

Specifications No.

C-2547

16-Nov-2018

CUSTOMER: Hawco

RoHS Compliant

COMPRESSOR SPECIFICATIONSCompressor type : Scroll Compressor (Algebraic type)

Refrigerant : R404A , R449A

Power source : 1PH, 208 - 230V, 60Hz

Motor type : CSR

Model Name	Nominal Capacity [W]		Motor Rated Output [W] (HP)	Remark
	R404A	R449A		
DS1529X1	3,300	3,500	1,500 (2.0)	With UL
DS1834X1	3,770	4,035	1,800 (2.4)	

Packing	Check
Gathered Packing	<input type="checkbox"/>
Separated Packing	<input type="checkbox"/>

We acknowledge the receipt of this copy.

Please return this compressor specifications after confirming the contents. If you do not return this copy by the above date, we will assume that you have checked the contents.

Hitachi-Johnson Controls Air Conditioning, Inc.
 Tochigi Factory Compressor Design Group
 500 Tomita, Ohira-machi, Tochigi-shi, Tochigi-ken

APPD.	CHKD.	DWN.
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NOTE

The Specifications in this bulletin are subject to change without notice,
 in order that HITACHI may bring the latest innovations to our customers.





SAFETY PRECAUTION

Read and understand all of the safety precautions in this manual before operating the product. These precautions are intended to ensure safe and correct operation of the product and to prevent injury to the operator and other persons and damage to the product. Observe these precautions strictly.






The following symbols indicate the presence of potentially hazardous conditions.

 WARNING	This symbol indicates a potentially hazardous situation which, if not avoided, <u>could result in</u> death or serious injury.
 CAUTION	This symbol indicates a potentially hazardous situation which, if not avoided, <u>may result in</u> minor or moderate injury or property damage accidents to the product. It may also be used to alert against unsafe practices.

The meanings of the graphic symbols in text are shown below.

	<u>Be sure to perform</u> the operation.
	<u>Disconnect</u> the power cable from the electrical outlet.
	<u>Connect</u> the grounding wire.
	<u>Prohibit</u> .

WARNING

	<u>Provide</u> the refrigerating cycle unit with adequate electrical grounding. Incomplete grounding could result in electrical shock hazards in the event of troubles and current leakage.
	<u>Connect</u> a fuse or a leak circuit breaker to the main circuit to avoid electrical shock hazards or fire in the event of troubles and current leakage.
	<u>Check</u> to see that the main power is turned off, before repairing, to avoid electrical shock hazards in case of touching the terminals.
	<u>Measure</u> the temperature of the hermetic terminals of the compressor and then <u>connect</u> the appropriate lead wires. Lead wire insulation deterioration (thermal deterioration) could result in electrical shock hazards, short-circuiting, or fire.
	<u>Keep</u> the lead wires <u>away</u> from the surface of the compressor or the piping. Lead wire insulation deterioration (thermal deterioration) could result in electrical shock hazards, short-circuiting, or fire.



Keep the lead wires away from any rotational parts like fans or any vibrational parts like piping.

Lead wire insulation deterioration due to vibration or friction could result in electrical shock hazards, short-circuiting, or fire.



Do NOT make the compressor self-evacuated during operation, which avoids overheating the compressor that could cause burns or fire.



Do NOT touch the surface of the compressor with empty hands, which avoids burns. The surface is very hot during operation and immediately after it has stopped.



Do NOT use this compressor for air compression, which avoids overheating of the compressor that could cause burns or fire.



Do NOT view the inspection window of the compressor for internal observation directly. Use a video camera or other suitable equipment to avoid serious injury owing to explosion of the inspection window or blowout of the refrigerant.



Wear protective goggles during repairs to avoid serious injury owing to explosion of piping or blowout of the refrigerant.

CAUTION



Do NOT install the compressor in a humid place or locations exposed to water. Do NOT dip it into water or spray it with water. In case of using the sound insulation material to enclose the compressor, which is highly hygroscopic, that material must NOT absorb water. Insulation deterioration causes electrical shock hazards, current leakage, short-circuiting, or explosion owing to corrosion.



Attach the specified cover to the hermetic terminals of the compressor by the specified method to prevent entry of dirt.

Incomplete electrical conduction of the hermetic terminals may cause troubles or fire.



Do NOT apply electrical pulse to the compressor while its inside is maintained in a vacuum. It avoids insulation failure inside the compressor, which may result in electrical shock hazards, current leakage, or fire.



Store the compressor in clean and dry environment. Insulation failure of the hermetic terminals of the compressor may result in electrical shock hazards or current leakage. Corrosion of the compressor surface may result in explosion. Blowout of the refrigerant may result in burns.



In case of attaching cluster terminals, the PTC starter, receptacle terminals, or other electrical parts to the hermetic terminals of the compressor, those parts must NOT be obliquely connected or twisted after connections, which avoids reducing fastening force of the terminals. Incomplete electrical conduction of the hermetic terminals may cause troubles or fire.

1. GENERAL SPECIFICATIONS

Model			DS1529X1		DS1834X1	
Nominal Output	HP		2.0		2.4	
	W		1,500		1,800	
Power Supply	-		1 phase, 208 - 230 V, 60 Hz			
Refrigerant	-		R404A, R449A			
Allowable amount of Refrigerant Charge	g		3,000		3,000	
Refrigerant Oil	-		POE (VG68)			
Oil Charge	liter		0.85		0.85	
Displacement	cm ³ /rev		29.1		34.0	
	m ³ /h		6.03		7.05	
Rated Revolution	min ⁻¹		3,456			
Performance ⁽¹⁾			R404A	R449A	R404A	R449A
Cooling Capacity	W		3,300	3,500	3,770	4,035
Power Input	W		1,900	1,775	2,190	2,070
COP	-		1.74	1.97	1.72	1.95
Sound Level and Vibration Level ⁽²⁾						
Sound Level ⁽³⁾	dBA		MAX. 65	MAX. 65	MAX. 68	MAX. 66
Vibration Level ⁽⁴⁾	µm		MAX. 50	MAX. 35	MAX. 60	MAX. 45
Net Weight (Including Oil)	kg		22.5		22.5	
Piping ⁽⁵⁾ Connection	Suction	-	φ 16.1 ID (BR)			
	Discharge	-	φ 9.72 ID (BR)			
	Injection	-	φ 6.2 ID (BR)			
Motor	Type	-	Capacitor start and run Permanent Split motor (CSR)			
	Poles	-	2			
	Voltage	V	208	230	208	230
	Starting Current	A	56	62	62	68
	Winding resistance (at20°C)	Ω	Main	Aux	Main	Aux
			1.226	1.878	1.092	1.603
Capacitor	Starting Capacitor	-	60µF / 450V		75µF / 400V	
	Running Capacitor	-	45µF / 450V		55µF / 450V	
Starting Relay	-		AMVL-250V2		AMVL-250V2	

[notes]

(1)Above performance is based on the following conditions

Refrigerant	R404A	R449A
Evaporating Temperature(dew point)	- 6.7 °C (0.481MPa[abs])	- 6.7 °C (0.406MPa[abs])
Condensing Temperature(dew point)	48.9 °C (2.234MPa[abs])	48.9 °C (2.072MPa[abs])
Return gas Temperature	4.4°C	
Sub cooling	0K	
Ambient Temperature	32.0 °C	
Compressor Cooling	Fan Cooling+Liquid Injection	

(2)Measurement condition for Sound and Vibration Level.

Refrigerant	R404A	R449A
Suction Pressure	0.202 MPa[abs]	0.161 MPa[abs]
Discharge Pressure	1.811 MPa[abs]	1.659 MPa[abs]
Return gas temp.	18 °C	
Noise of soundproof room	under 40 dBA	
Vibration of soundproof room	under 5 µm	
Liquid refrigerant back	No liquid back	
Draft	No draft	

(3)Sound level is measured at the point 30cm away from the compressor surface in a soundmeasuring room.

(4)Vibration level is measured on the compressor surface.

(5)Connection Type

BR : Brazing, RL : Rotalock, FL : Flange, FR : Flare

(6)Scope of Supply

- 1) Compressor Assembly Charged with Refrigerant Oil and Nitrogen Gas.
- 2) The companion connections shall be provided by others.

The other specifications

- 1. Hermetic terminal : 1/4"quick connect type
- 2. Space volume of inner shell : 2000 mL
- 3. Motor Insulation grade : E
- 4. Approval voltage range rated voltage ±10%
- 5. Starting performance

The minimum starting voltage shall be as TABLE 1. (see note 7) under the following conditions.

- (1) The starting pressure should be between the suction and discharge of the compressor was balanced and adjusted as shown in the TABLE 1.
- (2) The temperature of compressor case was adjusted to 20 °C or higher at the starting conditions.

TABLE 1

Starting conditions Motor temperature	Ambient temp.	Pressure MPa [abs]		Minimum starting voltage {V2}
		R404A	R449A	
Cold-starting Cold state (Room temperature)	20°C	1.35	1.22	85% of rated voltage
Hot-starting<Standard> Hot state after operated under standard condition	32 °C	1.29	1.16	85% of rated voltage
Hot-Starting<Overload> Hot state after operated overload condition.	43 °C	1.42	1.28	90% of rated voltage

[note 7]

The starting voltage (V2) is measured by Hitachi starting test apparatus. It means the accelerable minimum voltage by the accelerating torque between the motor starting torque and the stalling torque, and it is different with the continuous operable voltage (V4) after the reach of maximum speed of motor. (see Fig 1)

As the starting voltage of the product depend on the structure and design of the product, you should measure the starting voltage of the product and you should confirm it is no problem.

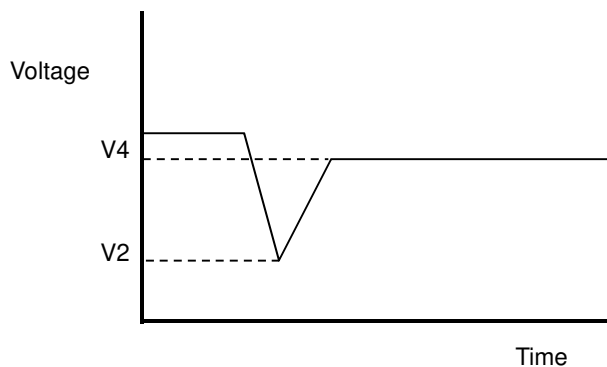


Fig 1

2. PARTS AND DRAWING LIST

Item	Q'ty/Compressor			Drawing No.	Remarks	SUPPLY			
	DS1529X1	DS1834X1				Pat.1	Pat.2	Pat.3	Pat.4
Dimension sketch	X	X		BB0004094		-			
Circuit diagram	X	X		BB0041918		-			
Refrigeration system	X	X		3CYCA6131		-			
Connecting sketch of accumulator	X	X		3CYCA6121					
Compressor packing sketch	Gathered Packing	X	X	BB0044458					
	Separated Packing	X	X	BB0044459		-			
OVER LOAD PROTECTOR	1	1		-	Internal OLP	YES			
Mounting Parts	RUBBER GROMMET	4	4	3CYC62866	3TMW65223A	YES			
	PIPE	4	4	4CYC11219	3PFHA5981A	YES			
	WASHER	4	4	4CYC11220	3SPAA5982A	YES			
Terminal and cover	TERMINAL-COVER (HERM-COVER)	1	1	BB0041336	BB0036762A	YES			
	RUBBER PLATE	1	1	3CYCA4999	3TKEA5983A	YES			
	NUT	1	1	3CYC62897	3SMGA5984A	YES			
	BUSH	1	1	BB0007021		YES			
Electrical parts	E-BOX	M	F	BB0000406	BB0000405				
	START CAPACITOR	(1)	-	3CYCA3791	60µF/450V				
	DISCHARGE RESISTANCE ^[8]	-	(1)	3CYCA4980	75µF/400V				
	RUNNING CAPACITOR	(1)	-	3CYCA3790	45µF/450V	YES			
	STARTING RELAY	-	(1)	3CYCA4981	55µF/450V	NO			
	STARTING RELAY	(1)	(1)	3CYCA1986	AMVL-250V2				
	START CAPACITOR	1	-	3CYCA3791	60µF/450V	-	YES		
	DISCHARGE RESISTANCE ^[8]	-	1	3CYCA4980	75µF/400V	-	YES		
	RUNNING CAPACITOR	1	-	3CYCA3790	45µF/450V	-	YES		
	STARTING RELAY	-	1	3CYCA4981	55µF/450V	-	YES		
	STARTING RELAY	1	1	3CYCA1986	AMVL-250V2	-	YES		
	Cycle parts	CAPILLARY FOR LIQUID INJECTION ^[9]	1	1	BB0032682B	Resistance value 13.3kPa	YES		
ACCUMULATOR		2	2	3CYCA5055	2PDP62110A valid volume 1060mL (530mLX2)	YES	NO	YES	NO

[note 8]

A discharge resistance has been attached to the starting capacitor.

[note 9]

The recommended resistance value for the injection capillary is the result of the matching trial using our calorimeter.

Since proper capillary specification will depend on refrigeration cycle, please conduct a matching test installed in your product subject to the following conditions.

- (1) To satisfy the over load coil temperature: 115°C or lower. (preferably about 100°C max)
- (2) To apply the Injection capillary resistance value considering the appropriate amount of injection resulting in the best performance in the cooling capacity and input value.

3. APPLICATION RANGE

1. Scope

This specification is applied to HITACHI scroll compressor.

2. Common specification of compressor

2.1 Appearance

The surface of compressor shall be painted black and has no cracks, dents, peeling, or significant rust.

2.2 Marking

Model name and production date should be shown on the surface of compressor. The compressor containing refrigeration oil and dried N₂ gas has one white circle mark and one yellow circle mark.

2.3 Insulation distances

IEC60335-2-34 are applied.

2.4 Insulation resistance

Measurement should be above 10 MΩ between charged parts and non-charged parts by 500 V insulation resistance meter at normal temperature and normal humidity.

2.5 Dielectric Withstand Voltage Test

After 2.4 test, 1500 V A/C 50 Hz or 60 Hz is applied between live parts and dead metal parts continuously for one minute by gradual rise of voltage. In case of 1800 V, duration is one second instead of one minute.

2.6 Maximum allowable Pressure and Test Pressure

TABLE 2 Test Pressure

Components	Maximum allowable Pressure [abs]		Tightness Test pressure [abs]	Strength test Pressure(type-test) [abs]
	R404A	R449A		
Refrigerant	R404A	R449A	R404A, R449A	R404A, R449A
Compressor	3.19MPa	3.163MPa	3.24MPa	15.79MPa

2.7 Dryness

Residual water content is below 0.18mL by the cold trap method described below:

TABLE 3 Cold trap method

Item	Condition
Furnace	146 ± 3 °C
Pre-heat hour	No pre-heat
Hour of taking water (Preheating time excluded)	6 hours
Degree of vacuum (Continuous vacuum)	Below 133 Pa [abs]
Solvent for cold bath	Methanol
Coolant for cold bath	Dry ice

2.8 Cleanliness

Drain the refrigerant oil. Pour washing liquid into the compressor. Lay down and roll the compressor and drain washing liquid. Filtrate by filter paper. The trapped particles should be under 70 mg.

3. System design limitations

3.1 Observance of the specification

The compressor should always be operated under the condition set forth in this specification and it should not be operated under any other specifications. Accessories should also be used as specified. In addition, the specified parts should be used during servicing.

Circuit breaker (or fuse) and earth leakage circuit breaker should be connected to main electric circuit.

3.2 Power source voltage

Voltage applied to the hermetic terminal should be within the range mentioned in this specification.

In the case of 3 phases electric power source, the unbalance of the voltage between each phase must be used within 3%.

Unbalance = $\frac{\text{Max.deviation voltage} - \text{Ave.voltage}}{\text{Average voltage}} \times 100(\%)$ Furthermore, in the case of 3 phases electric power

source, the wiring for reverse rotating caused by two phases replacement must not be used. The damage of the compressor caused by the reverse rotating is out of warranty. If wiring may cause reverse rotating, the direction relay listed on the list of equipment and materials must be connected.

3.3 Operating temperatures and pressures

Suction pressure and discharge pressure should be within the range of Fig 4, 5. (page 14, 15)

The pressure difference between discharge and suction is shown in TABLE 4.

[Oil supply system in compressor doesn't work without this pressure difference.]

TABLE 4

Model	DS1529X1,DS1834X1
Discharge pressure—Suction pressure (MPa)	0.61

The operating temperatures of a compressor should be within the range shown in the following section 3.4 - 3.7.

3.4 Compressor case bottom temp

6 degrees higher than condensing temperature. (Refer to Fig attached with 3.10.)

3.5 Motor winding temp. (Measured by the resistance method)

(1) Standard load condition

Rated voltage ; 105°C MAX

Rated voltage ±10% ; 115°C MAX

(2) Overload condition^[10]

Rated voltage ±7.5% ; 115°C MAX

Winding temperature being lower than 115°C by liquid injection-cooling in any kind of environment.

Please be careful to temperature rises by the sunlight.

3.6 Suction pipe temp.

Higher than outlet pipe of evaporator

[note 10]

Overload condition should not be continuous.

3.7 Temperature and pressure at blocked fan condition

To avoid problem of fire, discharge pressure should be under 4.22MPa[abs].

3.8 Compressor ambient temperature

The compressor should be operated within the ambient temperature range that satisfies the motor winding temperature requirements shown previously Section 3.3. This compressor should be used in the place that the ambient temperature is above -10 °C. Please confirm the starting of compressor, when the temperature of compressor surface is -10 °C.

Under -10°C ambient temperature, in the case that the temperature of compressor surface is above -10°C by the crankcase beating etc, you can use the compressor if the starting is possible.

3.9 Operating and Shut-off interval

The compressor should not be started/stopped more than 6 times per hour. The compressor should be operated continuously at least for 5 minutes after being turned on. Allow a minimum of 3 minutes shut-off time before restarting.

Compressor should be started on the condition that pressure status of high/low pressure sides is balanced.

3.10 Oil level of compressor

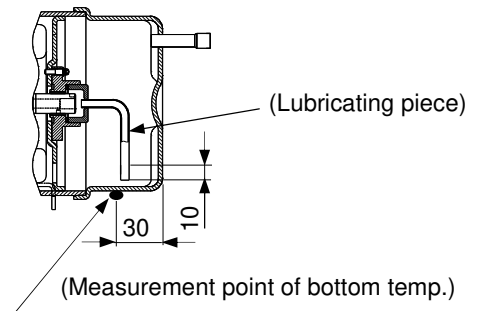
Oil level of compressor should be higher than 10 mm from the lubricating piece fixed on the end of the crankshaft.

We recommend to check oil level using compressor with sight glass. We can supply the compressor with sight glass by your order. (In case of foaming situation, the height of this foam does not mean the height of the oil level.)

If the oil level is not kept, the oil shortage will occur, and influence the reliability of compressor.

To keep oil level, following points are important.

- 1) Oil should be returned continuously to the compressor.
- 2) The compressor should be operated continuously at least for 5 minutes after being turned on. (see Clause 3.9)
- 3) Liquid refrigerant must not flood back to the compressor.
Oil may flow out of the compressor if liquid refrigerant back.
- 4) The pressure difference between discharge and suction is shown in TABLE 4. (see Clause 3.3)



3.11 Liquid refrigerant back Accumulator

There should be superheated gas returned to the compressor under all normal operating conditions.

Liquid refrigerant must not flood back to the compressor.

Liquid back damages the compressor.

We recommend to use the accumulator to prevent liquid back to the compressor.

When knocking noise, current increase and undesirable vibration are caused, another accumulator should be equipped to the compressor and/or refrigerant charge should be reduced to prevent liquid refrigerant flood back.

Liquid level in the accumulator should be maintained smaller than the valid volume of accumulator. (see Fig 2)

We recommend to check liquid level in the accumulator using accumulator with sight glass.

We can supply the accumulator with sight glass by your order.

The accumulator must have a hole to return oil. If you use a non-specified accumulator, to prevent harm to oil return, please check size and location of oil return hole. Please refer to the drawing of accumulator.

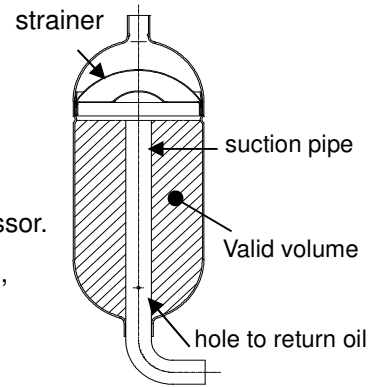


Fig 2

3.12 Strainer

Strainer should be equipped to avoid insert foreign bodies.

We can supply the accumulator with a strainer by your order.

In case of using an accumulator without a strainer, a strainer should be added to a tube on suction side.

3.13 Allowable incline

Compressor should be operating in the horizontal rotating shaft. But the inclination of shaft is within 3 deg in every direction. In case of the hermetic terminal side in the shaft direction is higher than horizontal, it should be kept up to 5 deg.

3.14 Pipe vibration

The displacement of the pipes, which connect from the compressor to other parts of the refrigeration systems, should be less than 0.8 mm (1/32") when the compressor is operating at rated frequency +10 / -10 and voltage range of rate $\pm 10\%$.

Displacement in excess of 0.8 mm (1/32") will require changing tube length and/or routing.

3.15 Connecting tube design

in designing and routing tubing that connects the compressor to the other parts of the air conditioner, the following should be considered.

Moving tubes to the moving parts;
 minimum clearance 12.7 mm (1/2")

Moving tubes to non-moving parts ;
 minimum clearance 9.5 mm (3/8")

Moving tubes never touch the electrical lead wires.

3.16 Dust of hermetic terminal

Hermetic terminal area should be covered with the electrical cover by the designated method to prevent the entering of dust.

3.17 Rotation direction of compressor

Connect compressor terminals as specified in circuit diagram. Reverse operation will result pump breakdown.

3.18 Internal over load protector (OLP).

Although an OLP that Hitachi selected is installed in this compressor, the current and temperature may not be appropriated for the structure or design of the unit in which the compressor will be mounted. Unit-mounting matching tests should therefore be conducted and checks should be performed to ensure that the requirements listed as item (1) and (2) below are satisfied.

(1) OLP non-operating test:

The provisions of section 3.3 should be satisfied.

(2) OLP operating test (trouble-assuming test):

When the compressor ambient temperature is $23\pm 2^{\circ}\text{C}$, the winding temperature should not exceed 190°C at rated voltage $\pm 6\%$, and when the compressor ambient temperature is $0\pm 2^{\circ}\text{C}$, the winding

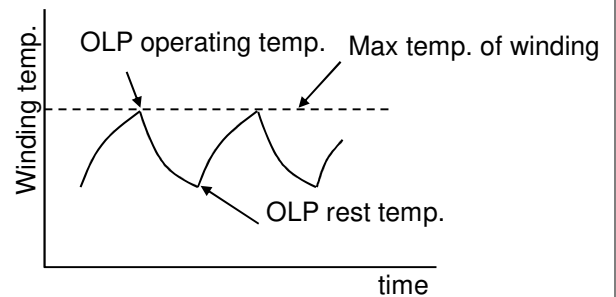


Fig 3

temperature should not exceed 240°C at 85% rated voltage, and when the compressor ambient temperature is $40\pm 2^{\circ}\text{C}$, the winding temperature should not exceed 190°C at the rated voltage $\pm 6\%$.

Supplementary description;

- ① Exception for the value in transitional states.
- ② The motor winding temperature should be measured using the resistance method.
- ③ The tests should be terminated when the total number of OLP operations or the total OLP operating time reaches 10,000 (time) or 15 days, which ever comes first.

But OLP is equipped in order to avoid the problem of fire. It's not for a restriction of coil temperature, 115°C MAX.

4. Process limitations

4.1 The degree of vacuum in the refrigerating system should be less than 133 Pa[abs] at room temperature just before charging refrigerant.

The reference quantity of water in the refrigerating system is less than 0.2g.

The quantity of water the cycle in operation is to make to the 40 ppm following in the refrigerating cycle by using the suitable dryer that does not contain ACTIVATED ALUMINA.

4.2 The structure of cycle constitution or drier should be done so that the powder of the drying material does not come out throughout the cycle.

4.3 The weight of foreign particles on the inside surface of the heat exchange tubes should be less than 0.05 g/m². This value means the weight of foreign particles filtered after washing inside surface of the heat exchange tubes with alkali.

Metallic dust should not be permitted to enter the refrigerating system.

4.4 Eliminate all system contaminates such as trichloroethane, alkalis, soaps, acids, oil and washing fluid used in machining the heat exchanger.

4.5 Always purge the compressor with dry nitrogen during assembly of the system.

4.6 The quantity and kind of contamination (the process materials) in the cycle should be grasped and managed.

Carry on reliability test that Input contamination a lot than anticipated contamination quantity.

4.7 The motor winding temperatures should be less than 149 °C in process of manufacturing the refrigerating system. The temperature of the hermetic terminal body should be less than 177 °C.

4.8 The compressor should be operated for more than 20 seconds within 15 minutes after refrigerant is put into the system so that proper lubrication of the pump can occur.

5. Miscellaneous

5.1 The pipe and hermetic pins, which are attached to the compressor, should not be bent.

5.2 The compressor should never be operated while under vacuum; otherwise, internal arcing can damage parts.

5.3 The compressor should not be operated in a method that forms a vacuum and absorbs air.

5.4 The compressor should not be left open to the atmosphere for more than 15 minutes.

5.5 The electric pulse should not be applied to the hermetic terminals when the compressor is under vacuum.

5.6 The compressor should be kept in a clean place with low-moisture.

5.7 The compressor must not be applied for transportation equipment such as automobiles, trains, ships, and the others.

5.8 The compressor should not be splashed intentionally with water.

5.9 Refrigerant should be charged from the condenser end of the refrigeration system. Never charge refrigerant to the compressor directly.

5.10 Temperatures within systems during stable compressor operation should not be less than -45 °C to prevent wax precipitation from the oil.

5.11 The compressor, if dropped, should not be used.

5.12 Compressor mounting

Rubber grommets are designed soft to provide noise isolation and to lessen vibration energy transmission. Stud bolt should be designed to provide sufficient clearance for noise and vibration isolation and to prevent compressor from coming off its mount.

5.13 The first starting voltage supplied to the refrigerating system should be more than the starting voltage mentioned TABLE 1. (Page 4)

Because the viscosity of the oil may be high at first starting until the refrigerant dissolves in the oil.

5.14 The compressor should be kept out of a corrosive atmosphere, such as a chemicals storage area.

5.15 The lead wires should be connected to the hermetic terminals without touching the surface of the compressor.

5.16 The compressor should be used within one year of receipt.

5.17 The failure of refrigeration system components such as the reversing valve, solenoid valve, defrost mechanism, refrigerant control parts, fan motor, etc. may cause failure of the compressor. Reliability of those components should be checked.

A design that insures no leakage during manufacturing and usage should be applied.

5.18 The refrigerating cycle should be grounded.

5.19 The failure of accessory parts (ex. Capacitor) utilized by the customer is not related to Hitachi-Johnson Controls Air Conditioning, Inc.

5.20 The person who is directly in charge of setting up the product or repair of the product should be well instructed to prevent contamination of this product by water or other foreign matters.

When recharging refrigerator, dryer must be changed. And water value should be less than 40 ppm.

5.21 When connecting terminals of the unit to the hermetically sealed terminals of the compressor, the parts must not be obliquely connected or twisted after connection, fastening force of the terminals would be reduced.

5.22 Modifications and additions

If modifications or additions are to be made to the items provided for in this specification, both companies shall immediately report the details of those modifications or additions, together with the reasons for them, in writing before performing the modifications or additions.

5.23 Occurrence of problems

If problems occur after delivery, both companies shall immediately list those problems. After reporting, a solution to these problems will be sought and reported.

Hitachi-Johnson Controls Air Conditioning, Inc. has no obligation duty for the problem in the case that the user didn't obey this compressor using specification & criteria.

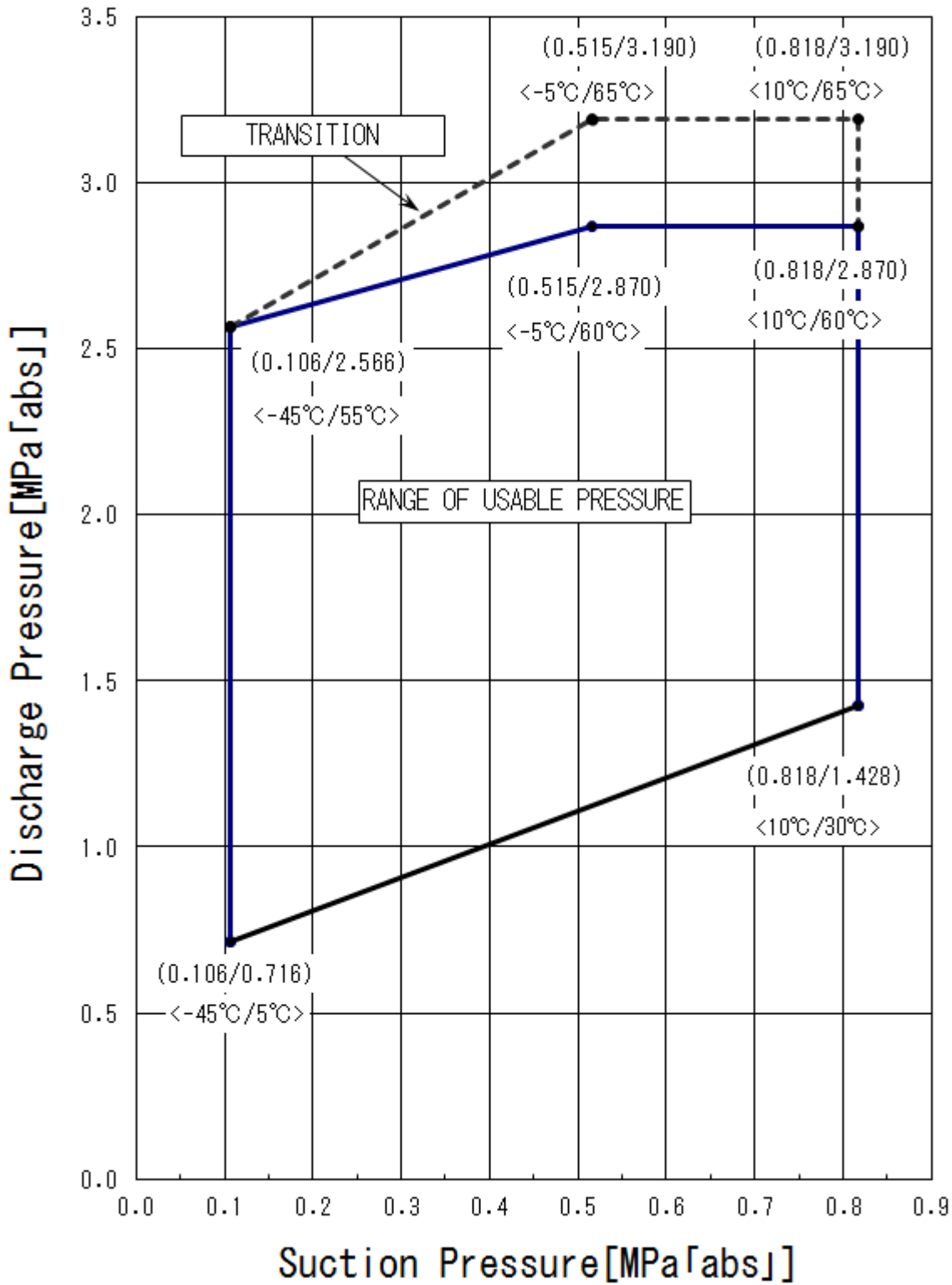
5.24 Term of Validity

This specification shall go into effect from the date that the user signs the specification.

6. RANGE OF USABLE PRESSURE

REFRIGERANT : R404A

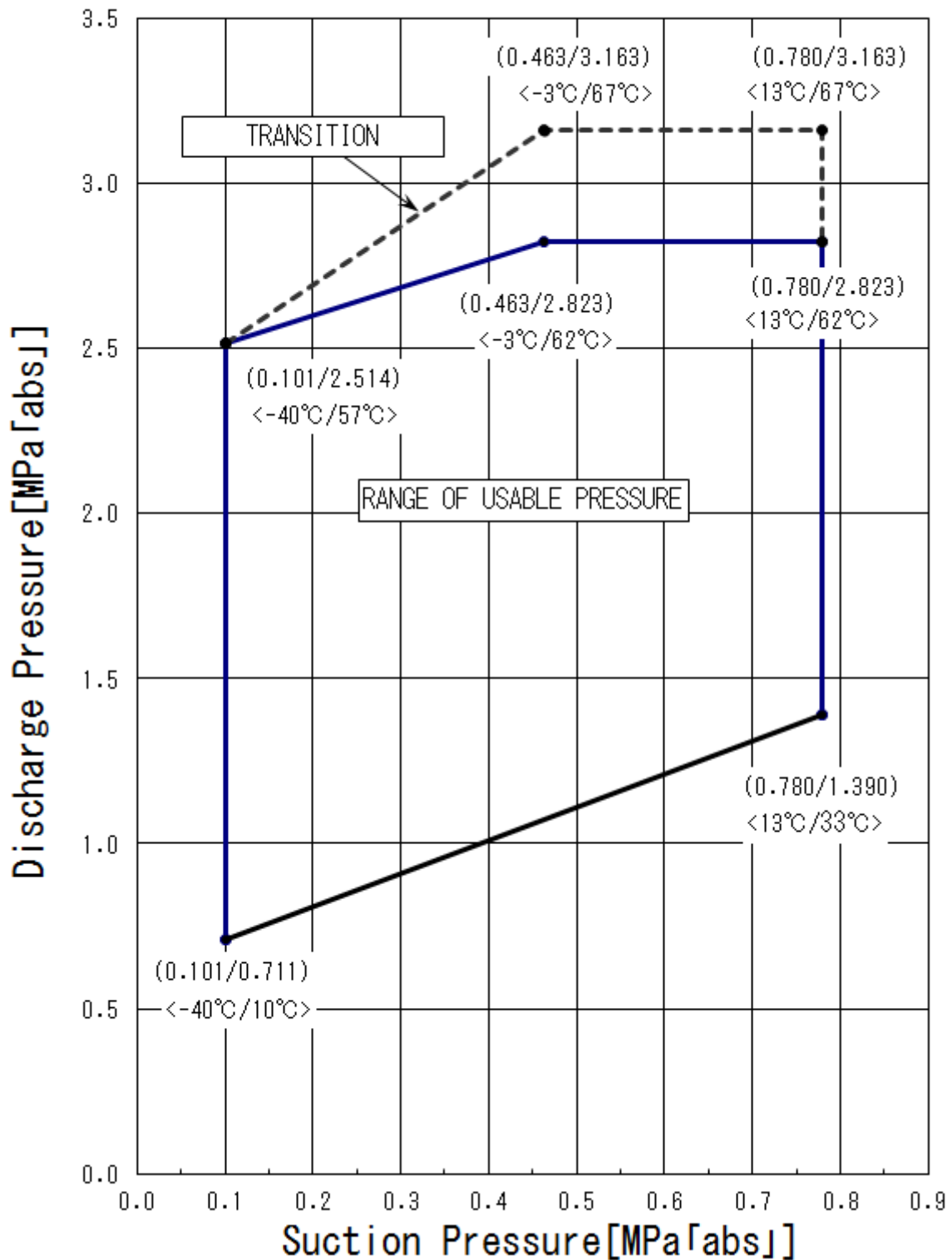
Model : DS1529X1 , DS1834X1



(Suction pressure / Discharge pressure (MPa[abs]))
 < Evaporation Temp / Condensing Temp [°C] >

Fig 4

REFRIGERANT : R449A
 Model : DS1529X1,DS1834X1



(Suction pressure / Discharge pressure (MPa[abs]))
 < Evaporation Temp / Condensing Temp [°C] >

Fig 5

7. PERFORMANCE DATA

Model : DS1529X1 Refrigerant: R404A

Refrigerant	R404A
Power Supply	1PH/208V/60Hz
Sub Cooling	0 K
Return Gas Temp.	18 °C
Cooling	Fan Cooling+Liquid Injection

Cooling capacity[W]

Calculated values

Condensing Temp. °C	Evaporating Temp.°C											
	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	906	1,146	1,451	1,822	2,258	2,759	3,327	3,960	4,660	5,426	6,259	7,165
40	856	1,067	1,341	1,680	2,082	2,550	3,081	3,676	4,337	5,062	5,853	6,711
45	807	987	1,232	1,538	1,907	2,340	2,834	3,393	4,014	4,698	5,446	6,257
50	773	921	1,130	1,399	1,727	2,115	2,563	3,071	3,638	4,265	4,949	5,693
55	739	855	1,028	1,260	1,546	1,891	2,292	2,750	3,263	3,831	4,453	5,128

Motor Input[W]

Calculated values

Condensing Temp. °C	Evaporating Temp.°C											
	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,176	1,215	1,255	1,295	1,334	1,373	1,412	1,451	1,491	1,530	1,569	1,608
40	1,279	1,323	1,368	1,412	1,457	1,500	1,544	1,589	1,633	1,677	1,720	1,764
45	1,382	1,431	1,481	1,530	1,580	1,628	1,676	1,726	1,774	1,823	1,871	1,920
50	1,513	1,560	1,618	1,670	1,722	1,774	1,825	1,877	1,928	1,980	2,030	2,081
55	1,644	1,690	1,755	1,810	1,865	1,920	1,974	2,028	2,082	2,136	2,189	2,242

Current[A]

Calculated values

Condensing Temp. °C	Evaporating Temp.°C											
	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	6.2	6.4	6.5	6.7	6.8	7.0	7.1	7.3	7.4	7.6	7.7	7.9
40	6.6	6.8	6.9	7.1	7.3	7.5	7.6	7.8	8.0	8.2	8.3	8.5
45	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.1
50	7.5	7.7	7.9	8.1	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8
55	8.0	8.3	8.5	8.7	8.9	9.2	9.4	9.6	9.8	10.1	10.3	10.5

Model : DS1529X1 Refrigerant: R449A

Refrigerant	R449A
Power Supply	1PH/208-V/60Hz
Sub Cooling	0 K
Return Gas Temp.	18 °C
Cooling	Fan Cooling+Liquid Injection

Cooling capacity[W]

Calculated values

Condensing Temp. °C	Evaporating Temp.°C										
	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,001	1,288	1,640	2,060	2,550	3,113	3,746	4,455	5,238	6,097	7,036
40	945	1,206	1,533	1,927	2,390	2,923	3,529	4,207	4,961	5,789	6,695
45	888	1,126	1,426	1,794	2,230	2,735	3,312	3,961	4,686	5,485	6,361
50	845	1,053	1,323	1,656	2,056	2,523	3,061	3,667	4,347	5,098	5,923
55	804	982	1,221	1,521	1,885	2,315	2,813	3,378	4,015	4,721	5,499

Motor Input[W]

Calculated values

Condensing Temp. °C	Evaporating Temp.°C										
	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,117	1,153	1,189	1,226	1,263	1,302	1,343	1,387	1,432	1,481	1,535
40	1,219	1,259	1,300	1,341	1,383	1,426	1,472	1,520	1,571	1,625	1,685
45	1,322	1,367	1,411	1,458	1,504	1,552	1,603	1,655	1,712	1,771	1,836
50	1,445	1,497	1,544	1,593	1,643	1,694	1,748	1,803	1,863	1,925	1,993
55	1,569	1,628	1,679	1,731	1,784	1,838	1,894	1,953	2,015	2,080	2,149

Current[A]

Calculated values

Condensing Temp. °C	Evaporating Temp.°C										
	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	5.9	6.1	6.2	6.3	6.5	6.6	6.8	7.0	7.1	7.3	7.5
40	6.3	6.5	6.6	6.8	6.9	7.1	7.3	7.5	7.7	7.9	8.2
45	6.7	6.9	7.0	7.2	7.4	7.6	7.8	8.0	8.3	8.5	8.8
50	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.7	8.9	9.2	9.5
55	7.7	7.9	8.1	8.4	8.6	8.8	9.0	9.3	9.5	9.8	10.1

Model : DS1834X1 Refrigerant: R404A

Refrigerant	R404A
Power Supply	1PH/208V/60Hz
Sub Cooling	0 K
Return Gas Temp.	18 °C
Cooling	Fan Cooling+Liquid Injection

Cooling capacity[W]

Calculated values

Condensing Temp. °C	Evaporating Temp. °C											
	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,100	1,354	1,697	2,126	2,646	3,254	3,953	4,740	5,616	6,583	7,641	8,796
40	1,024	1,252	1,563	1,956	2,431	2,989	3,629	4,352	5,157	6,046	7,020	8,079
45	948	1,151	1,430	1,785	2,216	2,723	3,305	3,964	4,699	5,509	6,398	7,362
50	862	1,039	1,289	1,610	2,003	2,466	3,000	3,606	4,282	5,028	5,844	6,729
55	776	928	1,148	1,436	1,789	2,209	2,695	3,247	3,865	4,547	5,291	6,097

Motor Input[W]

Calculated values

Condensing Temp. °C	Evaporating Temp. °C											
	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,388	1,420	1,452	1,483	1,515	1,547	1,578	1,610	1,642	1,673	1,705	1,737
40	1,511	1,552	1,593	1,633	1,674	1,714	1,754	1,795	1,835	1,875	1,915	1,955
45	1,635	1,685	1,733	1,783	1,833	1,881	1,930	1,979	2,027	2,076	2,124	2,173
50	1,747	1,804	1,870	1,932	1,993	2,153	2,115	2,176	2,198	2,297	2,356	2,415
55	1,859	1,923	2,007	2,081	2,154	2,426	2,300	2,373	2,370	2,517	2,587	2,658

Current[A]

Calculated values

Condensing Temp. °C	Evaporating Temp. °C											
	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	7.1	7.2	7.3	7.4	7.5	7.7	7.8	7.9	8.0	8.1	8.3	8.4
40	7.5	7.6	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	9.0	9.2
45	7.9	8.1	8.3	8.5	8.7	8.9	9.1	9.3	9.4	9.6	9.8	10.0
50	8.6	8.8	9.0	9.1	9.3	9.5	9.7	9.9	10.0	10.2	10.4	10.6
55	9.3	9.5	9.6	9.8	10.0	10.1	10.3	10.5	10.6	10.8	11.0	11.1

Model : DS1834X1 Refrigerant: R449A

Refrigerant	R449A
Power Supply	1PH/208V/60Hz
Sub Cooling	0 K
Return Gas Temp.	18 °C
Cooling	Fan Cooling+Liquid Injection

Cooling capacity[W]

Calculated values

Condensing Temp. °C	Evaporating Temp. °C										
	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,185	1,508	1,917	2,417	3,010	3,699	4,484	5,368	6,353	7,440	8,633
40	1,110	1,407	1,785	2,249	2,800	3,442	4,174	5,000	5,921	6,939	8,056
45	1,035	1,307	1,655	2,083	2,592	3,186	3,867	4,635	5,492	6,442	7,482
50	953	1,200	1,522	1,919	2,396	2,952	3,591	4,314	5,124	6,020	7,003
55	871	1,095	1,391	1,758	2,202	2,722	3,321	4,001	4,765	5,610	6,539

Motor Input[W]

Calculated values

Condensing Temp. °C	Evaporating Temp. °C										
	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	1,297	1,327	1,356	1,388	1,421	1,454	1,490	1,528	1,568	1,611	1,660
40	1,425	1,462	1,500	1,539	1,579	1,621	1,665	1,710	1,759	1,811	1,869
45	1,554	1,598	1,644	1,691	1,738	1,788	1,840	1,893	1,951	2,012	2,079
50	1,670	1,731	1,788	1,845	1,994	1,965	2,027	2,058	2,162	2,235	2,314
55	1,787	1,864	1,932	2,000	2,252	2,143	2,217	2,224	2,375	2,459	2,550

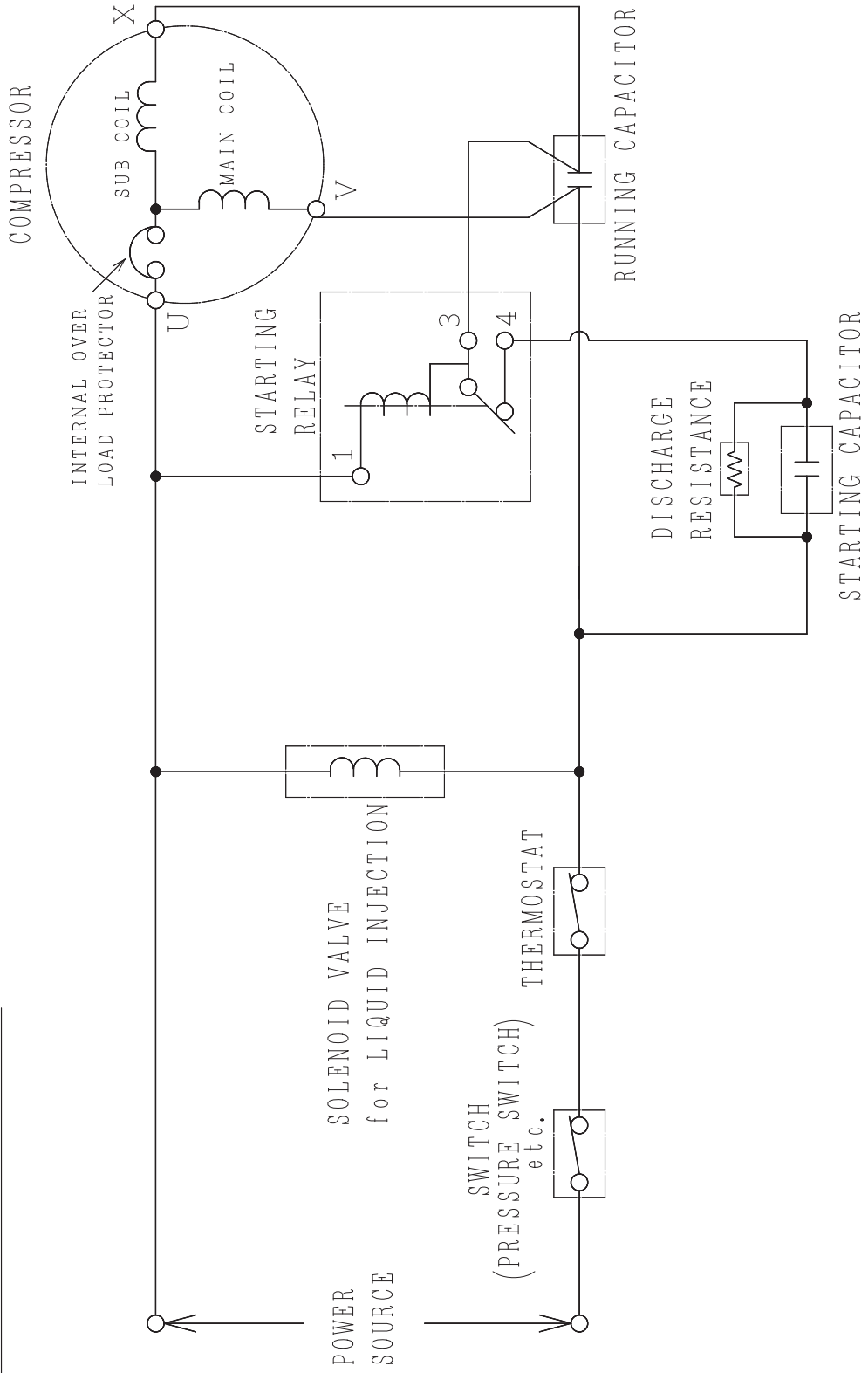
Current[A]

Calculated values

Condensing Temp. °C	Evaporating Temp. °C										
	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
35	6.6	6.7	6.8	6.9	7.1	7.2	7.3	7.5	7.6	7.8	8.0
40	7.0	7.2	7.3	7.5	7.6	7.8	8.0	8.2	8.4	8.6	8.8
45	7.5	7.7	7.8	8.0	8.2	8.4	8.6	8.8	9.1	9.3	9.6
50	8.1	8.3	8.5	8.7	8.8	9.0	9.2	9.4	9.6	9.9	10.1
55	8.8	9.0	9.1	9.3	9.4	9.6	9.8	10.0	10.2	10.4	10.7

BB0041918

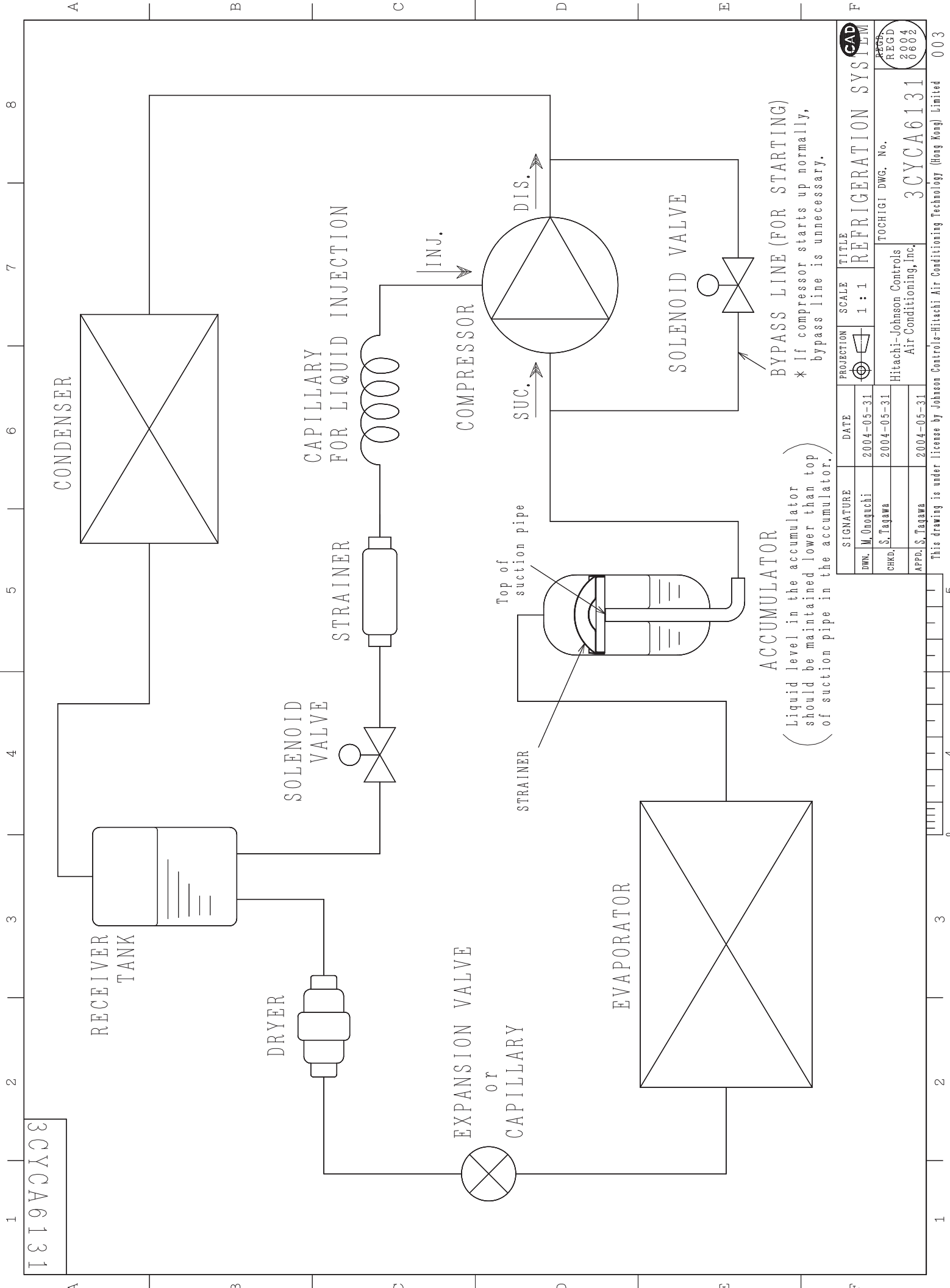
SINGLE-PHASE POWER



SIGNATURE		DATE	PROJECTION	SCALE	TITLE
DWN.	K. Habu	2013-11-28		NTS	CIRCUIT DIAGRAM
CHKD.	K. Matsunaga	2013-11-28			
APPD.	M. Onouchi	2013-11-28			
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CAD
REGD
2013
1128

TOCHIGI DWG. No.
Hitachi-Johnson Controls
Air Conditioning, Inc.
3CYCBB0041918



3CYCA6131

BYPASS LINE (FOR STARTING)
 * If compressor starts up normally,
 bypass line is unnecessary.

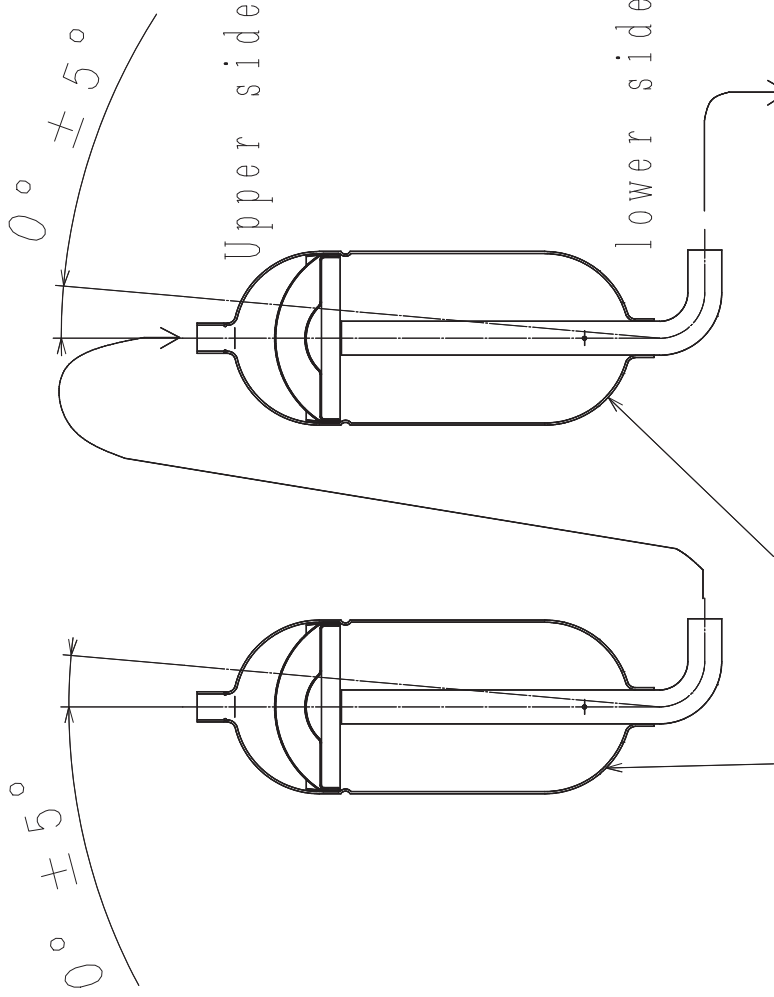
ACCUMULATOR
 (Liquid level in the accumulator
 should be maintained lower than top
 of suction pipe in the accumulator.)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. M. Onoguchi	2004-05-31		1 : 1	REFRIGERATION SYSTEM
CHKD. S. Tagawa	2004-05-31			
APPD. S. Tagawa	2004-05-31			

Hitachi-Johnson Controls
 Air Conditioning, Inc.
 TOCHIGI DWG. No. 3CYCA6131

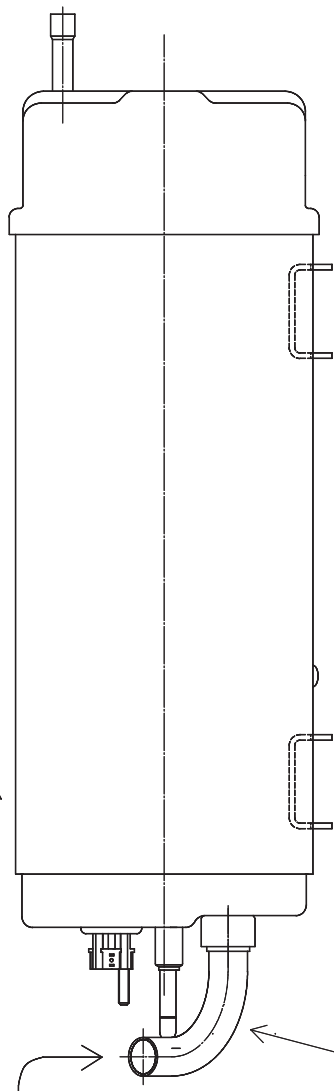
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3CYCA6121



The accumulator should be connected between discharge pipe of evaporator and suction pipe of compressor. The allowable incline should be less than 5°. The two accumulators should be connected in series like the figure.

COMPRESSOR



Suction pipe of compressor

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. F. Nishioka	2004-05-26	First Angle	1 : 2	CONNECTING SKETCH OF ACCUMULATOR
CHKD. M. Onoguchi	2004-05-26			
APPD. S. Tagawa	2004-05-26			

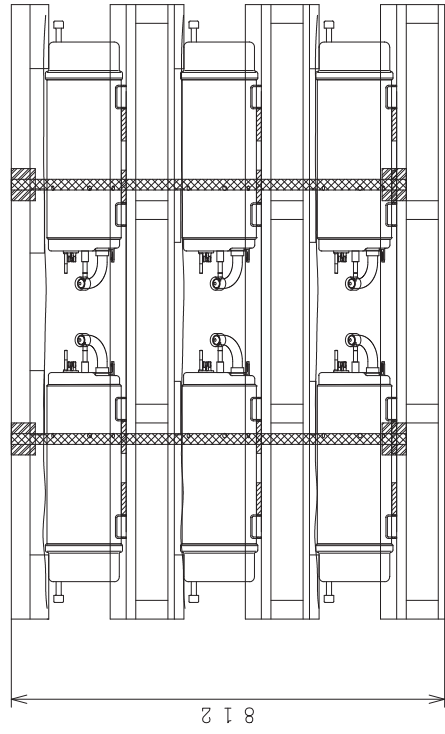
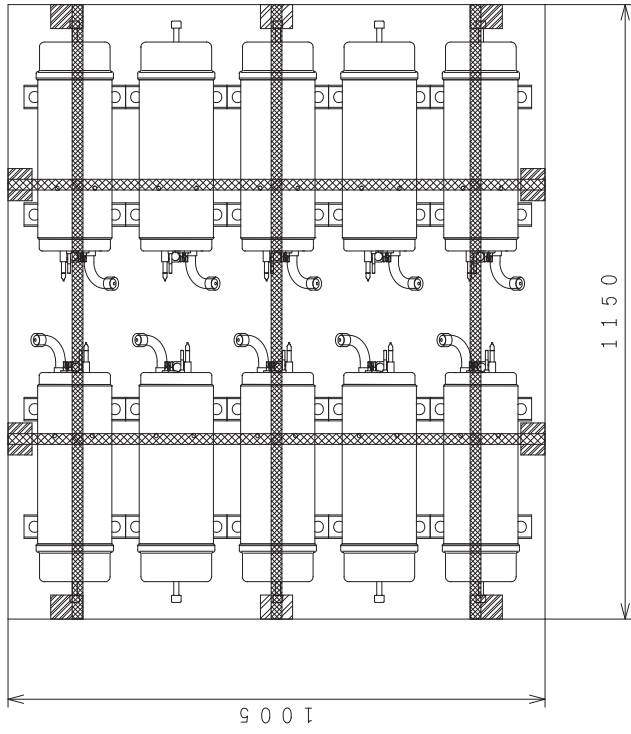
CAD
REGD
2004
0527

TOCHIGI DWG. No. 3CYCA6121

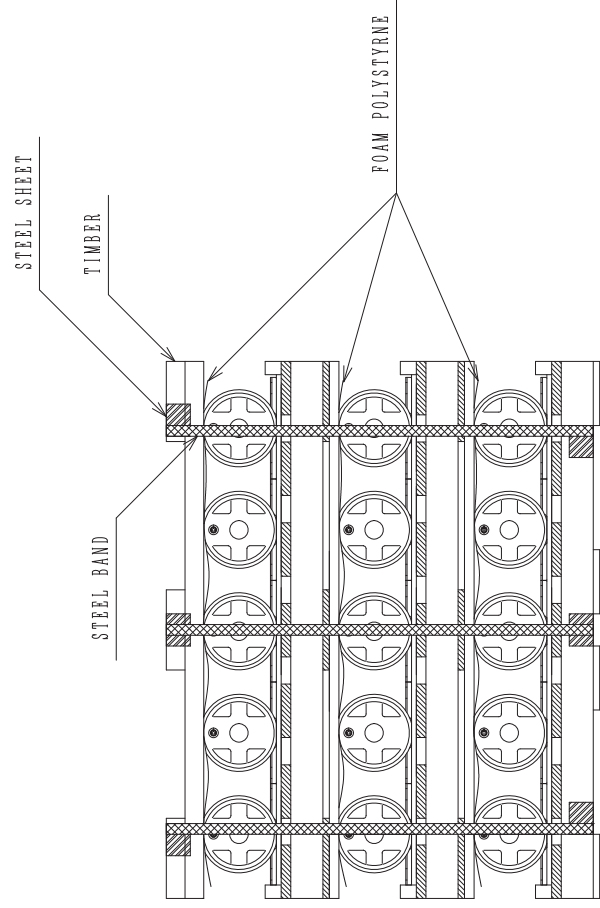
Hitachi-Johnson Controls Air Conditioning, Inc.

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BB004458



MODEL	INCLUDED NUMBER	NUMBER OF STEPS	GROSS WEIGHT (kg)
DS1836S1	30	3	760
DS1529S1			
DS1529V1	30	3	760
DS1529X1			
DS1834S1	30	3	760
DS1834V1			
DS1834X1			
DS2244V1	30	3	790



SIGNATURE	DATE	PROJECTION	SCALE	TITLE
	2014-04-28	⊕	1:10	DS COMPRESSOR PACKING SKETCH
DWN. K. Habu	2014-04-28			
CHKD. K. Matsunaga	2014-04-28			
APPD. M. Onouchi	2014-04-28			
Hitachi Appliances, Inc. Tokyo Japan		TOCHIGI DWG. No.		REGD 2014 0428
3CYCBB004458				

100

5

6

7

8

0

1

2

3

4

5

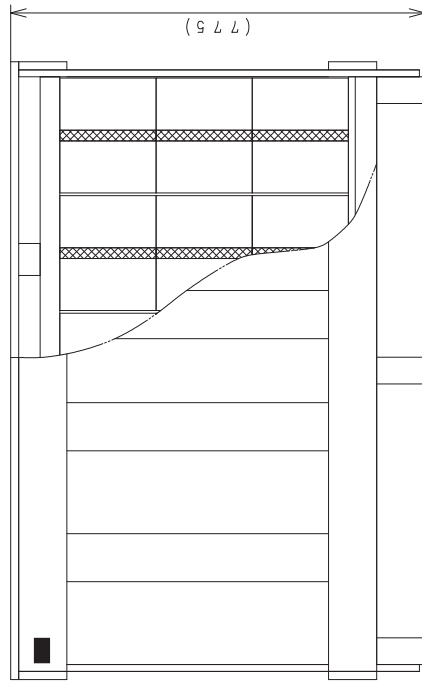
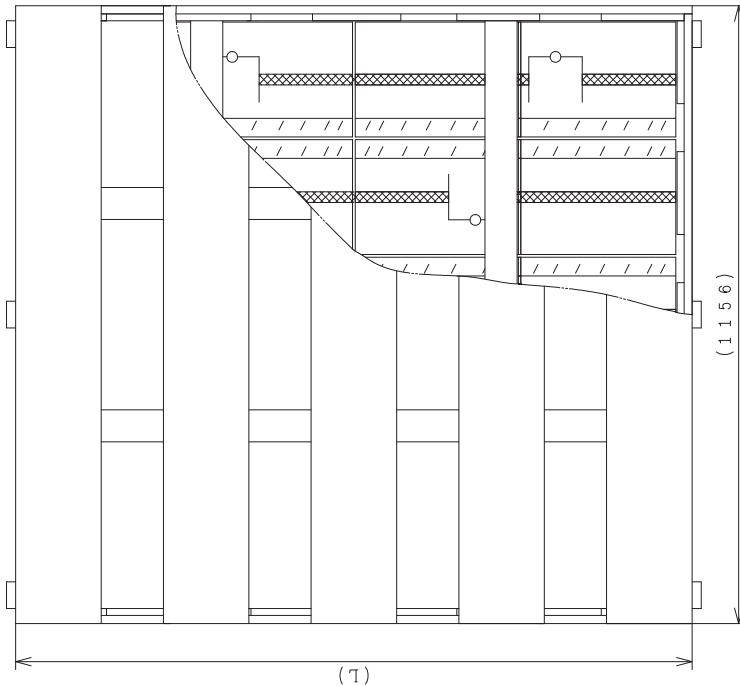
6

7

8

002

BB004459



TIMBER

CARDBOARD BOX

MODEL	INCLUDED NUMBER	NUMBER OF STEPS	L	GROSS WEIGHT (kg)
DS1836S1	30	3	1266	770
DS1529S1	30	3	1266	770
DS1529V1	30	3	1266	770
DS1529X1	30	3	1266	770
DS1834S1	30	3	1266	770
DS1834V1	30	3	1266	770
DS1834X1	30	3	1266	770
DS2244V1	30	3	1366	810

SIGNATURE		PROJECTION	SCALE	TITLE
DWN. K. Habu	DATE 2014-04-29	1st Angle	1 : 10	DS COMPRESSOR PACKING SKETCH
CHKD. K. Matsuura	DATE 2014-04-29			
APPD. M. Onouchi	DATE 2014-04-29			
Hitachi Appliances, Inc. Tokyo Japan		TOCHIGI DWG. No.		REGD 2014 0429
		3CYCBB004459		

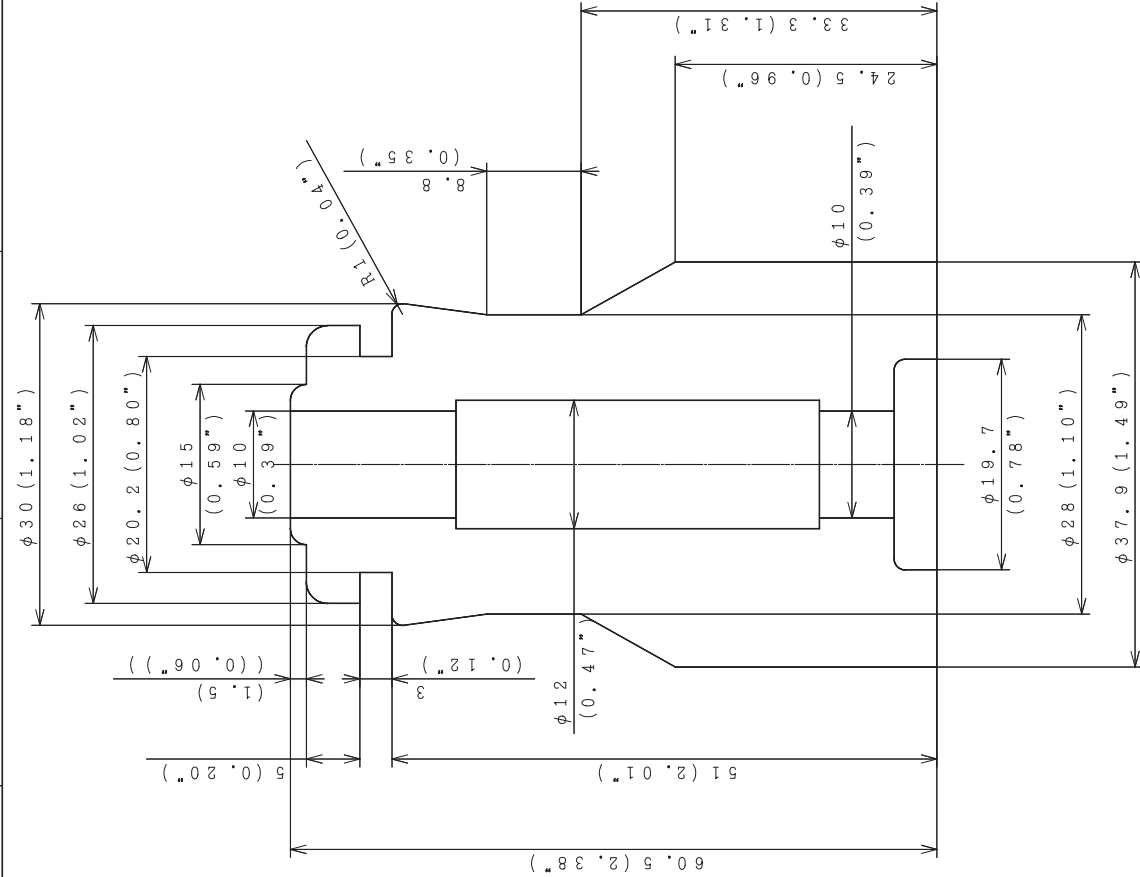
100

6

7

002

3CYC62866



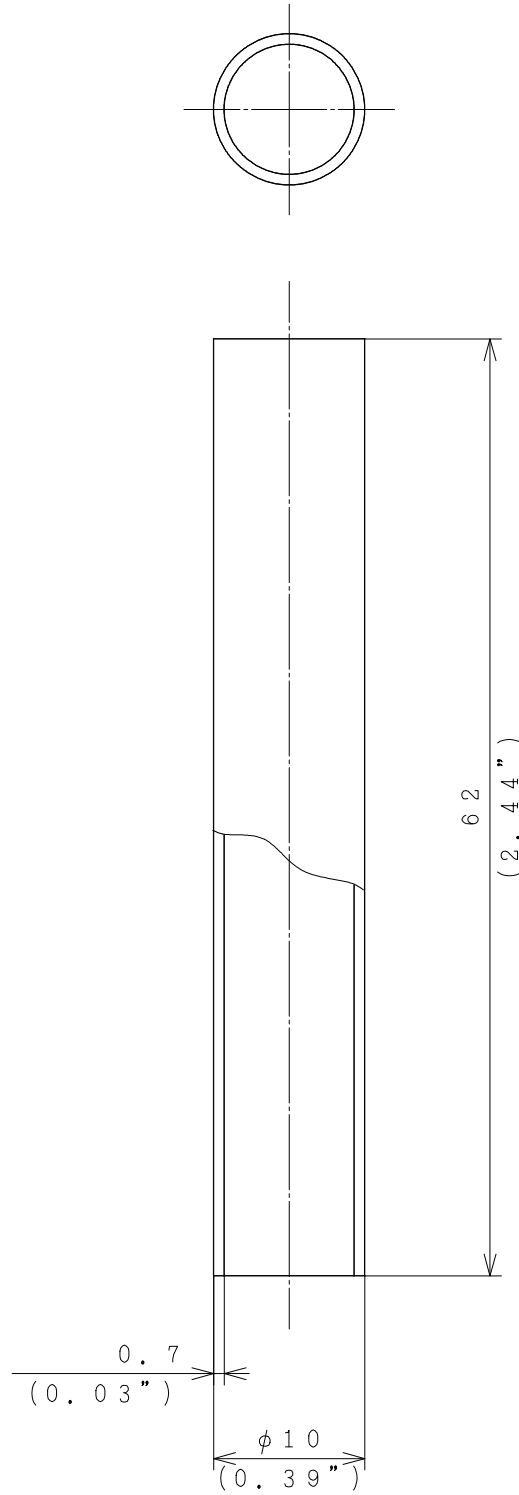
MATERIAL: NATURAL RUBBER

COLOR : BLACK


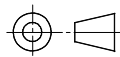
DIMENSION: mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE	CAD
DWN. Y. Nakada	1992-05-13		2 : 1	RUBBER GROMMET	
CHKD. K. Sekiguchi	1992-05-13				
APPD. Y. Serizawa	1992-05-13				
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				3CYC62866	

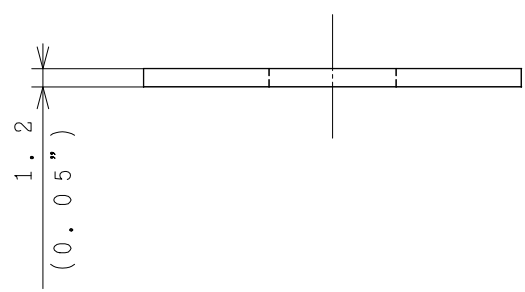
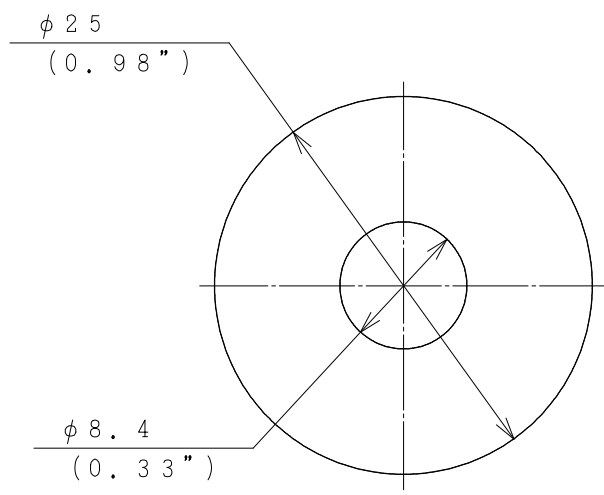
4CYC11219




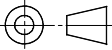
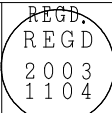
MATERIAL : STEEL PIPE
 DIMENSION : mm (i n)

SIGNATURE		DATE	PROJECTION	SCALE	TITLE	
DWN.	F. Nishioka	2003-10-27		2 : 1	PIPE	
CHKD.	M. Onoguchi	2003-10-28				
APPD.	A. Simada	2003-10-29				
			Hitachi-Johnson Controls Air Conditioning, Inc.		TOCHIGI DWG. No.	
					4CYC11219	

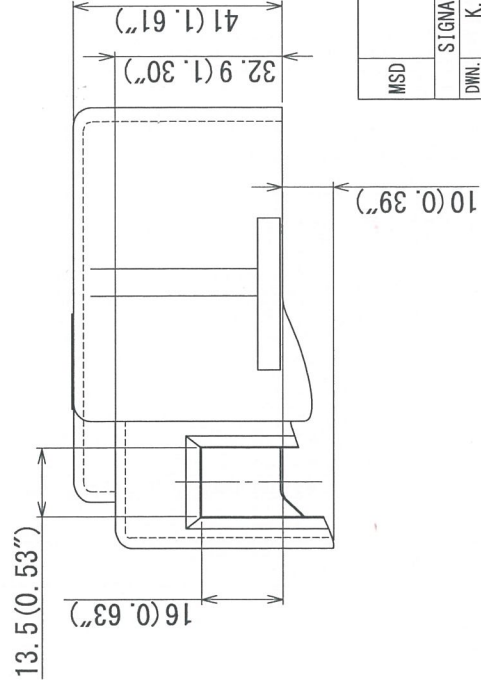
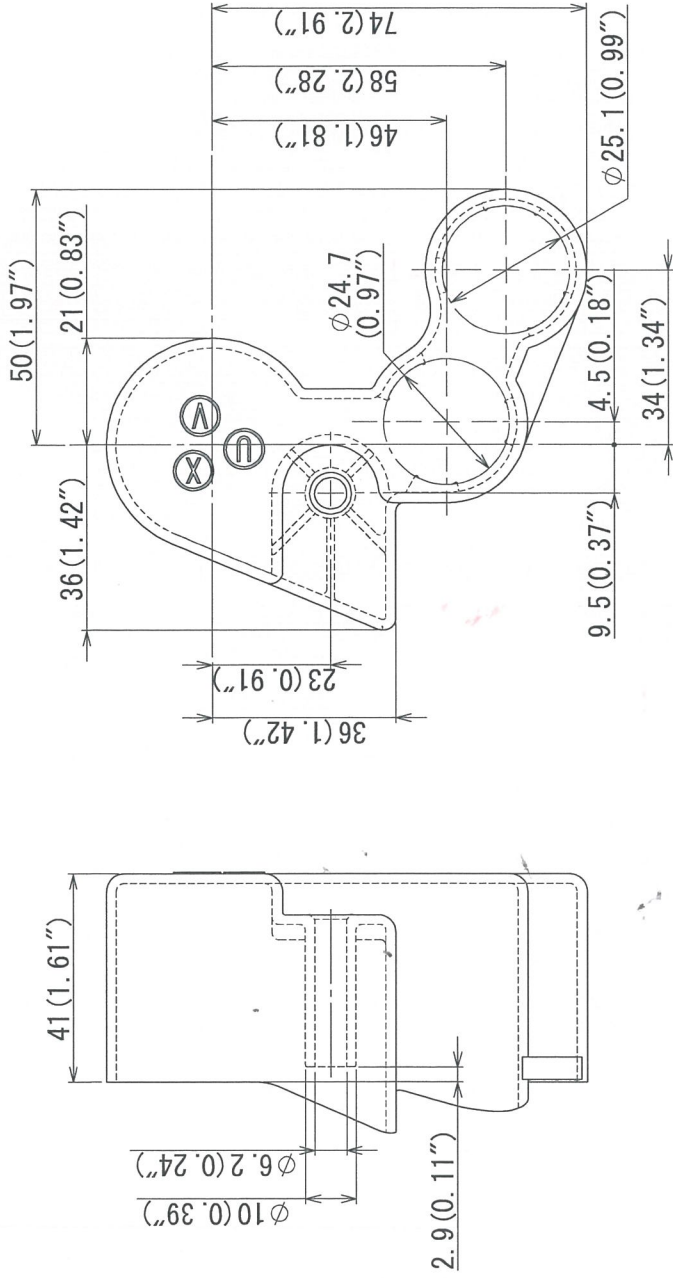
4CYC11220



NOTES
 MATERIAL : COLD ROLLED CARBON STEEL SHEETS
 AND STRIP
 SURFACE : ZINC-COATED
 DIMENSION : mm (in)

SIGNATURE		DATE	PROJECTION	SCALE	TITLE	
DWN.	F. Nishioka	2003-10-27		2 : 1	WASHER	
CHKD.	M. Onoguchi	2003-10-28				
APPD.	A. Simada	2003-10-29				
			Hitachi-Johnson Controls Air Conditioning, Inc.		TOCHIGI DWG. No.	
					4CYC11220	

BB0041336

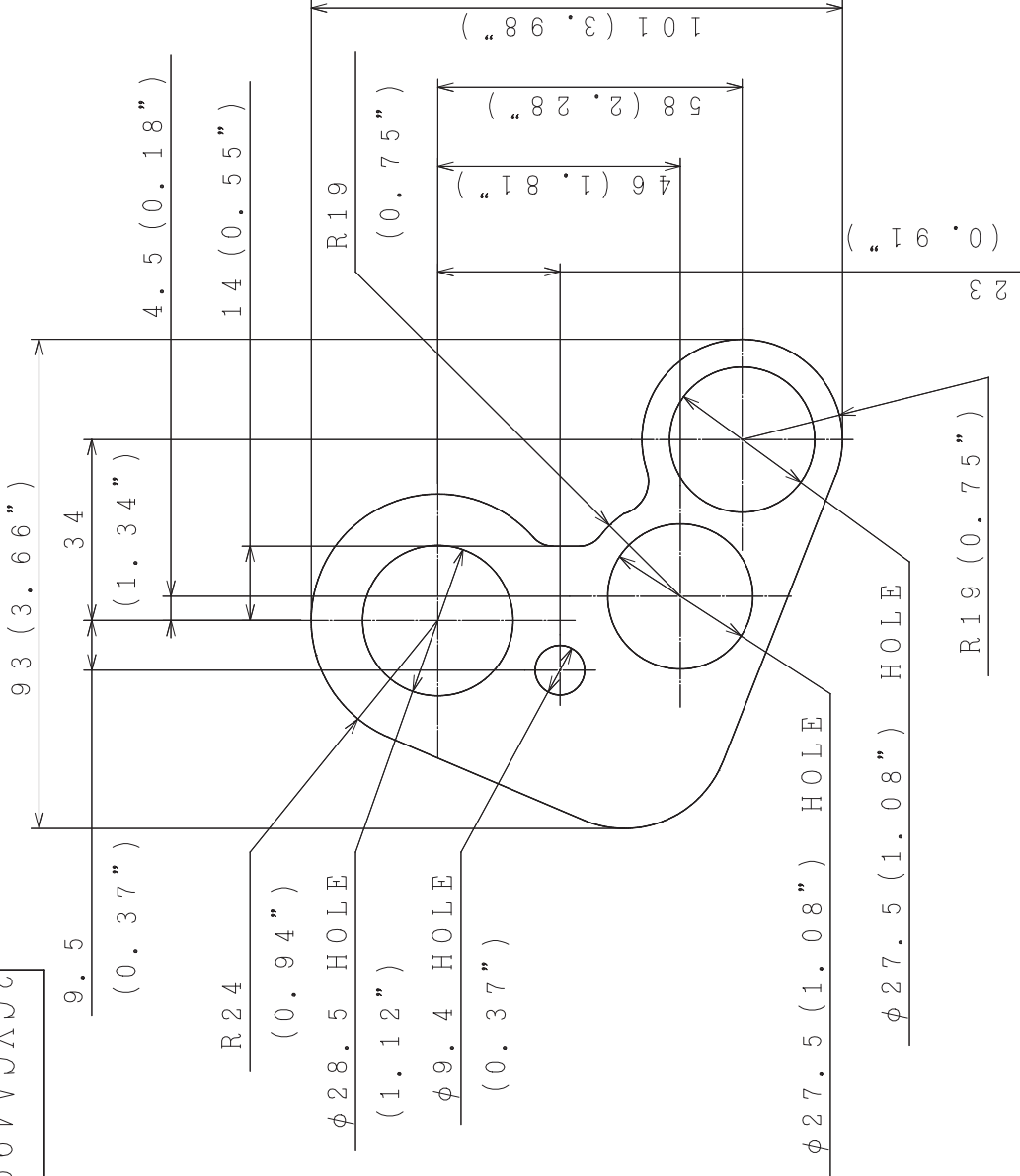


DIMENSION : mm (in)

MSD	JOB NO.	PRDT	C
SIGNATURE		DATE	PROJECTION TITLE
DWN.	K. Habu	2013-10-17	3DCAD
CHKD.	K. Matsunaga	2013-10-17	
APPD.	M. Onoguchi	2013-10-17	
Hitachi Appliances, Inc. Tokyo Japan			TOCHIGI DWG. NO.
3CYC BB0041336			HERM-COVER
REGD 2013 1017			SCALE 1:1

UL Flame Class:94-5V or Equivalent

3CYCA4999



NOTES
 COLOR: BLACK
 MATERIAL: EPDMFOP-B

DIMENSION: mm (in)

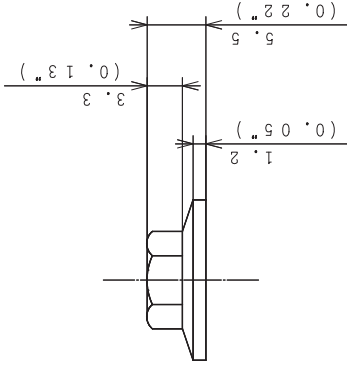
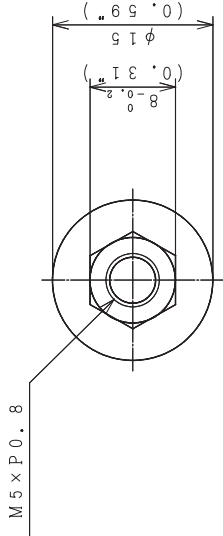
SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. M. Aoyama	2003-10-28		1 : 1	RUBBER PLATE
CHKD. M. Onoguchi	2003-10-28			
APPD. A. Simada	2003-10-29			

TOCHIGI DWG. No. 3CYCA4999
 Hitachi-Johnson Controls Air Conditioning, Inc.
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REGD 2003 1104

3CYC62897

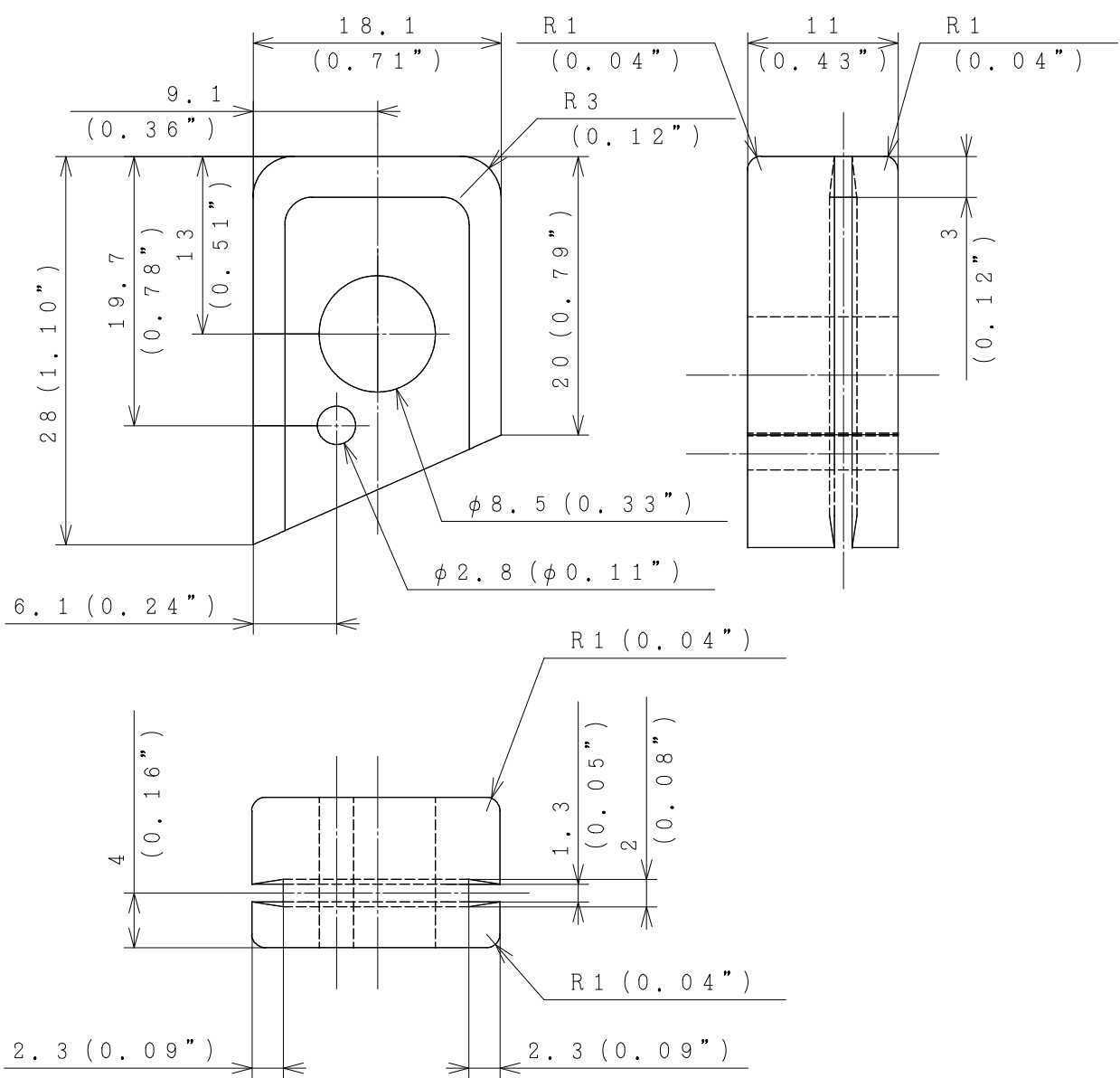


MATERIAL : SWRM6


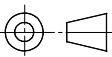
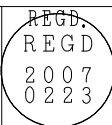
DIMENSION : mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE	CAD
DWN. Y. Nakada	1992-05-13		2:1	NUT	REGD 1992 0515
CHKD. K. Sekiuchi	1992-05-13	Hitachi-Johnson Controls Air Conditioning, Inc.		TOCHIGI DWG. No.	
APPD. Y. Serizawa	1992-05-13			3CYC62897	

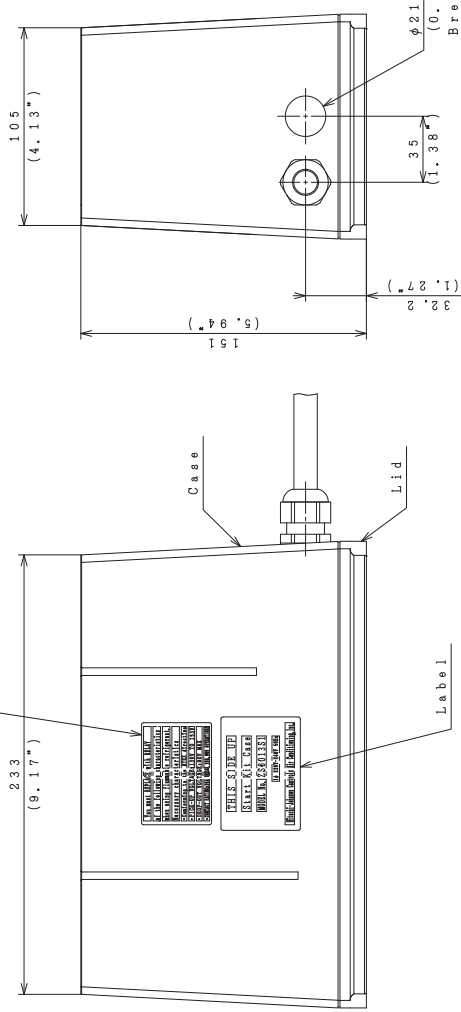
BB0007021



MATERIAL: EPDM
 DIMENSION: mm (in)

SIGNATURE		DATE	PROJECTION	SCALE	TITLE	
DWN.	W. Sugawara	2007-02-22		2 : 1	BUSH	
CHKD.	M. Onoguchi	2007-02-22				
APPD.	A. Simada	2007-02-22				
			Hitachi-Johnson Controls Air Conditioning, Inc.		TOCHIGI DWG. No.	
			4CYC BB0007021			

R-Label (E-BOX Type: C, D, E only)
 You must REPLACE with RELAY of the following characteristics when using flammable refrigerant. Necessary characteristics
 • Comforming to the ATEX directive
 • PICK-UP VOLTAGE: 130V TO 153V
 • DROP-OUT VOLTAGE: 90V MAX
 • CONTACT RATING: 20A BREAK 200,000 OPERATIONS



THIS SIDE UP
 Indicate compressor type number and installation direction
 Comp. Model: ZS*****
 Power source: 1φ 220V-240V 50Hz

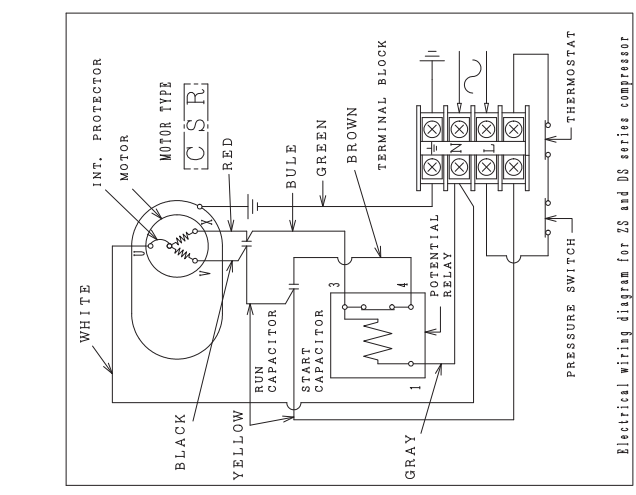
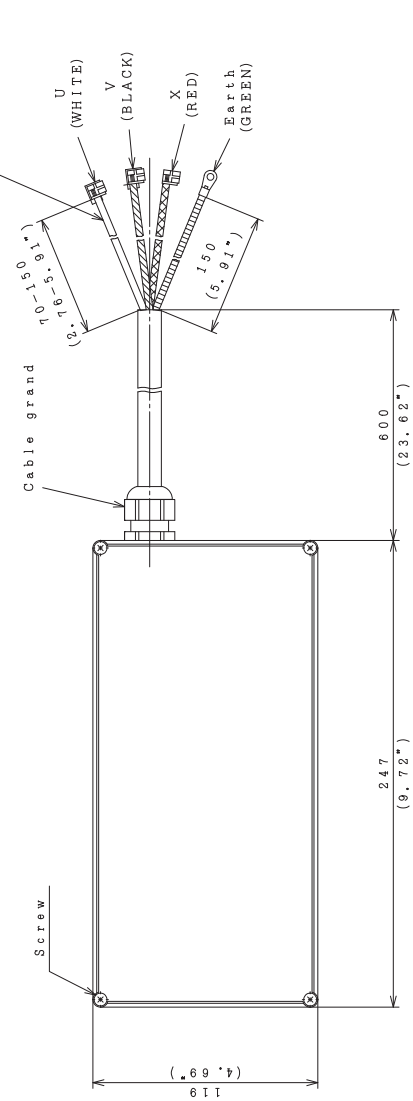


Fig. 1 Diagram
 Electrical wiring diagram for ZS and DS series compressor

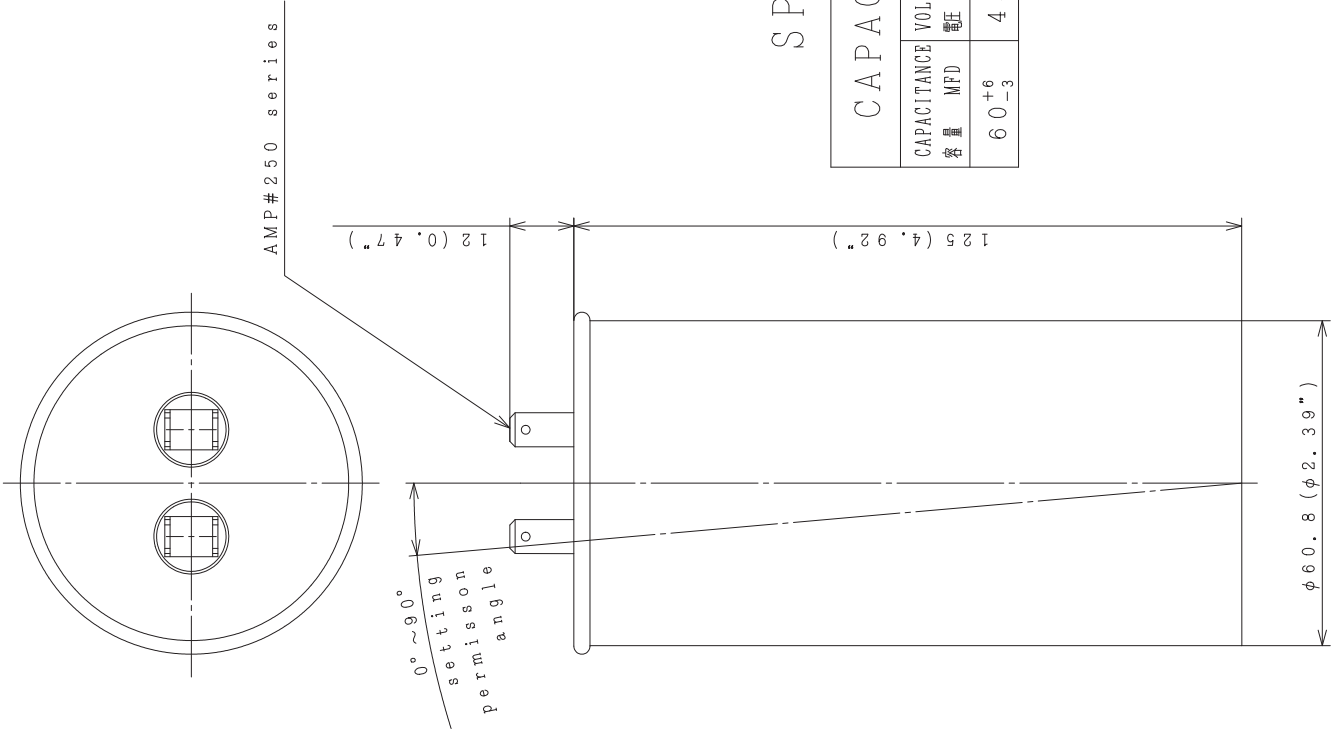
E-BOX Type	Comp. type	Power source	Potential relay	Running Capacitor	Starting Capacitor
A	ZS4084S1	1φ 220-240V 50Hz	AMVL-145V1	30μF/400V	30μF/400V 68kΩ-2W
B	ZS6013S1	1φ 220-240V 50Hz	AMVL-240V1	25μF/400V	40μF/400V 68kΩ-2W
C	ZS7516S1	1φ 220-240V 50Hz	AMVL-240V1	30μF/450V	40μF/400V 68kΩ-2W
D	ZS1120S1	1φ 220-240V 50Hz	AMVL-240V1	40μF/450V	40μF/450V 68kΩ-2W
E	ZS1334S1	1φ 220-240V 50Hz	AMVL-240V1	55μF/450V	75μF/400V 68kΩ-2W
F	DS1834X1	1φ 220-230V 60Hz	AMVL-250V2	55μF/450V	75μF/400V 68kΩ-2W
G	ZS4084P1	1φ 115V 60Hz	AMVL-195V2	30μF/400V	60μF/400V 68kΩ/2W
H	ZS6013P1	1φ 115V 60Hz	AMVL-195V2	30μF/400V	60μF/400V 68kΩ/2W
J	ZS6013X1	1φ 220-230V 60Hz	AMVL-250V2	30μF/450V	40μF/450V 68kΩ/2W
K	ZS7516X1	1φ 220-230V 60Hz	AMVL-250V2	30μF/450V	40μF/450V 68kΩ/2W
L	ZS1120X1	1φ 220-230V 60Hz	AMVL-250V2	45μF/450V	60μF/450V 68kΩ/2W
M	DS1529X1	1φ 220-230V 60Hz	AMVL-250V2	45μF/450V	60μF/450V 68kΩ/2W

- Notes
1. Material of Case and Lid: Polybutylene terephthalate
 2. Water tight lebel: IP44
 3. Case and Lid Flame resistance level: 94-5V
 4. Potential relay operation is influenced by setting direction. Box installing direction should comply with upward label indication.
 5. The curcuit diagram of Fig.1 is indicated inside a lid.
 6. Dimension:mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWL W. Saitoh	2005-07-26	1:2	E-BOX	
CHKD M. Uotachi	2005-07-26			
APPD A. Saitoh	2005-07-26			

Hitachi-Johnson Controls
 Air Conditioning, Inc. 2CVCB0000406

3CYCA3791



STARTING CAPACITOR and DISCHARGE RESISTANCE
始動用キャパシタと放電抵抗

1. CAPACITOR TYPE

METALLIZED FILM CAPACITOR

メタライズド フィルム コンデンサ

Please do not ALUMINUM ELECTROLYTIC CAPACITOR. Because, starting capacitor turn on continuity electrify when the contact point of the relay deposited.

電圧リレーの接点が溶着した場合、始動キャパシタに連続通電される恐れがあるため、アルミ電解コンデンサは使用しないでください。

2. You need to attach a discharge resistance to the starting capacitor

始動キャパシタには放電抵抗を取付けて下さい。

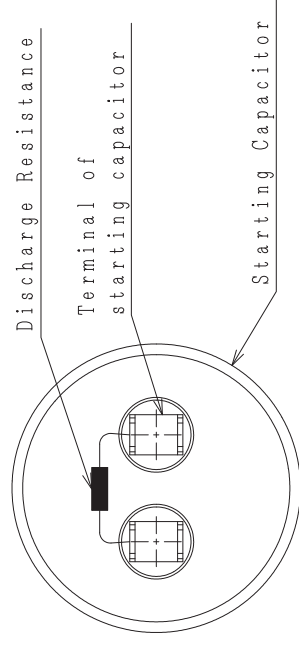
Large amount of current which was charged in the starting capacitor may go into the contact point of the relay, and the contact part might be deposited.

Therefore, you are required to attach a discharge resistance to the starting capacitor with the specification below.

Csに蓄えられた電荷により、リレーの接点に大電流が流れ、接点が溶着する恐れがありますので、下記仕様の放電抵抗をCsに取付けて下さい。

SPECIFICATION 仕様

CAPACITOR		DISCHARGE RESISTANCE	
CAPACITANCE 容量	MFD 60 ⁺⁶ ₋₃	FREQUENCY 電圧 V, AC 周波数 Hz	NORMAL POWER RESISTANCE
	450	50/60	2W 68kΩ



DIMENSION: mm (in)

SIGNATURE		DATE	PROJECTION	SCALE	TITLE
DWG.	A. Murakami	2003-02-18		1:1	STARTING CAPACITOR
CHKD.	M. Koyama	2003-02-18			
APPD.	Y. Nakada	2003-02-19			

Hitachi-Johnson Controls
Air Conditioning, Inc.

TOCHIGI DWG. No.
3CYCA3791

REGD
2003
0224

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0867V00E

STARTING CAPACITOR and DISCHARGE RESISTANCE
始動用キヤパシタと放電抵抗

- CAPACITOR TYPE
METALLIZED FILM CAPACITOR
メタライズド フィルム コンデンサ

Please do not ALUMINUM ELECTROLYTIC CAPACITOR. Because, starting capacitor turn on continuity electrify when the contact point of the relay deposited.

電圧リレーの接点が溶着した場合、始動キヤパシタに連続通電される恐れがあるため、アルミ電解コンデンサは使用しないでください。

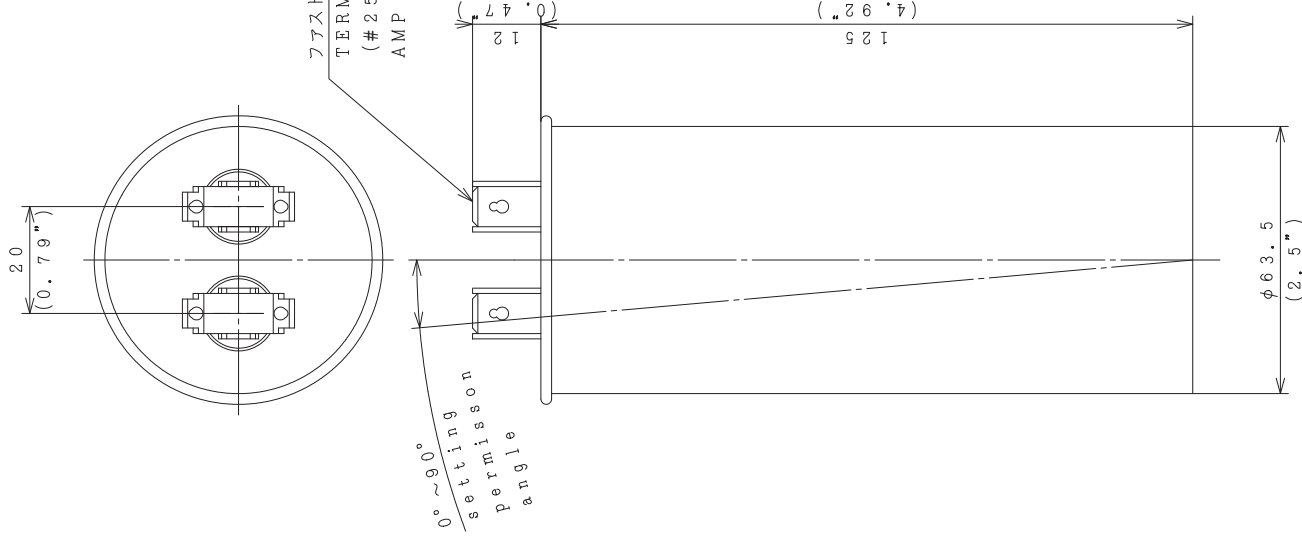
- You need to attach a discharge resistance to the starting capacitor
始動キヤパシタには放電抵抗を取付けて下さい。

Large amount of currency which was charged in the starting capacitor may go into the contact point of the relay, and the contact part might be deposited.

Therefore, you are required to attach a discharge resistance to the starting capacitor with the specification below.

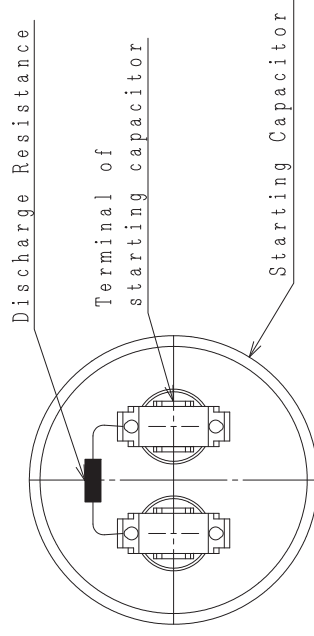
Csに蓄えられた電荷により、リレーの接点に大電流が流れ、接点が溶着する恐れがありますので、下記仕様の放電抵抗をCsに取付けて下さい。

ファストタブ端子
TERMINAL (4-TINE)
(#250シリーズ)
AMP 250 QUICK-CONNECT



SPECIFICATION 仕様

CAPACITOR		DISCHARGE RESISTANCE	
CAPACITANCE 容量 MFD	VOLTAGE 電圧 V, AC	FREQUENCY 周波数 Hz	NOMAL POWER RESISTANCE
75+3 -1.5	400	50	2W
			68kΩ



SIGNATURE		DATE	PROJECTION	SCALE	TITLE
DWG.	F. Nishioka	2003-10-30		1 : 1	始動用キヤパシタ STARTING CAPACITOR
CHKD.	M. Unoquchi	2003-10-30			
APPD.	A. Simada	2003-10-30			

Hitachi-Johnson Controls
Air Conditioning, Inc.
TOCHIGI DWG. No. 3CYCA4980



06LEVCJCE

RUNNING CAPACITOR 運転用キャパシタ

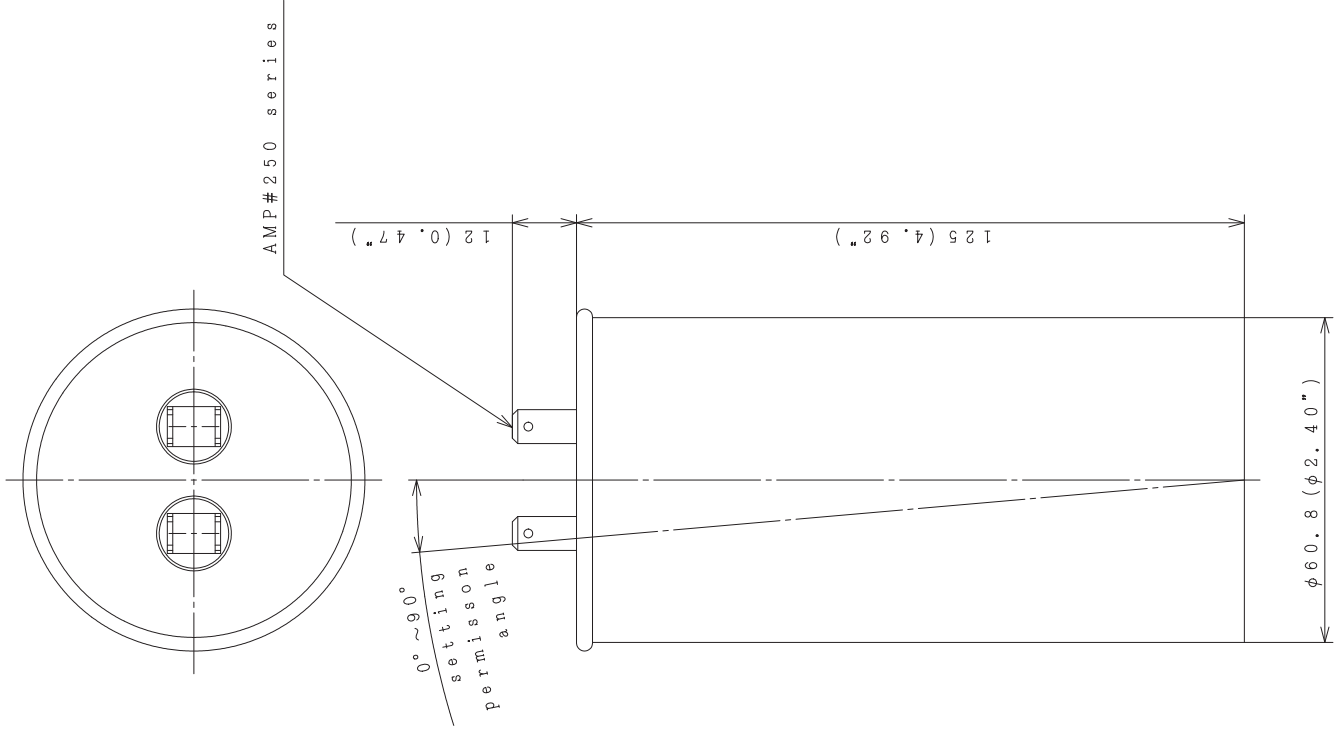
1. TYPE 種類

METALLIZED FILM CAPACITOR

メタライズド フィルム コンデンサ

2. SPECIFICATION 仕様

CAPACITOR	
CAPACITANCE 容量 MFD	VOLTAGE 電圧 V, AC
45 ^{+4.5} _{-2.3}	450
FREQUENCY 周波数 Hz	50/60



DIMENSION: mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. A. Murakami	2003-02-18		1 : 1	RUNNING CAPACITOR
CHKD. M. Koyama	2003-02-18			
APPD. Y. Nakada	2003-02-19			

TOCHIGI DWG. No.	REGD
3CYCA3790	2003 0224

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3CYCA4981

RUNNING CAPACITOR 運転用キャパシタ

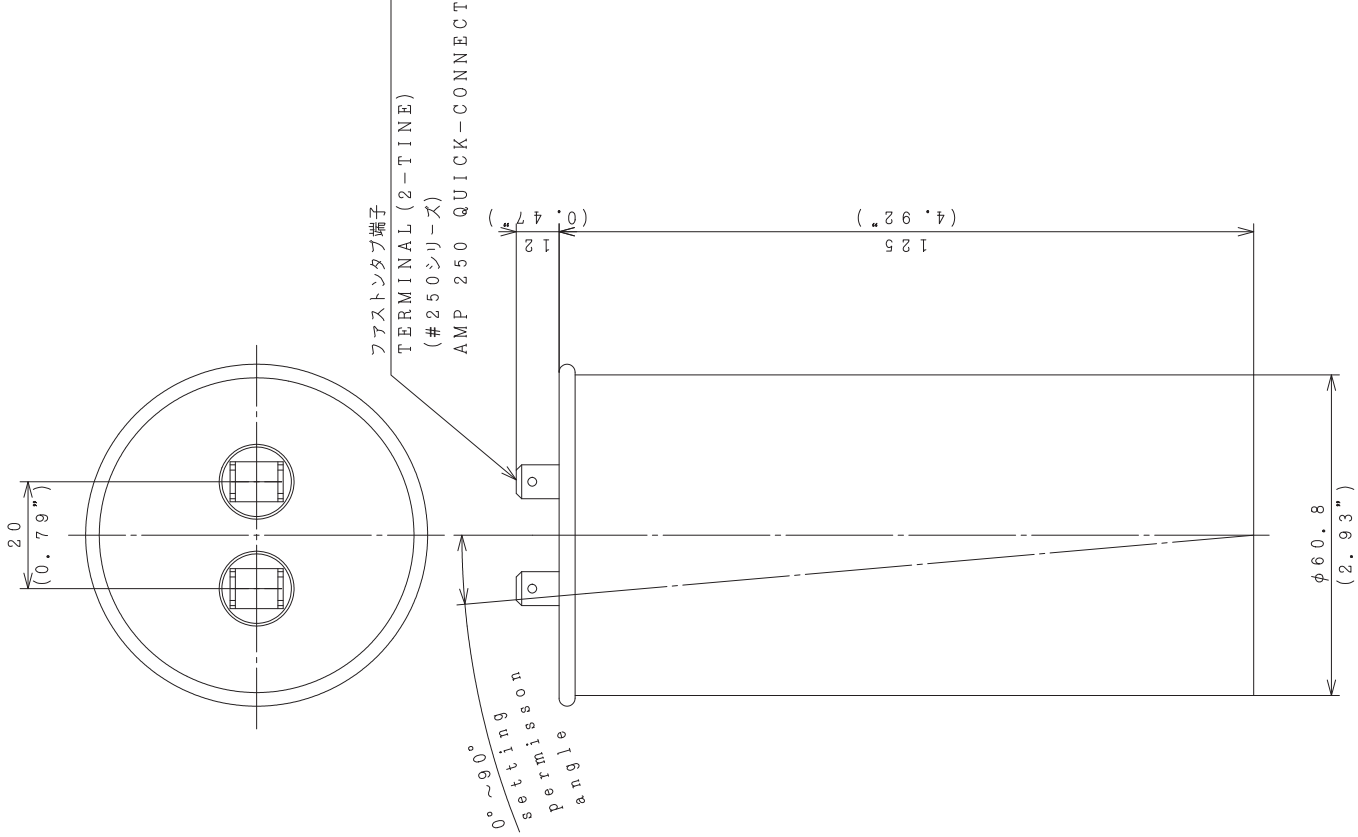
1. TYPE 種類

METALLIZED FILM CAPACITOR

メタライズド フィルム コンデンサ

2. SPECIFICATION 仕様

CAPACITOR		
CAPACITANCE 容量	VOLTAGE 電圧 V, AC	FREQUENCY 周波数 Hz
55 ⁺⁴ ₋₂	450	50/60



SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. F. Nishioka	2003-10-30		1 : 1	運転用キャパシタ RUNNING CAPACITOR
CHKD. M. Unoouchi	2003-10-30			
APPD. A. Simada	2003-10-30			

REGD.	TOCHIGI DWG. No.
2003 1104	3CYCA4981

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SPECIFICATION

RELAY TYPE	AMVL-250V2
FREQUENCY	60Hz
NOMAL VOLTAGE	AC250V
OPERATING VOLTAGE	AC165±10V
RECOVERY VOLTAGE	AC90 or less
CONTACT CAPACITY	20A
CONTACT TYPE	type b

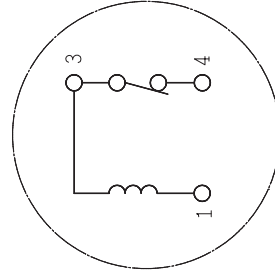
1. Please keep the direction of the installation of the relay.
 There is a case not to operate normally when installing in the direction which is different from the direction.

リレー設置方向を守って使用下さい。
 図示方向と異なる向きに取付けると正常に作動しない恐れがあります。

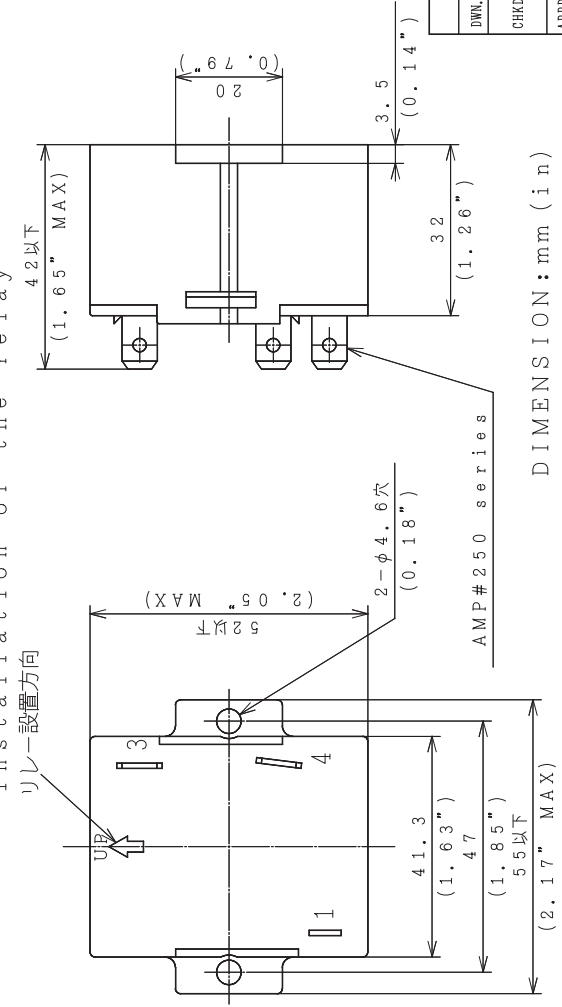
*CONTACT TYPE b (ON→OFF)



CIRCUIT DIAGRAM



installation of the relay
 リレー設置方向

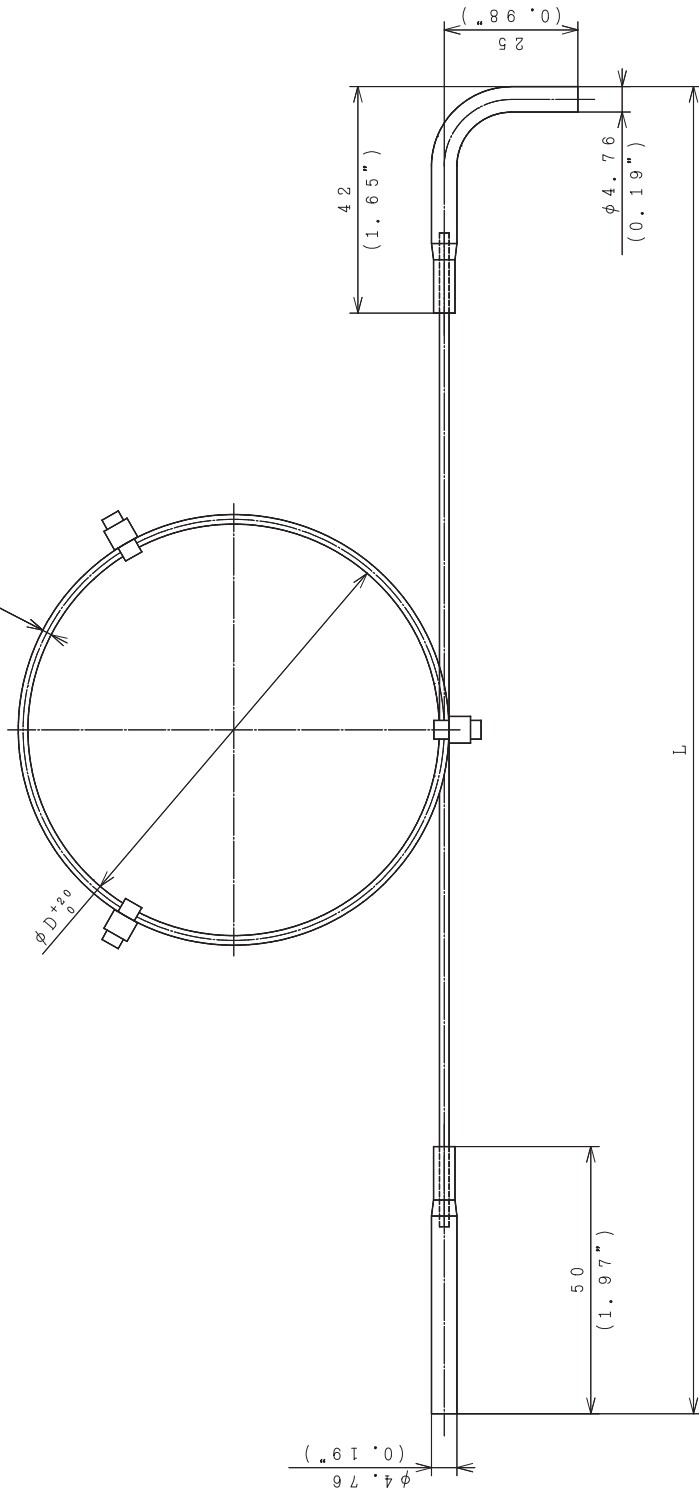


DIMENSION : mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. K. Morita	2001-12-05	⊕	1 : 1	STARTING VOLTAGE CONTROL RELAY
CHKD. M. Onoguchi	2001-12-05			
APPD. K. Ishigami	2001-12-05			
	2001-12-06			
Hitachi-Johnson Controls Air Conditioning, Inc.				TOCHIGI DWG. No.
This drawing is under license by Johnson Controls-Hitachi Air Conditioning Technology (Hong Kong) Limited				3CYCA1986
REGD. 2001 1207				006

332000BB

$\phi 0.68 \text{ ID} \times \phi 1.80 \text{ D}$
($0.03 \text{ ID} \times 0.070 \text{ D}$)



TYPE	RESISTANCE VALUE	L	ϕD	NUMBER OF TURNS
A	79.8 kPa	250 (9.84")	45 (1.77")	19
B	13.3 kPa	155 (6.10")	47 (1.85")	1
C	26.6 kPa	206 (8.11")	71 (2.80")	2
D	53.3 kPa	246 (9.69")	77 (3.03")	6
E	39.9 kPa	206 (8.11")	77 (3.03")	4
F	6.67 kPa	142 (5.59")	10 (0.39")	1

D I M E N S I O N : m m (i n)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. K. Echigoya	2012-05-10		NTS	TOCHIGI DWG. No. 3CYCBB0032682
CHKD. M. Unoouchi	2012-05-10			
APPD. A. Simada	2012-05-12	Hitachi Appliances, Inc. Tokyo Japan		

CAD
REGD
2012
0512

100

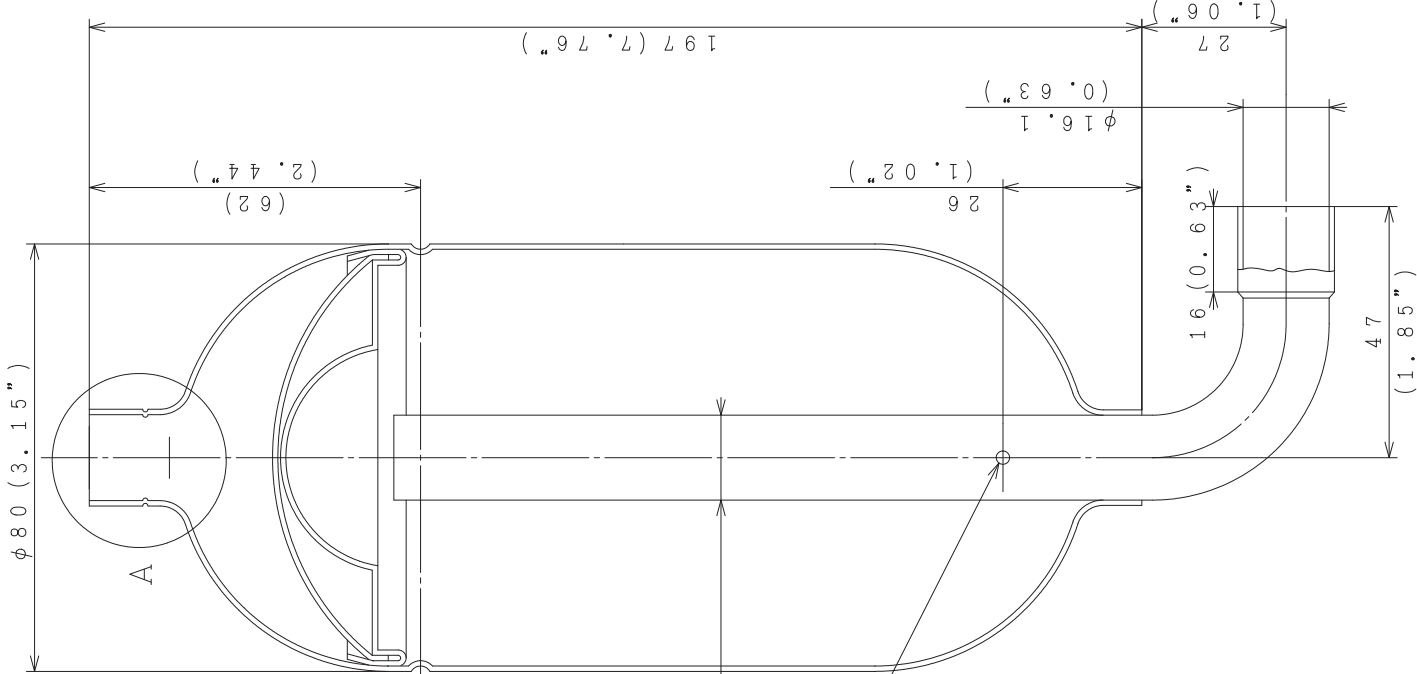
6

7

004

3CYCA5055

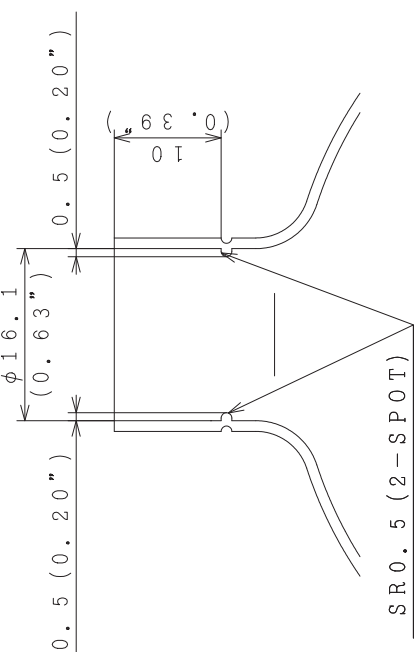
UPPER SIDE



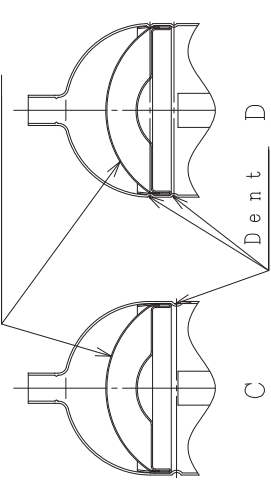
LOWER SIDE

$\phi 15.88 \times t 0.8$
 $(0.63" \times 0.03")$

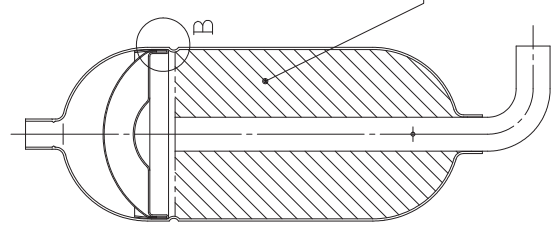
A (2:1)



Mesh parts



B (NTS)



Dent for fixing the mesh parts (C or D)

VALID VOLUME: 530mL

Note

1. Use to stand upper A side vertically.
2. The phosphor copper brazing be done while blowing or being full of N₂ gas.
3. The total number: 2 pieces (Total valid volume: 1060ml)
Use to connect accumulators in series.

DIMENSION: mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. F. Nishioka	2003-11-05		1:1	ACCUMULATOR
CHKD. M. Unoquchi	2003-11-05			
APPD. A. Simada	2003-11-05			

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 Air Conditioning, Inc.
 TOCHIGI DWG. No. 3CYCA5055

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