LAMPIRAN A

FOTO ALAT

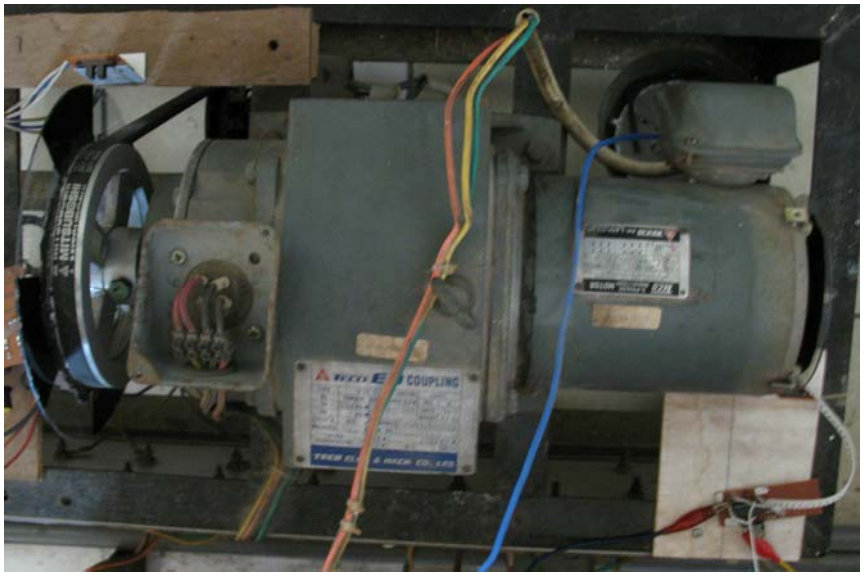

Foto1: Motor 3 phasa TECO tipe AEAFAC, dan TECO ED COUPLING tipe VSED

Foto2: Perangkat keras MCS-51, DAC, dan inverter.

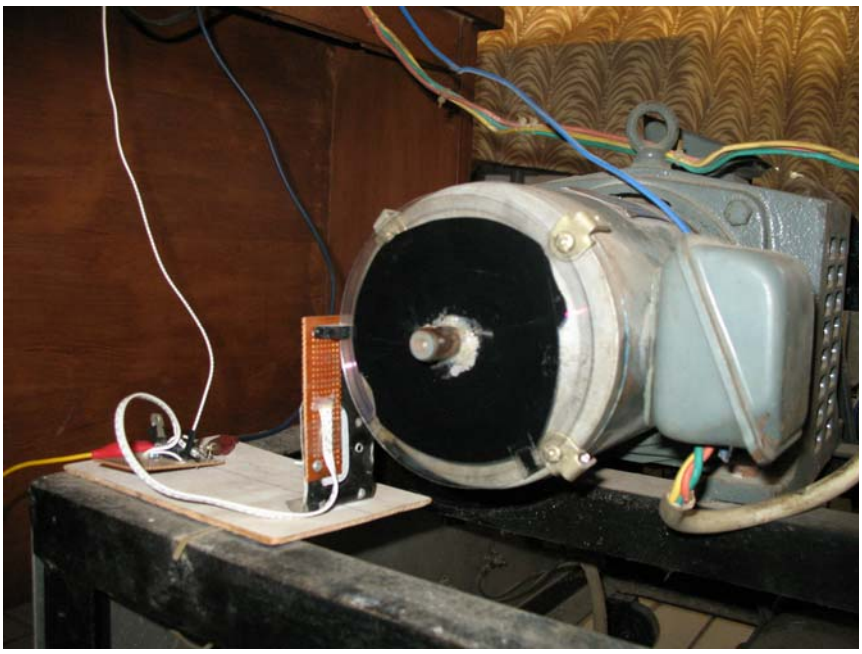

Foto3: Rangkaian sensor *optocoupler* dan piringan akrilik yang dipasang pada motor

LAMPIRAN C

BAHASA ASSEMBLY (MCS-51)

DAN

BAHASA PASCAL (BORLAND DELPHI 7)

```
 org 0h
awal:       ljmp haha
            inc r7                  ;RLI
            call delay
            cjne r7,#20,terus
            mov ie,#00h             ;nonaktifkan INT0
            ljmp tulis

terus:      reti

 org 30h
haha:       mov p1,#05h             ;program utama dimulai
            sjmp yes
hihi:       mov p1,#14h
yes:        mov r3,#00h
            mov r4,#00h
            mov r5,#00h
nyari:      call init
            nop
dav:        call inchar             ;cek tombol start dari serial
            cjne a,#20h,ari
            mov r4,#04h
            sjmp mulai
ari:        cjne a,#21h,dav


mulai:      mov r6,#00h
            mov r7,#00h
            mov ie,#81h             ;aktifkan INT0
            mov a,p1                ;DAC
            mov b,#05h
            add a,b
            mov p1,a
            cjne r3,#10,tanpa
            cjne a,#0ffh,cari
            mov r5,#05h
            sjmp cari

tanpa:      cjne r4,#04h,dengan     ;pengaturan delay tanpa beban
            cjne a,#87h,atur
            mov r3,#10
            sjmp cari

dengan:     cjne a,#0A0h,atur       ;pengaturan delay dengan beban
            mov r3,#10
            sjmp cari

atur:       mov r3,#20h             ;pengaturan delay

cari:       cjne r6,#06h,cari       ;tunggu interrupt
            cjne r5,#05h,cul
            sjmp hihi
cul:        sjmp dav

init:       mov tmod,#20h           ;initial baud rate
            mov TH1,#0fdh
            setb TR1
            mov scon,#52h
            ret
```

```
tulis:      mov a,r7                ;kirim data ke serial
            call outchr
            mov r6,#06h
            reti

outchr:     jnb ti,outchr           ;kirim data ke serial
            mov sbuf,a
            clr ti
            ret

inchar:     clr a                   ;ambil data dari serial
            jnb ri,inchar
            clr ri
            mov a,sbuf
            ret


delay:      mov a,r3                ;delay untuk interrupt
            mov r0,a
dly1:       mov r1,a
dly2:       mov r2,a
dly3:       djnz r2,dly3
            djnz r1,dly2
            djnz r0,dly1
            ret
```

```
unit U_davon;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics,
Controls, Forms,
  Dialogs, ExtCtrls, AfDataDispatcher, AfComPort, StdCtrls,
AfPortControls,
  Grids, TeeProcs, TeEngine, Chart, Series;

type
  TForm1 = class(TForm)
    Button1: TButton;
    Button2: TButton;
    StringGrid1: TStringGrid;
    AfPortRadioGroup1: TAfPortRadioGroup;
    AfDataDispatcher1: TAfDataDispatcher;
    AfComPort1: TAfComPort;
    Timer1: TTimer;
    Chart1: TChart;
    Series1: TLineSeries;
    Edit1: TEdit;
    Label1: TLabel;
    Label2: TLabel;
    Edit2: TEdit;
    Button3: TButton;
    Series2: TLineSeries;
    procedure Button2Click(Sender: TObject);
    procedure Timer1Timer(Sender: TObject);
    procedure AfDataDispatcher1DataReceived(Sender: TObject);
    procedure Button3Click(Sender: TObject);
    procedure Button1Click(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }
  end;

var
  Form1: TForm1;

implementation

{$R *.dfm}
var
atusdet : integer;
detik : integer;
waktu : real ;
frek : integer ;
me : integer ;
rpm : real ;
```

```
procedure TForm1.Button2Click(Sender: TObject);
begin
me:=$20;
frek:= 1 ;
With chart1.Series[0] do
begin
Addxy (0,0);
end;

timer1.Enabled := true;
form1.AfDataDispatcher1.WriteData(me,1);
end;
var
davon : integer = 1 ;
procedure TForm1.Timer1Timer(Sender: TObject);
begin
inc (atusdet);
edit1.Text := floattostr(atusdet);
if (atusdet = 100)then
begin
 inc (detik);
edit2.Text := floattostr(detik);
atusdet := 0    ;
 end;
end;
 procedure TForm1.AfDataDispatcher1DataReceived(Sender: TObject);
begin
timer1.Enabled := false ;
waktu := ((detik+(atusdet/100))/60);
 rpm :=  (20/waktu) ;
stringgrid1.Cells[1,davon] := floattostr(rpm);
if me=$20
then
with
chart1.Series[0]
do
begin
AddXY (frek,rpm);
end;
if me=$21
then
with
chart1.Series[1]
do
begin
addxy (frek,rpm);
end;

inc(frek);
inc(davon);
atusdet := 0;
detik := 0;
timer1.Enabled := true ;
form1.AfDataDispatcher1.WriteData(me,1);
end;
```

```
procedure TForm1.Button3Click(Sender: TObject);
begin
me:=$21;
With chart1.Series[1] do
begin
Addxy (0,0);
Addxy (1,0);
Addxy (2,0);
Addxy (3,0);
Addxy (4,0);
frek:= 5 ;
end;
timer1.Enabled := true;
form1.AfDataDispatcher1.WriteData(me,1);
end;


procedure TForm1.Button1Click(Sender: TObject);
begin
timer1.Enabled := false ;
atusdet := 0;
detik := 0;
end;

end.
```