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Final report

Hangzhou XiLing Refrigeration Electric Appliance CO.

Test Report

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Product Test Report

Refrigerator Model: BCD-188B
Test Standard : SYDG9802
Test Date: March 17 , 98
Refrigerant: R600a

Product Test Lab of Development Center

1 . Preface

The tests have been performed based on the following items in order to adjust the refrigerant circuit of XiLing BCD-188B with R600a as refrigerant:

1、 Using special compressor
2、 Adjusting the flow of capillary tube
3、 Adjusting the filled quantity of refrigerant

The condenser and the evaporator have not been adjusted in the test and there are not many different types of compressors to choice, so the compare test of different compressors has not been performed. On account of the test conditions and the limited time, the experiment to fix the optimal flow of capillary tube has not been carried out.

We shall get following aims after the conversion experiment:

1、 By optimizing the R600a refrigerant circuit , the energy consumption should near to or lower than that of R12 refrigerant circuit

2、 To master the fundamental law of refrigerant circuit of BCD-188B with R600a as refrigerant

2 . Test conditions and Test procedure

1、 Test conditions: the lab and test have been carried out the principle of China standard GB8059.2-1995

2、 Test procedure: we test the items as the following order:

- continuous running test at ambient temperature of t_a=32 ℃
- Energy consumption at t_a=25 ℃,$t_i \leqslant$ 5 ℃
- Running test at low temperature t_a=16 ℃
- Running test at high temperature t_a=32 ℃

3. Technical data indicated

compressor brand	National	type of compressor	QD100Y
thermostat brand	FuShan	type of thermostat	WDF-29
standard of capillary	1.9X0.71mm	flow of capillary	270L/h
evaporator No.1	-	evaporator No.2	-
condenser No.1	-	condenser No.2	-
*the filled quantity	36g		

Note: "-" stands the same to R12 refrigerant circuit
"*" stands the initial the filled quantity

4. Continuous running result

t_i cooler	t_j freezer	turn of the filled quantity
-7.38 ℃	-32.61 ℃	39g

5. Energy consumption result

parameter					thermostat pos.			5						
	cooler temperature(℃)				freezer temperature(℃)									running time
	T10	T11	T12	Tm	T1	T2	T3	T4	T5	T6	T7	T8	Th	(min)
start	6.8	5.1	4.0	3.0	-17.6	-18.0	-20.8	-21.2	-19.0	-19.5			-18.0	37
stop	2.9	0.1	-1.1		-19.3	-18.1	-19.8	-20.4	-19.6	-20.0				53
working period				90min				working coefficient				41 percent		
average running power				91W				energy consumption				0.898KWh/d		

6. Running test at low ambient temperature(ta=16 ℃)

parameter					thermostat pos.			4						
	cooler temperature(℃)				freezer temperature(℃)									running time
	T10	T11	T12	Tm	T1	T2	T3	T4	T5	T6	T7	T8	Th	(min)
start	6.4	5.5	4.7	3.6	-18.5	-18.7	-20.4	-20.8	-18.5	-19.2			-18.5	29
stop	3.2	1.5	0.3		-18.8	-19.1	-20.7	-21.2	-19.1	-19.7				85
working period				114min				working coefficient				25percent		
average running power				93W				energy consumption				0.569KWh/d		

7. Running test at high ambient temperature(ta=32 ℃)

parameter								thermostat pos.					5	
	cooler temperature(℃)				freezer temperature(℃)									running time
	T10	T11	T12	Tm	T1	T2	T3	T4	T5	T6	T7	T8	Th	(min)
start	8.3	6.1	4.9	4.4	-18.0	-18.5	-21.5	-21.9	-19.5	-19.9			-18.0	41
stop	4.9	1.6	0.3		-18.2	-18.7	-21.6	-21.9	-19.8	-20.2				39
working period				80min				working coefficient					51 percent	
average running power				91W				energy consumption					1.119KWh/d	

8 . Analysis and discuss

1、 According to the result of continuous running test, the filled quantity of refrigerant in the conversed refrigerant circuit is 48g.It is 40 percent of what the R12 refrigerant circuit needs.

2、 The energy consumption of conversed refrigerant circuit is 10 percent lower than that of R12 refrigerant circuit. The working coefficient of two circuits is same, but the running power of R600a refrigerant circuit is smaller than that of R12's.

3、 The working period of conversed refrigerant circuit becomes longer and the temperature differential between cooler and freezer is small and the energy consumption does not meet what we have expected, so all of above indicated that the refrigerant circuit can be optimized.

April 2, 98