

LAMPIRAN

LISTING PROGRAM
PROTOTYPE KENDALI LAMPU PEMANAS DENGAN SISTEM JARINGAN
SYARAF TIRUAN MODEL DELTA RULE

```
#include <mega8.h>
#include <stdlib.h>
// Alphanumeric LCD Module functions
#asm
    .equ __lcd_port=0x12 ;PORTD
#endasm
#include <lcd.h>
#include <delay.h>

#define SW1 PINB.0
#define SW2 PINB.1

#define L1 PORTC.1
#define L2 PORTC.2
#define L3 PORTC.3
#define L4 PORTC.4
#define FAN PORTC.5

#define mode_ADC 0x00
// Read the AD conversion result
unsigned int baca_adc(unsigned char pin_adc)
{
    ADMUX=pin_adc | mode_ADC;
    delay_us(10);
    ADCSRA|=0x40;
    while ((ADCSRA & 0x10)==0);
    ADCSRA|=0x10;
```

```

return ADCW;
}

// Declare your global variables here
int SUHU;
int X1, X2;
int T1,T2,T3,T4;
int Y1,Y2,Y3,Y4;
int Yt1,Yt2,Yt3,Yt4;
int d1,d2,d3,d4;
int Yt1,Yt2,Yt3,Yt4;

char buffer[33];
float suhu_celcius, alpha=0.2, treshold=0.5;
float dw11,dw12,dw13,dw14,dw21,dw22,dw23,dw24;
float w11,w12,w13,w14,w21,w22,w23,w24;
float w11a,w12a,w13a,w14a,w21a,w22a,w23a,w24a;
float w11b,w12b,w13b,w14b,w21b,w22b,w23b,w24b;
float w11c,w12c,w13c,w14c,w21c,w22c,w23c,w24c;
float w11d,w12d,w13d,w14d,w21d,w22d,w23d,w24d;
float jml1,jml2,jml3,jml4;
float jmlt1,jmlt2,jmlt3,jmlt4;

void over_heating (void)
{FAN=1;}

void main(void)
{
// Declare your local variables here
PORTB=0x00;
DDRB=0x00;

```

```
PORTC=0x00;
DDRC=0x3E;
PORTD=0x00;
DDRD=0x00;

// Timer(s)/Counter(s) Interrupt(s) initialization
TIMSK=0x00;

// Analog Comparator initialization
// Analog Comparator: Off
// Analog Comparator Input Capture by Timer/Counter 1: Off
ACSR=0x80;
SFIOR=0x00;

ADMUX=mode_ADC;
ADCSRA=0x84;

// LCD module initialization
lcd_init(16);
lcd_clear();
lcd_gotoxy(0,0);
lcd_putsf("INCUBATOR CERDAS");

lcd_gotoxy(0,1);
lcd_putsf("*JST-DELTA RULE*");
delay_ms(2000);

while (1)
{
    // Place your code here
    lcd_clear();
```

```
SUHU = baca_adc(0);  
suhu_celcius = (float)SUHU*500/1023;
```

ftoa(suhu_celcius,1,buffer); //float to array, mengubah tipe data float k tipe data array yg kan ditampilkan di LCD

```
lcd_gotoxy(0,0);  
lcd_putsf("SUHU:");  
lcd_gotoxy(5,0);  
lcd_puts(buffer);  
lcd_gotoxy(10,0);  
lcd_putchar(0xdf);//menampilkan karakter derajat  
lcd_putsf("C");  
delay_ms(200);
```

```
w11=0.6; w12=0.6; w13=0.2; w14=0.6; w21=0.7; w22=0.3; w23=0.7;  
w24=-0.1;
```

```
w11b=w11a; w12b=w12a; w13b=w13a; w14b=w14a; w21b=w21a;  
w22b=w22a; w23b=w23a; w24b=w24a;
```

```
w11c=w11b; w12c=w12b; w13c=w13b; w14c=w14b; w21c=w21b;  
w22c=w22b; w23c=w23b; w24c=w24b;
```

```
jml1=(((X1*w11)+(X2*w21))|((X1*w11b)+(X2*w21b))|((X1*w11c)+(X2*w21  
c))|((X1*w11d)+(X2*w21d)));
```

```
jml2=(((X1*w12)+(X2*w22))|((X1*w12b)+(X2*w22b))|((X1*w12c)+(X2*w22  
c))|((X1*w12d)+(X2*w22d)));
```

```
jml3=(((X1*w13)+(X2*w23))|((X1*w13b)+(X2*w23b))|((X1*w13c)+(X2*w23  
c))|((X1*w13d)+(X2*w23d)));
```

$jml4 = (((X1 * w14) + (X2 * w24)) / (((X1 * w14b) + (X2 * w24b)) / (((X1 * w14c) + (X2 * w24c)) / (((X1 * w14d) + (X2 * w24d)))));$

```
if (jml1 <= treshold)
    {Y1=0;} else {Y1=1;}
if (jml2 <= treshold)
    {Y2=0;} else {Y2=1;}
if (jml3 <= treshold)
    {Y3=0;} else {Y3=1;}
if (jml4 <= treshold)
    {Y4=0;} else {Y4=1;}
```

$d1 = T1 - Y1; d2 = T2 - Y2; d3 = T3 - Y3; d4 = T4 - Y4;$

$dw11 = \alpha * X1 * d1;$
 $dw12 = \alpha * X1 * d2;$
 $dw13 = \alpha * X1 * d3;$
 $dw14 = \alpha * X1 * d4;$
 $dw21 = \alpha * X2 * d1;$
 $dw22 = \alpha * X2 * d2;$
 $dw23 = \alpha * X2 * d3;$
 $dw24 = \alpha * X2 * d4;$

$w11a = w11 + dw11; \quad w12a = w12 + dw12; \quad w13a = w13 + dw13;$
 $w14a = w14 + dw14; w21a = w21 + dw21;$

$w22a = w22 + dw22; w23a = w23 + dw23; w24a = w24 + dw24;$

$w11b = w11a + dw11; \quad w12b = w12a + dw12; \quad w13b = w13a + dw13;$
 $w14b = w14a + dw14; w21b = w21a + dw21;$

$$w22b=w22a+dw22; w23b=w23a+dw23; w24b=w24a+dw24;$$

$$w11c=w11b+dw11; w12c=w12b+dw12; w13c=w13b+dw13;$$

$$w14c=w14b+dw14; w21c=w21b+dw21;$$

$$w22c=w22b+dw22; w23c=w23b+dw23; w24c=w24b+dw24;$$

$$w11d=w11c+dw11; w12d=w12c+dw12; w13d=w13c+dw13;$$

$$w14d=w14c+dw14; w21d=w21c+dw21;$$

$$w22d=w22c+dw22; w23d=w23c+dw23; w24d=w24c+dw24;$$

$$jmlt1=(X1*w11a)+(X2*w21a);$$

$$jmlt2=(X1*w12a)+(X2*w22a);$$

$$jmlt3=(X1*w13a)+(X2*w23a);$$

$$jmlt4=(X1*w14a)+(X2*w24a);$$

$$jmlt1=(X1*w11b)+(X2*w21b);$$

$$jmlt2=(X1*w12b)+(X2*w22b);$$

$$jmlt3=(X1*w13b)+(X2*w23b);$$

$$jmlt4=(X1*w14b)+(X2*w24b);$$

$$jmlt1=(X1*w11c)+(X2*w21c);$$

$$jmlt2=(X1*w12c)+(X2*w22c);$$

$$jmlt3=(X1*w13c)+(X2*w23c);$$

$$jmlt4=(X1*w14c)+(X2*w24c);$$

if (jmlt1>treshold)

{ Yt1=1; L1=Yt1;} else { Yt1=0; L1=Yt1;}

if (jmlt2>treshold)

{ Yt2=1; L2=Yt2;} else { Yt2=0; L2=Yt2;}

if (jmlt3>treshold)

```

        {Yt3=1; L3=Yt3;} else {Yt3=0; L3=Yt3;}
if (jmlt4>treshold)
    {Yt4=1; L4=Yt4;} else {Yt4=0; L4=Yt4;}

if ((SW1==0 && SW2==0) && (suhu_celcius<=39))
{
    lcd_gotoxy(0,1);
    lcd_putsf("PILIH LOGIKA SW!");
    delay_ms(1000);

    X1=0; X2=0;
    T1=0;T2=0;T3=0;T4=0;
}

if ((SW1==0 && SW2==1) && (suhu_celcius<=39))
{
    lcd_gotoxy(0,1);
    lcd_putsf("LAMPU=L1 & L3 ON");
    delay_ms(1000);

    X1=0; X2=1;
    T1=1; T2=0; T3=1; T4=0;
}

if ((SW1==1 && SW2==0) && (suhu_celcius<=38))
{

    lcd_gotoxy(0,1);
    lcd_putsf("LAMPU= L1L2L4 ON");
    delay_ms(1000);
    X1=1; X2=0;

```

```
T1=1; T2=1; T3=0; T4=1;
}

if ((SW1==1 && SW2==1) && (suhu_celcius<=38))
{

lcd_gotoxy(0,1);
lcd_putsf("LAMPU=L1L2L3 ON");
delay_ms(1000);

X1=1; X2=1;
T1=1; T2=1; T3=1; T4=0;
}

if (suhu_celcius>=39)
{

over_heating();
lcd_gotoxy(0,1);
lcd_putsf("- OVER HEATING -");
delay_ms(1000);
}

};
}
```

LAY OUT SKEMA RANGKAIAN

PROTOTYPE KENDALI LAMPU PEMANAS DENGAN SISTEM JARINGAN SYARAF TIRUAN MODEL DELTA RULE

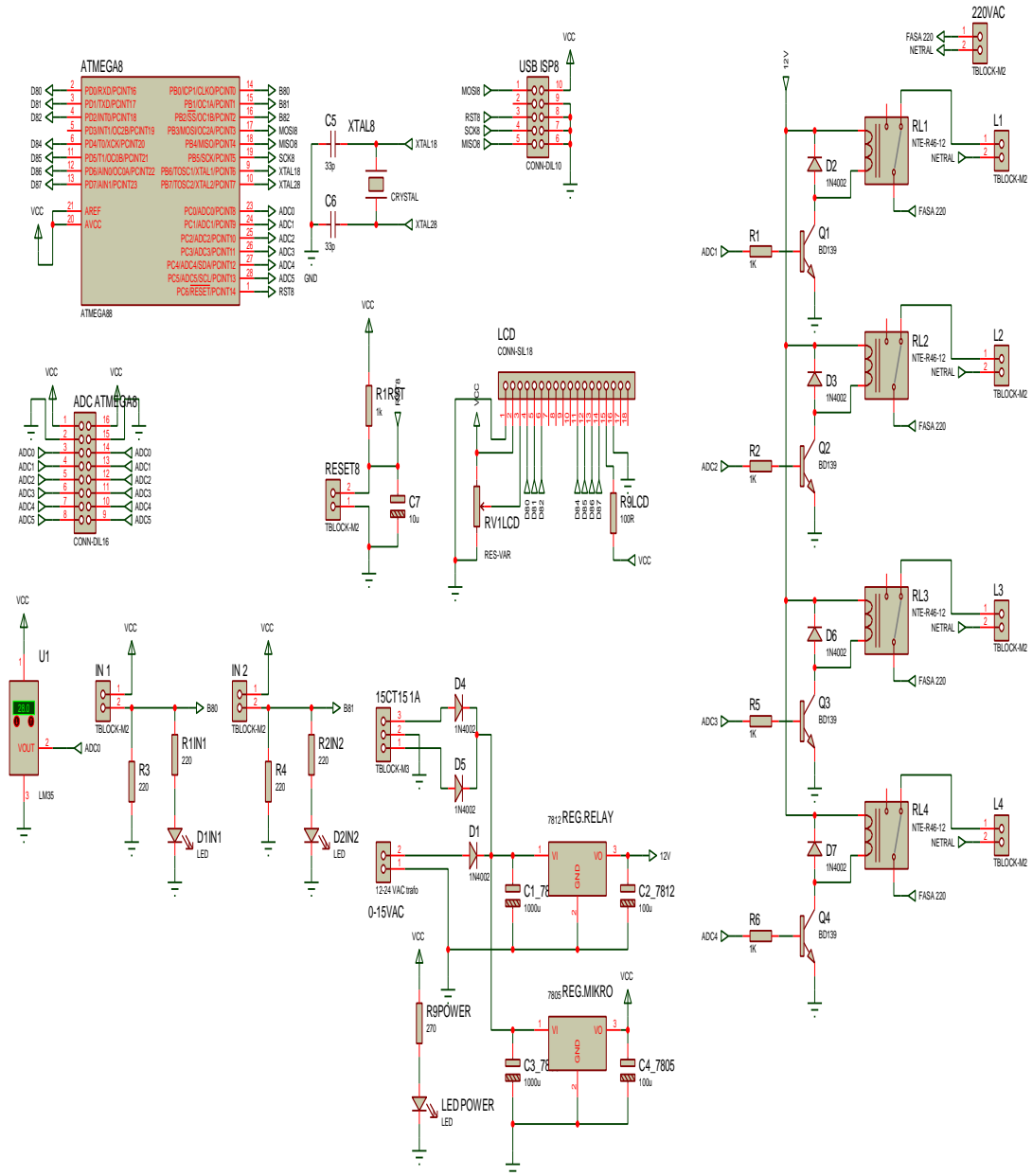
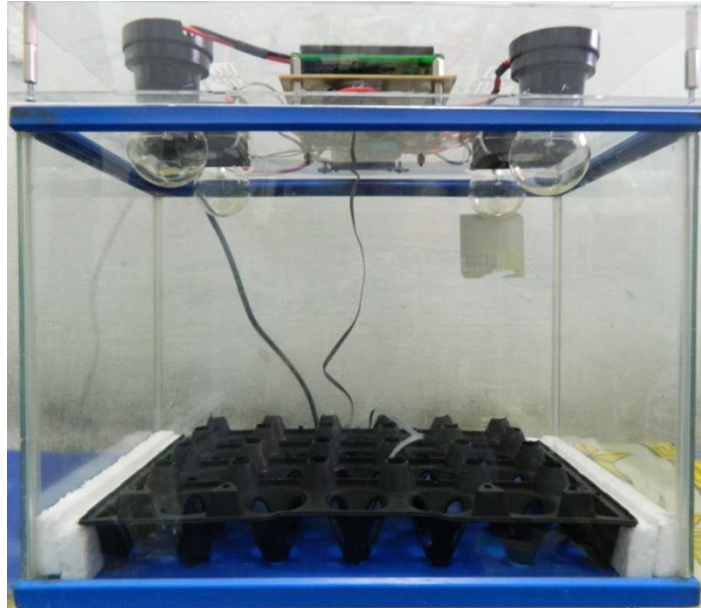


FOTO ALAT
PROTOTYPE KENDALI LAMPU PEMANAS DENGAN SISTEM JARINGAN
SYARAF TIRUAN MODEL DELTA RULE

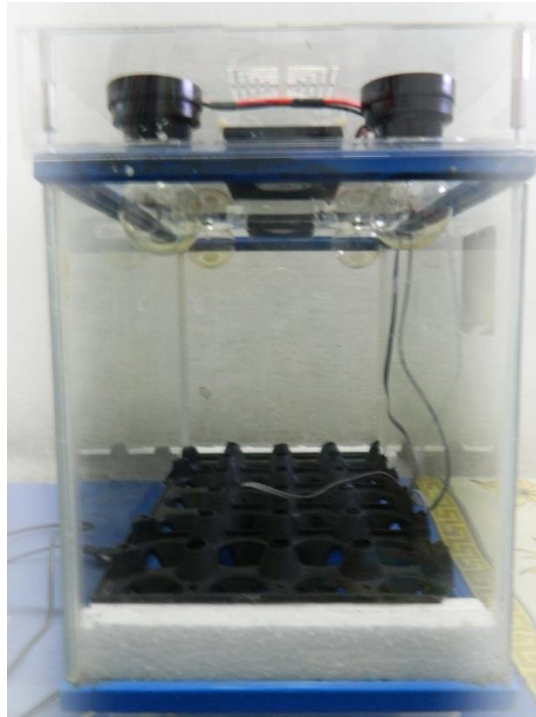
A. Tampak Depan



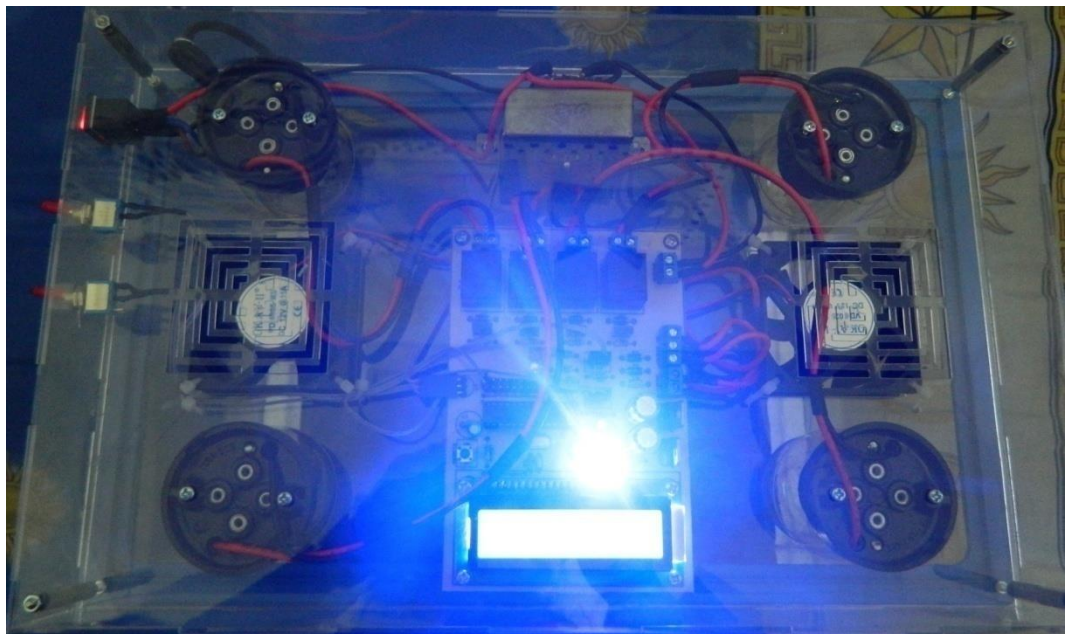
B. Tampak Samping Kiri



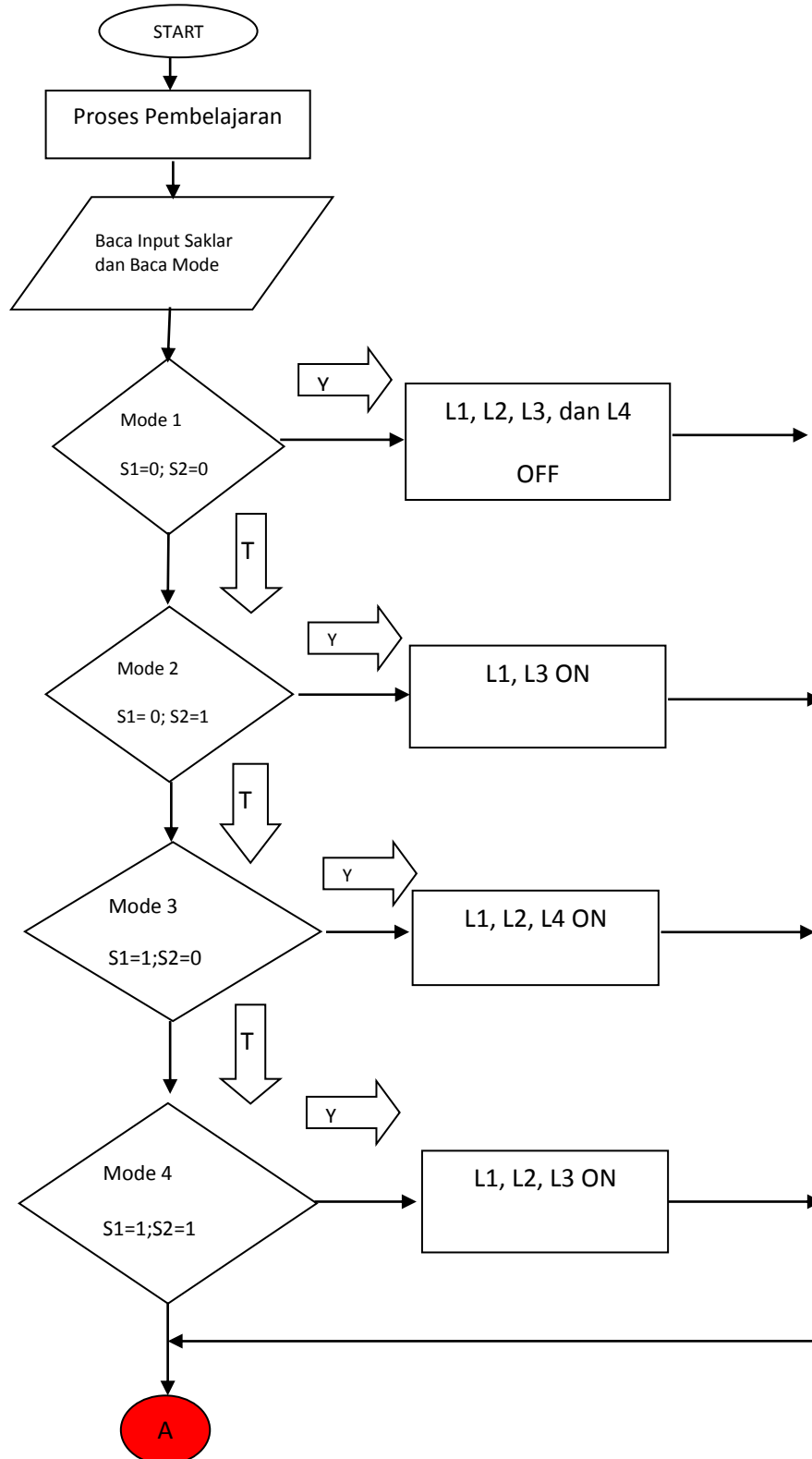
C. Tampak Samping Kanan

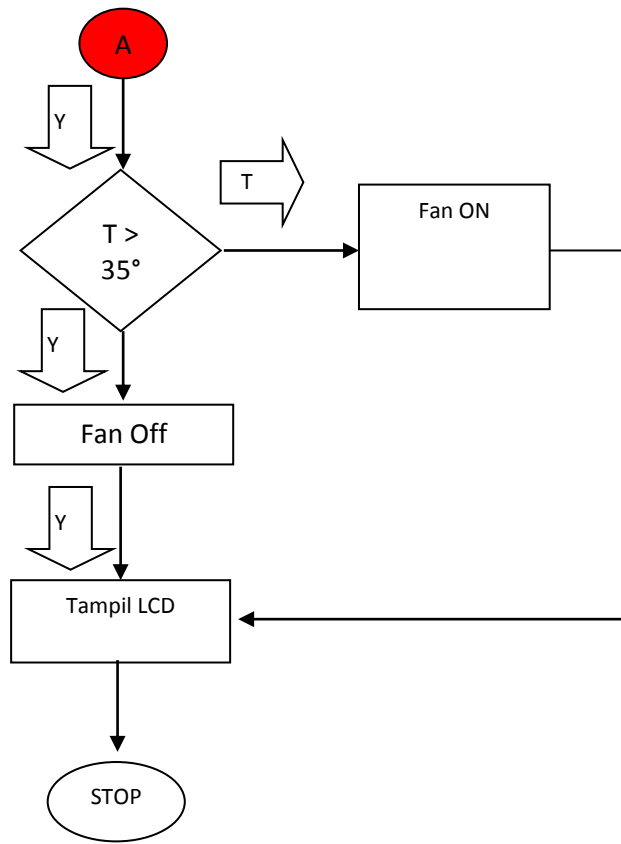


D. Tampak Atas




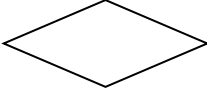

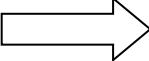


FLOWCHART PERANCANGAN SOFTWARE
PROTOTYPE KENDALI LAMPU PEMANAS DENGAN SISTEM JARINGAN
SYARAF TIRUAN MODEL DELTA RULE





Keterangan flowchart :

No.	Simbol	Keterangan
1.		Simbol Terminasi adalah symbol yang menunjukkan awal atau akhir sebuah proses.
2.		Simbol proses atau langkah menyatakan sebuah kegiatan yang akan ditampilkan dalam diagram alir.
3.		Menyatakan sebuah hasil dari aliran proses.
4.		Simbol titik keputusan digunakan untuk mewakili data masuk atau data keluar.
5.		Garis alir berfungsi menunjukkan arah aliran proses atau algoritmanya.
6.		Simbol ini berfungsi sama dengan garis alir.