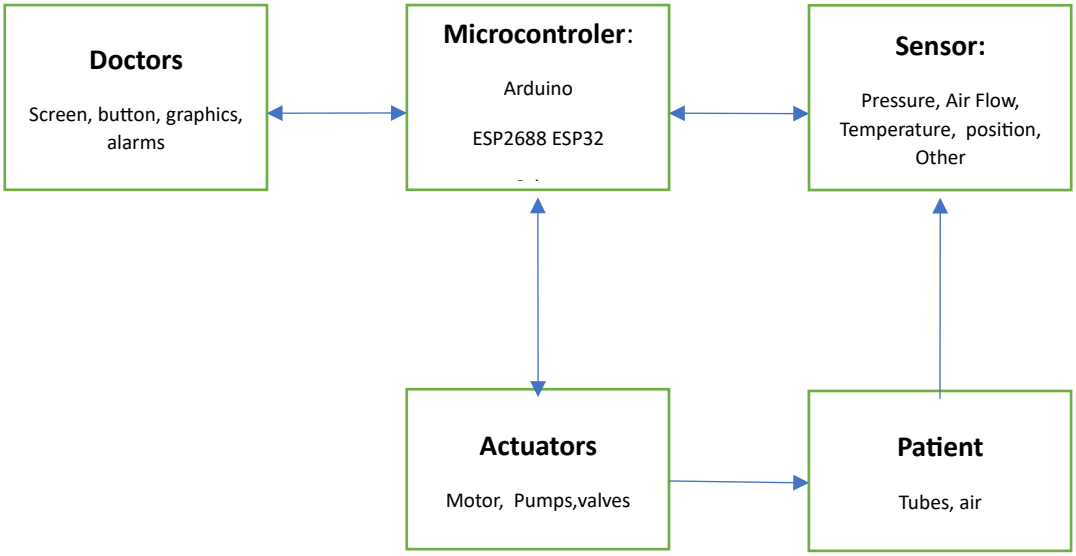
Pressure Measure

This document studies the use of barometric sensors in pandemic ventilators.

The objective of the pandemic ventilator is to provide the **patient** with air in adequate conditions (pressure, temperature, flow, O2 concentration, etc.) For this there are some **actuators** (pumps, blowers, valves, motors). The actuators are controlled by a **microcontroller** (arduino, ESP32 or other), using the information provided by the **sensors** (pressure, temperature, flow, others). **Doctors** adjust respirator parameters and receive information on the patient's situation.

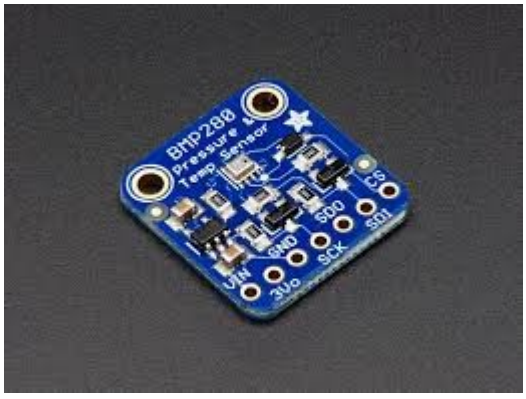


This document will only cover pressure sensors and their integration into the system.

Barometric micro electric Mechanci sensors(B-MEMS) measure atmospheric pressure

B-MEMS are widely used in smartphones, drones, etc. They are made by millions and cost between € 1 and € 5 and are 2-5mm in size.There are several dozen different Barometric MEMS whose specifications make them suitable for use in Pandemic Ventilators.

The most widely used is the Bosh BMP280. You can buy the sensor for less than €2 from electronic component distributors, or integrated into small PCBs on maker´s Shops.

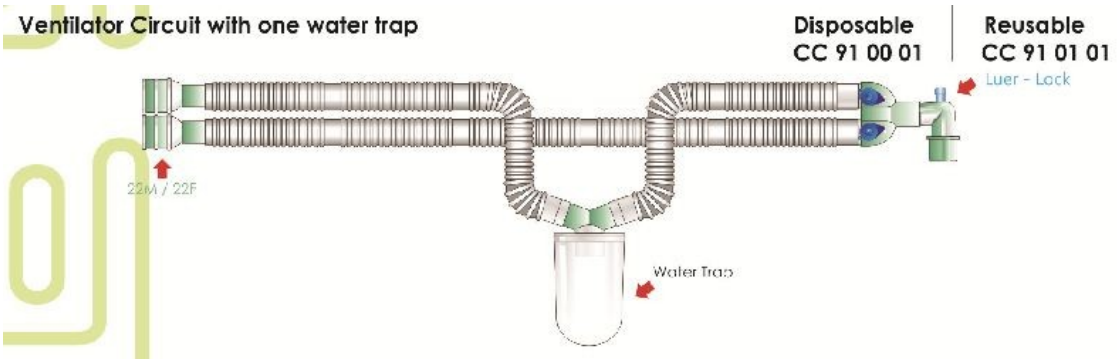


1)Communication

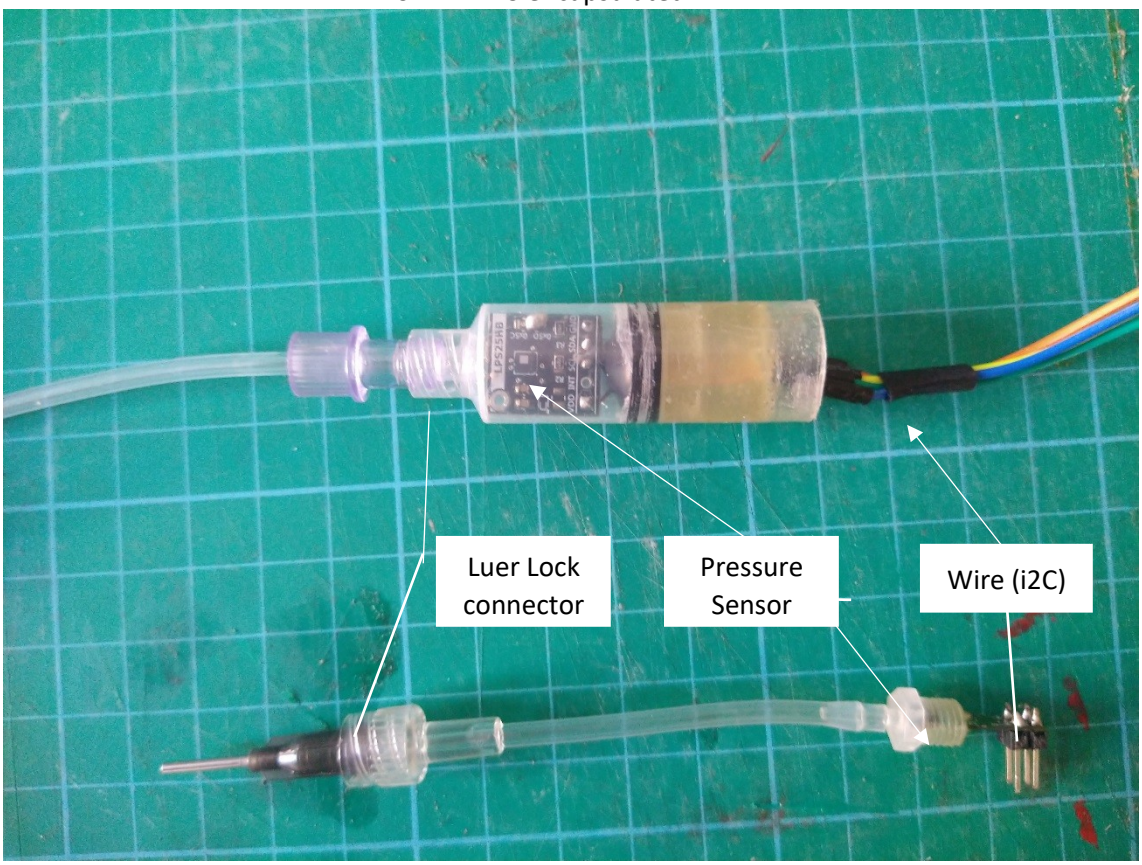
The sensors communicate with the microprocessor through I2C (or SPI).
Need 4 wires (3.3V, GRD, SDA, SCL).

2) Integration in Ventilator Circuit:

Barometers are designed to measure atmospheric pressure, not pressure inside the Ventilator tubes. It is necessary to encapsulate them, so that they can be connected to a ventilator tubes. Luer lock connections are the most used in medical equipment. You can find luer lock connections in most of the commercial ventilator circuit.



Two B-MEMS encapsulated



There are several ways to encapsulate the connectors depending on the availability of the materials.