BWR 系列变压器绕组温控器

BWR Series Transformer Winding Temperature Controller

一．产品简介(Product introduction)

BWR系列变压器绕组温度计是变压器专用仪表。该仪表采用附加温升的原理而设计，它是在BWR-04B的基础上，采用国际先进技术，将BWR--04B型变压器绕组温度计、BL型变流器和DFY--24V 稳压电源等合为一体。该产品具有体积小、功能全、安装方便、操作简单等特点。输出（4--20）mA电流信号供计算机系统及二次仪表使用，实现无人电站管理。

BWR系列变压器绕组温控器，主要由弹性元件、传感导管、感温部件、电热元件、温度变送器、一体化变流器和数显仪组成。

变压器绕组温度计的温包插在变压器油箱顶层的油孔内，当变压器负荷为零时，绕组温度计的读数为变压器油的温度。当变压器带上负荷后，通过变压器电流互感器取出的与负荷成正比的电流，经变流器调整后流经嵌装在波纹管内的电热元件。电热元件产生的热量，使弹性元件的位移量增大。因此在变压器带上负荷后，弹性元件的位移量是由变压器顶层油温和变压器负荷电流二者所决定。变压器绕组温度计指示的温度是变压器顶层油温与线圈对油的温升之和，反映了被测变压器线圈的最热部位温度。

The series of BWR transformer winding thermometer is a dedicated instrument for transformers. This instrument is designed based on the principle of additional temperature rise. It integrates the BWR-04B type transformer winding thermometer, BL type converter, and DFY-24V stabilized power supply, among others, using international advanced technology. The product features a small size, full functionality, easy installation, and simple operation. It outputs a (4-20) mA current signal for use by computer systems and secondary instruments, enabling unmanned power station management.

The series of BWR transformer winding temperature controller is mainly composed of elastic elements, sensing pipes, temperature sensing components, electric heating elements, temperature transmitters, integrated converters, and digital display meters.

The temperature bulb of the transformer winding thermometer is inserted into the oil hole at the top of the transformer tank. When the transformer load is zero, the reading of the winding thermometer indicates the temperature of the transformer oil. After the transformer is loaded, a current proportional to the load is taken from the transformer current transformer, adjusted by the current converter, and then flows through the electric heating element embedded in the bellows. The heat generated by the electric heating element increases the displacement of the elastic element. Therefore, after the transformer is loaded, the displacement of the elastic element is determined by both the top oil temperature of the transformer and the load current. The temperature indicated by the transformer winding thermometer is the sum of the top oil temperature and the temperature rise of the coil over the oil, reflecting the temperature of the hottest part of the measured transformer coil.

二．型号、规格、结构、特点(Model, specification, structure, characteristics)

2.1、型号及说明(Model and description)

BWR –04/6 AJ (TH)

- (TH)：三防要求加标 TH　Three defense requirements are marked with TH
- AJ：A:输出 Pt100 铂电阻值，J：输出 4-20mA A: Output Pt100 platinum thermistor value, J: Output 4-20mA
- 04/6：开关数量　Number of switches
- BWR：变压器绕组温控器　Transformer winding temperature controller

2.2、主要技术参数及性能(Main technical parameters and performance)：

2.2.1. 输出信号:Pt100 铂电阻值、4-20mA。

Output signal: Pt100 platinum resistance value, 4-20mA.

2.2.2. 工作条件:环境温度(-40~+55) ℃、相对湿度≤95%。

Working conditions: Environmental temperature (-40-+55) ℃ , relative humidity ≤95%.

2.2.3. 测量范围:常规(0~150)℃。其他范围可以定制。

Measurement range: Conventional (0-150) ℃.Other ranges can be customized.

2.2.4. 准确度:1.5 级。

Accuracy: Level 1.5.

2.2.5. 开关性能:四、六组可调开关，各组开关均能在全量程内任意设定。

Switching performance: Four or six sets of adjustable switches, each set of switches can be set arbitrarily within the full range.

2.2.6. 开关动作误差: ±4℃。

Switching action error：±4℃

2.2.7. 开关切换差: (6±2) ℃。

Switching action error: (6±2) ℃

2.2.8. 开关额定功率:AC220V 5A。

Rated power of switch: AC220V 5A.

2.2.9. 温包尺寸:(Φ14×150)mm、安装螺纹为(M27×2)mm。

Temperature bulb size:（Φ 14 × 150）mm, with an installation thread of (M27 × 2)mm.

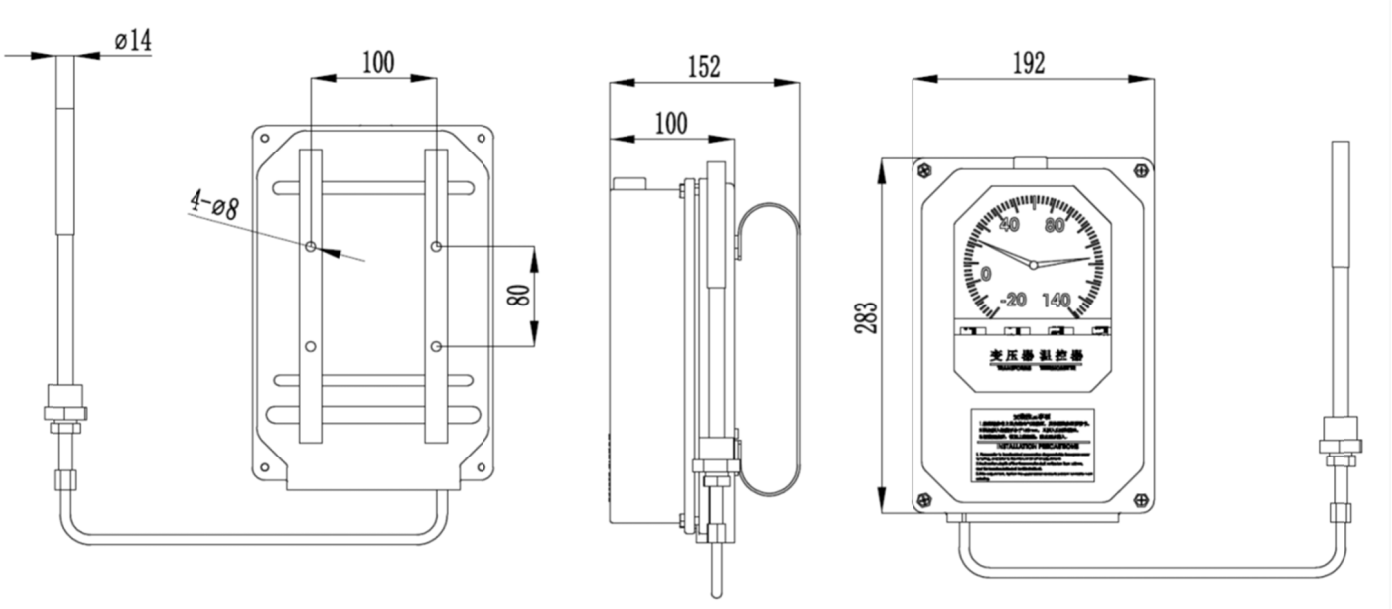
2.2.10.毛细管长度常规 6m.其他长度可以定制。

The regular length of the capillary tube is 6m. Other lengths can be customized.

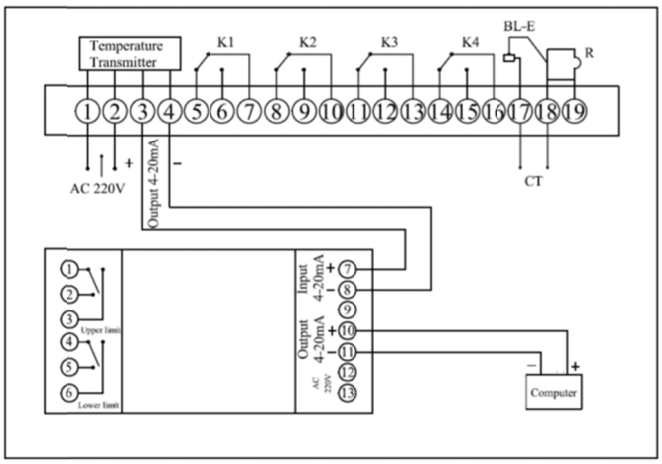
2.2.11. 防护等级：IP55。

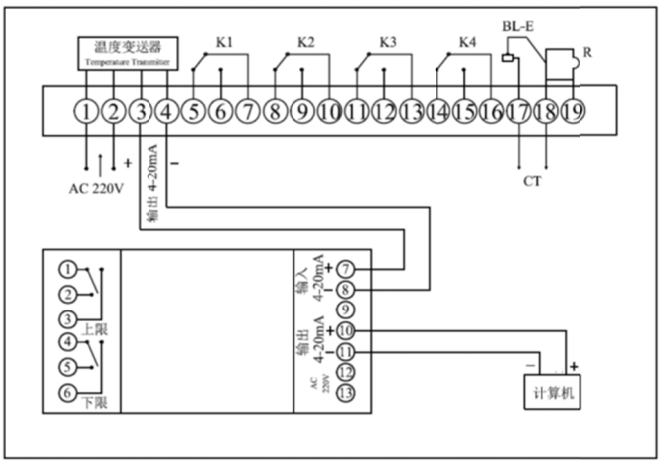
Protection level: IP55

2.3、外形及安装尺寸图(Shape and installation dimension drawing)

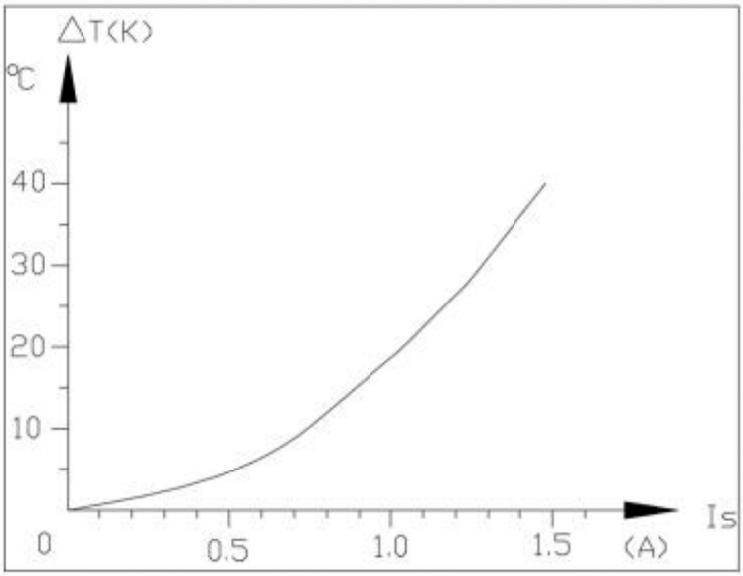


2.4、电气接线原理图及功能详解(Electrical wiring schematic diagram and detailed function explanation)





2.5、电热元件温升特性(Temperature rise characteristics of electric heating elements)



△T （℃）	Is（A）
10	0.74
12	0.80
14	0.86
16	0.92
18	0.98
20	1.04
22	1.09
24	1.14
26	1.19
28	1.24
30	1.28
32	1.32
34	1.36
36	1.40
38	1.44

三.变流器的选用 （Selection of inverters）

档位号 Gear number	变压器电流互感器二次额定电流Ip（A） Transformer current transformer - secondary rated current Ip (A)	输出电流 Is（A） Output current Is (A)	K	等效阻抗Ω Equivalent impedanceΩ
A	5≥Ip>3	（32~38）%×Ip	3	R≤0.56
		（24~32）%×Ip	4	
		（15~24）%×Ip	5	
		（10~15）%×Ip	6	
B	3≥Ip>2	（50~60）%×Ip	3	R≤1.35
		（40~50）%×Ip	4	
		（28~40）%×Ip	5	
		（17~28）%×Ip	6	
C	2≥Ip>1	（75~90）%×Ip	3	R≤2.5
		（60~75）%×Ip	4	
		（40~60）%×Ip	5	
		（25~40）%×Ip	6	
D	1≥Ip>0.61	（150~180）%×Ip	3	R≤12.0
		（120~150）%×Ip	4	
		（100~120）%×Ip	5	
		（50~100）%×Ip	6	