

DESIGNING OF CPAP VENTILATOR WITH AUTOMATED NEBULISER DISPENSER SYSTEM FOR ASTHMA PATIENTS

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Abstract- Ventilators are used for patients that cannot breathe on their own or when someone suffers from a severe respiratory disease. Life support ventilators can be used 24 hours per day when a patient suffers from a neuromuscular disease or has experienced a severe traumatic accident that has left them unable to breathe on their own. Sometimes patients are also placed on ventilators for short term use in acute settings such as hospitals when they are severely sick. ventilators are also used non-invasively when patients have severe COPD. For this situation, it is only used during the night similarly to the CPAP and BiPAP. Still it forms difficult to treat the patients who are suffering from breathing trouble disease like asthma. They need to take nebulizer in frequent interval of time and hence we have designed a system which will automatically feed the nebulizer when the patient in the ventilator is suffering from the breathing trouble.

1.INTRODUCTION

CPAPs are most commonly used for obstructive sleep apnea treatment. Pressurized air is forced down the airway to keep the airway open and free from obstruction. This prevents sleep apnea from occurring. It always breathes.

Continuous positive airway pressure therapy (CPAP) uses a machine to help a person who has obstructive sleep apnea (OSA) breathe more easily during sleep.

PCB Design products include an auto router and basic mixed mode SPICE simulation capabilities.

SCHEMATIC CAPTURE- Schematic capture in the Proteus Design Suite is used for both the simulation of designs and as the design phase of a PCB layout project

PORTABLE HIGH-FREQUENCY VENTILATOR-

The efficiency of CO₂ washout using the proposed ventilator has been demonstrated in animal trials.

Intermittent positive pressure ventilation (IPPV) in a neonates with respiratory failure saves lives, its use is associated with lung injury and chronic lung disease, Randomization and commencement of the treatment needed to be as soon as possible after the start of CV and usually in the first 12 hours of life VENTILATOR The aerosolization device most frequently used during mechanical ventilation. Continuous nebulization can influence the delivered tidal volume and lead to significant medication loss during expiration

HARDWARE DESCRIPTION : POWER SUPPLY- A regulated power supply is an

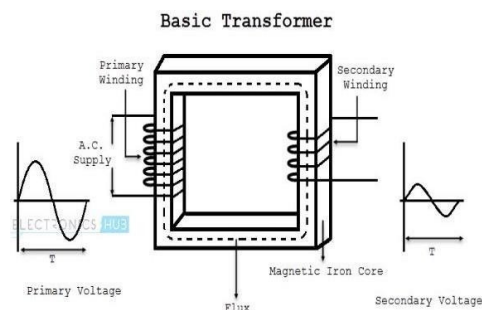


VENTILATOR

Current) into a constant DC. The output from the regulated power supply may be alternating or unidirectional, G05F1/70 regulating power factor; regulating reactive current or power

TRANSFORMER- The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level r. Transformer has 240V primary windings and centre tapped secondary winding. The transformer has flying colored insulated connecting leads (Approx 100 mm long). The Transformer act as step down transformer reducing AC - 240V to AC - 12V

PRODUCT DESCRIPYION- A step down transformer in which the secondary winding is more than primary winding. Due to this windings it can able to step down the voltage. A Transformer changes electricity from high to low voltage or low to high voltage using two properties of electricity.



Step Down Transformer

FEATURES- Output current:1A , Supply voltage: 220-230VAC, Output voltage: 12VAC, Soft Iron Core, 1Amp Current Drain

BRIDGE RECTIFIER- The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners. One advantage of a bridge rectifier over a conventional fullwave rectifier is that with a given transformer the bridge rectifier produces a voltage output that is nearly twice that of the conventional full- wave circuit

VOLTAGE REGULATOR- Regulator IC units contain the circuitry for reference source, comparator amplifier, and overload protection all in a single IC

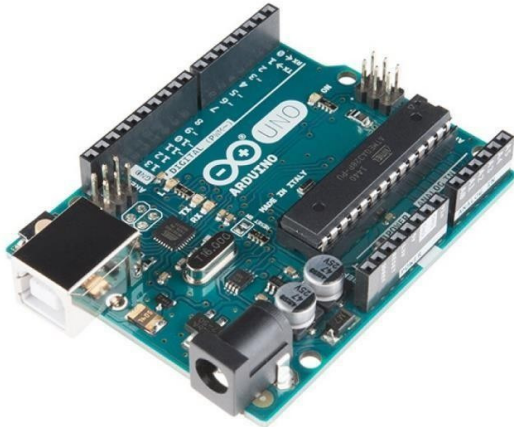


VOLTAGE REGULATOR

The regulators can be selected for operation with load currents from hundreds of milli amperes to tens of amperes, corresponding to power ratings from milli watts to tens of watts. The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts

MICROCONTROLLER UNIT- Arduino is an open- source project that created microcontroller based kits for building digital devices and interactive objects that can sense and control physical devices programming the microcontrollers, the Arduino project provides an integrated development environment (IDE) which also supports the languages C and C++, It has 14 digital input/output pins (which 6 can be used as PWM outputs), 6

Analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button



ARDUINO UNO

FEATURES- Microcontroller: ATmega328P, Operating voltage: 5V , Input voltage: 7-12V, Flash memory: 32KB, SRAM: 2KB, EEPROM: 1KB Real time biometrics, Robotic applications, Academic applications

LIQUID CRYSTAL DISPLAY- LCD stands for liquid crystal display. They come in many sizes 8x1 , 8x2, 10x2 , 16x1 , 16x2 , 16x4 , 20x2 , 20x4 ,24x2 , 30x2 , 32x2 , 40x2

This is an LCD Display designed for E-blocks. It is a 16 character, 2- line alphanumeric LCD display connected to a single 9-way D-type connector. This allows the device to be connected to most E-Block I/O ports. The LCD display requires data in a serial format, which is detailed in the user guide below. The display also requires a 5V power supply. Please take care not to exceed 5V, as this will cause damage to the device. The 5V is best generated from the E-blocks Multi programmer or a 5V fixed regulated power supply

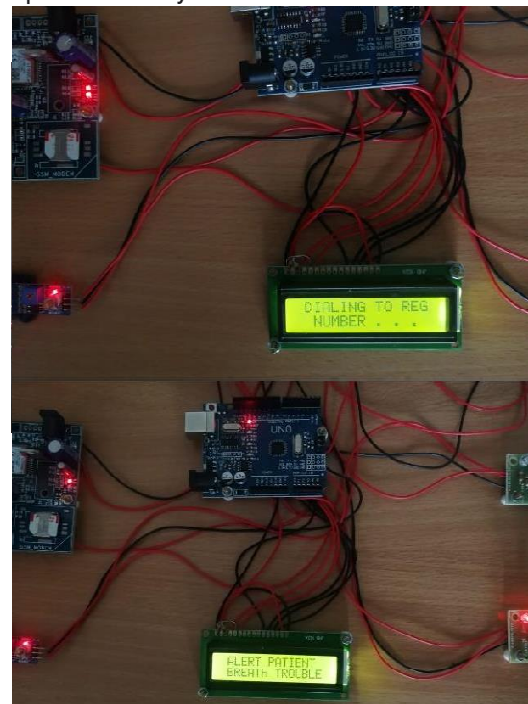


16X2 LCD DISPLAY

FEATURES- Input voltage: 5v, E-blocks compatible, Low cost, Compatible with most I/O ports in the E-Block range, Ease to develop programming code using Flow code icons

APPLICATIONS- Data Monitoring Purposes

OUTPUT AND RESULTS- CPAP differs from bilevel positive airway pressure (BiPAP) where the pressure ... failure in which it augments the cardiac *output* and improves V/Q matching. where the air flow is introduced into the airways to maintain a continuous pressure to constantly stent the airways open, in people who are breathing spontaneously.



trouble is monitored consistently In order to have prevention measures for short sustained breathing trouble, the automatic nebulizer dispenser is activated and breathing trouble is cured instantly rather than developing critical issues from early diagnosis , when the patient fall critical and even after the nebulizer dispensing, the breath trouble is not controlled case, the short SMS is sent to the doctor and also the call notification is sent to have immediate attending the patient

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