

压缩机纳入仕様书

COMPRESSOR SPECIFICATION

1、压缩机型号及图样 Model Name & Drawings

型号	Model Name:	5CF227SA04
规格书	Specification:	5CF227SA04-00-GGS-0
通用附属书	Common Appendix	CE-100004E
安全要求书	Safety Request	CE-100006E

2、法规满足 Conformity of laws and regulations

取得认证 Certificates obtained	CE
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该机型允许销售地: 欧洲, 若需销往其他国家或地区需取得我司许可。

Permitted Sales Regions: Europe, for other countries and regions, need to be approved by our company in advance.

3、压缩机及标准附件一览 List of Compressor & Accessory Parts

名称 Name	部品编号 Part No.	数量 Qty	备注 Remarks
压缩机 Compressor	5CF227SA04	1	已注油 Oil in
部品 PARTS	减震橡胶垫 Mounting Grommet	M-0101-DSF	4
	套管 Mounting Sleeve	M-0201-DSF	4
	曲轴箱加热带 Crankcase Heater	E-0301-DSF	2 可选 Optional
	转换接头 Half Union	A-0501-DSF	1 可选 Optional

4、参考图面 Reference Drawings

关联图面 Reference Drawings: D-0105-DSF、M-5101-DSF-0、E-0301-DSF、A-0501-DSF、D-0201-DSF、E-0910-DSF

客户 USER:

AREA COOLING SOLUTIONS S. A. U.

制造 MANUFACTURER:

松下压缩机(大连)有限公司

Panasonic Appliances Compressor (Dalian) Co., Ltd.

APPROVED 承认	PURCHASING MANAGER 审核	TECHNICAL MANAGER 审查	LEADER 批准	CHECKED 校阅	SUBMITTED 作成
				杨春立 2022.10.31	常艳红 2022.10.31

此纳入仕様书一式两份, 一份由客户保存, 一份返回我司进行存档。

This specification is made out in two originals, please return one original with your approval signature.

Panasonic

No. : 5CF227SA04-00-GGS-0

APPROVAL SHEET
SPECIFICATIONS OF HERMETIC SCROLL COMPRESSOR

MODEL	5CF227SA04
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NO.	DATE	PAGE	REVISION DETAILS	PAPCDL SIGNED	CLIENT SIGNED

REVISION RECORD

Panasonic Appliances Compressor (Dalian) Co., Ltd.

1. General Specifications

1.1 Specifications

Content		Unit	Specification
Compressor Model		—	5CF227SA04
Type		—	Hermetic Scroll Compressor
Application		—	High Back Pressure
Evap. Temp. Range		°C	-25~+25
Compressor Cooling Type		—	Natural Cooling
Power Source	Phase	—	3
	Rated Voltage	V	380~415
	Rated Frequency	Hz	50
Voltage Range		V	342~456
Weight (Including Oil)		kg	101
Refrigerant		—	R410A
Oil Type		—	FV68S
Oil Charge		ml	4500
Displacement		cm ³ /rev	227
Maximum Continuous Current (MCC)		A	56.4
Motor	Motor Type	—	3-PH Induction Motor
	Number of Poles	—	2
	Electrical Insulation	Class	B
	Nominal Revolution	min ⁻¹	2920
	Starting Current	A	205
	Winding Resistance [at 25°C]	Ω	U-V 0.517
			U-W 0.510
			V-W 0.525
Connection Tube	Suction Line (O.D.)	mm	41.2 (1.622)
	Discharge Line (O.D.)	mm	34.9 (1.374)
Compressor Surface Paint		—	Black Paint

Notes

- 1 Voltage range is applied at standard rating conditions.
- 2 Motor specifications in the table are the average values for your reference.
- 3 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

Power Source (3PH)	Hz	50	Remark
	V	380	
Capacity	W	63,000	reference
	(BTU/hr)	214,956	
Input Power	W	19,000	
Current	A	32.9	

Standard Rating Conditions

Refrigerant		R410A
Condensing Temp.	°C	54.4
Evaporating Temp.	°C	7.2
Suction Gas Temp.	°C	18.3
Liquid Temp.	°C	46.1
Ambient Temp.	°C	35.0

2.2 Sound Level

Power Source (3PH)	Hz	50
	V	380
Sound Level	dB(A)	80Max.

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
Minimum Starting Voltage	V	323

Conditions

Compressor Temp.	°C	10~60
Ambient Temp.	°C	10~40
High Pressure	MPa(G)	3.25
Low Pressure	MPa(G)	0.9

2.3 Others

Content		Unit	Specification
Design Pressure	L.P. S.	MPa(G)	2.7
	H. P. S.	MPa(G)	4.5
Insulation Resistance		MΩ	100 (without refrigerant)
Dielectric Strength (The leakage current is less than 10mA)		V	1900 (1 minute)
Residual Moisture		mg	4000

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
Mounting Grommet	4	M-0101-DSF	0	
Mounting Sleeve	4	M-0201-DSF	0	
Crankcase Heater	2	E-0301-DSF	0	Optional
Half Union	1	A-0501-DSF	0	Optional

3.2 The Drawing for Reference

Parts Name	Parts Code	Revision No.
Compressor Outline Drawing	D-0102-DSF	0
Mounting Parts Listing	M-5101-DSF	0
Crankcase Heater	E-0301-DSF	0
Half Union	A-0501-DSF	0
Packing Dimensions	D-0201-DSF	0
Wiring Diagram	E-0910-DSF	0

3.3 External Motor Protector

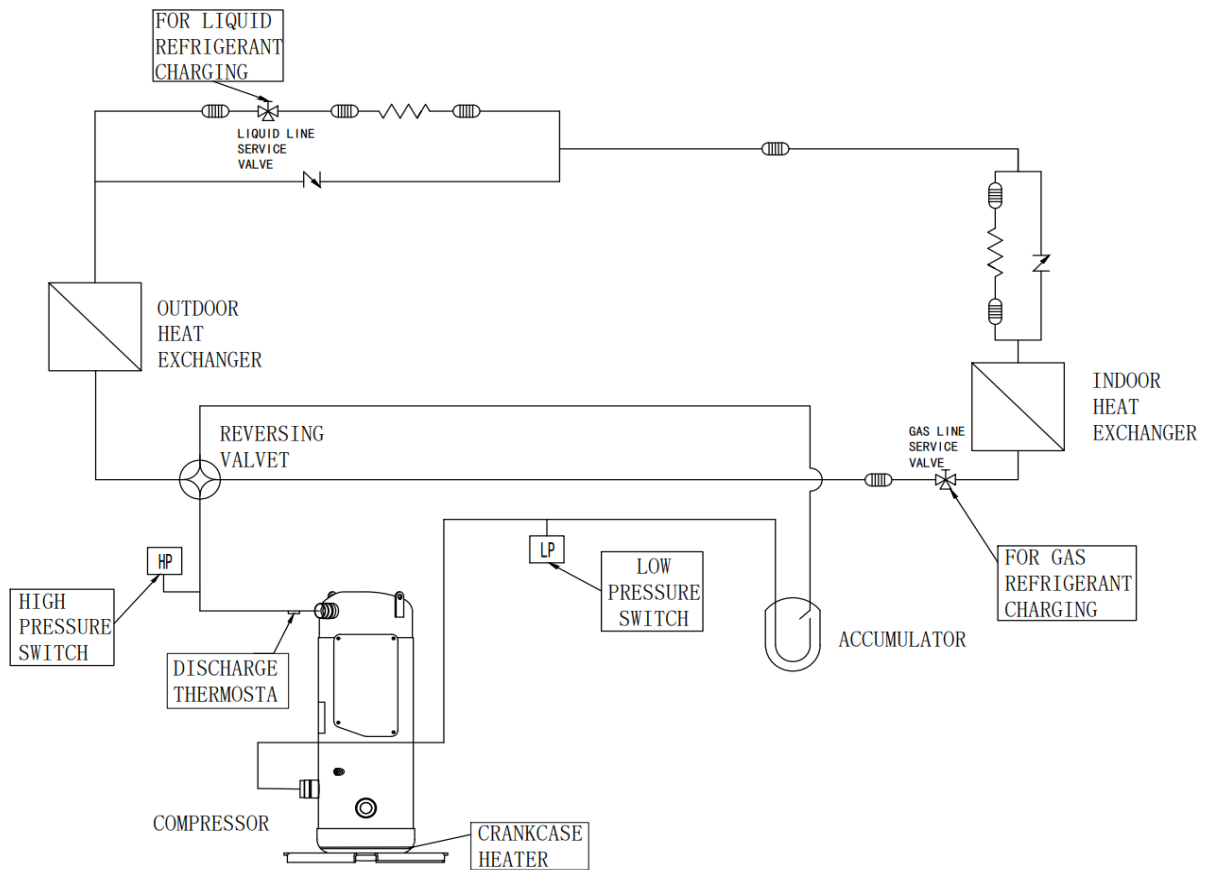
Parts Name	Specification	
External Motor Protector	Supplier	KRIWAN INT69Y 22A630
	Supply Voltage	AC 50/60Hz 115-240V
	Protection feature: overload protection	Reset time: 5±1min Reset mode: automatic reset
	Protection feature: Motor Lock	1st Motor Lock in 24h, Reset time is 5±1min, automatic reset 2nd Motor Lock in 24h, Reset time is 60±12min, automatic reset 3rd Motor Lock in 24h, Reset Off, Manual Reset is needed.
	Protection feature: Motor Phase	Prevent the compressor from reverse phase and lack of phase. In case of relevant faults, adjust the wiring and reset manually.

Section 4. Compressor Protection

4.1 Protection Required but not Included with compressor

Protection Device	Items	Specifications
Crankcase Heater	Rated Power	44*2 Watts
Discharge Thermostat	Mounting Position	Located within 100mm(4 in)from the compressor shell
	Trip Temperature	130±5℃
	Reset Temperature	95±11℃
High Pressure Switch	Setting	Cut-out seting no higher than 4.45Mpa(G)
Low Pressure Switch	Setting	Cut-out seting no lower than 0.15Mpa(G)

4.2 Recommended Refrigerant Flow Diagram



PERFORMANCE DATA

Compressor Model	5CF227SA04
Power Source	3PH 50Hz 380V
Suction Gas Superheat(K)	11.1
Sub Cooling(K)	8.3
Compressor Cooling	Natural Cooling
Refrigerant	R410A

CAPACITY(W)

Condensing Temperature(°C)	Evaporating Temperature(°C)							
	-15	-10	-6.7	0	4.4	7.2	10	15
35.0	36,340	43,450	48,890	62,120	72,700	80,360	88,810	106,190
40.5	33,940	40,530	45,560	57,780	67,540	74,600	82,390	98,370
45.0	32,080	38,260	42,980	54,430	63,560	70,160	77,430	92,360
50.0	30,120	35,880	40,280	50,920	59,400	65,510	72,260	86,070
54.4		33,910	38,030	48,010	55,950	61,670	67,980	80,890
60.0			35,360	44,560	51,860	57,120	62,910	74,750
65.0				41,710	48,490	53,370	58,730	69,700

POWER(W)

Condensing Temperature(°C)	Evaporating Temperature(°C)							
	-15	-10	-6.7	0	4.4	7.2	10	15
35.0	12,340	12,440	12,500	12,640	12,720	12,780	12,840	12,940
40.5	13,780	13,870	13,940	14,070	14,150	14,210	14,260	14,360
45.0	15,120	15,210	15,280	15,400	15,480	15,540	15,590	15,690
50.0	16,790	16,870	16,930	17,050	17,130	17,180	17,240	17,330
54.4		18,490	18,540	18,660	18,730	18,780	18,830	18,910
60.0			20,800	20,900	20,970	21,010	21,050	21,130
65.0				23,090	23,150	23,190	23,220	23,290

CURRENT(A)

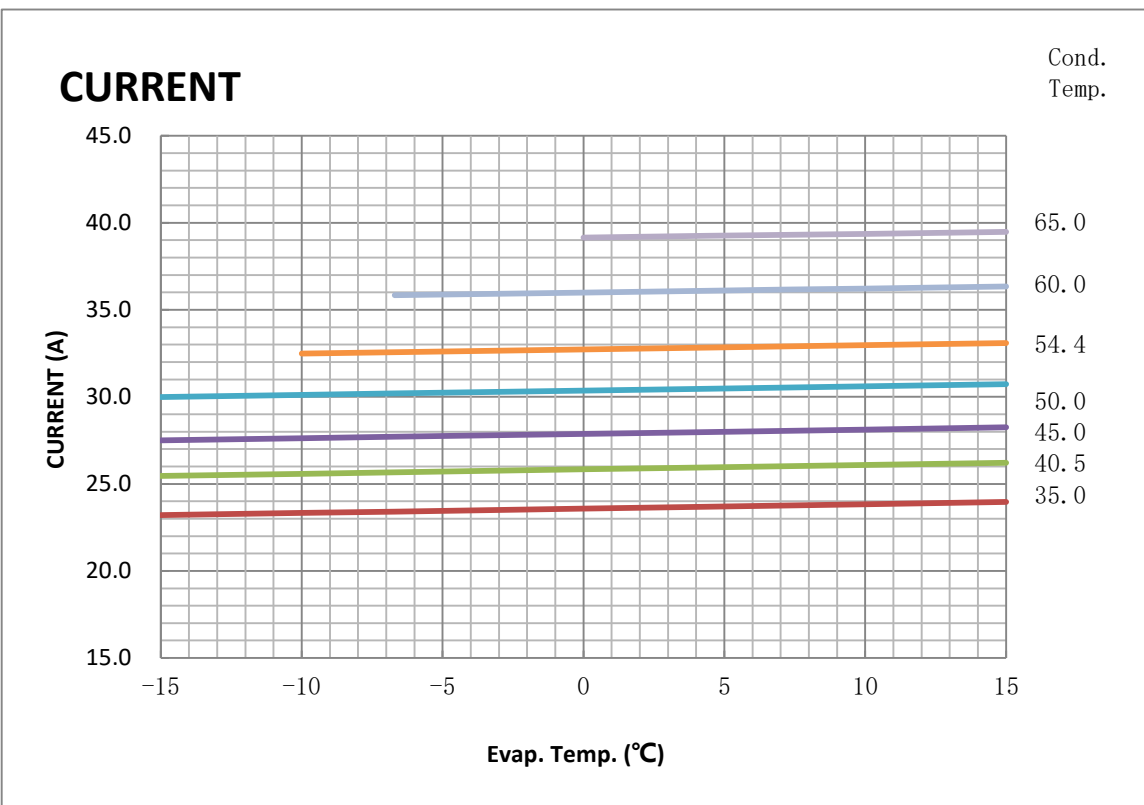
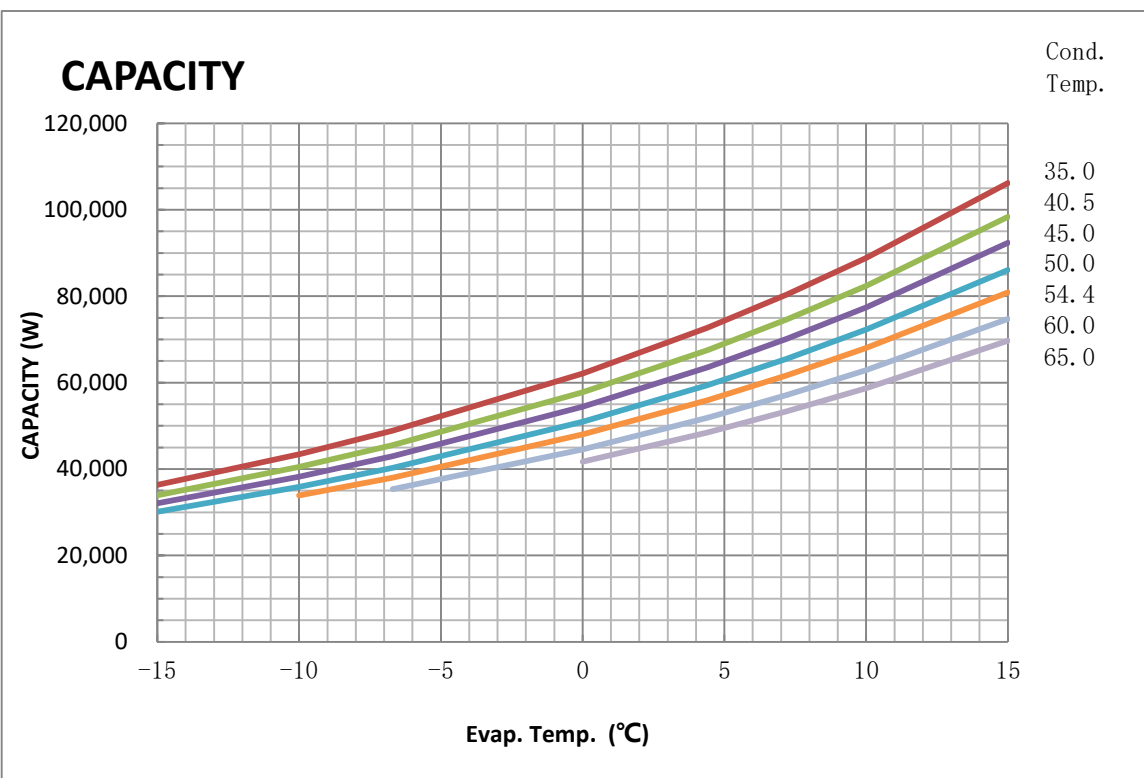
Condensing Temperature(°C)	Evaporating Temperature(°C)							
	-15	-10	-6.7	0	4.4	7.2	10	15
35.0	23.2	23.3	23.4	23.6	23.7	23.8	23.8	24.0
40.5	25.5	25.6	25.7	25.8	25.9	26.0	26.1	26.2
45.0	27.5	27.6	27.7	27.9	28.0	28.1	28.1	28.3
50.0	30.0	30.1	30.2	30.4	30.5	30.5	30.6	30.7
54.4		32.5	32.6	32.7	32.8	32.9	33.0	33.1
60.0			35.8	36.0	36.1	36.2	36.2	36.3
65.0				39.1	39.2	39.3	39.4	39.5

Mass Flow(kg/h)

Condensing Temperature(°C)	Evaporating Temperature(°C)							
	-15	-10	-6.7	0	4.4	7.2	10	15
35.0	689	815	910	1,140	1,322	1,452	1,596	1,888
40.5	685	809	903	1,129	1,307	1,434	1,574	1,859
45.0	683	805	898	1,120	1,295	1,420	1,557	1,836
50.0	680	800	891	1,109	1,281	1,404	1,538	1,811
54.4		796	886	1,101	1,269	1,390	1,522	1,789
60.0			879	1,089	1,254	1,372	1,501	1,762
65.0				1,080	1,241	1,357	1,483	1,738

Compressor Model(Code)
Power Source

5CF227SA04
3PH 50Hz 380V



COEFFICIENTS OF PERFORMANCE CURVES

Compressor Model **5CF227SA04**
 Power Source **3PH 50Hz 380V**
 Suction Gas Superheat (K) **11.1**
 Sub Cooling (K) **8.3**
 Compressor Cooling **Natural Cooling**
 Refrigerant **R410A**

$$X = C1 + C2*(S) + C3*D + C4*(S^2) + C5*(S*D) + C6*(D^2) + C7*(S^3) + C8*(D*S^2) + C9*(S*D^2) + C10*(D^3)$$

X—CAPACITY(W) OR POWER(W) OR CURRENT(A) OR MASS FLOW(kg/h)

S—EVAPORATING TEMP, °C

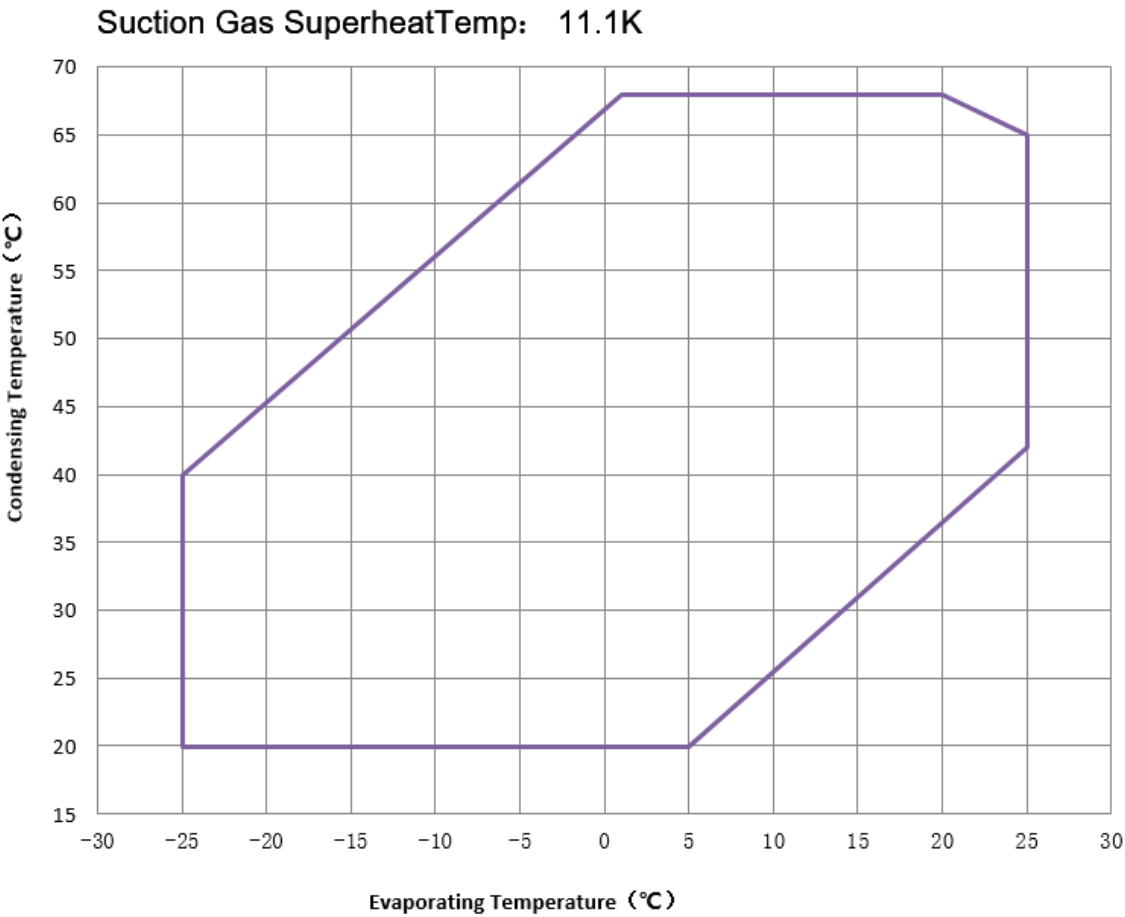
D—CONDENSING TEMP, °C

380V-50Hz	CAPACITY (W)	POWER (W)	CURRENT (A)	MASS FLOW (kg/h)
C1	9.597763E+04	8.638326E+03	1.561747E+01	1.213078E+03
C2	3.711488E+03	1.211987E+01	1.839732E-02	4.430304E+01
C3	-1.125011E+03	-1.199174E+01	7.061926E-02	-2.157424E+00
C4	6.136768E+01	2.075279E-02	2.350162E-05	7.945544E-01
C5	-5.059060E+01	4.683859E-01	3.614520E-04	-1.829552E-01
C6	4.471919E+00	3.605568E+00	4.483092E-03	1.598050E-03
C7	4.141732E-01	-4.652641E-04	-3.972816E-08	6.742663E-03
C8	-5.915192E-01	-2.035478E-05	-2.784592E-07	-3.830342E-03
C9	2.375649E-01	-6.982637E-03	-4.744710E-06	4.238330E-04
C10	-7.767257E-08	-1.640922E-08	-1.656827E-11	9.781569E-10

Note: The polynomial coefficients subject to change without notice.

Section 5 Operating Envelope

Refrigerant : R410A



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.

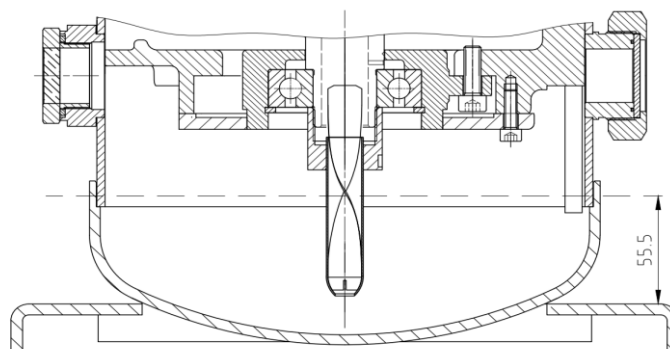
No.	Item	Standard	Limit	Remark
1	Refrigerant	R410A		
2	Average Evap. Temp.	-25~+25℃ 0.23~1.54MPa（G）	+25℃ 1.54MPa（G）	Compressor Suction Pressure
3	Average Cond.Temp.	+20~+68℃ 1.34~4.45MPa（G）	+68℃ 4.45MPa（G）	Compressor Discharge Pressure
4	Compression Ratio	2~8	8	
5	Winding Temp.	115℃ Max.	130℃	
6	Shell Bottom Temp.	Upper Limit:90℃ Max.		When compressor is running
		Lower Limit: Evaporating Temp.+12K Min.		
		Lower Limit:Ambient Temp.+11K Min.		When compressor shuts off
7	Discharge Gas Temp.	115℃ Max.	130℃ Max.	Located within 100mm(4 in)from the compressor shell
8	Suction Gas Temp.	Superheat: 5K(10 °F)Min.	There should be no scour sound caused by liquid inhalation(No increase in current and vibration)	It should meet the requirement of item 5, 6, 7 and 14 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.
		Single Phase Models: 90% of the rated voltage min.		
11	On/Off Cycling	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		For at least 7 minutes - on/3 minutes-off is recommended. 200,000 cycle Max.
12	Refrigerant Charge	Oil/Refrigerant(wt.)≥0.35.		Specific gravity of the Oil:0.94.
13	Minimum Oil Level	More than 2.2L		Please see next page
14	Abnormal Pressure Rise/Drop	Pressure Rise: 4.45MPa(G) (464psig) Max.		By high pressure switch
		Pressure Drop: 0.15MPa(G) (21.8psig) Min.		By low pressure switch
15	System Moisture Level	200ppm Max.		
16	System Uncondensable Gas Level	1 Vol.% Max.		24 hrs. after vacuuming: 1.01kPa Max.
		Residual Oxygen 0.1 Vol.% Max.		
17	Tilt	5Deg.Max.		

Operation beyond the above limits must be approved by Panasonic Appliances 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 condition.
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. Max Temp. in the terminal box is 70°C. If the compressor is installed in an enclosed space, ventilation must be ensured to prevent excessive temperature of the compressor and terminal box. Meanwhile, it is necessary to choose suitable cables, to ensure the temp. inside the terminal box not exceeding 70°C.
12. The screw tightening torque of terminal box cover is $1.2 \pm 0.2 \text{ N.m}$. Please do not modify the original installation of each part inside the terminal box.
13. Terminal box IP level is IPx4 after Cable Gland (IP54 class) installed.
14. When the compressor body and its packaging is abandoned, please follow every sales environmental standards, for packaging, refrigerant oil, solid recycle and dispose.
15. It is necessary to install leakage protector.
16. Panasonic Appliances Compressor (Dalian) Co, Ltd provide the 《Compressor Specification Common Appendix》 and 《Safety Request on the use of Compressor》 also fit this specification.
17. Minimum oil level reference (2200ml);
When two compressors running parallel, the maximum oil level should be within the sight range of the sight glass.
18. When connecting the tandem piping, the adapter (half union) must be fixed before tightening the nut. During tightening, the adapter (half union) is not allowed to rotate, the tightening torque is 90~100N.m; After connection, rust proof treatment shall be carried out on the adapter (half union). When the tandem piping is not connected, the nut is forbidden to open.



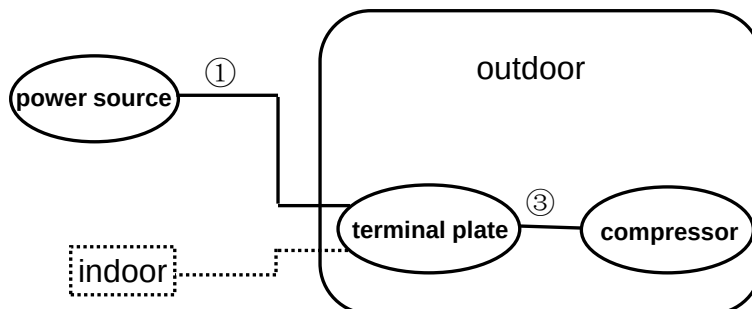
Section 7. Selection of Electrical Wire

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

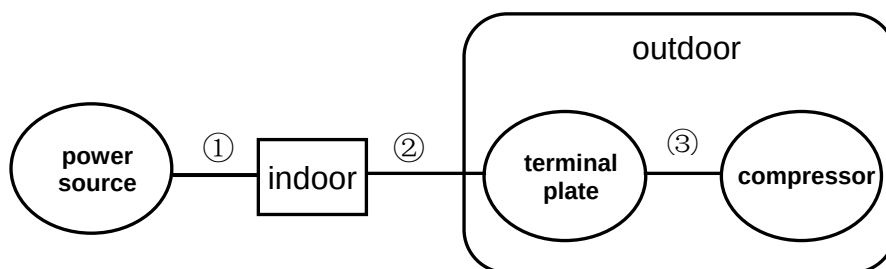
We recommend selecting the wire size from the table below.

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.
50max.	2.0	3.5	5.5	8.0	14.0	22.0	2.0
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
260max.	↑	22.0	30.0	38.0	↑	↑	14.0
280max.	14.0	↑	↑	↑	60.0	100.0	↑
300max.	↑	↑	↑	↑	↑	↑	↑

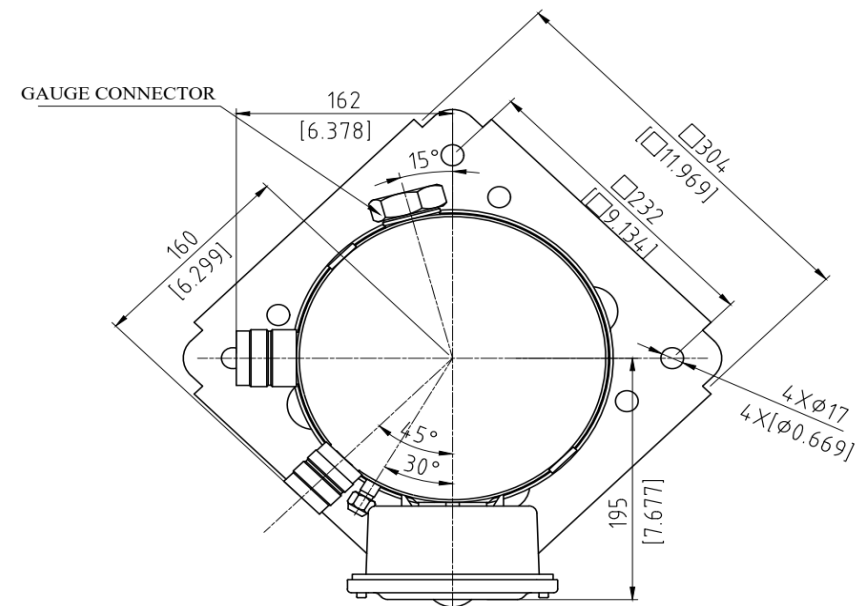
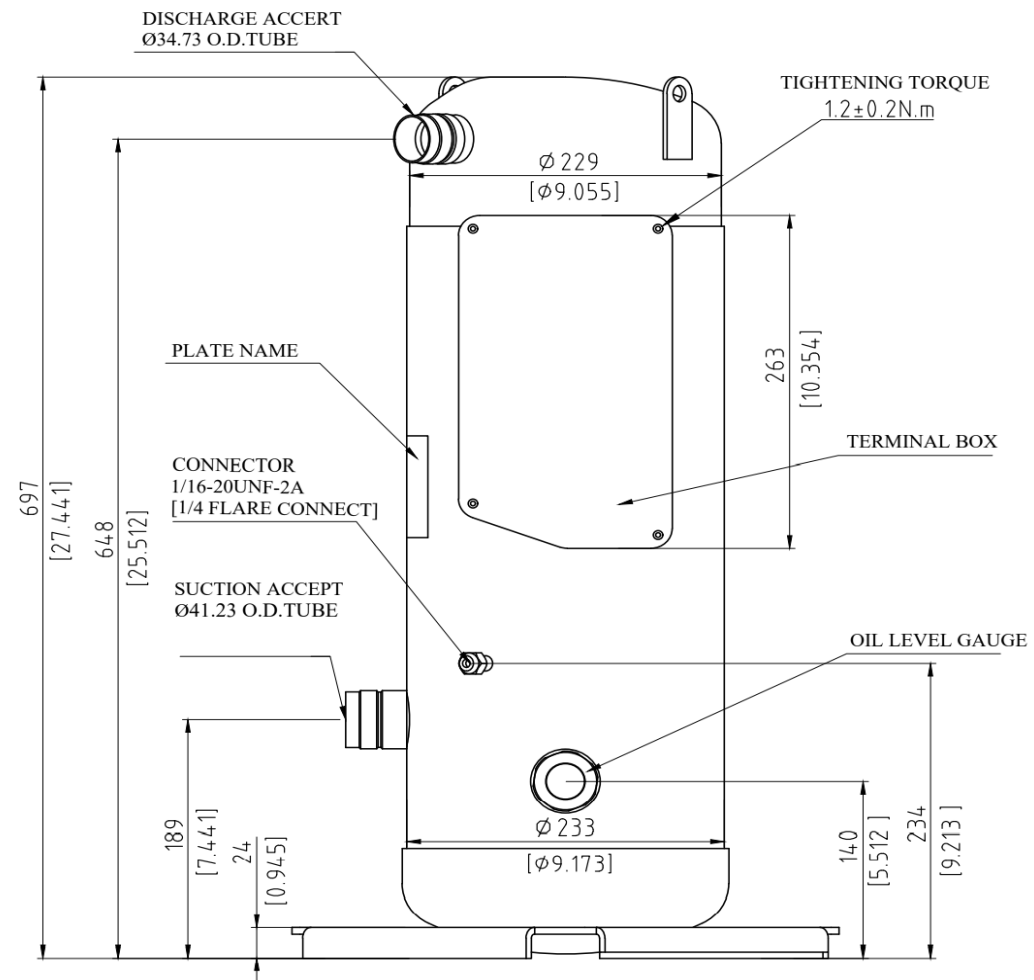
* 8.0mm² wire can be used below 0.8m

7.3 Caution of Ground

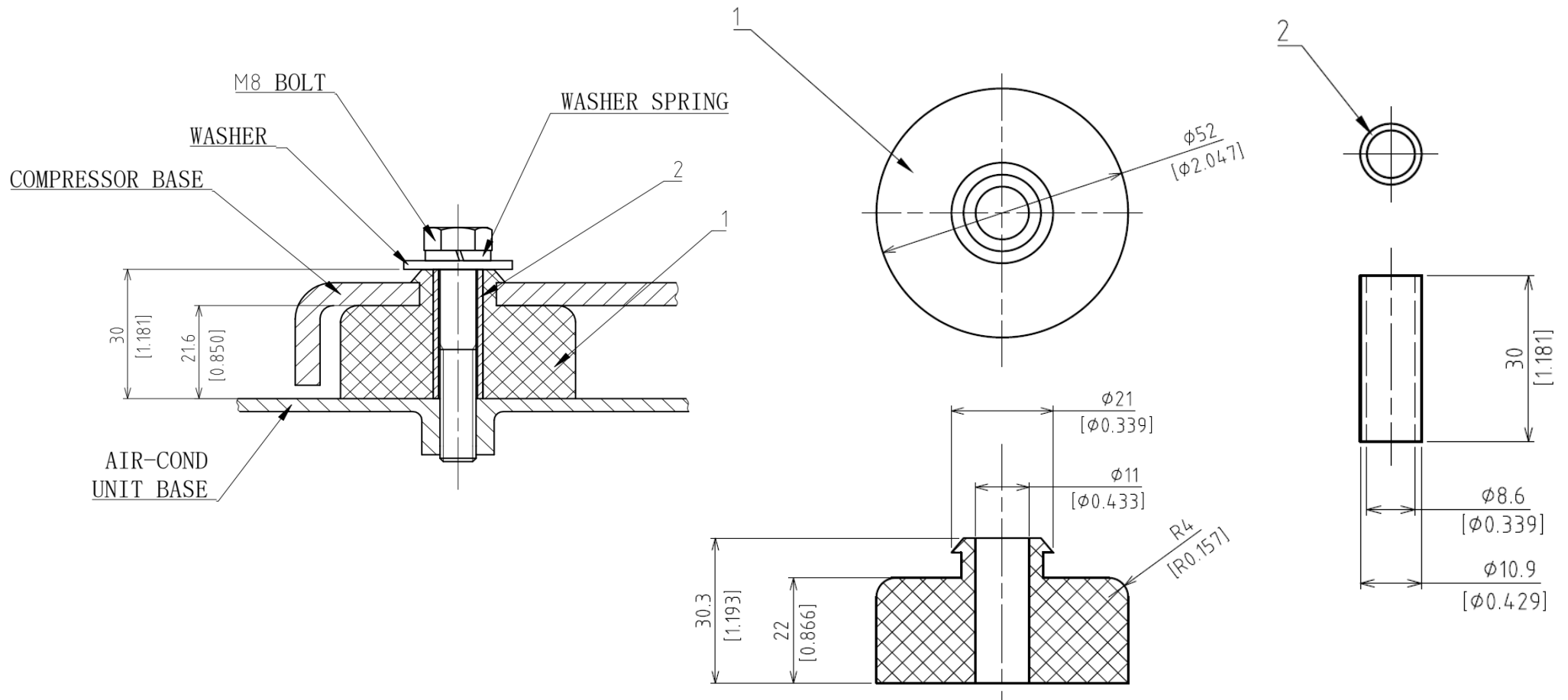
The internal motor protector does not protect the compressor against all possible conditions.

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

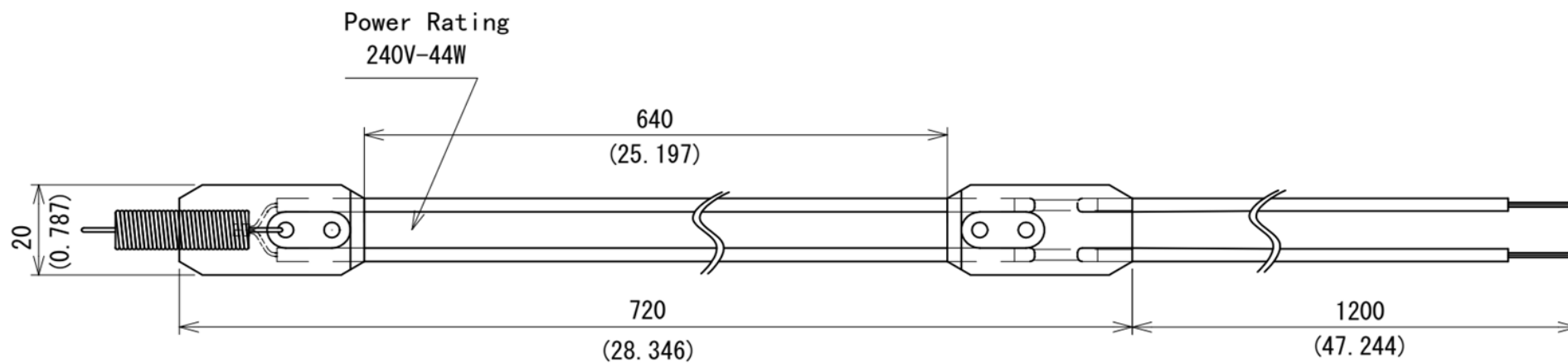
Earth leakage circuit breaker must be installed.



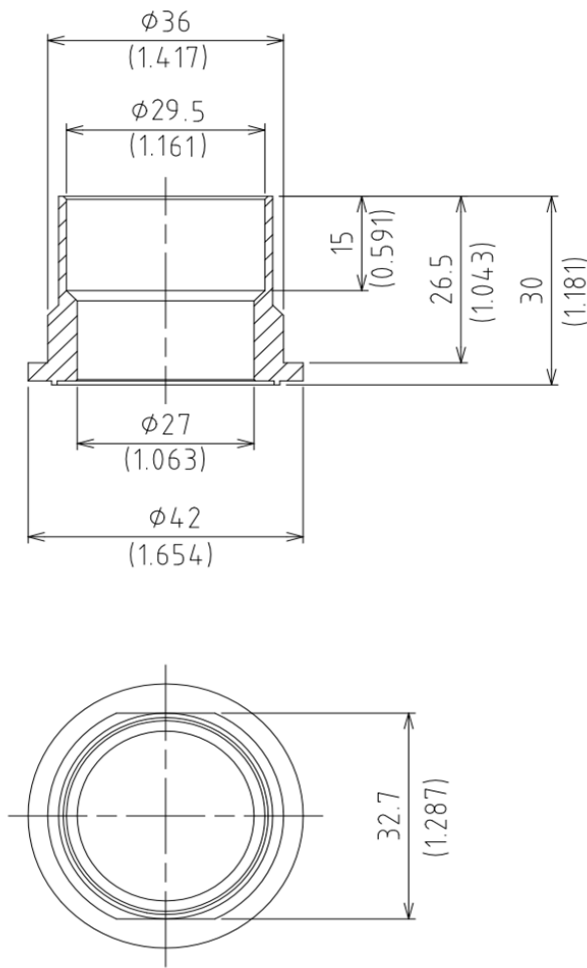
Part Code
D-0105-DSF
Name
Compressor Outline Drawing



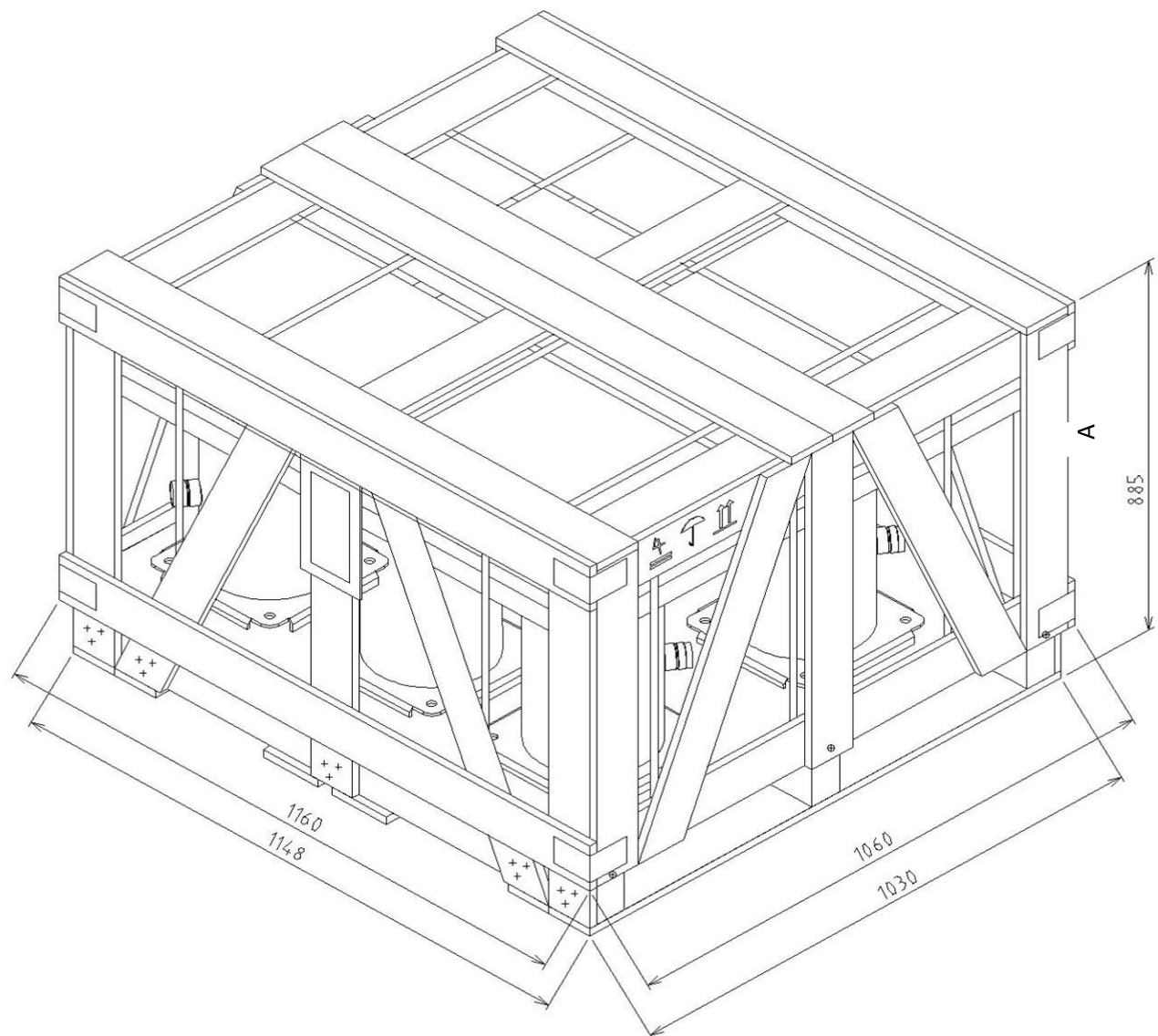
Part Code
M-5101-DSF
Name
Mounting Parts Listing



Part Code
E-0301-DSF
Name
Crankcase Heater



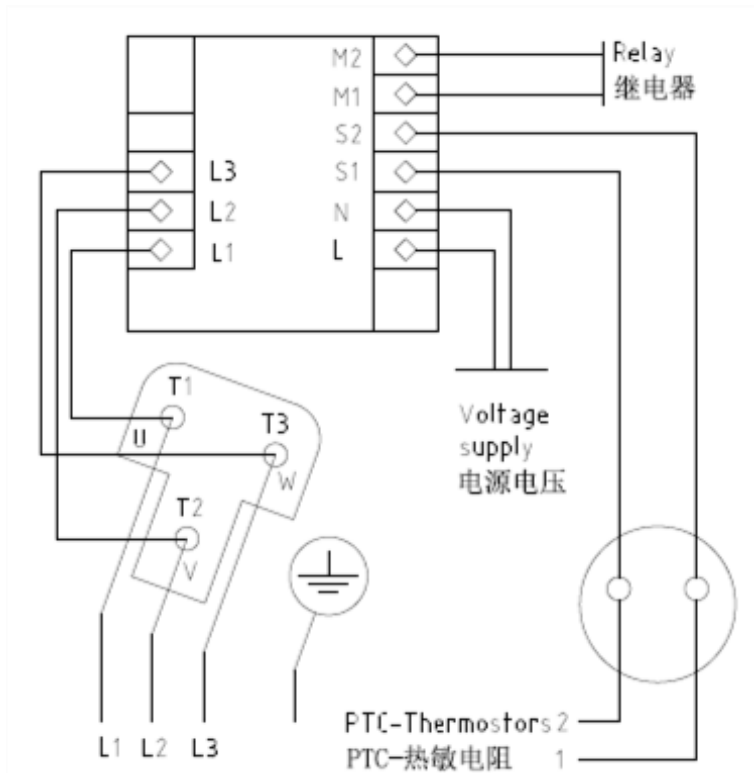
Part Code
A-0501-DSF
Name
Half Union



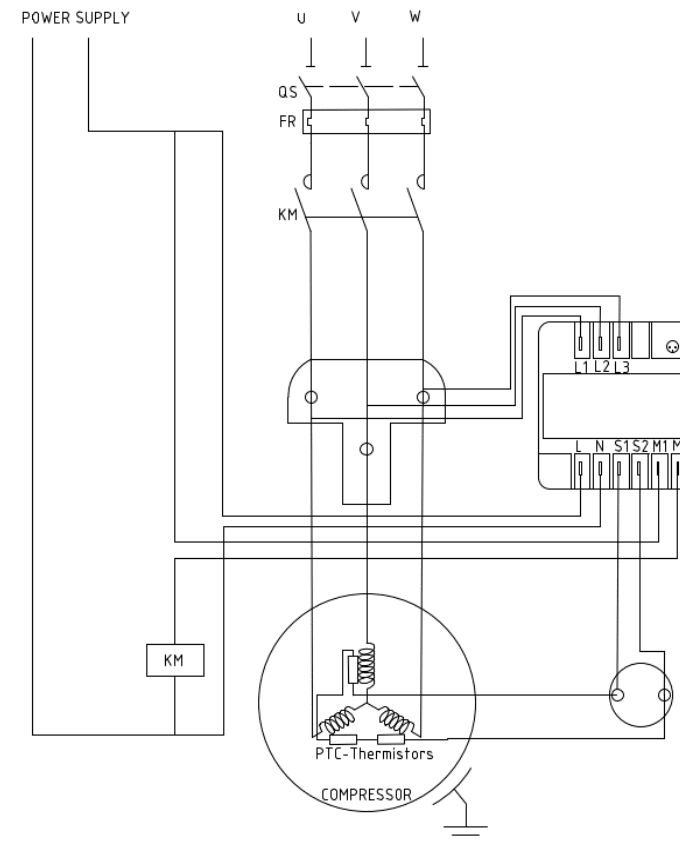
Compressor Model	A
5CF227SA04	885 [34.843]

Part Code
D-0201-DSF
Name
Packing Dimensions

Terminal box internal Wiring Diagram
(Please do not modify the original layout)



System Wiring Diagram



Part Code
E-0910-DSF
Name
Wiring Diagram