

# Test Report

**CTS**

Corea Testing Standard Institute

CTS Co., Ltd.  
71-9, Dongtangiheung-ro, Dongtan-  
myeon, Hwaseong-si, Gyeonggi-do,  
Korea

## 1. Client

- Name : Rainbow Electronics Co., Ltd.  
- Address : 303-204 Bucheon Techno-park Ssangyong III  
#36-1, Samjeong-dong Ojeong-gu, Bucheon-city,  
Gyeonggi-do, Korea  
- Date of Receipt : June 25, 2013

2. Use of Report : Environment Test (Cold test & Heat test)

## 3. Test Sample

- Product : THERMOSTAT  
- Model and/or type reference : TS-120SR & PTSC-090C  
- Manufacture : Rainbow Electronics Co., Ltd.  
- Address : 303-204 Bucheon Techno-park Ssangyong III  
#36-1, Samjeong-dong Ojeong-gu, Bucheon-city,  
Gyeonggi-do, Korea  
- Rating(s) : TS-120SR 250 V~, 20 A, Temp.: 0 °C ~ 120 °C  
PTSC-090C 250 V~, 20 A, Temp.: 0 °C ~ 90 °C

4. Date of Test : June 17, 2013 ~ June 24, 2013

5. Test method used : KS B 6156

## 6. Testing Environment

- Environment : Temperature: 23.7 °C Relative Humidity: 47.7 %R.H  
- Location :  In Lab  In Chamber  On Site Test

## 7. Test Results & Uncertainty

Affirmation	Tested by Name: Sung-Woo, Cho (Signature)	Technical Manager Name: Man-Woo, Lee (Signature)
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## 1. General Information

- ◆ This report gives the results of environment testing of a Rainbow Electronics Co., Ltd. manufactured by thermostat with model No. TS-120SR & PTSC-090C
- ◆ The test samples were submitted by Rainbow Electronics Co., Ltd. without packed condition on June 13, 2013
- ◆ All of the tests were performed at CTS Co., Ltd.  
(Address: 71-9, Dongtangiheung-ro, Dongtan-myeon, Hwaseong-si, Gyeonggi-do, Korea)

## 2. Description of test product(s)

### 2.1 Identification of test product(s)

Model No.	TS-120SR	PTSC-090C
Temperature Range	0 °C ~ 120 °C	0 °C ~ 90 °C
Electrical Ratings	250 V~, 20 A	250 V~, 20 A

### 2.2 Test instrument

Equipment	Manufacturer	Type/Model	Calibration due date
Temp & Humidity chamber	Elex Polytech	CTH5500	2014-03-26
Insulation / Continuity	METREL	MI2123	2014-03-20
Withstanding Voltage Tester	Woori	WR-5200A	2014-04-22
Mechanical Convention Oven	Elex Polytech	ENT4500	2014-03-20
Digital Multimeter	AGILENT	34401A	2014-03-21

### 3. Test Method

#### 3.1 Cold test

- ▶ Leave the thermostat in the chamber of  $-25 \pm 3$  °C for 48 hours and take the product out. Check if there's any condensation or drop of water. If condensation or drop of water is shown, clean it sufficiently and leave it for 2 hours. Then, carry out the test of 10.4.2 and check whether there's any problem in function by the change of temperature, crack, expansion, deformation or not. Carry out the test of 10.5 and 10.6 again.

#### 3.2 Heat test

- ▶ Leave the thermostat in the chamber of  $70 \pm 2$  °C for 48 hours and take the product out. And leave it for 2 hours. Then, carry out the test of 10.4.2 and check whether there's any problem in function by the change of temperature, crack, expansion, deformation or not. Carry out the test of 10.5 and 10.6 again.

#### 3.3 Temperature test (10.4.2)

- ▶ When the contact opens or stop signal from the combustion of the liquid temperature, the difference between the liquid temperature and the set temperature is investigated.

#### 3.4 Insulation Resistance test (10.5)

- ▶ Insulation resistance is defined in KS C 1302. the insulation resistance is measured by applying the test voltage.
  - a. between charging terminals and Non - charging terminals.
  - b. between independent charging terminals.
  - c. between Non-continuous contacts terminals.

Rated insulation voltage	Rated voltage of the insulation resistance tester to use (V)
60 or less	DC 250
60 excess 250 or less	DC 500

#### 3.5 Electric Strength test (10.6)



- ▶ The appliance is disconnected from the supply and the insulation is immediately subjected to a voltage having a frequency of 60 Hz for 1 min. Test values of the test voltages are specified in table.

Voltage measurement location	Rated insulation voltage	Test voltage (V)
between charging terminals, Non-charging terminals and independent charging terminals	60 or less	500
	60 excess 125 or less	1000
	125 excess 250 or less	1500
between Non-continuous contacts terminals	250 or less	500



No breakdown shall occur during the test.

## 4. Test Result

### 4.1 Model No.: TS-120SR

KS B 6156			
Clause	Requirement + Test	Result - Remark	Verdict
<b>10.7</b>	<b>Cold test</b>		—
	There shall be no crack, expansion, deformation	 No crack, expansion, deformation	P
10.4.2	Temperature shall be within $\pm 4$ °C - Setting temp.: 80 °C	77.7 °C	P
10.5	Insulation Resistance - More than 10 MΩ.	$\infty$	P
10.6	Electric Strength - Test voltage of 1500 V, for 1 min	No breakown	P
<b>10.8</b>	<b>Heat test</b>		—
	There shall be no crack, expansion, deformation	 No crack, expansion, deformation	P
10.4.2	Temperature shall be within $\pm 4$ °C - Setting temp.: 80 °C	79.3 °C	P
10.5	Insulation Resistance - More than 10 MΩ.	$\infty$	P
10.6	Electric Strength - Test voltage of 1500 V, for 1 min	No breakown	P

**4.2 Model No.: PTSC-090C**

KS B 6156			
Clause	Requirement + Test	Result - Remark	Verdict
<b>10.7</b>	<b>Cold test</b>		—
	There shall be no crack, expansion, deformation	 No crack, expansion, deformation	P
10.4.2	Temperature shall be within $\pm 4$ °C - Setting temp.: 70 °C	70.1 °C	P
10.5	Insulation Resistance - More than 10 MΩ.	$\infty$	P
10.6	Electric Strength - Test voltage of 1500 V, for 1min	No breakdown	P
<b>10.8</b>	<b>Heat test</b>		—
	There shall be no crack, expansion, deformation	 No crack, expansion, deformation	P
10.4.2	Temperature shall be within $\pm 4$ °C - Setting temp.: 70 °C	71.6 °C	P
10.5	Insulation Resistance - More than 10 MΩ.	$\infty$	P
10.6	Electric Strength - Test voltage of 1500 V, for 1 min	No breakdown	P

## 5. Appendix 1 (Photos of TS-120SR)



**Cold test**





## 5. Appendix 2 (Photos of PTSC-090C)



**Heat test**

