SAFETY

Ref. No.	LGETH-160820-122
Issued Date	Aug. 20. 2016
Rev. No.	Rev. 1
Rev. Date	May.28.2021

LG Electronics Inc.

SPECIFICATION SHEET for APPROVAL

MODEL : GK113PAH

CUSTOMER : EMBRITAL

APPROVAL			
NAME			
DATE			
AIR CONDITIONER MODEL			

LG Electronics Inc.

	Designed	Checked	Approved
NAME			Chatpepan
DATE	31 May 2021	31. May 21	31. May 21

ORIGINAL
310521.

Please read this specification sheet thoroughly before installation or operating.

Please Return 1 Copy on Your Approval.

Air Conditioning Compressor Division LG Electronics Inc.
Tel : (+66)38 - 923 - 109 Fax : (+66)38 - 923 - 119

Ref. No.	LGETH-160820-122
Issued Date	Aug. 20. 2016
Rev. No.	Rev. 1
Rev. Date	May.28.2021

0.Revision History

Date	Rev. No	Rev. description	Write
28.05.2021	1	Page A-9 -Revise spec sleeve damper length from 37 → 34 mm (Actual spec) Page 13/13 Revise label format (Refer 4M Change confirm)	Thunyarat D.

Ref. No.	LGETH-160820-122
Issued Date	Aug. 20. 2016
Rev. No.	Rev. 0
Rev. Date	-

1.Specification

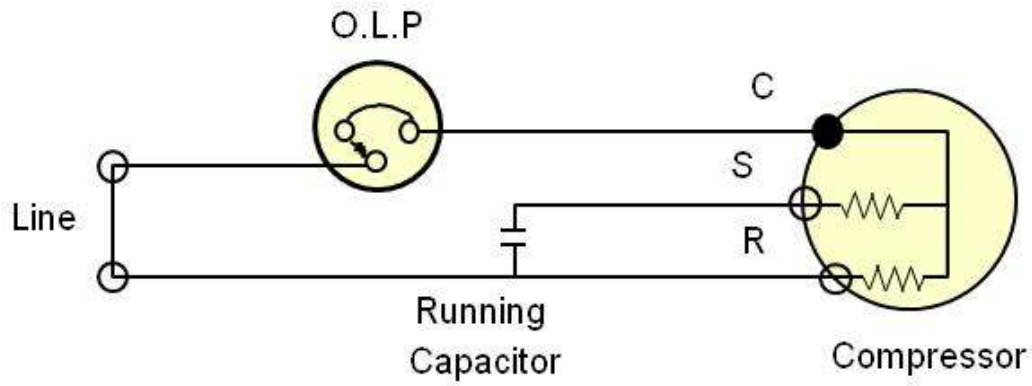
1.1 Compressor

1	Model Name	GK113PAH
2	Compressor Type	Hermetic Motor Compressor
3	Compression Type	Rotary Type (Rolling Piston Type)
4	Application	Refrigeration system (Cooling & Heating)
5	Refrigerant	R-410A
6	Safety Approval	VDE
7	Oil / Oil Charging Amount	POE(RB68A) / 330 cc
8	Displacement	11.3 ㎤ / rev
9	Painting	Black Color Paint
10	Net Weight (Including Oil, Reference)	11.7 kg
11	Suction Tube I.D	Φ 9.7 mm
12	Discharge Tube I.D	Φ 6.53 mm

1.2 Motor

Motor Type / Starting Type	Single Phase Induction Motor / PSC	
Pole / Rated Output	2 Pole / 780 Watts	
Power Source	1 Ph - 220~240 Volts - 50 Hz	
Rated Revolution	2,860/2,890 rpm	
Insulation Class	E Class	
Windings Resistance (at 25℃)	Main	4.02 ± 7% [Ω]
	Sub	4.19 ± 7% [Ω]
Locked Rotor Ampere	18.7 A (at 240 V)	

1.3 Wiring diagram



※ Make Sure to connect right way same with the wiring diagram.

1.4 Electrical Component

Running Capacitor	30 MFD / 370 VAC
Over Load Protector	MRA12130-12026

1.5 Performance

Voltage		220 V	240V
Cooling Capacity (±5%↑)	[BTU/h]	9,000	9,100
	[Watts]	2,637	2,667
Power Input (±5%↓)	[Watts]	914	938
EER(±5%↑)	[BTU/w・hr]	9.85	9.7
	[W/W]	2.92	2.84
Running Current	[A]	4.2	4.0

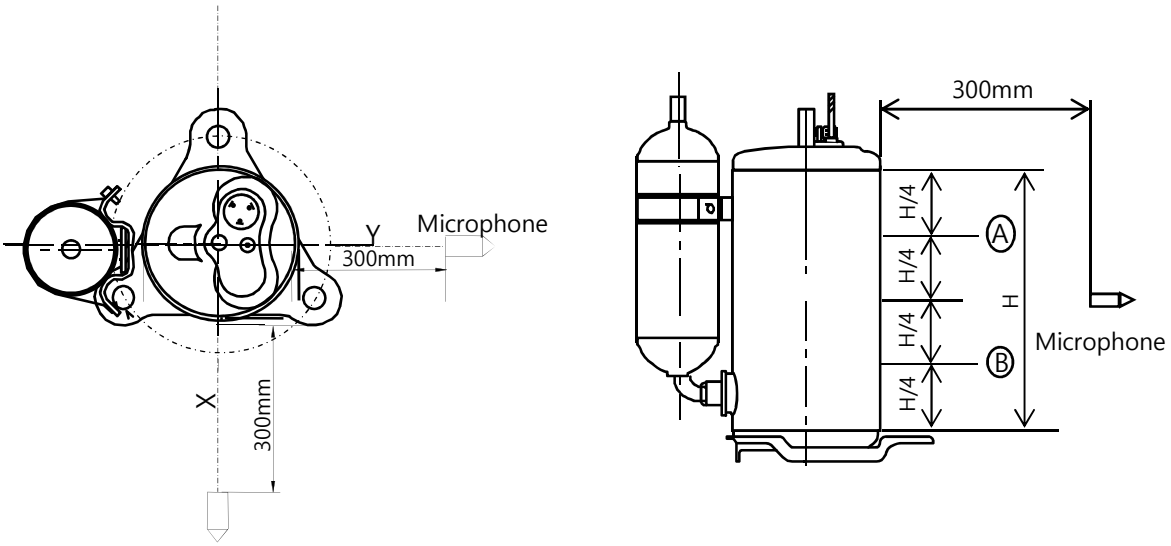
☞ Rated Conditions (ASHRAE-T Condition)

Cond. Temp. : 54.4 ℃ (130 ℉)
Evap. Temp. : 7.2 ℃ (45 ℉)
Return Gas Temp. : 35.0 ℃ (95 ℉)
Liquid Temp. : 46.1 ℃ (115 ℉)
Ambient Temp. : 35.0 ℃ (95 ℉)

1.6 Noise & Vibration

Voltage	At 240 V
Sound Level [dB(A)]	56±2 Max
Vibration [gal]	1,400 Max

Noise & Vibration Measuring Points



- Measuring points for specification approval
  - Noise : 2 points (X , Y)
  - Vibration : 2 points Ⓐ ~Ⓑ

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

- Test Condition :
  - Standard Condition (Ps/Pd = 9.12 / 33.45 kg/cm²G)

1.7 Minimum Starting Voltage

Standard Start - Temp. Condition : 35℃ - Balanced pressure : Pd – Ps ≤ 0.5 kgf/㎠	187 Volts

1.8 Voltage Range

at Standard Condition	187 ~ 264 Volts
at Overload Condition	198 ~ 264 Volts

☞ Test Conditions

	Standard	Overload
Con. Temp (℃)	54.4	63.8
Eva. Temp (℃)	7.2	10.4
Return Gas. Temp (℃)	35.0	25.0
Ambient Temp (℃)	35.0	43.0

1.9 Others

Leak Tight Pressure	High Pressure Side	40 kgf / ㎠ G
	Low Pressure Side	-
Hydrostatic strength Pressure	High Pressure Side	170 kgf / ㎠ G
	Low Pressure Side	80 kgf / ㎠ G
Insulation Resistance (with 500V D.C Mega Tester)		50 MΩ Min.
Withstand Voltage		At 1,800V 1 min (2,200 V / 1 Sec.) Leakage Current is less than 5 ㎃
Residual Moisture (Karl Fisher Method)		150 mg Max.
* Residual Impurities		50 mg Max

*) Each part was measured separately

2.Delivered Parts List

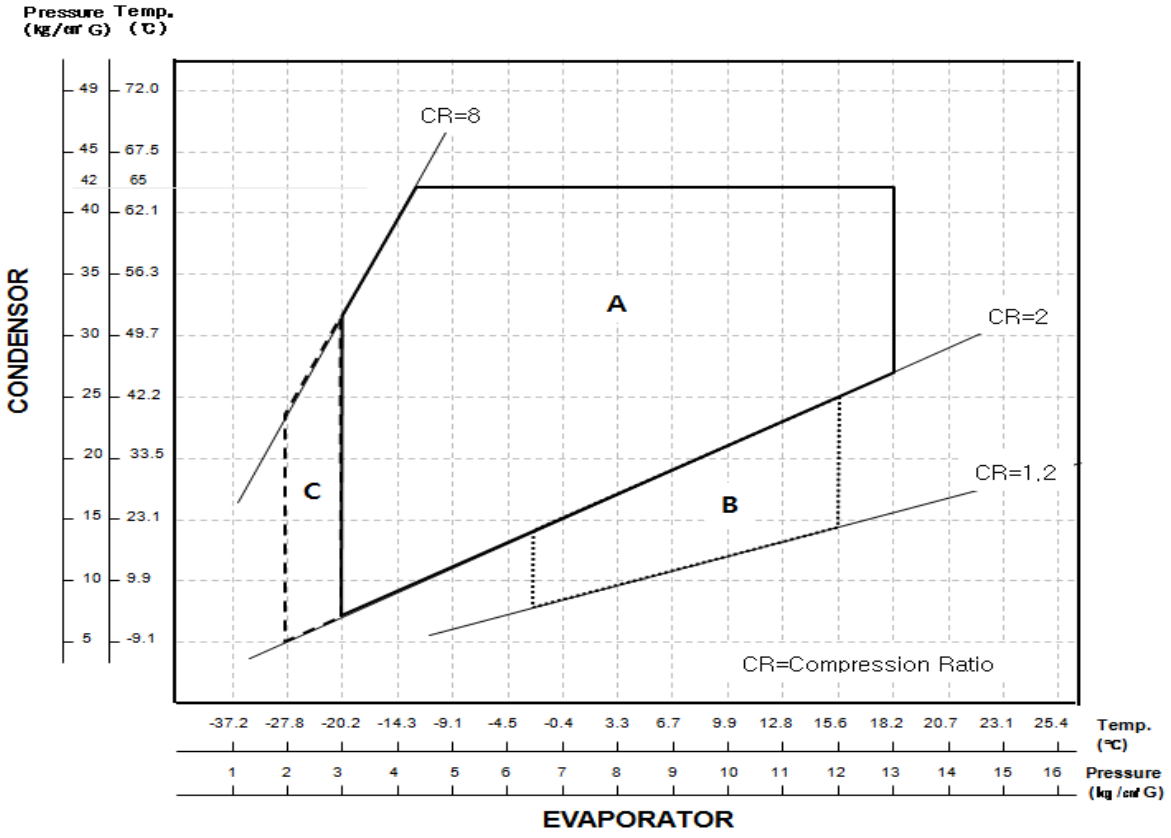
Parts Name	Type (Model)	EA	Parts Dwg. NO.	Supply	
			LG		
Compressor	GK113PAH	1	-	(Yes)	No
OLP	MRA12130-12026	1	6750U-L061A	(Yes)	No
Cover ,Terminal	-	1	3550U-L004C	(Yes)	No
Gasket	-	1	4986UHL001G	(Yes)	No
Nut, Common	-	1	FAD30241201	(Yes)	No
Washer, Customized	-	1	FAF30240201	(Yes)	No
Damper, Rubber	-	3	MCQ66473401	(Yes)	No
Sleeve, Damper	-	3	4816U – L001G	(Yes)	No
Bolt, Stud	-	-	-	Yes	(No)
Washer, Plain	-	-	-	Yes	(No)
Nut, Hexagon	-	-	-	Yes	(No)
Capacitor	-	-	-	Yes	(No)
Screw, Earth	M4*0.7 , Length : Max 6 mm.	-	-	Yes	(No)

※) Refer to Attachments (Accessory Parts Drawings.)

3.Operating Limit

3.1 Operation Range

Discharge Pressure	[kgf / ㎠ G]	42 Max.
Suction Pressure	[kgf / ㎠ G]	3.0 ~ 13.0
Discharge Temp.	[℃]	115 Max.
Motor Coil Temp.	[℃]	135 Max.



Area A : Normal Operating Zone

Area B : High Density Flow Zone
-During Starting within 3 minutes

Area C : During defrosting & re-starting
-Running time within 3 minutes

3.2 Application Limit

Refrigerant Charge Limit	800 g Max (Charge limit depends on Oil Dilution Rate *note 2 & accumulator 'K')
Liquid Refrigerant Back	System should be designed not to allow the liquid to go back to compressor which cause knocking noise, current increase or undesirable vibration
Δ T : Temp. Difference	Δ T = Case Bottom Temp. - Condensing Temp. It must be kept Δ T ≥ 5℃
Pressure Difference in Operating	The Pressure difference in operating shall be 5.0kgf/㎠ or more, but 3 minutes starting excluded.
ON/OFF Operation	Each cycle should be at least 6 minutes (ON Time : at least 3 minute , OFF Time : at least 3 minutes)
Pressure Difference at Starting	When starting, discharge pressure is balanced with suction pressure. (Pd – Ps ≤ 0.5 kgf/㎠)
Tilt in Operation	The allowable tilt of the compressor in operation shall be 5° or less.
System Accumulator	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) $K = \frac{\text{Volume of Accum. (Comp + System)} \times \text{Specific gravity of Refrigerant}}{\text{Charged Weight of Refrigerant}}$ ※ Effective volume of compressor accumulator = 149 ㎤ ※ Specific gravity of refrigerant (R410A) = 1.085 g/㎤ (at 20℃) If coefficient "K" does not meet recommendation, refrigerant system must check liquid back phenomenon at accumulator.
Protecting Reverse Operation	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.

⚠ WARNING

3.2 Application Limit

Frequency Range	Rated Frequency ±2%
Pipe Stress	Don't allow any force on discharge & suction pipe . The piping stress must be less than 300kgf/㎠ at starting and stopping. And less than 153kgf/㎠ at running.
Oil Level	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.
Protection device	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.
Pump down refrigerant	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 1kgf/㎠G. And before closing a service valve, compressor running for more than 5 minutes is recommended.

※ 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 separator, additional accumulator, etc)

* Effective Period of This Document *

This document will be effective after LG's receipt with your authorized signature. When design modification is approved by the customer, the current document is unavailable.

⚠ WARNING

3.3 Process Limit

Use defined Refrigerant and oil	Any process in where the HCFC's refrigerant or the different kind of oil against the defined. Compressor oil are mixed should be avoided.
Avoid Damage running	The running operation that inspection and the protector inspection that affect a damage to the function and durability of the compressor should be avoided
Running dummy indoor	When the outdoor unit is operated with the indoor dummy unit, the discharged oil should be recovered enough
Prevent oxidation in pipe	Always purge the system and the compressor with the dry nitrogen in order to prevent oxidation of the piping
Charging Refrigerant	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
Avoid Vacuum running	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
Avoid Air compression	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
Promptly Assemble compressor in line	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
Wiring	Wires connected to the compressor, follow the compressor specification manual and instructions
Storage temperature	-10℃ ~ 65℃

*** Note 1. OIL Dilution rate**

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

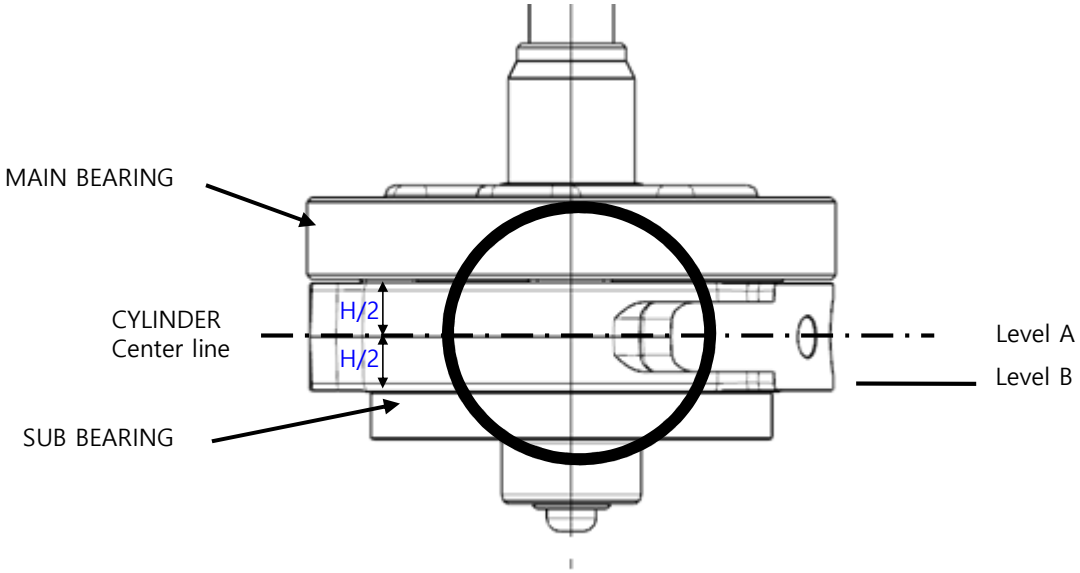
※ Specific Gravity of POE(RB68A)= 0.94 (at 20℃)

[Unit]

☞ Oil Weight : [g]

☞ Refrigerant Weight : [g]

**** Note 2. Oil Level Guide Line**



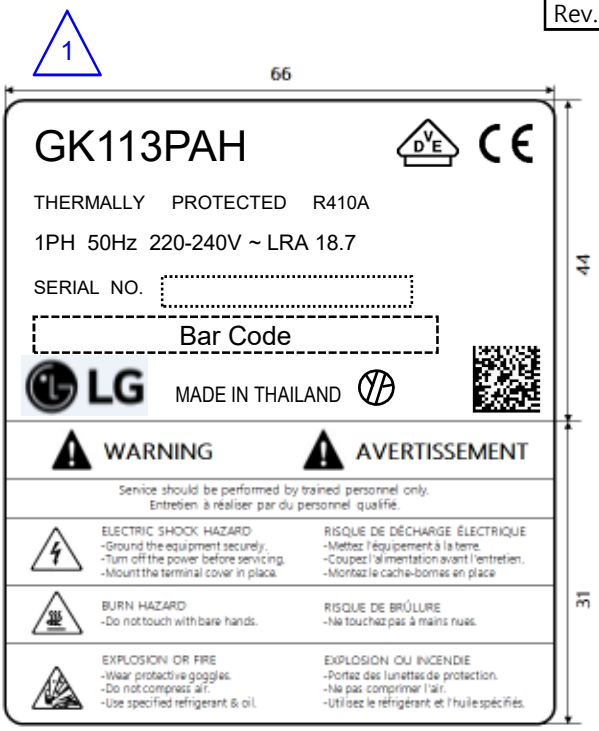
Over Level A : Steady state at any condition.

Over Level B : Minimum level of transition period within 3minutes

* Effective Period of This Document *

This document will be effective after LG's receipt with your authorized signature. When design modification is approved by the customer, the current document is unavailable.

* LABEL *



All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed. You are strongly advised to follow these safety instructions.

This is the Safety alert symbol. It indicates a hazardous situation which, if not avoided, could result in death or serious injury.

This is the Electric shock hazard symbol. It indicates a hazardous situation which, if not avoided, could result in the electric shock.

This is the Getting burnt symbol. It indicates a hazardous situation which, if not avoided, could cause fire.

This is the Explosion or Fire symbol. . It indicates a hazardous situation which, if not avoided, could cause explosion or fire.

*1. Effective Period of This Document *

This document will be effective after LG's receipt with your authorized signature.
When design modification is approved by the customer , the current document is unavailable.

*2. Compressor operating range *

The Compressor can operate within the limits of the outlined area.
Outside these operating fields, the system cause early defects in the compressor.
The compressor defects caused by applications operating outside the outlined area will not be considered under the warranty. If the appliance be operated out of the operating range, it must be agreed with the supplier.

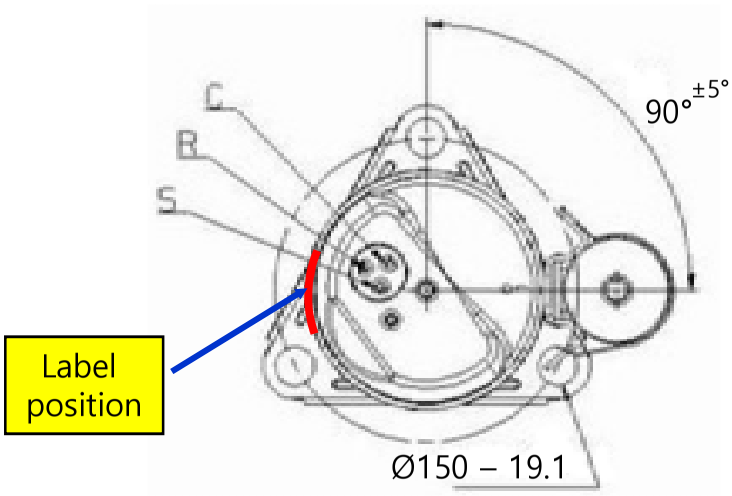
Ref. No.	LGETH-160820-122
Issued Date	Aug. 20. 2016
Rev. No.	Rev. 0
Rev. Date	-

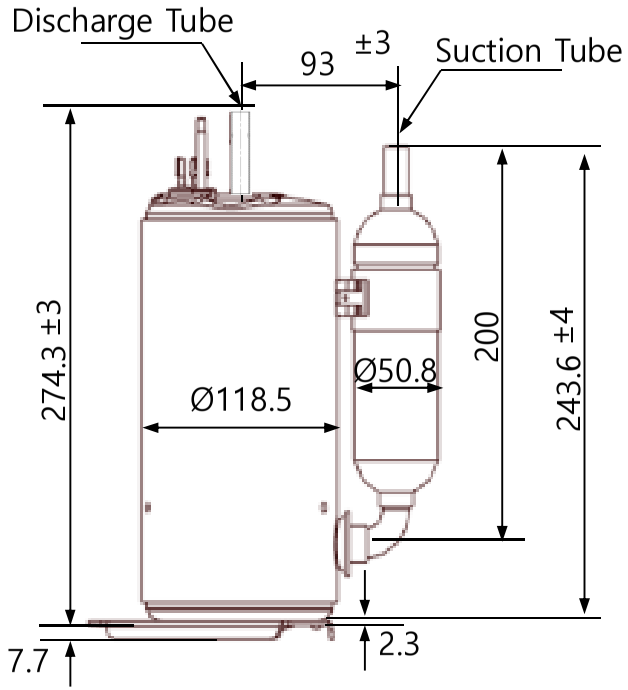
Attachment

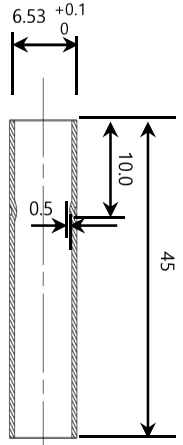
TH-COMP-ED-095-A4 (13.05.06)

A-1

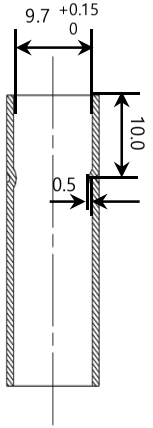
Ref. No.	LGETH-160820-121
Issued Date	Aug. 20. 2016
Rev. No.	Rev. 0
Rev. Date	-







Detail of Discharge Tube

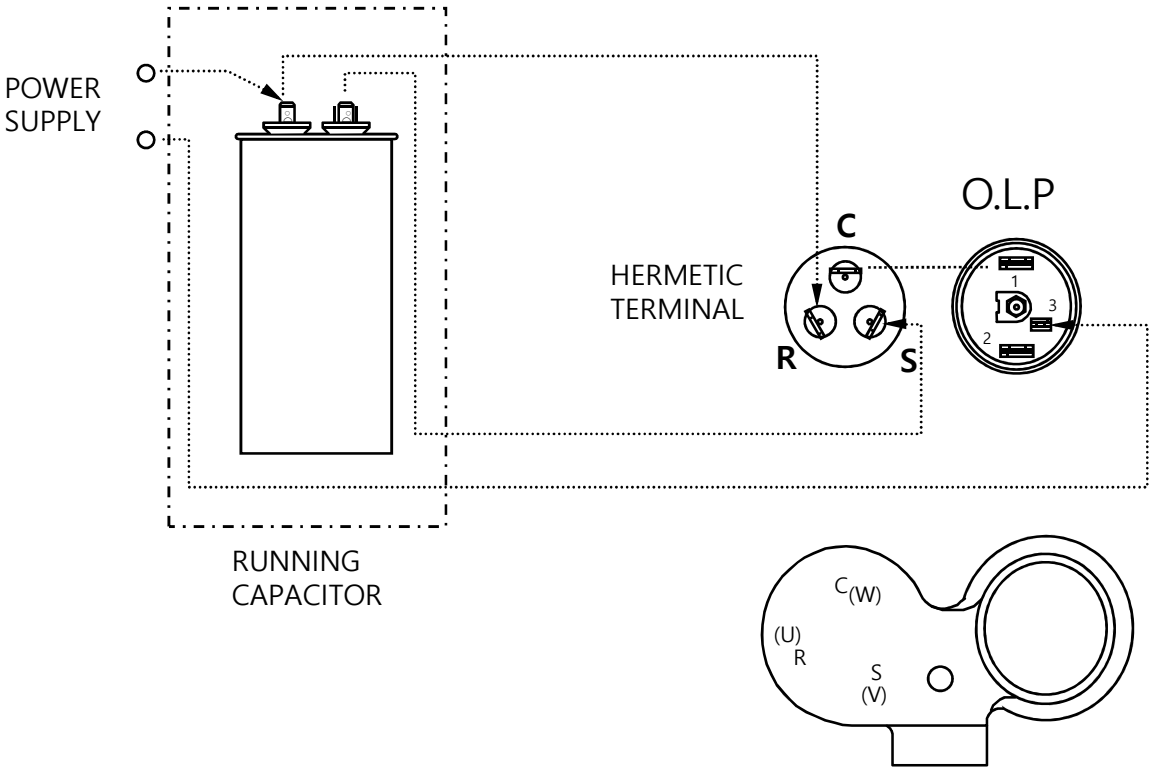


Detail of Suction Tube

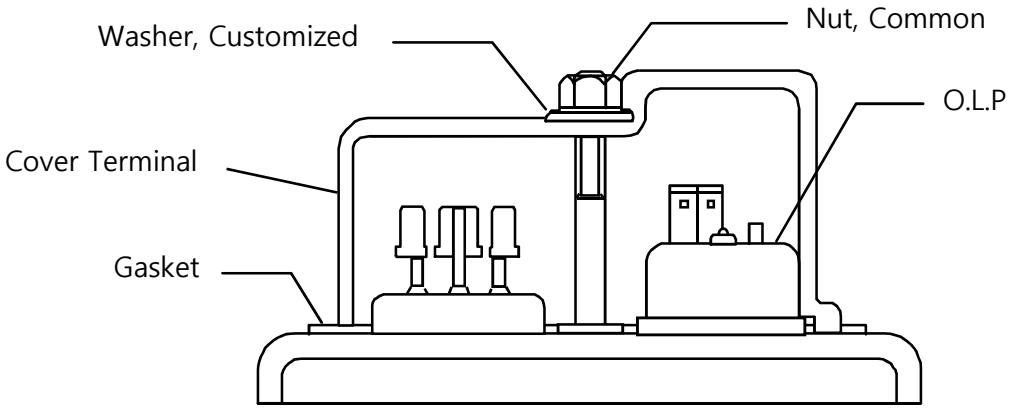
NOTES
1. PAINTING : BLACK PAINT (ELECTRO DEPOSITION)
2. OIL : POE(RB68A) 330 cc CHARGED
3. NITROGEN CHARGED AFTER DEHYDRATION

UNIT	mm	SCALE	N / S	COMP. OUT LINE
DES. ENGR.		CHF. ENGR.		
Aug.20.2016 PHONGSIRI S.		Aug.20.2016 SAMORNCHAI T.		GK113PAH
LG Electronics Inc. A/C COMP. DIVISION		CUSTOMER EMBRITAL		

Accessory Fitting



Cover Terminal



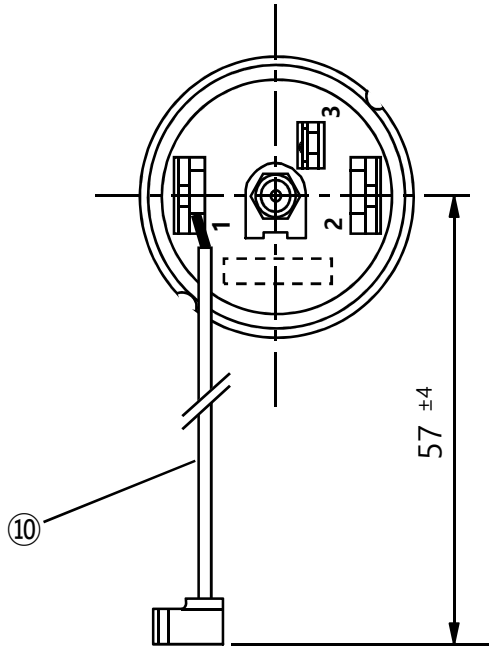
C,S,R Mark Embossed on Cover Terminal

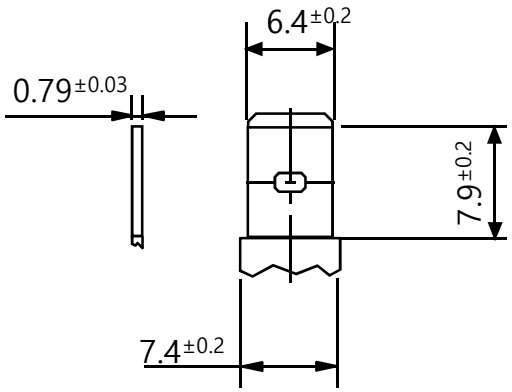
※ Nut assembly Should be below 20㎏f㎝.

Overload Protector

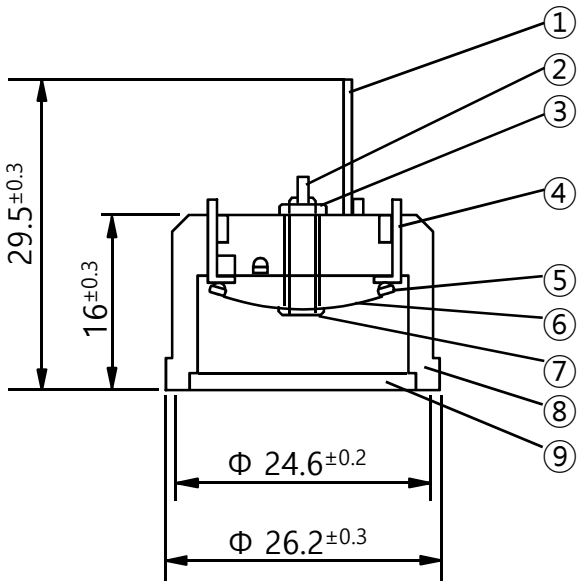
Drawing No. 6750U-L061A

(UNIT : ㎜)





TERMINAL ADAPTER



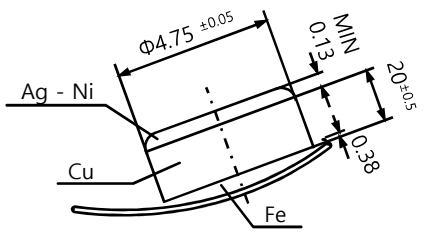
NO.	Q'TY	PART NAME	MATERIAL
1	1	TERMINAL ADAPTER	BRASS, TIN CLAD
2	1	ADJUST SCREW	BRASS
3	1	LOCK NUT	BRASS
4	2	TERMINAL (NO. 1,2)	Ag, Cu, STAINLESS CLAD
5	2	MOVABLE CONTACT	Ag-Ni ALLOY, Cu CLAD
6	1	BIMETAL DISC	INVAR Fe-Ni-Cr CLAD
7	1	DISC WASHER	BRASS
8	1	BASE	PHENOLIC RESIN
9	1	COVER	PHENOLIC RESIN 94V-0
10	1	LEAD WIRE	UL3321-AWG#14

VENDER : SENSATA

VENDER PART No. : MRA12130 – 12026

SPECIFICATION

1. **OPEN TEMP. : 150 ± 5 ℃**
2. **CLOSE TEMP. : 69 ± 9 ℃**
3. **SHORT TIME TRIP : 14.5 Amps., 11±5 sec. at 25℃**
4. **ULTIMATE TRIP CURRENT : 5.7 Amps., at 100℃**



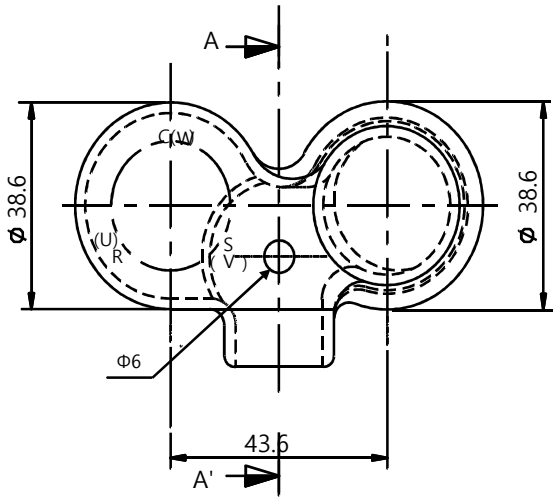
MOVABLE CONTACT

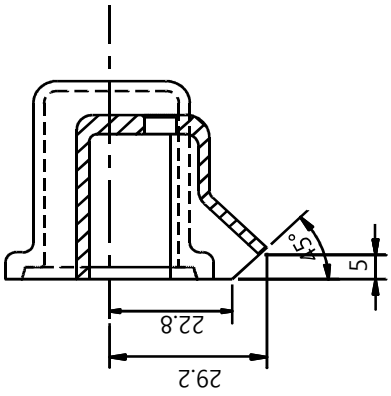
LG Electronics Inc.

Cover, Terminal

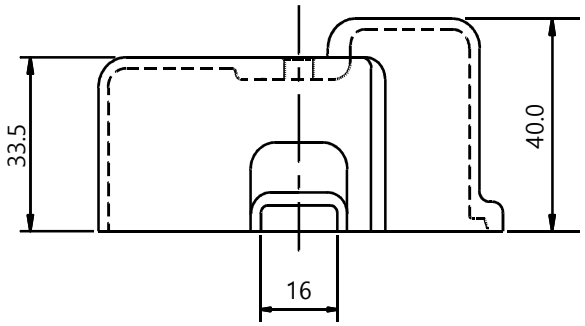
Drawing No. 3550U-L004C

(UNIT : mm)





Section A-A'



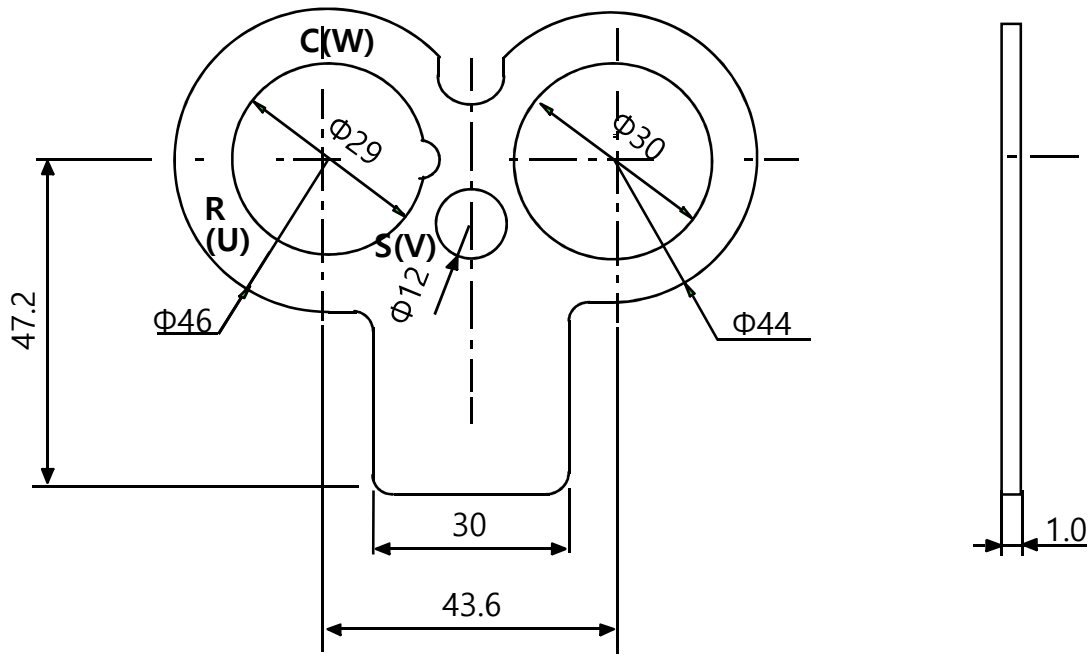
MATERIAL	COLOR	REMARK
Lupox TE-5006F (polybutylene terephthalate)	BLACK	MARKS(C(W),R(U),S(V))

LG Electronics Inc.

Gasket

Drawing No. 4986UHL001G

(UNIT : mm)



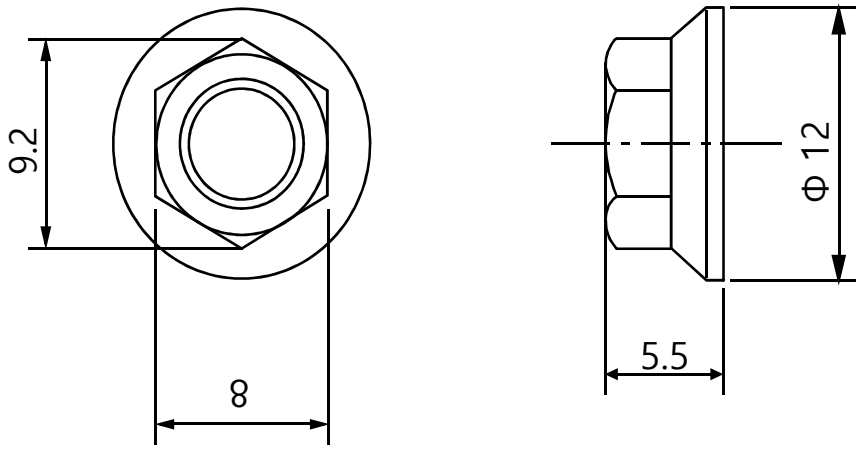
MATERIAL	REMARK
EPDM / SILICONE	MARKS(C(W),R(U),S(V))

LG Electronics Inc.

Nut, Commom

Drawing No. FAD30241201

(UNIT : mm)



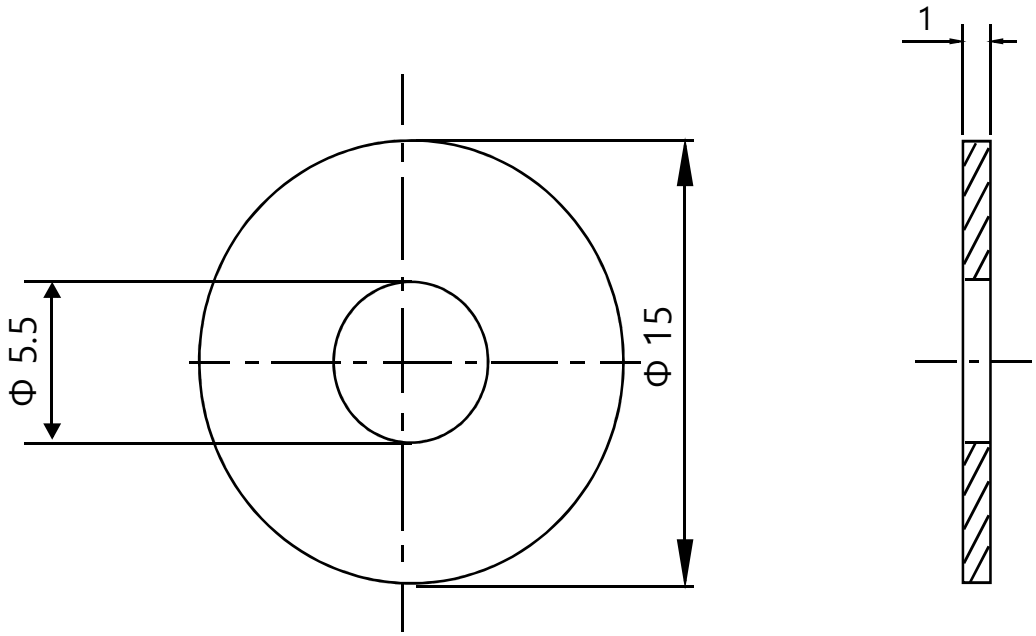
* MATERIAL : STEEL (ELECTRIC PLATING OF ZINC)

LG Electronics Inc.

Washer, Customized

Drawing No. FAF30240201

(UNIT : ㎜)



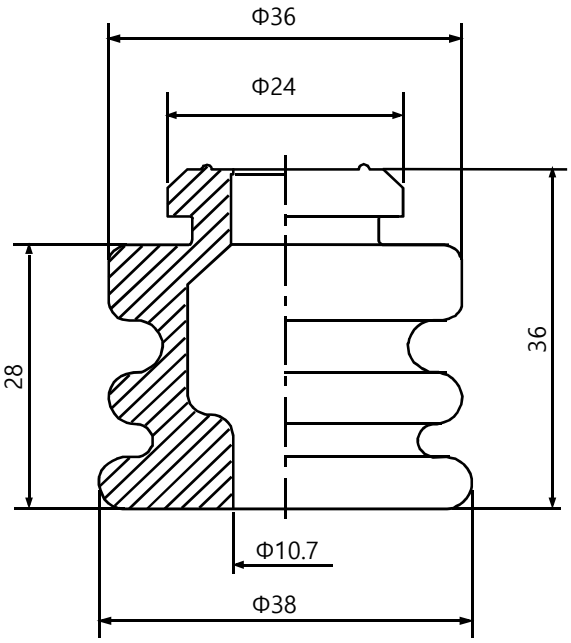
* MATERIAL : POLYAMIDE (NYLON)

LG Electronics Inc.

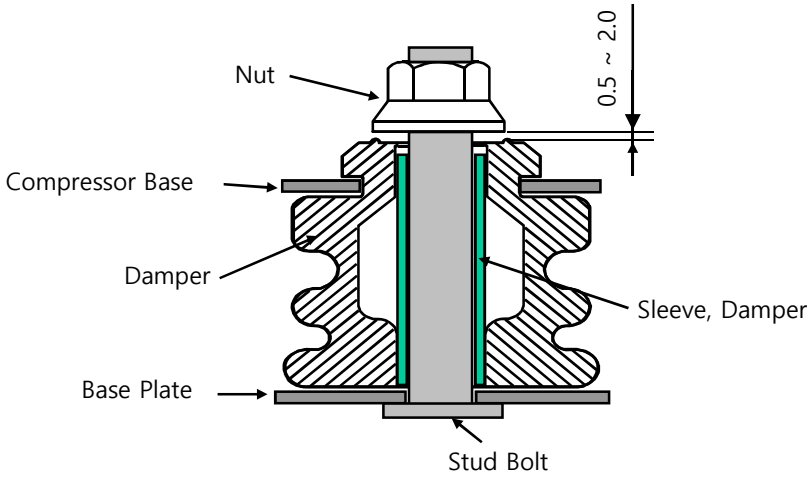
Damper, Rubber

Drawing NO. MCQ66473401

(UNIT : ㎜)



* MATERIAL : NATURAL RUBBER



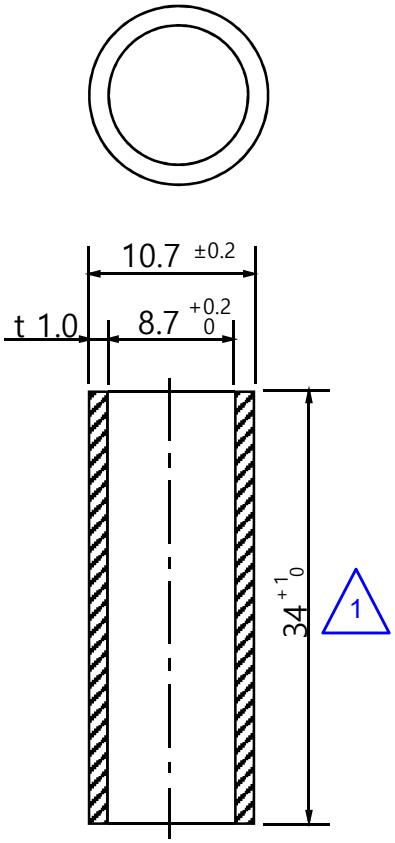
Damper Assembly

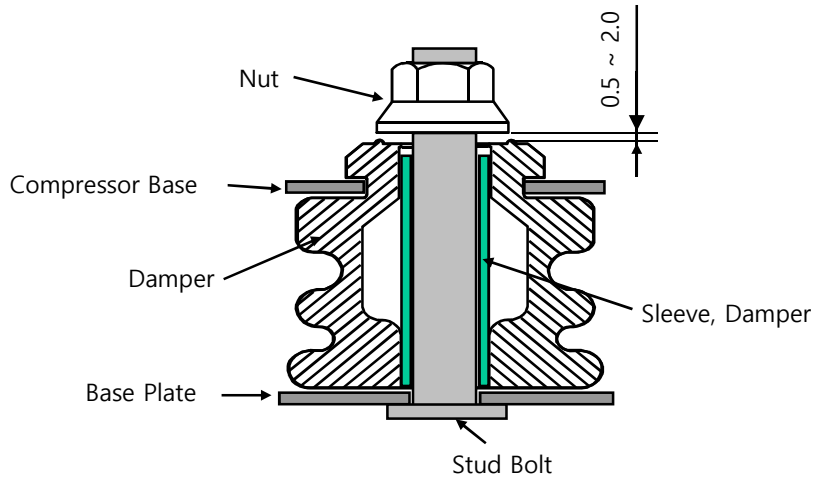
LG Electronics Inc.

Sleeve ,Damper

Drawing NO. 4816U-L001G

(UNIT : ㎜)



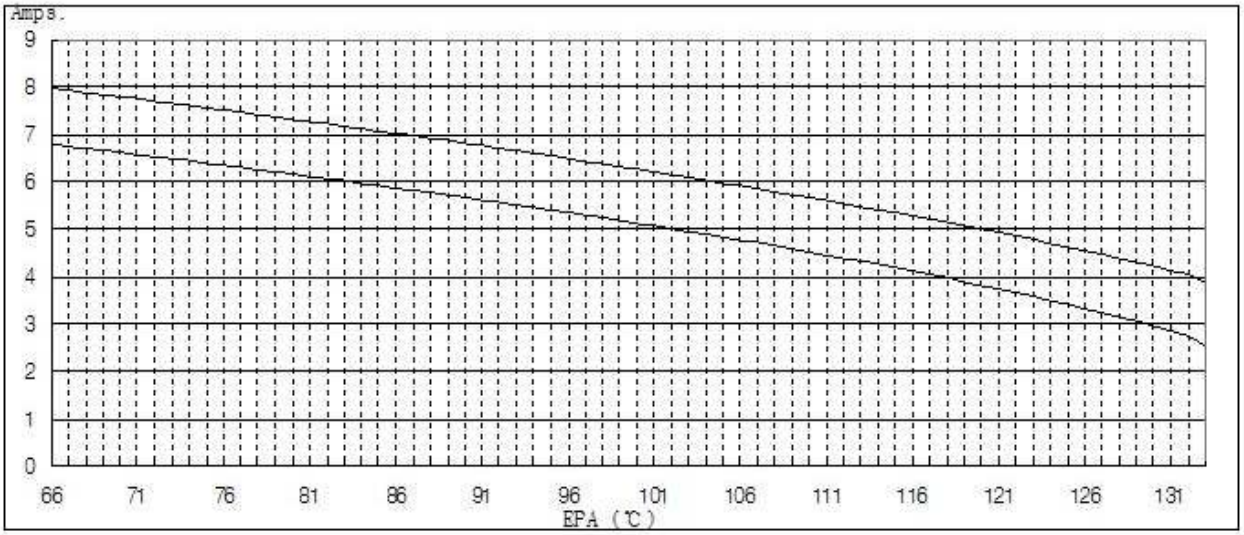


Damper Assembly

LG Electronics Inc.

O.L.P CHARACTERISTIC CURVE

LG P/No	:	6760U-LO61A	OPEN TEMP	: 160.0 ± 5 ℃	
VENDER	:	TEXAS INSTRUMENT KOREA	CLOSE TEMP	: 69.0 ± 9 ℃	
VENDER P/No	:	MRA12130-12026	SHORT TIME TRIP	: 14.6 A	11 ± 5 Sec, at 25 ℃
			ULTIMATE TRIP CURRENT	: 6.7 A , at 100 ℃	



1. EPA : Temperature (℃) , (FIG-1)

   EPA = (A + B) / 2

   A = Temp. of the inner space of Terminal Cover.
   B = Temp. of the seat of O.L.P (the top of compressor)

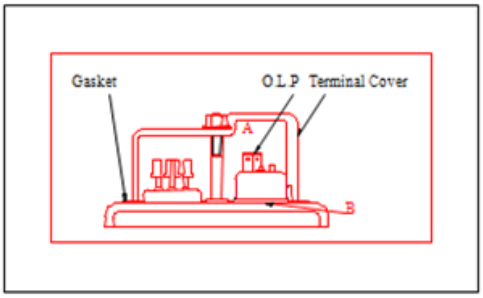


FIG-1

2. Reference (FIG-2)

   Section A : O.L.P doesn't work.(Compressor run)
   Section B : Uncertain section.
   Section C : O.L.P work. (Compressor doesn't run)

   * To run compressor, The Amp. & E.P.A must be in section-A.

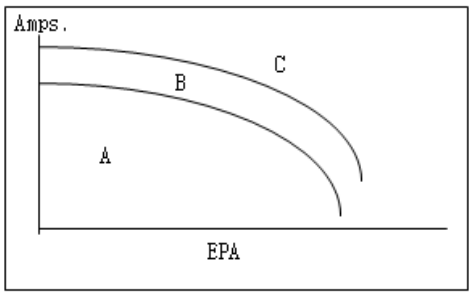


FIG-2

LG Electronics Inc.

Guideline of using R410A

■ Process Control

1. Residual Moisture

Moisture control of lubricant is very important, because hydrolysis of lubricant causes many problems.

2. Residual Chlorine

Chloric furuoro carbon and solvent cause decomposition of oil, no chlorine is recommended (if impossible, below 100 ppm)

3. Contamination Control

Contamination accelerate wear of compressor parts and decomposition of oil. Therefore contamination control must be required.

4. Compressor Sealing

It is recommended to assemble compressor within **5 minutes** after removing sealing cap of compressor.

5. Tube Connection

When brazing welding for tube connection, no use of Flux is recommendable.

■ Facilities

1. Vacuum Pump

Below 0.5 torr vacuum rate is recommendable.

2. Charging System

An exclusive charging equipment is necessary.

LG Electronics Inc.