

1057

Q/RANCO.BG-G-02

DHF-3C

Reversing Valve Design Specification

Confirmation
Confirmed on -----

_____ Dept. Tech Dept. _____ Section

Project Manager: _____

Verifier: _____

Production Manager: _____

Material Manager: _____

Manufacturer:
Changzhou Ranco Reversing Valve Co., Ltd

Technical Manager: 刘哲 2001.11.14

Quality Manager: 刘哲 14/11.01

Sales Manager: 李瑞 2001.11.14

Changzhou Ranco Reversing Valve Co., Ltd



October 2001

Technical Specification

No.	ITEMS	Technical Specification
1	Application	DHF-3C Reversing Valve (hereafter Valve) manufactured by our company apply to 1.5-2 HP heat-pump air conditioner with R22, R134a, R407C.
2	Standards	Production technology is conformed with Criteria of Changzhou Ranco Reversing Valve Co., Ltd.—REVERSING VALVE APPLY TO AIR CONDITIONER WHICH TAKE R410A AS REFRIGERATION MEDIUM
3	Certificate	Valves our company manufactured have been rewarded certificate of CCEE, UL (U.S.A.) and TUV (Germany). (Attachment)
4	Structure	<ol style="list-style-type: none"> 1. Valve is produced according to drawings and technical documents which customer has recognized; 2. Valve is composed of pilot valve, main valve and coil. (Coil is movable parts. Valve function will not change when subject to outside shock); 3. Valve inner is acid-resistant, which has characteristic of smooth surface and without burrs, corrosion, flaw after antiseptic treatment; 4. Valve sketch refers to attachment; 5. Main parts and components refer to attachment.
5	Electrical parameters	Rated voltage: 220V, 50/60Hz, Voltage range: +10%~15% namely 187~242V, Power: 5~7W.
6	Operational conditions	<ol style="list-style-type: none"> 1. Applied fluid temperature: -20℃~+120℃ (Instant of defrost -25℃); 2. Application temperature and humidity: when energized, -20℃~+50℃, humidity less than 95%RH; 3. Coil permitted maximum temperature: +130℃; 4. Maximum operational pressure: 3.0MPa; 5. Applied torque for coil screw: 253~383N·cm (26~39Kgf·cm); 6. Valve should be horizontally positioned during assembling. When welding, valve temperature should be

kept less than $\pm 120^\circ\text{C}$.

1. Internal leakage: Seal 1.6 connection tube, input gas of 0.98Mpa through D tube and test leakage of S tube under two conditions: DHH-3C 1500ml/min.
2. Air tightness: Apply pressure of 3.0Mpa to inner valve. During one minute dipping in water, no leaks from valve body and braze joints.
3. Pressure withstand: Apply pressure of 4.4Mpa to inner valve slowly. Holding 3 minute, there should be no abnormality, transformation, leakage, destroy in any part.
4. Burst pressure: Applying pressure of 14.7Mpa and 1 minute to inner valve, there is no valve destruction.
5. Maximum operational pressure difference: DHH-3C Valve can reverse normally and reliably when pressure difference is 2.25 Mpa and voltage is 85% of rated voltage—220V.
6. Minimum operational pressure difference: DHH-3C valve can reverse normally and reliably when pressure difference is 0.25 Mpa and voltage is 85% of rated voltage—220V
7. Minimum operating voltage: When DHH-3C valve properly operate under pressure difference of 2.25 Mpa, coil operating voltage should be no more than 85% of rated voltage—220 V.
8. Insulation: After two days' dipping in water, using DC500V mega ohmmeter test insulation resistance between electric and non-electric metal parts, it should be no less than 100M Ω .
9. Dielectric voltage withstand: Having been dipped in water of normal temperature for 24 hours, it is able to endure sinusoidal AC of 50Hz 1500V for 1 minute or sinusoidal AC of 1800V for 1 second without breakdown or flash over between electric and non-electric metal parts in the test under water.
10. Shorted turns: There is no shorted turns when exerted DC1500V voltage compared to the standard wave diagram.
11. Coil temperature rise: Temperature rise is no more than 80K.
12. Lead wire intension: Exert 49N force on each wire for 1 minute, there is no wire break.
13. Vibration: Under conditions of de-energized, no-load and without pressure, operated by vibration machine with amplitude of 33Hz, 2mm and direction of X, Y, Z for 2 hours, parts doesn't become loose, and can meet with performance requirements Item 1. 2, 5, 6, 7, 8.
14. Shock: Under conditions of de-energized, no-load and without pressure, conduct valve shock testing of 80g ($1.784.5\text{m/s}^2$) once from all directions, parts doesn't become loose, and can reach performance requirements Item 1. 2, 5, 6, 7, 8.

15. Heat resistance: Under the condition of de-energized, no-load and without pressure, put in thermostat with temperature of $120 \pm 5^\circ\text{C}$ for 24 hours and then 1 hour in normal temperature and humidity, valve doesn't become loose, transformed and destroyed, can reach the performance requirement Item. 1.2.5.6.7.8.9.
16. Frozen resistance: Under the condition of de-energized, no-load and without pressure, put in thermostat with temperature of $-30 \pm 5^\circ\text{C}$ for 24 hours and then 1 hour in normal temperature and humidity, valve doesn't become loose, transformed and destroyed, can reach the performance requirement Item 1.2.5.6.7.8.9 and 10.
17. Cold-hot shock: Adopt 1 hour of $120 \pm 5^\circ\text{C}$, 0.5 of normal temperature and 1 hour of $-30 \pm 5^\circ\text{C}$ as one circulation. Under the condition of de-energized, no-load and without pressure, conduct 5 cycles and normal temperature of 1 hour, valve doesn't become loose, transformed and destroyed, can reach the performance requirement Item 1.2.5.6.7.8.9 and 10.
18. Life test: Sealing tube E,C; leaving tube S opened and apply compressed air of 1.57Mpa to tube D, having operated 20000 times with the frequency of 5~7 time/ per min, valve can reach the performance requirement Item 1.2.5.6.7.8.9 and 10.
19. Salt test: Under the condition of de-energized, no-load and without pressure, having been tested according GB/T2423.17《Regulation of Electrical Basic Environment Test—Method of Kay Salt test》for 72 hours, no pernicious corrosion has been engendered, the valve can reach the performance requirement Item2, 8, and 9.
20. Noise test: Providing rated voltage of 50 Hz to coil and placing a noise meter 30cm from valve, the measured result is not higher than 45dB (A) .

Unconcerned matters, implement according 《Reversing Valve for Domestic and similar use 》 (JB/T8592-1997) .

Connection tube have been covered by tube cap for preventing dust and moisture. After valve placed in box, whole case will be encapsulated by polyethylene plastic bag. The package will ensure safety transportation without transformation and destroy. Package drawing refer to attachment.

Valve should be stored in environment with well ventilated and without corrosive gases.

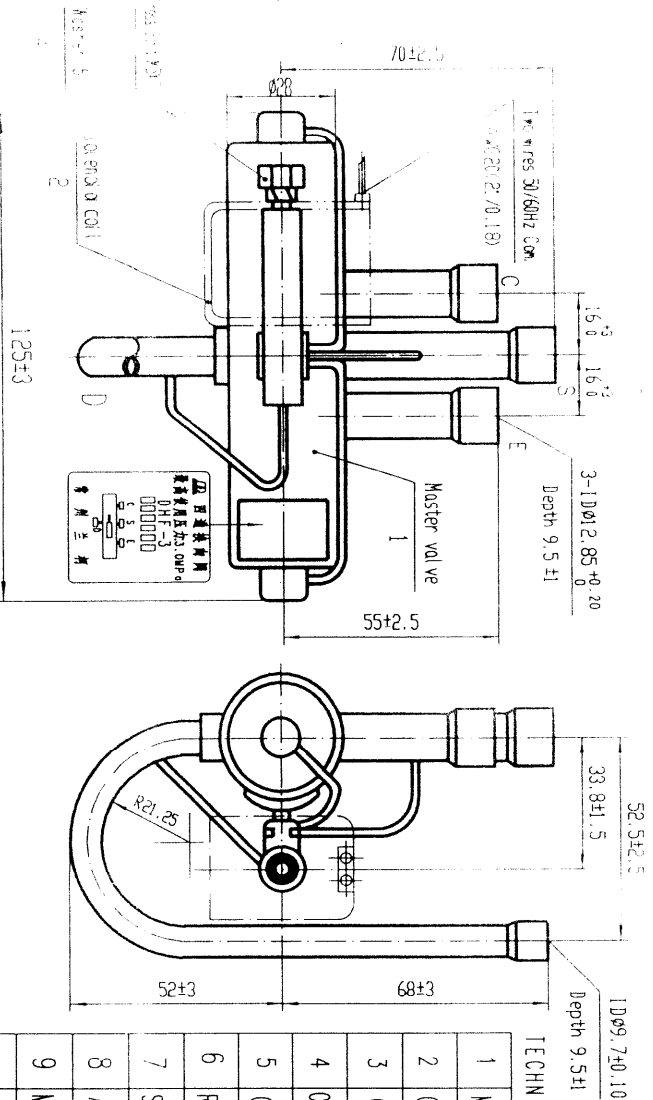
Materials of Main Parts and Components

No.	Part Name	Material	Specification	Supplier
1	Pilot Valve Body	ST1S304	∅11 × 0.5	Wujin Hengfeng Stainless Steel Tube Plant
2	Seat Stock	C3771 or C3604	R5	Shanghai First Copper Bar Plant
3	Capillary Tube	T ₂ Capillary Tube	∅2.5 × 0.5	Wujin Copper Tube Plant
4	Plunger, Tube Cap	QMR5L	∅9.87、∅11	日本山阳特钢
5	Slide	Teflon		Shanghai Chemical Plant
6	Valve Body	H65-Y Brass Tube	∅28×2	Jiangsu Xuanli Group
7	Valve Seat	C3771 or C3604	R11.9	Shanghai First Copper Bar Plant
8	Seal Cup	Teflon	∅ : 0.7	Nantong Tongmao Fluoroplastic Plant
9	slide	Nylon 66	CM3001N	日本东丽公司
10	Connection Tube	T ₂ Y ₂ Braze Tube		Jingjiang Copper Tube Plant
11	Coil Cover	Pure Iron Board DT4E	∅ : 1.5	Changheng Group Parts Plant
12	Coil			Changzhou Ranco Coil Co., Ltd
13	Varnished Wire	QZ-1	∅0.1	Calngzhou Wireless Materials General Plant
14	Encapsulation framework	Ethoxyline Resin		Changchun Plastic Plant
15	Lead wire	Ethylene propylene Wire	AWG20 (21/0.18) 125℃	Import

ON (Heating) OFF (Refrigerating)



The Flow of Refrigerant



TECHNICAL REQUIREMENTS

1	Max. Operation Pressure	3.0MPa
2	Coil Permitted Max. Temp	+130°C
3	Coil Temperature Rise	Not more than 80K
4	Operation Ambient Temp.	In energizing state -20°C~+50°C
5	Operation Ambient Humidity	less than 95%RH
6	Rated Voltage, Frequency	AC220V 50/60Hz
7	Switchable Fluid Temp	-20°C~+120°C (Removing Frost Moment -25°C)
8	Air Tightness	Under 3.0MPa pressure, no external and seal leakage
9	Minimum Damage Pressure	No damage under 14.7MPa water pressure
10	Internal Leakage	Not more than 1500mL/m in under 0.98MPa
11	Max. Operation Differential Pressure	2.25MPa
12	Min. Operation Differential Pressure	0.25MPa
13	Min. Operation Voltage	Equal to 85% of rated voltage
14	Life Cycle	More than twenty thousand times
15	Scope of Application	3~9KW

NOTES:

1. While Welding, The Valve Body's Temperature Should Not Be Over 120°C.
2. To Prevent Dust, Waste And Other Dirty Water From Entering The Valve's Cavity Seal The Whole Body With A Plastic Bag;
3. During Installation, The Axes Of The Master Valve Should Be In Horizontal Position;
4. The Torque Of The Bolts Is 3.45±0.4NM.

姓名	李
职位	李
日期	2000.9.3
审核	
日期	

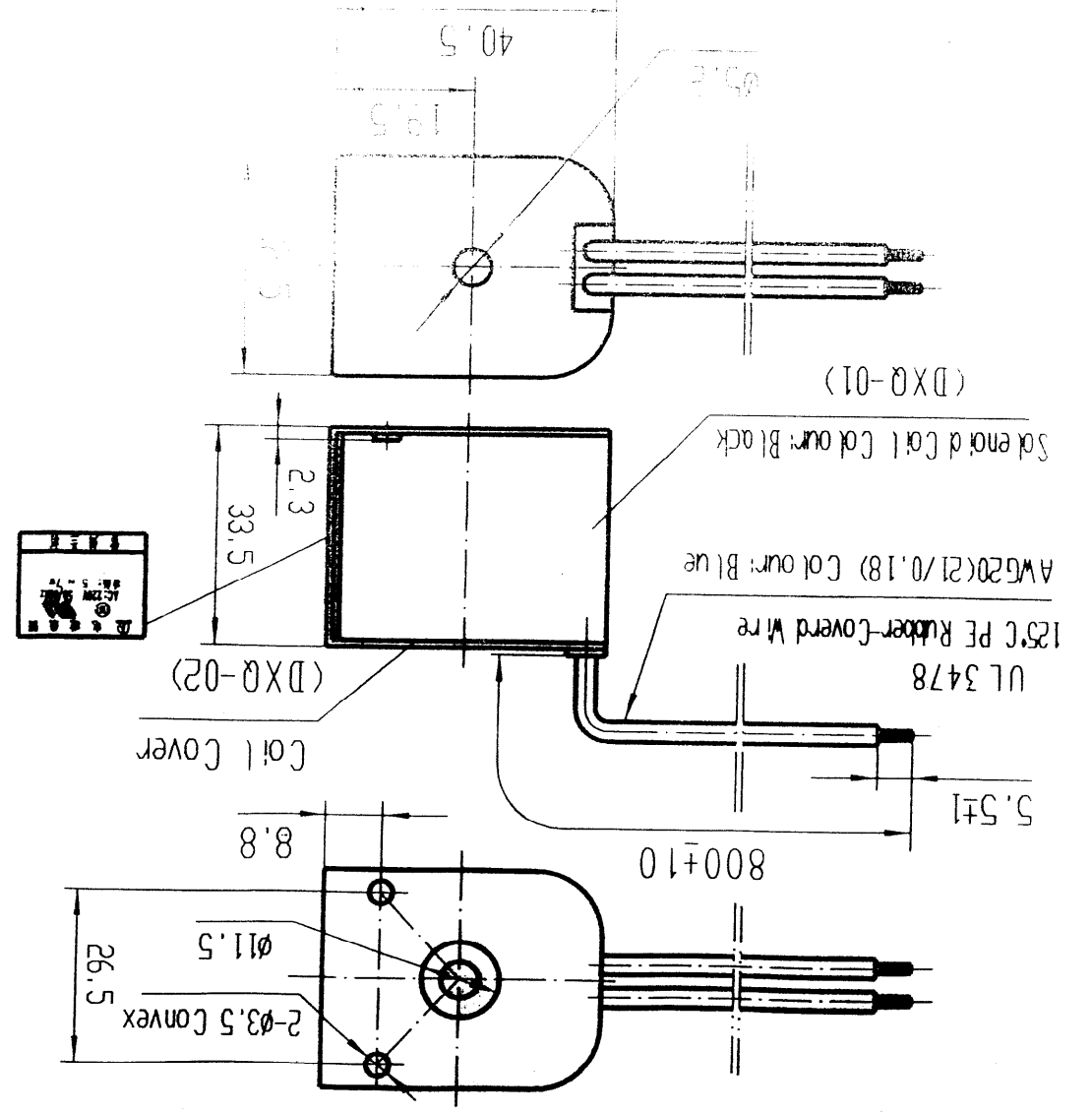
DHF-3		DHF-3-00-WX	
FOUR WAY REVERSING VALVES			
设计	审核	日期	重量
制图	校对	日期	比例
工艺	日期	共	张
Changzhou Ranco			

CHANGZHOU KANGOU

图号	DXQ-00-WX	比例	1:1	日期	2000.9.8	设计	张俊	审核	张俊	工艺	张俊
材料	2000.9.8	数量		重量		备注					

Technical Requirements

- Usage Conditions: Usage Ambient Temperature, In Energizing State $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$; Usage Ambient Humidity: 95RH Below ; Coil Permitting Max. Temperature: $+130^{\circ}\text{C}$;
- Rated Voltage: AC220V 50/60Hz, Allowance Voltage Change: $\pm 10\% \sim \pm 15\%$; Power: $5 \sim 7\text{W}$;
- Working State: Continence; Connection Mode: Two Wire $50/50\text{Hz}$ Com. ;
- Insulation Resistor: Not Less Than $100\text{M}\Omega$;
- Dielectric Strength: AC1500V/min. ;
- In 40°C Ambient Temperature Condition, Coil Temperature Rise Should Not Be More Than 80K ;



DXQ-00-WX

FOLLOW - UP SERVICE PROCEDURE
 (TYPE R)

ELECTRICALLY OPERATED VALVES - COMPONENT
 (Y10Z2)

* Manufacturer: CHANGZHOU RANCO REVERSING VALVE CO LTD (859401-001)

SUBURB OF CHANGZHOU
 WEICUN TOWN NORTHERN
 CHANGZHOU
 JIANGSU 213127 CHINA

* Applicant: SAME AS MANUFACTURER (859401-001)

* Recognized Company: SAME AS MANUFACTURER (859401-001)

This Procedure authorizes the above Manufacturer to use the marking specified by Underwriters Laboratories Inc. only on products covered by this Procedure, in accordance with the applicable Follow-Up Service Agreement.

The Prescribed Mark or Marking shall be used only at the above manufacturing location on such products which comply with this Procedure and any other applicable requirements.

The Procedure contains information for the use of the above named Manufacturer and the representatives of Underwriters Laboratories Inc. and is not to be used for any other purpose. It is lent to the Manufacturer with the understanding that it is not to be copied, either wholly or in part, and that it will be returned to Underwriters Laboratories Inc. upon request.

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UNDERWRITERS LABORATORIES, INC.



J. J. Ritchie

Vice President

Laboratory Management and Operations



电工产品认证合格证书(正本)

编号: CH0026037-98



CERTIFICATE OF CONFORMITY FOR ELECTRICAL EQUIPMENT (ORIGINAL)

NO: CH0026037-98

申请人: 常州兰柯四通阀有限公司

APPLICANT: CHANGZHOU RANCO REVERSING VALVE CO., LTD

制造厂名称及所在地:

常州兰柯四通阀有限公司, 江苏省常州市北郊魏村镇

NAME AND ADDRESS OF THE MANUFACTURER:

CHANGZHOU RANCO REVERSING VALVE CO., LTD

产品名称、规格、型号: 四通换向电磁阀

NAME, MODEL AND SPECIFICATION:
ELECTROMAGNETIC VALVE

DHF系列(DHF-2 DHF-3) 220V 50/60HZ 4~6W

DHF系列(DHF-2 DHF-3) 220V 50/60HZ 4~6W

产品安全认证检测依据的标准:

THE STANDARDS FOR THE PRODUCTS TO BE TESTED:

GB/T14536.1-93 GB14536.2-96

GB/T14536.1-93 GB14536.2-96

上述产品符合电工产品认证规则和程序的要求

特发此证。

THIS IS TO CERTIFY THAT THE ABOVE MENTIONED
PRODUCTS HAVE QUALIFIED FOR THE REQUIREMENTS
ABOUT CERTIFICATION RULES AND PROCEDURES FOR
THE ELECTRICAL EQUIPMENT

证书有效期: 自 一九九八年七月二十三日 起

PERIOD OF VALIDITY: FROM 23 JUL 1998
UNTIL 23 JUL 2002

至 二零零二年七月二十三日 止。

中国电工产品认证委员会

CHINA COMMISSION FOR CONFORMITY
CERTIFICATION OF ELECTRICAL EQUIPMENT

一九九八年七月二十三日

DATE OF ISSUE: 23 JUL 1998

TÜV Rheinland Product Safety GmbH

(TRPS)
Am Grauen Stein
Konstantin-Wille-Str. 1
51105 Köln
Fed. Rep. of Germany



Certificate

No. 086-14-0848-0108

Regarding the inspection of manufacturing and operating facilities according to the General Agreement with the Certification Body of TRPS

the Certificate Holder

Changzhou Ranco Reversing Valve Co., Ltd.
Xinhua Village, Weicun Town, Changzhou
Jiangsu 213127, P. R. China

has successfully demonstrated that an internal quality control
of those products approved by TÜV Rheinland is being carried out
and produced at the manufacturing facility.

Changzhou Ranco Reversing Valve Co., Ltd.
Xinhua Village, Weicun Town, Changzhou
Jiangsu 213127, P. R. China

An inspection of the manufacturer's quality control procedures and
internal records was conducted by a TÜV Rheinland appointed inspector on

06.06.2001

This certificate is valid until the next scheduled inspection
of up to 12 months, at the discretion of TÜV Rheinland.

Report-No. H 2131360

Certification Body

