

## ABSTRAK

Panjaitan Geopani Lelati. 2024. Perancangan Sistem Kontrol *Blower* Otomatis Di *Engine Room* KN (Kapal Negara) Jadayat Dengan Rangkaian *Direct On Line* (Dol) Berbasis Mikrokontroler. Skripsi. Tanjungpinang: Jurusan Teknik Elektro. Fakultas Teknik dan Teknologi Kemaritiman. Universitas Maritim Raja Ali Haji. Pembimbing I: Dr. Rozeff Pramana S.T., M.T., Pembimbing II: Ir. Anton Hekso Yuniarto S.T., M.Si

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*Blower* yang terdapat di dalam *engine room* biasanya diatur secara manual. Namun pengaturan manual dapat menjadi kurang efisien karena memerlukan penyesuaian secara manual untuk mematikan, dan menghidupkan kembali *blower*. Sehingga penelitian ini bertujuan merancang sistem kontrol *blower* otomatis di *engine room* kapal dengan menggunakan rangkaian *Direct On Line* (DOL) berbasis mikrokontroler. Sensor *temperature* DS18B20 digunakan untuk mendeteksi *temperature* di *engine room*, sedangkan mikrokontroler Arduino Nano digunakan untuk mengatur operasi *blower* berdasarkan nilai *temperature* yang terdeteksi. *Blower* 1 dan *blower* 2 aktif jika  $temperature \leq 39^{\circ}C$ , dalam mode *forward/reverse*. *Blower* 1 non-aktif saat  $temperature > 39^{\circ}C$ , namun *blower* 2 tetap aktif hingga  $temperature < 29^{\circ}C$ . Saat  $temperature \geq 29^{\circ}C - \leq 38^{\circ}C$ , *blower* 2 tetap beroperasi. Hasil pengujian dengan kondisi kapal bersandar menunjukkan bahwa *temperature* di *engine room* fluktuatif dalam rentang tertentu. *temperature* mencapai nilai tertinggi dalam rentang waktu 14:15:03 yaitu  $39,94^{\circ}C$ , yang mengaktifkan kedua *blower* untuk mensirkulasi udara kedalam *engine room*. Meskipun *temperature* awalnya cukup tinggi, *blower* berhasil menurunkan *temperature* menjadi  $28,94^{\circ}C$  dalam waktu 2 jam. Dengan penggunaan *blower* yang dioptimalkan berdasarkan nilai *temperature* yang terdeteksi, diharapkan sistem ini dapat mengurangi konsumsi energi, kemudahan dalam beroperasi, peningkatan keselamatan terutama mengurangi resiko kecelakaan kapal yang disebabkan oleh *temperature* yang tidak terkendali di *engine room*, dan perpanjangan masa pakai mesin dan mesin pompa lainnya.

**Kata Kunci** : Mikrokontroler, *Blower*, *Engine room*, Sensor DS18B20, *Suhu*

**ABSTRACT**

Panjaitan Geopani Lelati. 2024. *Design Of Automatic Blower Control System In Engine Room Of KN (Kapal Negara) Jadayat With Microcontroller-Based Direct On Line (Dol) Circuit*. Thesis. Tanjungpinang: Department of Electrical Engineering. Faculty of Engineering and Maritime Technology. Raja Ali Haji Maritime University. Advisor I : Dr. Rozeff Pramana S.T., M.T., Advisor II : Ir. Anton Hekso Yudianto S.T., M.Si

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*The blowers in the engine room are usually manually controlled. However, manual control can be inefficient because it requires manual adjustment to turn off and turn on the blowers. Therefore, this study aims to design an automatic blower control system in the ship's engine room using a microcontroller-based Direct On Line (DOL) circuit. The DS18B20 temperature sensor is used to detect the temperature in the engine room, while the Arduino Nano microcontroller is used to control the operation of the blowers based on the detected temperature value. Blower 1 and blower 2 are active if the temperature is  $\leq 39^{\circ}\text{C}$ , in forward/reverse mode. Blower 1 is inactive when the temperature  $> 39^{\circ}\text{C}$ , but blower 2 remains active until the temperature  $< 29^{\circ}\text{C}$ . When the temperature is  $\geq 29^{\circ}\text{C} - \leq 38^{\circ}\text{C}$ , blower 2 continues to operate. The test results show that the temperature in the engine room fluctuates within a certain range. The temperature reached its highest value at 14:15:03, which was  $39.94^{\circ}\text{C}$ , activating both blowers to circulate air into the engine room. Although the initial temperature was quite high, the blowers managed to lower the temperature to  $28.94^{\circ}\text{C}$  within 2 hours. With the use of blowers optimized based on the detected temperature value, it is expected that this system can reduce energy consumption, ease of operation, improve safety, especially reduce the risk of ship accidents caused by uncontrolled temperature in the engine room, and extend the life of machinery and other equipment.*

**Keyword :** *Microcontroller, Blower, Engine room, DS18B20 sensor, Temperature.*