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LAMPIRAN

A. LAMPIRAN FOTO ALAT



Rangkaian Alat Secara Keseluruhan

Motor Servo Modifikasi Regulator Gas

B. LAMPIRAN DATA SHEET SENSOR MQ-6

• FEATURES

- * High sensitivity to LPG, iso-butane, propane.
- * Small sensitivity to alcohol, smoke.
- * Fast response.

• APPLICATION

They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of LPG, iso-butane, propane, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke.

• SPECIFICATIONS

A. Standard work condition

Symbol	Parameter name	Technical condition	Remarks
V _c	Circuit voltage	5V±0.1	AC OR DC
V _H	Heating voltage	5V±0.1	AC OR DC
P _L	Load resistance	20K Ω	
R _H	Heater resistance	33 Ω ± 5%	Room Tem
P _H	Heating consumption	less than 750mw	

B. Environment condition

Symbol	Parameter name	Technical condition	Remarks
T _{ao}	Using Tem	-10°C -50°C	
T _{as}	Storage Tem	-20°C -70°C	
R _H	Related humidity	less than 95%Rh	
O ₂	Oxygen concentration	21%(standard condition)Oxygen concentration can affect sensitivity	minimum value is over 2%

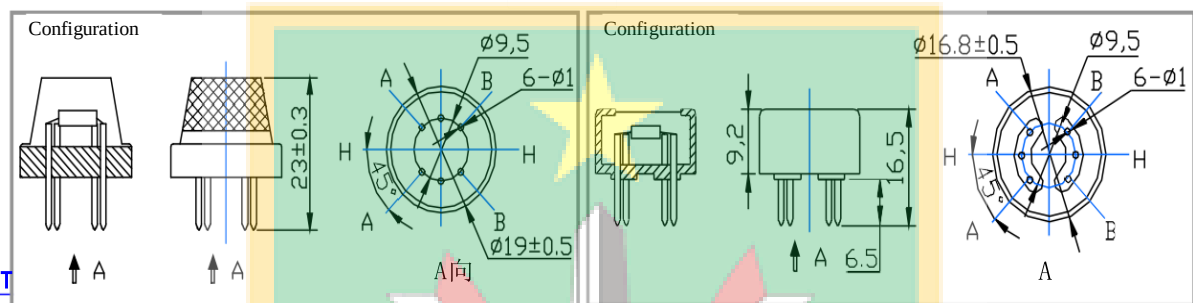
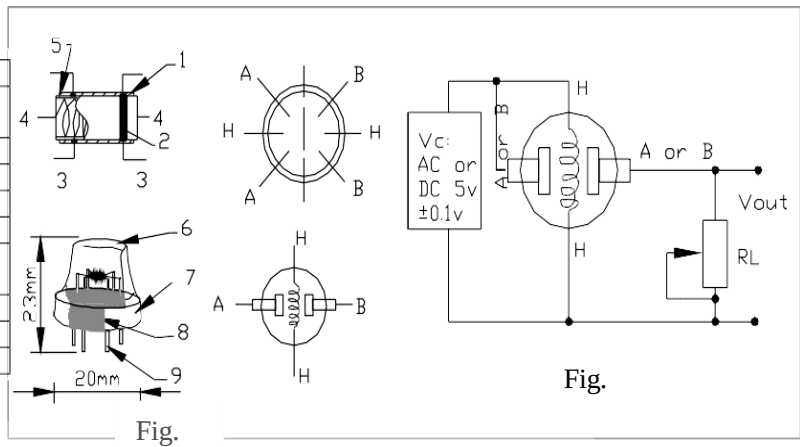
C. Sensitivity characteristic

C. Sensing characteristics			
Symbol	Parameter name	Technical parameter	Remarks
Rs	Sensing Resistance	10K Ω - 60K Ω (1000ppm LPG)	Detecting concentration scope: 200-10000ppm LPG , iso-butane, propane, LNG
α (1000ppm/ 4000ppm LPG)	Concentration slope rate	≤0.6	
Standard detecting condition	Temp: 20°C ±2°C Humidity: 65%±5%	Vc:5V±0.1 Vh: 5V±0.1	
Preheat time	Over 24 hour		

D. Structure and configuration, basic measuring circuit

Structure and configuration of MQ-6 gas sensor is shown as Fig. 1 (Configuration A or B), sensor composed by micro AL₂O₃ ceramic tube, Tin Dioxide (SnO₂) sensitive layer, measuring electrode and heater are fixed into a crust made by plastic and stainless steel net. The heater provides necessary work conditions for work of sensitive components. The enveloped MQ-6 have 6 pin, 4 of them are used to fetch signals, and other 2 are used for providing heating current.

	Parts	Materials
1	Gas sensing	SnO ₂
2	Electrode	Au
3	Electrode line	Pt
4	Heater coil	Ni-Cr alloy
5	Tubular ceramic	Al ₂ O ₃
6	Anti-explosion	Stainless steel gauze(SUS316)
7	Clamp ring	Copper plating Ni
8	Resin base	Bakelite
9	Tube Pin	Copper plating Ni



C. LAMPIRAN PROGRAM

```
#include <Servo_ESP32.h>

#include <Wire.h>

#include <LiquidCrystal_I2C.h>

#include <WiFi.h>

#include <WiFiClient.h>

#include <HTTPClient.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

int mq6Sensor = 36;

int RL = 1000;

int Ro = 100;

#define ledmerah 5

#define ledhijau 2

#define sensorfan 34

#define fan 14

static const int servoPin = 32; //printed G14 on the board

int angle =0;

int angleStep = 5;

int notif_fan = HIGH;

int angleMin =0;

int angleMax = 180;

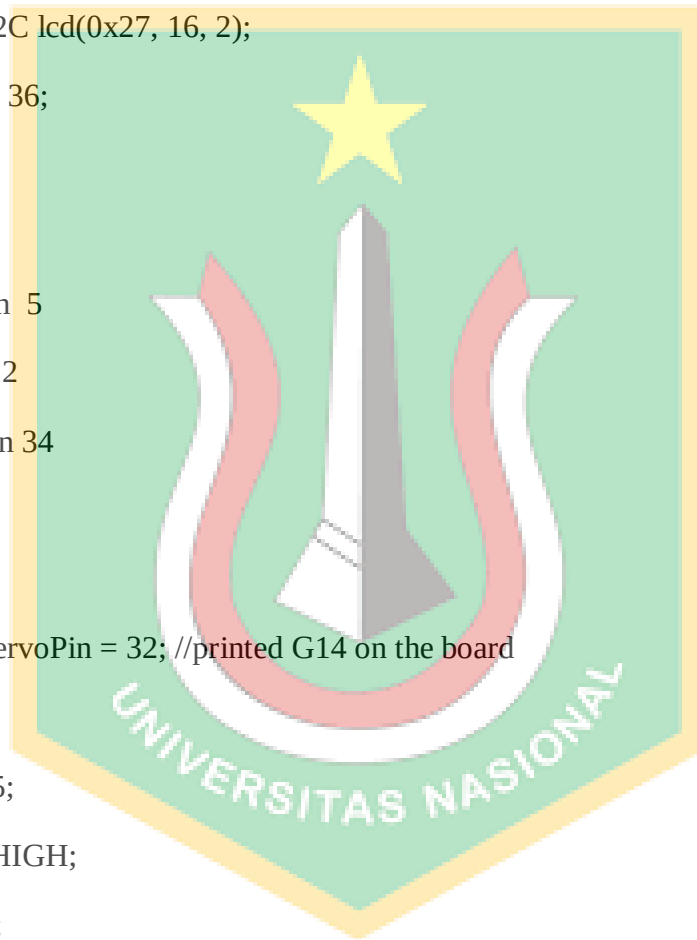
Servo_ESP32 servo1;

const char* ssid = "Monitoring_LPG"; // Wifi

const char* password = "12345678"; //Password Wifi

const char* serverName = "http://we.ngarduino.com/sendMessage.php";

void setup() {
```



```

Serial.begin(115200);

WiFi.begin(ssid, password);

Serial.println("Connecting");

while(WiFi.status() != WL_CONNECTED) {

    delay(500);

    Serial.print(".");

}

Serial.println("");

Serial.print("Connected to WiFi network with IP Address: ");

lcd.setCursor(0,1);

lcd.print("Connected to WiFi");

lcd.clear();

Serial.println(WiFi.localIP());

lcd.begin();

pinMode(ledmerah, OUTPUT);

pinMode(ledhijau, OUTPUT);

pinMode(fan,OUTPUT);

pinMode(sensorfan,INPUT);

servo1.attach(servoPin);

}

void loop() {

    int sensorvalue1 = analogRead(mq9Sensor); // membaca nilai ADC dari sensor

    float VRL = sensorvalue1*3.3/4095;

    Serial.print(" ADC : ");

    Serial.println(sensorvalue1);

    Serial.print(" Sensor volt : ");

    Serial.println(VRL);

```



```

float Rs = ( 3.3 * RL / VRL ) - RL;

// Serial.print("Rs : ");

// Serial.print(Rs);

// Serial.println(" Ohm");

float ppmCO = 100 * pow(Rs / Ro,-1.431);

// Serial.print("CO : ");

//Serial.print(ppm);

// Serial.println(" ppm");

lcd.setCursor(0,0);
  lcd.print("LPG :");
lcd.setCursor(6,0);
  lcd.print(ppmCO);
lcd.setCursor(10,0);
  lcd.print(" ppm ");

Serial.print("LPG : ");
Serial.print(ppmCO);
Serial.println(" ppm ");

int notif_fan = digitalRead(sensorfan);

// Serial.print(" nilai sensor fan = ");

// Serial.println(notif_fan);

delay(500);

if ( ppmCO >= 200 ){

  if(WiFi.status ( )== WL_CONNECTED){

    HTTPClient http;

    http.begin(serverName);

```




```

http.addHeader("Content-Type", "application/x-www-form-urlencoded");

String key = "6zkTTRdFkw78sVYkk8UokG6nrKIVNeVb"; //your key

String message1 ="ADA KEBOCORAN GAS ";

String message2 =" ppm ";

String requestData = "key="+key+"&message="+message1+ppmCO+message2;

int httpResponseCode = http.POST(requestData);

String payload = http.getString( );

Serial.println(payload);

http.end();

// servo1.write(-15);

delay(2000);

// Serial.print( "servo akrif");

}

servo1.write(-15);

digitalWrite(fan,LOW);

digitalWrite(ledhijau,LOW);

digitalWrite(ledmerah,HIGH);

delay(2000);

Serial.print( "regulator terbuka");

}

else {

    servo1.write(90);

    digitalWrite(fan,HIGH);

    digitalWrite(ledhijau,HIGH);

    digitalWrite(ledmerah,LOW);

    delay(2000);

    Serial.print( "regulator tertutup");

```



```

}

// batasan

if ( notif_fan == HIGH )

if(WiFi.status() == WL_CONNECTED){

  HTTPClient http;

  http.begin(serverName);

  http.addHeader("Content-Type", "application/x-www-form-urlencoded");

  String key = "6zkTTTdFkw78sVYkk8UokG6nrKIVNeVb"; //your key

  String message ="fan fault";

  String requestData = "key="+key+"&message="+message;

  int httpResponseCode = http.POST(requestData);

  String payload = http.getString();

  Serial.println(payload);

  http.end();

  delay(2000);

}

Serial.print( "fan fault");

}

//else ( notif_fan == LOW )

// {

//   Serial.print( "fan ok");

//

```

