

FOR REFERENCE

Specifications No. C- 1918

27-Oct-2003

CUSTOMER: _____

COMPRESSOR SPECIFICATIONS

Compressor type : **Scroll Compressor**

Model name : **DS1836S1**

Refrigerant : **R404A**

Power source : **1 , 220 ~ 240V , 50Hz**

Rated output : **1800W**

We acknowledge the receipt of this copy.



Please return this compressor specifications by __/__/____ 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 Home & Life Solutions , Inc.
Compressor Department

APPD.	CHKD.	DWN.







SAFETY PRECAUTION

Before operating the product, read these safety precautions and correctly use 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. Strictly observe these precautions.

The meaning of the  WARNING and  CAUTION symbols are as follows.

 WARNING	Means that mishandling is most likely to result in death or serious injury.
 CAUTION	Means that mishandling is likely to result in person injury or in physical damage to the product or surrounding structures.

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

	Signifies the operation that must be performed.
	Means that the power plug must be disconnected from the outlet.
	Means that grounding wire must be connected.
	Denotes "PROHIBITED".
	Means that the section must not be disassembled.
	Means that the section must not be touched.

WARNING



The refrigerating cycle unit must be provided with adequate electrical grounding. Inadequate or incomplete grounding may cause problems or electric chocks.



A fuse or a leak circuit breaker must be connected to the main circuit. Electric shock or fire may result in the event of problems or current leakage.



Before repairing, checks must be performed to see that the main power is turned off. Electric shock may result if the terminals are touched.



The temperature of the hermetic terminals of the compressor must be measured and then the appropriate lead wires connected. Lead wire insulation deterioration (thermal deterioration) may result in electric shock, short-circuiting, or fire.



The lead wires must not be brought into contact with the surface of the compressor or with the piping. Lead wire insulation deterioration (thermal deterioration) may result in electric shock, short-circuiting, or fire.



The lead wires must not be brought into contact with any rotational parts like fans or with any vibrational parts like piping.

Lead wire insulation deterioration due to vibration or contact may result in electric shock, short-circuiting, or fire.



The compressor must not be self-evacuated during operation. Overheating of the compressor may cause burns or fire.



The surface of the compressor during operation and immediately after it has stopped is very hot. Burns may result if the compressor is touched.



Compressor must not be executed for air compression. Overheating of the compressor may cause burns or fire.



The inspection window must not be directly viewed in compressors which have an inspection window for internal observation. Use a video camera or other suitable equipment to observe. Rupture of the inspection window or blowout of the refrigerant may cause injury.



Eye protection must be worn during repairs. Rupture of pipes or blowout of the refrigerant may cause injury.

CAUTION



The compressor must not be installed in a humid place or locations exposed to water. The compressor should not be dipped into water or not be sprayed with water. When the sound insulation material, which is easy to absorb water, will enclose the compressor, that material should not absorb water technically. Insulation deterioration causes electric shock, current leakage, short-circuiting, or rupture due to corrosion.



The hermetic terminals of the compressor must have the specified cover mounted using the specified method to prevent entry of dirt. Incomplete electrical conduction of the hermetic terminals cause problems or fire.



Electrical pulse must not be applied to the compressor while its interior is maintained in a vacuum. Incomplete electrical insulation of the compressor interior may result in electric shock, current leakage, or fire.



The compressor must be stored in a clean and dry environment. Incomplete electrical insulation of the hermetic terminals of the compressor may result in electric shock or current leakage, and corrosion of the compressor surface may result in rupture or in burns due to the blowout of the refrigerant.



When connection 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, fastening force of the terminals would be reduced. Incomplete electrical continuity of the terminals may result and cause problems of fire.

1.Scope
This specification is applied to HITACHI scroll compressor.

2.Specification

- 2.1 Model DS1836S1
- 2.2 Output 1800 W
- 2.3 Rated Voltage/Frequency/Phase 220 ~ 240V 50Hz 1
- 2.4 Application Refrigeration
- 2.5 Refrigerant R404A
- 2.6 Compressor cooling Forced air and Liquid injection
- 2.7 Displacement 35.7 mL/rev
- 2.8 Oil 68HES-H
- 2.9 Amount of oil charge 850 mL
- 2.10 Allowable amount of refrigerant charge 2500 g
- 2.11 Hermetic terminal 1/4"quick connect type
- 2.12 Mass 23.0 kg
- 2.13 Space volume of inner shell 2000 mL
- 2.14 Capacitor 75 μF/400V(starter) 55 μF/450V(running)
- 2.15 Starting Relay AMVL-240V1
- 2.16 Motor
 - (1) Motor type Capacitor start and run Permanent Sprit motor
 - (2) Locked rotor current 57 A (220V)
 - (3)Winding resistance Main coil 1.299 (at 20) Aux. coil 2.198
 - (4)Insulation grade E
- 2.17 Approval voltage range rated voltage ±10%
- 2.18 Compressor efficiency
 - (1) Rated capacity 2440/2460 W (see note 1) (at condition (4))
 - (2) Rated input 2260/2340 W (see note 1) (at condition (4))
 - (3) Current 10.6/10.6 A (see note 1) (at condition (4))
 - (4) Rated condition
 - Evaporation temp. -23.3 (0.267MPa)
 - Condensing temp. 54.4 (2.532MPa)
 - Liquid temp. entering expansion valve 32.2
 - Return gas temp. 18.3
 - Ambient temp. 32.2
 - Draft 2 m/s

- (5)Sound Level under 68 dBA (see note 2) (at condition (7))
- (6)Vibration Level under 60 μm (see note 3) (at condition (7))
- (7)Measurement condition for Sound and Vibration
 - Suction Pressure 0.433 MPa
 - Discharge Pressure 2.044 MPa
 - Noise of soundproof room under 40 dBA
 - Vibration of soundproof room under 5 μm
 - Return gas temp. 18
 - Liquid refrigerant back No liquid back
 - Draft No draft

note 1

Rated capacity and Rated input are measured by using the equipment including the calorimeter met to JIS B8606. Minimum allowable capacity is 90% of rated capacity, maximum allowable input is 110% of rated input.

Rated capacity and Rated input vary by the injection flow volume, and the appropriate injection capillary resistance depends on the refrigerating cycle's specification. In the case that the capacity which is measured by using the recommended injection capillary is different much with the rated capacity, you should alter the specification of the injection capillary.

note 2

Sound level is measured at the point 30cm away from the compressor surface in a sound measuring room.

note 3

Vibration level is measured on the compressor surface.

2.19 Starting performance

- (1)The minimum starting voltage shall be as TABLE 1. (see note 4) under the following conditions.

The starting pressure should be between the suction and discharge of the compressor was balanced and adjusted as shown in the TABLE 1.

The temperature of compressor case was adjusted to 20 or higher at the starting conditions.

TABLE 1

Starting conditions · Motor temperature	Ambient temp.	Pressure	Minimum starting voltage { V2 }
Cold-starting · Cold state(Room temperature)	20	1.35 Mpa	85% of rated voltage
Hot-starting<Standard> · Hot state after operated under standard condition	32.2	1.29 MPa	85% of rated voltage
Hot-Starting<Overload> · Hot state after operated overload condition.	43	1.42 MPa	90% of rated voltage

note 4

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.

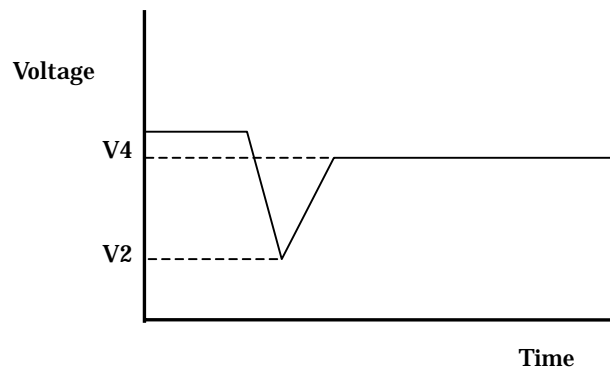


Fig 1

3. PARTS AND DRAWING LIST

TABLE 2

		PART NAME	QTY/SET	DRAWING No.	REMARKS	SUPPLY
Compressor	DS1836S1		1	3CYCA5053	Dimension sketch	YES
				3CYCA4127	Circuit diagram	
				3CYCA1588	Connecting sketch of accumulator	
		Refrigerant oil 68HES - H	850mL	-	charged	YES
CONTENTS	Mounting parts	RUBBER GROMMET	4	3CYC62866	3TMW65223A	YES
		PIPE	4	4CYC11219	Under development	YES
		WASHER	4	4CYC11220	Under development	YES
	Terminal- and cover	HERM-COVER	1	3CYCA4998	Under development	YES
		RUBBER PLATE	1	3CYCA4999	Under development	YES
		NUT	1	3CYC62897	Under development	YES
E BOX			1	2CYC60742	Type E	NO
CONTENTS	Electrical Parts	TP-SCREW-B	2	4CYC11209	3SKJA4297B	NO
		ANGLE	2	4CYC11210	3TCBA4261A	NO
		OVER LOAD PROTECTOR	1	-	Internal OLR	-
		START CAPACITOR	1	3CYCA4980	75 μ F/400V	NO
		DISCHARGE RESISTANCE	1	-	68k /2w	NO
		RUNNING CAPACITOR	1	3CYCA4981	55 μ F/450V	NO
		STARTING RELAY	1	3CYCA1991	AMVL-240V1	NO
Refrigerating cycle parts	CAPLLARY FOR LIQUID INJECTION	1	Recommended Resistance Value(Note5) 2.65kPa	Required for operation	NO	
	ACCUMLATOR	2	3CYCA5055	2S24E2636A valid volume 1060mL (530mL × 2)	NO	

Note5: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 or lower.(preferably about 100 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.

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

The Electrical Appliance and Material Safety Law (JAPAN) and JIS C9621 and UL984 are applied.

2.4 Insulation resistance

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

2.5 Dielectric Withstand Voltage Test

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

2.6 Pressure Test

Pressure test should be done by JIS B8620 and UL984.

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
Pre-heat hour	No pre-heat
Hour of taking water (Preheating time excluded)	6 hours
Degree of vacuum (Continuous vacuum)	Below 133 Pa
Solvent for cold bath	Methanol
Coolant for cold bath	Dry ice

2.8 Cleanliness

Drain the refrigerant oil. Pour R141b into the compressor. Lay down and roll the compressor and drain R141b. Filtrate by filter paper. The trapped particles should be under 70 mg.

2.9 Airtight test pressure

3.24MPa

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. Fuse or 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 unequilibrium of the voltage between each phase must be used within 3%.

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.

$$\text{Unequilibrium} = \frac{\text{Max.deviation voltage} - \text{Ave.voltage}}{\text{Average voltage}} \times 100(\%)$$

If wiring may caused 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. (page 11)

And discharge pressure - suction pressure 0.59MPa.

The operating temperatures and pressures of a compressor should be within the range shown in the following TABLE4.

TABLE 4

Item	Standard load condition	Overload condition	Blocked fan condition
Discharge pressure(MPa)	2.532	2.87	4.22 MAX
Suction pressure(MPa)	0.267	0.515	
Compressor case bottom temp.	99 or below and 6 degrees higher than condensing temperature.		
Motor winding temp. (measured by the resistance method)	Rated voltage; 105 MAX Rated voltage \pm 10%; 115 MAX	Rated voltage \pm 7.5%; 115 MAX	Under stable condition; 165 MAX(average) 190 MAX(highest)
Suction pipe temp.	Higher than outlet pipe of evaporator		
Discharge pipe temp.	Lower than 110 at 300 mm away from compressor surface.		
Ambient temp.	32.2	43	32.2

Note6

Overload condition should not be continuous.

Note7

The end of thermocouple should be soldered on the discharge pipe surface, and the soldered place is covered by urethane foam insulation preventing the influence of airflow, when you measure the discharge pipe temperature.

3.4 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 . Please confirm the starting of compressor, when the temperature of compressor surface is -10 .

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

3.5 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.

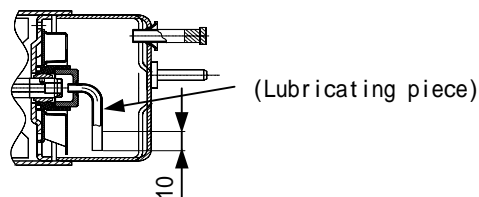
Compressor should be started on the condition that pressure status of high/low pressure sides ore balanced.

3.6 Oil back and oil level of compressor

Oil should be returned continuously to the compressor and not kept in the refrigerating system.

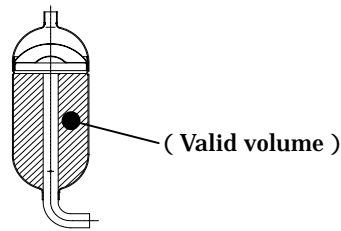
Oil level of compressor should be higher than 10mm from the lubricating piece fixed on the end of the crankshaft. Compressor must not be started operated under a dual-layer separate status. In case of foaming situation, the height of this foam does not mean the height of the oil level. If you don't keep the oil level, the oil shortage will occur, and influence the reliability of compressor.

(Please check the oil level by the compressor with sight glass we supply.)



3.7 Accumulator

The Accumulator should be valid volume above the valid volume of the accumulator of our company specification.



3.8 Liquid refrigerant back

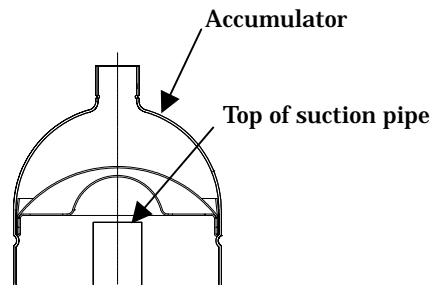
Liquid level in the accumulator should be maintained lower than top of suction pipe in the accumulator. (see fig 2)

(Please check the liquid level by the accumulator with sight glass we supply.)

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 refrigerant should not flood back to the compressor under all conditions in the system.

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

Fig 2



3.9 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.

3.10 Pipe vibration

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

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

3.11 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 12.7mm(1/2")

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

Moving tubes never touch the electrical lead wires.

3.12 Dust of hermetic terminal

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

3.13 Rotation direction of compressor

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

3.14 Over load protector (OLR).

Although Hitachi recommends the OLR specified in TABLE 2 of this specification, 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.

If the OLR could not satisfy the requirements in the unit test, this should be notified to Hitachi and then after reselection through mutual discussions on the optimum OLR for the unit, unit-mounting test should be performed again.

(1) OLR non-operating test:

The provisions of section 3.3 should be satisfied.

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

When the compressor ambient temperature is 23 ± 2 , the winding temperature should not exceed 190 at $200V \pm 6\%$, and when the compressor ambient temperature is 0 ± 2 , the winding temperature should not exceed 240 at 170V, and when the compressor ambient temperature is 40 ± 2 , the winding temperature should not exceed 190 at $200V \pm 6$.

Supplementary description;

Exception for the value in transitional states.

The motor winding temperature should be measured using the resistance method.

The tests should be terminated when the total number of OLR operations or the total OLR operating time reaches 10,000 (time) or 15 days, whichever ever comes first.

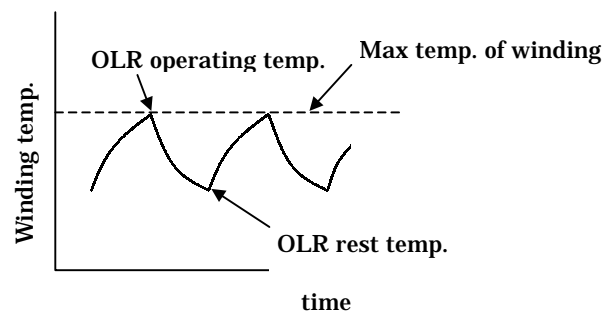


Fig 3

4. Process limitations

4.1 The degree of vacuum in the refrigerating system should be less than $133\text{Pa}[\text{abs}]$ at room temperature just before charging refrigerant. The quantity of water should be less than 0.2g.

The quantity of water the cycle in operation be to make to the 40ppm 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 $0.05\text{g}/\text{m}^2$. 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 contaminants such as trichloroethane, alkalis, soaps, acids, oil and washing fluid used during the 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 in process of manufacturing the refrigerating system. The temperature of the hermetic terminal body should be less than 177.

4.8 The compressor should be operated for more than 20 seconds within 15 minutes after refrigerant is put into the system so 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 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 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 3)

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 There should be adequate clearance between the OD23-under-surface of push-nut and the upper surface of rubber grommets.

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

5.18 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.

5.19 The refrigerating cycle should be grounded.

5.20 The failure of accessory parts (ex. Capacitor) utilized by the customer is not related to Hitachi Home & Life Solutions, Inc.

5.21 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 40ppm.

5.22 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.

5.23 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.

5.24 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 Home & Life Solutions, Inc. have no obligation duty for the problem in the case that the user didn't obey this compressor using specification & criteria.

5.25 Term of Validity

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

5.26 Submission of this Specification

Hitachi Home & Life Solutions, Inc. will submit two copies of this specification and the user shall return one copy only after acknowledging receipt of the specification.

This specification will be kept in the Compressor Design Department of Hitachi Home & Life Solutions, Inc.

No.	date	page revised	reason for revision	Hitachi Home & Life Solutions, Inc			CUSTOMER		
				APPD.	CHKD.	DWN.			

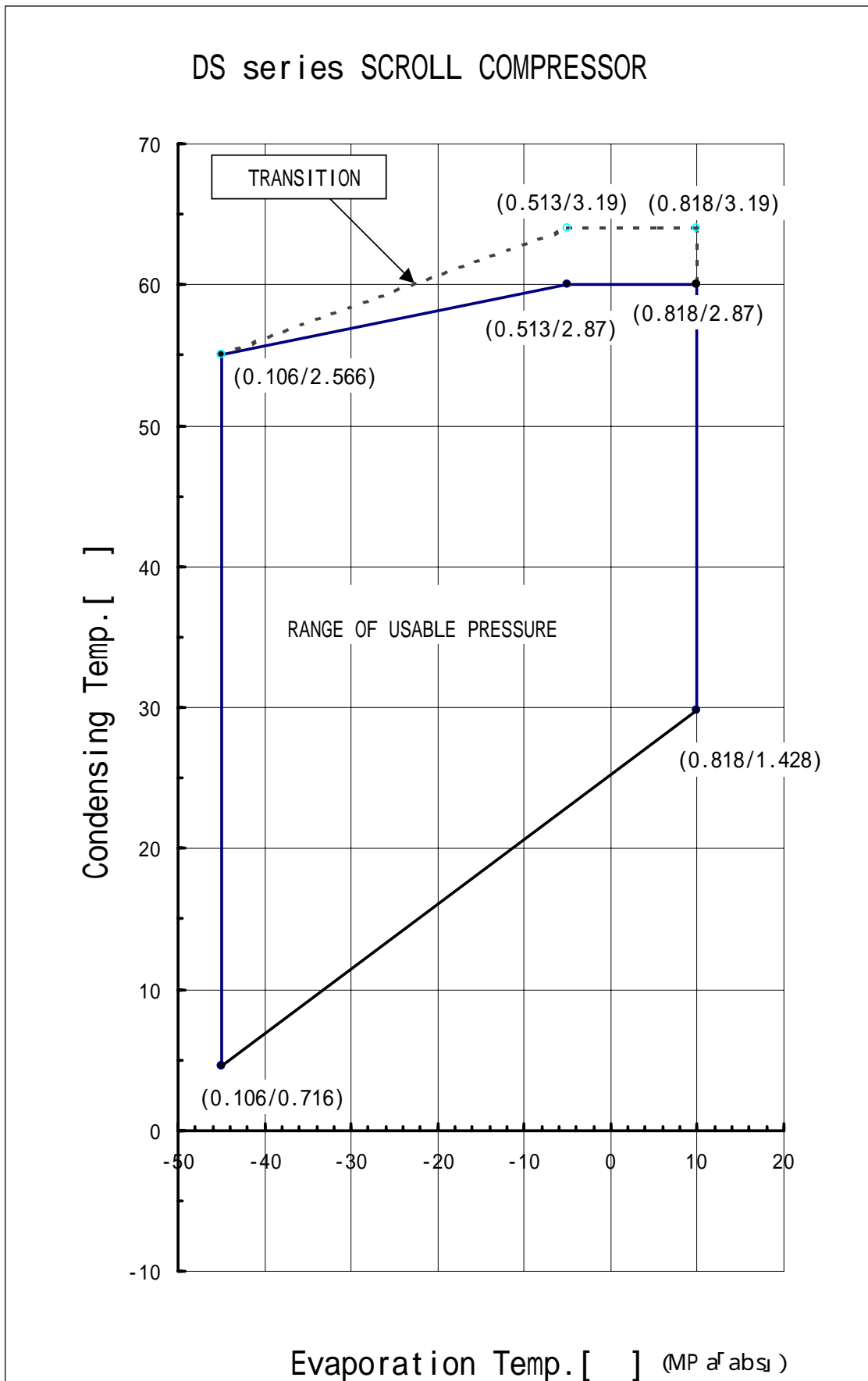
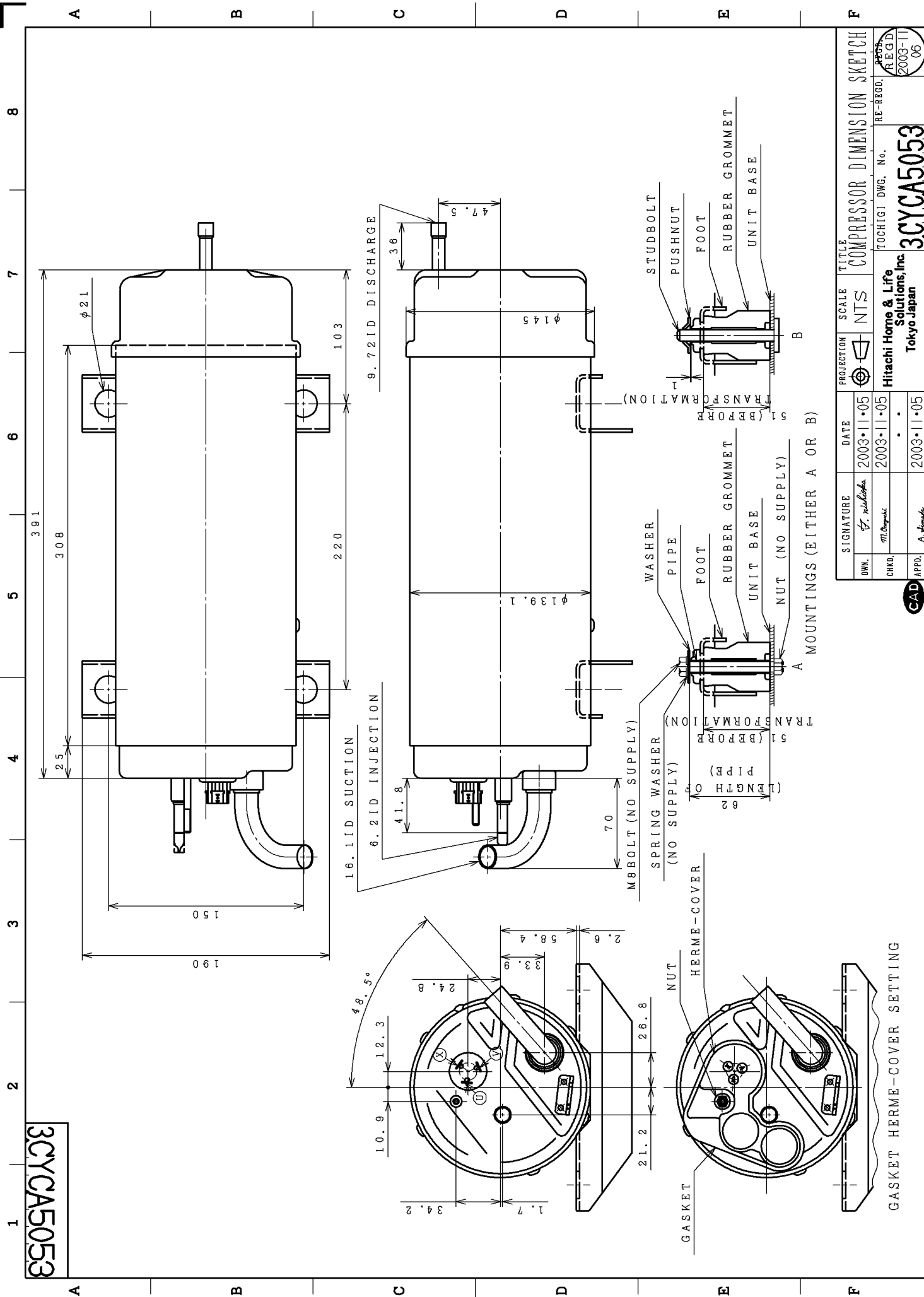


Fig.4

3CYCA5053



SIGNATURE		DATE	PROJECTION	SCALE	TITLE
DMK	<i>A. Hiroshi</i>	2003.11.05	1:1	NTS	COMPRESSOR DIMENSION SKETCH
CHKD	<i>M. Ogasawara</i>	2003.11.05			
APPD.	<i>A. Hiroshi</i>	2003.11.05			

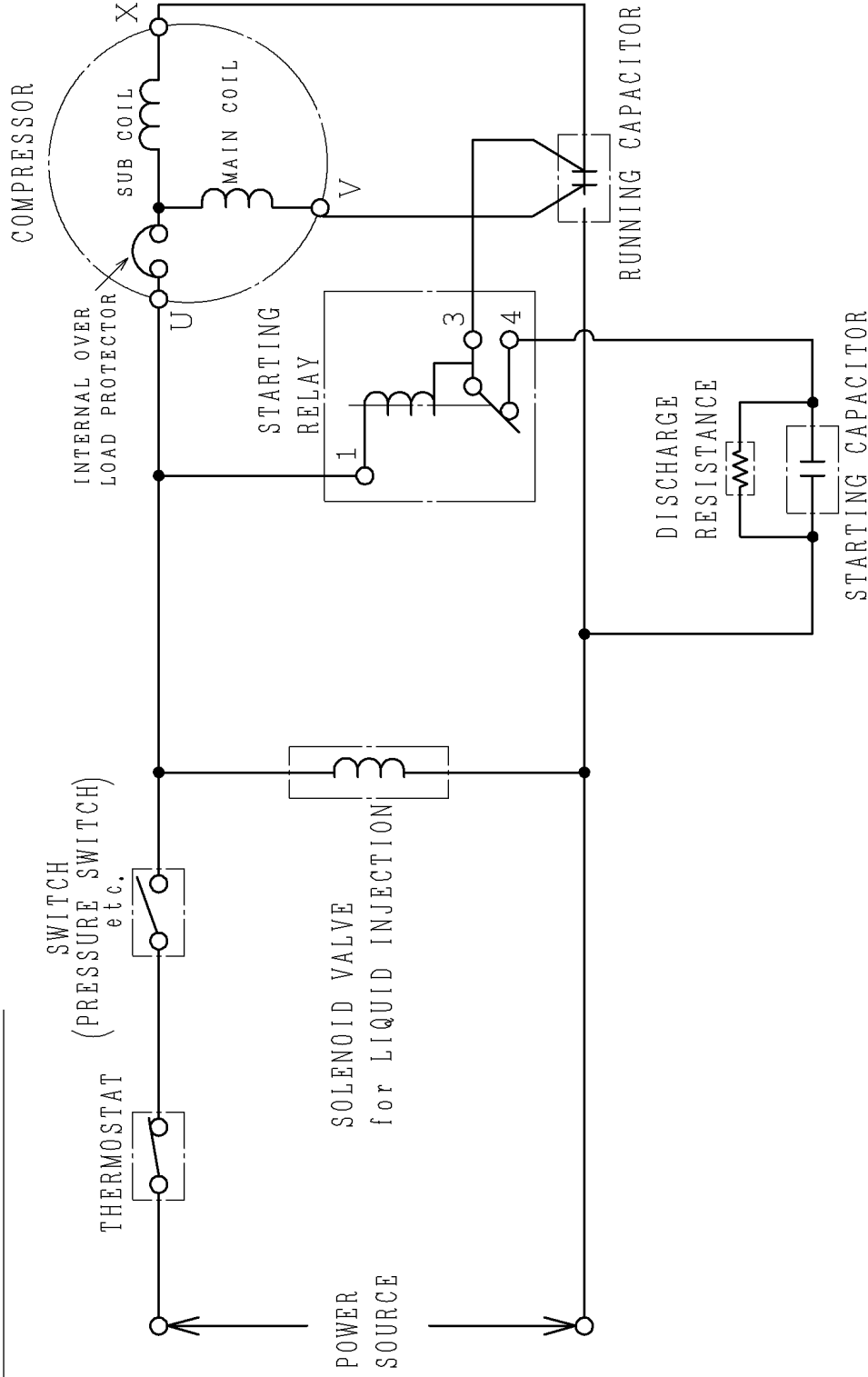
Hitachi Home & Life Solutions, Inc.
 Tokyo Japan
 TOCHIGI DWG. No. 3CYCA5053
 RE-REGD. 2003-11-06



GASKET HERME-COVER SETTING

3CYCA4127

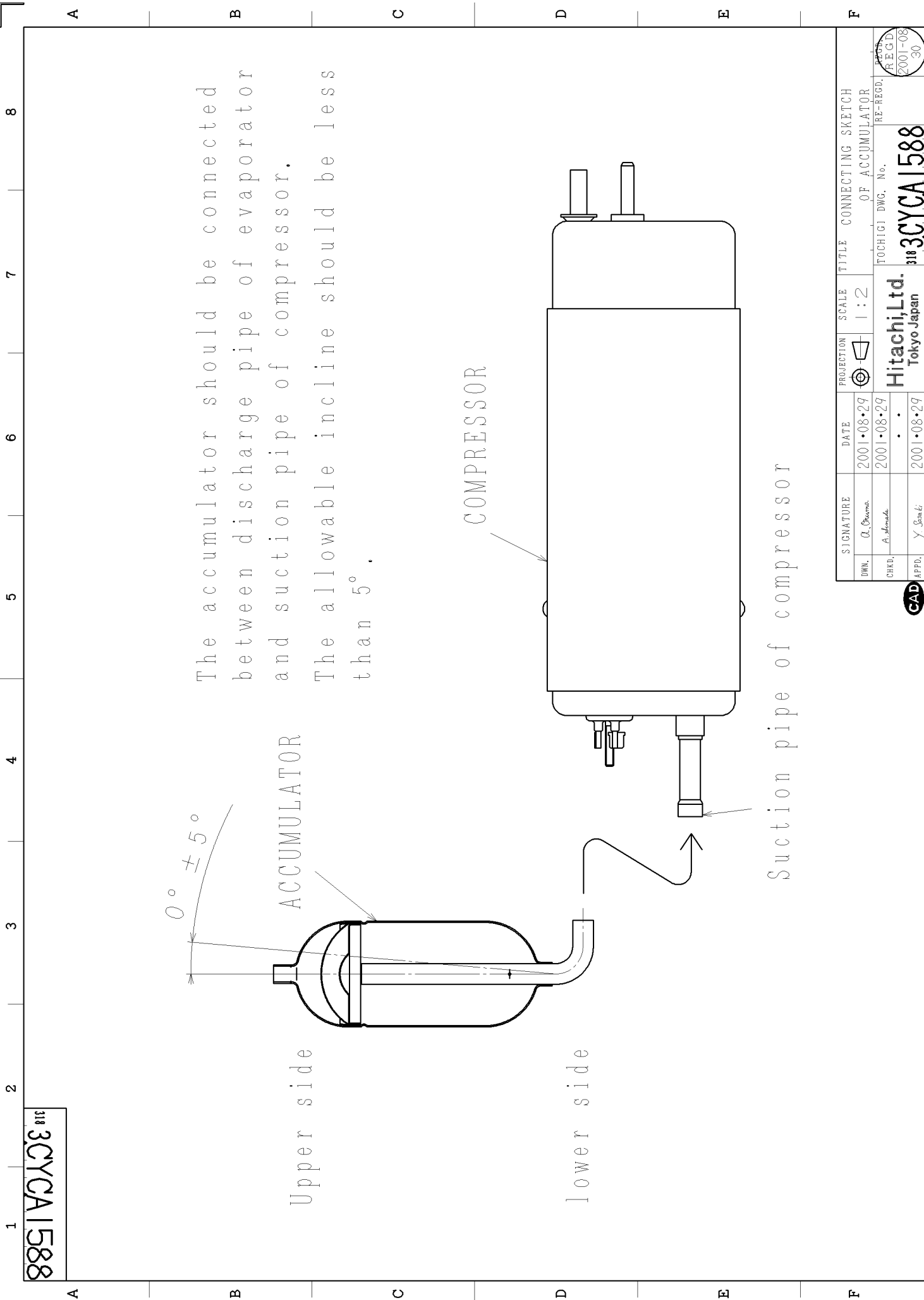
SINGLE-PHASE POWER



SIGNATURE	DATE	PROJECTION	SCALE	TITLE
<i>D. Murakami</i>	2003-02-18		1:1	CIRCUIT DIAGRAM
<i>M. Koyama</i>	2003-02-18			TOCHIGI DWG. No.
<i>Y. Nakano</i>	2003-02-19			Hitachi Home & Life Solutions, Inc. Tokyo Japan

APPROVED
REGD.
2003-02-24



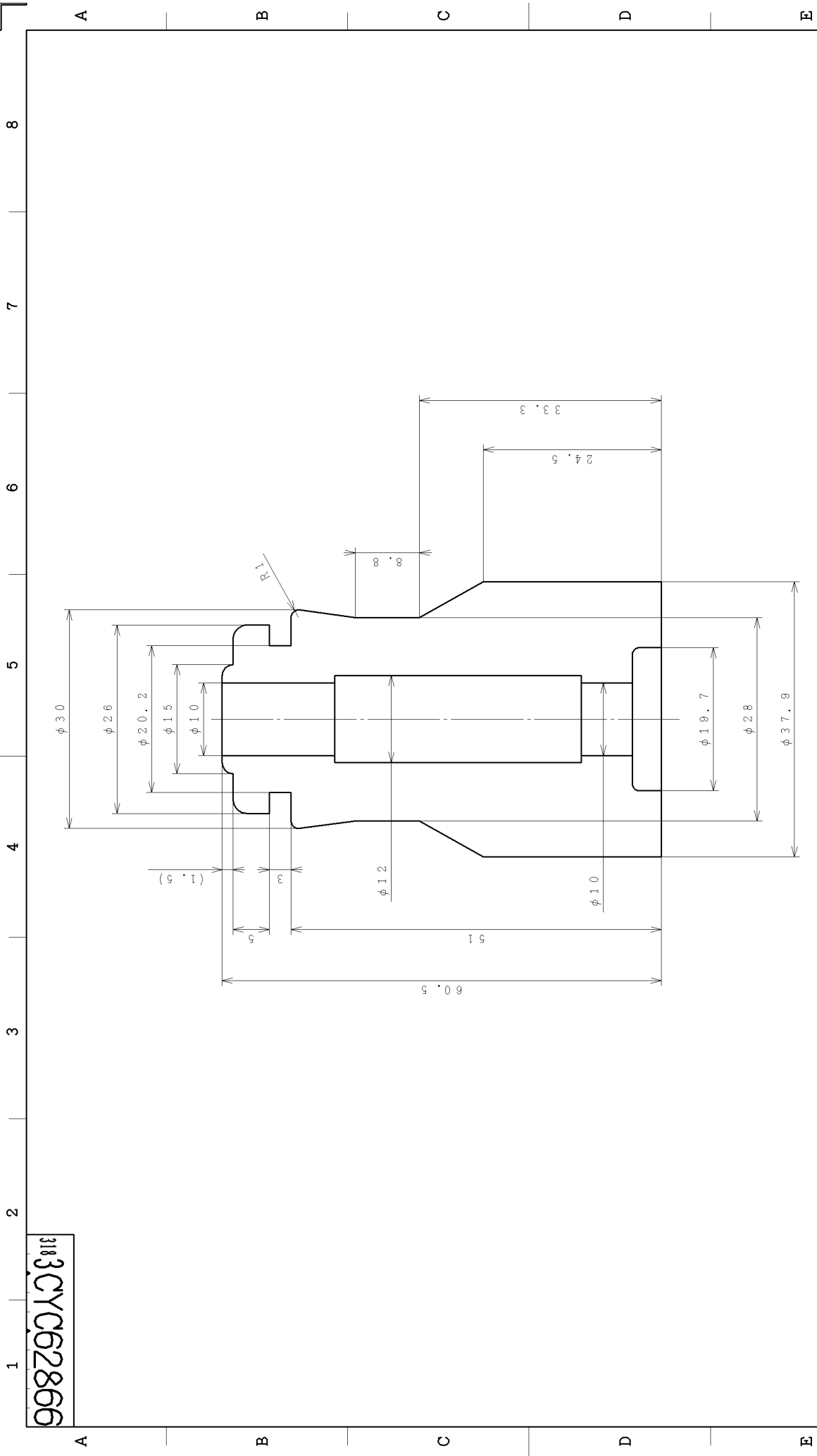


The accumulator should be connected between discharge pipe of evaporator and suction pipe of compressor.
 The allowable incline should be less than 5°.

Suction pipe of compressor

318 3CYCA1588

SIGNATURE		DATE	PROJECTION	SCALE	TITLE
DWG. <i>O. Okamoto</i>		2001.08.29	①	1:2	CONNECTING SKETCH OF ACCUMULATOR
CHKD. <i>A. Shimada</i>		2001.08.29			TOCHIGI DWG. No.
APPD. <i>Y. Shimizu</i>		2001.08.29			RE-REGD.
					318 3CYCA1588
					Hitachi, Ltd. Tokyo Japan
					REGD. 2001-08-30



318 3CYC62866

MATERIAL : NATURAL RUBBER

COLOR : BLACK

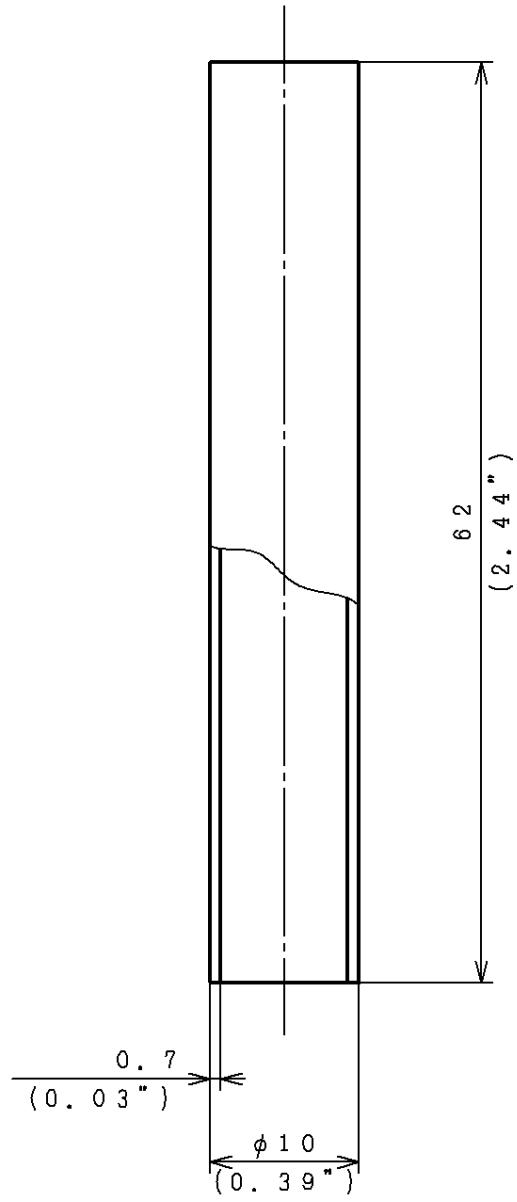
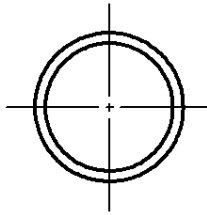
DIMENSION : mm

RE-MARKS	PROJECTION	SCALE
		2 : 1

DRAWN	DATE	TITLE	TOCHIGI DWG. NO.
CHKD	92-05-13	RUBBER	318
APPD	92-05-13	GROMMET	3CYC62866



4CYC11219



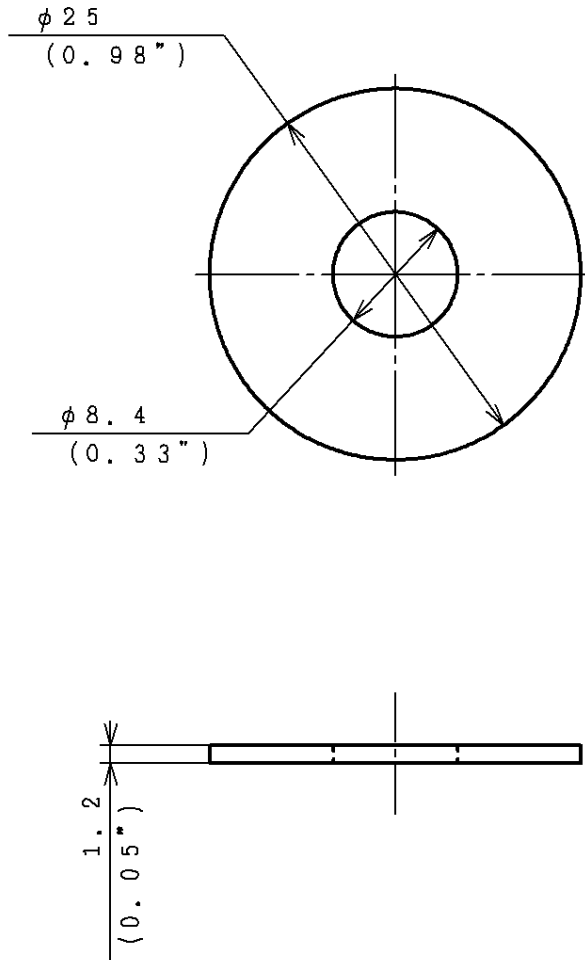
MATERIAL : STEEL PIPE
 DIMENSION : mm (i n)

CAD0003-011 4CYC11219001 5 2003-10-27 19:18 1A7

CAD

SIGNATURE		DATE	PROJECTION	SCALE	TITLE	RE-REGD.		REGD.
DWN.	<i>T. Nishitaka</i>	2003.10.27		2:1	PIPE			REGD
CHKD.	<i>M. Onoyachi</i>	2003.10.28	Hitachi Home & Life Solutions, Inc.		TOCHIGI DWG. No.			2003-11
APPD.	<i>A. Shimada</i>	2003.10.29	Tokyo Japan		4CYC11219			04

4CYC11220



NOTES

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

CAD

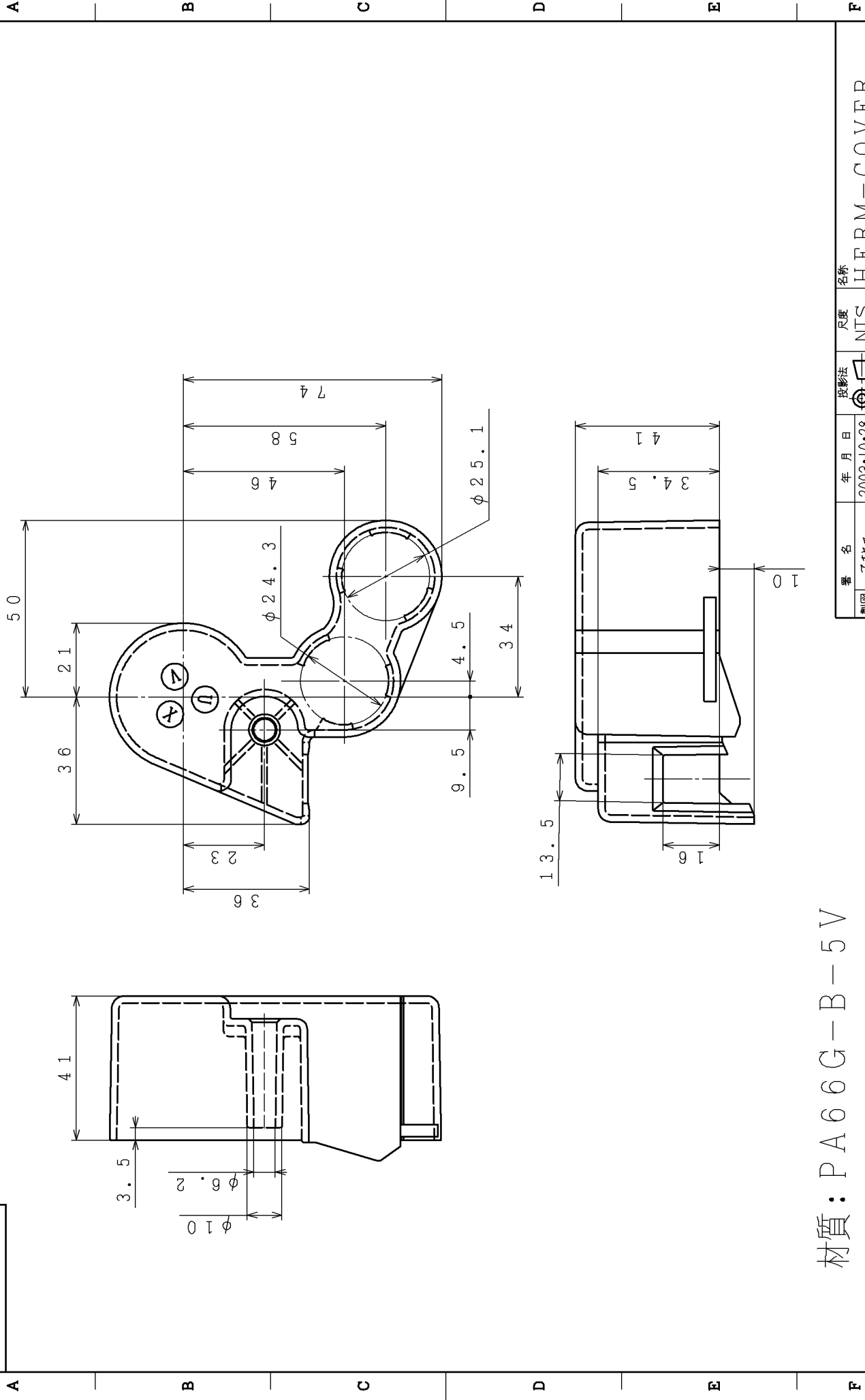
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DWN.	<i>T. Nishikawa</i>	2003.10.27		2:1	WASHER			REGD
CHKD.	<i>M. Onoyachi</i>	2003.10.28	Hitachi Home & Life Solutions, Inc. Tokyo Japan		TOCHIGI DWG. No.			2003-11 04
APPD.	<i>A. Shimada</i>	2003.10.29						

4CYC11220

REGD
2003-11
04

CAD0003-011 4CYC11220001 5 2003-10-27 19:18 1A7

3CYCA4998

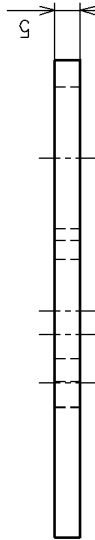
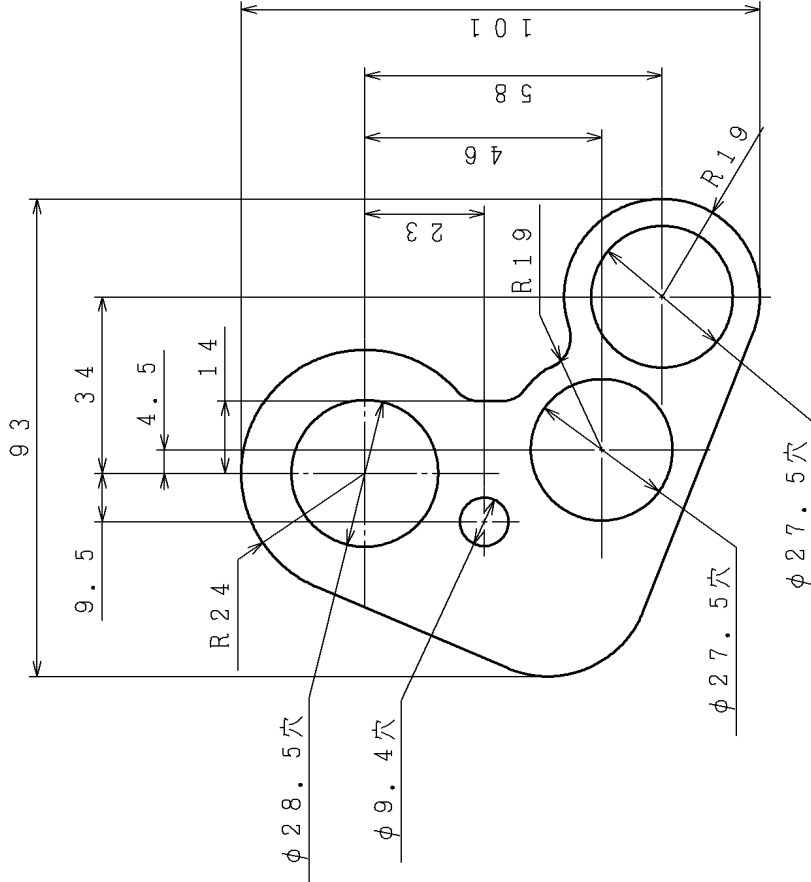


材質: PA66G-B-5V

製品名	7117ヤマ	年月日	2003・10・28	投影法	第一角法	尺度	NTS	名称	HERM-COVER
製図	オノノト	年月日	2003・10・28	製図者	日比野一夫	株式会社	ソリューブ	株式会社	3CYCA4998
審査		年月日		承認	シマダ	2003・10・29			
再入庫		年月日							

2003-11-04

3CYCA4999



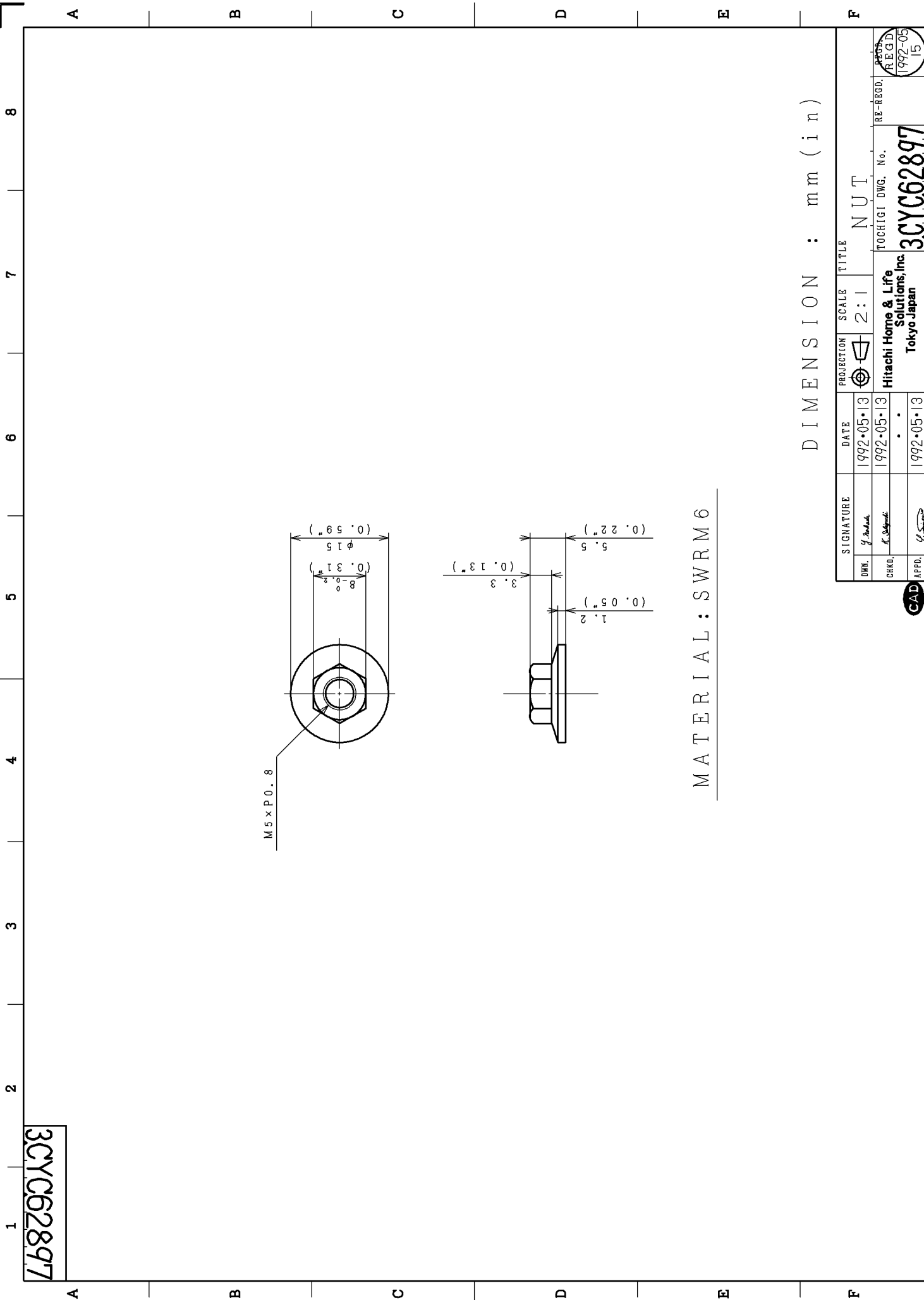
注記
 色調：黒色
 材質：EPDMFOP-B

1 2 3 4 5 6 7 8 A B C D E F

製図	7/1/24	年月日	2003・10・28	投影法	第一角法	尺度	1:1	名称	GOMU-ITA	再入庫	2003-11-04
審査	オノノト	年月日	2003・10・28	投影法	第一角法	尺度	1:1	名称	日立ホーム&ライフ ソリューションズ株式会社	再入庫	2003-11-04
承認	シマダ	年月日	2003・10・29	投影法	第一角法	尺度	1:1	名称	日立ホーム&ライフ ソリューションズ株式会社	再入庫	2003-11-04

3CYCA4999





M5 x P0.8

MATERIAL : SWRM6

DIMENSION : mm (in)

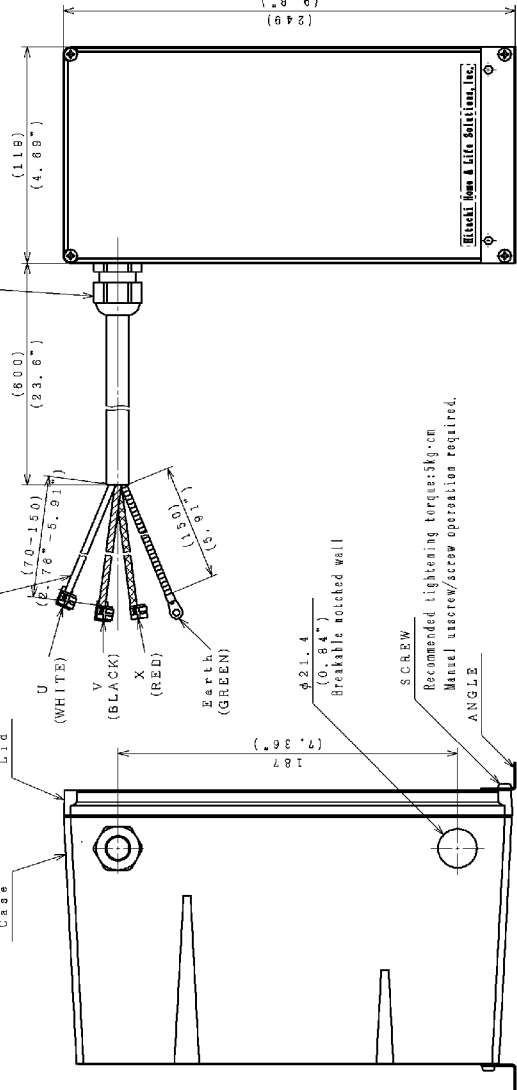
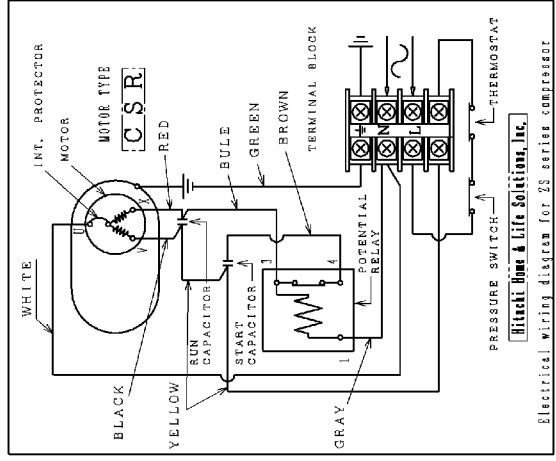
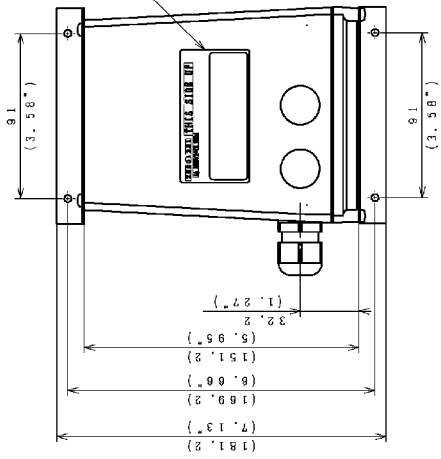
3CYC62897

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
<i>[Signature]</i>	1992.05.13		2:1	NUT
CHKD. <i>[Signature]</i>	1992.05.13	Hitachi Home & Life Solutions, Inc.		
APPD. <i>[Signature]</i>	1992.05.13	Tokyo Japan		

RE-REGD.
1992-05-15

TOCHIGI DWG. No. 3CYC62897

CAD



Diagram

E-BOX Type	Comp. type	Power source	Potential relay	Running Capacitor	Starting Capacitor
A	2S40B4S1	1φ 240-240V 50Hz	ANVL-145V1	30μF/400V	30μF/400V 68kΩ-2W
B	2S6013S1	1φ 240-240V 50Hz	ANVL-210V1	25μF/400V	40μF/400V 68kΩ-2W
C	2S7516S1	1φ 240-240V 50Hz	ANVL-240V1	30μF/450V	40μF/400V 68kΩ-2W
D	2S1120S1	1φ 240-240V 50Hz	ANVL-240V1	40μF/450V	40μF/450V 68kΩ-2W
E	DS1836S1	1φ 220-240V 50Hz	ANVL-240V1	55μF/450V	75μF/400V 68kΩ-2W
F	DS1836X1	1φ 220-240V 60Hz	ANVL-250V2	55μF/450V	75μF/400V 68kΩ-2W

Notes

1. Material of Case and Lid: Polybutylene terephthalate
2. Water tight label: 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.
4. Dimension: mm (in)

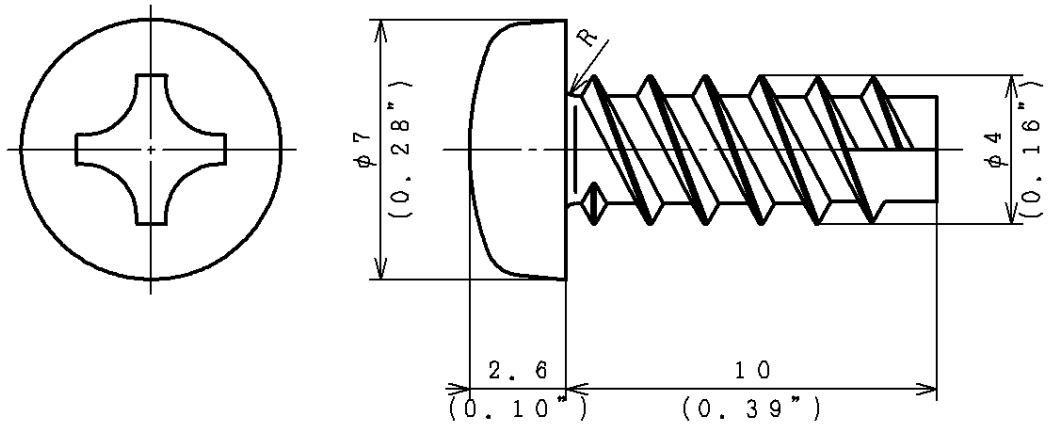
SIGNATURE: _____ DATE: 2003-04-14 PROJECTION SCALE: 1:2 TITLE: E-BOX

DWG. No.: _____ DATE: 2003-04-14 PROJECT: Hitachi Home & Life Solutions, Inc. Tokyo-plant

DESIGNER: _____ CHECKER: _____ APPROVER: _____

2CYC60742

4CYC11209



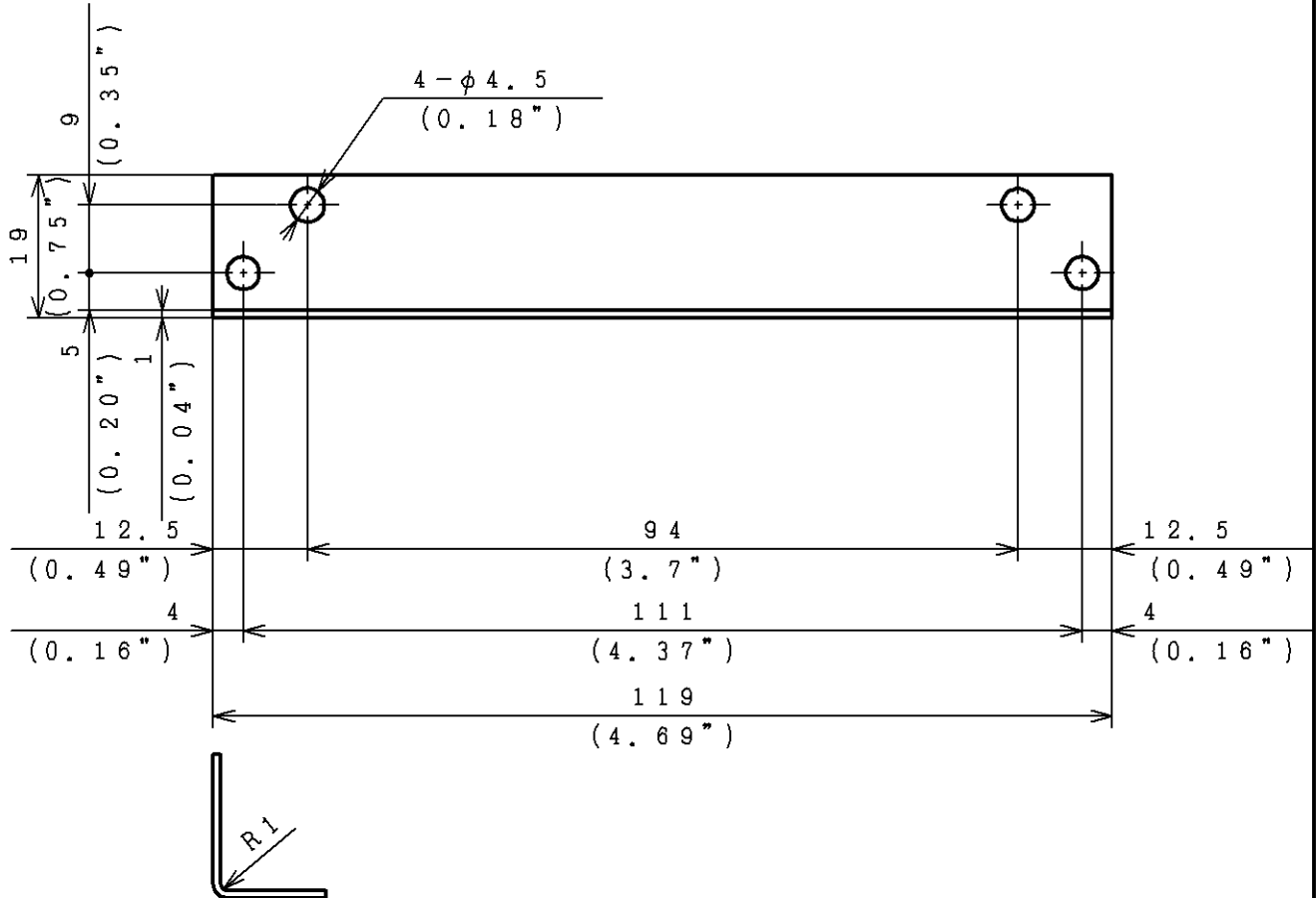
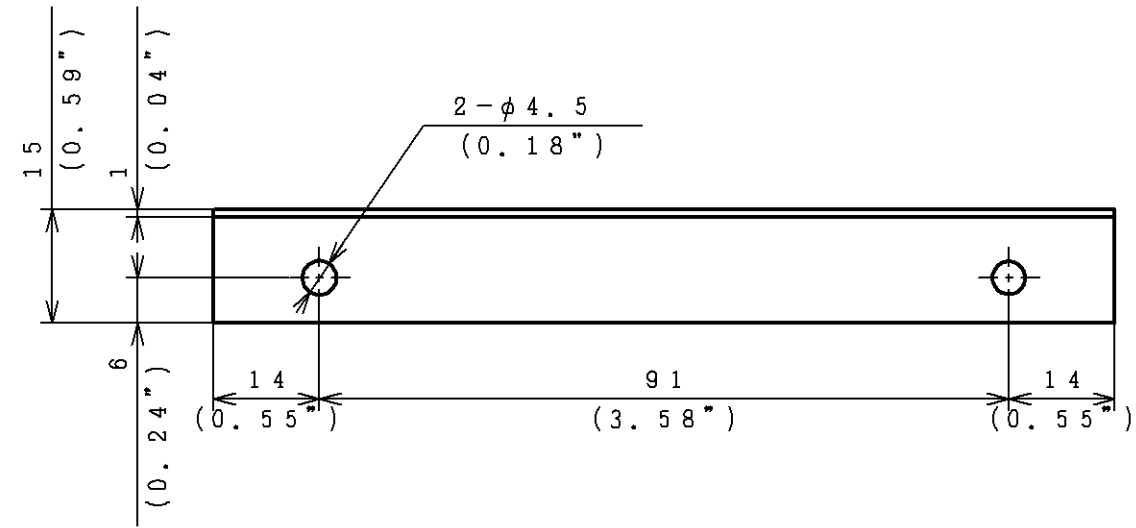
NOTES

1. Material: Carbon steel wires for cold heading and cold forging
2. Surface: Zinc-coating
3. Type: Cross-recessed head tapping screws
4. Dimension: mm (in)

CAD

SIGNATURE		DATE	PROJECTION	SCALE	TITLE
DWN.	<i>W. Sugano</i>	2003.04.11		1:1	TP - SCREW - B
CHKD.	<i>N. Nishino</i>	2003.04.11	Hitachi Home & Life Solutions, Inc. Tokyo Japan		TOCHIGI DWG. No. 4CYC11209
APPD.	<i>K. Kato</i>	2003.04.11			
			RE-REGD.	REGD.	REGD.
				2003-04	14

4CYC11210



NOTES

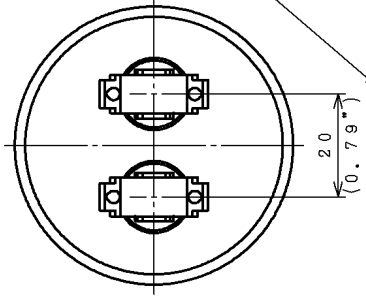
- 1. Material: Electrolytic zinc-coated steel
- 2. Surface: Zinc-coated
- 3. Dimension: mm (in)



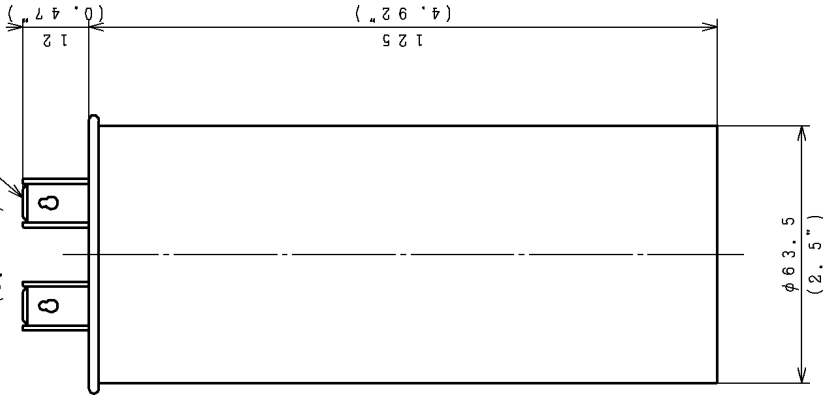
SIGNATURE	DATE	PROJECTION	SCALE	TITLE
DWN. <i>W. Sugawa</i>	2003.04.11		1:1	ANGLE
CHKD. <i>N. Hoshino</i>	2003.04.11	Hitachi Home & Life Solutions, Inc. Tokyo Japan		TOCHIGI DWG. No.
APPD. <i>K. Kato</i>	2003.04.11	4CYC11210		RE-REGD. REGD. 2003-04 14

C9909-027 4CYC11210002 5 2003-6-9 10:31 185

3CYCA4980



フアストンタブ端子
TERMINAL (4-TINE)
(#250シリーズ)
AMP 250 QUICK-CONNECT



STARTING CAPACITOR and DISCHARGE RESISTANCE

始動用キヤパシタと放電抵抗

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。

2. 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。

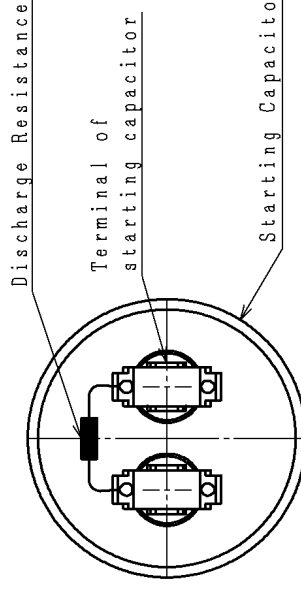
Large amount of currency which was charged in the starting capacitor may go into the contact point of the relay, and the contact part might be deposited.

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。

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



Starting Capacitor

SIGNATURE		DATE		PROJECTION		SCALE		TITLE	
DMK	<i>E. Nishikubo</i>	2003・10・30				1:1		STARTING CAPACITOR	
CHKD.	<i>M. Ogasawara</i>	2003・10・30						TOCHIGI DWG. No.	
APPD.	<i>A. Horikawa</i>	2003・10・30						Hitachi Home & Life Solutions, Inc.	
								Tokyo Japan	
								3CYCA4980	

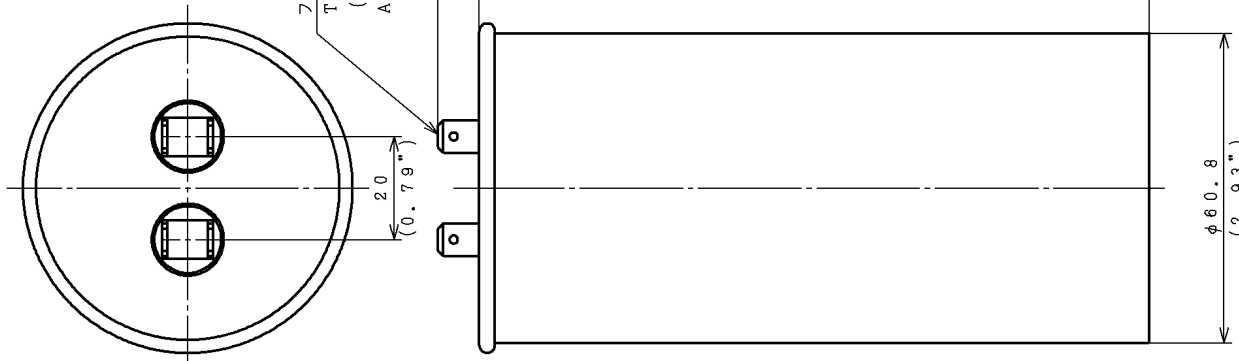
REGRD
2003-11
04

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

ファストタブ端子
TERMINAL (2-TINE)
(#250シリーズ)
AMP 250 QUICK-CONNECT



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

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
Hitachi Home & Life Solutions, Inc. Tokyo Japan	2003・10・30	1:1	1:1	運転用キャパシタ RUNNING CAPACITOR
CHKD.	2003・10・30	TOCHIGI DWG. No. 3CYCA4981		
APPD.	2003・10・30	RE-REGD. 2003-11-04		

3CYCA1986

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

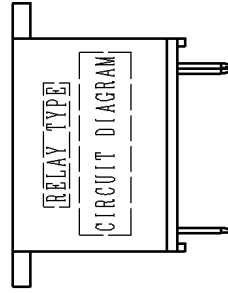
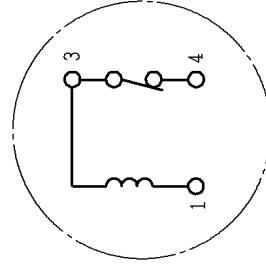
1. Please keep the direction of the installation of the relay.
 There is a case not to operate normally when installing in the direction which is different from the direction.

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。

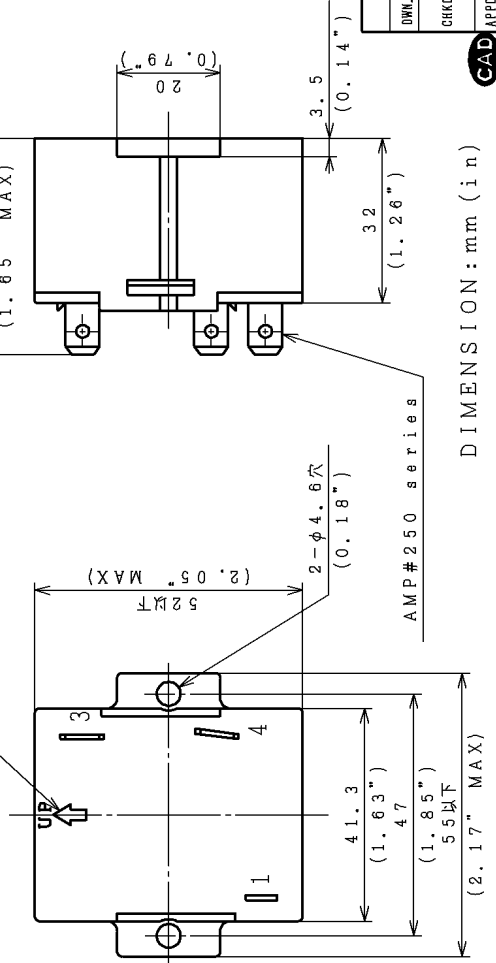
*CONTACT TYPE b (ON→OFF)



CIRCUIT DIAGRAM



installation of the relay
 リレー設置方向



DIMENSION : mm (in)

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
<i>R. Masuda</i>	2001.12.05		1:1	STARTING VOLTAGE
<i>M. Ohgaki</i>	2001.12.05			CONTROL RELAY
<i>K. Nakagawa</i>	2001.12.05			TOCHIGI DWG. No.
<i>Y. Sasaki</i>	2001.12.06			RE-REGD.

Hitachi Home & Life Solutions, Inc. 3CYCA1986
 Tokyo Japan

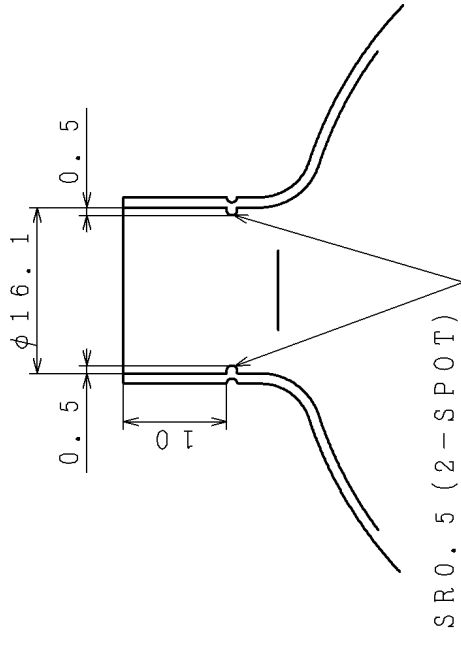
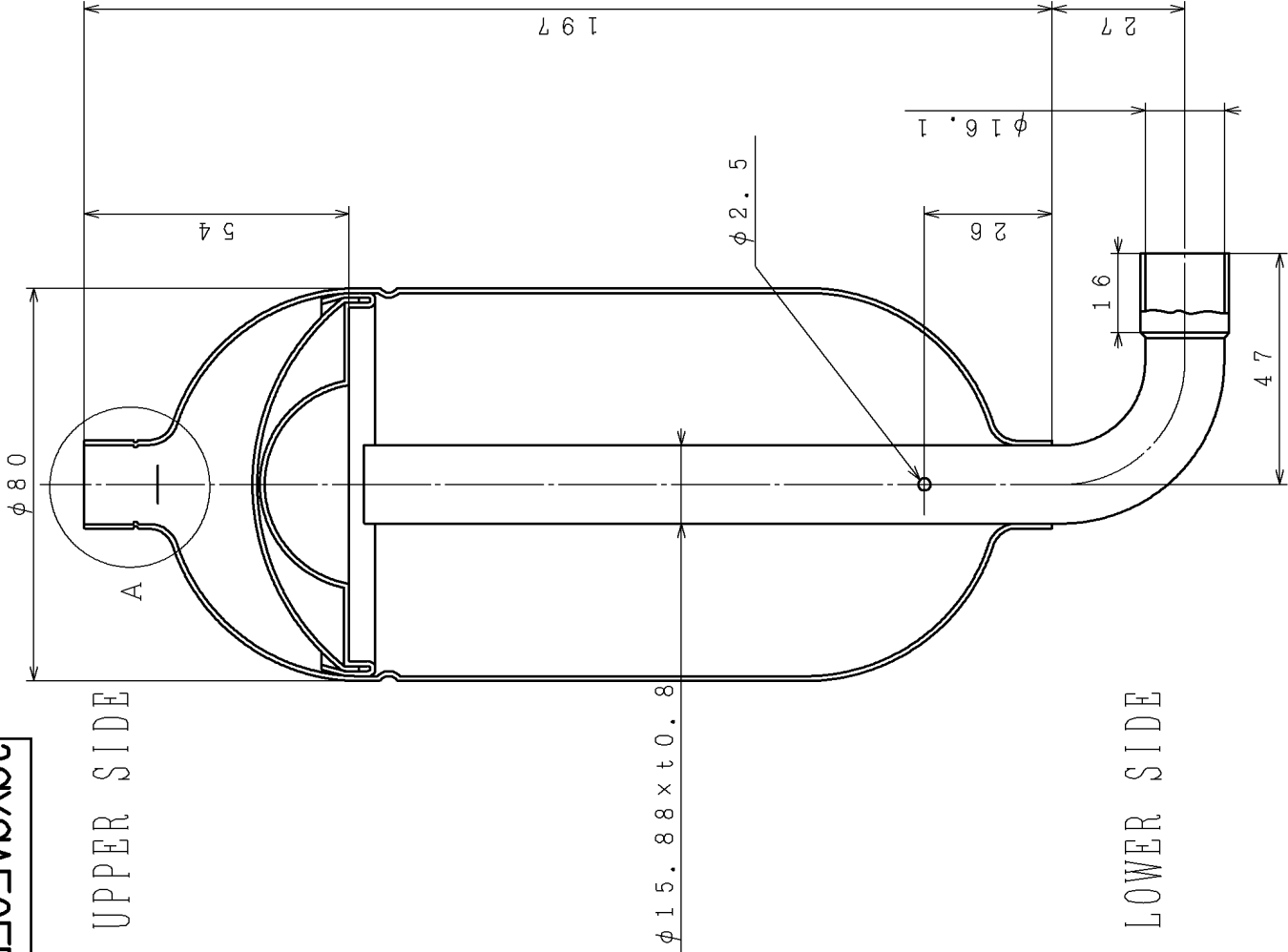
REGD. 2001-12-07



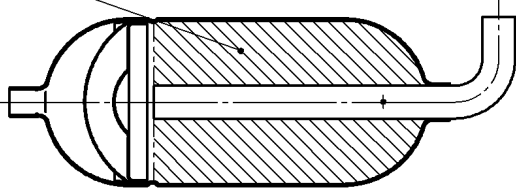
3CYCA5055

UPPER SIDE

LOWER SIDE



A (2:1)
VALID VOLUME: 530mL



(NTS)

注記

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.

SIGNATURE	DATE	PROJECTION	SCALE	TITLE
<i>A. Hirose</i>	2003.11.05		1:1	ACCUMULATOR
<i>M. Ogasawara</i>	2003.11.05			
<i>A. Hirose</i>	2003.11.05			

Hitachi Home & Life Solutions, Inc.
Tokyo Japan

TOCHIGI DWG. No. 3CYCA5055

RE-REGD. 2003-11-06