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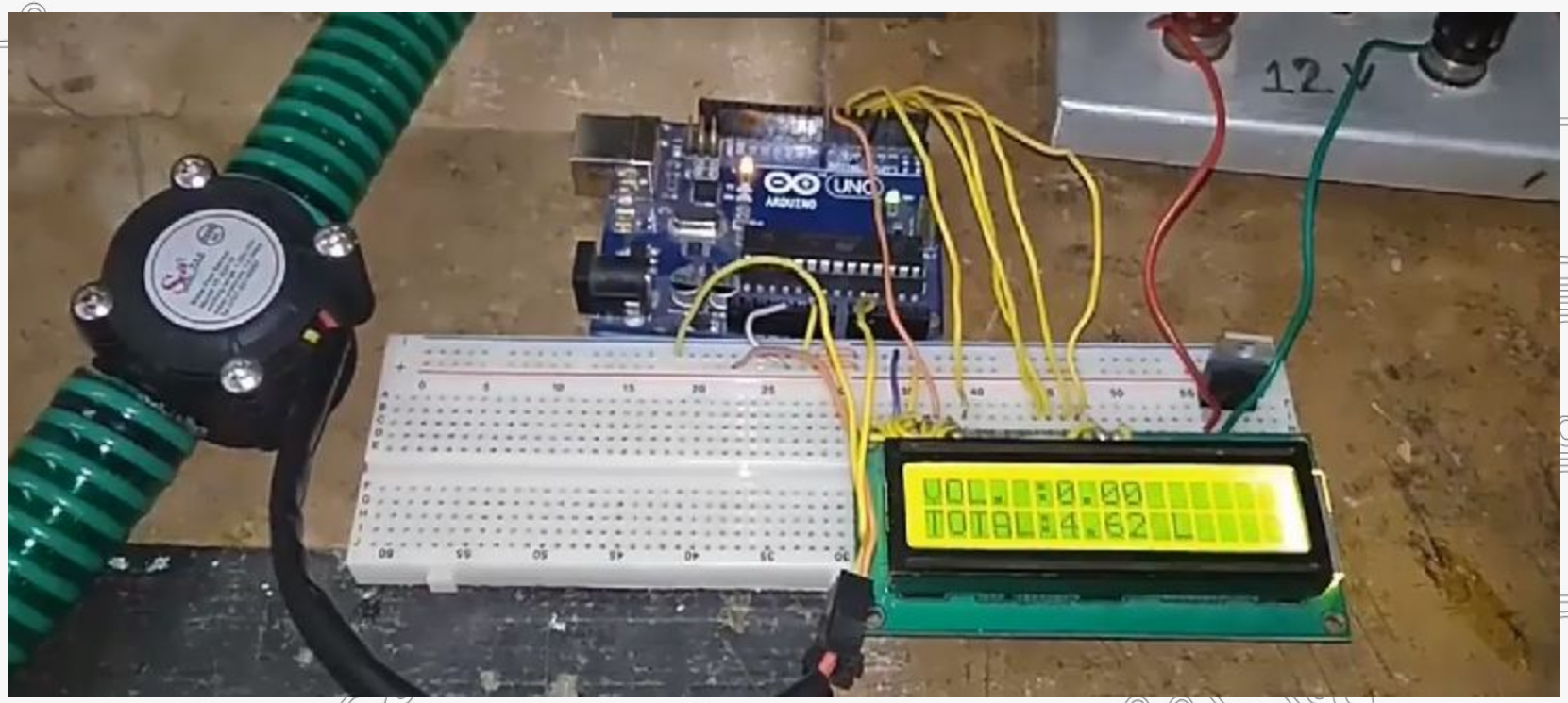
Water flow rate and Volume measurement



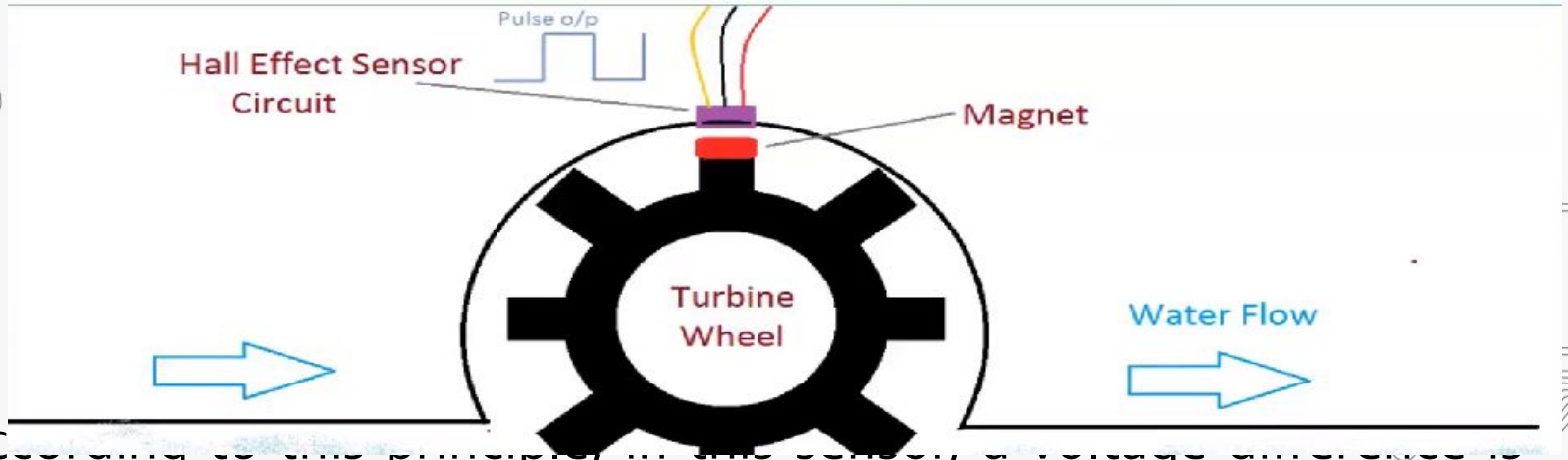
Water Flow sensor

Water Flow sensors are installed at the water source or pipes to measure the rate of flow of water and calculate the amount of water flowed through the pipe. Rate of flow of water is measured as liters per hour or cubic meters. Water flow sensor consists of a plastic valve from which water can pass. A water rotor along with a hall effect sensor is present the sense and measure the water flow.

When water flows through the valve it rotates the rotor. By this, the change can be observed in the speed of the motor. This change is calculated as output as a pulse signal by the hall effect sensor. Thus, the rate of flow of water can be measured.

Working principle

- The main working principle behind the working of this sensor is the Hall effect.



- According to this principle, in this sensor, a voltage difference is induced in the conductor due to the rotation of the rotor.

- This induced voltage difference is transverse to the electric current.

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- Water flow sensors can measure the rate of flow of water either by measuring velocity or displacement.
- These sensors can also measure the flow of water like fluids such as measuring milk in a dairy industry etc..
- These sensors can be easily interfaced with microcontrollers like Arduino. For this, an Arduino microcontroller board for processing, a Hall effect water flow sensor, a 16×2 LCD display, and Breadboard connecting wires are required. The sensor is placed at the water source inlet or at the opening of the pipe.

Components required

- Arduino Mega
- Water flow sensor
- 16x2 LCD
- Jumper wires
- Potentiometer(10k)
- Breadboard

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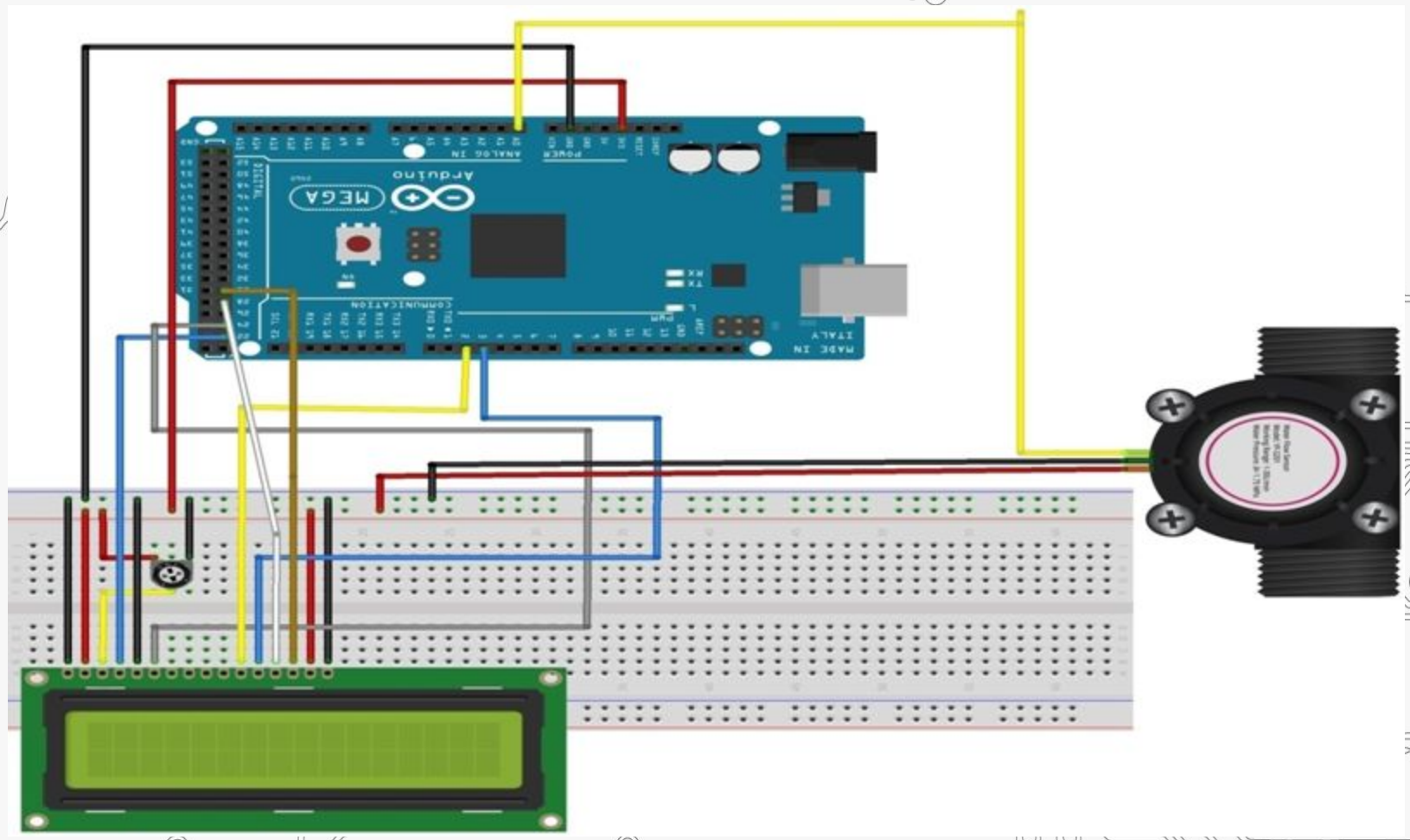
Connection Diagram



Water flow sensor connections

- Connect Ao pin of water flow sensor with Ao pin of Arduino Mega.
- Connect Vcc and GND(ground) pin of water flow sensor with Arduino 5V and GND respectively.

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Connections for LCD :

- PIN1 or Vss to ground
- PIN2 or Vdd or Vcc to +5V power
- PIN3 or Vee to potentiometer (gives maximum contrast best for a beginner)
- PIN4 or RS (Register Selection) to PIN22 of Arduino
- PIN5 or RW (Read/Write) to ground
- PIN6 or E (Enable) to PIN24 of Arduino
- PIN11 or D4 to PIN2 of Arduino
- PIN12 or D5 to PIN3 of Arduino
- PIN13 or D6 to PIN28 of Arduino
- PIN14 or D7 to PIN30 of Arduino
- PIN15 or A to +5V of Arduino
- PIN16 or K to GND of Arduino

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Code

Water_flow_rate_and_volume_measurement | Arduino 1.8.19

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Water_flow_rate_and_volume_measurement

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(22,24,2,3,28,30);
int X;
int Y;
float TIME = 0;
float FREQUENCY = 0;
float WATER = 0;
float TOTAL = 0;
float LS = 0;
const int input = A0;
void setup()
{
Serial.begin(9600);
lcd.begin(16, 2);
lcd.clear();
lcd.setCursor(0,0);
lcd.print("Water Flow Meter");
lcd.setCursor(0,1);
lcd.print("****************");
delay(2000);
pinMode(input,INPUT);
}
void loop()
{
X = pulseIn(input, HIGH);
Y = pulseIn(input, LOW);
TIME = X + Y;
```

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pinMode(input,INPUT);
}
void loop()
{
X = pulseIn(input, HIGH);
Y = pulseIn(input, LOW);
TIME = X + Y;
FREQUENCY = 1000000/TIME;
WATER = FREQUENCY/7.5;
LS = WATER/60;
if(FREQUENCY >= 0)
{
if(isinf(FREQUENCY))
{
lcd.clear();
lcd.setCursor(0,0);
lcd.print("VOL. :0.00");
lcd.setCursor(0,1);
lcd.print("TOTAL:");
```

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Project Link : https://youtu.be/kbKnLTPTNbg