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English Manual for Steel Construction Fire Resistance Coating Test Furnace



Model: YY422

Power: 220V/50Hz

Foreword

Much appreciated that you buying our products, we provide the high quality goods and reliable after-sales service.

To ensure the personnel safety and equipment integrity, read the operation manual carefully and pay attention to the precautions of using before operation. This manual details the design principles, standards, structure, operation, calibration, maintenance, possible faults and solution, electrical diagram and so on. The “test rule”, “standard” mentioned in the manual are only for reference, if your company disagrees, just review the standards or data on you own.

The machine had passed the strict internal inspection by our technician before package and transpiration. But the machine will still be affected by the impact or shock during moving and transportation. Thus carefully unpack this unit and inspect for any damage which may have been caused in transit. In the unlikely event of anything being damaged please offer us a report on detail and we will solve it in time.

Special Statement:

- This manual can not be used as the basis for any request to our company.
- Our company keeps the final interpretation right of this manual.

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1. Introduction

The Steel Construction Fire Resistance Coating Test Furnace is designed as standard ISO 834-1, GB 14907, GB/T9978, which specifies a test method for determining the fire resistance of various elements of construction when subjected to standard fire exposure conditions. The test data thus obtained will permit subsequent classification on the basis of the duration for which the performance of the tested elements under these conditions satisfies specified criteria. The instrument has reasonable design structure, convenient operation and maintenance, high degree of automation, and temperature error are less than national standards; it is an ideal tool for scientific research personnel to work on fireproof coatings.

2. Working conditions

- (1) Ambient temperature: 5 ° C - 30 ° C.
- (2) Relative humidity: \leq 85%.
- (3) Power supply voltage: 220V \pm 10%, 50HZ, power: 200W.
- (4) Gas source: liquefied petroleum gas.

(5) Dimensions of the instrument: test furnace (660 ± 10) mm * (660 ± 10) mm * (1080 ± 10) mm, control box 510 mm * 450 mm * 400 mm.

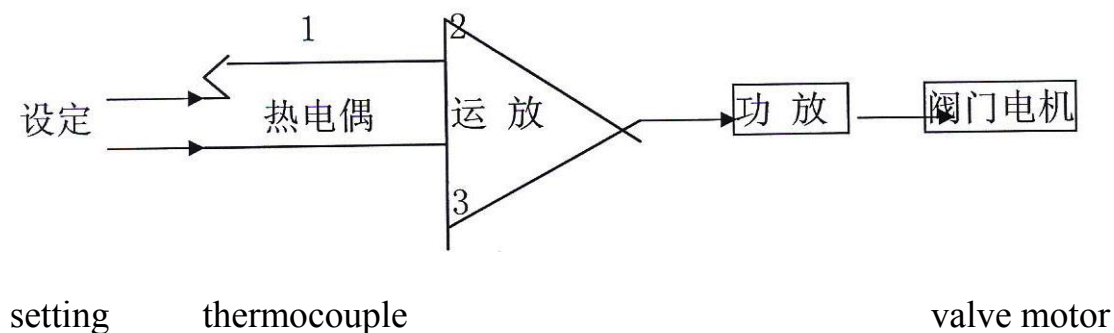
(6) Test piece: universal beam.

(7) Automatic control time - temperature rise curve and record.

(8) When the backfire temperature of the test piece reaches $(140\text{ }^{\circ}\text{C} + \text{ambient temperature})$ or the internal temperature reaches $(180\text{ }^{\circ}\text{C} + \text{ambient temperature})$, it will automatically alarm.

3. Test theory

The machine refers to $T - T_0 = 345 \log (8t + 1)$ function curve, that is time---temperature control curve, which corresponding representative value is the basis for setting temperature rise (hereinafter referred to as setting), and put setting and thermocouple signal are sent to the amplifier at the same time for comparison. The following figure as



When the thermocouple temperature is higher than the setting value, the valve motor will automatically shut off and the flame temperature will decrease; when the thermocouple temperature is lower than the setting value, the valve motor will automatically open and the flame temperature will rise; the flame at the thermocouple will run from the beginning to the end according to a pre-designed standard curve. When the backfire temperature of the test piece reaches (140 °C + ambient temperature) or the internal temperature of the test specimen reaches (180 °C + ambient temperature), an alarm signal is automatically issued.

4. Control panel



5. Test specimen preparation

5.1 Install test holder, insert thermocouple and gas pipe as required. Plug in the corresponding cable and turn on the power.

5.2 Checking furnace temperature thermocouple top should be in the center above of the burner spout.

5.3 Press the instrument power switch and the screen will light up.

5.4 Check whether the three displayed temperature values on the instrument screen are ambient temperature. If 3276.7 is displayed, the thermocouple is not connected. It should be re-examined.

5.5 Press setting button to set furnace target temperature, backfire temperature, and sample internal temperature.

5.6 Open the gas valve, press the “Ignition” button on control panel. After the ignition is successful, press the “Start” switch, the test starts, temperature curve is displayed at the same time. The test time on the instrument panel starts to count. After a period of time, check the temperature curve whether meets the requirements, if it is satisfied, the temperature---time curve of the instrument must also meet the requirements (see Table 1). Setting check is completed, press the "Stop" switch.

Time min	Temperature °C
5	556 ± 80
10	659 ± 99
15	718 ± 70
30	821 ± 80
60	925 ± 46

90	986 ± 49
120	1029 ± 51

Sample Preparation:

a) Put 116 universal beam (length 500mm) seven pcs, pre-embedded thermocouple as bellowing figure 1(holes generated by pre-embedded thermocouple should be reliably closed)

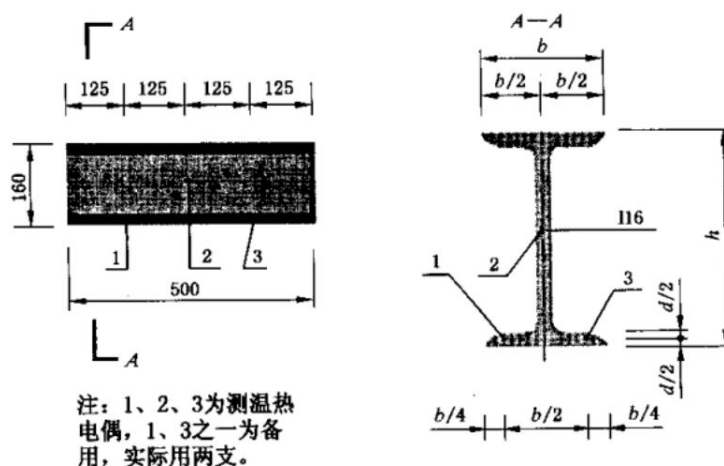


Figure 1 attach fire resistance test thermocouple photo (unit: mm)

注：1，2，3 为测温热电偶，1，3 之一为备用，实际用两支

Note:123 is temperature thermocouple, 1 or 3 is spare, actually use two

b) application to 7 sets short steel beams surface as coating specified, and the coating thickness shall be specified as WCB(1.5~2.0)mm, WB(4.0~5.0)mm, WH(20~25)mm. While the thickness deviation of each short steel beam specimen should not exceed 10%.

6. Test procedure

6.1 Power on, the screen lights up, and turn off the flow meter on the control panel via clockwise.

6.2 Place the prepared sample in the specified position of the test furnace, and place the backfire temperature thermocouple on the back of the sample. The internal temperature thermocouple is inserted into the center hole of the sample.

6.3 Press the “Ignition” switch on the instrument panel, turn on the flow meter counterclockwise, adjust gas flow rate to about 5L/min, ignite the burner, and heat the sample. When the internal temperature of the sample reaches 50 °C, press “Start”. The instrument starts to work automatically, and the test time starts to count.

6.4 During the test, manually or automatically adjust the intake air amount or the intake air amount minus button to adjust the internal temperature of the furnace.

6.5 Do test for 10 minutes, the gas flow rate can be increased to the maximum value. When the instrument alarm sounds during the test, it indicates that the sample has reached the fire endurance. The test time stops counting, turned off the flow meter clockwise, and the smoke is immediately exhausted. At this time, the time displayed on the test time display on the instrument panel should be recorded.

6.6 Repeat 6.2-6.5 for the next sample test.

6.7 After the test is completed, the gas source and power switch should be turned off to clean the sample.

7. Attention

- 1). Please using the specified voltage, the instrument should have a grounding wire.
- 2). Some materials release toxic and harmful gases when testing samples. It is recommended that the test be carried out in a fume hood and be protected by human body.
- 3). When using liquefied gas, natural gas, gas and other gas sources, the pipeline connections should not leak, and the vent pipe should be replaced in time.
- 4). The operator cannot leave the test site during the test.
- 5). Computer-controlled equipment should be protected against viruses.
- 6). Equipped with fire-fighting equipment.
- 7). All power sources and air sources should be turned off at the end of the test.

8. Warranty

Model	YY422	Item Name	Steel Construction Fire Resistance Coating Test Furnace	Purchase Date	
Buyer				Address	
Tel		Item No		Manufactu re Date	
Date				Repairm an	
Maintenanc e Report					
Note	Do not make warranty card lost, unauthorized alteration void				

9. PACKING LIST

Items	Name	Qty	Check
1	Control chamber	1	
2	Test furnace	1	
3	Holder set	1	Motor & Fan
4	M6*30 screw nut	6	
5	Thermocouple	3	
6	Power line	1	
7	Manual	1	
8	Warranty	1	

