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22039

Zanussi Elettromeccanica

Zel Tianjin Compressor Co. Ltd.

**Phase-out project**  
( UNIDO PROJECT MP/CPR/97/090 )

**- FINAL REPORT -**  
**3<sup>rd</sup>**

ZANUSSI ELETTROMECCANICA SPA  
JOINT VENTURES & TECHNOLOGIES  
Senior project engineer  
Enrico Del Fabbro



ZANUSSI ELETTROMECCANICA SPA  
JOINT VENTURES & TECHNOLOGIES  
Technology Development Manager  
Emilio Pierobon



Date : 19<sup>th</sup> October 1998

## SUMMARY

1. Report of massive production
2. Catalogue of the ZEL - Zanussi Elettromeccanica Tianjin Compressor Co. Ltd. - OF Range
3. Certificate of quality and performance
4. Design data sheet
5. Great wall acceptance certificate
6. VDE approval for OF1350 C

## 1. Report of massive production

After the installation, testing and commissioning of all the new machines involved in the phase-out project, as reported in the "Progress and Commissioning - 2<sup>nd</sup> report", many samples of several new compressors models (Ozone Friendly) have been assembled in the Tianjin Factory and then qualified by IMQ (Italy) VDE (Germany). The performances have been found in accordance with the design data sheet.

The massive production of the OZONE-FREE compressors started at the end of MAY'98. Although the producibility of several models had already checked with the sampling, due to the market request, during the months June'98 to August'98 it has been assembled several batches of only one model of compressor in the following quantities:

<b>Compressor type</b>	<b>June'98</b>	<b>July'98</b>	<b>August'98</b>	<b>Total</b>
	<b>Pieces</b>	<b>Pieces</b>	<b>Pieces</b>	<b>Pieces</b>
<b>C708343500 OF 1350 C</b>	<b>4994</b>	<b>19170</b>	<b>211</b>	<b>24375</b>

As per the first sampling, all the performances of the product have been checked also on some compressors of each batch of the mass production. All the results have been found in accordance with the contractual specifications.

This document certifies that all the work and the activities performed under the Phase-out Contract as per UNIDO PROJECT MP/CPR/97/090 up to the mass production have been finished successfully.

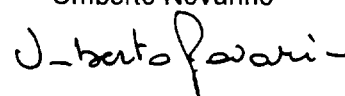
Zanussi Elettromeccanica

Emilio Pierobon



Zel Tianjin Compressor Co. Ltd.

Umberto Novarino



## 2. Catalogue of the ZEL - Zanussi Elettromeccanica Tianjin Compressor Co. Ltd. - OF Range

# ZEL

**Zanussi Elettromeccanica  
Tianjin Compressor Co., Ltd.**

## **OF Range**

**Application: LBP  
Refrigerant: R134a  
PTC Starting Device**

中国扎努西电气机械  
天津压缩机有限公司

用途：低背压  
制冷剂 R134a  
PTC 起动元件

# OF Range

性能参数 Preliminary data

型号 <i>Model</i>	工作容积 <i>Displ.</i>	冷却方式 <i>Cooling</i>	电机型式 <i>Type</i>	ASHRAE (1)			净重 <i>Net Weight</i>	充油量 <i>Oil Charge</i>	额定电压 <i>Rated Voltage</i>	电压范围 <i>Voltage Range</i>
				制冷量 <i>Capacity</i>	输入功率 <i>Inp. Pow.</i>	性能系数 <i>COP</i>				
	cc	(2)		W	Wi	W/W	Kg	cc		V/50 Hz

## Standard Efficiency 普通型

OF789C	4.38	S	RSIR	99	95	1.04	9.2	180	220V/50 Hz	165~242
OF1033C	5.73	S	RSIR	133	121	1.10	9.7	270	220V/50 Hz	165~242
OF1260C	7.00	S	RSIR	160	143	1.12	10	270	220V/50 Hz	165~242
OF1350C	7.52	S	RSIR	178	152	1.15	10	270	220V/50 Hz	165~242
OF1550C	8.60	S	RSIR	215	187	1.15	10.5	270	220V/50 Hz	165~242

## High Efficiency 高效型

OF789CY	4.38	S	RSIR/RSCR	110	94/89	1.17/1.23	9.2	180	220V/50 Hz	165~242
OF1033CY	5.73	S	RSIR/RSCR	138	115/109	1.20/1.26	9.9	270	220V/50 Hz	165~242
OF1260CH	7.00	S	RSCR	162	126	1.28	10.3	270	220V/50 Hz	165~242
OF1350CH	7.52	S	RSCR	185	137	1.35	10.5	270	220V/50 Hz	165~242
OF1550CH*8.60		S	RSCR	215	159	1.35	10.6	270	220V/50 Hz	165~242

\* under development 正在开发

按照中国的噪音标准,  
改进型压缩机

Noise level according to Chinese standard  
Improved vibration and discharge pulsation levels

### 1) 试验条件

蒸发温度 -23.3 °C  
冷凝温度 55 °C  
过冷温度 32 °C  
吸气温度 32 °C  
环境温度 32 °C

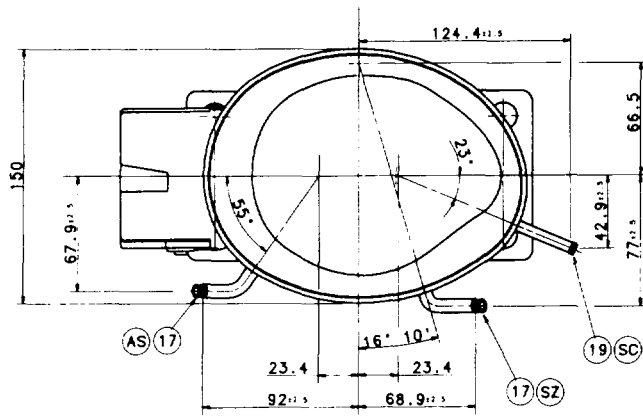
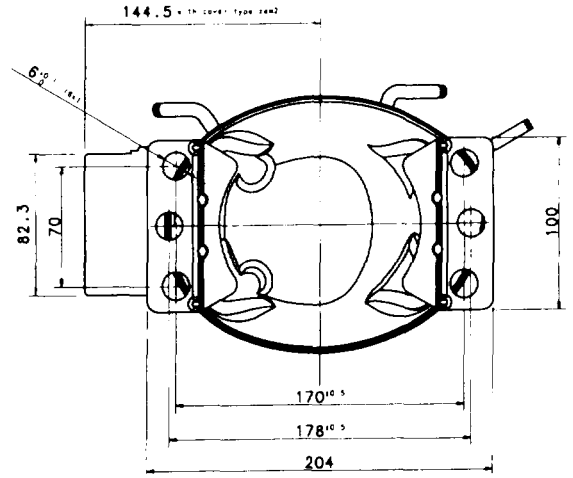
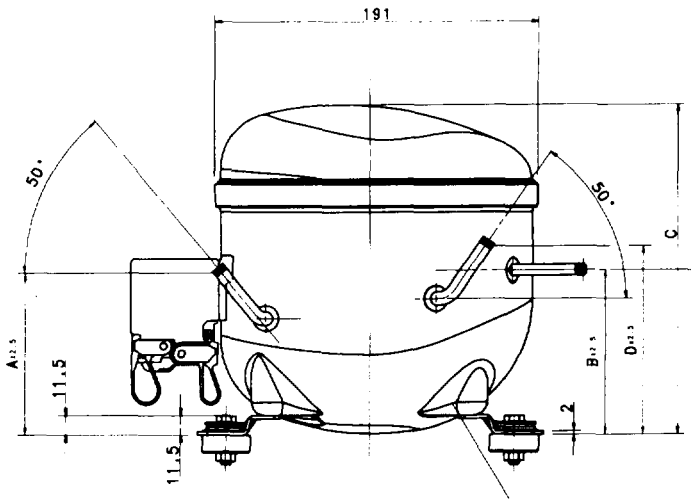
2) 冷却方式: S = 静态

### 1) Ashrae test conditions:

Evaporating temperature: -23.3 °C  
Condensing temperature: 55 °C  
Subcooling temperature: 32 °C  
Suction temperature: 32 °C  
Ambient temperature: 32 °C

2) Cooling: S=Static

压缩机外形尺寸 Compressors dimensions

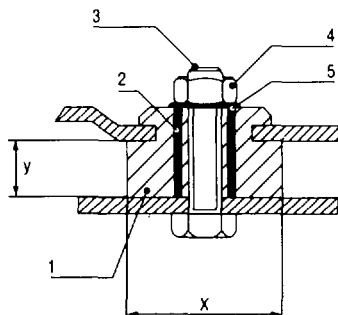


管子内径 Tubes inside diameter	邦迪 Bundy
工艺管 AS-process	$\varnothing 6^{+0.145}_{+0.070}$
吸气管 SZ-suction	$\varnothing 6^{+0.145}_{+0.070}$
排气管 SC-discharge	$\varnothing 4.75^{+0.145}_{+0.070}$

所有尺寸单位: 毫米  
All dimensions in mm

Compressor Type	A	B	C	D	Compressor Type	A	B	C	D
OF789C	108.3	109.5	124	183.5	OF789CY	108.3	109.5	124	183.5
OF1033C	118.3	119.5	134	193.5	OF1033CY	118.3	119.5	134	193.5
OF1260C	118.3	119.5	134	193.5	OF1260CH	118.3	119.5	134	193.5
OF1350C	118.3	119.5	134	193.5	OF1350CH	118.3	119.5	134	193.5
OF1550C	128.3	129.5	144	203.5	OF1550CH	128.3	129.5	144	203.5

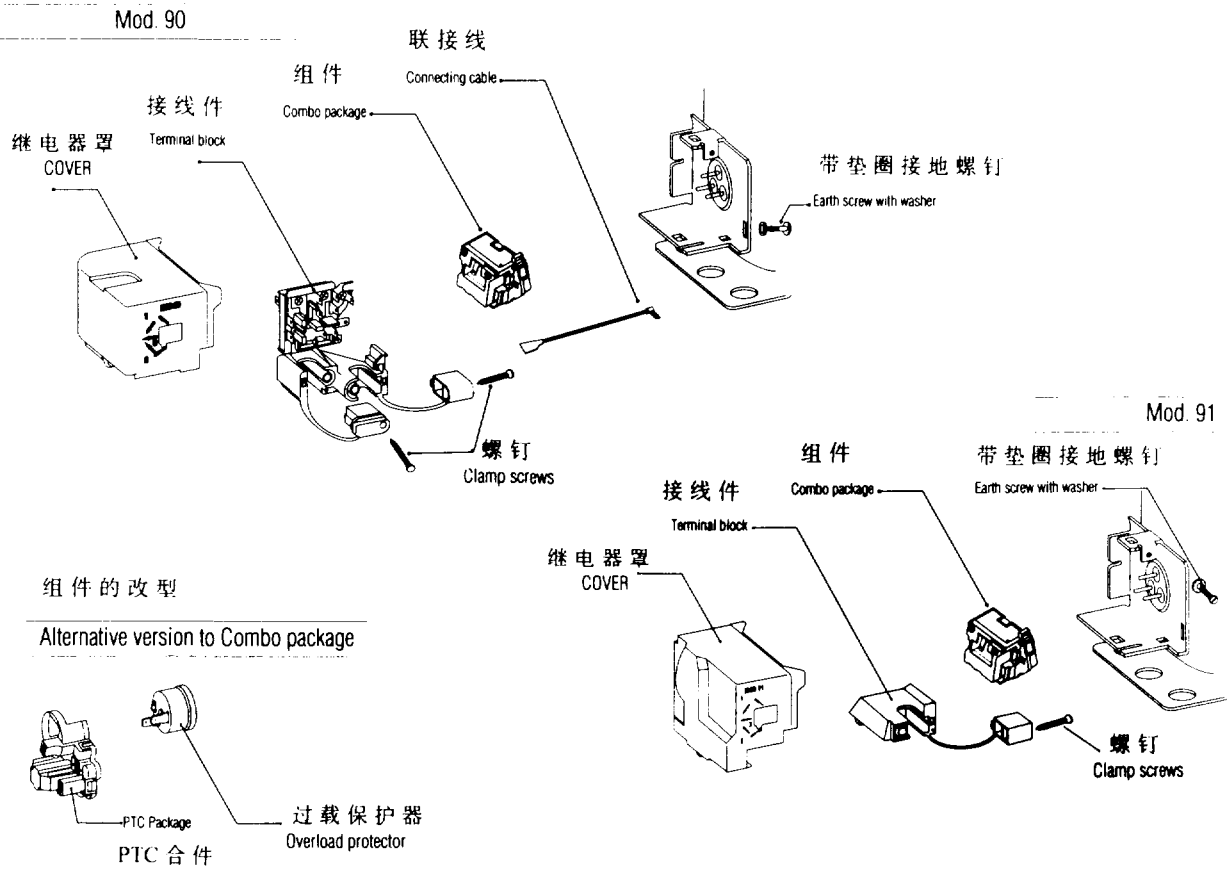
安装附件 Mounting accessories



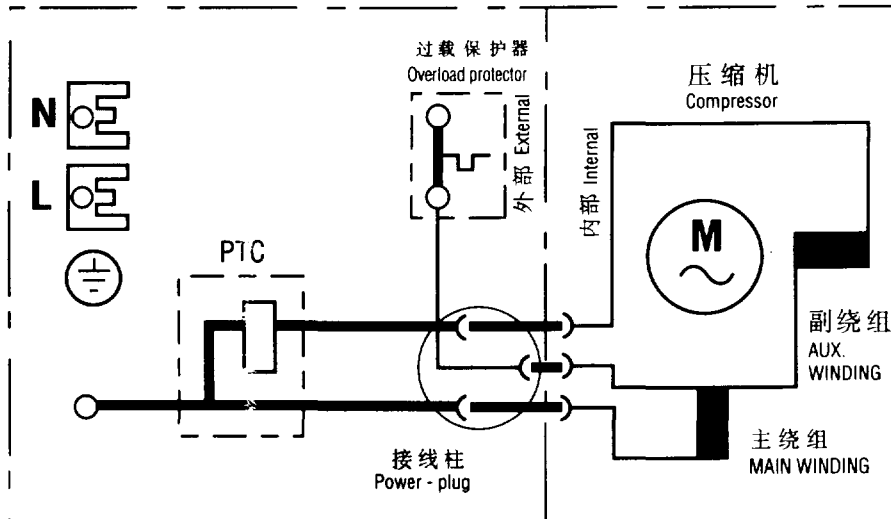
- |         |                   |
|---------|-------------------|
| 1) 橡胶垫  | 1) Rubber grommet |
| 2) 衬套   | 2) Spacing sleeve |
| 3) 六角螺栓 | 3) Hexagon head   |
| 4) 六角螺母 | 4) Hexagon nut    |
| 5) 垫圈   | 5) Washer         |
- X=28.5 毫米      X=28.5 mm  
y=10.3 毫米      y=10.3 mm



电扇零件装配示意图 With terminal box



电扇电机接线图 Electrical diagram



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Elettromeccanica Tianjin  
Compressor Company Ltd  
25 Jujing Road Hedong District  
300171 Tianjin  
People's Republic of China  
Phone: + 86-22-24302644  
Fax: + 86-22-24302568



Tianjin, 16<sup>th</sup> October 1998

## Certificate of quality and performance

After the testing and commissioning of all the new machines involved in the phase-out project the new compressors models properly designed for the R134a refrigerant have been produced and assembled in the Zel Tianjin Compressor Factory so as to prove the production capacity, quality and performances in compliance with the contractual clauses.

The following four contractual models designed for the R12 refrigerant: M792D , M1040D , M1260T, M1350D have been replaced by the models OF 789C, OF1033C, OF1250C, OF1350C with equivalent characteristics of quality and safety and with upgraded performances as per paragraph 3.2.5 of the Terms of Reference.

From the real production batches, at least 12 compressors for each model have been tested according to the Chinese actual rules. All the results have been found in accordance with the design specifications and with the testing and Certification Institute (i.e. VDE, .... ).

This document certifies that the compressors produced in the Zel Tianjin Compressor Factory fulfil completely the requirements of the Phase-out Contract - UNIDO PROJECT MP/CPR/97/090.

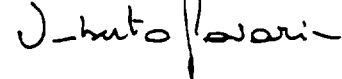
Zanussi Elettromeccanica

Emilio Pierobon



Zel Tianjin Compressor Co. Ltd.

Umberto Nozarino



#### 4. Design data sheet

# OF1350 C

## PRODUCT SPECIFICATION

---

### OPERATION:

Application:	L.B.P.	Max. Ambient Temp:	43°C
Refrigerant:	R134a	(1) Max. Steady Discharge Temp:	120°C
Operation:	Capillary	(1,2) Max. Peak Discharge Temp:	135°C
Cooling:	Static	Max. Steady Condensing Temp:	60°C
		(2) Max. Peak Condensing Temp:	70°C
		Max. Winding Temp:	130°C
		Max. Impurities:	30 mg
		Max. Oil Water Content:	60 ppm
		Max. Compressor Water Content:	100 mg

### COMPRESSOR:

Displacement:	7.52 cc	Oil Type:	Ester
Bore:	23.6 mm	(4) Viscosity:	19 cSt
Stroke:	17.2 mm	Suction Muffler:	Semi-direct
(3) Net Wt:	10.0 kg		
Case Size:	4		
Oil Charge:	270 cc		

### ELECTRICAL:

Power Supply:	200 - 220V	Motor Type:	RSIR
Voltage Limits:	170 - 242V	Locked Rotor Current:	15.5 / 8.9 A**
Frequency:	50 Hz		
Phase:	1 ph		
		Main Winding Resistance at 25°C:	8.9 Ω
		Start Winding Resistance at 25°C:	11.7 Ω

\*\* Maximum current / Measured after 4 seconds

(1) Measured 5cm. from the shell with insulated thermocouples

(2) For transient conditions during 'Pull Down'

(3) Net weight is with oil but without electrics

(4) Measured at 40°C

For rated performance, the suction line must be connected to the stub marked 'AS' on the attached drawing.

Except for high efficiency compressors, performance data is without a run capacitor.

**ELECTRICAL COMPONENTS:**

ZEM Starting Device: PTC- 8100  
 ZEM PTC Resistance: 14 Ω  
 'Combo' PTC Resistance: 14 Ω

**PROTECTORS:**

PROTECTORS	TEXAS ¾	ELECTRICA ¾	COMBO
Type	MRP 304LW xxxx	T 0490 / xx	C2-308 NFBYY xx
Open °C	130 - 140 °C	125 - 135 °C	115 - 125 °C
Close °C	70 - 52 °C	70 - 55 °C	70 - 52 °C
U.T.C	3.30 A 70 °C	2.67 A 70 °C	2.36 A 70 °C
Time Check Current	9.70 A	9.40 A	11.0 A (5-15s)
Max. Current	15.0 A	18.0 A	23.0 A (2s max.)
Code (if any)	T8	AD	2B

*Texas 'xxxx' Codes: 3201 for terminal boards Mod.89,90  
 3166 for terminal board Mod.91*

*Electrica 'xx' Codes: 74 for terminal boards Mod.89,90  
 26 for terminal board Mod.91*

*Combo 'xx' Codes: ...for different contact versions*

*The combined PTC and 4TM protector 'COMBO' is for use with terminal boards Mod.89,90.*

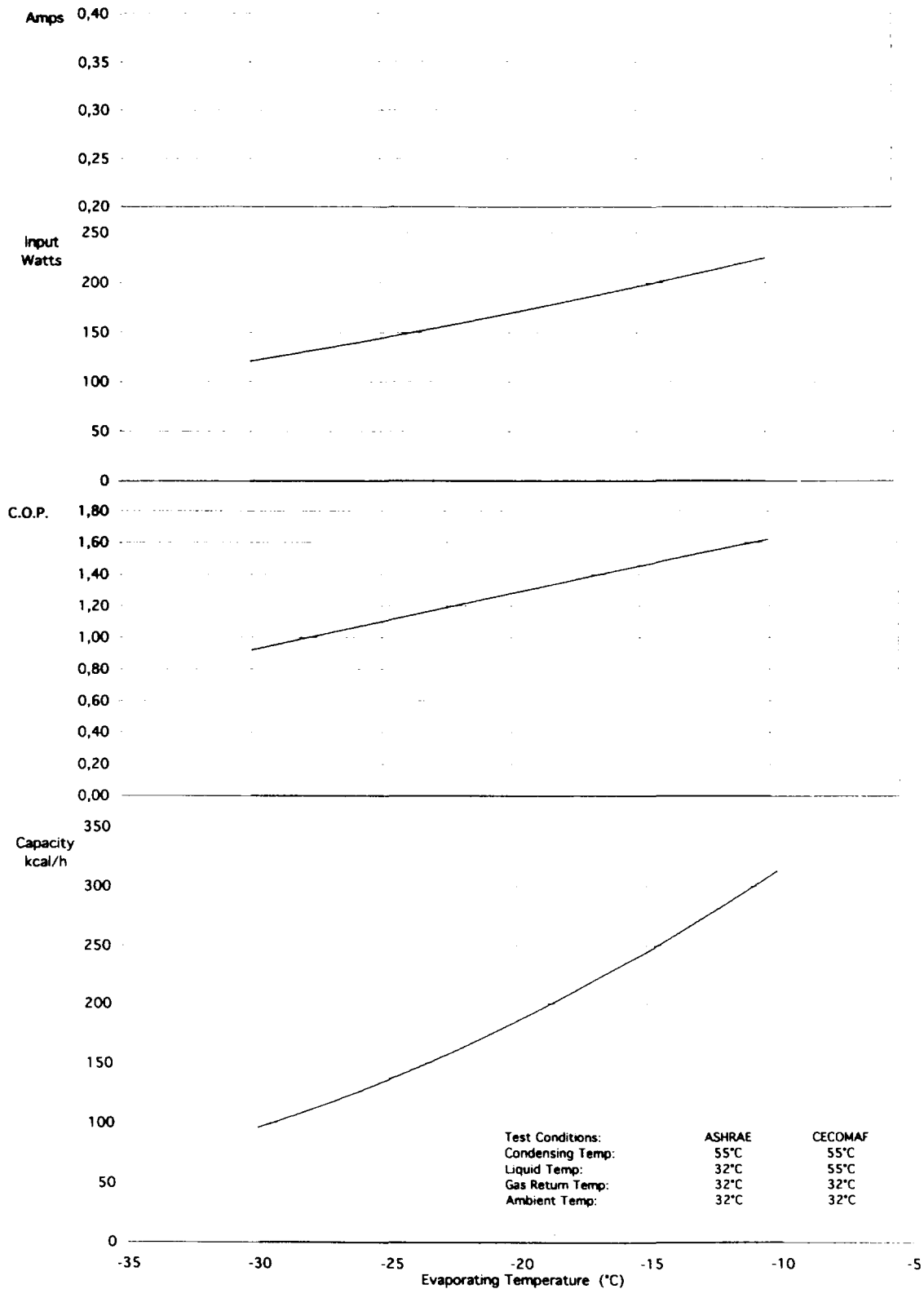
# OF1350 C

## PRODUCT SPECIFICATION

**PERFORMANCE:**

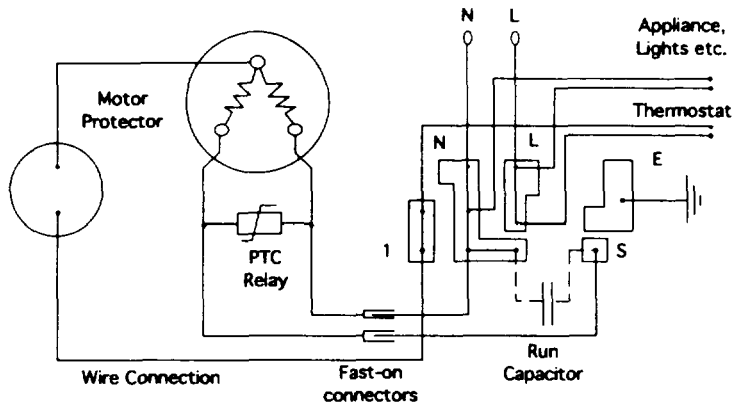
(Graphs are at ASHRAE conditions)

220v 50Hz



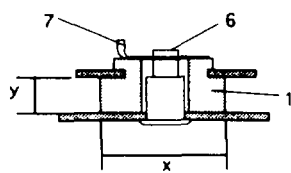
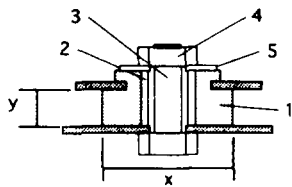
		Evaporating Temperature °C	-30	-25	-23,3	-20	-15	-10
<u>ASHRAE:</u>	Capacity	Kcal/h	96	136	152	186	244	313
	C.o.P.	W / W	0,92	1,10	1,16	1,28	1,45	1,62
<u>CECOMAF:</u>	Capacity	W	91	129		176	231	296
	C.o.P.	W / W	0,75	0,90		1,04	1,18	1,32
	Input Power	W	121	144	152	169	196	225
	Current	A			1,19			

### Circuit Diagram for Mod.90 Terminal Board

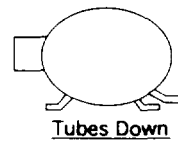
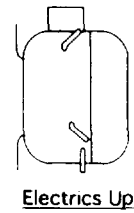
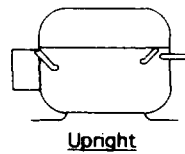


### Recommended Transport Positions when fitted into appliances

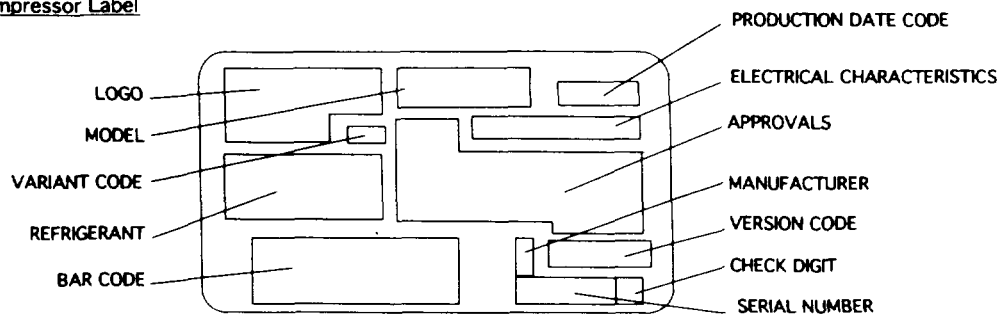
### Mounting Accessories



- x = 26mm or 28.5mm  
 y = 9mm or 10.3mm  
 Other sizes available
1. Rubber grommet
  2. Sleeve
  3. Hexagon head bolt
  4. Hexagon nut
  5. Washer
  6. Steel pin
  7. Clip



### Compressor Label



5. Great wall acceptance certificate

( of which find attached the certificate  
for product OF1350 CH as reference )





# 电工产品认证合格证书(正本)

编号: CH0026028-98

申请人: 扎努西电气机械天津压缩机有限公司

制造厂名称及所在地:

扎努西电气机械天津压缩机有限公司, 天津市河东区九经路25号

产品名称、规格、型号: 电动机-压缩机

OF1350CH

产品检测依据的标准:

GB4706.1-92, GB4706.17-96

上述产品符合电工产品认证规则和程序的要求。

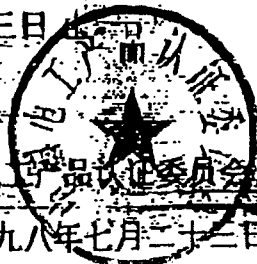
特发此证。

证书有效期: 自一九九八年七月二十三日起

至二零零二年七月二十三日

中国电工产品认证委员会

一九九八年七月二十三日



# CERTIFICATE OF CONFORMITY (ORIGINAL) FOR ELECTRICAL EQUIPMENT

NO: CH0026028-98

APPLICANT: ZANUSSI ELETTROMECCANICA TIANJIN COMPRESSOR CO., LTD.

NAME AND ADDRESS OF THE MANUFACTURE:

ZANUSSI ELETTROMECCANICA TIANJIN COMPRESSOR CO., LTD.

NAME, MODEL AND SPECIFICATION:

MOTOR-COMPRESSOR

OF1350CH

THE STANDARDS FOR THE PRODUCTS TO BE TESTED:

GB4706.1-92, GB4706.17-96

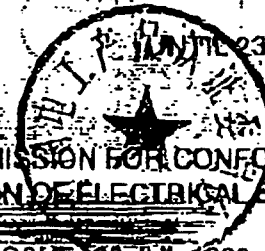
THIS IS TO CERTIFY THAT THE ABOVE MENTIONED PRODUCTS HAVE QUALIFIED FOR THE REQUIREMENTS ABOUT CERTIFICATION RULES AND PROCEDURES FOR THE ELECTRICAL EQUIPMENT

PERIOD OF VALIDITY FROM 23 JUL 1998

23 JUL 2002

CHINA COMMISSION FOR CONFORMITY  
CERTIFICATION OF ELECTRICAL EQUIPMENT

DATE OF ISSUE: 23 JUL 1998



## 6. VDE approval for OF1350 C



VDE Prüf- und Zertifizierungsinstitut

VDE Testing and Certification Institute

Merianstraße 28 · D-63069 Offenbach · Tel. (+49) (69) 83 06-0 · Fax (+49) (69) 83 06-555

VDE

Appendix No. 1  
to Marks Licence No. 103990  
file ref. 21809-2560-0001/30329

ks licence No.:

file ref.:

(filled in by the

Institute)

Constructional data for electric motor-operated appliances / electric heating appliances /  
electric motor-operated tools

Form 142E

- 1.1 Manufacturer: See Annex 1
- 1.2 Place of manufacture: See Annex 1
- 1.3 Product category: Hermetic Motorcompressor
- 1.4 Type \*\*: OF 789 C
- 2.1 Nominal voltage: 200-220V 50Hz
- 2.2 Nominal input:
- 2.3 Protection against electric shock \*): Class I(Protective-earth- contact) - II (Protective insulation) - III (extra-low voltage)
- 2.4 Degree of protection \*): ~~covered~~ ~~drip proof~~ ~~splash proof~~ ~~watertight construction~~
- 2.5 Supply connection \*): ~~non-detachable flexible cable or cord~~ permanent connection/appliance coupler/internal connection
- 2.5.1 Kind of connection \*): X, ~~Y~~, ~~Z~~
- 2.6 Materials; 2.6.1 Enclosure: 2.6.2 Water container:
- 2.7 Refrigerating equipment: permissible operating overpressure, pressure side bar 2.8 Type of refrig. R134a
- 2.9 File reference - Compressor: 2.10 Quantity of coolant: kg
- 3.1 Further technical information (short-time, intermittent duty, operating time, nominal contents, operating overpressure):

- 4 Data about the motor 4.1 Manufacturer: See Annex 1 4.2 Number of revolutions: 3000
- 4.3 Type reference: a) OF 789 C 4.4 Kind of motor: Async. Monophase 4.5 Nominal voltage:

	Resistance [ $\Omega$ ]	Wire thickness	Number of turns	Insulation class (Insul.)
4.6 Winding a) 1:	MAIN 14.10 $\pm$ 7%	0.600 mm	40-63-82-96-103	synt.
2:	START 19.20 $\pm$ 7% at 20°C	0.350 mm	57-53-46-35	synt.

- 4.7 Information on ambient temperatures (if higher than (25):
- 4.8 Temperatur class: T
- 5 Components installed in the appliance (switch, temperature regulator, heater, cables, capacitor, sockets etc.)

Type	Manufacturer	Information on type, current, input or similar	tested acc. to?	any certification mark?
See Annex 2				

\*) cross out if not applicable \*\*)

Please give information on separate sheet about typ series and the relevant components, if applicable  
continue with form 198 or separate sheet, if necessary

Offenbach, 15. Jan. 1998  
VDE Testing and Certification Institute  
Department VDE Prüf- und Zertifizierungsinstitut  
Abteilung TM

VDE-Form 142E.0595  
Copyright - all rights reserved

Place: Pordenone Date: 15.10.1997

ZANUSSI ELETTROMECCANICA S.p.A.  
Via Consorziale - Loc. COMINA  
PORDENONE

(Stamp and signature of the manufacturer)

Name und Sitz des Zeichengenehmigungs-Inhabers/Name and registered seat of the marks licence holder

**Zanussi Elettromeccanica Tianjin Compressor Co. Ltd., 25, Juijing Road, TJ- Hengdong District Tianjin**

Fertigungsstätte/Place of manufacture

**-AA- TJ-Hengdong District Tianjin**

Statistik/Statistics

**44 vde10\_97.zel/1997-10-15**

Aktenzeichen/File

**21809-2560-0001/30329 TM1/Kr-ec**

Datum/Date

**1998-01-15**
**VDE-Zeichen / VDE Mark :**


Die Bedingungen zum Benutzen des Zeichens sind auf Blatt 1 von 1998-01-15 genannt.  
The conditions to use the mark are referred to on page 1 of 1998-01-15.

 Jahresgebühren-Einheiten/  
annual fee units

Geprüft nach / tested according to

DIN 57700 Teil 1 (VDE 0700 Teil 1):1981-02

DIN VDE 0700 Teil 1 A2:1988-04

DIN VDE 0700 Teil 34:1985-10

DIN VDE 0700 Teil 34 A1:1996-07

HD 251 S3, Änderung 1 und 2:1979

HD 251 S3, Änderung 3:1987

HD 277 S1:1984

HD 277 S1/A2:1995

**Motorverdichter**
**Motor compressor**
**7,0**

Bezeichnung:

Typ OF 789 C

4,0

Model:

Type OF 1260 C

4,0

OF 1350 C

4,0

Nennspannung:

AC 200 - 220 V, 50 Hz

Nominal voltage:

Schutzmaßnahme:

Schutzklasse I

Protection against electric shock:

class I

Schutzart:

abgedeckt

Degree of protection:

ordinary

Kältemittel:

R 134 a

Refrigerant:

Kühlung:

statisch

Cooling:

static

Weitere Angaben vergleiche Anlagen Nr. 1, 2 und 3

Additional details see annex No. 1, 2 and 3

VDE Prüf- und Zertifizierungsinstitut

Abteilung TM

Summe der

Jahresgebühren-

Einheiten

 -----  
19,0  
=====

Total annual fee units

i. A.

VDE Testing and Certification Institute · Institut VDE d'Essais et de Certification

Zanussi Elettromeccanica S.p.a.  
Via Consorziale, 13 Località Comina  
33170 Pordenone (ITALY)  
Phone + 434 393 439  
Telefax + 434 393 313

Sede Legale:  
Via Giardini Cattaneo 3, 33170 Pordenone  
Capitale Sociale L.20.000.000.000 i.v.  
Uff. Reg. Imp. N. 4780 C.C.I.A. (PN) 017448  
Cod. Fiscale 00197140261

**ANNEX 1**

ref: vde01b\_98.zel

date: 04/03/1998

**MANUFACTURER :**

Zanussi Elettromeccanica Tianjin Compressor Co. Ltd.

**PLACE OF MANUFACTURE :**

Zanussi Elettromeccanica Tianjin Compressor Co. Ltd.

25, Jiujing Road

Hendong District Tianjin

P.R. CHINA

**TRADE MARKS :**

- 1) ZEL
- 2) VERDICHTER (VOE)
- 3) ELECTROLUX COMPRESSORS

# **Electrolux**

## COMPRESSORS

Zanussi Elettromeccanica S.p.a.  
Via Consorziale, 13 Località Comina  
33170 Pordenone (ITALY)  
Phone + 434 393 439  
Telefax + 434 393 313

Sede Legale:  
Via Giardini Cattaneo 3, 33170 Pordenone  
Capitale Sociale L.20.000.000.000 i.v.  
Uff. Reg. Imp. N. 4780 C.C.I.A. (PN) 017448  
Cod. Fiscale 00197140261

### ANNEX 2

ref : vde10\_97.zel

date: 15/10/1997

### ELECTRICAL COMPONENTS LIST

<i>Object</i>	<i>Manufacturer</i>	<i>Code</i>	<i>Tested acc. to ?</i>	<i>Any Certif. Mark</i>
Starting device PTC	ZEM	8100		NO
Protector	TEXAS	MRP 348 LZ xxxx	EN 60 730-2-4	NO
Protector (*)	ELECTRICA	T 0530 xx	EN 60 730-2-4	NO
Device 'COMBO' PTC + Protector (*)	TEXAS	C2-222 NFB YY-xx	EN 60 730-2-4	NO
Terminal Block	ZEM	Mod. 89		NO
Terminal Block (*)	ZEM	Mod. 90		NO
Terminal Cover (*)	ZEM	Mod. 91		NO

(\*) - Alternative use component.

FOR COMPRESSOR TYPE : OF 789 C