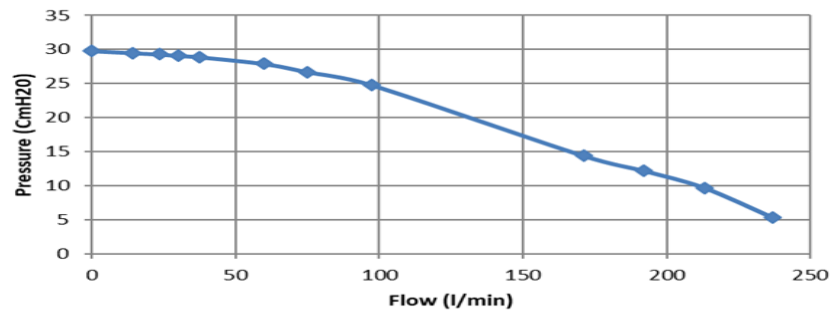
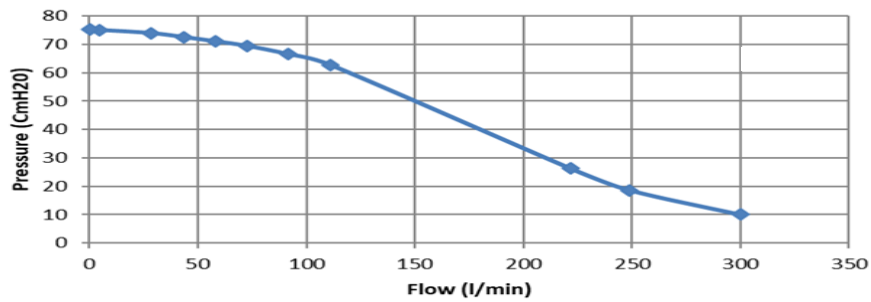


12 V



16 V



24 V

Figure S11: Pressure-flow (P-V) of the designed centrifugal fan

For 24 V, the P-V, Blower performance exceeded by far the requirements for CPAP application: it can provide more than 50 cmH<sub>2</sub>O for flow up to 145 l/min. Reducing power supply to 16 V; the pressure generated by the blower was higher than 24 cmH<sub>2</sub>O for air flow up to 100 l/min. With a power supply of 12 V, the fan can provide up to 14 cmH<sub>2</sub>O with a flow of 105 l/min which should be enough for most clinical applications of CPAP,

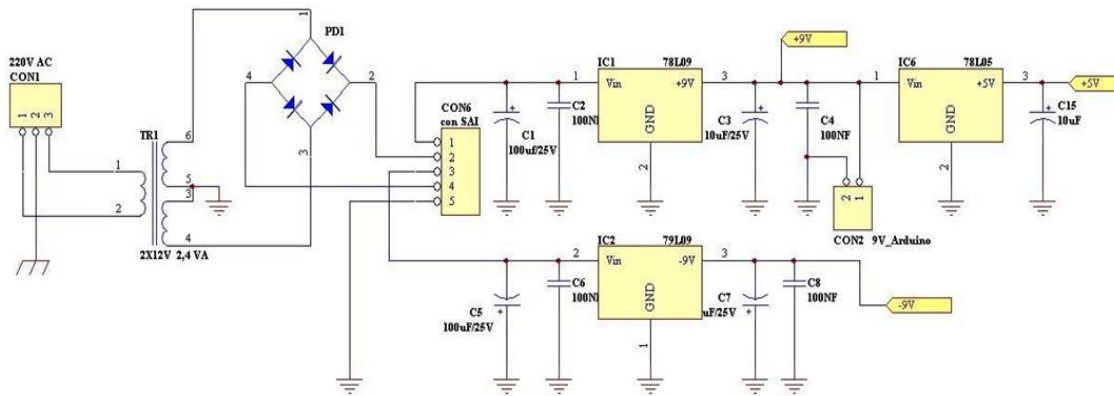


Figure SI2: Circuit of the power supply

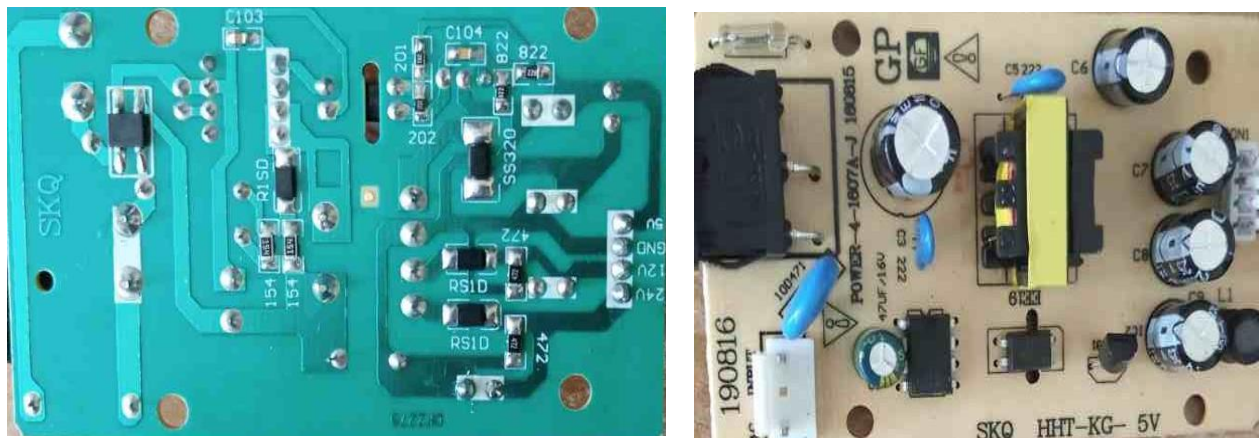


Figure SI3: Circuit of the power supply

Components Used:

Designator	Value	Description
R6	1K2	Resistor 1/4W 1%
R3	1K2	Resistor 1/4W 1%
R2	1K2	Resistor 1/4W 1%
R1	1Mega	Resistor 1/2W 1%
D1	1N4007	Rectifier diode 1
D2	1N4007	Rectifier diode 1
D3	1N4007	Rectifier diode 1
T1	2N2222	NPN Transistor
C4	100µF/25V	Radial electrolytic capacitor
C5	100µF/25V	Radial electrolytic capacitor
C2	100µF/25	Radial electrolytic capacitor





Figure SI5: PCB Circuit of the Proportional-Integral (PI) controller

### Components Used:

Designator	Value	Description
R6	1K2	Resistor 1/4W 1%
R3	1K2	Resistor 1/4W 1%
R2	1K2	Resistor 1/4W 1%
R1	1Mega	Resistor 1/2W 1%
D1	1N4007	Rectifier diode 1 <sup>a</sup>
D2	1N4007	Rectifier diode 1 <sup>a</sup>
D3	1N4007	Rectifier diode 1 <sup>a</sup>
T1	2N2222	NPN Transistor
DZ1	4,7V/1W	Zener Diode
C4	100uF/25V	Radial electrolytic capacitor
C5	100uF/25V	Radial electrolytic capacitor
C2	100uf/25	Radial electrolytic capacitor
C1	680NF/400V	Axial polypropylene capacitor
C3	1000uf/25	radial electrolytic capacitor
R5	220 Ohm	Resistor 1W 1%
R4	560 Ohm	Resistor 1/2W 1%
CON2	Batt12V	2 Pin PCB Terminal Block
CON1	CON 220VAC PANEL	Connector 220V pcb panel
D4	Diodo 5A	Rectifier diode 5 <sup>a</sup>
CON3	FA 12V/5A	2 Pin PCB Terminal Block
IC1	H11L2	Optocoupler
DL1	LED Rojo	LED 5mm

DL2	LED Verde	LED 5mm
RL1	RELAY 55.14.09.012	Relay Finder
IC2	TMR3-1222E	DC/DC converter
con6	con 220v out	3-pin connector 2,54
F1	fuse220v/2A	5x20 fuse holder PCB bayonet closure
CON4	To PCB PI controller	5-pin connector 2,54
CON5	To Power blower PCB	2 Pin PCB Terminal Block