Test Report

Report number: WB1105270098

<table>
<tr><td>customer inspected</td><td colspan="2">San Men road Tesco</td><td>Assignment source</td><td>Commission</td></tr>
<tr><td>Unit Name</td><td colspan="2">TRANE chiller</td><td>Test item</td><td>Comparison test of chiller energy saving</td></tr>
<tr><td>Model and specification</td><td colspan="2">RTHDE3GEG3</td><td>Unit Manufacturer</td><td>TRANE</td></tr>
<tr><td>Manufacture time</td><td colspan="2">2005</td><td>Serial number</td><td>/</td></tr>
<tr><td>Test basis/integrated judgment principle</td><td colspan="4">SJB0001-2004 Evaluations Of Energy Saving Effect For Chiller and Heat Pump Unit DB31/T255-2003 Centralized Air Condition(Central Air Condition)System Energy Saving Operation and Management Requirements</td></tr>
<tr><td>Test date</td><td colspan="4">2011/8/3,2011/9/2</td></tr>
<tr><td>Director of Test</td><td colspan="4">印慧</td></tr>
<tr><td>Testers</td><td colspan="4">印慧 刘书荟 朱伟庆 黄鸣</td></tr>
<tr><td>Test conclusion</td><td colspan="4">See attached page of this test report

(stamp) report date : 2011,9,14</td></tr>
<tr><td rowspan="2">Unit inspected (commission) Communications Data</td><td>Address</td><td colspan="3">No 501.San Men Road .Shanghai</td></tr>
<tr><td>Zip code</td><td>200061</td><td>Tel</td><td>61400677</td></tr>
</table>

Approve Review Major tested by

1、 Profile

There are two sets of TRANE chillers with 257.8KW capacity for meeting the cooling demand in summer, the two chillers are #1 and #2. They have been used for 6 years since 2005.

SGRI did energy saving work on #1 chiller in August 2011 : installed automatic tube cleaning system which is imported from CQM of Israel (ATCS) , the tests conducted on site are divided into two parts to get the energy saving rate , before installing (2011.8.3) and after installing (2011.9.2).

2、 Test basis

<SJB0001-2004 Evaluations of Energy Saving Effect for Chiller and heat pump unit >

< DB31/T255-2003 Centralized Air Condition (Central Air Condition) System Energy Saving Operation and Management Requirements >

3、 Test method

The performance coefficient test for a running chiller is based on SJB0001-2004 Evaluations Of Energy Saving Effect For Chiller And Heat Pump Unit and DB31/T255-2003 Centralized Air Condition (Central Air Condition) System Energy Saving Operation And Management Requirements , test diagram shown in Figure 1 :

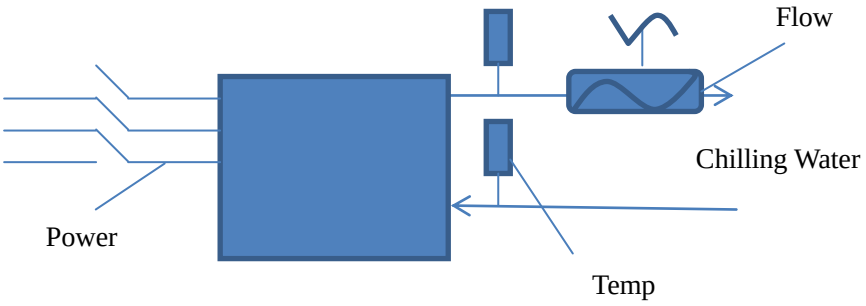

Figure1 Arrangement of Test Point

Unit parameters and the instruments in table as below:

Table 1 unit parameters

Name	TRANE
Model	RTHDE3G3G3
Rated speed	3000rpm
Rated power of compressor	257.8KW
Refrigerant	R134a
Manufactory	TRANE
Rated cooling capacity	1436.3KW

Table 2 list of the test instruments

Name	Model	Accuracy	Manufactory
Power Quality Analyzer	3196	0.1 level	HIOKI
Temperature Collected Recorder	Testo 177-T4	±0.3℃（－100~＋70℃）	(Germany) Testo
Ultrasonic Flow Meter	F601	±1.6％ of reading±0.01m/s	(Germany)FLEXIM
Ultrasonic Flow Meter	G601	±1.6％ of reading±0.01m/s	(Germany)FLEXIM
Precision Temperature & Humidity Recorder	625	0.1 level	TESTO

4、 Test data & Results calculated

The two parts of the test were conducted under the same conditions such as the duration of test, instruments related settings and test areas. The final data are modified because of the little change of environment conditions; the process is shown as below:

4.1 、Test data

The load rate of the chiller are 84.2％, 66.7％ respectively by two parts of test. More specific data are in the table as below

Table 3 test data sheet

Item	Symbol	Unit	Data Source	Test time	
				Pre-installation 2011.8.3	After-installation 2011.9.2
Air/ engine room Temp	t	℃	Measured	33.6/33.4	29.2/29.1
Air/ engine Humidity		%	Measured	45.2/61.6	70.0/76.1
Frozen water flow	V	m^3/h	Measured	142.04	158.8
Output Temperature of Chilled Water	t_1	℃	Measured	12.5	12.1
Input Temperature of Chilled Water	t_2	℃	Measured	17	16.0
Evaporating Pressure	P_0	kPa	Indicated by Unit	347.5	339.9
Evaporating Temperature	t_0	℃	Indicated by Unit	12.3	12.0
Condensing Pressure	P_k	kPa	Indicated by Unit	914.7	853.8
Condensing Temperature	t_k	℃	Indicated by Unit	40.3	37.7
Average Power of the Unit	N	kW	Measured	216.96	171.95

4.2、Date calculated

According to SJB001-2004, the capacity of condensing units and correction calculated by the following formulas:

$$Q = V \cdot (t_2 - t_1) \cdot \rho \cdot C/3600 \quad KW$$

Cooling capacity is modified from conditions of after-installation to pre-installation

$$Q_{mod} = Q \cdot \alpha_1 \cdot \alpha_2$$

α_1: When t_0 (Evaporating Temp)±1℃， then $\alpha_1 = 1 \mp (4\sim5)\%$

α_2: When t_k (Condensing Temp)±1℃， then $\alpha_2 = 1 \mp (1\sim1.2)\%$

COP of units

$$COP = \frac{Q}{N}$$

In this calculation, the density of water is 1000kg/m^3; heat capacity is 4.1868kj/kg.℃

According to the SJB001-2004, energy saving rate is calculated by the following formula:

$$\text{Energy saving rate} = \frac{COP_{Aft} - COP_{Pre}}{COP_{Aft}} \times 100\%$$

Table 4 calculation results

	Pre-installation	After-installation
Output cooling capacity （kW）（be modified after installation）	745.7	706.6
Input Power （kW）	216.96	171.95
COP	3.437	4.109
Energy saving rate (%)	**16.36**	

Conclusion:

Comparing to the pre-installation, when the unit system worked properly and met the demand, the performance of #1 chiller was improved by 16.36%。