LG Electronics Inc.

SPECIFICATION SHEET for REFERENCE
(Preliminary)

MODEL : AQ028VAA

CUSTOMER : EMBRITAL

Purchasing Manager : _____

Engineering Manager : _____

LG Electronics Inc.

Sales Manager : _____

Engineering Manager : _____

Air Conditioning Compressor Divisions , LG Electronics Inc.

Tel : (55) 269 - 3868 Fax : (55) 268 - 4897

Ref. No.	-
Date	May.24.2005
Rev. No.	REV. 0
Rev. Date	-

1.Specification

1.1 Compressor

1	Compressor Model Name	AQ028VAA
2	Compressor Type	Hermetic Motor Compressor
3	Compression Type	Scroll Type
4	Displacement	34.31 cm^3 / rev
5	Refrigerant	R410A
6	Oil / Oil Charging Amount	PVE(FVC 68D) / 750±10 cc
7	Nitrogen Gas Holding Pressure	0.8 ±0.2 kg/cm^2G
8	Painting	Black Color Paint
9	Net Weight (Including Oil)	26±1 kg (55.3 ±2.2 lb)
10	Suction Tube I.D	ø 19.2 ± 0.1 mm
11	Discharge Tube I.D	ø 12.9 ± 0.1 mm

1.2 Motor

Motor Type	Inverter 3-PH induction motor	
Pole / Rated Output	2 Pole / 2,255 watts	
Power Source	3 Ph 145 volt 60 Hz	
Rated Revolution	3,470 rpm	
Insulation Class	135 ℃	
Winding Resistance (at 75 ℃)	U-V	0.61 ± 7% ohm
	V-W	0.59 ± 7% ohm
	W-U	0.62 ± 7% ohm

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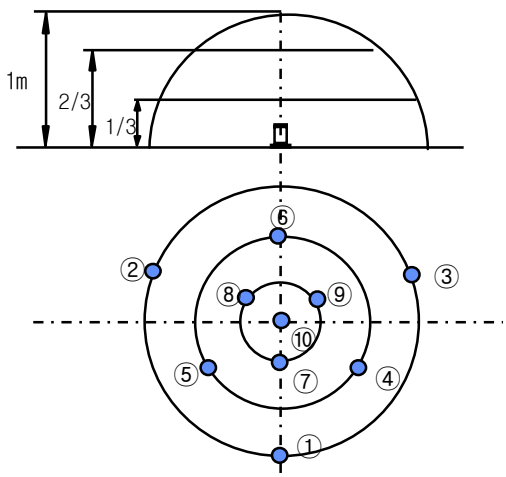
1.3 Performance(※)

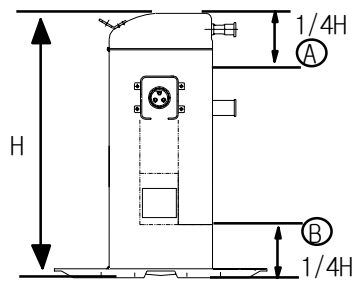
Frequency[Hz] / Voltage [V]		60 / 145	90 / 185
Cooling Capacity (±5%)	[BTU/h]	27,500	42,130
	[kcal/h]	6,930	10,617
Power Input (±5%)	[watts]	3,076	4,560
EER (±5%)	[Btu/wh]	8.94	9.24
Running Current	[A]	14.2	16
Sound Level	[dB(A)]	68±2	74±2
Vibration	[㎛]	35	35

(※) Rating Conditions

Cond. Temp.: 54.4 ºC (130 ºF) Return Gas Temp. : 18.3 ºC (65 ºF)
Evap. Temp.: 7.2 ºC (45 ºF) Liquid Temp. : 46.1 ºC (115 ºF)
Ambient Temp. : 35.0 ºC (95 ºF)

Noise & Vibration Measuring Points





● Compressor sound is measured according to ANSI/ARI 530-89 standard.

● Compressor vibration is measured by a vibration meter which is contacted compressor body's Ⓐ, Ⓑ

1.4 Others

Leak Tight Pressure	Air Pressure	40 kg/cm^{2}G
Hydrostatic Strength Pressure	High Pressure Side	130 kg/cm^{2}G
	Lower Pressure Side	65 kg/cm^{2}G
Insulation Resistance (with 500V D.C Mega Tester)		50 MΩ Min.
Withstand Voltage		2,200 V- 1 sec. Leakage Current is less than 5mA.
Residual Moisture / Residual Impurities		200 mg Max. / 80 mg Max.

1.5 Electrical Component

Part Name		Specification
Running Capacitor		-
Overload Protector		Not OLP (Follow A-9)
RUN	Open.Temp.	-
	Close Temp.	-
	Amps/Time To Trip(at 25℃)	-
U/T	Amps/Time To Trip(at 70℃)	-

2.Delivered Parts List

Parts Name	Type (Model)	EA	Parts' Dwg. NO.		Supply	
			LG			
Compressor	AQ028VAA	1	2520UUBV2AA		(YES)	NO
O.L.P	-		-		YES	(NO)
Cover, Terminal	-	1	3550U - D002A		(YES)	NO
Gasket	-	1	4986U - L002A		(YES)	NO
Grommet	-	3	4022U - L004B		(YES)	NO
Grommet,Sleeve		3	4816U - L001B		(YES)	NO

※) Refer to Attachments (Accessory Parts Drawings.)

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Date	May.24.2005
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3.Operating Limit

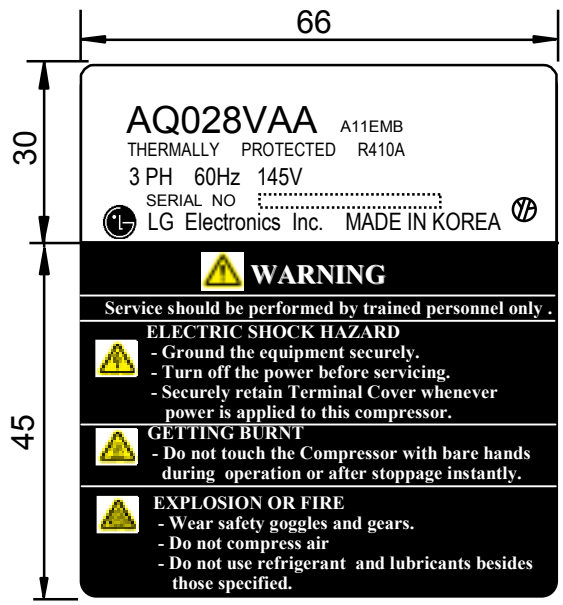
Discharge Pressure [kg / cm^2 G]	42 Max.
Suction Pressure [kg / cm^2 G]	4.8 ~ 15.0
Motor Coil Temp. [°C]	135 Max.
Discharge Temp. [°C]	125 Max.

Refrigerant Charge Limit	2,300g Max.
Continuous Flood Back	Continuous Flood Back before the compressor should not be more than 10% of the total circulation quantity of refrigerant.
On/Off Interval & Cycles	On / Off =3 Minutes / 3 Minutes 20,000 Cycles or less
Voltage Range	Rated Voltage ± 10 % (refer to A-2)
VariableFrequency Range	30 Hz~120 Hz
Compression Ratio in Operating	The Compression ratio in operating shall be 6.7 or less except 3 minutes starting period.
Pressure Difference at Starting	When starting,discharge pressure is balanced with suction pressure.
Tilt in Operation	The allowable tilt of the compressor in operation shall be 3 ° or less

* 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 *



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Attachment

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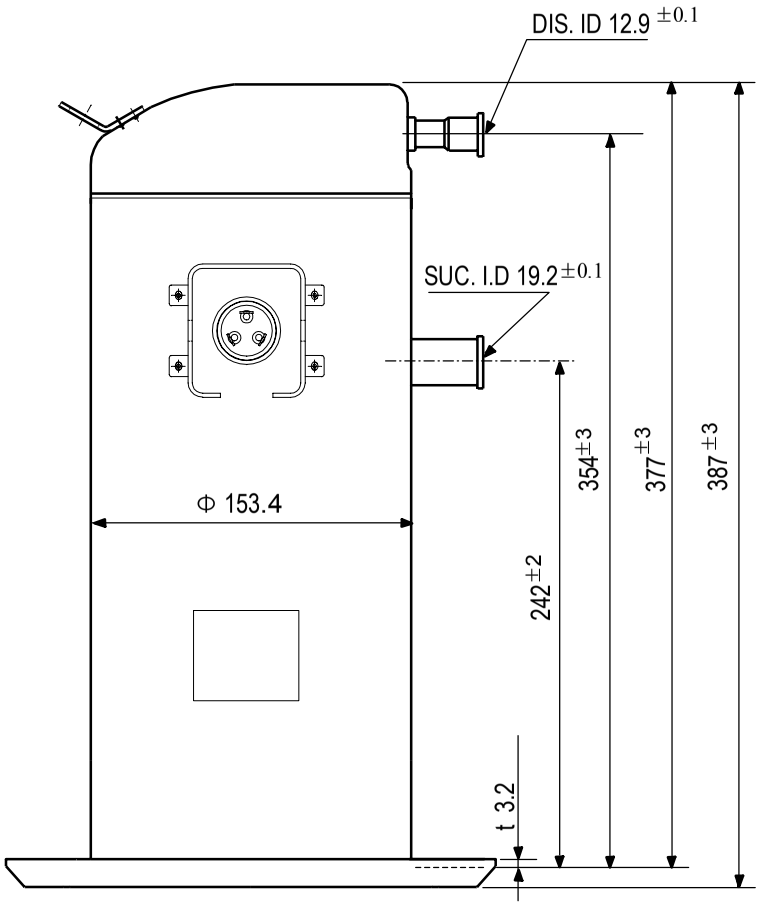
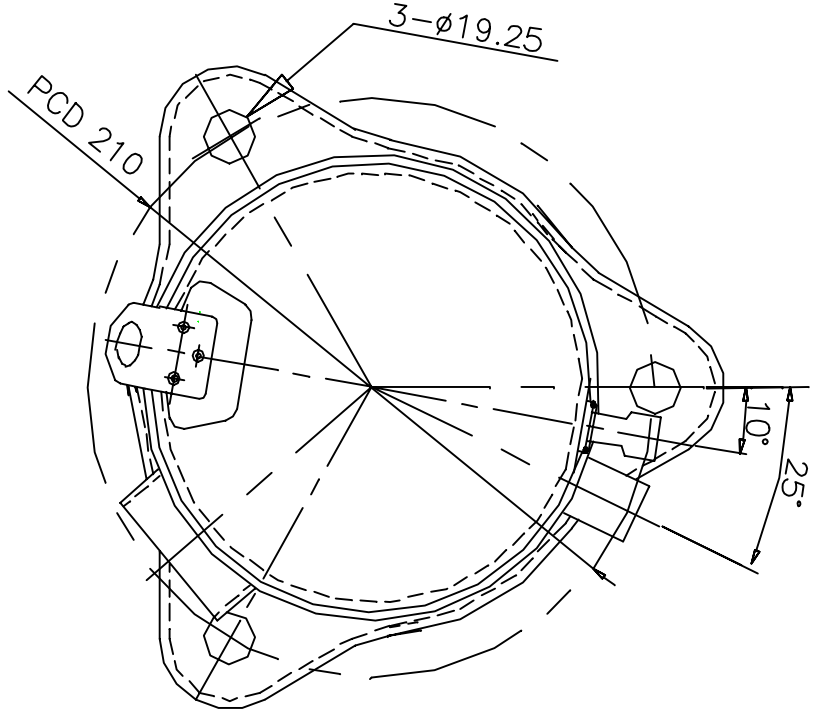


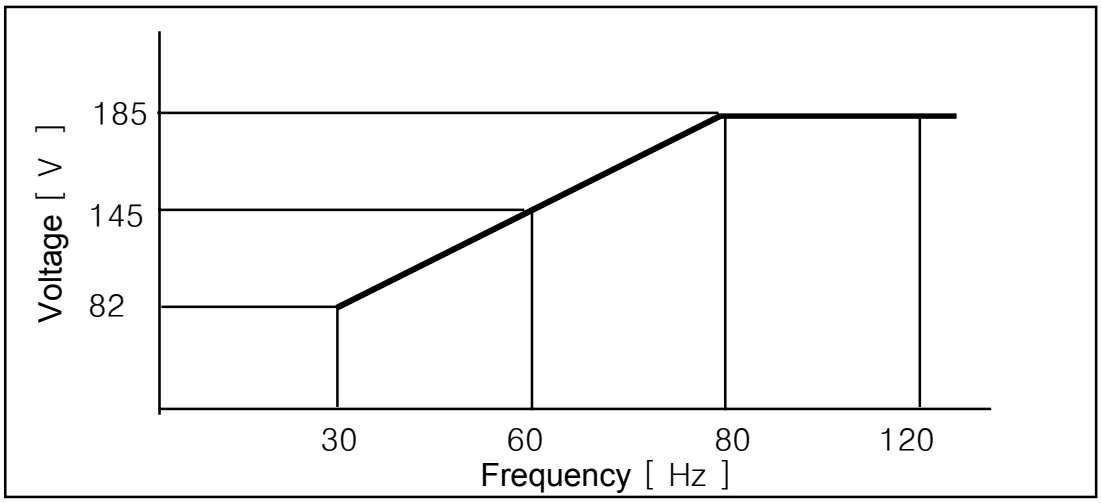


NOTES
1. PAINTING : BLACK PAINT (ELECTRO DEPOSITION)
2. OIL : SUNISO 4GSI OR EQUIVALENT 750 cc CHARGED
3. NITROGEN CHARGED AFTER DEHYDRATION

UNIT	mm	SCALE	N / S	COMP. OUT LINE
DES. ENGR.		CHF. ENGR.		
May. 23. 2005 K.N.UM		May. 23. 2005 H. C. JEONG		AQ028VAA
LG Electronics Inc. ACC. Divisions		CUSTOMER Embrital		

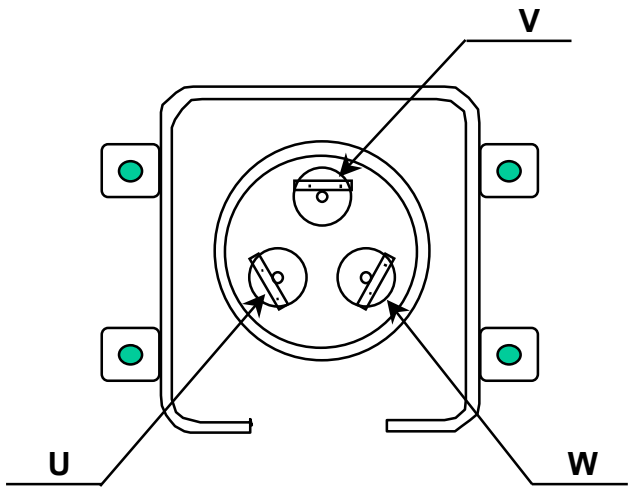
A-1

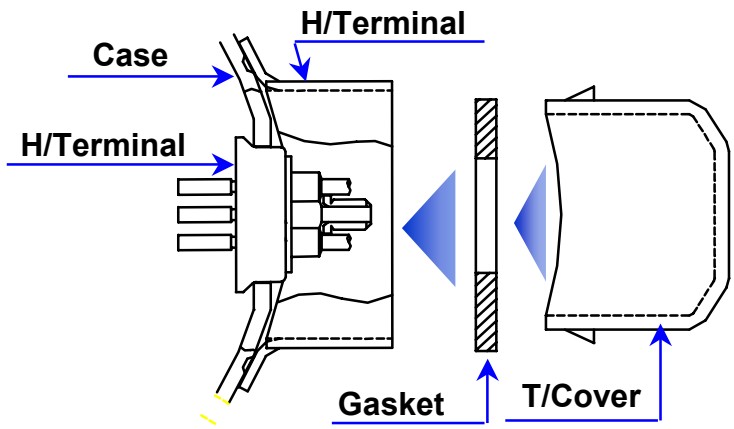
Standard V/F Characteristic



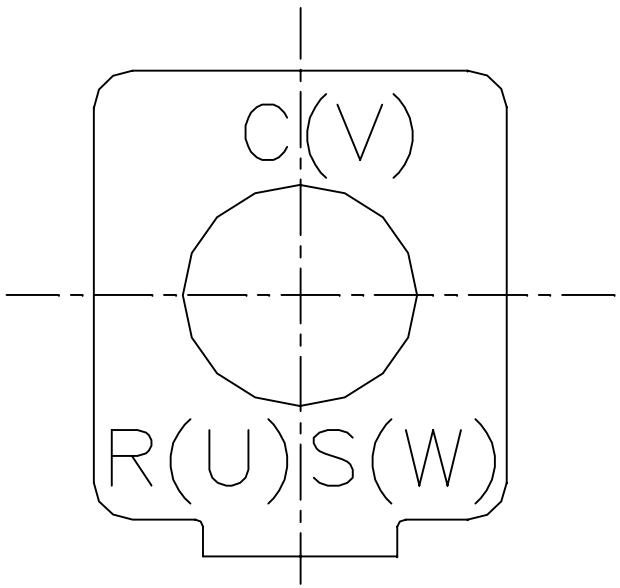
Starting Frequency	5 Hz (MIN)
Accelerating Level	2 Hz/Sec (MIN)
Current	30 A(MAX)
ON/OFF CYCLE	6 times/ an hour (MAX) [operate at 50~75HZ for oil return about 30 seconds after running] [Min. off time is 3 minutes]
Crankcase Heater	Be equipped with heater in the lower case in time of operating below zero [capacity: 40W]

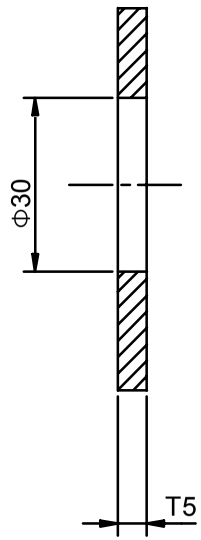
Accessory Fitting





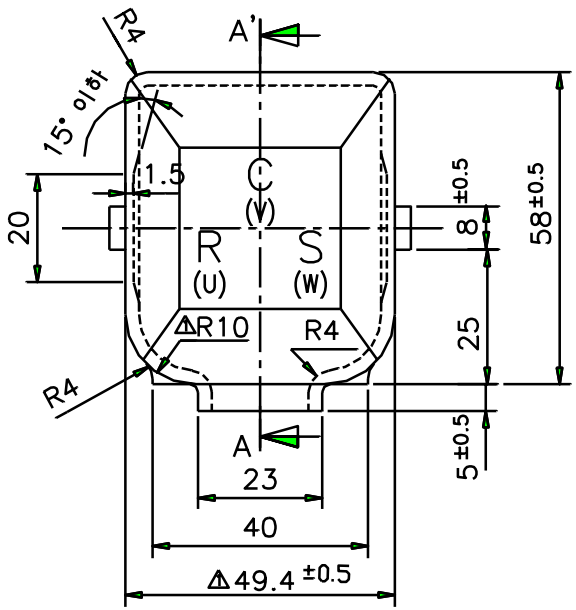
U,V,W Mark Embossed on Cover Terminal

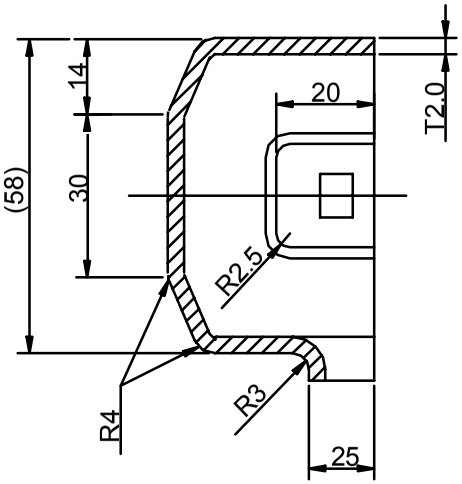




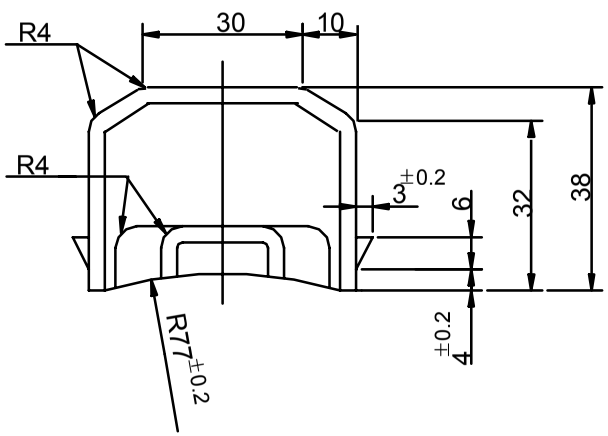
* MATERIAL : EPDM SPONGE
* COLOR : BLACK

UNIT	mm	SCALE	N / S	GASKET
DES. ENGR.		CHF. ENGR.		
03/ 03/ 2003 K.N.UM		03/ 03/ 2003 H. C. JEONG		4986U-L002A
LG Electronics Inc. ACC. Divisions		CUSTOMER Embrital		



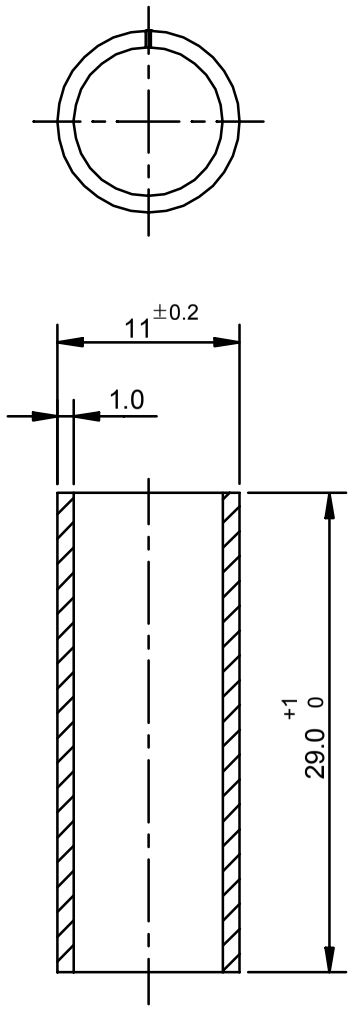


SECTION A-A'



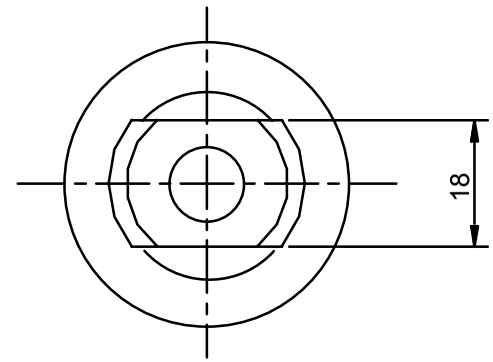
* MATERIAL : LUCKY LUMAX 5106F1
* COLOR : BLACK

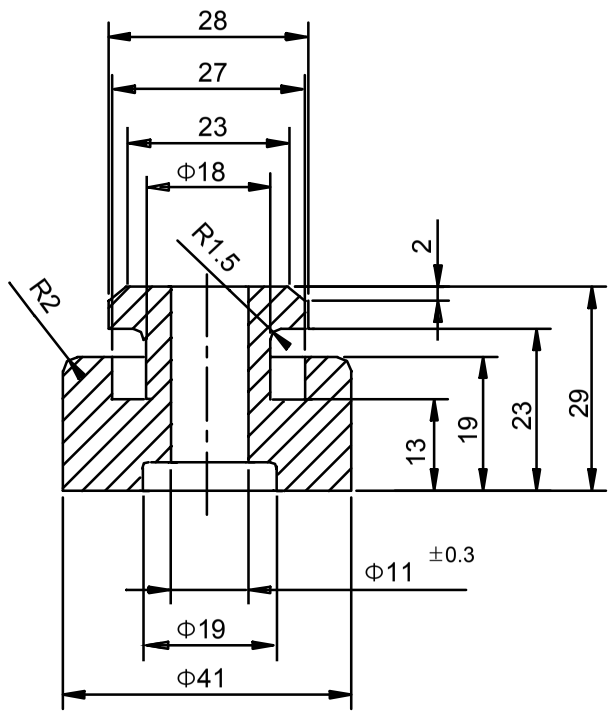
UNIT	mm	SCALE	N / S	Cover,Terminal
DES. ENGR.		CHF. ENGR.		
03/ 03/ 2003 K.N.UM		03/ 03/ 2003 H. C. JEONG		3550U-D002A
LG Electronics Inc. ACC. Divisions		CUSTOMER Embrital		



* MATERIAL : SCP-1
* SURFACE TREATMENT : FZMY-2

UNIT	mm	SCALE	N / S	SLEEVE,GROMMET
DES. ENGR.		CHF. ENGR.		
03/ 03/ 2003 K.N.UM		03/ 03/ 2003 H. C. JEONG		4816U-L001B
LG Electronics Inc. ACC. Divisions		CUSTOMER Embrital		





* MATERIAL : NATUAL RUBBER
* COLOR : GRAY

UNIT	mm	SCALE	N / S	GROMMET
DES. ENGR.		CHF. ENGR.		
03/ 03/ 2003 K.N.UM		03/ 03/ 2003 H. C. JEONG		4022U-L004B
LG Electronics Inc. ACC. Divisions		CUSTOMER Embrital		

Application Considerations

1. Accumulators

Durability is ensured by the Compliant Scroll's inherent ability to handle liquid refrigerant in flooded start and defrost cycle operation, and an accumulator is normally not required.
However, large volumes of liquid refrigerant which repeatedly flood back to the compressor during normal off cycles or excessive liquid refrigerant flood-back during steady operation can dilute the oil in any compressor to the point where bearing become inadequately lubricated and wear may occur.

2. Crankcase Heaters

Due to the Compliant Scroll's inherent ability to handle liquid refrigerant in flooded conditions, no crankcase heater is required when the system charge does not exceed following values :

⦿ 4.5 Kg for AQ028 ~ AR081

A crankcase heater is needed to drive out excessive amounts of refrigerant that have migrated into the shell during standstill periods and no accumulator is piped to provide free drainage during the off cycle as shown in figure 1.

3. Pump.Down

For scroll compressors pump.down is not recommended.
Deep-vaccum operation break down compressor.

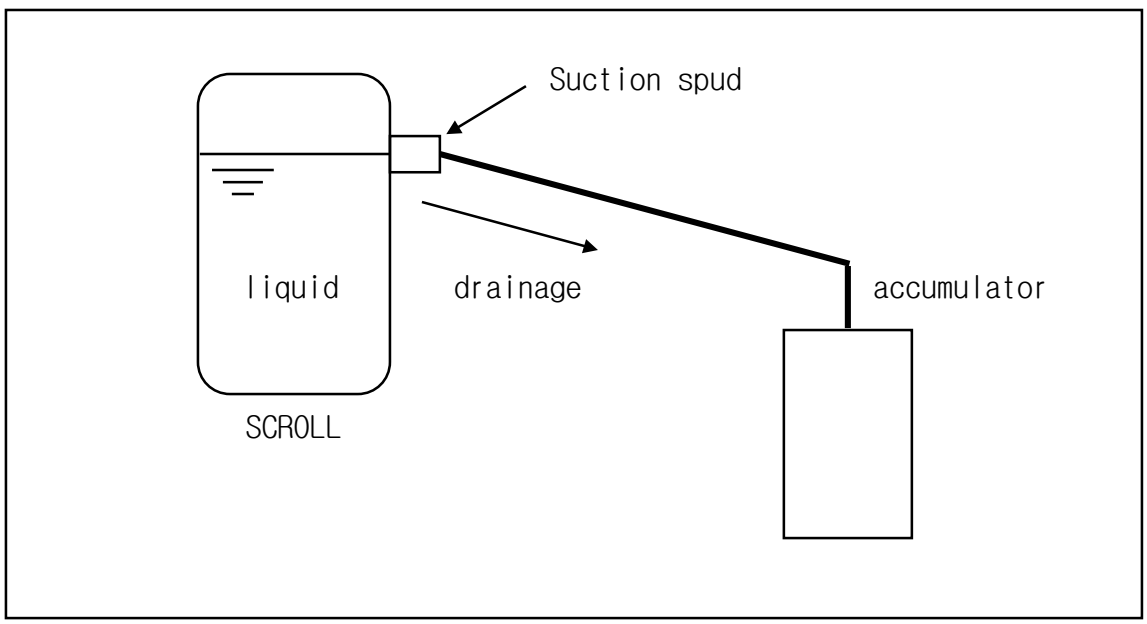


Fig. 1 Accumulator Installation

4.Must be equipped with safety device

1) High Temp.Protector

Attach high temp.protector for the purpose of control discharge temp. below 125℃

2) High Pressure Protector

Attach high pressure protector for the purpose of control discharge pressure below 42kg/㎠G

3) lower Pressure Protector

Attach lower pressure protector for the purpose of control lower pressure over 0 Kg/㎠G

4) Protective Device Against Overload Current

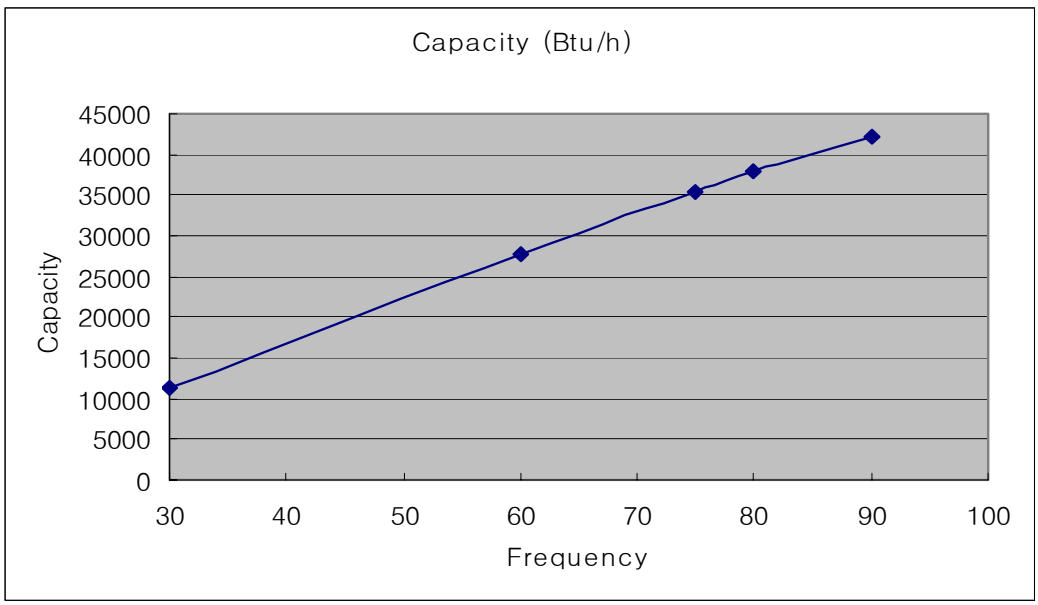
Attach over load protective device at air conditioner against excessive current

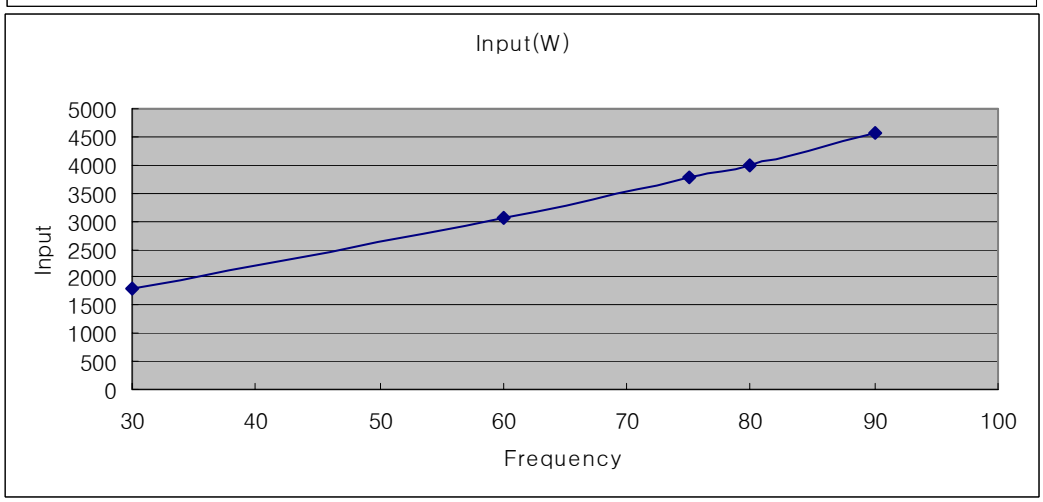
Compressor Performance data

(※) Rating Conditions

Cond. Temp.:	54.4 °C (130 °F)	Return Gas Temp.	:	18.3 °C (65 °F)
Evap. Temp.:	7.2 °C (45 °F)	Liquid Temp.	:	46.1 °C (115 °F)
		Ambient Temp.	:	35.0 °C (95 °F)

Frequency (Hz)	Voltage (V)	Capacity (Btu/h)	Input (W)	EER (Btu/hW)	Current (A)	Mass Flow (kg/hr)
30	82	11275	1782	6.33	15.2	73
60	145	27650	3047	9.07	14.2	180
75	175	35362	3762	9.40	14.4	230
80	185	37851	4005	9.45	14.5	246
90	185	42178	4560	9.25	15.9	274





PERFORMANCE TABLE

MODEL : AQ028VAA (3PH,145V-60Hz)

Saturated Evaporating Temperature	Items		Saturated Condensing Temperature 40℃ (104°F)	45℃ (113°F)	50℃ (122°F)	55℃ (131°F)	60℃ (140°F)	65℃ (149°F)
	Capacity	(Btu/h)	18583	17286	16099	15144		
-10℃	Input	(Watts)	2205	2419	2661	2898		
(14°F)	Flow Rate	(kg/h)	96.74	96.23	95.40	94.39		
	EER	(Btu/W.h)	8.43	7.15	6.05	5.23		
	Current	(Amps)	10.87	11.67	12.59	13.51		
	Capacity	(Btu/h)	22346	20708	19180	17761	16452	
-5℃	Input	(Watts)	2236	2461	2715	2997	3307	
(23°F)	Flow Rate	(kg/h)	119.58	117.85	115.79	113.40	110.68	
	EER	(Btu/W.h)	9.99	8.41	7.06	5.93	4.97	
	Current	(Amps)	11.03	11.91	12.91	14.04	15.29	
	Capacity	(Btu/h)	26778	24799	22930	21171	19520	
0℃	Input	(Watts)	2258	2495	2760	3053	3375	
(32°F)	Flow Rate	(kg/h)	145.17	142.22	138.93	135.32	131.37	
	EER	(Btu/W.h)	11.86	9.94	8.31	6.93	5.78	
	Current	(Amps)	11.09	12.06	13.14	14.35	15.68	
	Capacity	(Btu/h)	31878	29559	27349	25248	23257	21375
5℃	Input	(Watts)	2271	2519	2796	3101	3434	3796
(41°F)	Flow Rate	(kg/h)	173.51	169.33	164.82	159.98	154.81	149.31
	EER	(Btu/W.h)	14.04	11.73	9.78	8.14	6.77	5.63
	Current	(Amps)	11.07	12.11	13.28	14.57	15.98	17.51
	Capacity	(Btu/h)	37646	34986	32435	29994	27662	25439
10℃	Input	(Watts)	2275	2535	2823	3139	3484	3857
(50°F)	Flow Rate	(kg/h)	204.60	199.19	193.46	187.39	181.00	174.27
	EER	(Btu/W.h)	16.55	13.80	11.49	9.55	7.94	6.60
	Current	(Amps)	10.95	12.08	13.32	14.69	16.18	17.79
	Capacity	(Btu/h)	44083	41082	38190	35408	32735	30172
15℃	Input	(Watts)	2270	2541	2841	3169	3525	3910
(59°F)	Flow Rate	(kg/h)	238.43	231.80	224.84	217.55	209.93	201.98
	EER	(Btu/W.h)	19.42	16.17	13.44	11.17	9.29	7.72
	Current	(Amps)	10.75	11.95	13.28	14.72	16.29	17.99
	Capacity	(Btu/h)	51188	47846	44614	41490	38477	35573
20℃	Input	(Watts)	2256	2539	2850	3190	3557	3954
(68°F)	Flow Rate	(kg/h)	275.01	267.15	258.97	250.45	241.61	232.44
	EER	(Btu/W.h)	22.69	18.84	15.65	13.01	10.82	9.00
	Current	(Amps)	10.45	11.73	13.14	14.67	16.32	18.09

PERFORMANCE CURVE

MODEL : AQ028VAA (3PH,145V-60Hz)

●Rated Condition

Evaporating Temp.	7.2 ℃	45.0。F
Condensing Temp.	54.4 ℃	130.0。F
Suction Gas Temp.	18.3 ℃	65.0。F
Subcooled Temp.	8.3 ℃	15.0。F
Ambient Temp.	35.0 ℃	95.0。F

Motor Type : A/C Inverter
Running Capacitor : - ㎌ - VAC