

# PNEUMVENT

This Document Contains the Schematics for the custom Printed Circuit Board (PCB) upon which PNEUMVENT is built on

Please Reference the Block Diagrams for a better understanding of the schematic

Please Reference the Annotated PCB to understand the component placement and locations as this document only shows the electrical schematic and not the circuit board.

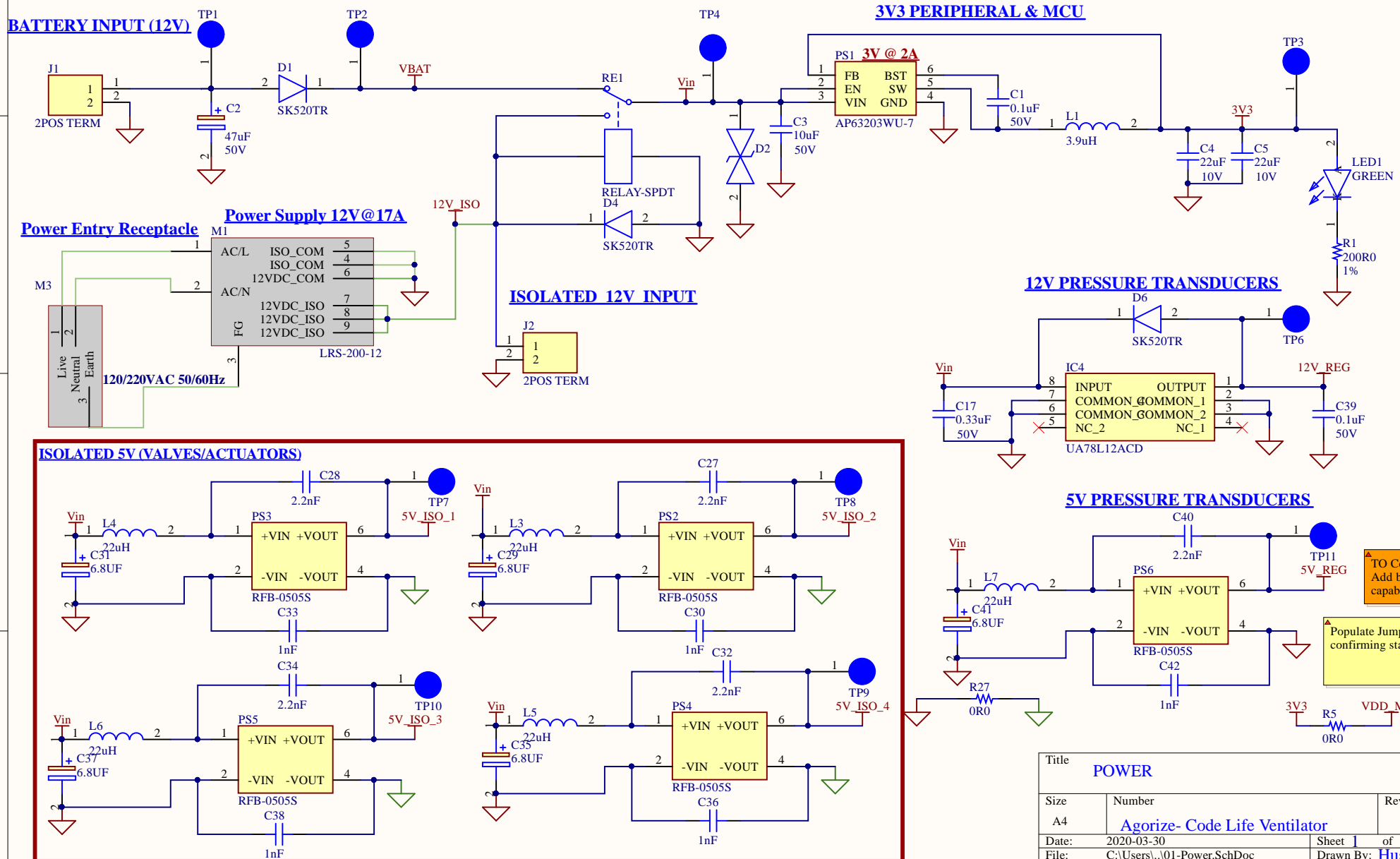
The circuit board is also ready as it has been routed and verified.

This Schematic is created to meet all the guidelines and design specifications for the Code of Life challenge for building a ventilator to help serve the people affected by the COVID-19 crisis

Thanks.  
Hussam Eid  
info@hussameid.com

Title <b>COVER</b>		
Size A4	Number <b>Agorize- Code Life Ventilator</b>	Revision <b>A</b>
Date:	2020-03-30	Sheet <b>0</b> of <b>7</b>
File:	C:\Users\...\00-INTRO.SchDoc	Drawn By: <b>Hussam Eid</b>

# POWER MANAGMENT (BATTERY AND WALL SOCKET)

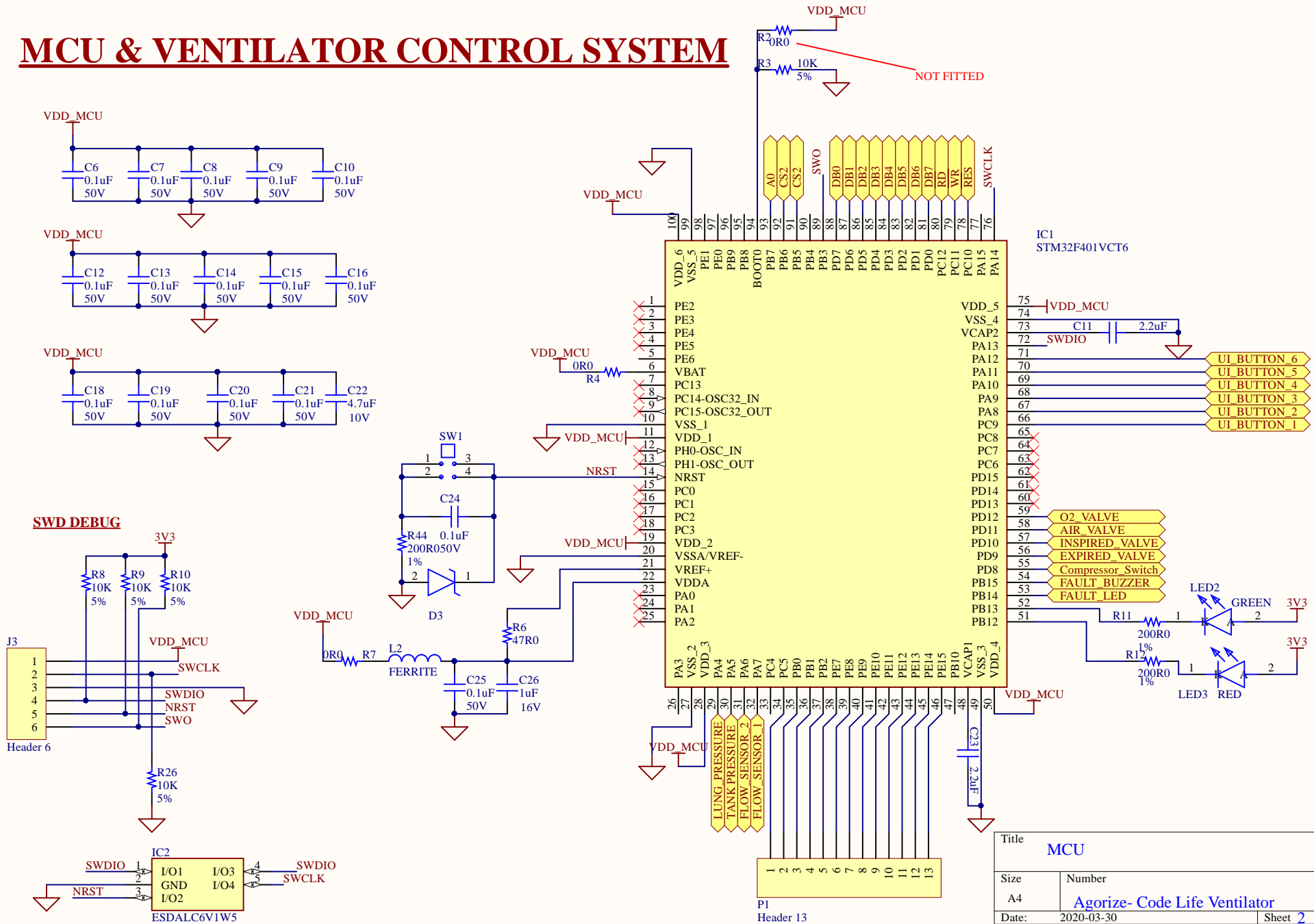


TO Consider:  
Add battery charging capabilities

Populate Jumper after confirming stable 3.3V

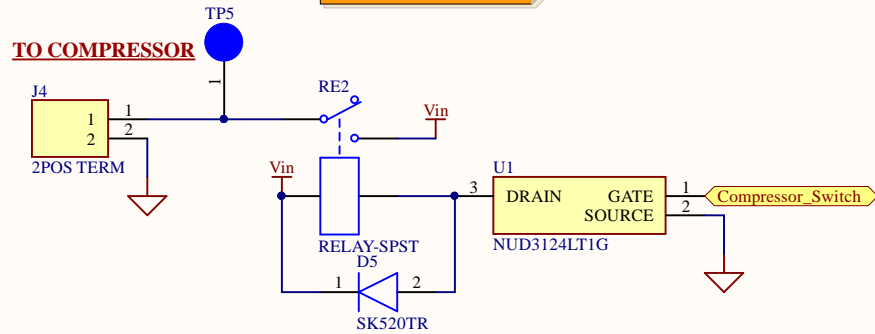
Title		
POWER		
Size	Number	Revision
A4	Agorize- Code Life Ventilator	A
Date:	2020-03-30	Sheet 1 of 7
File:	C:\Users\...\01-Power.SchDoc	Drawn By: Hussam Eid

# MCU & VENTILATOR CONTROL SYSTEM

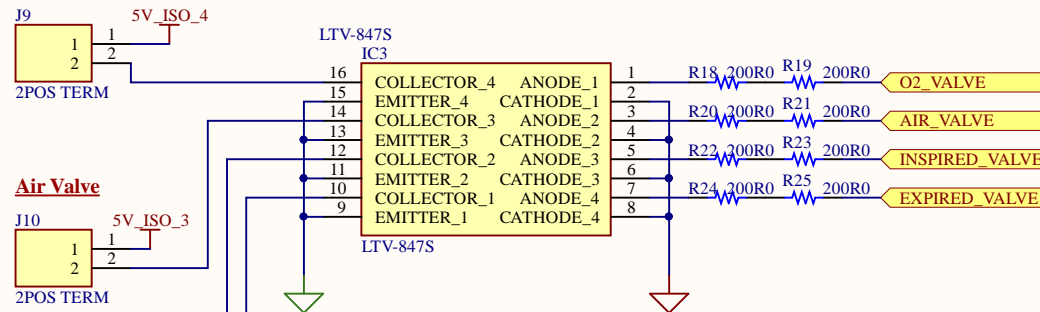


# ACTUATORS / AIR VALVE CONTROL

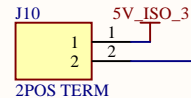
Consider controlling the compressor using a MOSFET for PWM functionality



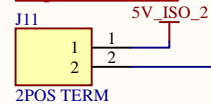
## O2 Valve



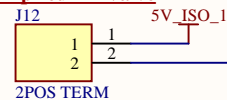
## Air Valve



## Inspired Air Valve



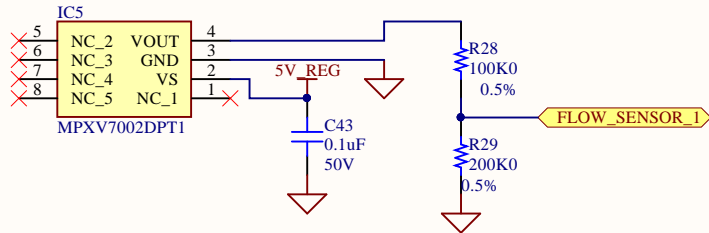
## Expired Air Valve



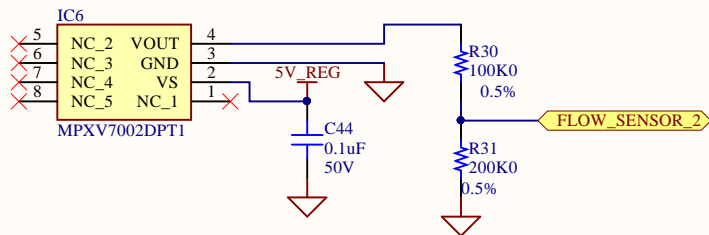
Title		
ACTUATOR		
Size	Number	Revision
A4	Agorize- Code Life Ventilator	A
Date:	2020-03-30	Sheet 3 of 7
File:	C:\Users\...\03-Actuators.SchDoc	Drawn By: Hussam Eid

# SENSORS, FEEDBACK & SIGNAL CONDITIONING

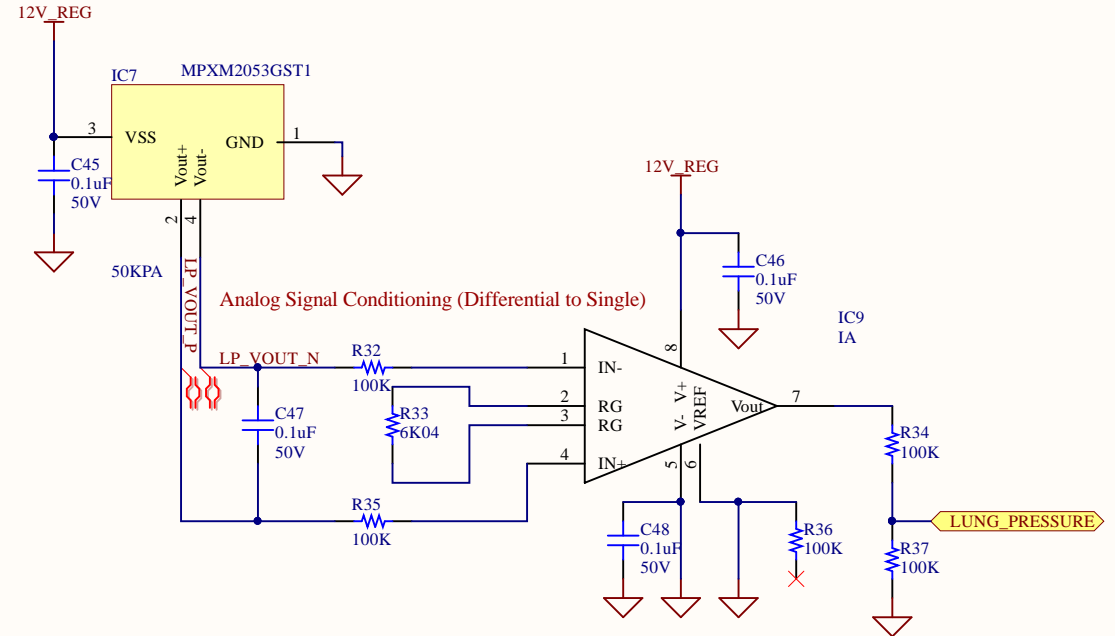
**Differential Flow Sensor 2**



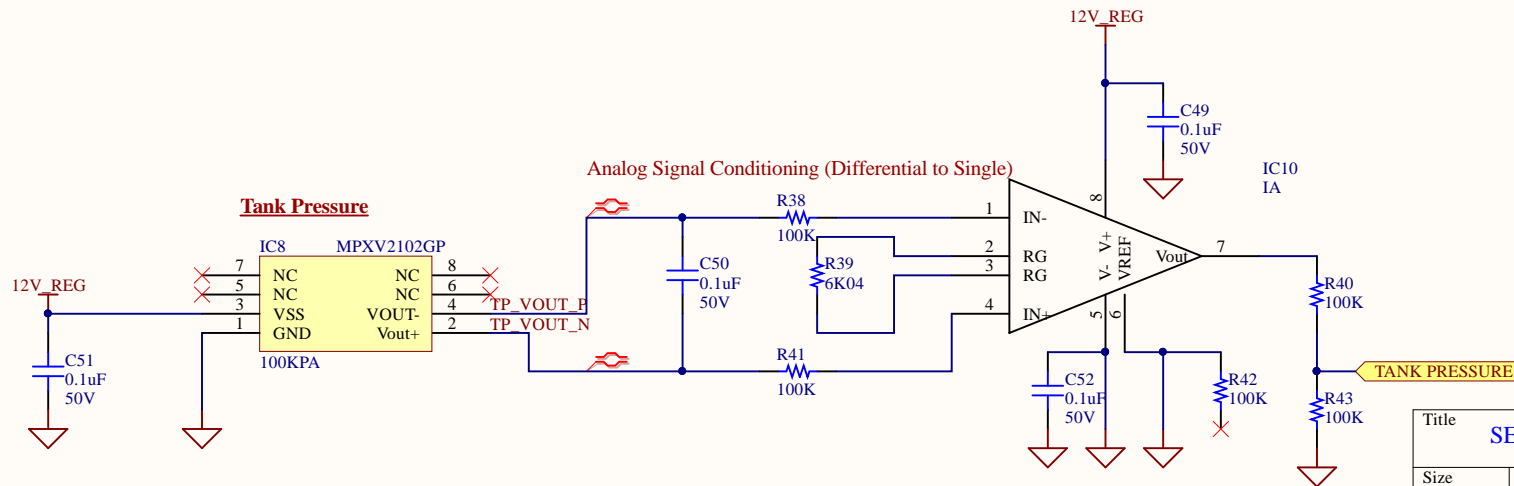
**Differential Flow Sensor 1**



**Lung Pressure**

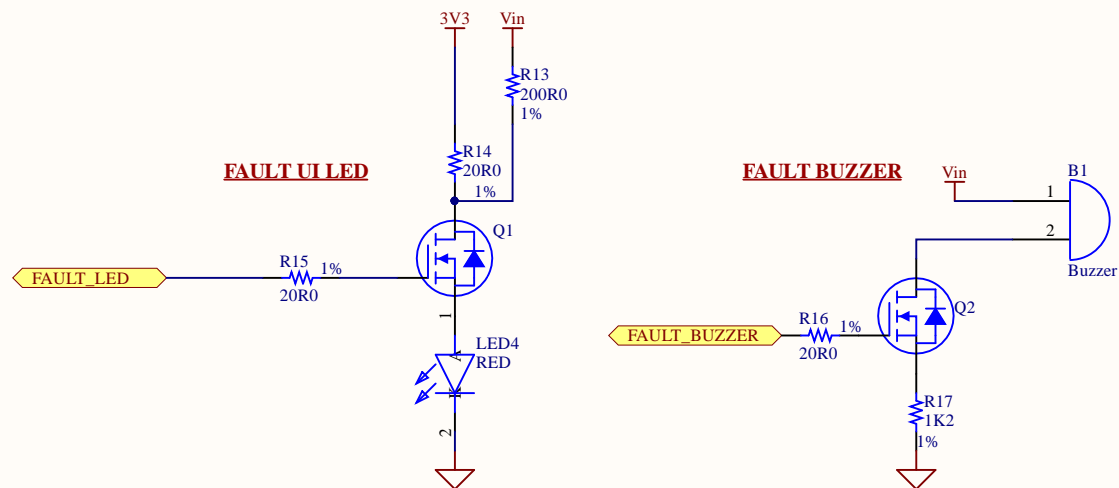


**Tank Pressure**



Title		
SENSORS, FEEDBACK & SIGNAL CONDITIONING		
Size	Number	Revision
A4	Agorize- Code Life Ventilator	A
Date:	2020-03-30	Sheet 4 of 7
File:	C:\Users\...04-Sensors.SchDoc	Drawn By: Hussam Eid

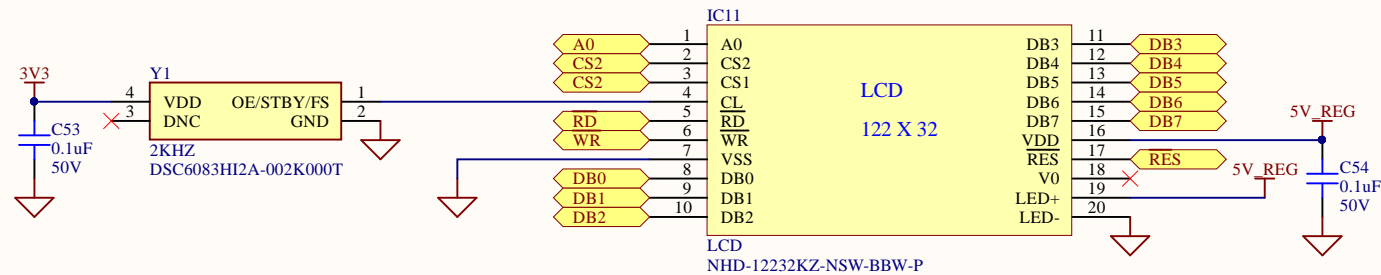
# ERROR & FAULT ALARM INDICATORS



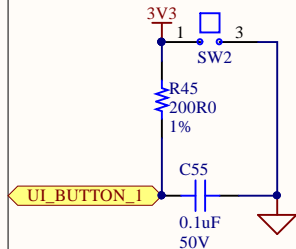
Title			ERROR & FAULT ALARM INDICATORS
Size	Number	Revision	
A4	Agorize- Code Life Ventilator	A	
Date:	2020-03-30	Sheet 5	of 7
File:	C:\Users\...\05-Alarm.SchDoc	Drawn By:	Hussam Eid

# Human-Machine Interface (HMI)

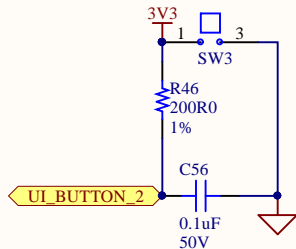
## LCD DISPLAY



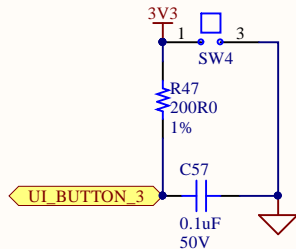
## UI BUTTON 1



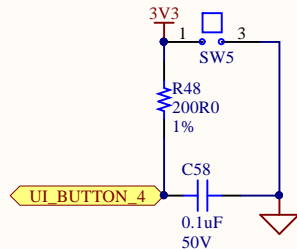
## UI BUTTON 2



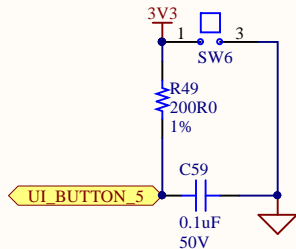
## UI BUTTON 3



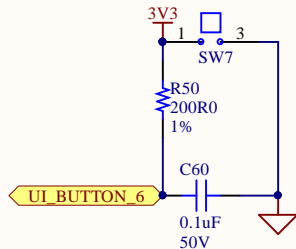
## UI BUTTON 4



## UI BUTTON 5



## UI BUTTON 6



Title		
Human-Machine Interface (HMI)		
Size	Number	Revision
A4	Agorize- Code Life Ventilator	A
Date:	2020-03-30	Sheet 6 of 7
File:	C:\Users\...\06-User Interface.SchDoc	Drawn By: Hussam Eid

# MECHANICAL COMPONENTS AND ACCESSORIES

## ELECTROMECHANICAL VALVES



M5  
2/2 Electrovalves Plate



M6  
2/2 Electrovalves Plate



M11  
2/2 Air solenoid valve



M12  
2/2 Air solenoid valve



M17  
3/2 Electrovalves Plate



M18  
3/2 Electrovalves Plate



M23  
3/2 Air solenoid valve



M24  
3/2 Air solenoid valve

## POWER COMPONENTS



M2  
Compressor



M4  
15 AWG WIRE



M33  
12V 75Ah Battery



M31  
20 POS FEMALE Receptacle Connector



M32  
POWER CORD 18AWG NORTH AMERICAN

## ELECTROMECHANICAL VALVE ACCESSORIES



M7  
Reduction Fitting



M8  
Reduction Fitting



M9  
Reduction Fitting



M10  
Reduction Fitting



M13  
Push-in fitting



M15  
Push-in fitting



M14  
Push-in fitting



M16  
Push-in fitting



M19  
Push-in fitting



M21  
Push-in fitting



M20  
Push-in fitting



M22  
Push-in fitting



M25  
Plug socket with cable



M26  
Plug socket with cable



M27  
Plug socket with cable



M28  
Plug socket with cable



M29  
Push-in Y-connector



M35  
PTC 1/4"



M30  
Tubing 4mm

## BREATHING ACCESSORIES



M34  
Spirometer Kit

## ENCLOSURE



M36  
Hinged Enclosure



M37  
Screws

Title <b>MECHANICAL COMPONENTS AND ACCESSORIES</b>			
Size A4	Number <b>Agorize- Code Life Ventilator</b>		Revision <b>A</b>
Date:	2020-03-30	Sheet <b>7</b> of <b>7</b>	
File:	C:\Users\...\07-Mechanicals.SchDoc	Drawn By:	<b>Hussam Eid</b>