AUTOMATED TEMPERATURE REGULATED SOUND SYSTEM USING PROGRAMMABLE INTELLIGENT COMPUTER (PIC)

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Automated temperature regulated sauna system using programmable intelligent computer (PIC) / Shalani Vadivelu.

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AUTOMATED TEMPERATURE REGULATED SAUNA SYSTEM USING PROGRAMMABLE INTELLIGENT COMPUTER (PIC)

By
SHALANI A/P VADIVELU

A thesis submitted in partil fulfilment of
the requirement for the award of the degree of
Bachelor of Applied Science (Physics, Electronics and Instrumentation)

FACULTY OF SCIENCE AND TECHNOLOGY
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk **AUTOMATED TEMPERATURE REGULATED SAUNA SYSTEM USING PROGRAMMABLE INTELLIGENT COMPUTER (PIC)** oleh **SHALANI A/P VADIVELU**, no. matrik: **UK 15497** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Fizik sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Gunaan (Fizik Elektronik & Instrumentasi), Fakulti Sains dan Teknologi, UMT.

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DECLARATION

I hereby declare that this thesis entitled **Automated Temperature Regulated Sauna System using Programmable Intelligent Computer (PIC)** is the result of my own research except as cited in the references.

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AUTOMATED TEMPERATURE REGULATED SAUNA SYSTEM USING PROGRAMMABLE INTELLIGENT COMPUTER (PIC)

ABSTRACT

Sauna is usually a small room or facility designed to relax its occupants through sweating and nowadays it is even used for social gathering or unique pastime. However saunas nowadays are operated manually by producing heat through water boiler or pouring water rocks inside the sauna room itself. This automated temperature regulated sauna system uses PIC 16F877A, temperature sensors (LM 35), water valve, motors, heater with modified circuit and some other component to develop four subsystems which are room temperature control system, automated water boiling and refilling system, time duration countdown system and water surface steam temperature control system. The steam for the sauna room is produced by water boiler that refills and boils automatically and the whole system is controlled by PIC without any monitoring. Besides that, the temperature in the sauna room is controlled in more than one direction to give an equally distributed heat in the room. In this project, system operation are written in C language before compiled using PCWH C-Compiler and downloaded into PIC in order to fulfil its objectives. Then the system is developed by soldering the circuits and interfacing hardware with programming. Later on, the circuits are assembled into a complete model that is packaged as a sauna room on top of a water boiler with modified circuit heater. This system provides an equally maintained temperature control system, requires less manpower, produces heat through slow and constant rate of steam, easy to handle and saves power with its two type of modes which are standby mode and active mode.

PENGAWALAN PENGALIRAN SUHU SECARA AUTOMATIK BAGI SISTEM SAUNA DENGAN KOMPUTER BESTARI BOLEH ATURCARA (PIC)

ABSTRAK

Pada kebiasaannya, sauna adalah bilik kecil atau fasiliti yang direka untuk menenangkan penggunanya melalui kaedah berpeluh dan kini ia juga digunakan untuk perjumpaan sosial dan meluangkan masa dengan unik. Bagaimanapun, sauna pada masa kini adalah dioperasikan secara manual di mana haba dihasilkan dengan menempatkan pemanas air atau menuangkan air ke atas batu panas di dalam bilik sauna itu sendiri. Projek pengawalan pengaliran suhu secara automatik bagi sistem sauna ini menggunakan mikropengawal, PIC 16F877A, penderia suhu (LM 35), injap air, motor, pemanas air dengan litar yang diubahsuai dan beberapa komponen yang lain untuk membina empat subsistem iaitu sistem pengawalan suhu bilik, sistem pemanasan dan pengisian air secara automatic, sistem pembilang masa operasi dan pengawalan suhu wap di atas permukaan air. Wap untuk dialirkan ke bilik sauna adalah dihasilkan oleh pemanas air yang mengisi dan memanas air secara automatik, di mana seluruh sistem ini dikawal oleh mkropengawal PIC tanpa sebarang pengawasan. Selain itu, suhu di dalam bilik sauna dikawal daripada lebih dari satu arah supaya dapat memberi pengaliran haba yang sekata di dalam bilik tersebut. Dalam projek ini, operasi sistem ditulis dalam bahasa C sebelum dikumpul atau disusun dengan menggunakan penyusun C PCWH dan dimuat turun ke dalam mikropengawal untuk memenuhi keperluan objektifnya. Kemudian, sistem dibina dengan mematerí litar dan hubung kaitkan alat-alat dengan perisian komputer.Seterusnya, semua litar yang dibina dikumpulkan ke dalam satu model lengkap yang dibungkuskan menjadi satu bilik sauna di atas pemanas air yang telah diubahsuai litarnya. Sistem ini secara keseluruhannya member sistem pengawalan suhu yang sekata, memerlukan tenaga kerja yang kurang, menghasilkan haba dengan kadar wap yang perlahan dan konsisten, senang dioperasi dan menjimatkan tenaga dengan adanya dua mod operasi iaitu mod bersedia dan mod aktif.