LG
Life's Good

| Doc. No. | LGETH -190401-021 |
|---|---|
| Rev. No. | 0 |
| Date | 1-Apr-2019 |

Rotary Compressor

# SPECIFICATION for APPROVAL

## MODEL: QVS325PNA

**LG Electronics**

| Designed | Approved |
|---|---|
| Sign | |
| Date 1-Apr-2019 | 1-04-2019 |

**PHU DAI HUNG**

| APPROVAL | |
|---|---|
| Sign | |
| Date | |

ORIGINAL

010419

Please return one copy on your approval.
Please read this specification thoroughly before installation or operating.

| | |
|---|---|
| Doc. No. | LGETH -190401-021 |
| Rev. No. | 0 |
| Date | 1–Apr–2019 |

Rotary Compressor

# SPECIFICATION for APPROVAL

## MODEL: QVS325PNA

**LG Electronics**

| Designed | Approved |
|---|---|
| Sign | |
| Date | |

**PHU DAI HUNG**

| APPROVAL | |
|---|---|
| Sign | |
| Date | |

Please return one copy on your approval.
Please read this specification thoroughly before installation or operating.

Revision History

| No | Date | Article | Description | Writer |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Contents

1. Specification
    1.1 Compressor
    1.2 Motor
    1.3 Wire Diagram
    1.4 Electrical Component
    1.5 Performance
    1.6 Noise, Vibration
    1.7 Minimum Starting Voltage
    1.8 Voltage Range
    1.9 Others
2. Delivered Parts List
3. Operating Limit
4. Label
5. Attachment
    5.1 Compressor Drawing
    5.2 Accessory Fitting
    5.3 Part Drawings

# 1.Specification

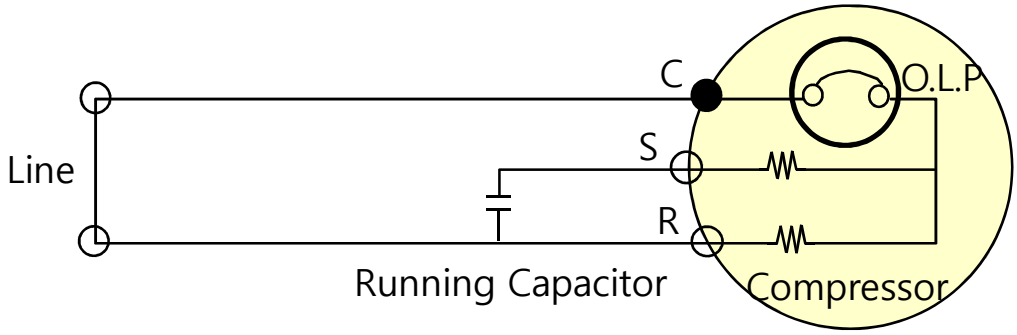
## 1.1 Compressor

| | | |
|---|---|---|
| 1 | Model Name | QVS325PNA |
| 2 | Compressor Type | Hermetic Motor Compressor |
| 3 | Compression Type | Rotary Type (Rolling Piston Type) |
| 4 | Application | Refrigeration system (Cooling & Heating) |
| 5 | Refrigerant | R-22 |
| 6 | Safety Approval | - |
| 7 | Oil / Oil Charging Amount | 4GSI or NM56 / 630 ± 10 cc |
| 8 | Displacement | 32.5 ㎤ / rev |
| 9 | Painting | Black Color Paint |
| 10 | Net Weight ( Including Oil ) | 16.7 kg |
| 11 | Suction Tube I.D | Φ 12.8 mm |
| 12 | Discharge Tube I.D | Φ 9.7 mm |

## 1.2 Motor

| | | |
|---|---|---|
| Motor Type / Starting Type | Single Phase Induction Motor / PSC | |
| Pole / Rated Output | 2 Pole / 1,463 Watts | |
| Power Source | 1 Ph - 220/240 Volts - 50 Hz | |
| Rated Revolution | 2,862/2,884 rpm | |
| Insulation Class | E Class | |
| Windings Resistance ( at 25℃) | Main | 1.94 ± 5% Ohms |
| | Sub | 3.89 ± 5% Ohms |
| Locked Rotor Ampere | 43 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 | 50 MFD / 400 VAC |
| Overload Protector | INTERNAL TYPE |

## 1.5 Performance

| Voltage | | At 220 V | At 240 V |
|---|---|---|---|
| Cooling Capacity (-5%↑) | [ BTU/h ] | 19,200 | 19,300 |
| | [ W ] | 5,627 | 5,656 |
| Power Input (+5%↓) | [ Watts ] | 1,825 | 1,910 |
| EER (-5%↑) | [ BTU/w・hr ] | 10.5 | 10.1 |
| | [ W / W ] | 3.08 | 2.96 |
| Running Current | [ A ] | 8.5 | 8.2 |

☞ Rated Conditions (ASHRAE-T Condition)

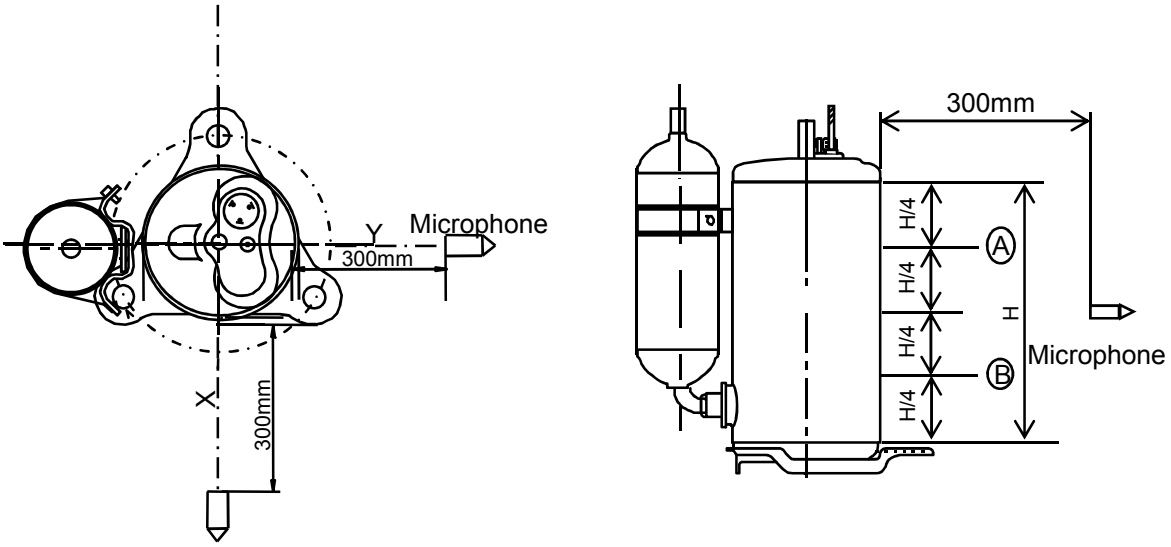
Cond. Temp. : 54.4 ℃ ( 130 ℉ )
Evap. Temp. : 7.2 ℃ ( 45 ℉ )

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) ] | 72 Max |
| Vibration | [μm] | 250 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 Ⓐ ~ Ⓑ
- Test Condition :
  - Standard Condition (Ps/Pd = 5.34 / 20.86 kg/cm²G)

## 1.7 Minimum Starting Voltage

| | |
|---|---|
| Cold Start<br>- Temp. Condition : 35℃<br>- Balanced pressure : Pd – Ps ≤ 0.5 ㎏f/㎠ | 187 Volts Max. |
| - Balanced pressure : Pd – Ps = 0 ㎏f/㎠ | 187 Volts Max. |

## 1.8 Voltage Range

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

☞ Test Conditions

| | Standard Condition | Overload Condition |
|---|---|---|
| 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 | 28 kgf / ㎠ G |
| | Low Pressure Side | - |
| Hydrostatic trength Pressure | High Pressure Side | 155 kgf / ㎠ G |
| | Low Pressure Side | 50.6 kgf / ㎠ G |
| Insulation Resistance ( with 500V D.C Mega Tester ) | | 50 ㏁ Min. |
| Withstand Voltage | | At 2,200 V / 1 Sec.<br>Leakage Current is less than 5 ㎃ |
| Residual Moisture ( Karl Fisher Method ) | | 80 mg Max. |
| * Residual Impurities | | 70 mg Max |

*) Each part was measured separately

# 2.Delivered Parts List

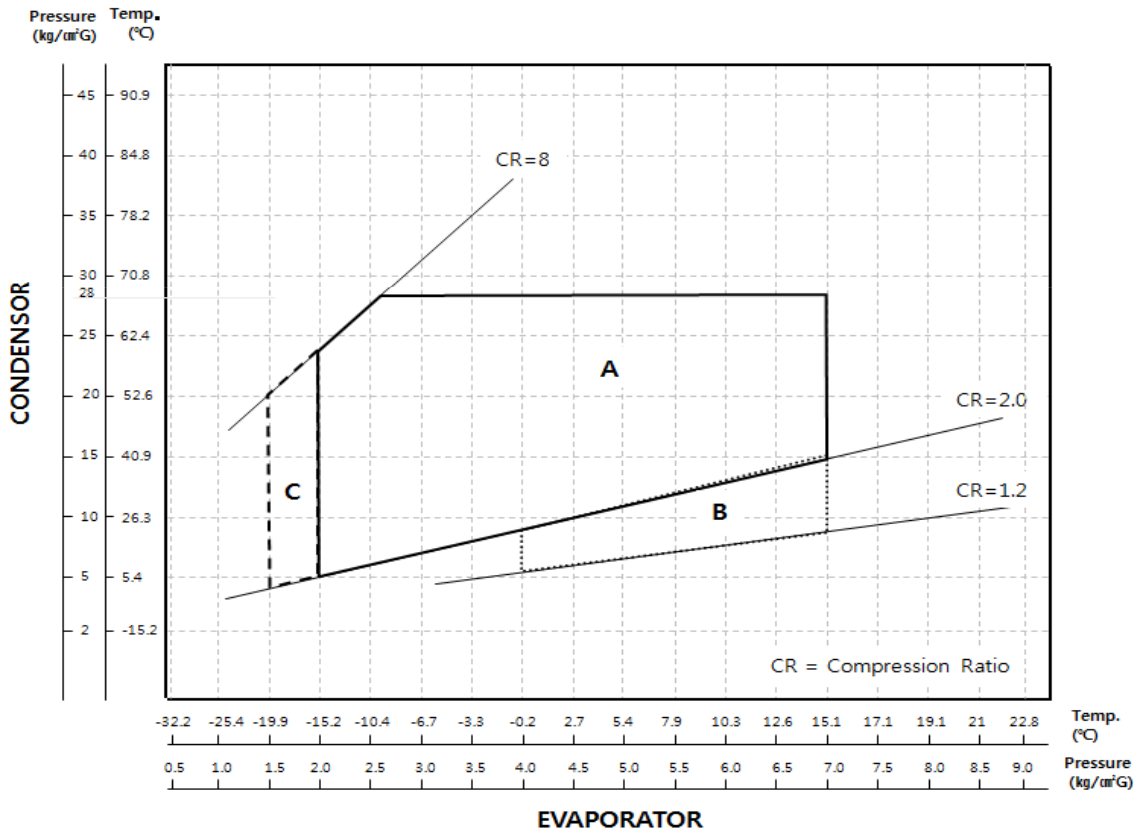
| Parts Name | Type ( Model ) | EA | Parts Dwg. NO. | Supply | |
|---|---|---|---|---|---|
| | | | LG | | |
| Compressor | QVS325PNA | 1 | - | (YES) | NO |
| O.L.P | INTERNAL TYPE | - | - | YES | (NO) |
| Cover, Terminal | - | 1 | 3550U-L005D | (YES) | NO |
| Gasket | - | 1 | 4986UHL004A | (YES) | NO |
| Nut, Common | - | 1 | FAD30241201 | (YES) | NO |
| Washer, Customized | - | 1 | FAF30240201 | (YES) | NO |
| Damper, Rubber | - | 3 | MCQ61847401 | (YES) | NO |
| Sleeve, Damper | - | - | - | YES | (NO) |
| Washer, Plain | - | - | - | YES | (NO) |
| Nut, Hexagon | - | - | - | YES | (NO) |
| Bolt, Stud | - | - | - | 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 ] | 28 Max. |
| Suction Pressure | [ kgf / ㎠ G ] | 2.0 ~ 7.0 |
| Discharge Temp. | [ ℃ ] | 115 Max. |
| Motor Coil Temp. | [ ℃ ] | 130 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

※ This guide contains many important safety messages. Always read and obey all safety messages.

**⚠ WARNING** You can be killed or seriously injured if you don't follow instructions.

## 3.2 Application Limit

| | |
|---|---|
| Refrigerant Charge Limit | [WRAC for Cooling Only] 1,745g Max (*K ≥ 0.3, **OIL Dilution Rate=0.20)<br>[WRAC for Heat Pump ] 1,106g Max (*K ≥ 0.4, **OIL Dilution Rate=0.22)<br><br>[SRAC for Cooling Only] 1,106g Max (*K ≥ 0.4, **OIL Dilution Rate=0.20)<br>[SRAC for Heat Pump] 738g Max (*K ≥ 0.6, **OIL Dilution Rate=0.22)<br>(Charge limit depends on Oil Dilution Rate *note 1 & 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.<br>It must be kept ΔT ≥ 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<br>(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.<br>( 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.<br><br>Ratio coefficient 'K" should be over 0.6(heating system) or 0.4(cooling syetem)<br><br>$*K = \frac{\text{Effective Volume of Accum.} \times \text{Specific gravity of Refrigerant}}{\text{Charged Weight of Refrigerant}}$<br><br>※ Effective Volume of Accumulator = 354㎤<br>※ Specific Gravity of Refrigerant (R-22) = 1.25 g/㎤ ( at 20℃ )<br><br>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. |
| Earth connection | Use compressor with grounded system only. |

**⚠ WARNING**

## 3.2 Application Limit

| | |
|---|---|
| Frequency Range | Rated Frequency ±2% |
| Pipe Stress | Don't allow any force on discharge & suction pipe .<br>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.<br>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.<br>Guideline of pump down process.<br>- Time : less than 30 seconds<br>- Suction Pressure : It should not run under below 1kgf/㎠G.<br>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.<br>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℃ |
| Earth connection | Use compressor with grounded system only. |

** Note 1. OIL Dilution rate

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

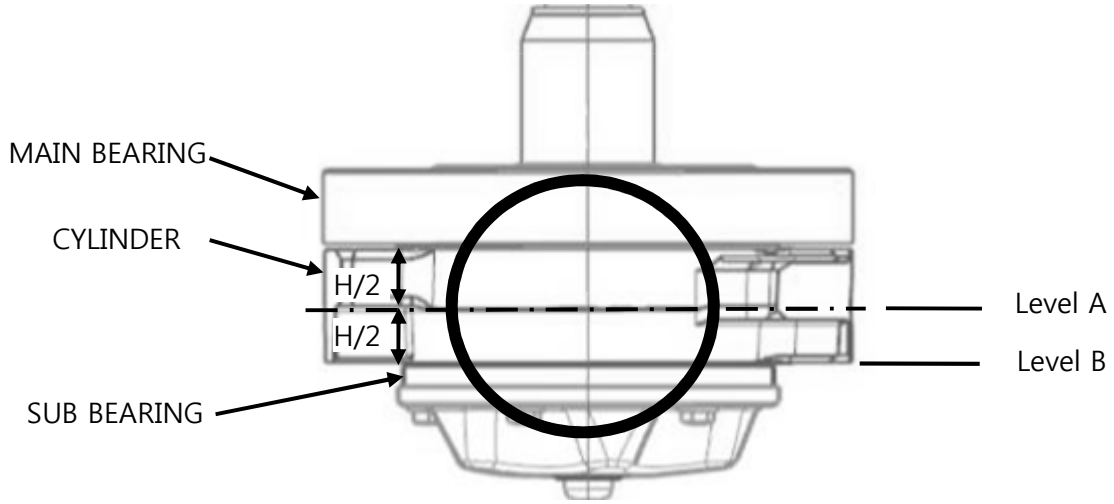
※ Specific Gravity of 4GSI or NM56 = 0.92 (at 20℃)

[ 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

## 4. LABEL

[UNIT : mm]


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 *

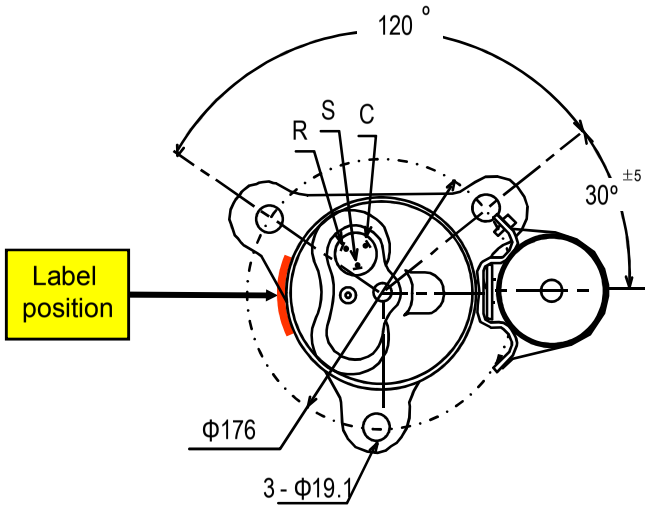
This document will be effective after LG's receipt with your authorized signature. When design modification is approved by the customer , the current document is unavailable.

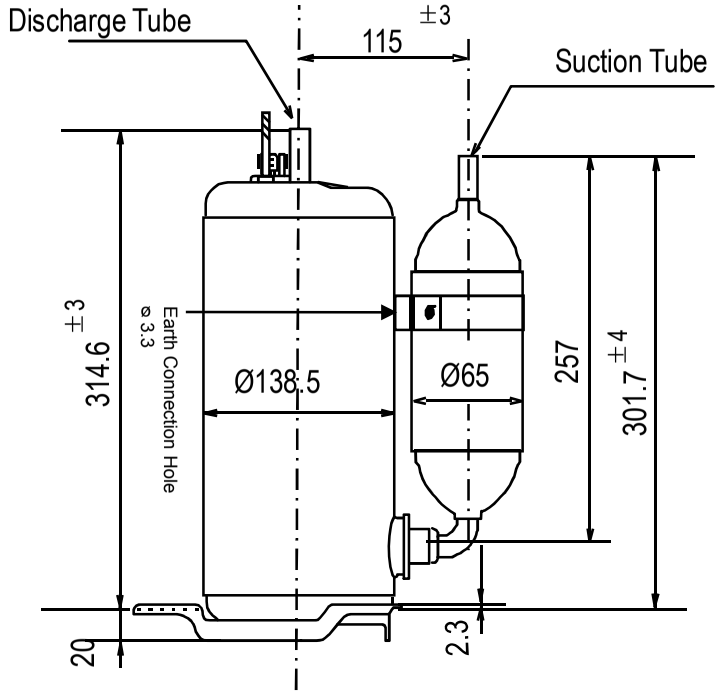
### *2. Compressor operating range *

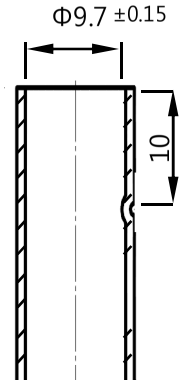
The Compressor can operate within the limits of the outlined area.
Outside these operating fields, the system cause early defects in the compressor.
The compressor defects caused by applications operating outside the outlined area will not be considered under the warranty. If the appliance be operated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

# 5. Attachment

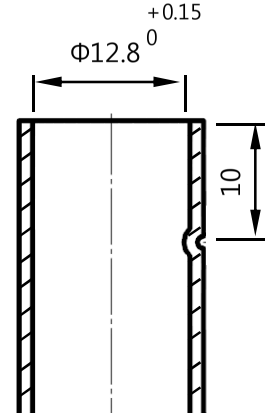

| | | PAGE |
|---|---|---|
| 5.1 Compressor Drawing | : | 15 |
| 5.2 Accessory Fitting | : | 16 |
| 5.3 Part Drawings | : | 17 ~ 21 |




Detail of Discharge Tube

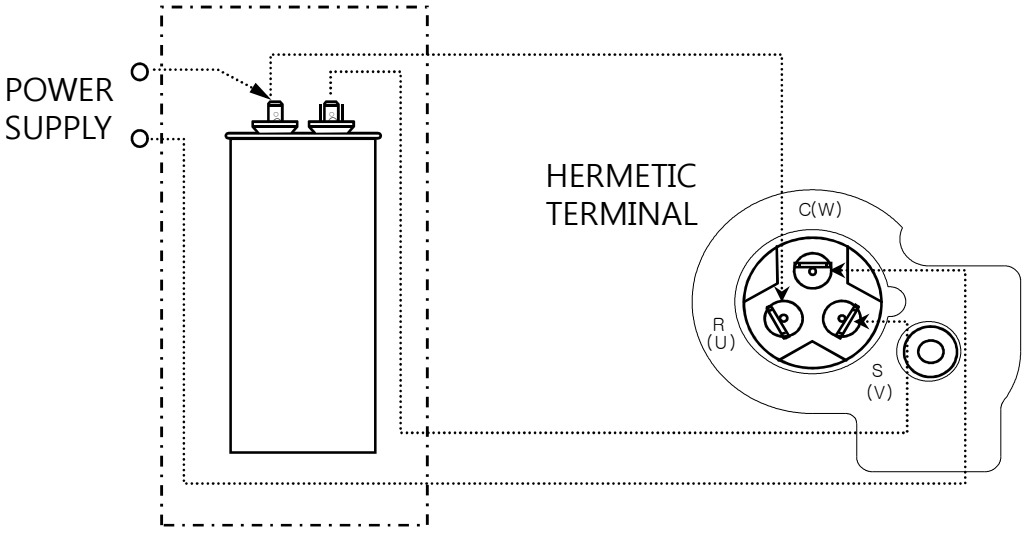


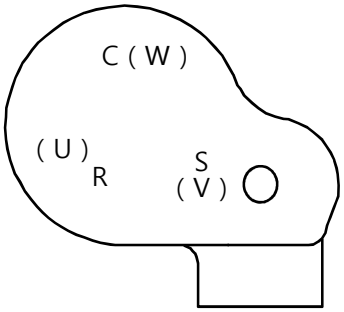

Detail of Suction Tube

NOTES
1. PAINTING : BLACK PAINT ( ELECTRO DEPOSITION )
2. OIL : NM56 OR 4GSI 630 cc CHARGED
3. NITROGEN CHARGED AFTER DEHYDRATION

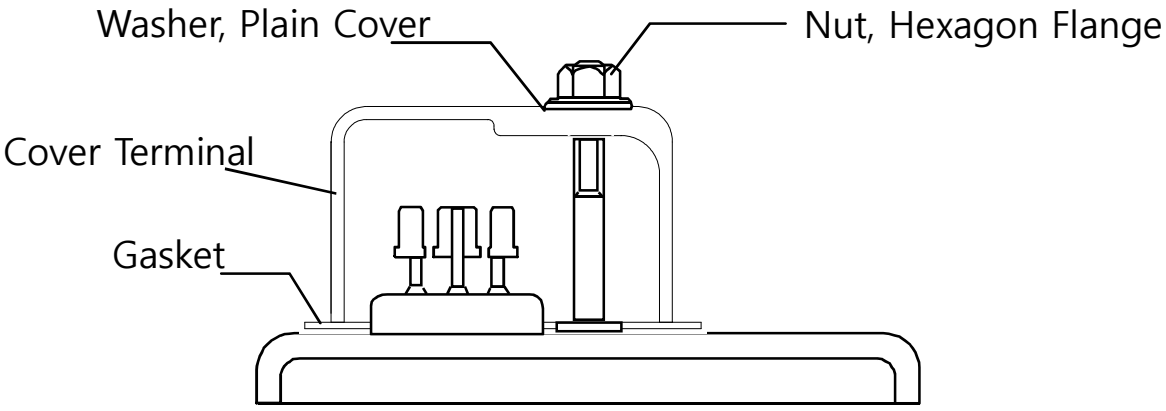
| | | | | |
|---|---|---|---|---|
| UNIT | mm | SCALE | N / S | COMP. OUT LINE |
| DES. ENGR. | | CHF. ENGR. | | |
| 1–Apr–2019 SUTTIPONG S. | | 1–Apr–2019 SAMORNCHAI T. | | QVS325PNA |
| LG Electronics Inc. A/C COMP. DIV. | | CUSTOMER PHU DAI HUNG | | |

# Accessory Fitting




Cover Terminal



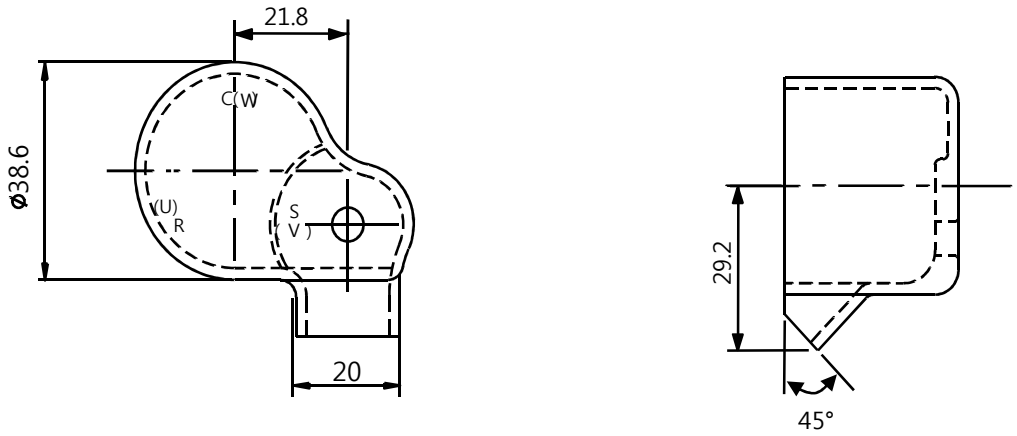

C,S,R mark embossed on cover terminal

Nut assembly torque should be below 20 kgfcm.

# Cover, Terminal

## Drawing No. 3550U-L005D

( UNIT : mm )



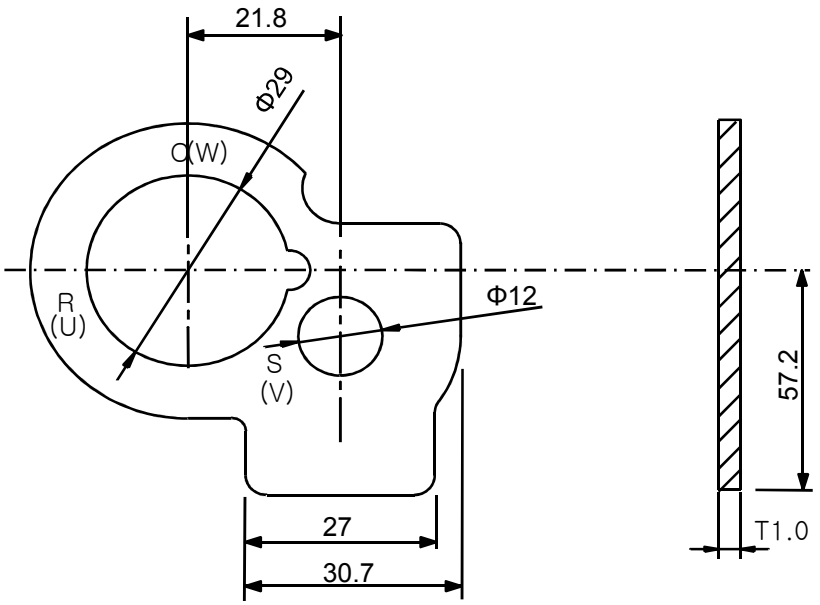

| MATERIAL | COLOR | REMARK |
|---|---|---|
| Lupox TE-5006F<br>(polybutylene terephthalate) | BLACK | MARKS(C(W),R(U),S(V)) |

LG Electronics Inc.

# Gasket

## Drawing No. 4986UHL004A

( UNIT : ㎜ )



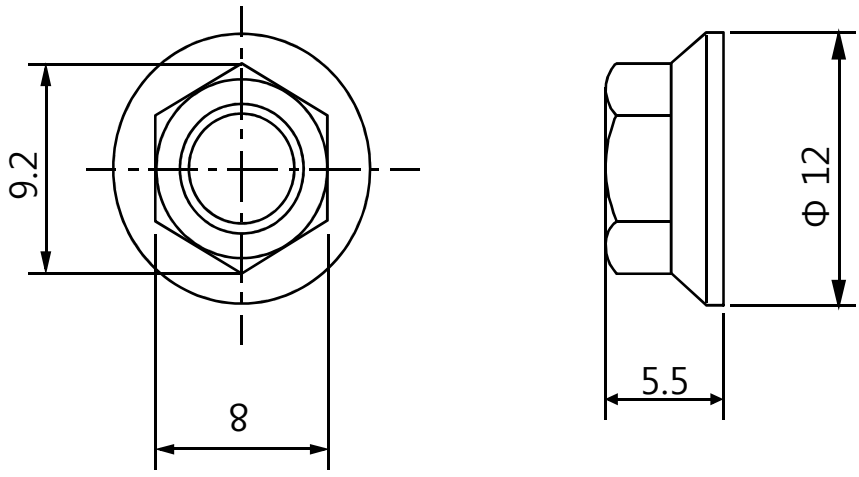

| MATERIAL | REMARK |
|---|---|
| SILICONE | MARKS(C(W),R(U),S(V)) |

LG Electronics Inc.

# Nut, Common

## Drawing No. FAD30241201

( UNIT : ㎜ )



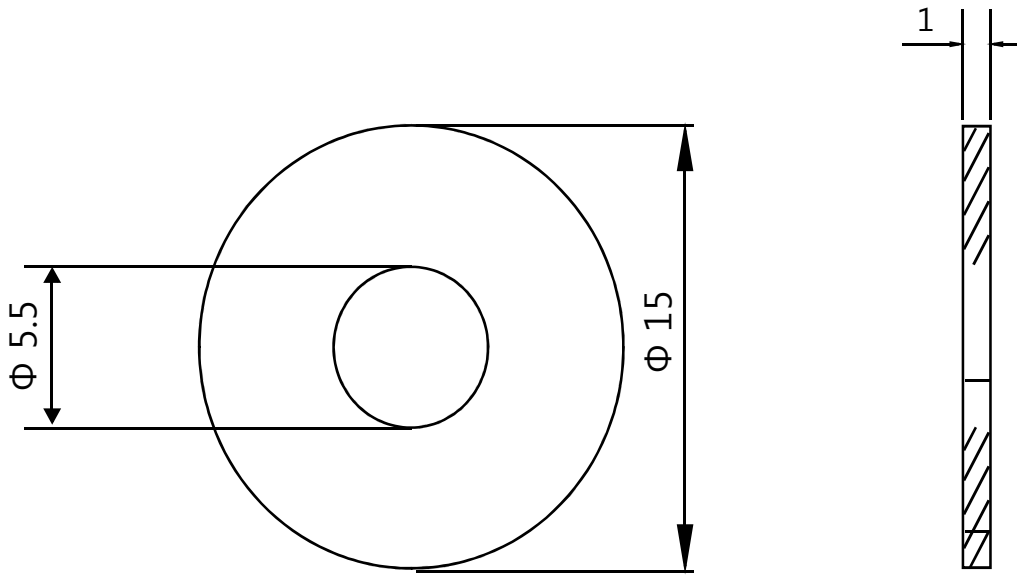

* MATERIAL : STEEL ( ELECTRIC PLATING OF ZINC )

LG Electronics Inc.

# Washer, Customized

## Drawing No. FAF30240201

( UNIT : ㎜ )



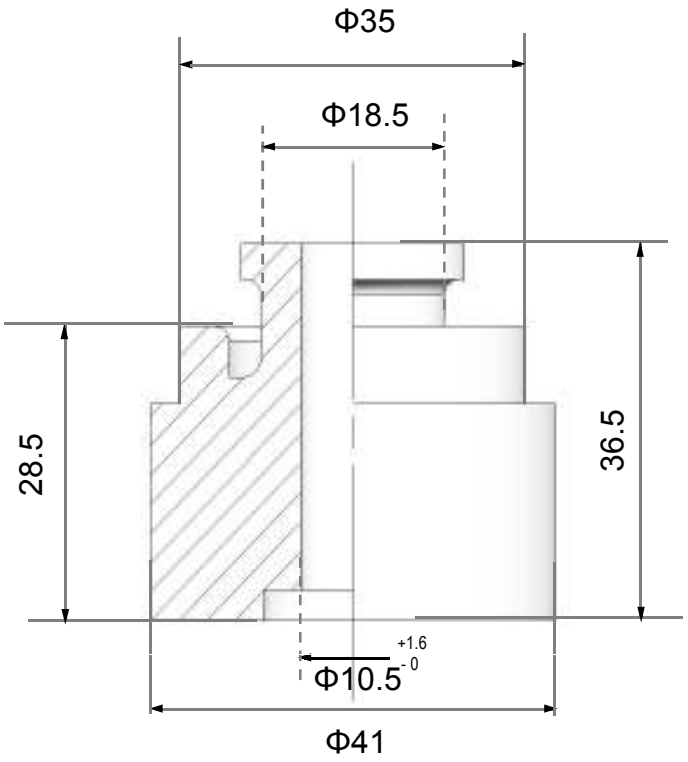

* MATERIAL : POLYAMIDE ( NYLON )

LG Electronics Inc.

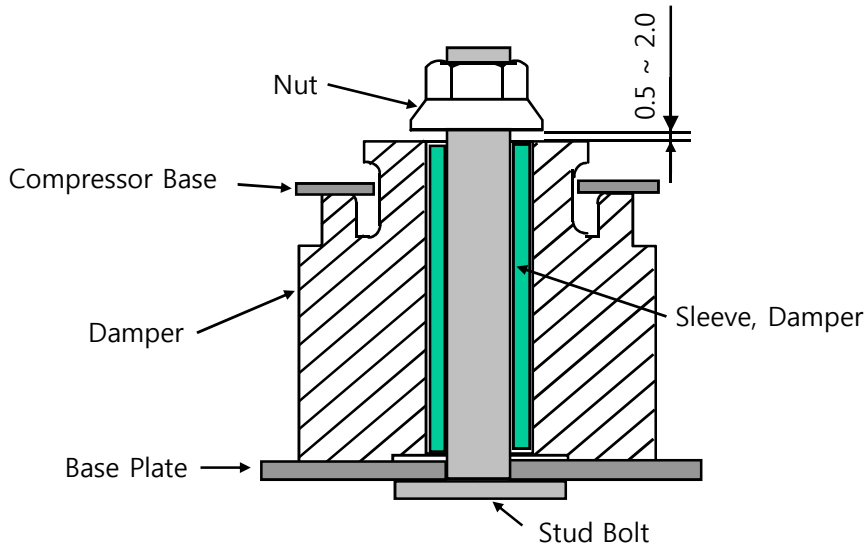
# Damper, Rubber

## Drawing NO. MCQ61847401

( UNIT : mm )




* MATERIAL : NATURAL RUBBER




Damper Assembly

LG Electronics Inc.