No. : LCC205LA04-00-GGS-0

APPROVAL SHEET
SPECIFICATIONS OF HERMETIC SCROLL COMPRESSOR

MODEL	LCC205LA04

△				
△				
△				
NO.	PAGE	REVISION DETAILS	SIGNATURE	APPROVED

REVISION RECORD

Sonyo Compressor (Dalian) Co., Ltd.

Section 1. General Specifications

Content		Unit	Specification	
Compressor Model		—	LCC205LA04	
Type		—	Hermetic Scroll Compressor	
Application		—	High Back Pressure	
Compressor Cooling Type		—	Natural Cooling	
Power Source	Phase	—	3	
	Rated Voltage	V	380 ~ 415/440 ~ 460	
	Rated Frequency	Hz	50/60	
Voltage Range		V	342 ~ 456/396 ~ 506	
Weight (Including Oil)		kg	70.8	
Refrigerant		—	R513A	R407C
Oil Type		—	FV68S	
Oil Charge		mL	2800	
Displacement		cm^3/rev.	205.4	
Maximum Continuous Current (MCC)		A	31.8/33.6	32.2/35.0
Motor	Motor Type	—	3-PH Induction Motor	
	Number of Poles	—	2	
	Electrical Insulation	—	E	
	Locked Rotor Ampere(LRA)	A	110	
	Winding Resistance [at 25°C (77°F)]	Ω	W-U 1.351	
			W-V 1.373	
			U-V 1.308	
Connection Tube （※1）	Suction Line (O.D.)	mm (in)	25.40 (1.000)	
	Discharge Line (O.D.)	mm (in)	19.05 (0.750)	
Compressor Surface Paint		—	Black Paint	

Notes

（※1）All units with parentheses are reference values.

Expiration of Specification

Expiration of this specification shall be effected until issuing a notice with indication of the expiration date from the issued date . In case of improvement or elimination of this specification , it shall be handled by the revision record based on agreement between both sides.

Section 2. Performance Warranty

2.1 Performance

Refrigerant	-	R513A		R407C	
Power Source (3PH)	Hz	50	60	50	60
	V	380	440	380	440
Capacity	W	23,900	28,350	36,250	43,350
	(BTU/hr)	81,547	96,730	123,685	147,910
Input Power	W	7,400	9,030	11,560	13,980
Current	A	13.2	13.6	19.5	20.3

Standard Rating Conditions

Refrigerant	-	R513A	R407C
Condensing Temp.	℃	54.5	54.4
Evaporating Temp.	℃	7.0	7.2
Suction Gas Temp.	℃	18.5	18.3
Liquid Temp.	℃	46.0	43.8
Ambient Temp.	℃	35.0	35.0

2.2 Sound Level

Power Source (3PH)	Hz	50	60	50	60
	V	380	440	380	440
Sound Level	dB(A)	71Max.	75Max.	72Max.	76Max.

Notes

1 The operating conditions are the same as 2.1.

2 MIC location is the distance of 1m (3.28feet) from the compressor.

3 Sound Level is an average sound pressure level in four directions.

2.3 Minimum Starting Voltage

Power Source (3PH)	Hz	50	60
Minimum Starting Voltage	V	323	374

Conditions

Compressor Temp.	℃	10～60
Ambient Temp.	℃	10～40
High Pressure	MPa(G)	2.06
Low Pressure	MPa(G)	0.59

2.4 Others

Content		Unit	Specification（reference)
Design Pressure	L.P. S.	MPa(G)	1.60
	H. P. S.	MPa(G)	3.20
Insulation Resistance		MΩ	100Min. (without refrigerant)
Dielectric Strength (The leakage current is less than 10mA)		V	2000(1 minute)
Residual Moisture		mg	400Max.

Note:

1. The insulation resistance be measured with a DC500V megohm tester.

Section 3. Standard Accessories

3.1 Accessories List

Parts Name	Qty	Parts code	Revision No.	Note
Terminal Box Cover	1	A-0101-DSB	0	Installed on Compressor
Terminal Box Clip	1	A-0201-DSB	0	Installed on Compressor
Eyelet Rub Lead Wire	1	A-0301-DSB	0	Installed on Compressor
Mounting Grommet	4	M-0101-DSC	0	-
Mounting Sleeve	4	M-0201-DSC	0	-
Screw Special	1	B-0101-DSB	0	Installed on Compressor
Connector Block	1	B-0201-DSC	0	Installed on Compressor
Discharge Thermostat	1	E-0101-DSC	0	-

3.2 The Drawing for Reference

Parts Name	Parts Code	Revision No.
Compressor Outline Drawing	D-0105-DSC	0
Mounting Parts Listing	M-5102-DSC	0
Packing Dimensions	D-0202-DSC	0
Wiring Diagram	E-0912-DSC	0
Discharge Thermostat	E-0101-DSC	0

3. 3 Inernal Motor Protector (in compressor)

Parts Name	Specification(Reference)	
Inernal Motor Protector	Model	UP28UA142-504
	Trip Temprature	170^{+5}_{0} ℃
	Reset Temprature	70±10℃
	Trip Current	66A / 3～10s

1. When the protector is not on current, the ambient temperature of the protector rises to the temperature of protector which is for touching current and off, this is trip temperature. Then, the ambient temperature of the protector goes down the moment it touches current and closes, at this moment, the temperature of the protector is reset temperature.

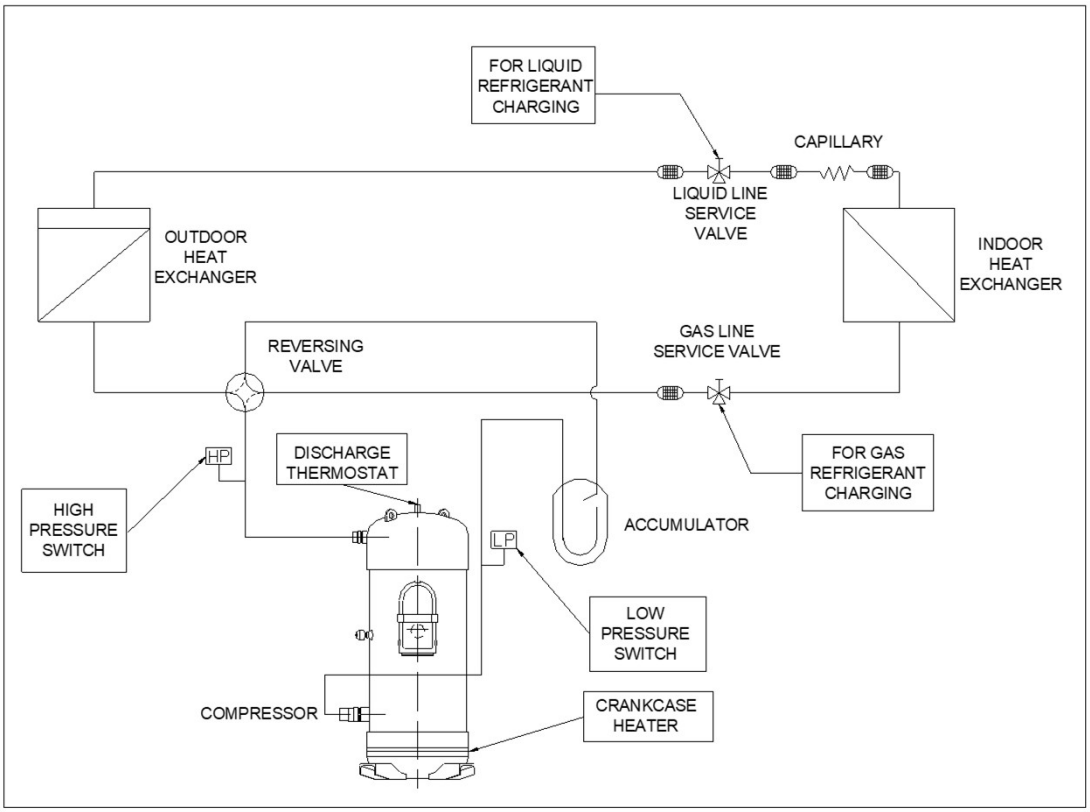
2. When the current of compressor is overloaded, under the ambient temperature 25℃, the protector can guarantee the motion in the limited current within the first operating circles 3-10seconds.

Section 4. Compressor Protection

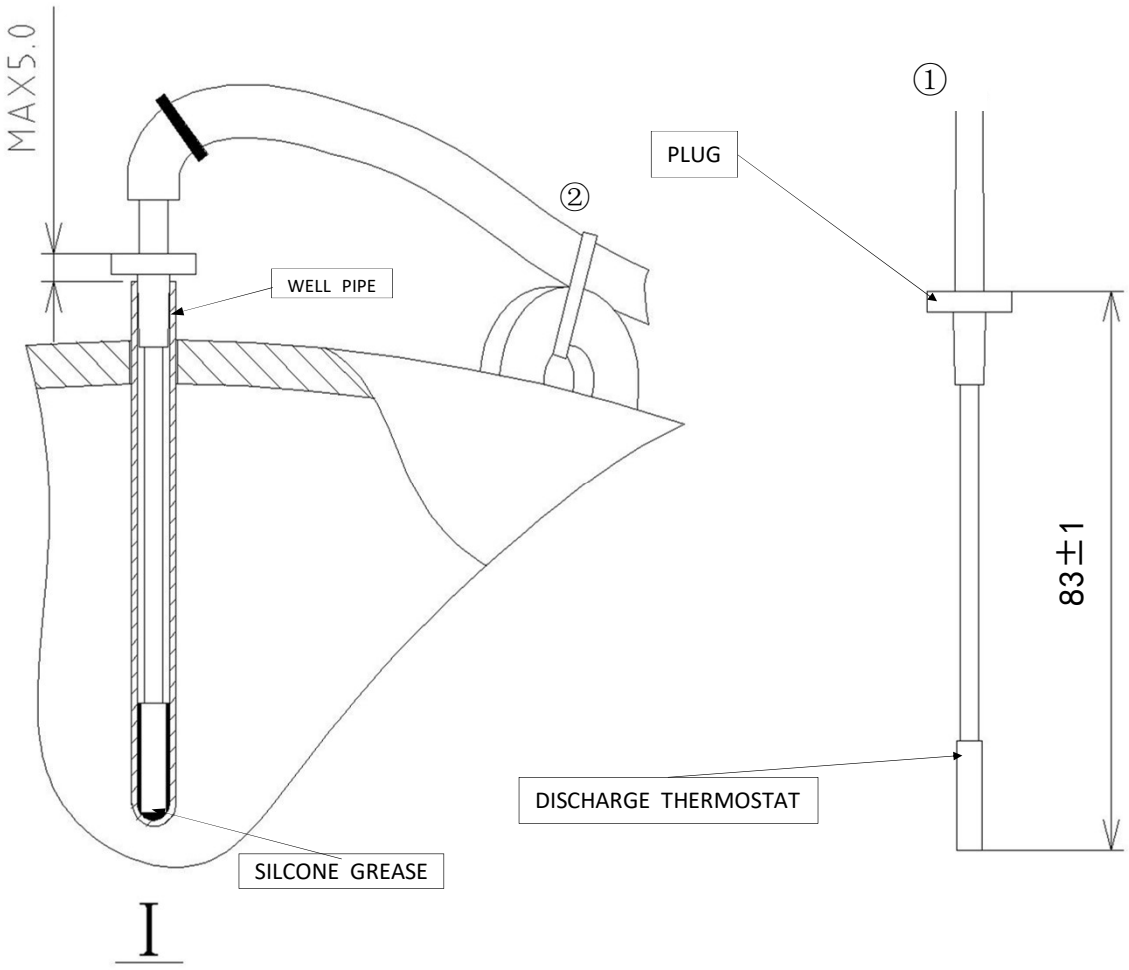
4.1 Protection Required but not Included with compressor

Protection Device	Items	Specifications
Reversal Defensible Relay	Features	To protect the compressor from reverse rotation
	Rated Voltage	AC 380～415/440～460V
Crankcase Heater	Rated Power	88W at 240V
Discharge Thermostat	Mounting Position	Inside of the well pipe on the top of compressor
	Trip Temperature	135±5℃
	Reset Temperature	86±15℃
High Pressure Switch	Setting	Cut-out setting no higher than 3MPa(G)
Low Pressure Switch	Setting	Cut-out setting no lower than 0.03MPa(G)

4.2 Position of the Protection and Refrigerant Charging



4.3 Discharge Thermostat installation requirements



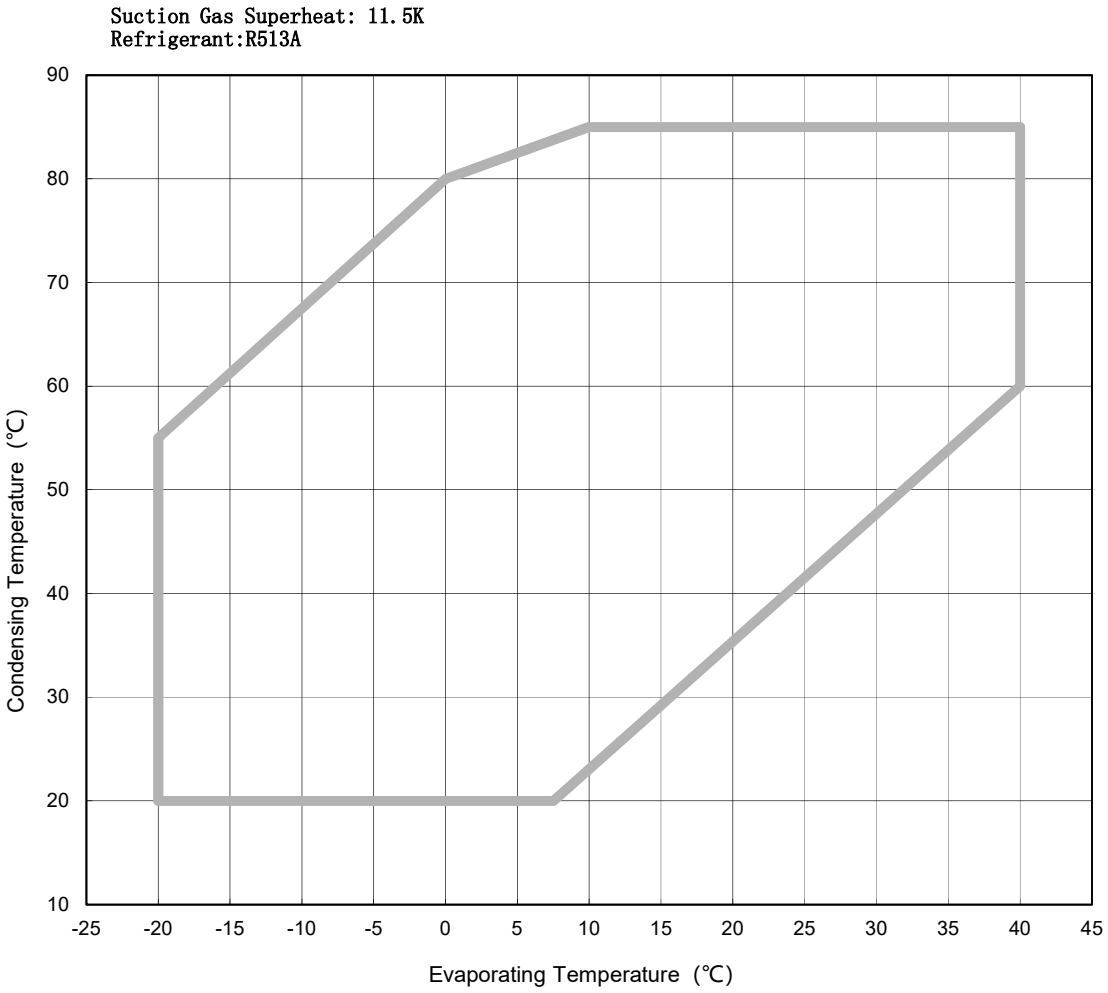
（1）Inserting the Discharge Thermostat, please confirm that the Well Pipe has been filled with the Silcone Grease.

（2）Combine Plug and Discharge Thermostat as shown in Figure ①,inserting the Discharge Thermostat into the bottom of the Well Pipe.

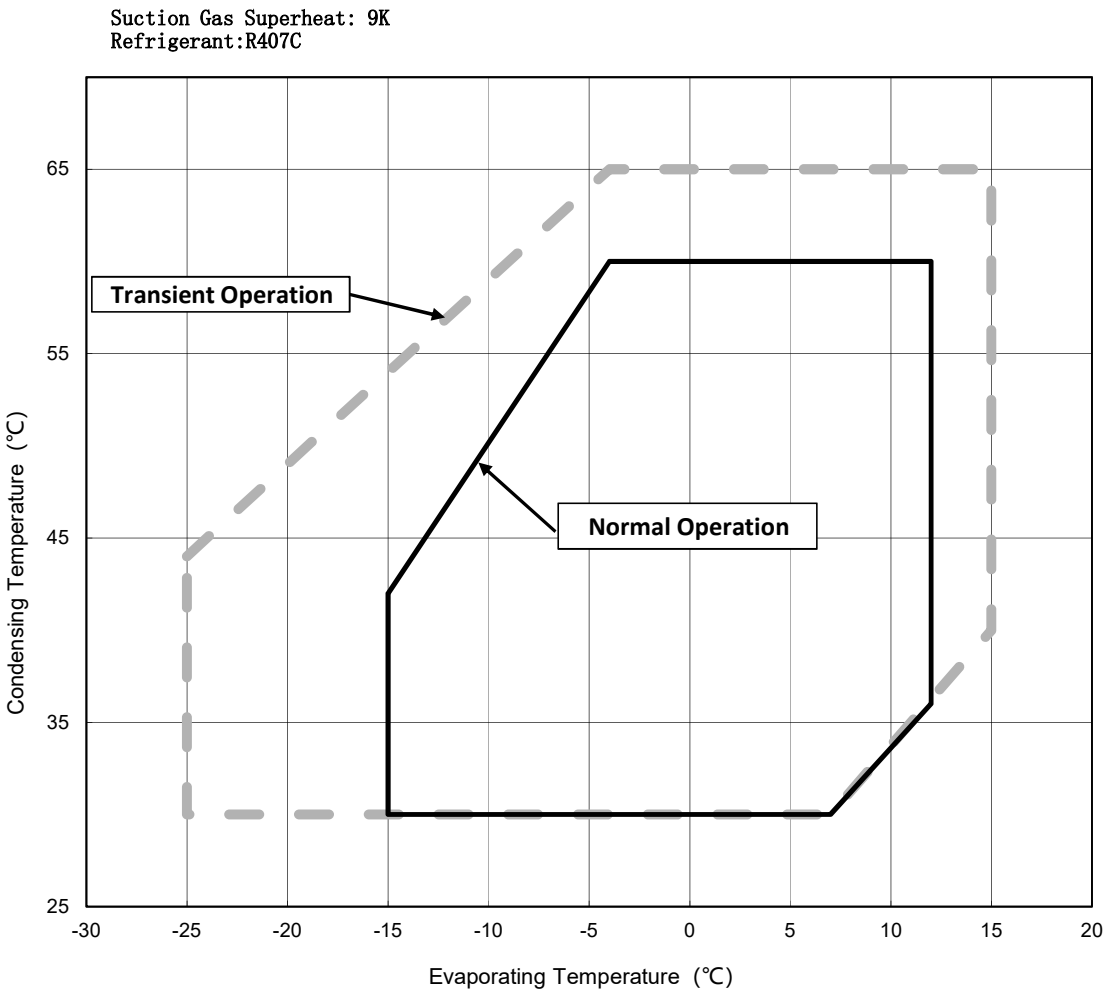
（3）After inserting the Discharge Thermostat , please insert the Plug into the Well Pipe for sealing, the Plug should be exposed less than 5mm(edge included).

（4）Discharge Thermostat fixed as shown in Figure ②，Wiring reference wiring diagram.

5. Operating Envelope



5. Operating Envelope



Section 6. Application Standard & Limit

The following requirements apply to vertical type hermetic scroll compressors:

Standard: Applicable to ordinary conditions in Japan JIS B8616 or equivalent conditions, such as standard rating conditions, maximum operating conditions, low temperature conditions, etc.

Limit: Applicable to transitional brief period of time, such as start-up and beginning of defrost mode.

No.	Item			Remark
1	Refrigerant	R513A		Refrigerant must meet a criterion
2	Evaporating Temp.	-20~40℃ 0.05~0.97MPa(G)		Average temp. of evaperator Inlet and outlet.
3	Condensing Temp.	20~85℃ 0.52~2.88MPa(G)		Average temp. of condensor Inlet and outlet.
4	Compression Ratio	1.5 ~ 10.4		
5	Winding Temp.	125℃Max.		
6	Shell Bottom Temp.	Upper Limit:90℃ Max.		When compressor is running
		Lower Limit: Evaporating Temp.+12K Min.		
		Lower Limit:Ambient Temp.+11KMin.		When compressor shuts off
7	Discharge Gas Temp.	115℃ Max.	135℃ Max.	Temp. inside of the copper pipe on the top of compressor
8	Suction Gas Temp.	Superheat: 5K Min.	No excessive noise.	It should meet the requirement of item 5, 6, 7 and 13 within 30cm of the suction fitting.
9	Running Voltage	Within ±10% of the rated voltage		Voltage at compressor terminals.
10	Starting Voltage	Three Phase Models: 85% of the rated voltage min.		Dropped voltage at compressor terminals.
11	On/Off Period	On Period: Until the oil level returns to the center of the lower bearing Off Period: Until balance of high and low pressure is obtained		Minimum 10 minutes for each ON/OFF cycle and 3 minutes for OFF time is recommended. The total ON/OFF cycle shall be less than 200.000 cycles.
12	Refrigerant Charge	Oil/Refrigerant(wt.)≥0.35.		Specific gravity of the Oil:0.94.
13	Minimum Oil Level	No less than 70% of the initial oil charge		
14	Abnormal Pressure Rise/Drop	Pressure Rise: 3.00MPa（G） Max.		By high pressure switch
		Pressure Drop:0.03MPa（G） Min.		By low pressure switch
15	System Moisture Level	200ppm Max.		
16	System Uncondensable Gas Level	1 Vol.% Max. Residual Oxygen 0.1 Vol.% Max.		24 hrs. after vacuuming: 1.01kPa Max.
17	Tilt	5 °Deg.Max.		

Operation beyond the above limits must be approved by Sonyo Compressor (Dalian) Co., Ltd.

(G): Gauge Pressure

Section 6. Application Standard & Limit

The following requirements apply to vertical type hermetic scroll compressors:

Standard: Applicable to ordinary conditions in Japan JIS B8616 or equivalent conditions, such as standard rating conditions, maximum operating conditions, low temperature conditions, etc.

Limit: Applicable to transitional brief period of time, such as start-up and beginning of defrost mode.

No.	Item	Standard	Limit	Remark
1	Refrigerant	R407C		Refrigerant must meet a criterion
2	Evaporating Temp.	-15~12℃ 0.20~0.65MPa(G)	-25~15℃ 0.07~0.73MPa(G)	Average temp. of evaperator Inlet and outlet.
3	Condensing Temp.	30~60℃ 1.17~2.56MPa(G)	65℃ 2.88MPa(G)	Average temp. of condensor Inlet and outlet.
4	Compression Ratio	2 ~ 6	10	
5	Winding Temp.	115℃Max.	125℃Max.	
6	Shell Bottom Temp.	Upper Limit:90℃ Max.		When compressor is running
		Lower Limit: Evaporating Temp.+12K Min.		
		Lower Limit:Ambient Temp.+11KMin.		When compressor shuts off
7	Discharge Gas Temp.	115℃ Max.	135℃ Max.	Temp. inside of the copper pipe on the top of compressor
8	Suction Gas Temp.	Superheat: 5K Min.	No excessive noise.	It should meet the requirement of item 5, 6, 7 and 13 within 30cm of the suction fitting.
9	Running Voltage	Within ±10% of the rated voltage		Voltage at compressor terminals.
10	Starting Voltage	Three Phase Models: 85% of the rated voltage min.		Dropped voltage at compressor terminals.
11	On/Off Period	On Period: Until the oil level returns to the center of the lower bearing Off Period: Until balance of high and low pressure is obtained		Minimum 10 minutes for each ON/OFF cycle and 3 minutes for OFF time is recommended. The total ON/OFF cycle shall be less than 200.000 cycles.
12	Refrigerant Charge	Oil/Refrigerant(wt.)⩾0.35.		Specific gravity of the Oil:0.94.
13	Minimum Oil Level	No less than 70% of the initial oil charge		
14	Abnormal Pressure Rise/Drop	Pressure Rise: 3.00MPa（G） Max.		By high pressure switch
		Pressure Drop:0.03MPa（G） Min.		By low pressure switch
15	System Moisture Level	200ppm Max.		
16	System Uncondensable Gas Level	1 Vol.% Max. Residual Oxygen 0.1 Vol.% Max.		24 hrs. after vacuuming: 1.01kPa Max.
17	Tilt	5 °Deg.Max.		

Operation beyond the above limits must be approved by Sonyo Compressor (Dalian) Co., Ltd.

(G): Gauge Pressure

Notes

1 Installation should be completed within 15 minutes after removing the rubber plugs.

2 Do not use the compressor to compress air.

3 Do not energize the compressor under vacuumed conditon.

4 Evacuation and Refrigerant charge： Evacuate internal section in the refrigeration system from high and low pressure sides and charge liquid refrigerant from condenser outlet side. Additional charge shall be done with gas condition from low side.

5 Do not tilt over the compressor while carrying it.

6 Do not remove the paint.

7 Crankcase heater is required when the oil sump temperature is too low to meet the requirement of item 6 on page7.

8 Voltage fluctuation between compressor terminals, during operation, shall be within 2% of the rated voltage.

9 Do not operate compressor in reverse rotational direction.

10 Suction strainers are recommended for all applications.

11 Copper Piping Stress	Start/Shutdown	34.32 N/mm^2 Max.
	Run	12.26 N/mm^2 Max.

12 When The Compressor body and its packaging is abandoned,Please follow every sales environmental standards, For packaging refrigerant oil ,solid recycle and dispose.

13 Sonyo Compressor (Dalian) Co,Ltd provide the 《Compressor Specification Common Appendix》 and 《Safty Request on the use of Compressor》also fit this specification.

14.Limitation of Liability：

1)Our responsibility for this compressor shall be limited to the following range.

①The damage caused by a fault or defect of this compressor.

2)Warranty period:

①Generally speaking, within 18 months after the compressor is delivered to the customer.

The specific warranty time shall be agreed with our business department.

3)Response in case of defect found：

①During the warranty period, our company will investigate and judge the cause and responsibility of compressor damage, and notify the customer of the investigation results.

②After investigation, if it is confirmed that the compressor produced by our company is damaged and the customer's product is defective, our company will bear the responsibility for the upper limit of the compressor cost.

4)Our company will not provide quality guarantee for the compressor under the following circumstances：

①Damage caused by improper use when exceeding our compressor use specifications and compressor use safety requirements or other use standards formulated by the state.

②Compressor damage caused by defects in customer product design or manufacturing.

③Compressor damage caused by improper transportation, storage, handling, operation of customers or end users.

④Compressor damage caused by inevitable accidents, such as natural disasters: earthquake, fire, flood, collapse,etc.

5)Others：

①If the customer complains about the defects of our compressor in the end user or market, our company will cooperate with the investigation.

②Our company will not bear any responsibility for any loss caused by customers' failure to use according to technical requirements.

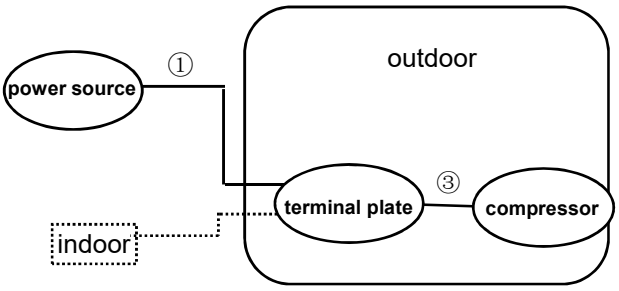
Section 7. Selection of Electrical Wire

Voltage drop may occur due to the large current draw during compressor starting.

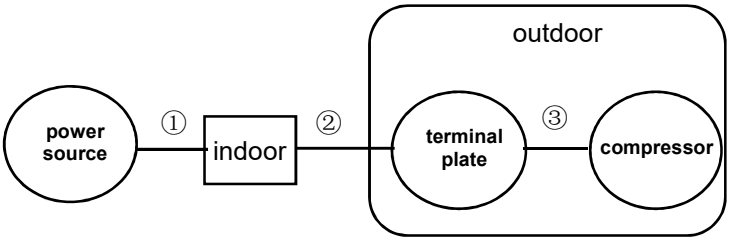
We recommend selecting the wire size from the table below.

7.1 Type of Unit

7.1.1 Window & Commercial Type Unit



7.1.2 Split Type(Separate Type)



7.2 Size Table of Electrical Wire

Starting current (A)	Size of electrical wire (mm^2)						
	Remark ① or Remark ①+② (heat-resistance Temperature: 60°C min.)						Remark③ (heat-resistance Temperature: 120°C min.)
	5m max.	10m max.	15m max.	20m max.	30m max.	50m max.	1m max.
20max.	2.0	2.0	2.0	3.5	5.5	8.0	2.0
30max.	↑	↑	3.5	5.5	↑	14.0	↑
40max.	↑	3.5	5.5	↑	8.0	↑	↑
50max.	↑	↑	↑	8.0	14.0	22.0	↑
60max.	↑	5.5	↑	↑	↑	↑	↑
70max.	3.5	↑	8.0	14.0	↑	↑	3.5
80max.	↑	↑	↑	↑	22.0	30.0	↑
90max.	↑	↑	14.0	↑	↑	↑	↑
100max.	↑	8.0	↑	↑	↑	38.0	↑
110max.	↑	↑	↑	↑	↑	↑	↑
120max.	5.5	↑	↑	22.0	30.0	↑	↑
140max.	↑	14.0	↑	↑	↑	50.0	5.5
160max.	↑	↑	22.0	↑	↑	↑	↑
180max.	↑	↑	↑	↑	38.0	60.0	8.0
200max.	8.0	↑	↑	30.0	↑	↑	↑
220max.	↑	↑	↑	↑	50.0	80.0	↑
240max.	↑	↑	↑	↑	↑	↑	8.0*

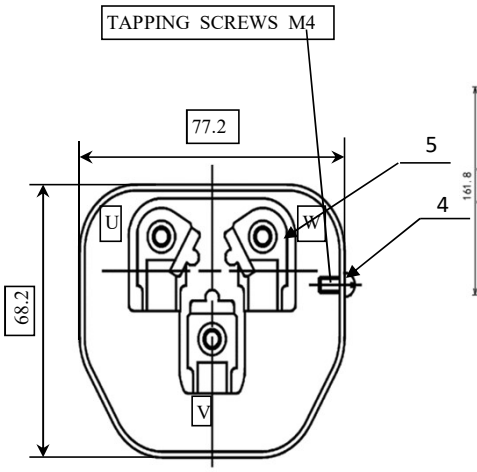
* 8.0 mm2 wire can be used below 0.8m

7.3 Caution of Ground

The internal motor protector does not protect the compressor against all possible conditions.

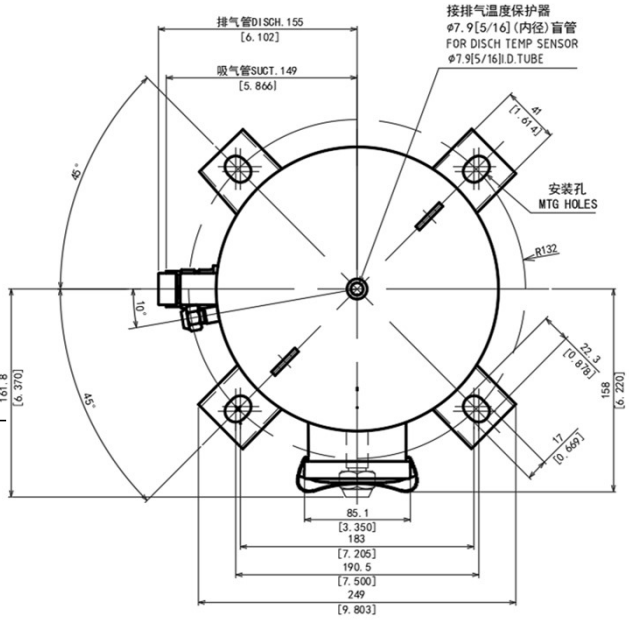
Please be sure that the system utilizes the ground connection when installed in the field.

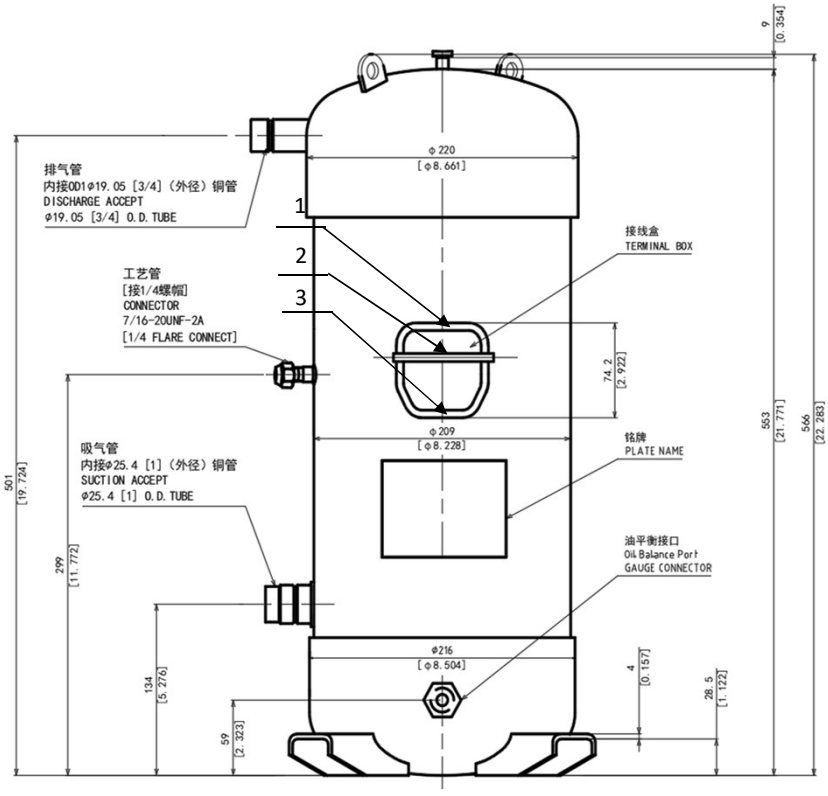
Earth leakkage Circuit Breaker must be installed.



TERMINA

The bolt tightening torque is 2.5～3N·m





No.	Part Code	Qty	Name
1	A-0101-DSB	1	Terminal Box Cover
2	A-0201-DSB	1	Terminal Box Clip
3	A-0301-DSB	1	Eyelet Rub Lead Wire
4	B-0101-DSB	1	Screw Special
5	B-0201-DSC	1	Connector Block

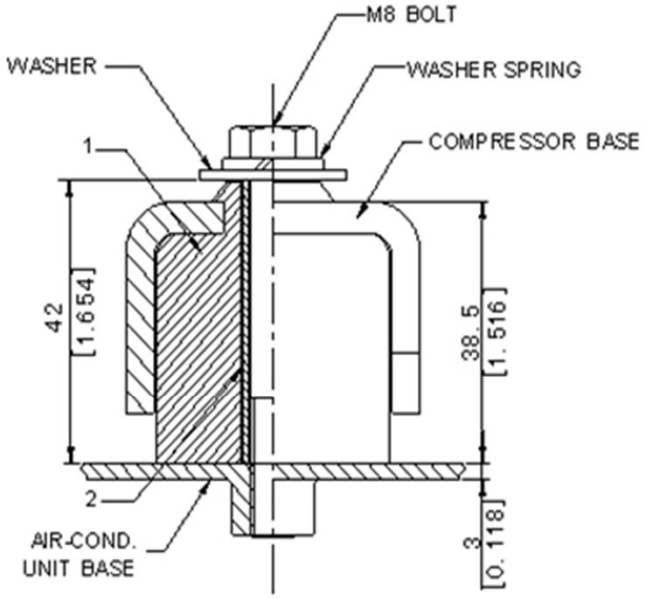
Part Code

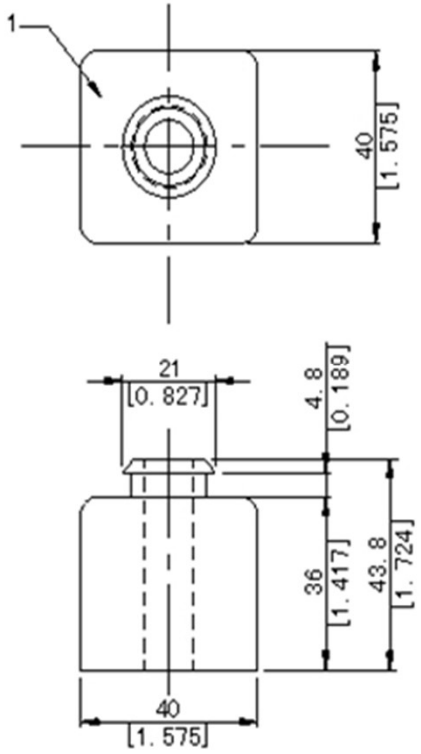
D-0105-DSC

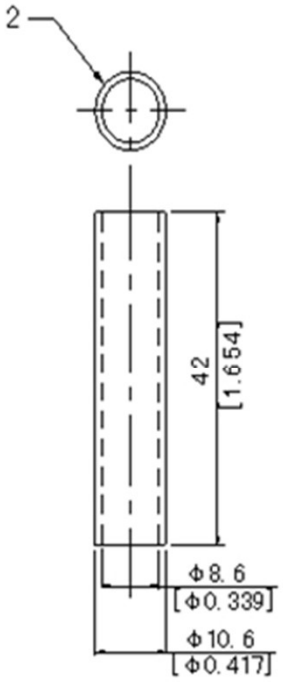
Name

Compressor Outline Drawing

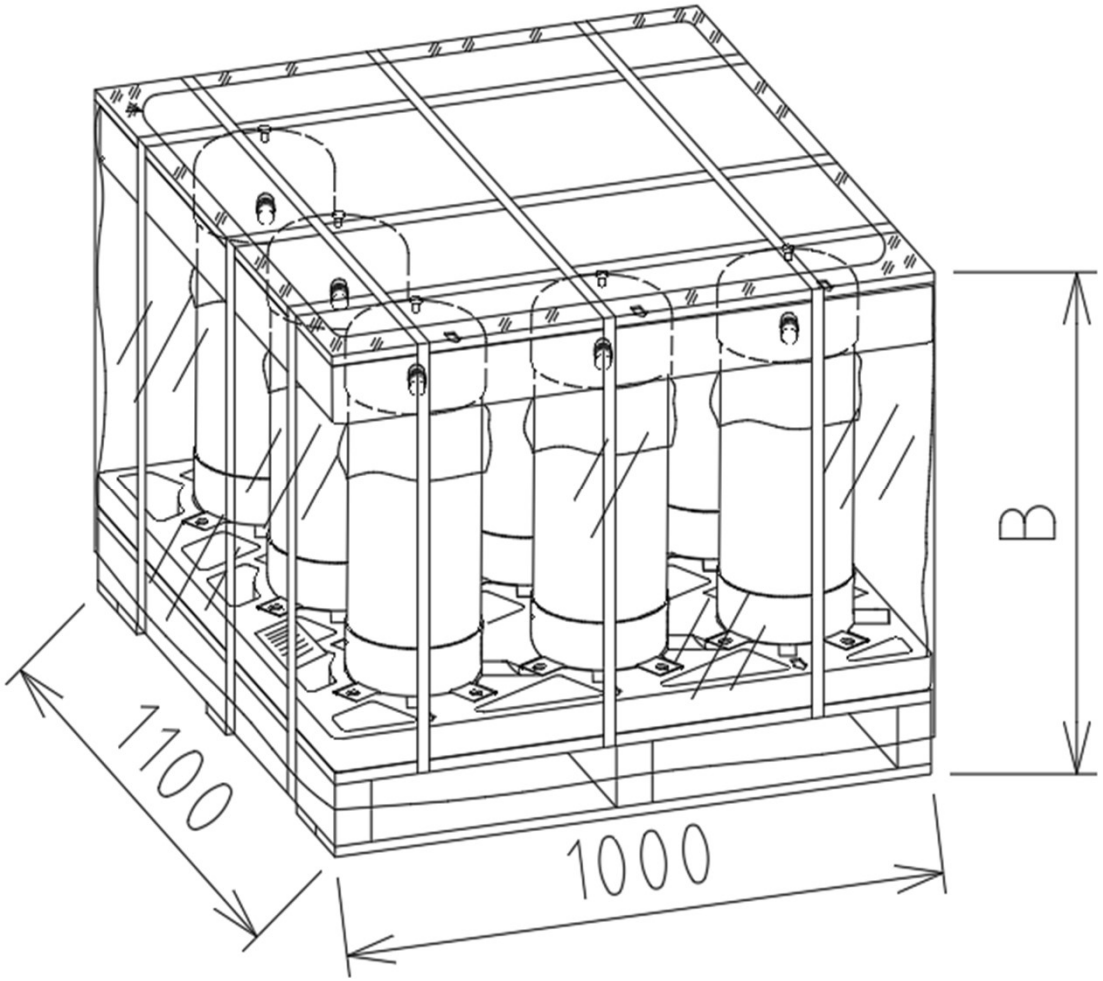
No.	Part	QTY	Name
1	M-0101-DSC	4	Mounting Grommet
2	M-0201-DSC	4	Mounting Sleeve







Part Code
M-5102-DSC
Name
Mounting Parts Listing



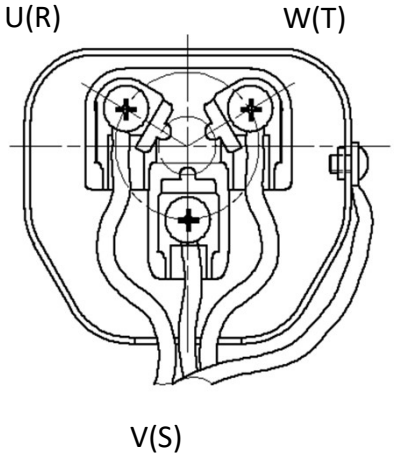
Model	B
LCC205LA04	735

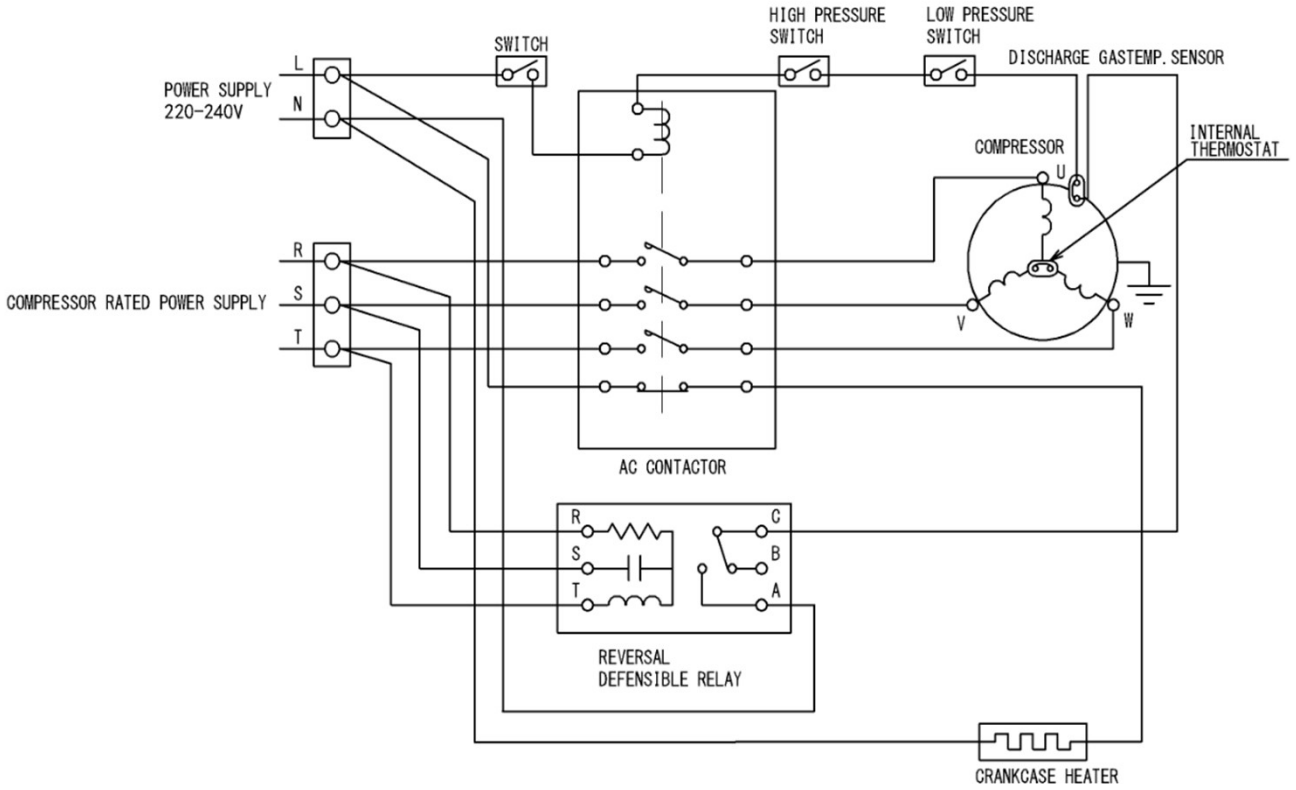
Part Code

D-0202-DSC

Name

Packing Dimensions



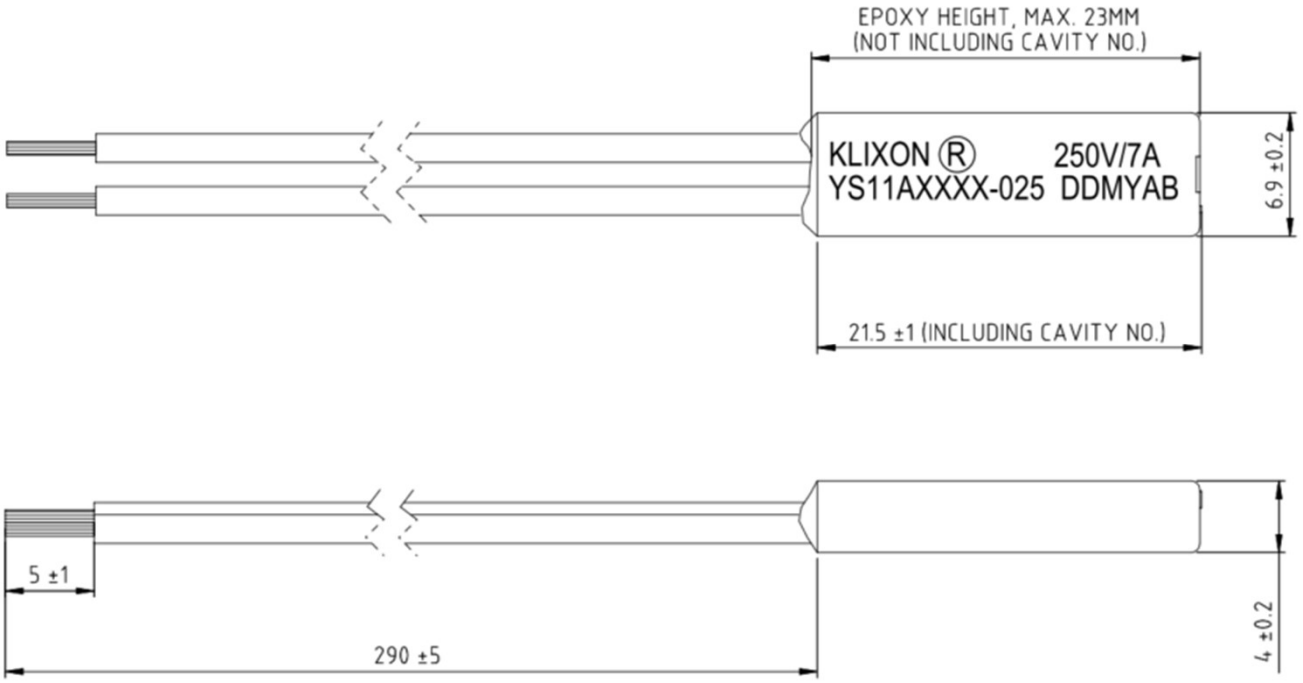


Part Code

E-0912-DSC

Name

Wiring Diagram



Part Code
E-0101-DSC
Name
Discharge Thermostat