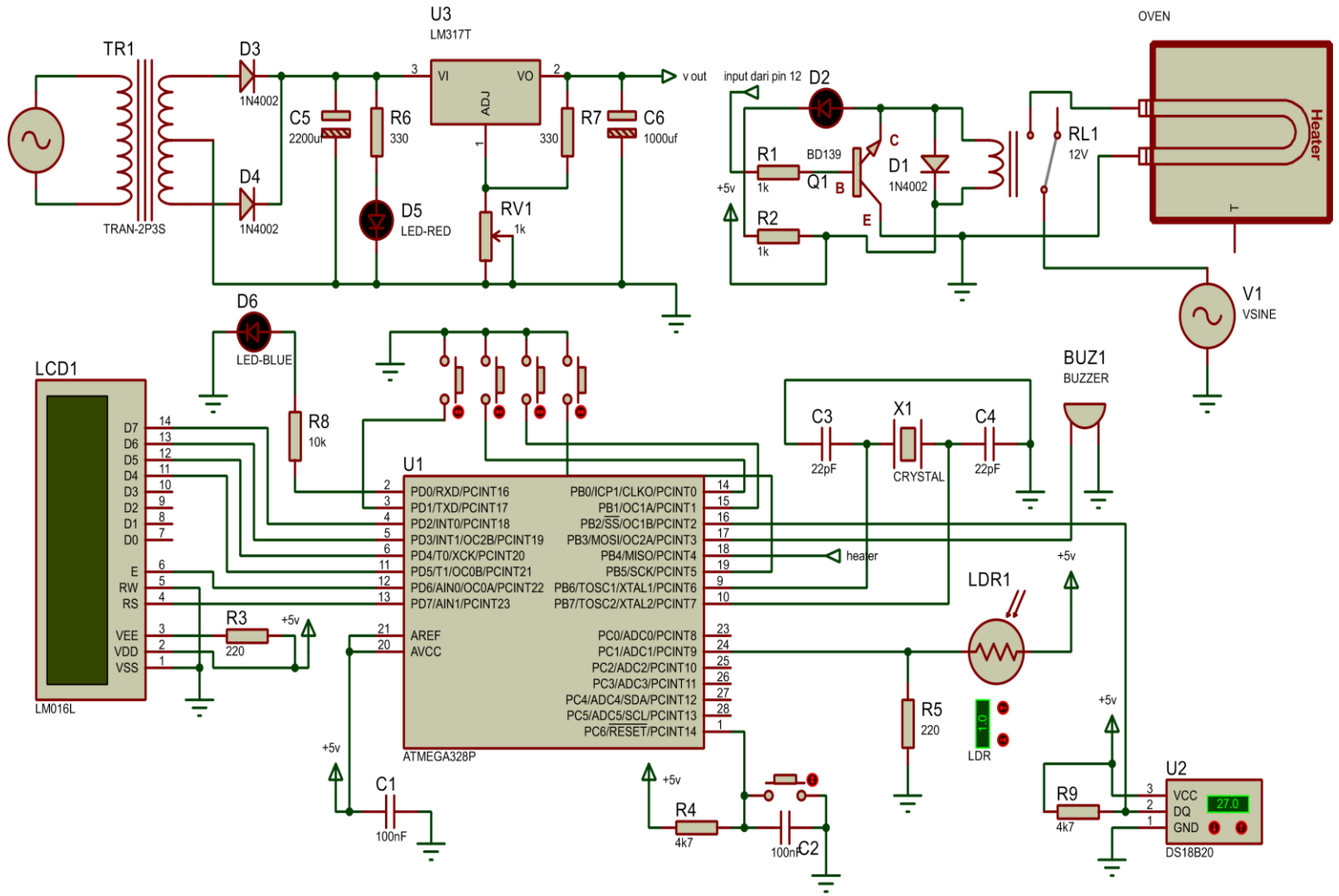
LAMPIRAN

1. Gambar Rangkaian keseluruhan



2. Coding program

```
#include <OneWire.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);

#define DS18S20 10
#define ldr A0
#define buzzer 11
#define heater 12
//mendefinikan bahwa nama itu ada pada pin itu
OneWire ds(DS18S20);
boolean sensor, start, conf, upset, downset = false;
//boolean itu tipe data
int ledred;
int midTemp = 30;
int minTemp, maxTemp;
#define button1 1
#define button2 8
#define button3 9
#define button4 13

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);

  //untuk push button
  pinMode(button1,INPUT);
  pinMode(button2, INPUT);
  pinMode(button3, INPUT);
  pinMode(button4, INPUT);
  digitalWrite(button1, HIGH);
  digitalWrite(button2, HIGH);
  digitalWrite(button3, HIGH);
  digitalWrite(button4, HIGH);

  pinMode(0,OUTPUT);
  pinMode(DS18S20, INPUT);
  pinMode(ldr, INPUT);
  pinMode(heater, OUTPUT);
  pinMode(buzzer, OUTPUT);

  digitalWrite(heater, LOW);
  digitalWrite(buzzer, LOW);

  lcd.begin(16,2);
  minTemp = midTemp - 1;
  maxTemp = midTemp + 1;
```

```
}
void welcome()
{
  lcd.setCursor(3,0);
  lcd.print("WELCOME TO");
  lcd.setCursor(2,1);
  lcd.print("BLOOD WARMER");
  delay(300);
  lcd.clear();
}
void infrared()
{
  ledred=analogRead(A0);
  if (ledred < 90)
     {sensor = true;}
  else
     {sensor = false;}
}
void alarm()
{
  digitalWrite(buzzer, HIGH);
  delay(100);
  digitalWrite(buzzer, LOW);
  delay(50);
  digitalWrite(buzzer, HIGH);
  delay(100);
  digitalWrite(buzzer, LOW);
  delay(500);
  digitalWrite(buzzer, HIGH);
  delay(100);
  digitalWrite(buzzer, LOW);
  delay(50);
  digitalWrite(buzzer, HIGH);
  delay(100);
  digitalWrite(buzzer, LOW);
}
void button()
{
  if (digitalRead(1)==0)
     {
       conf = true;
       start= false;
     }
  if (digitalRead(8)==0)
     {
       start= true;
       conf = false;
```

```
    }
  if (digitalRead(9)==0)
     {downset = true;}
  else {downset = false;}

  if (digitalRead(13)==0)
     {upset= true;}
  else {upset = false;}
}
void loop() {
  // put your main code here, to run repeatedly:
 infrared();
 button();
   if (start == false && conf == false)
     {
       welcome();
     }
  if (start == true && sensor == true)
     {
       float realTemp = getTemp();
       lcd.clear();
       lcd.setCursor(3,0);
       lcd.print("BLOOD TEMP");
       lcd.setCursor(4,1);
       lcd.print(realTemp);
       if (realTemp <= minTemp)
          {digitalWrite(heater, HIGH);
          digitalWrite(0,LOW);
          }
       if (realTemp >= maxTemp)
          {digitalWrite(heater, LOW);
          digitalWrite(0,HIGH);
          }
       if (sensor == false)
          {
            lcd.clear();
            lcd.setCursor(0,0);
            lcd.print("   WARNING !!   ");
            lcd.setCursor(0,1);
            lcd.print(" REFILL BLOOD ! ");
            digitalWrite(heater, LOW);
            alarm();
          }
     }
  if (conf == true)
     {
       lcd.clear();
```

```
        lcd.setCursor(0,0);
        lcd.print("SET DEFAULT TEMP");
        lcd.setCursor(10,1);
        lcd.print("C");
        lcd.setCursor(6,1);
        lcd.print(midTemp);

        if (upset == true && maxTemp <= 41)
         {
           midTemp+=1;
           minTemp = midTemp;
           maxTemp = midTemp + 0; //awalnya nilainya
2
         }
         if (downset == true && minTemp >= 30)
         {
           midTemp-=1;
           minTemp = midTemp;
           maxTemp = midTemp + 0;
         }
      }
  if (start == true && sensor == false)
      {
         lcd.clear();
         lcd.setCursor(0,0);
         lcd.print("   WARNING !!   ");
         lcd.setCursor(0,1);
         lcd.print(" REFILL BLOOD ! ");
         alarm();
         lcd.clear();
      }
  delay(500);
}
//kurang paham disini
float getTemp()
{
  //returns the temperature from one DS18S20 in DEG
Celsius
  byte data[12];
  byte addr[8];
  if ( !ds.search(addr))
  {
     ds.reset_search();
     return -1000;
  }
  if ( OneWire::crc8( addr, 7) != addr[7])
  {
```

```
      Serial.println("CRC is not valid!");
      return -1000;
    }
    if ( addr[0] != 0x10 && addr[0] != 0x28)
    {
      Serial.print("Deviceot recognized");
      return -1000;
    }
    ds.reset();
    ds.select(addr);
    ds.write(0x44,1); // start conversion, with
parasite power on at the end
    byte present = ds.reset();
    ds.select(addr);
    ds.write(0xBE); // Read Scratchpad

    for (int i = 0; i < 9; i++)
    {
      data[i] = ds.read();
    }
    ds.reset_search();
    byte MSB = data[1];
    byte LSB = data[0];
    float tempRead = ((MSB << 8) | LSB);
    float TemperatureSum = tempRead / 16;

    return TemperatureSum;
}
```