



Over Temperature Protection and Thermistors

As a standard, HDD motors are equipped with overtemperature protection. The protection consists of three PTC thermistors in series, one for each phase. The PTC thermistors are manufactured according to norms DIN 44081 and DIN 44082. According to these norms, the resistance for a single thermistor at room temperature is in the range 20 Ohms – 250 Ohms. For three thermistors in series, the total room temperature resistance is typically between 150 Ohms – 300 Ohms (50 Ohms – 100 Ohms per thermistor) but can be as high as 750 Ohm without indicating malfunction.

The PTC thermistors have a switch temperature of 150 C. When $T < 145\text{ C}$, $R < 550\text{ Ohm}$ for each thermistor ($R < 1650\text{ Ohms}$ for the whole triplet), and when $T > 155\text{ C}$, $R > 1330\text{ Ohm}$ for each thermistor ($R < 4990\text{ Ohms}$ for the whole triplet). The resistance should be measured with a d.c. voltage no greater than 2.5V. More detailed information about the PTC resistors can be found [here](#).

As an option, HDD motors can be equipped with a temperature measurement device of type KTY84-130. Detailed information about this device can be found [here](#). The resistance of the KTY device depends continuously on temperature, as described in this document.