

Hitachi Highly

Rollkolbenverdichter

Rotary Compressors

Spezifikation

Installation Manual

WHP01900VUV-H8JU

R 134a - R 513A- R 1234yf

12,2 cm³/rev

220 - 240V/1/50

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	SUBJECT Model WHP01900VUV-H8JU SPECIFICATION			PAGE: 1/28
1. SCOPE This specification is applied to SHANGHAI HITACHI Heat pump water heater compressor.				
2. SPECIFICATION OF COMPRESSOR				
2.1 Model WHP01900VUV-H8JU				
2.2 Rated Voltage/Frequency/Phase 220V~240V/50Hz/single				
2.3 Application Heat pump water heater				
2.4 Refrigerant R-134a or R513A or R1234yf				
2.5 Compressor Cooling Forced air				
2.6 Displacement 12.2ml/rev				
2.7 Performance				
Performance (Voltage 220~240V)				
Refrigerant	R134a	R513A	R1234yf	
Item	Rated condition	Rated condition	Rated condition	
Nominal Heating Capacity	1895W/1915W	1895W/1938W	1905W/1925W	
Motor input	450W/465W	450W/468W	453W/470W	
Current	2.2A/2.2A	2.2A/2.2A	2.2A/2.2A	
COP(see*)	4.20/4.10	4.21/4.14	4.20/4.09	
Test Conditions				
Evaporating temp.	7.2℃	7.2℃	7.2℃	
Condensing temp.	54.4℃	54.4℃	54.4℃	
Liquid temp. entering expansion valve.	46.1℃	46.1℃	46.1℃	
Return gas temp.	35℃	35℃	35℃	
Ambient temp.	35℃	35℃	35℃	

* COP= $\frac{\text{Heating capacity (W)}}{\text{Motor input (W)}}$

- 2.8 Allowable amount of refrigerant charge 1300 g
- 2.9 Amount of oil charge 320 ± 20 ml (Initial)
- 2.10 Oil HAF68D1 or equivalent

- 2.11 Space volume of inner case 900 ml
- 2.12 Net weight 10.5 kg incl. oil

- 2.13 Hermetic Terminal 1/4" quick connect type

2.14 Motor

- Type Permanent Split Capacitor
- Capacitor 15MFD/420 Volts
- Locked rotor amps 15.5 A (240V/50Hz)
- Approved voltage range Rated Voltage (-10%, +10%)
- Winding resistance (M/S) 4.82/6.22 Ω (at 20°C)

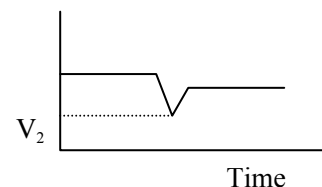
- 2.15 Starting performance
- (1) The starting voltage should be as follows.
 - (2) The starting pressure should be balanced between the suction and discharge of the compressor and should be adjusted to the following table.
 - (3) The temperatures of the compressor enclosure should be more than 20°C continuously at the following table.

TABLE 1

Starting Conditions		Spec
Motor temperature	Pressure MPa {kgf/ cm ² G}	Starting voltage (V ₂)**
Cold-Starting Cold state (room temperature)	R134a 0.73 {6.38} R513Aa 0.78 {6.92} R1234yf 0.74 {6.57}	Below 85% of rated voltage
Hot-Starting(Standard) Hot state after operated under standard load condition	R134a 0.69 {6.03} R513A 0.74 {6.55} R1234yf 0.71 {6.22}	Below 85% of rated voltage
Hot-starting(Overload) Hot state after operated under overload condition	R134a 0.95 {8.61} R513A 1.00 {9.20} R1234yf 0.95 {8.67}	Below 90% of rated voltage

* Nominal heating capacity equals refrigerant capacity adding motor input. Refrigerant capacity and motor input are measured by secondary Refrigerant calorimeter Methods of GB5773 by Shanghai Hitachi Electrical Appliances Co., Ltd. Allowable heating capacity should be more than 95% of the nominal heating capacity and allowable motor input should be less than 107% of nominal motor input.

** V₂ means minimum voltage measured between pins of hermetic terminal at the compressor starts.



***. The suction pressure is measured on the position above the filter of accumulator.

	<p>SUBJECT</p> <p>Model WHP01900VUV-H8JU SPECIFICATION</p>	PAGE: 4/28
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3. PARTS AND DRAWING LIST

WHP01900VUV-H8JU	Drawing code	Q'ty	Remarks
Outline dwg.	4CYCD0XXX	—	Dimensioned sketch
Wiring diagram	SC01D576	—	
Electrical components			
Motor protector	4CYC00982H	1	B110-160-241E
Running capacitor	4CYC00173H23	*	15μF-420WV
Terminal parts accessories			
Terminal part assy	SC01DA46	—	
Terminal cover	SC01DA53	1	
Sleeve	4CYC00995	1	
Motor Pro. Spring	SC01DA45	1	
Packing	SC01DA54	1	
Rubber washer	SC01DA63	1	
Flange nut	SC01D430	1	
Mounting accessories			
Mount assy	SC01DA55	—	
Rubber mount	SC01DA68	3	

*. Out of supply, for reference.

4. CHARACTERISTICS

4.1 Residual moisture 120mg MAX

4.2 Residual impurities 100mg MAX

1. SYSTEM DESIGN LIMITATIONS

1.1 Power source and Voltage

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

In the case of three phase, the phase imbalance should be within 3% among the compressor terminals. The phase imbalance should be calculated according to the follow formula.

$$\text{the phase imbalance} = \frac{(V)_{\max} - (V)_{\text{mean}}}{(V)_{\text{mean}}} \times 100\%$$

(V)_{max}:Maximum voltage among the three terminals. (V)

(V)_{mean}:average voltage among the three terminals. (V)

1.2 Operating Temperatures and Pressures

The operating temperatures and pressures of the compressor should be within the range shown in the table 2 and graph 1.

1.3 Operating and Shut-off Period

The compressor should be operated continuously at least for 5 minutes after being turned ON.

3 minutes shut-off time should be ensured at least until restarting.

1.4 Oil Back and height of the oil level

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

Oil level of compressor should be higher than 7.5 mm from the lubricating piece fixed on the end of the crankshaft.

Compressor must not be started operated under a dual-layer separate status.

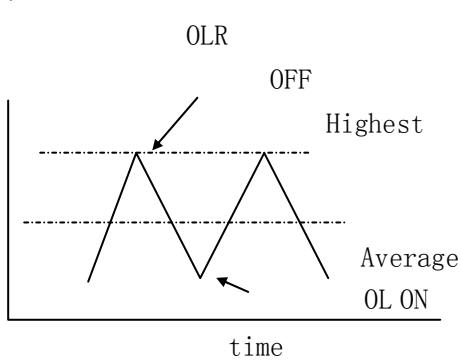
However, in case of foaming situation, the height of this foam does not mean the height of the oil level.

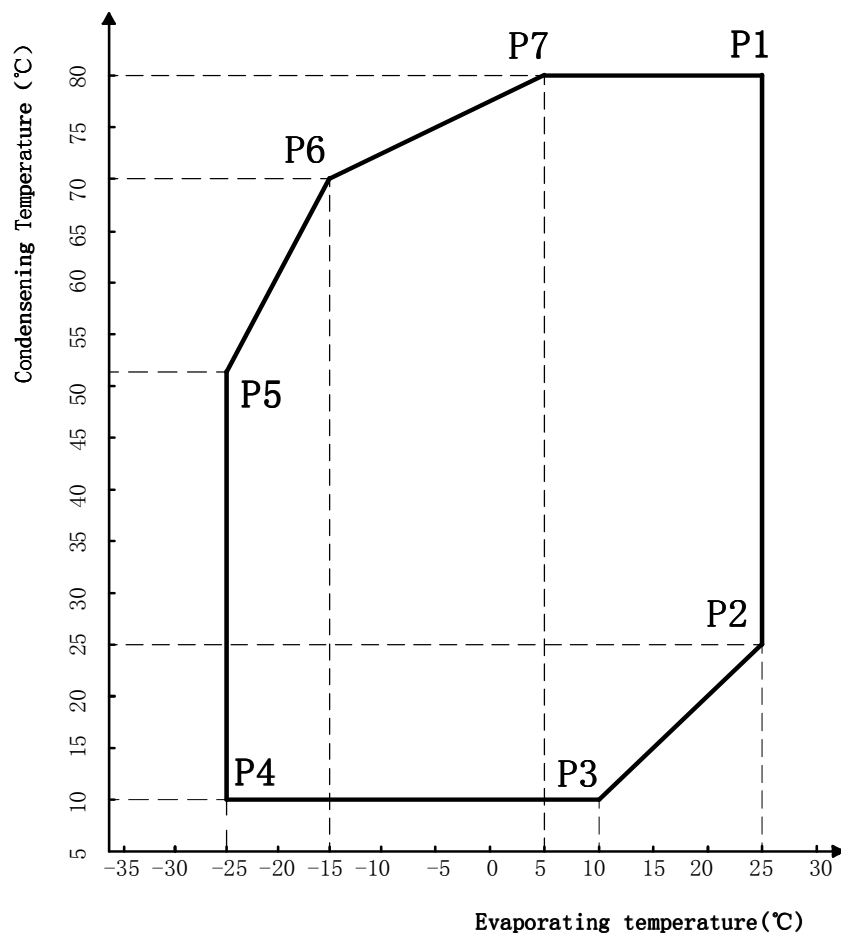
If you do not keep the oil level, the oil shortage will occur, and influence the reliability of compressor.

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

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

Table 2

Item	Operating Envelope (see graph 1)		
Refrigerant	R134a	R513A	R1234yf
Discharge pressure MPa {kgf/ cm ² G}	2.63 {25.85} MAX (condensing temperature :80℃)	2.69 {26.43} MAX (condensing temperature :80℃)	2.52 {24.70} MAX (condensing temperature :80℃)
Suction Pressure MPa {kgf/cm ² G}	0.11~0.67 {0.12~5.83} (Evaporation Temperature : -25℃	0.12~0.71 {0.22~6.24} (Evaporation Temperature : -25℃	0.12~0.68 {0.22~5.93} (Evaporation Temperature : -25℃
Compressor case bottom temp	99℃ or below and 6 degrees higher than condensing temperature		
Motor winding temp.	Voltage ±10% 127℃ MAX		
Motor winding temp. under locked-rotor condition	<p>under stable condition: :</p> <p>Average 165℃ MAX Temp</p> <p>Highest 190℃ MAX</p> 		
Accumulator temp	Higher than outlet pipe of evaporator		



Graph 1

	P1	P2	P3	P4	P5	P6	P7
Condensing temperature	80°C	25°C	10°C	10°C	52°C	70°C	80°C
Evaporation Temperature	25°C	25°C	10°C	-25°C	-25°C	-15°C	5°C

1.5 Discharge pipe temperature

Discharge pipe temperature is measured at a distance 300mm from the surface of compressor and should be less than 110°C. The tip of the thermocouple is fixed by soldering when measuring discharge pipe temperature .Furthermore, soldering point is covered with urethane foam to prevent the effect of wind.

1.6 Temperature of Shell Bottom

The Temperature of compressor shell Bottom must be 6 degrees higher than the corresponding saturated temperature of discharge pressure under normal operating conditions.

1.7 Avoid refrigerant migration

The refrigerant migration to compressor shell should be avoided during the heat pump water heater system shut down periods, It's suggested that the electric heating belt should be used around the shell bottom when necessary.

1.8 Allowable Incline

The allowable incline should be less than 5° during operation.

1.9 Pipe Vibration

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

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

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1.10 Connecting Tube Design

In designing and routing tubing that connect from the compressor to the other parts of the air conditioner, 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 to lead wire.

2. PROCESS LIMITATIONS

2.1 The degree of vacuum in the refrigerating system should be less than 20Pa
{ 150×10^{-3} mmHg} at room temperature just before charging refrigerant.

The quantity of water should be less than 0.15ml.

2.2 Prevent moisture from entering into the enclosed unit system . When the moisture entered into the unit with refrigerant R134a/R513A/R1234yf, the refrigerant oil and the organic compound material presented in the hermetic motor will possibly decompose on the affecting of water . It will result in the capillary depositing and the reducing of insulation resistance.

It is necessary to install a dryer to dehumidify the residual moisture mixed in the refrigerant in the cycling system . The specially defined device for drying and filtering of HFC-R134a is advised.

2.3 The weight of foreign particles on the inside surface of the heat exchanger tubes should be less than 0.05g/m^2 .

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

This value means the weight of foreign particles filtered after washing inside surface of the heat exchanger tubes with R-11.

Prevent the impurities from entering into the enclosed unit system . When the impurities entered into the enclosed system , it will damage the moving mechanism parts and result in the capillary depositing.

2.4 Eliminate all system contaminants such as trichlorethylene, alkalies, soap , acid , oil & washing fluid used at machining the heat exchanger tubes.

2.5 Purge parts with dry nitrogen or dry air to remove remains in parts (dust, detergent, etc.) before assembly of system.. Time for purging : over one second for pipe ; over three seconds for heat exchanger . Purging pressure: $0.9 \pm 0.1\text{MPaG}$. Dew point of dry air: Below -20°C .

Dry nitrogen should be charged in compressor before assembly of system.
Welding should be finished within one minute after charge of nitrogen. Dry nitrogen needs to be charged again and weld if over one minute. Always purge the compressor with dry nitrogen during assembly of system .

2.6 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 .

2.7 The compressor should be operated for more than 20 seconds within 15 minutes after charging refrigerant into the system so proper lubrication results.

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3. MISCELLANY

3.1 The pipe and hermetic pins attached to the compressor should not be bent.

3.2 The compressor should never be operated while under vacuum; otherwise, internal arcing can cause damaging parts.

3.3 The compressor should not be operated to form a vacuum and to absorb air.

3.4 The compressor should not be left opened in the atmosphere for more than 5 minutes.

When the air entered into the unit system with refrigerant R134a , it will expedite the deterioration of the oil and result in the capillary depositing and the reducing of insulation resistance.

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

3.6 The compressor should be kept in the clean place with low-moisture.

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

3.8 The compressor should not be splashed with water intentionally.

3.9 Use the refrigerant of specified brand . When the refrigerant not specified used , it will possibly cause trouble of the performance and reliability of the compressor by the impurities in the refrigerant.

3.10 Refrigerant should be charged from the end of condenser of refrigerating systems. Never charge refrigerant to the compressor directly.

3.11 Compressor mounting

Rubber grommets are designed soft to provide the 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.

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3.12 The first starting voltage supplied to the refrigerating system should be more than the starting voltage mentioned TABLE 1(page 3).

The refrigerant can not dissolve in the oil at the beginning because of the high viscosity of the oil.

3.13 The compressor should be kept out of the corrosive atmosphere such as in a chemicals storage, beside a hot spring and so on.

3.14 The lead wires should be connected to hermetic terminals without being touched on the surface of the compressor.

3.15 The fuse or/and breaker should be equipped in the main circuit.

3.16 The oil should be returned continuously to the compressor and not stayed in the refrigerating system.

3.17 There should be adequate clearance between the OD26-under-surface of Bolt -Head and the upper surface of rubber grommets.

3.19 To avoid water and impurity into the refrigeration system and make sure no leakage of refrigerant during the operating course. It's required to direct the erector and maintenance man of air-conditioner.

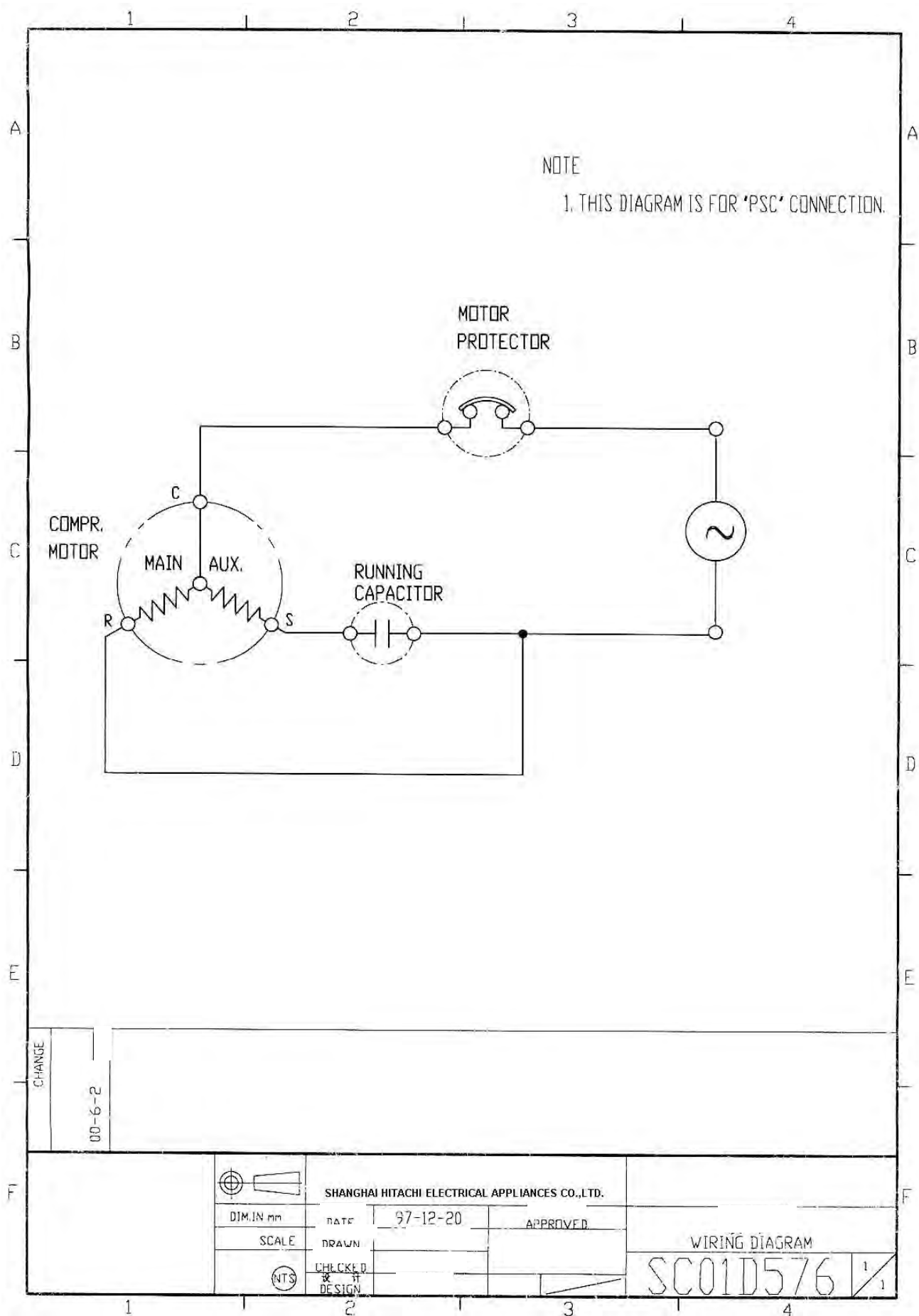
1. Basis for Checking upon Delivery

The Performance test will be carried out in accordance with this “compressor specification”.

The Safety Performance in accordance with GB4706.1 Safety of household and similar electrical appliances General requirements and GB 4706.17 Safety of household and similar electrical appliances Particular requirements for motor-compressor.

2. Rule for Checking upon Delivery

If come across any quality problem, please notify the company in written form within 30 days after the arrival of the cargo, the company shall exchange exactly the number of the products, otherwise they shall be regarded as being up to standard.



286000982 F

图号	部 品 名	材 质	原 材 料 尺 寸	备 注
1	MOTOR PRO			
90	SCL 3039			

注：1、标记按材料技术条件。

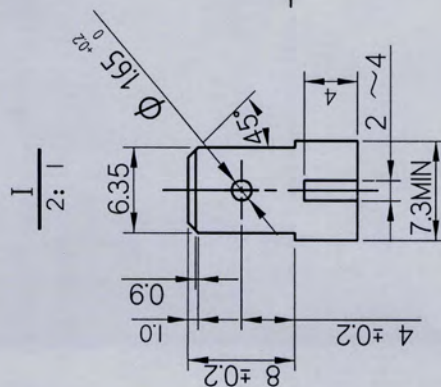
2、端子（1、3）部抗拉伸力不小于5kgf，

时间不少于1min。

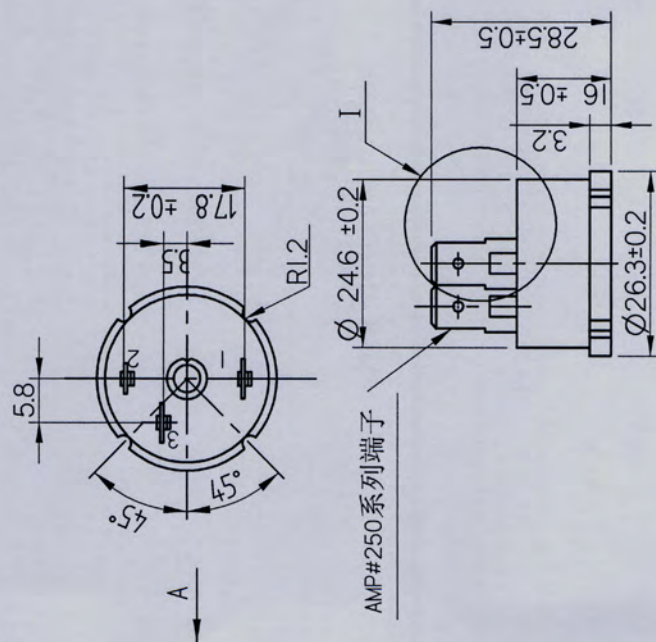
3、图 I 中的倒角允许作成圆角，图 I 中尺寸 2~4 如大于3，上端允许用R与两边相切。

4、B-4处R1.2圆弧槽为2个或4个。

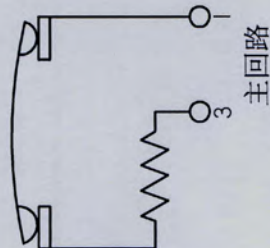
5、交货部品需符合设计基准SIS SPOS 005《制品含有化学物质管理基准的规定》。



A向局部



接线图

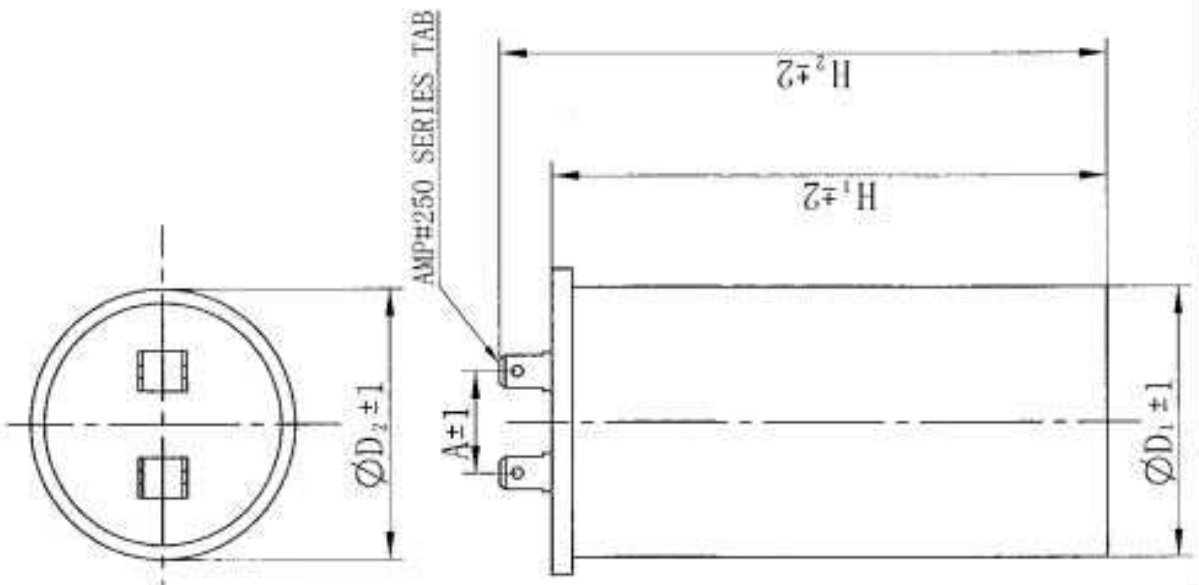


图号	名称	图例	比例	入册	备注
初版	马达保护器		2016.1.28		
改定	MOTOR PRO		2016.1.28		
改定			2016.1.28		

上海日立电器有限公司

4CYC00982

4CYC00173



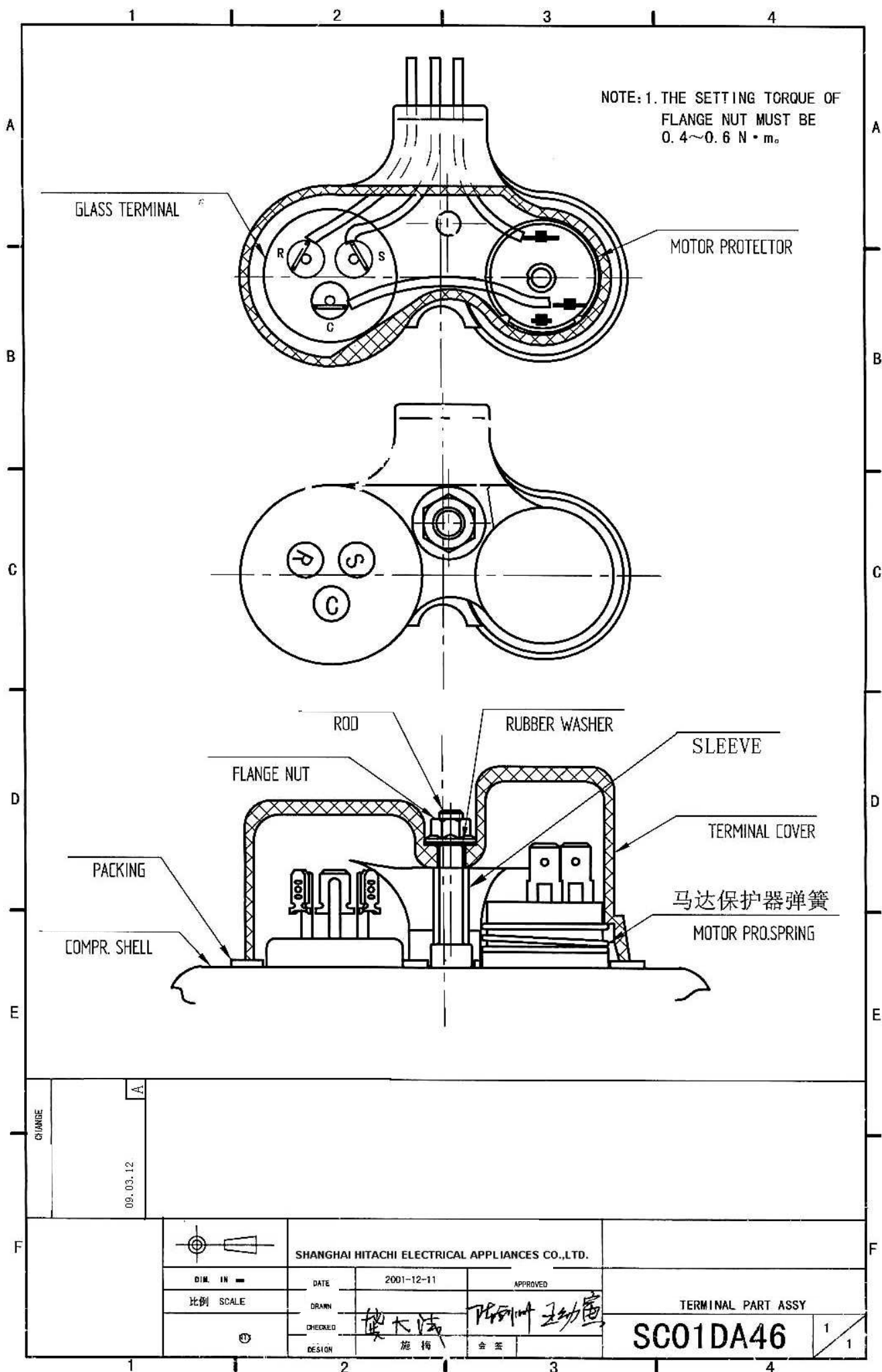
SPECIFICATION

NO	RATING		DIMENSIONS					MFG. NO.
	CAPACITANCE μF	VOLTAJE V	TEMP. COE. ppm/°C	φD ₁	φD ₂	H ₁	H ₂	A
1	25	330	50/60	11.5	18	95	110	18
2	30	230	50/60	11.5	18	95	88	18
3	30	330	50/60	11.5	18	130	138	18
4	35	330	50/60	11.5	18	130	138	18
5	40	230	50/60	11.5	18	95	103	18
6	40	330	50/60	11.5	18	130	138	18
7	45	230	50/60	11.5	18	95	103	18
8	50	230	50/60	11.5	18	95	103	18
9	55	230	50/60	11.5	18	95	103	18
10	60	230	50/60	11.5	18	95	103	18
11	25	450	50/60	11.5	18	130	138	18
12	15	230	50/60	11.5	18	95	103	18
13	25	230	50/60	11.5	18	95	103	18
14	50	300	50/60	11.5	18	130	138	18
15	60	300	50/60	11.5	18	130	138	18
16	35	450	50/60	11.5	18	130	138	18
17	45	230	50/60	11.5	18	95	103	18
18	60	250	50/60	11.5	18	95	103	18
19	25	450	50/60	11.5	18	130	138	18
20	30	270	50/60	11.5	18	95	103	18
21	50	250	50/60	11.5	18	95	103	18
22	50	150	50/60	11.5	18	95	103	18
23	15	420	50/60	11.5	18	100	110	18
24	45	450	50/60	11.5	18	130	138	18
25	10	450	50/60	11.5	18	130	138	18
26	60	350	50/60	11.5	18	130	138	18
27	65	350	50/60	11.5	18	130	138	18
28	70	350	50/60	11.5	18	130	138	18
29	15	300	50/60	11.5	18	130	138	18
30	17	350	50/60	11.5	18	130	138	18
31	17	450	50/60	11.5	18	130	138	18
32	30	450	50/60	11.5	18	130	138	18
33	10	450	50/60	11.5	18	130	138	18
34	20	450	50/60	11.5	18	130	138	18

REV	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD
1	15.2.20	15.2.20	15.2.20	15.2.20	15.2.20	15.2.20	15.2.20	15.2.20	15.2.20

PROJECTION SCALE VTS

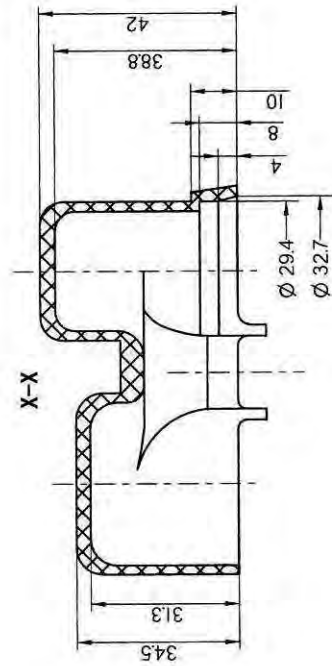
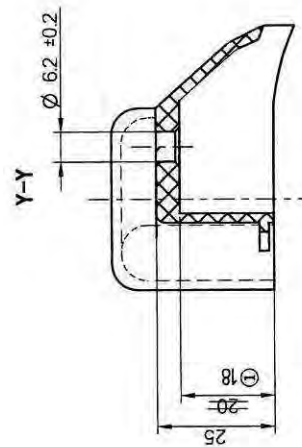
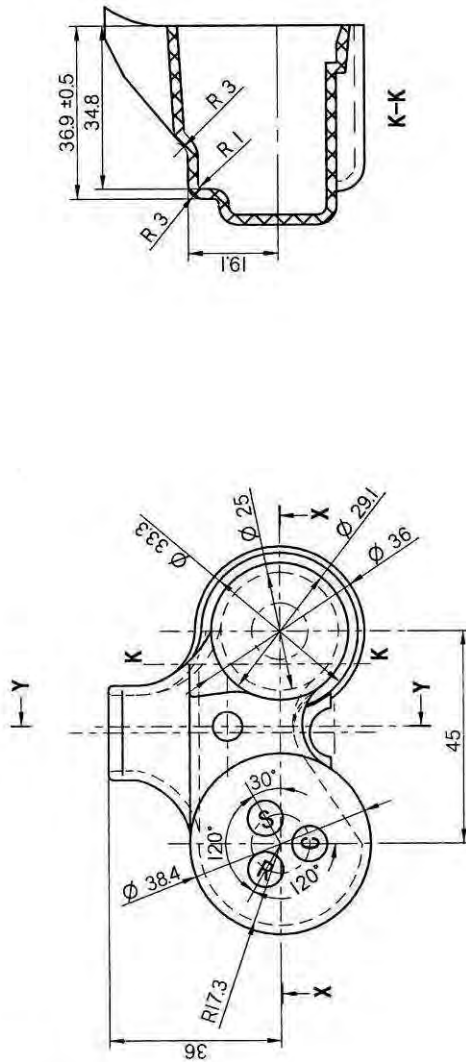
4CYC00173



SC01DA53


NOTES

1. MATERIAL: VALOX-420SEO-BK1066
2. MINIMAL THICKNESS ABOVE 1.6mm



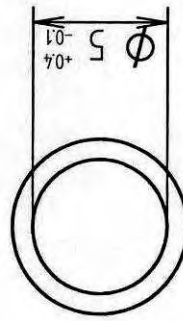
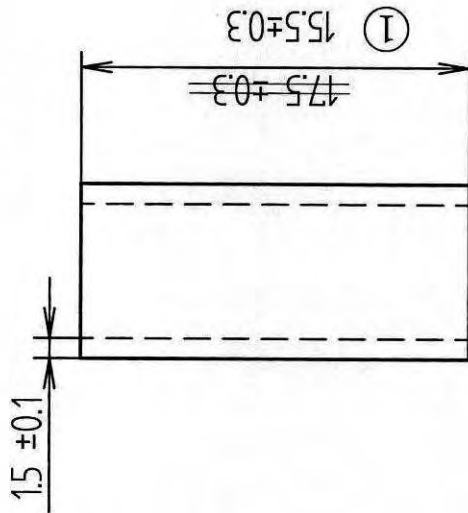
TERMINAL COVER

SC01DA53

09.03.04	投影法	
09.03.04		
09.03.04	比例	1:1
09.03.04	入库	

A

4CYC00995



NOTE:
1. COLOR: WHITE
2. MATERIAL: SILICONE RUBBER

DIMENSION: mm

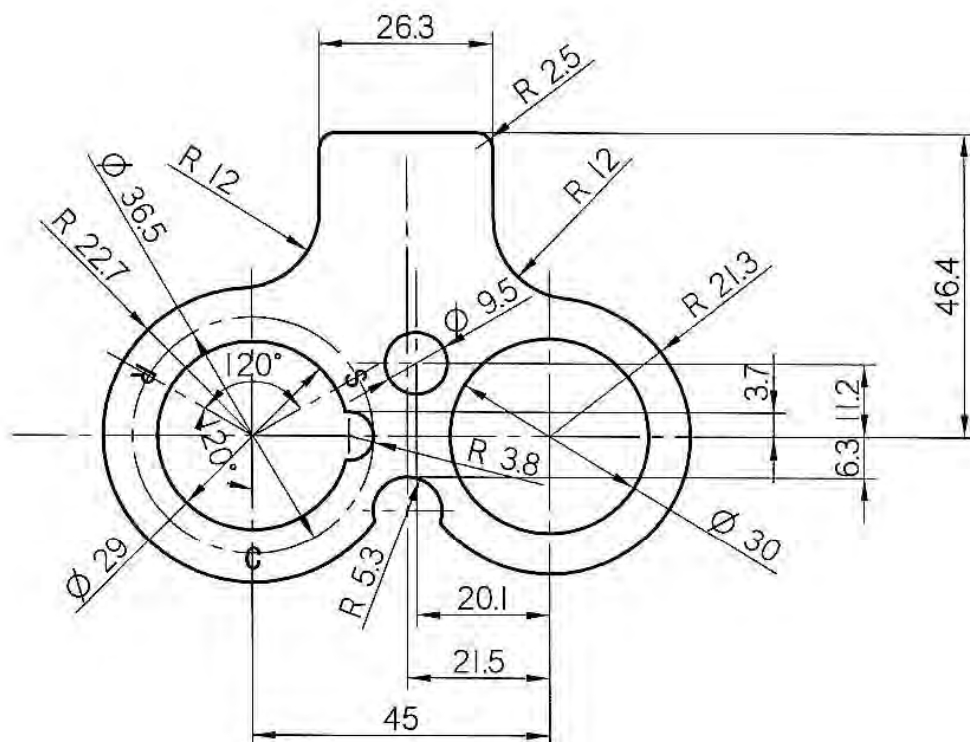
REGD	RE. MARKS	PROJECTION		SCALE	DWN. NO.
		Shanghai Hitachi Ltd.		NTS	
	DWN.	TITLE			
	CHKD.	SLEEVE			
	CHKD.	09. 11. 10	09. 11. 10		
	APPD.	09. 11. 10	09. 11. 10		

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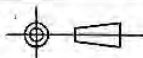
NOTES

1. MATERIAL: EPTR (ETHYLENE PROPYLENE
TRIPOLYMER RUBBER)

2. THICKNESS: 1.5mm



CHANGE



SHANGHAI HITACHI ELECTRICAL APPLIANCES CO.,LTD.

DIN IN

DATE

2001-12-12

APPROVED

比例 SCALE

DRAWN

CHECKED

DESIGN

1:1

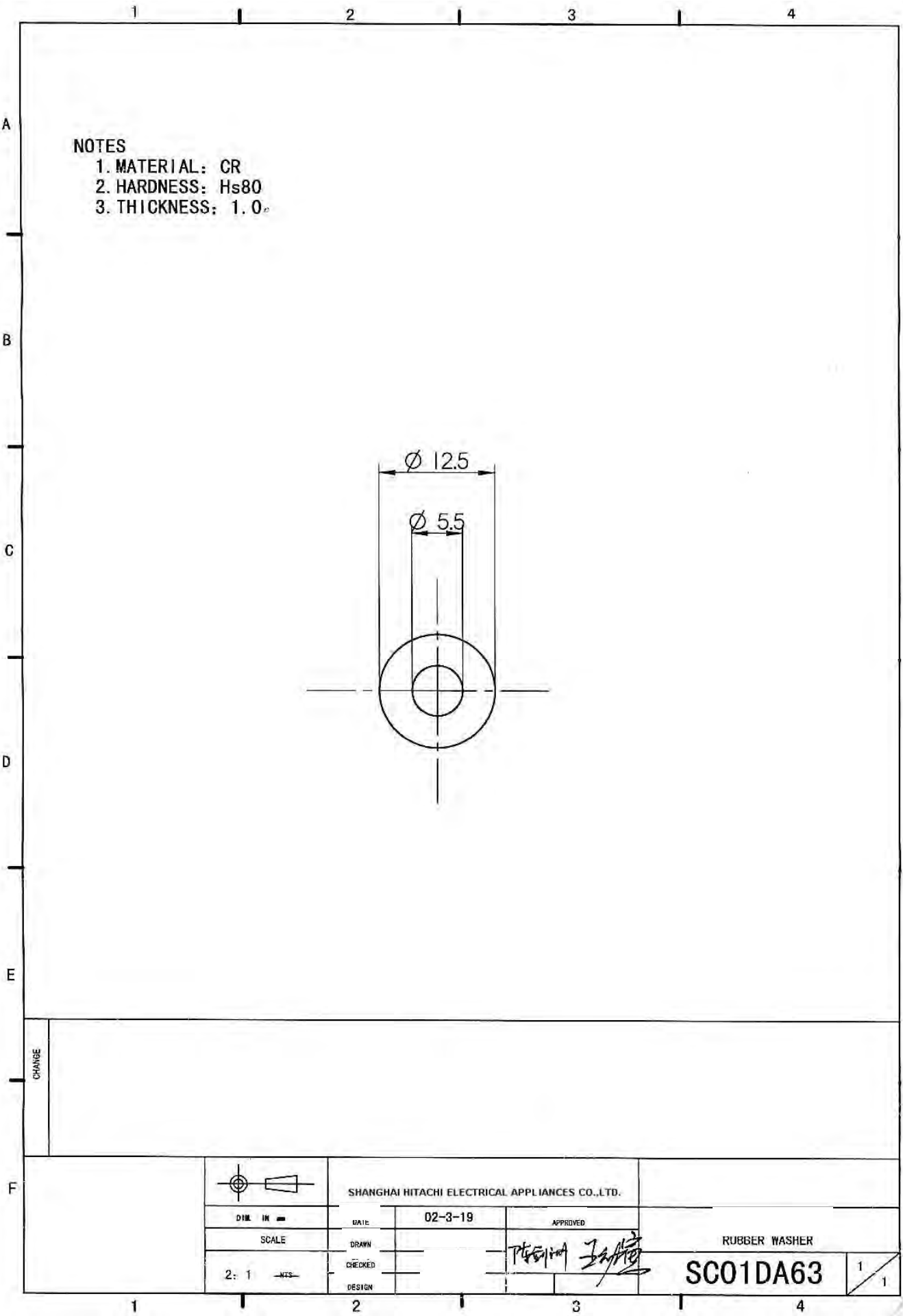
WTS

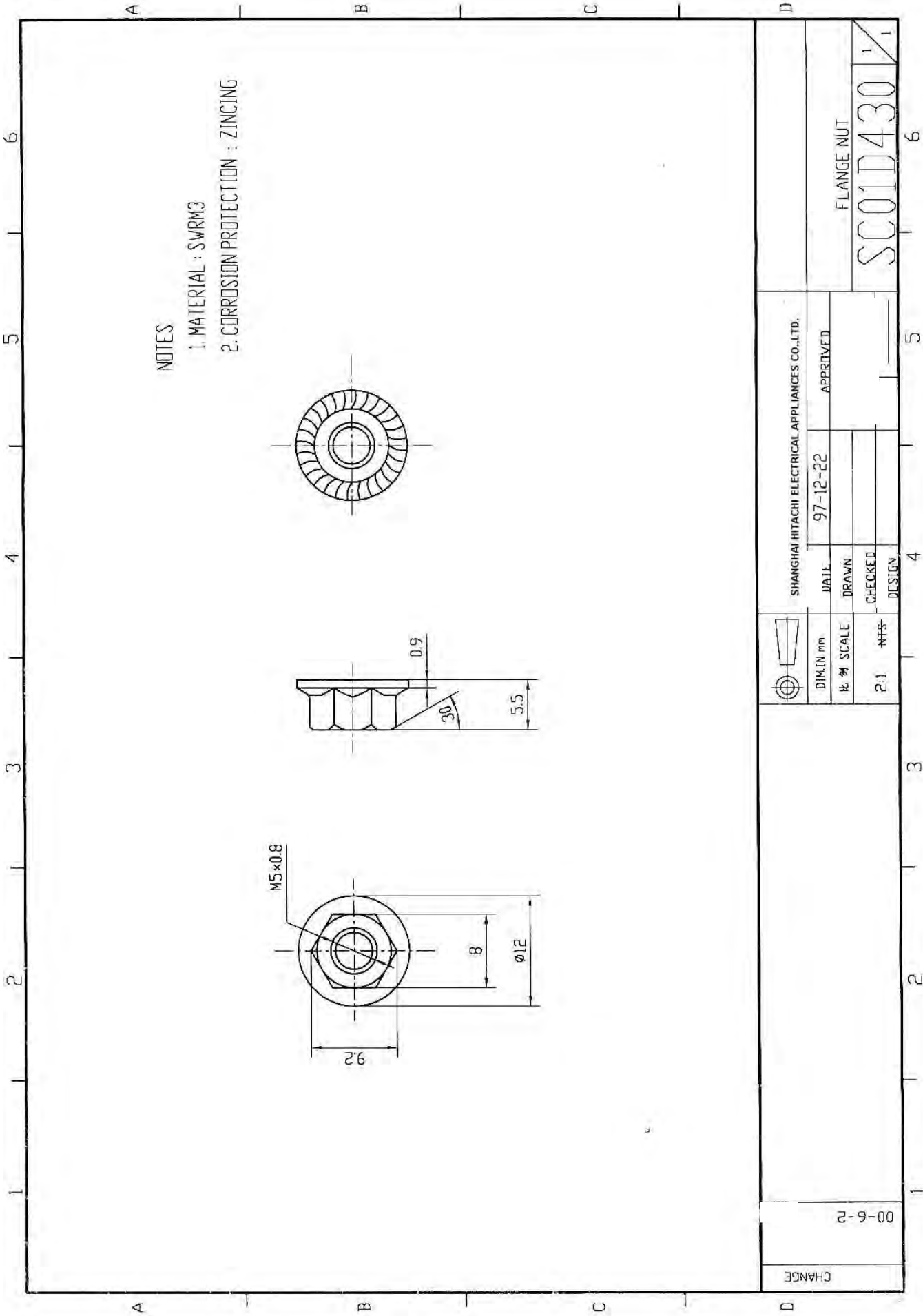
PACKING

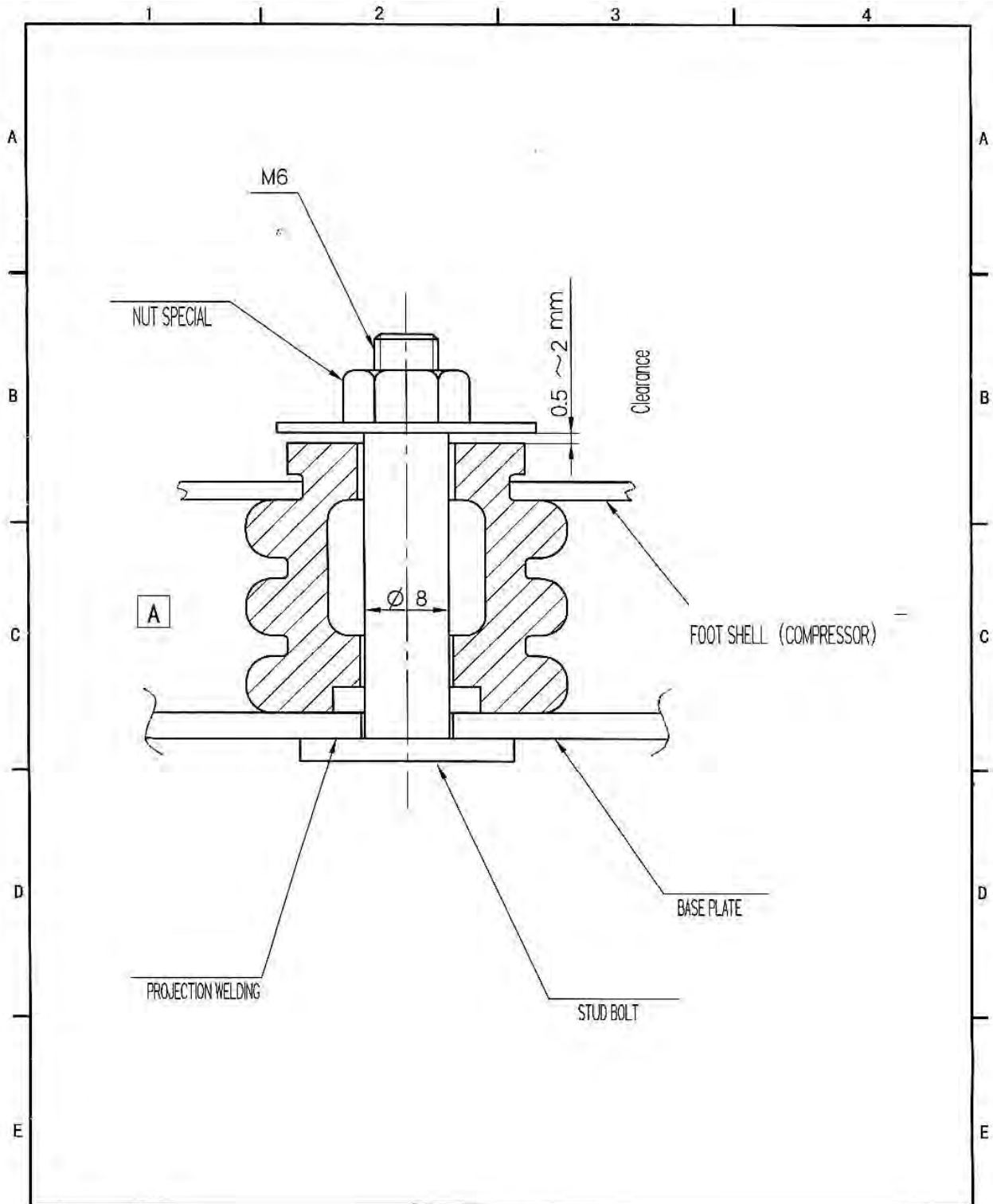
SC01DA54

1

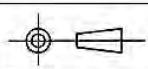
1







CHANGE
(C-1)
R-1
TD/003-058-2002
02-7-17
A



SHANGHAI HITACHI ELECTRICAL APPLIANCES CO.,LTD.

DTL IN mm

DATE 2002-1-22

APPROVED

SCALE

SA TE DRAWN

MOUNT ASSY

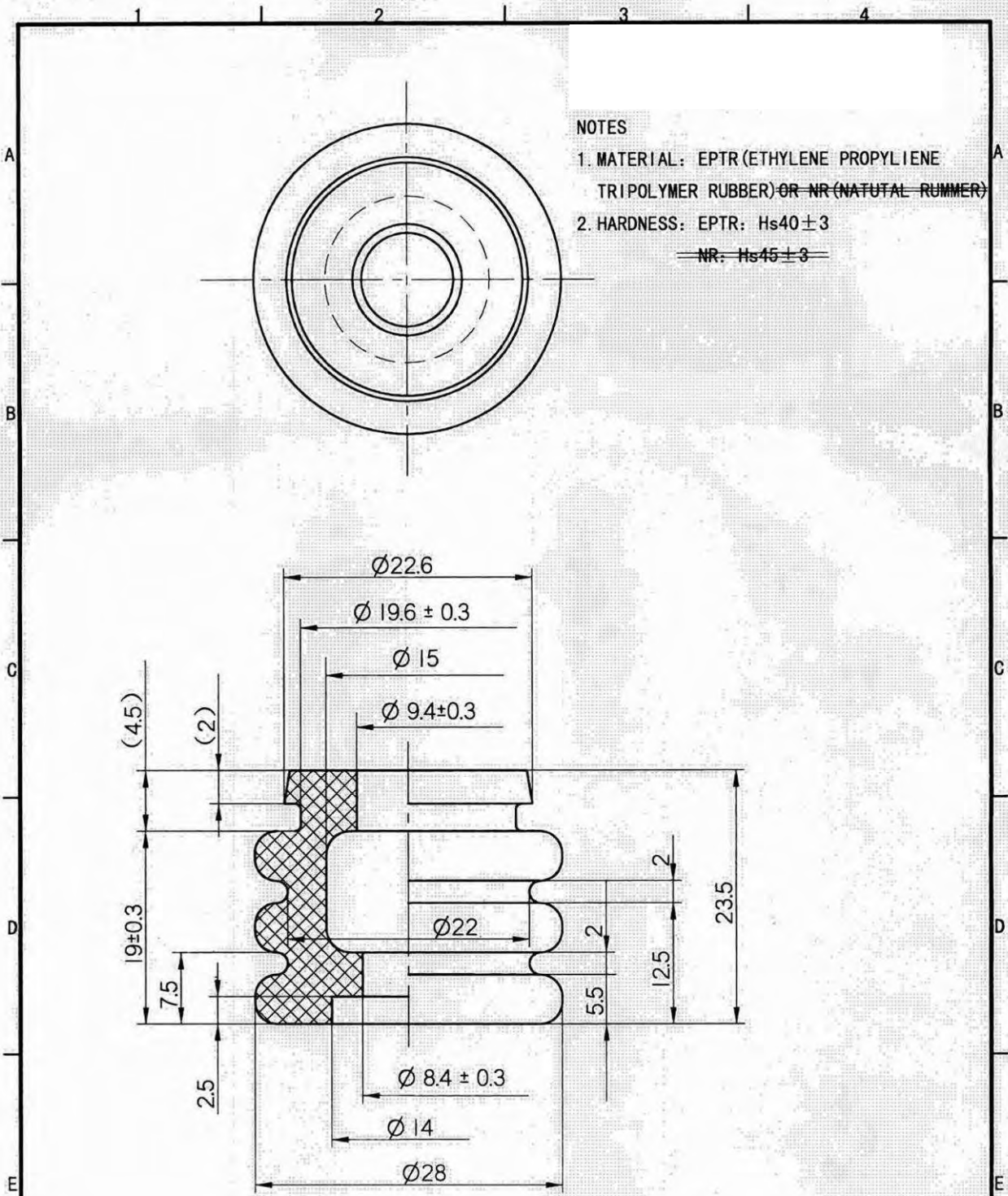
2: 1 WTS

CHECKED

DESIGN

SC01DA55

1/1



NOTES

1. MATERIAL: EPTR (ETHYLENE PROPYLENE TRIPOLYMER RUBBER) OR NR (NATURAL RUBBER)
2. HARDNESS: EPTR: $H_s40 \pm 3$
~~NR: $H_s45 \pm 3$~~

CHANGE	08.01.23	10.03.18	SHANGHAI HITACHI ELECTRICAL APPLIANCES CO., LTD.			RUBBER MOUNT SC01DA68		
			DIM. IN mm	DATE	2008-01-23			APPROVED
			比例 SCALE	DRAWN	孙敏红			王立峰
			2:1 NTS	CHECKED	孙敏红			
			DESIGN				1/1	

Specification Revision Record				
No.	Date	Page in Spec	Revision Reason	Conclusion Date
A				
B				
C				
D				
E				
F				
G				
H				
J				
K				
L				
M				
N				
P				
Q				
R				
S				
T				
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