

*DAIKIN*



**No. AT99C049EC**

Aug.30.2006

# **SPECIFICATIONS**

**COMPRESSOR**

**MODEL : JT160BCBY1L@K**

**XI'AN DAIKIN QING'AN COMPRESSOR CO., LTD**

## 1. Range of Application and Assembly

### 1-1 Applied Range

The specifications provided here apply to the JT160BCBY1L@K Hermetic Scroll Compressor.

### 1-2 Range of Assembly

As detailed in the following table:	Name	Quantity	Plan No.	Remarks
1	Compressor	1	DA429 —293	Including lubricant
2	Anti-vibration Rubber	4	DA429 —903	
3	Spacer	4		

Note: The pressure units in these specifications refer to the gauge pressure, unless stated otherwise.

## 2. Main Specifications

### 2-1 Ratings

Item		JT160BCBY1L@K
Rated Output	KW	3.75
Number of Poles	—	2
Displacement	cm <sup>3</sup> /r	83.1
Rated Speed (=Nominal Revolution)	r/min	2900 [50Hz]
Lubricant	—	SUNISO 4GSDID-K or DAPHNE SE56P
Lubricant (Volume)	cm <sup>3</sup>	1500
Refrigerant	—	R22
Inlet Pipe (I.D.)	mm	(19.1 C1220T-O)
Outlet Pipe (I.D.)	mm	(12.7C1220T-O)
Weight (including refrigeration oil)	Kg	35.1
Power Supply	—	3 phase at 50Hz
Rated Voltage	V	380 [50Hz]

## 3. Quality Specifications

### 3-1 Appearance and Dimensions

The entire surface of the compressor has been coated with black paint (dipping and quick-dry painting). (coating membrane thickness is 15 μ m, at least)

Outer dimensions are shown on the attached diagrams of the exterior.

### 3-2 Leak Test and Pneumatic Resistance Test

The leak and pneumatic resistance tests of the compressor are conducted under the following conditions.

	Low-pressure side [MPa]	High-pressure side [MPa]
Leak Test	1.3	3.0
Pneumatic Resistance Test	10.5	10.5

### 3-3 Compressor Characteristics

Frequency	Voltage	Refrigerating Capacity	Input	Current	Sound Pressure	Vibration
[Hz]	[V]	[kW]	[kW]	[A]	[dBA]	[μm]
50	380	15.0	4.66	8.6	60max.	50 max.

Note 1. The above characteristics are satisfied under the following operating conditions (ASRE/T).

Evaporating Temperature [ °C ]	Condensing Temperature [ °C ]	Superheating Degree [ °C ]	Super-cooling Degree [ °C ]
7.2	54.4	27.8	8.3

2. The refrigerating capacity, input, and current fluctuate within a range between 95% and 105%.

3. The sound pressure value is measured for the position one meter in front of the compressor at a height half, in use Daikin' s genuine rubber mounting.

4. The vibration value is measured at the compressor legs attached, in use Daikin's genuine rubber mounting.

### 3-4 Motor Characteristics

- Insulation : Class E
- Starting Current : 65.8 A (at 380 V/50 Hz、 LRA)
- Starting Voltage : Minimum terminal voltage of 294 V (50Hz) (within 0.8 sec.)
- Starting Pressure : 1.80 MPa (high pressure)  
: 0.60 MPa (low pressure)
- Winding Resistance : 2.572Ω (average) at 20°C
- Insulation Resistance : 30 M min. (when dry), 1 M min. (when refrigerant flood the compressor.)
- Withstand Voltage : 2,400 VAC for 1 sec. and no dielectric breakdown impress

### 3-5 Others

- Moisture content : 500 mg [max.]
- The compressor is filled up with nitrogen gas at a pressure of 0.01 Mpa before shipping.

## 4. Compressor Operating Range

### 4-1 Operating Range

Refer to page 8 for the Compressor's Possible Operating Range.

### 4-2 Precautions

#### 1) Temperature

- Discharge port temperature : 150 max.
- Discharge gas temperature range : Between Condensing temperature + 20°C and 125°C
- Oil temperature : 80°C max.
- Motor winding temperature : 120°C max. (Average temperature based up on resistance measure of motor winding)

#### 2) Power Supply

- Maximum voltage fluctuation :  $\pm 10\%$  of rated voltage
- Maximum frequency fluctuation :  $\pm 2\%$  of rated frequency

#### 3) Refrigerant Systems

- Allowable refrigerant charge : 2.5 kg
- Design the refrigerant circuit so that the quantity of liquid refrigerant returning will be minimized.
- Oil concentration in oil sump during operation : Refer to the oil concentration range in 8-6.
- The compressor must be filled with refrigerant through the liquid pipe.
- The compressor may be filled with an excessive refrigerant charge, provided that circuit design is conducted with an appropriate device, such as an accumulator, is employed so that the compression mechanism will be free of excessive refrigerant.
- Counter pressure (i.e. Suction pressure – discharge pressure) at pneumatic or leak test : 1.47MPa max.

#### 4) Others

- Maximum operating times : 12 per hour
- Make sure that the shortest operation period is two minutes or more. Be sure to wait for at least three minutes to start the compressor after turning it off.
- Mounting Angle :  $\pm 10^\circ$  max.
- Be sure to employ a crankcase heater. The recommendable output is 33 W.
- Liquid height of residual compressor oil during operation should be maintained in the compressor external bottom at, at least, 17mm.

## 5. Protection Devices

When the compressor is installed in an air-conditioner system, it must be installed with the following protection devices.

### 5-1 Discharge Pipe Thermostat

Attach a discharge pipe thermostat within 30 cm of the discharge pipe in order to prevent the temperature of the exhaust gas of the compressor from rising excessively due to overloading or gas supply interruption. The thermostat must be set at temperature less than the maximum stipulated in 4.2.1). (reference value:  $123.5 \pm 0.5^{\circ}\text{C}$ ).

### 5-2 Low Pressure Switch

Attach a low-pressure switch operating at a low pressure of  $0.02 \pm 0.02\text{MPa}$  in order to prevent the compressor from damage that may be caused by excessively low-pressure pumping.

### 5-3 Reverse-Phase Protector

The rotation of the compressor in the reverse direction is prohibited because the compressor may be damaged if rotated in the reverse direction. Attach a reverse-phase protector that detects the phase inversion of the compressor without operating the compressor.

### 5-4 Internal Motor Protector

- Manufacturer : UBUKATA INDUSTRIES CO., LTD
- Model : UP18SE0820-99
- Temperature Characteristics : Open Temperature  $160^{\circ}\text{C} \pm 5^{\circ}\text{C}$   
: Close Temperature  $80^{\circ}\text{C} \pm 10^{\circ}\text{C}$
- Electrical Characteristics : Power supply Voltage 380V  
: Power supply Frequency 50Hz  
: Trip performance Specified In Page 11/19  
: Maximum Electrical Capacity 75A(380V)

### 5-5 High Pressure Switch

In order to interrupt the operation of the compressor in the case of extraordinary pressure rises, attach a high-pressure switch that operates at the pressure values provided as leak test pressure values in 3-2.

## 6. Performance Curves

Reference to the accessional datum.

## 7. Origins and Factory

Xi'an Daikin Qing'an Compressor Co., Ltd. (IN CHINA)

## 8. Possible Compressor Operating Range

- Refer to 7-5 on the following page for the possible compressor operating range.
- Possible operating range is divided into four areas (areas 1~4). The attendant conditions for each differ.
- Operate the compressor upon sufficient confirmation of the following attendant conditions, particularly for areas 2, 3 and 4.

### 8-1 Area 1

Observe the precautions in 4-2.

### 8-2 Area 2

Specifically confirm the following from the precautions in 4-2.

Discharge port temperature: 150 max.

Motor winding temperature: 120 max.

Oil temperature: 80 max.

Oil concentration: Within the oil concentration range in 8-6.

### 8-3 Area 3

Specifically confirm the following.

Oil concentration: Within the oil concentration range in 8-6.

Liquid compressor: No liquid compressor

### 8-4 Area 4

Specifically confirm the following:

Continuous operating time: 10 minutes max.

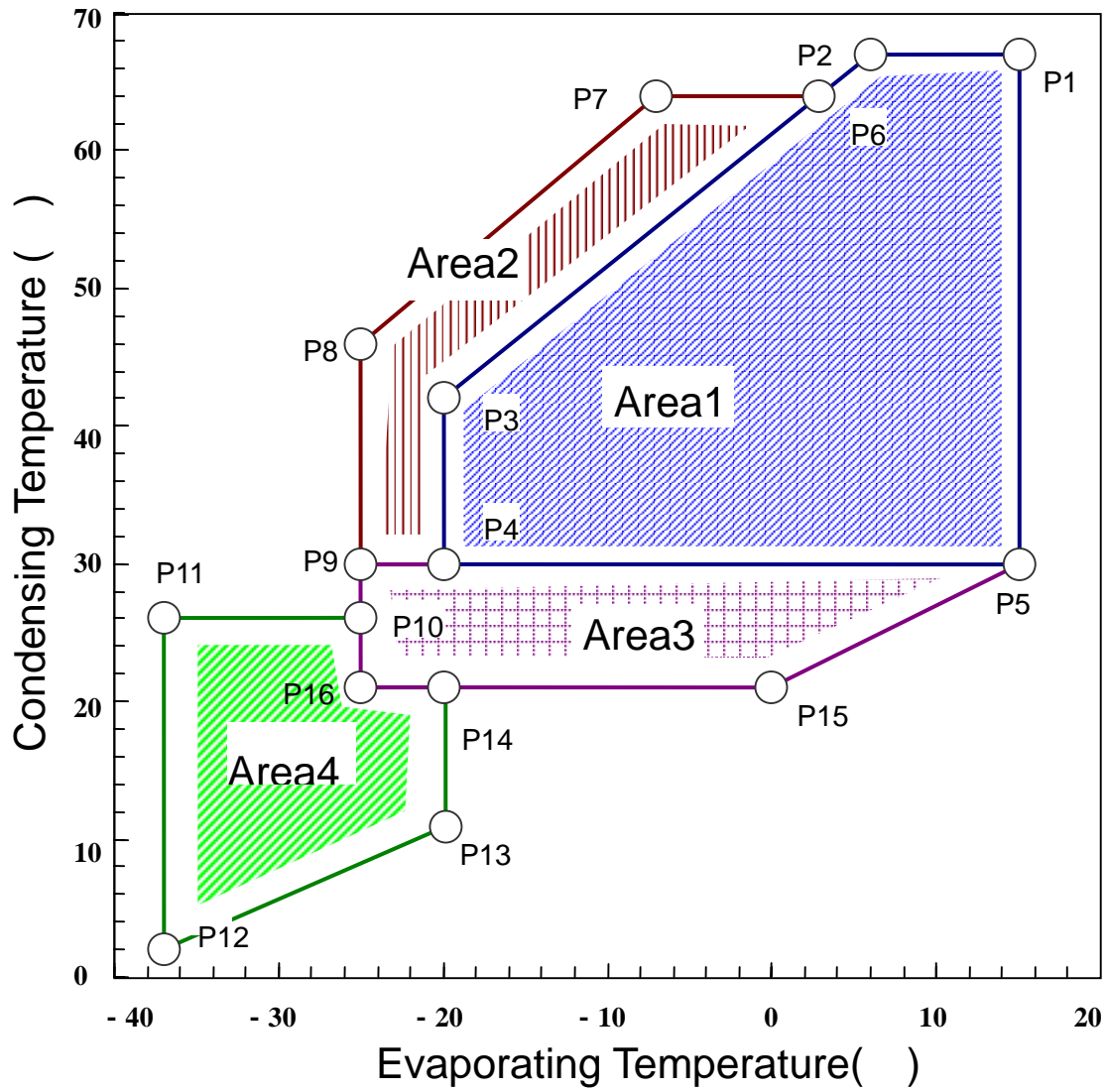
Oil concentration: Within the oil concentration range in 8-6.

Liquid compression: No liquid compression

Discharge port temperature: 150 max.

Motor winding temperature: 120 max.

8-5 Possible Compressor Operating Range

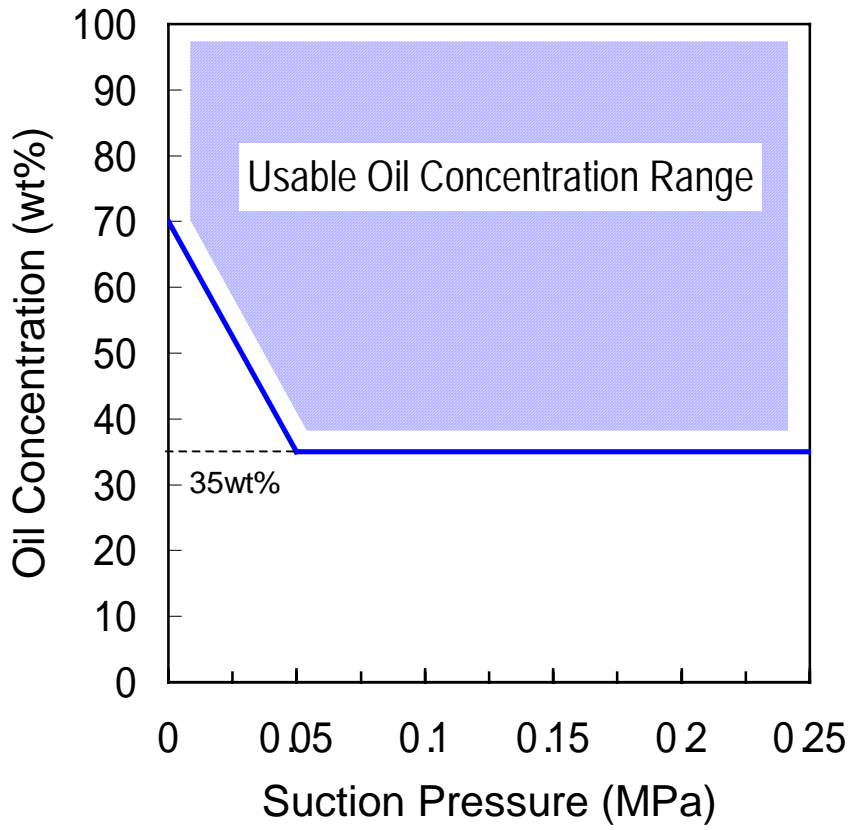


Point	P1	P2	P3	P4	P5	P6	P7	P8
Evaporating Temperature( )	15	6	- 20	- 20	15	3	7	- 25
Condensing Temperature( )	67	67	42	30	30	64	64	46

Point	P9	P10	P11	P12	P13	P14	P15	P16
Evaporating Temperature( )	- 25	- 25	- 37	- 37	- 20	- 20	0	- 25
Condensing Temperature( )	30	26	26	2	10	21	21	21

### 8-6 Oil Concentration Range

Operate the compressor with the following oil concentration range in the compressor oil trap.



## Nameplate

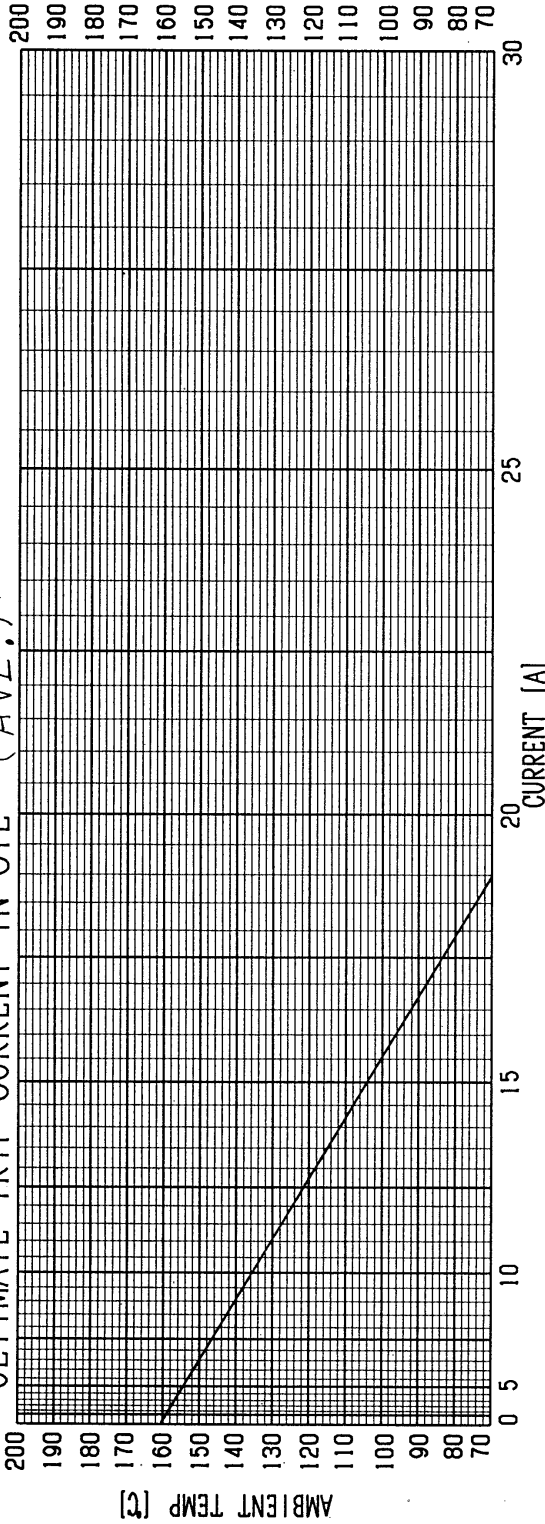
The nameplate on the compressor will appear as follows.



### <Guide>

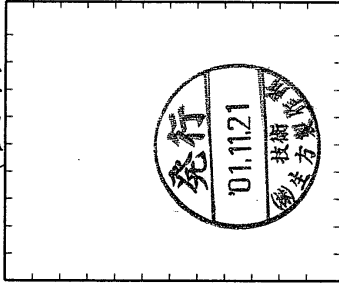
- |                |                                |
|----------------|--------------------------------|
| • MODEL        | <b>A</b> :Model Name           |
| • POWER SOURCE |                                |
| V              | <b>B</b> :Rated Voltage        |
| PHASE          | <b>C</b> :Phase number         |
| Hz             | <b>D</b> :Rated frequency      |
| • MFG.NO.      | <b>E</b> :Manufacturing number |

ULTIMATE TRIP CURRENT IN OIL (AVE.)



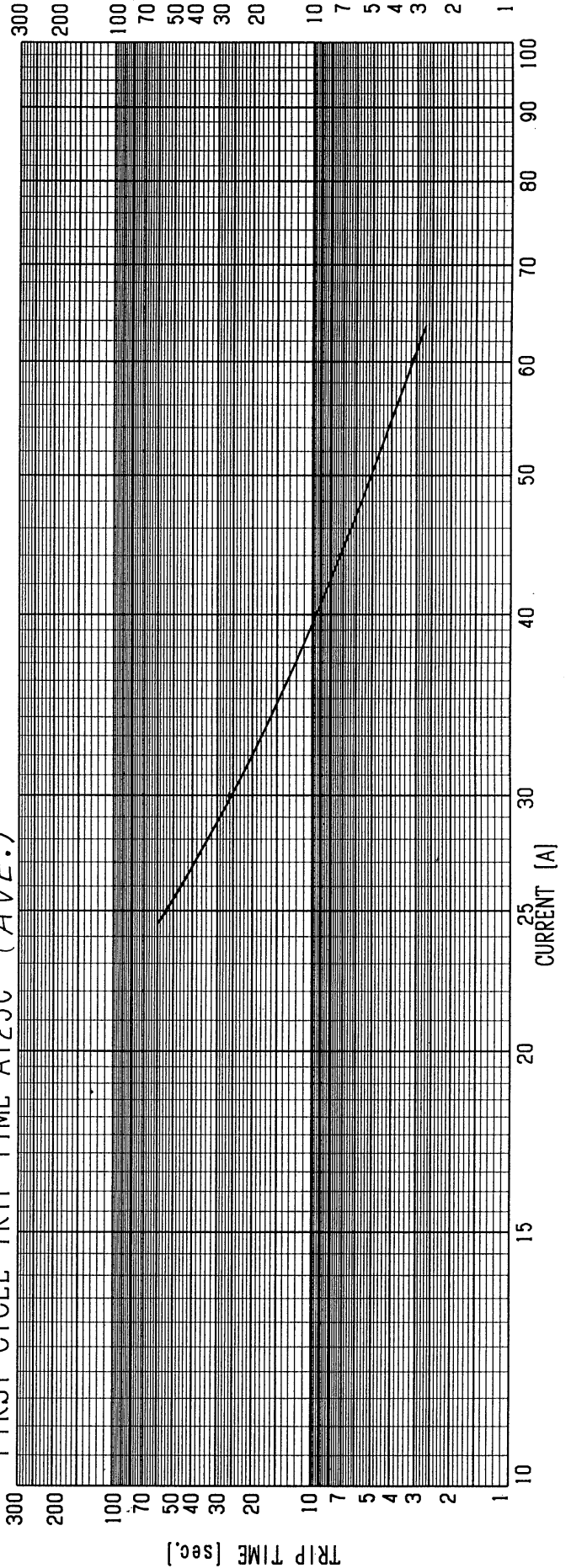
TYPE 160BC用

UPI8SE0820-99  
(D87)



4 UNIKATA INDUSTRIES CO., LTD.  
PHONE 052-612-3333 FAX 052-612-3336

FIRST CYCLE TRIP TIME AT 25°C (AVE.)

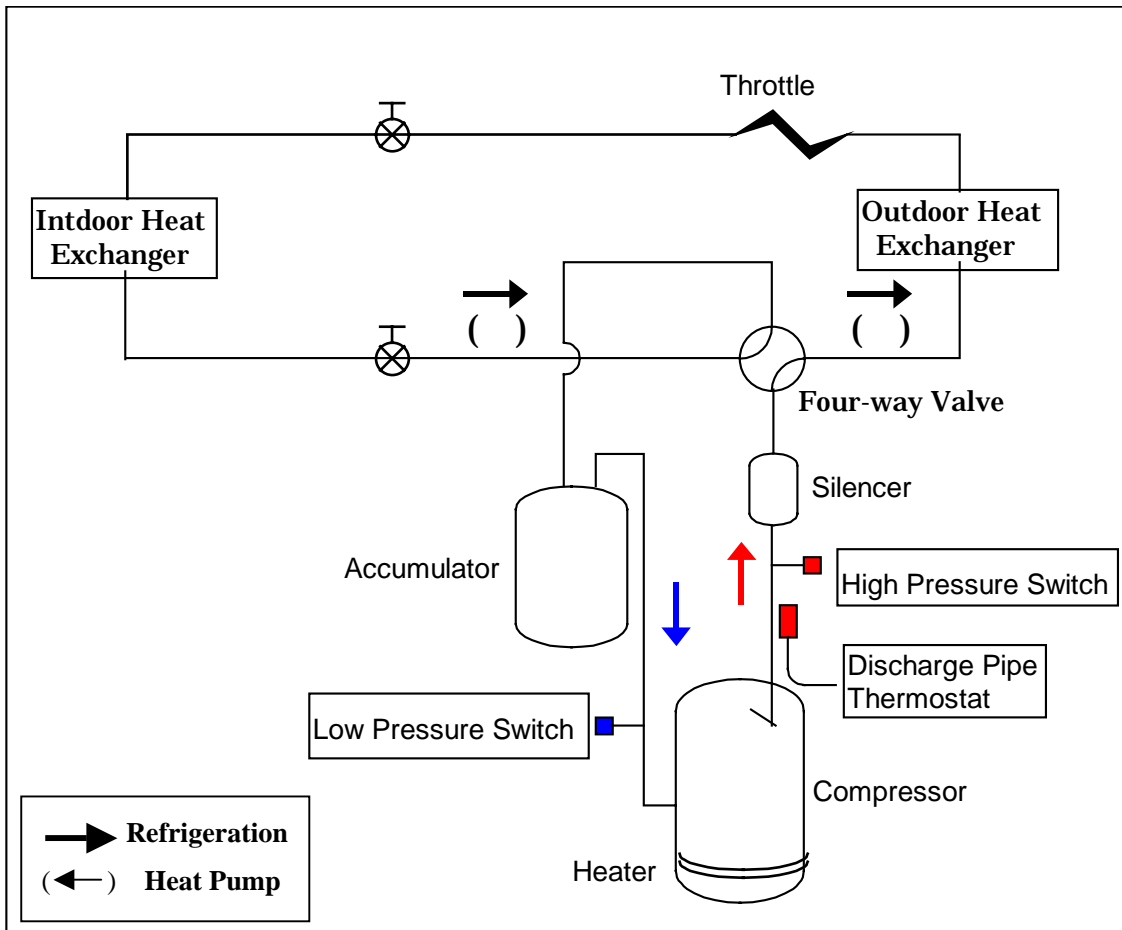


While install the compressor, Setting position of protection devices must be attention.

- Protection Devices : Low Pressure Switch  
 High Pressure Switch  
 Discharge Pipe Thermostat

	Setting Position	Notice
Low pressure switch	Compressor ~ Accumulator	Confirm Discharge port temperature
High pressure switch	Compressor ~ Four-way Valve	
Discharge pipe thermostat	Distance from discharge pipe is 30cm (max)	Confirm Discharge port temperature

Not i ce: The setting position must possibly close to the compressor.



Reverse-Phase Protector

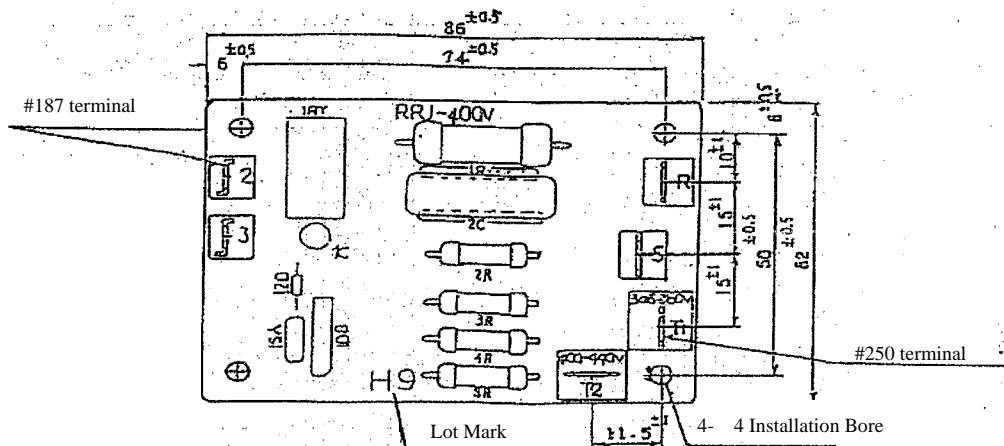
1 : Operating Condition

Item	Used Condition
1 Installation Site	Inside Control Box of Indoor or Outdoor System
2 Operating Temperature	- 20 ~ 60
3 Storage Temperature	- 25 ~ 70
4 Humidity	Maximum Range 98%RH, under 80%RH Year Average, under 80%RH at 60 .Capable fluctuating Temperature or Humidity.

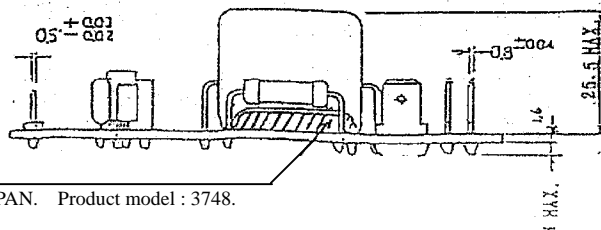
2 : Specification

Item	Specification
1 Model	RPJ-400V
2 Function	Make: Positive – Phase – Sequence Break: Negative – Phase - Sequence
3 Rated Main Circuit Voltage	R-S-T1 AC 346V ~ 380V(3 Phase) R-S-T2 AC 400V ~ 440V(3 Phase)
4 Time Rating	Continuous
5 Output Contact Rating	AC 250V Inductive Load Making 8A(Pf=0.65),Breaking 2A(Pf=0.4) Resistive Load 3A(Pf=0.95 MIN.)
6 Life	10000 Times MIN.
7 Weight	37g
8 Applicable Mounting Spacers	XGLS-8S(Made By KITAGAWA INDUSTRY CO.,LTD.)4 pieces

3 : Dimension Diagram

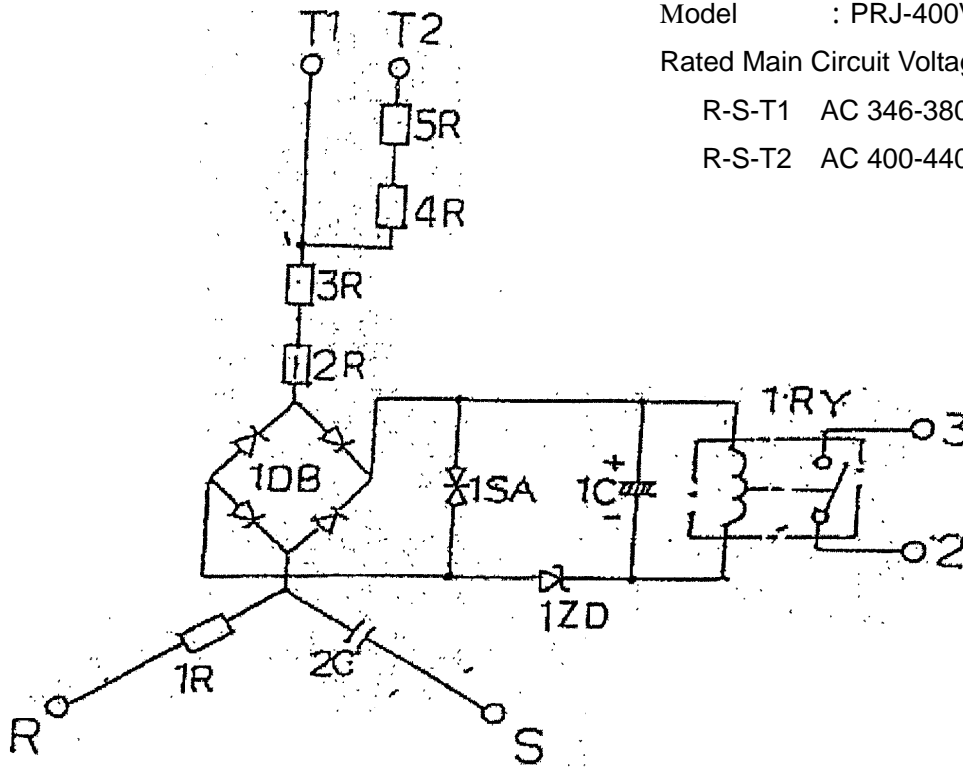


Stamp Color: Black



2C Capacitor: Fixed by Binder  
Binder is made by SIMITOMO 3M , JAPAN. Product model : 3748.

4 : Circuit Diagram



Model : PRJ-400V

Rated Main Circuit Voltage :

R-S-T1 AC 346-380V(50/60 Hz)

R-S-T2 AC 400-440V(50/60 Hz)

5 : Parts Table

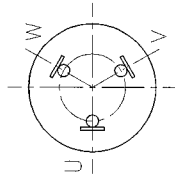
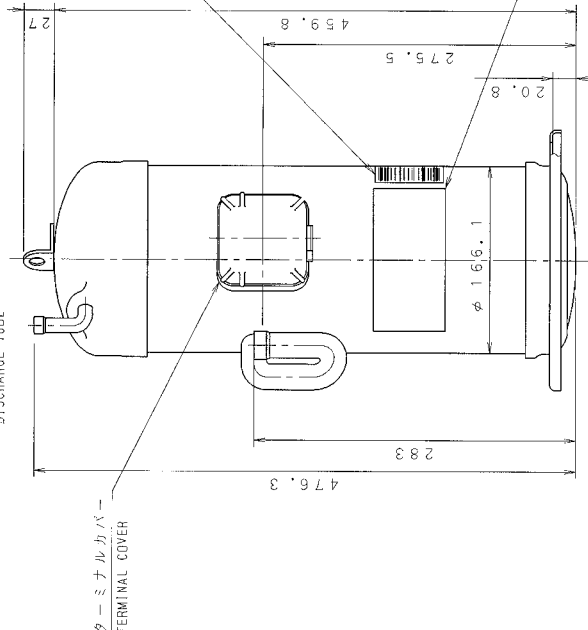
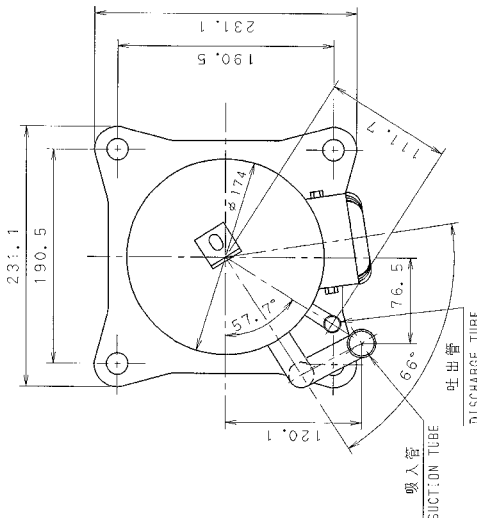
	Parts Name	Mark	Quantity	Specification
1	Resist-Oxidation Metal-film Resistor	1R	1	8W 82k
2	Resist-Oxidation Metal-film Resistor	2R	1	2W 5.6k
3	Resist-Oxidation Metal-film Resistor	3R	1	2W 5.6k
4	Resist-Oxidation Metal-film Resistor	4R	1	2W 5.6k
5	Resist-Oxidation Metal-film Resistor	5R	1	2W 5.6k
6	Electrolytic Capacitor	1C	1	50V 22 μF
7	Metallized Polyester film Capacitor	2C	1	AC600V 0.039 μF
8	Diode Subassembly	1DB	1	200V 1A
9	Rheostat	1SA	1	120V
10	Low-Voltage Diode	1ZD	1	500mV 24V
11	Relay	1RY	1	G6B-1114P-US, DC 24V(OMRON)
12	Printed Circuit Board	-	1	CEM-3, 94V-O
13	Terminal (#250)	-	4	Tinned Brass (0.8t)
14	Terminal (#187)	-	2	Tinned Brass (0.5t)

CAD/BOM  
第3角投影法  
3RD ANGLE PROJECTION

Internal Use Only(社外秘)

図番 DA429-293G  
図名 JT160BCBY1L

機種名 MODEL	JT160BCBY1L	JT150BCBY1L
定格出力 RATED OUTPUT ( KW )	3.75	
排シノケ量 SWEEP VOLUME (cm <sup>3</sup> /rev)	83.1	78.1
反掃油量 反掃油量 (Z/Min)	2900	
油標油充量 REF. OIL GRADE	SUNISO 4GSDID-K 及/ハ DAPHNE SE56P	
油標油充標準量 REF. OIL CHARGE ( L )	1.5	
冷却油 REFRIGERANT	R22	
吸入側接続 SUCTION CONN.	φ19.1 I. D.	
吐出側接続 DISCHARGE CONN.	φ12.7 I. D.	
質量流量 NET FLOW (G/HR)	33.6	
電圧 POWER SUPPLY	3 PHASE 50 HZ	
電圧範囲 VOLTAGE RANGE ( V )	380	



端子位置  
PHASE ARRANGMENT

NOTES: 1.バーコード銘板ハ、必要ニ応ジテ貼付ヲ行ウ。  
PUT ON THE BARCODE LABEL ACCORDING TO IT'S NEEDS.

CCM  
2

為鉛APICS  
(Oで囲む)  
00・10・20・  
50・60・70

新発設計  
担当  
西川

06/08/11  
重慶西川  
(8064076)

06/06/07  
西川  
バーコード銘板  
貼付位置変更  
(8063064)

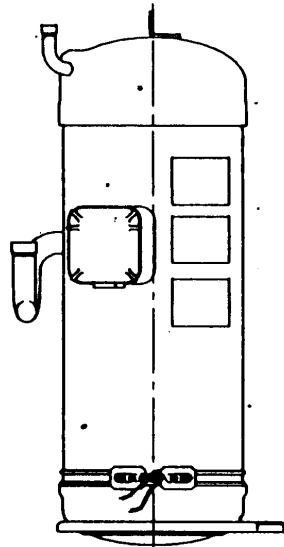
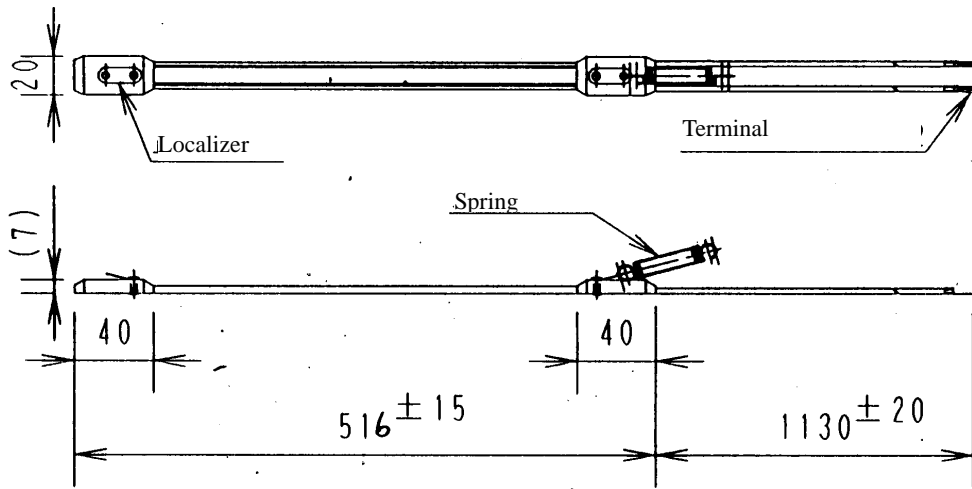
配先  
K.G.N. 2

尺 度 SCALE	φ
作 成 日 DATE	06.01.19
受 注 番 号 ORDER NO.	
製 作 数 QUANT.	

ダイキン工業株式会社  
DAIKIN INDUSTRIAL CO., LTD.

名 称	JT160BCBY1L	外形図
図 番	DA429-293G	部品コード PART CODE
製 図 者	西川 吉田(健)	120100
検 査 者	杉山	

DWG. NO. DA 429-906



**Heater Specification**

- 1. output : 33W ± 7%
- 2. voltage : 200V ± 10%
- 3. Insulating performance (after put it in water for 24h)
  - \* withstand voltage : 1500v for 1 min ,and the insulator no broke through.
  - \* Insulation Resistance : 100M Min. (Test with DC 500V gauge for 1 min)

**Caution**

Even if the compressor does not work, also supply power to heater.

**Manner of Heater Installation**

改正欄 REV.
△
△
△
配布先
め 田 白

第 3 角 法 3RD ANGLE PROJECTION		尺 度 SCALE	
作成日 DATE		YR	MO DA
95		6	15
承認 APPROVED	照 査 CHECKED	設 計 DESIGNED	製 図 DRAWN
め	田	白	流

JT160~106B	
Crank-Case Heater	
タイケン工業株式会社 DAIKIN INDUSTRIES LTD.	図 番 DWG. NO. <b>DA 429-906</b>



図番 DRW. NO.  
DA429-4369A

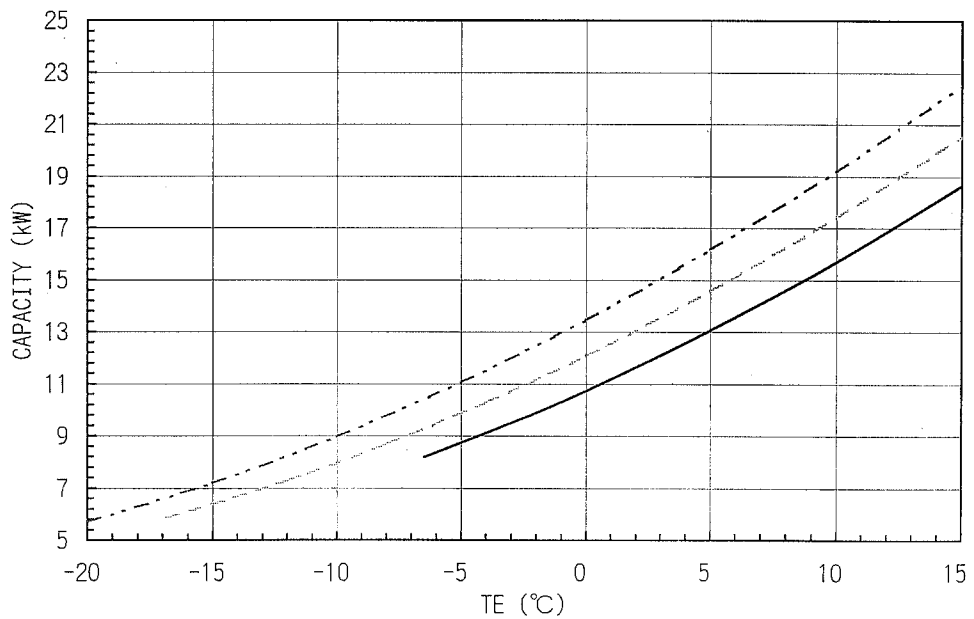
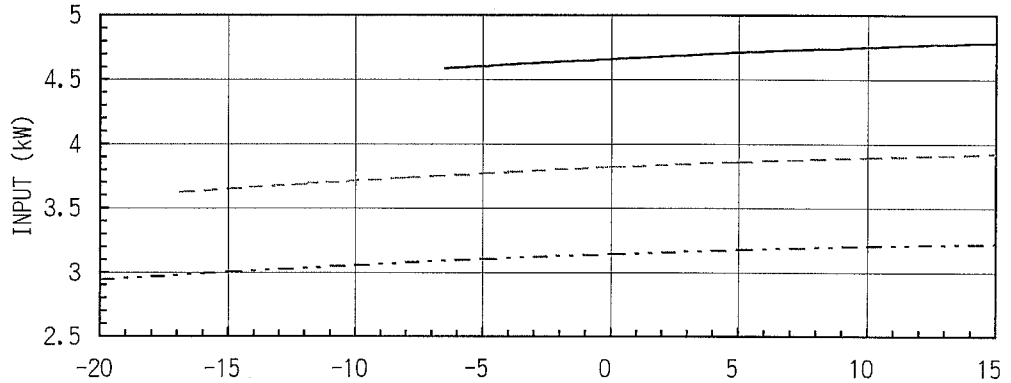
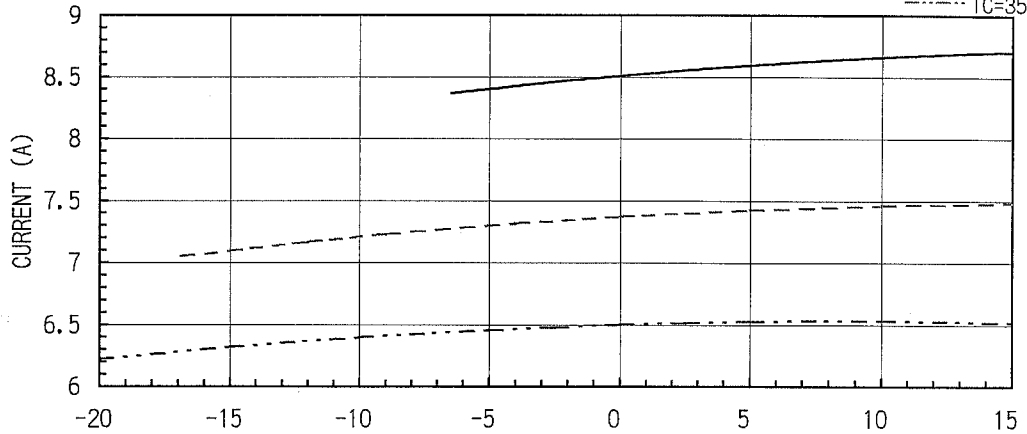
TC: 55°C TE: 5°C

CAPACITY  
13.0 [kW]

INPUT  
4.71 [kW]

CURRENT  
8.59 [A]

— TC=55°C  
- - - TC=45°C  
· · · TC=35°C



改正欄 REV.  
△ 02・02・12  
SI単位化

△ 中島西川

△

第3角法 3RD ANGLE PROJECTION		尺度 SCALE	
作成日 DATE YR 02 MO 02 DA 12			
承認 APPROVED	照査 CHECKED	設計 DESIGNED	製図 DRAWN

JT160BC-Y1L  
380 V- 50Hz R-22  
SH(°C) : 8 SC(°C) : 5

PERFORMANCE  
CURVES  
100% LOADING

配布先

吉田 02.2.15	中島 02.2.15	西川 02.2.15
---------------	---------------	---------------

ダイキン工業株式会社  
DAIKIN INDUSTRIES LTD

図番 DRW. NO.  
DA429-4369A

図番 DRW. NO.  
**DA429-4370A**

$$[CAPACITY, INPUT, CURRENT] = R(1) + R(2) * TC + R(3) * TE + R(4) * TC^2 + R(5) * TC * TE + R(6) * TE^2$$

TC=CONDENSING TEMP. (°C)      TE=EVAPORATING TEMP. (°C)

380V- 50Hz      R-22      SH(°C) : 8      SC(°C) : 5      100% LOADING

	CAPACITY(kW)	INPUT(kW)	CURRENT(A)
R(1)	1.8853561E+01	2.0950785E+00	5.5171838E+00
R(2)	-1.6593993E-01	7.3956634E-04	-1.7847035E-02
R(3)	6.4685076E-01	1.4062780E-03	-1.5347328E-02
R(4)	3.3430231E-04	8.3437515E-04	1.3124979E-03
R(5)	-3.8662790E-03	1.6874939E-04	6.2500237E-04
R(6)	6.1918604E-03	-1.4374942E-04	-3.7500143E-04

改正欄 REV.
△ 02・02・12
SI単位化
中島 西川
△
△
配布先

第3角法 3RD ANGLE PROJECTION	尺度 SCALE	COEFFICIENTS OF PERFORMANCE CURVES	
作成日 DATE YR 02 MO 02 DA 12		MODEL : JT160BC-Y1L	
承認 APPROVED	照査 CHECKED	設計 DESIGNED	製図 DRAWN
吉田	中島	211	
ダイキン工業株式会社 DAIKIN INDUSTRIES LTD			図番 DRW. NO. DA429-4370A