

# Fuel Volume Indicator

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**Abstract -** The main goal of our project is to create a product called Fluid Volume Indicator that will enable customers or users to get the exact amount of fuel or water that has been passed through it using a density and water flow sensor. We can also use this product to stop people from defrauding us at gas stations.

**Key Words:** Water Flow Sensor, Density, Fuel, Fuel volume indicator

## 1. INTRODUCTION

When we pay for 1 litre of gas, the actual amount of gas in the tank is often less than 1 litre. When driving through a rural region, this programme grows in size. As a result, we attempted to create a product by which we could transfer fuel and determine the amount of fuel entering the tank.



Figure 1: Setup

## 2. LITERATURE REVIEW

Our project is now complete, and all we have to do now is watch it run using Arduino software. We will be able to fix the number due to a formula mistake within the next week, or else our whole project will be ready, because we have mounted it on a breadboard because we do not have one.

## 3. OBJECTIVE

The goal is to create a system that can calculate the amount of fuel flowing through it so that it can be used when filling

up a car, bike, or other vehicle. So that we can verify that the filled fuel corresponds to the Pump meter.

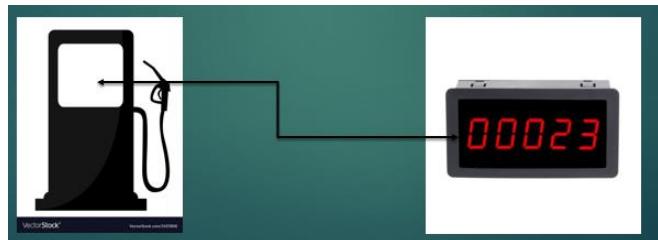


Figure 2: Fuel Display

## 4. METHODOLOGY/EXPERIMENTAL

- Using a Fluid Volume Indicator, which can also calculate fuel flown through it, to avoid fuel station cheating.
- It's small and low-maintenance.

## Material Required: -

Material	Quantity	Total Price (Rs.)
Microcontroller	1	210
Water Flow Sensor	1	255
Display	1	70
Others		150

As a result, the net cost would be 685.

It would be more effective if we do it on a broad scale. If the cost exceeds 500 rupees, the cost would be reduced to 550 rupees since we can create a cheap board that performs the same function instead of using Arduino. We also want our project to be small and convenient for the user, so instead of using a breadboard, we'll use a PCB.

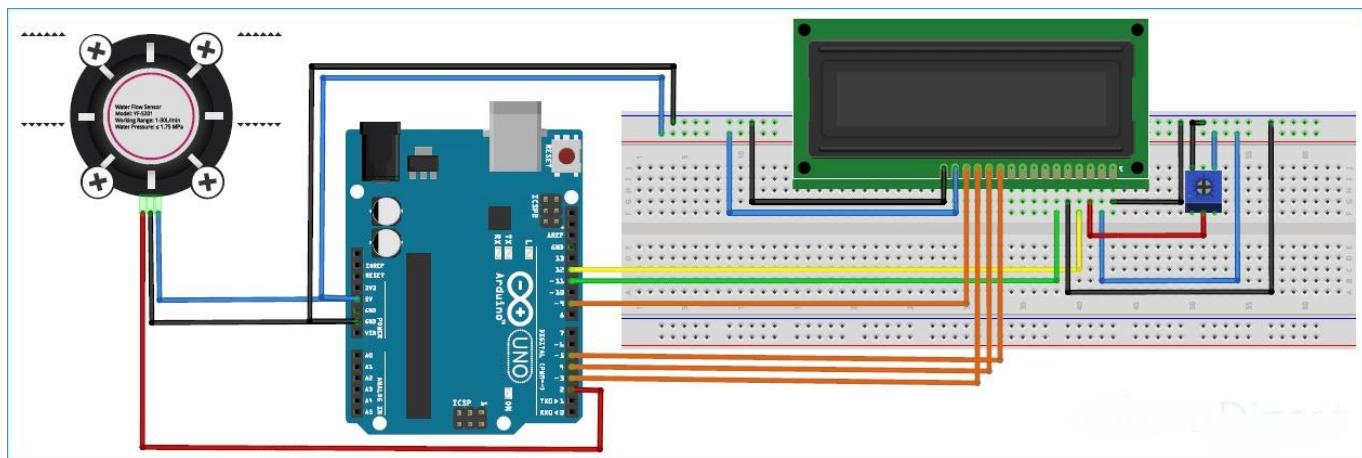


Figure 3: Circuit Diagram

We built our framework and the main model void out of this content, and we only used official Arduino software.

This project isn't online, and it's a brand-new idea that we're investigating so that we can deliver the best product possible with our knowledge and efforts.

## 5. WORKING

The density of gasoline and diesel is defined at the gas station. The fuel density must be entered into our device. On an LCD mounted to the breadboard, the volume flow metre controls and shows the volume of fuel as it flows through it. The feature of this device's water flow indicator is.

Water will flow through the water flow sensor thanks to a plastic valve. A water rotor and a hall effect sensor are used to sense and measure the water flow.

When water moves through the valve, the rotor rotates. This diagram depicts the change in motor speed. This change is calculated by the hall effect sensor and output as a pulse signal. As a consequence, the water flow rate can be calculated.

## 6. CONSTRUCTION

The most important feature we required was a device that could measure liquid flow. In this case, we've used a Water Flow Sensor. We've integrated it into a circuit that also contains a microcontroller.

## 7. CALCULATION

Inferential flow rate can be inferred using a variety of techniques, such as a change in velocity or kinetic energy. The flow rate was calculated using the change in water velocity. The velocity is determined by the pressure that pushes the through pipelines. The average velocity is a good

measure of the flow rate since the cross-sectional area of the pipe is known and constant.

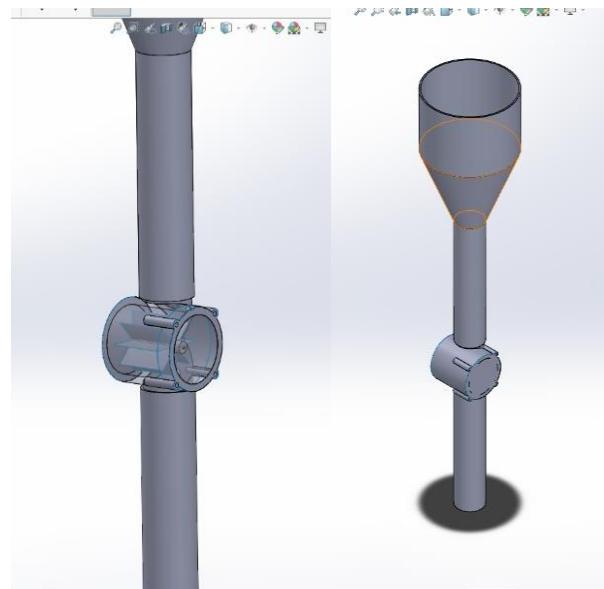


Figure 4: CAD created in SOLIDWORKS

In such situations, the flow rate/total flow of water through the pipe is determined using the  $Q=VA$  relationship, where  $Q$  is the flow rate/total flow of water through the pipe,  $V$  is the average velocity of the flow, and  $A$  is the cross-sectional area of the pipe (viscosity, density, and the friction of the liquid in contact with the pipe also influence the flow rate of water).

PHz stands for Pulse Frequency (Hz)

$Q$  = Fuel discharge rate (Litres/min)

$Q_h$  = Fuel Discharge (Litres/Hour)

$Q = 7.5 \times PHz$

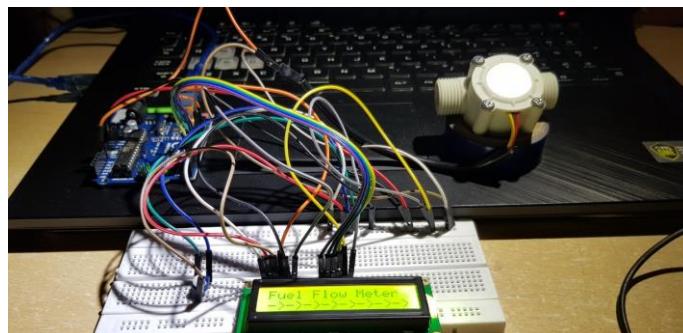
$Q_h = (PHz \times 60) / (7.5 \times Q)$



**Figure 5: Fuel collector module**

## 8. CONCLUSIONS

We were able to design a Fluid Volume Indicator that could calculate fuel flow and show the amount on an LCD screen. We did not put any money into this machine, but we put all our resources into it, and we are pleased with the project's outcome. From the initial conversation to the final assembly, our entire team has contributed to this project.



**Figure 6: Final Assembly**

## 9. FUTURE SCOPE

Our device is still in its infancy. We were constrained. We can create a system that is more compact and fits around the fuel tank cap. We can improve measurement precision by using a more costly volume flow metre.

## 10. ACKNOWLEDGEMENT

We would like to express our gratitude to our College for allowing us to complete a project.

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## 11. REFERENCES

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## 12. BIOGRAPHIES



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