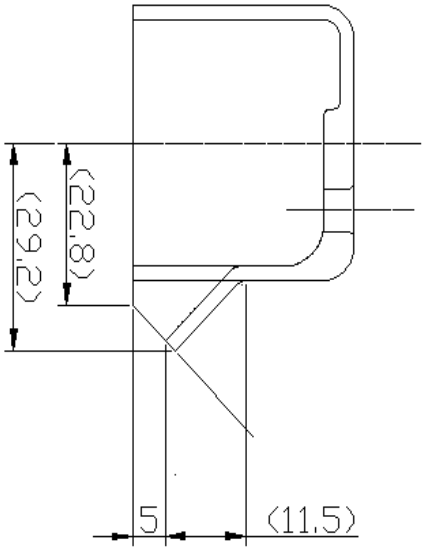
Accessory Fitting

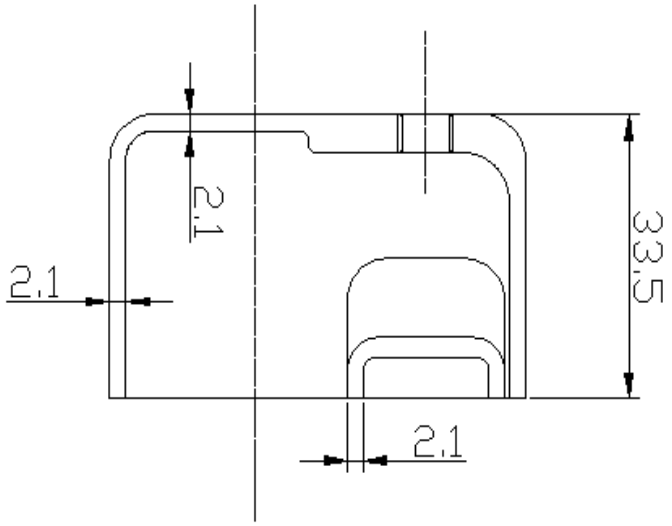




C,S,R Mark Embossed on Cover Terminal

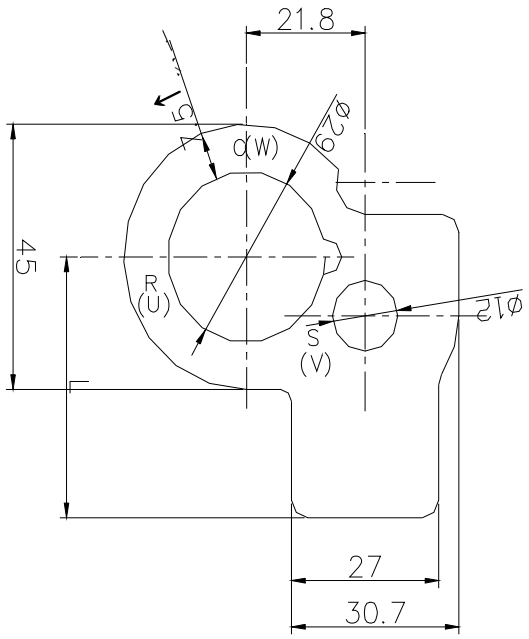


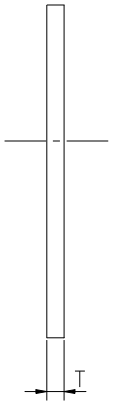


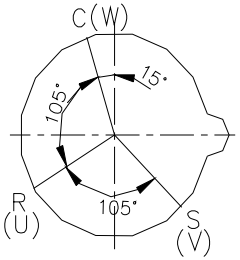


MATERIAL	COLOR	REMARK
LUMAX	BLACK	**MARKS(C(W),R(U),S(V))**

UNIT	mm	SCALE	N / S	COVER, TERMINAL
DES. ENGR.		CHF. ENGR.		
2013.07.05 Z.C.CHEN		2013.07.05 Byun Sangmyung		3550UTL005A
LG Electronics(Tianjin) Appliance Co.,Ltd		CUSTOMER Tili		



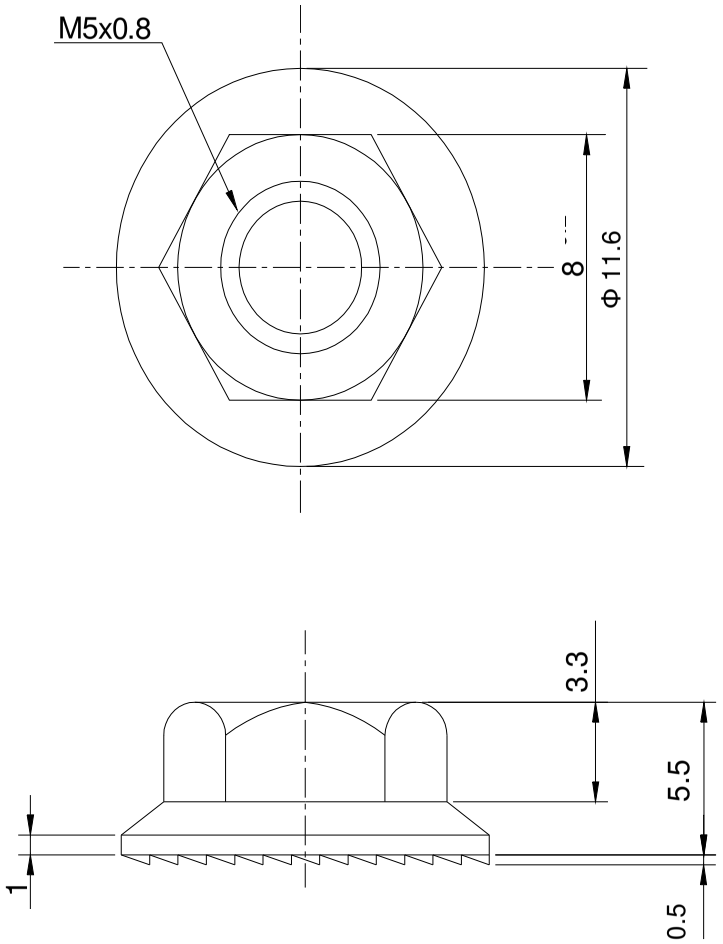




T (Thickness)	MATERIAL	Remark	L
$1.0^{+0.2}_{0}$	EPDM	Marks (C (W) , R (U) , S (V))	57.2

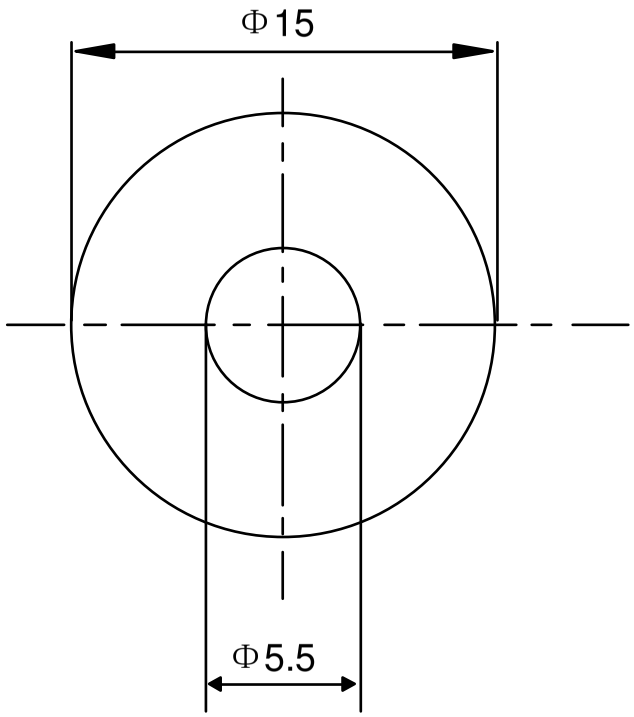
UNIT	mm	SCALE	N / S	GASKET
DES. ENGR.		CHF. ENGR.		
2013.07.05 Z.C.CHEN		2013.07.05 Byun Sangmyung		4986UTL004B
LG Electronics(Tianjin) Appliance Co.,Ltd		CUSTOMER Tili		

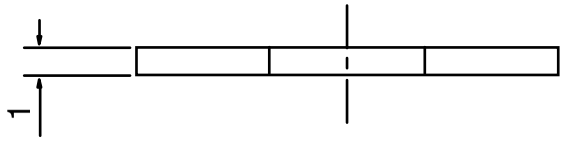
A-5



* MATERIAL : STEEL (ELECTRIC PLATING OF ZINC)

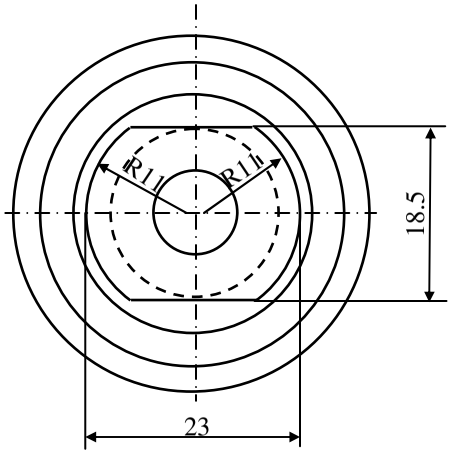
UNIT	mm	SCALE	N / S	NUT, DRAWING
DES. ENGR.		CHF. ENGR.		
2013.07.05 Z.C.CHEN		2013.07.05 Byun Sangmyung		1NZZUTL001A
LG Electronics(Tianjin) Appliance Co.,Ltd		CUSTOMER Tili		

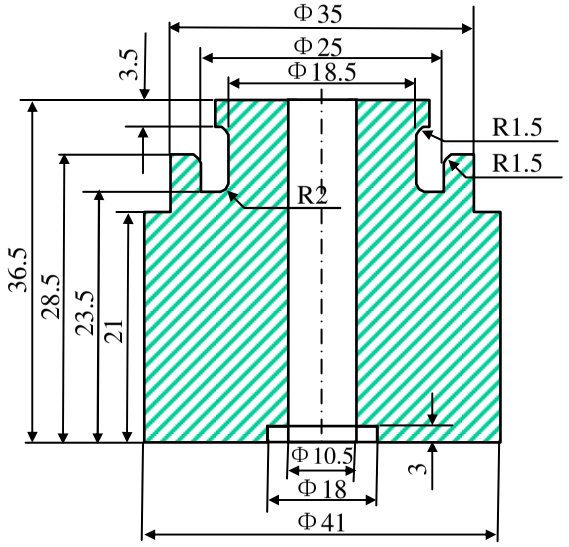




* MATERIAL : POLYAMIDE (NYLON)

UNIT	mm	SCALE	N / S	WASHER, DRAWING
DES. ENGR.		CHF. ENGR.		
2013.07.05 Z.C.CHEN		2013.07.05 Byun Sangmyung		1WZZUTL001A
LG Electronics(Tianjin) Appliance Co.,Ltd		CUSTOMER Tili		





* MATERIAL : NATURAL RUBBER

UNIT	mm	SCALE	N / S	GROMMET
DES. ENGR.		CHF. ENGR.		
2013.07.05 Z.C.CHEN		2013.07.05 Byun Sangmyung		4022UTL005A
LG Electronics(Tianjin) Appliance Co.,Ltd		CUSTOMER Tili		