

## PERBANDINGAN KONFIGURASI 2 KAWAT DAN 3 KAWAT PADA PENGUKURAN SUHU DENGAN SENSOR PTC MENGGUNAKAN METODE JEMBATAN WHEATSTONE

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### INTISARI

Telah dilakukan penelitian Perbandingan konfigurasi 2 kawat dan 3 kawat pada pengukuran suhu dengan sensor PTC menggunakan jembatan *wheatstone*. Adapun tujuan dari penelitian ini adalah mengetahui karakteristik sensor PTC dan mengetahui kemampuan rangkaian jembatan *wheatstone* yang digagas dalam mengkarakterisasi sensor PTC serta mengetahui hasil perbandingan konfigurasi 2 kawat dan 3 kawat pada pengukuran suhu dengan sensor PTC.

Metode yang digunakan dengan Perbandingan konfigurasi 2 kawat dan 3 kawat pada pengukuran suhu dengan sensor PTC tipe PTGL05AS100K4B51B0 menggunakan jembatan *wheatstone* yang diuji dengan rentang suhu 30°C sampai dengan 150°C. Berdasarkan hasil penelitian, dapat dilihat adanya karakteristik dari sensor termistor PTC dan perbandingan antara rangkaian jembatan *wheatstone* 2 kawat dan 3 kawat yang telah dirancang, diantaranya sensitivitas untuk menentukan grafik hubungan suhu dengan tegangan kemudian resistansi untuk menentukan grafik hubungan suhu dengan resistansi, selanjutnya ketidakpastian untuk menentukan grafik hubungan suhu dengan ketidakpastian gabungan. Pencocokan data menggunakan fungsi polinomial orde tiga dan linieritas.

Kesimpulan yang didapat adalah karakteristik sensor PTC sama seperti karakteristik sensor pada umumnya yaitu terdapat *curie point* di suhu 130°C yang diuji dengan rangkaian jembatan *wheatstone* serta rangkaian jembatan *wheatstone* 3 kawat lebih sensitif dari 2 kawat serta ketidakpastiannya lebih kecil.

**Kata kunci :** jembatan *wheatstone*, sensor termistor PTC

**COMPARISON BETWEEN CONFIGURATION OF TWO-WIRE AND THREE-  
WIRE ON TEMPERATURE MEASUREMENT OF PTC SENSOR USING  
WHEATSTONE BRIDGE METHOD**

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**ABSTRACT**

*A research of configuration comparison between two-wire and three-wire on temperature measurement of PTC sensor using wheatstone bridge has been done. This research aimed to (1) know the characteristics of PTC sensor, (2) know the ability of wheatstone bridge series that was used to characterize the PTC sensor (3) find out the result of configuration comparison between two-wire and three-wire on temperature measurement used PTC sensor.*

*Method that was used is configuration comparison between two-wire and three-wire on temperature measurement of type PTGL05AS100K4B51B0 used wheatstone bridge was tested by temperature ranges from 30 °C to 150 °C. As results of the research, was seen the characteristic of thermistor PTC sensor and comparison between a series of the wheatstone bridge two wire connections and three-wire connections that has been designed, included sensitivity to determine a chart that was showed the relationship between temperature and voltage then, resistance to determine a chart that was showed the relationship between temperature to the resistance, the uncertainty to determine a chart relationship between uncertainty combination and temperature. Checked the data by using polynomial function three orde and linearity.*

*Conclusions obtained that PTC has same characteristic as usual sensors which had curie point in temperature 130 °C that was tested by a series of the wheatstone bridge, a series of the wheatstone bridge three-wire connections more sensitive and has a lower uncertainty values than two-wire connections.*

**Key words :** *The wheatstone bridge, thermistor PTC sensor.*