

Thermocouple common failures and analysis



Thermocouple common failures are mainly manifested as follows

a. The thermocouple compensation wire is connected backwards. This is mainly a problem in the infrastructure, responsible for the wiring of the personnel caused by a moment of carelessness, is a human factor. When the thermocouple compensation wire is reversed, the display on the operator control station is usually larger or smaller than the actual value (depending on the channel measurement circuit).

b. The thermocouple's compensation wire insulation is worn out, resulting in a grounded signal loop. This is mainly because the compensation wire is hard, and in the junction box and not placed flat, when dealing with the fault many times screwing the junction box cover touches the compensation wire and will be worn out. Such failures are reflected in the operator control station on the temperature value is generally small.

c. Terminal box terminals in poor contact. Because the compensation wire and thermocouple wire are relatively hard, so the site maintenance when tightening the wiring is more difficult, sometimes start to tighten the wire but after a while with the deformation of the wire and loose. Such failures are reflected in the operator control station on the temperature display value for no display or display value over the range.

d. Compensation resistance failure. Such failures are manifested as thermocouples connected to the temperature display value slowly rise or fall.

e. Boiler tail flue measurement thermocouple failure rate is high. Downtime maintenance will be removed from the thermocouple found that the head of the thermocouple, including the sheath tube by the flue gas scouring serious wear, the sheath tube made of wear-resistant steel material to avoid the potential for such failures.

f. Signal shielding system DCS cabinet grounding is poor. Such faults are very likely to cause the accumulation of charge on the signal line, causing signal drift or shaking. As the problem is difficult to identify the fault point, the usual method of handling is to untie the signal line, its discharge to ground processing.

g. The temperature input signal fails after the isolator, and the temperature value signal reflected on the operator control station is abnormal. After replacing the isolator, it is normal.

These are often encountered in the maintenance of the problem, but in finding these faults, it is recommended to use a multimeter in the DCS I/O terminal cabinet to measure the voltage value of the input, so that you can quickly determine whether the local measurement end of the problem or the DCS part of the problem, for multi-point input can also be compared with several other thermocouple signal. If you can not determine the line to measure the resistance value, usually the thermocouple resistance value of about 100Ω.

