LAMPIRAN A

PROGRAM CODE VISION AVR

```
/*****************************************************
This program was produced by the
CodeWizardAVR V1.25.3 Standard
Automatic Program Generator
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http://www.hpinfotech.com
Project  : TA
Version  :
Date     : 04/03/2013
Author   : F4CG
Company  : F4CG

Chip type           : ATmega16
Program type        : Application
Clock frequency     : 11,059200 MHz
Memory model        : Small
External SRAM size  : 0
Data Stack size     : 256
```

```
*****************************************************/
#include <mega16.h>
// Alphanumeric LCD Module functions
#asm
   .equ __lcd_port=0x18 ;PORTB
#endasm
#include <lcd.h>
#include <stdio.h>
#include <delay.h>
#define ADC_VREF_TYPE 0x00

// Read the AD conversion result
unsigned int read_adc(unsigned char adc_input)
{
ADMUX=adc_input | (ADC_VREF_TYPE & 0xff);  // Start the AD conversion
ADCSRA|=0x40;   // Wait for the AD conversion to complete
while ((ADCSRA & 0x10)==0);   //Menunggu konversi selesai
ADCSRA|=0x10;
```

```
return ADCW;    // 10 bit
}
// Declare your global variables here
unsigned int temp;
float vin ;
int output,A;
char s[33];

void main(void)
{
A=0;
PORTB=0x00;          // Keluaran Port B sebagai logik low (0)
DDRB=0xFF;           // Port B sebagai output (LCD)
PORTC=0xFF;          //Aktifi pull up resistor Port C
DDRC=0xFF;           //Port C sebagai output (Solenoid Valve)
ADMUX=ADC_VREF_TYPE & 0xff;
ADCSRA=0x87;
lcd_init(16);
```

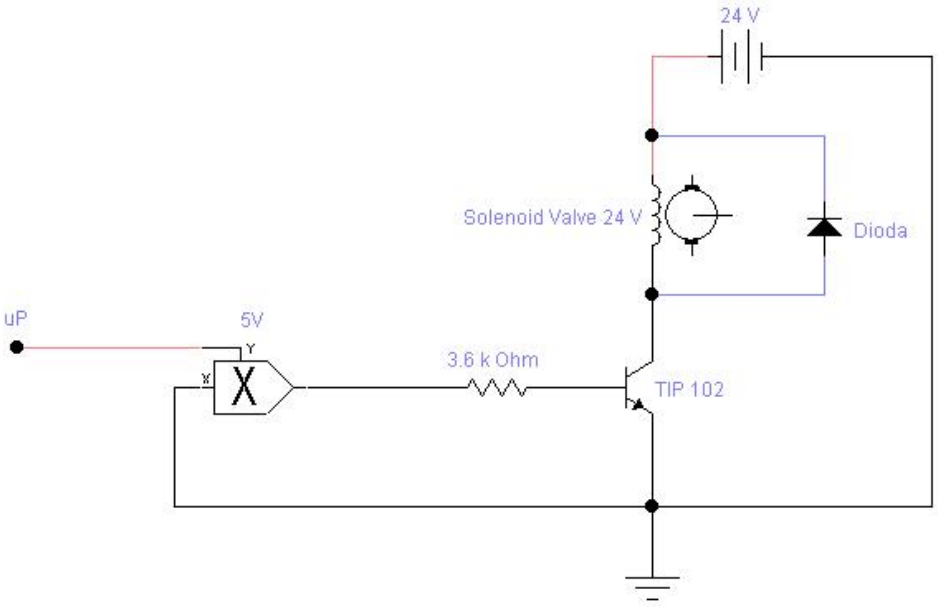
```
while (1)
    {
    //program Nilai PPM
    lcd_clear();
    lcd_gotoxy(0,0);
    lcd_putsf("== Sensor LPG ==");
     temp=read_adc(0);//port A.0
    //y1,2 = (1,01V ,  3,59V)
    //x1,2=(200PPM , 10.000 PPM)
    //y1=mx1+c
    //dari batas bawah y1=1,01 dan x1=200 PPM
    //ppm=( vin - C ) / m
     vin=temp*0.00489;
     // per 1 bit = (5v) :1024 =0.00489 V / bit
        output=( vin - 0.959 ) / 0.00026 ;
           //  m = (3,59 – 1,01 ) / 9800 PPM =0.00026
           //  C = y1 - ( m*x1 ) untuk y1 = 1,01 V dan x1= 200PPM maka C= 0.959
          //  output= ( vin – C ) / m )
```

```
lcd_gotoxy(2,1);
sprintf(s, " PPM :% d",output);
lcd_puts(s);
delay_ms(1000);
```

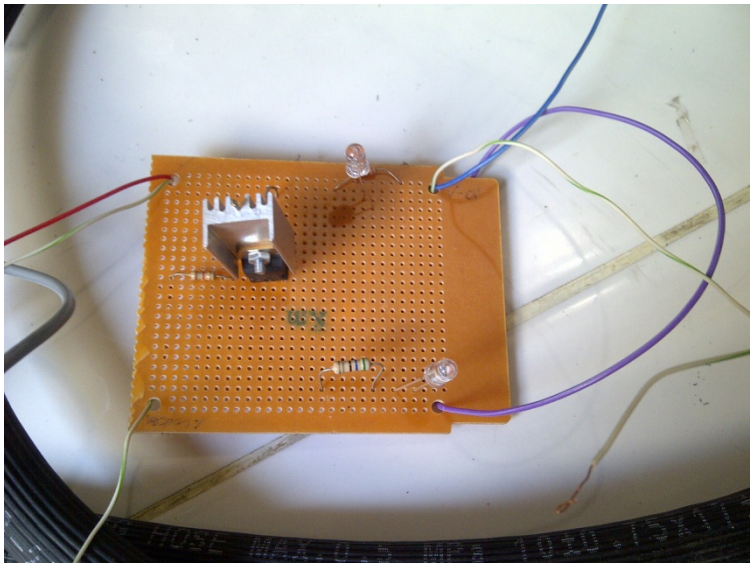
```
// Program solenoid dan LED
If ( output >= 3000 )
{ PORTC = 0;
   A=A+1;      }

 If ( A>0 )
 { PORTC = 0;
 PORTD = 255;
 }
 };
}
```

LAMPIRAN B

TAMPILAN PERANCANGAN ALAT PENDETEKSI KEBOCORAN GAS BERBASIS ATMEGA16



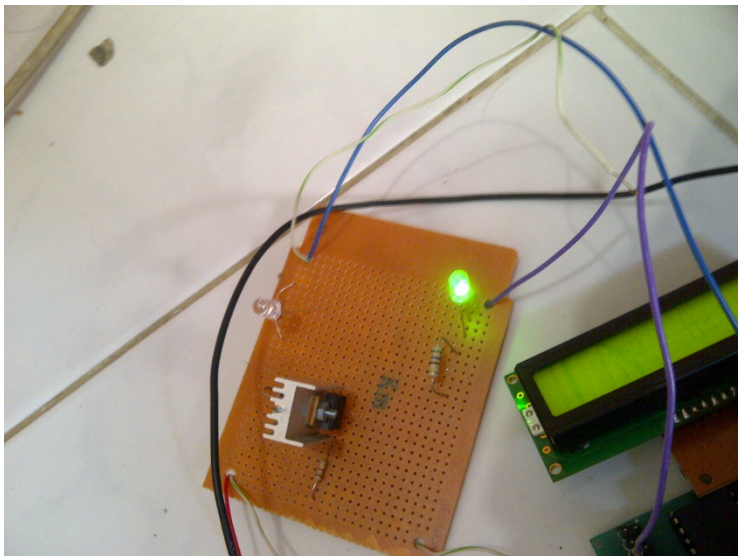
(a)



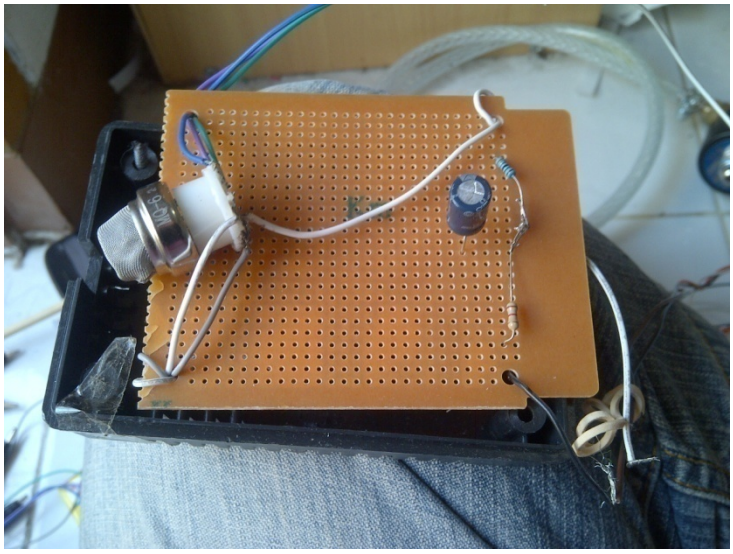
(b)

B-1 (a) / (b) Driver Solenoid Valve

B-2 Solenoid Valve



(a)



(b)

B-3 (a) Tampilan LCD dan (b) Rangkaian Sensor