

1
2
3

ASR

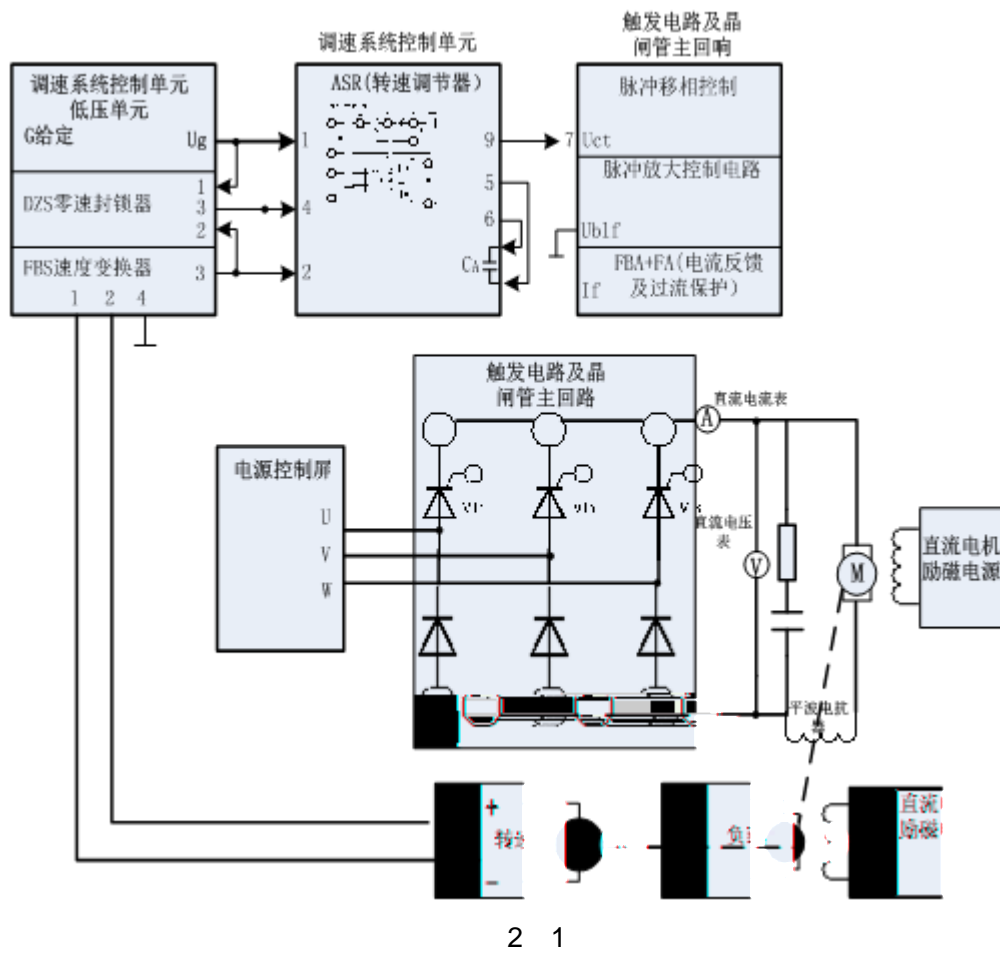
1
2

—

—

2 1

- 1) NMCL-32/MEL-002T
- 2) **L** NMCL-331
- 3) **Rd** NMEL



1
3
5
7

2
4
6

1
2
3
4
5
6
7

ASR

ASR "5" "6"

U_g

ASR RP3

1A

7 μ F

1

a 60° 6 " 1V 2V

b $U_g=0$ " " Ub " 1" a 150°
 " U" " U" 180°

c ASR DZS S " " ASR
 " 3" " 5" " 6" 7uF,
 ASR PI ASR " 2" 1V Ug
 ASR RP1,PR2, " 3" $\pm 5V$

2

a ASR "9" U_{ct} G U_{ct} U_g

b " " " " " " U V

W $220V$

c U_g $n_0=1500 /$
 M01 600
 3 5

U_d i_d n

i_d A					
U_d V					
n r/min					

3

a G U_{ct} $n=1500r/m$ FBS
 FBS 5V G U_{ct} ASR
 "9" U_{ct} ASR "5" "6"

b

c U_g $n_0=1500 /$ ASR
 RP₃ 2 3 5

U_d i_d n

i_d A					
U_d V					
n r/min					

4

PI a — ASR "5" "6" "5" "6" 7 μ F ASR

b

U_g $n_0=1500$ /
3 5

i_d A					
U_d V					
n r/min					

1

ASR

2

n_0

U

3

n_0

U_g

4

- 1
- 2
- 3
- 4

- 1
- 2
- 3
- 4
- 5

3-1

ASR,ACR

ASR

ACR

ASR

, ACR

ACR

a_{min}

b_{min}

\hat{u}

ASR

$U_g = U_{fn}$

ASR

1
2
3
4
5

U_g

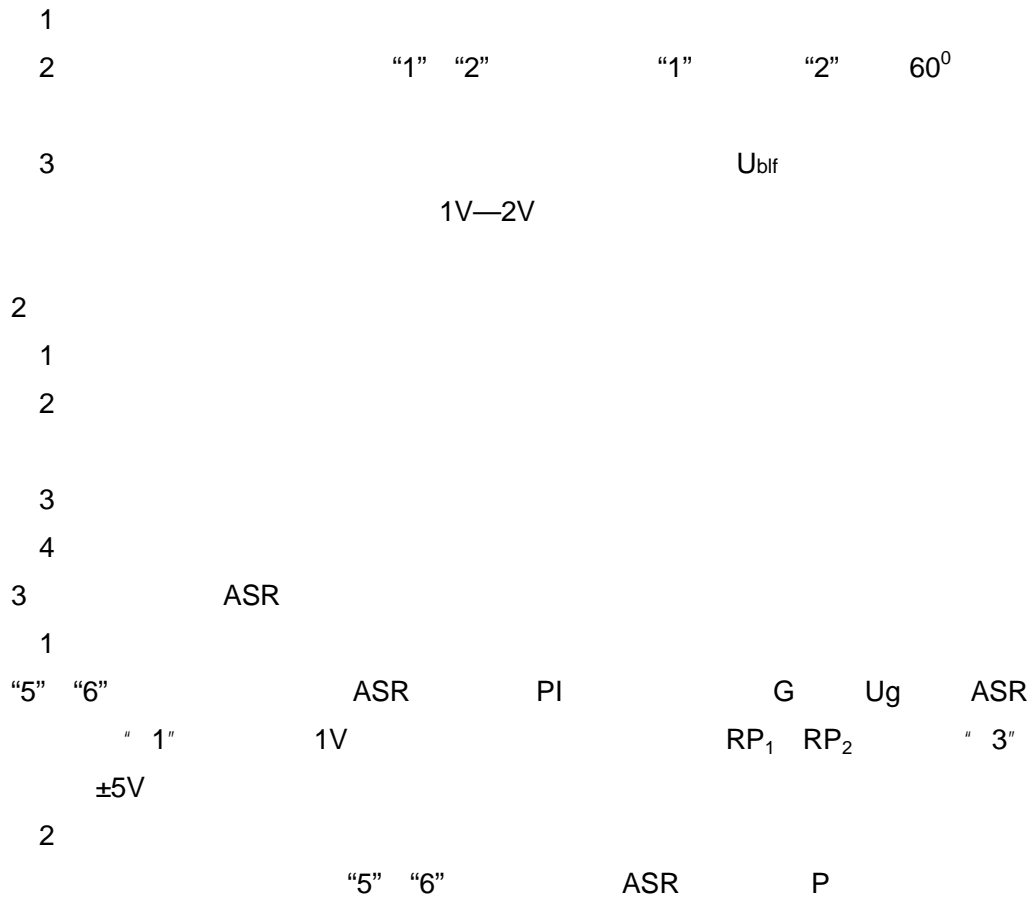
“ ”

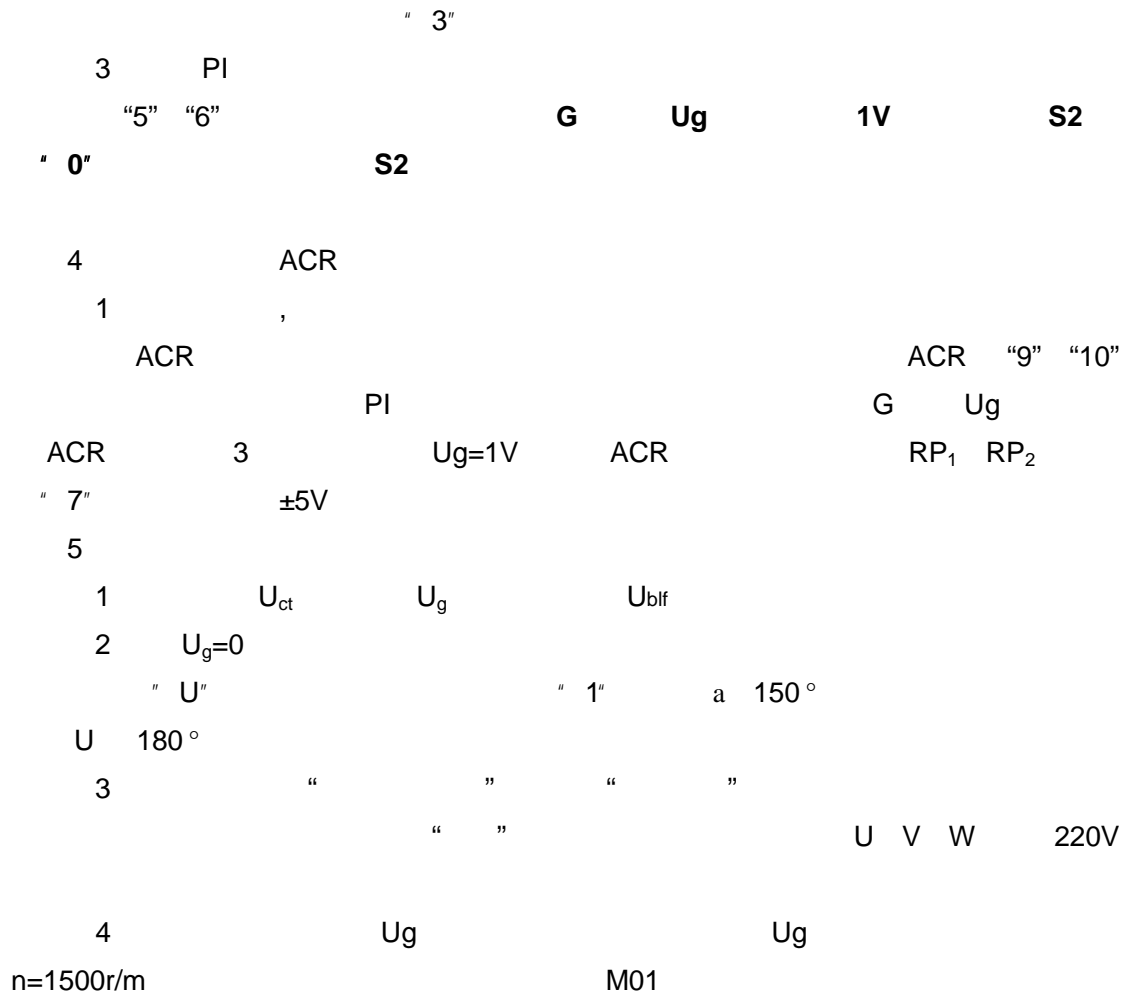
.

1

- 1) NMCL-32/MEL-002T
- 2) **L** NMCL-331
- 3) **Rd** NMEL-03/4 NMCL-03
- 4) **G** **Ug** NMCL-31 NMCL-31A SMCL-01
- 5) Uct NMCL-33 NMCL-33F
- 6) NMCL-33 NMCL-33F
- 7) ACR ASR NMCL-18
- 8) TG
- 9) NMEL-13A/F/C
- 10) NMCL-32 NMEL-18/2
- 11) M01 NMEL-13A
- 12) M M03

3-1

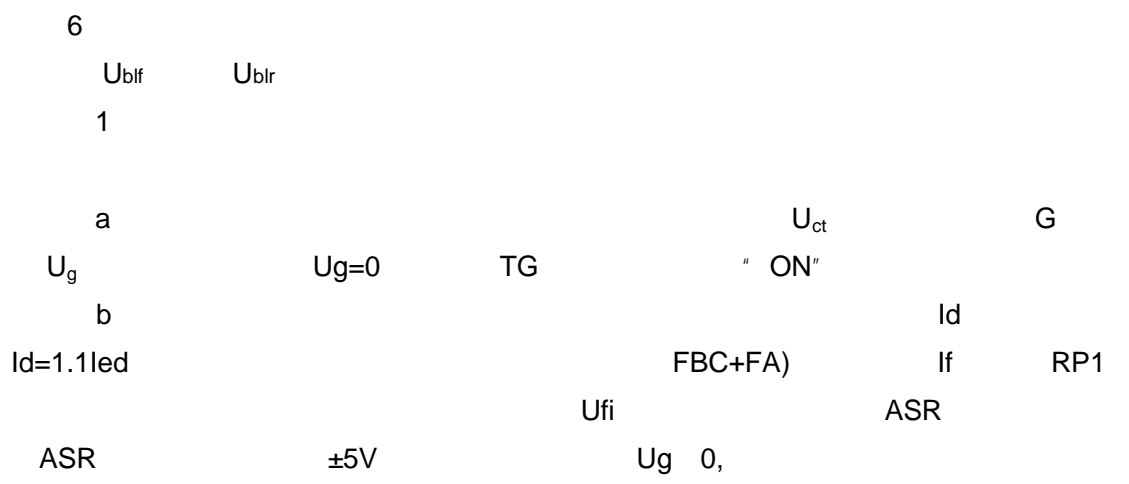




600
 3 5 U_d i_d n

$n=f(I_d)$

n(r/min)						
I(A)						
U _d						



c Ug Uct Ug ACR "3" If ACR 1
 ACR "7" Uct PI ACR
 ACR "9" "10" 1.5μF Ug ASR
 +5V 1.1led Id
 If Ufi Id<1.1led Id<led
 Ug 0,
 2

a Ug Uct Ug Ug 0,
 TG " ON" Ug n=1500r/min
 FBS RP 5V
 Ug=0

b ASR Ug
 ASR 2 ASR 3 Uct Ug Ug
 Ug

4 ASR,ACR PI
 ASR "5" "6" 1.5μF ACR 7μF RP1 RP2
 ±5V

1 n=f Id
 a Ug 1500 r/min
 M01
 600
 3 5
 Ud Id n n=f

Id

n(r/min)						
I(A)						

Ug=0

5 ASR,ACR PI
 ASR "5" "6" 1.5μF ACR 7μF RP1 RP2
 ±5V
 ASR " 1" ACR " 1"

1

2

3

Ug 0

- 1
- 2
- 3
- 4

- 1
- 2 PWM SG3525
- 3 H PWM
- 4

- 1 PWM SG3525
- 2
- 3
- 4
- 5
- 6 H PWM

IGBT H UPW 5 1 DLD PWM GD MOS

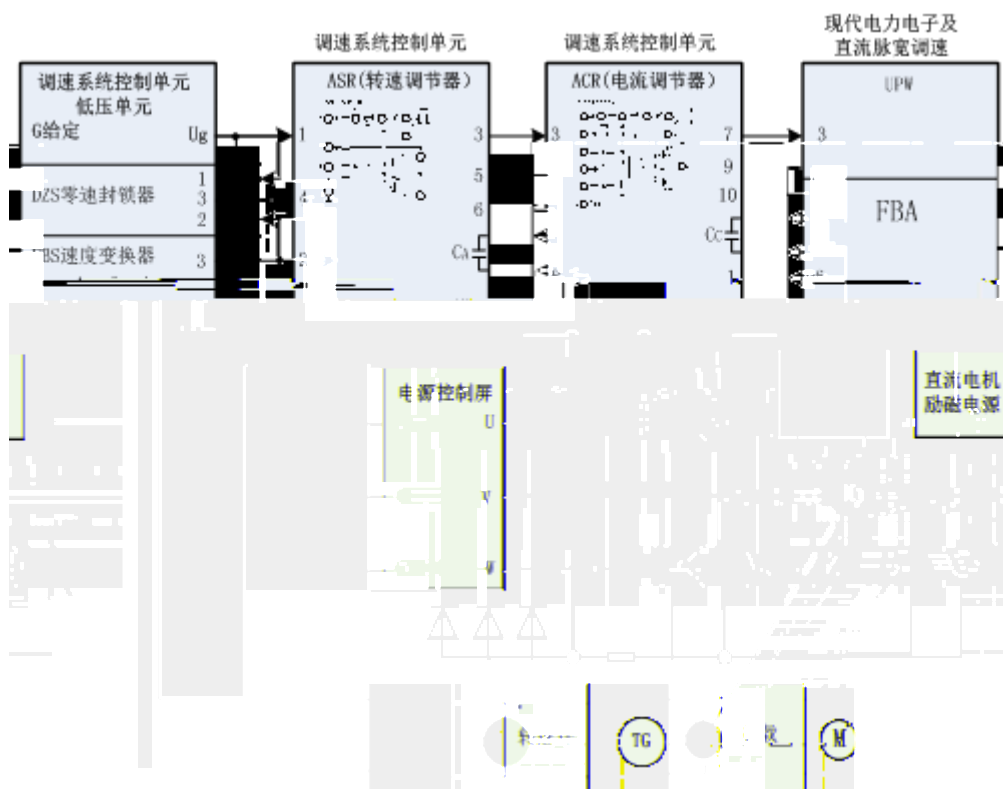
FA
UPW

Silicon General
PWM

SG3525

5 1

- 1) NMCL-32/MEL-002T
- 2) **L** NMCL-331
- 3) **Rd** NMEL-03/4 NMCL-03
- 4) **G Ug** NMCL-31 NMCL-31A SMCL-01
- 5) UPW,FBA NMCL-22
- 6) TG
- 7) NMEL-13A/F/C
- 8) NMCL-32 NMEL-18/2
- 9) M01 NMEL-13A



5 1

- 1
- 2
- 3
- 4

5
6
7
8

1
2
3
4
5
6
7

ASR

ASR "5" "6"

ASR RP3

7 μ F

1A

U_g

" "

1 SG3525

1

UPW "1"

UPW" 4

$t_{dVT1.VT2} =$

$t_{dVT3.VT4} =$

3

5 1

G

Ug

UPW"3"

Ug

UPW " 8"

UPW"2"

DLD"1"

1

a

b

1000r/min

M01

600

1A

c

"FBA"

"g"

2.5V

2

1000r/min

"FBS"

5V

3

1000r/min

3—5

n

i_d

n=1400r/min

n(r/min)							
i_d (A)							

n=800/min

n=500r/min

n=800r/min

n(r/min)							
i_d (A)							
M(N.m)							

n=500r/min

n(r/min)							
i_d (A)							
M(N.m)							

S_1

" "

4

5 1

ASR ACR

PI

1
 a RP3
 b "5" "6" 5 μ F
 c RP₁ RP₂ $\pm 2.5V$
 2
 a RP3
 b "5" "6" 5 7 μ F
 c **G** **Ug** S₂ " " S₁
 RP₁ ACR ACR RP₁
 S₁ " " DLD "2"
 ACR RP₂ ACR DLD "2"
 5

- 1
- 2
- 3
- 4

- 1
- 2
- 3

			(ACR)	(ASR)
(FBC)	(FBS)	(GT)		
2-1				

6 1

- 1) NMCL-32/MEL-002T
- 2) M09/M08
- 3) **Rd** NMEL-03/4 NMCL-03
- 4) **G Ug** NMCL-31 NMCL-31A SMCL-01
- 5) Uct NMCL-33 NMCL-33F
- 6) NMCL-33 NMCL-33F
- 7) ACR ASR NMCL-18
- 8) TG
- 9) NMEL-13A/F/C

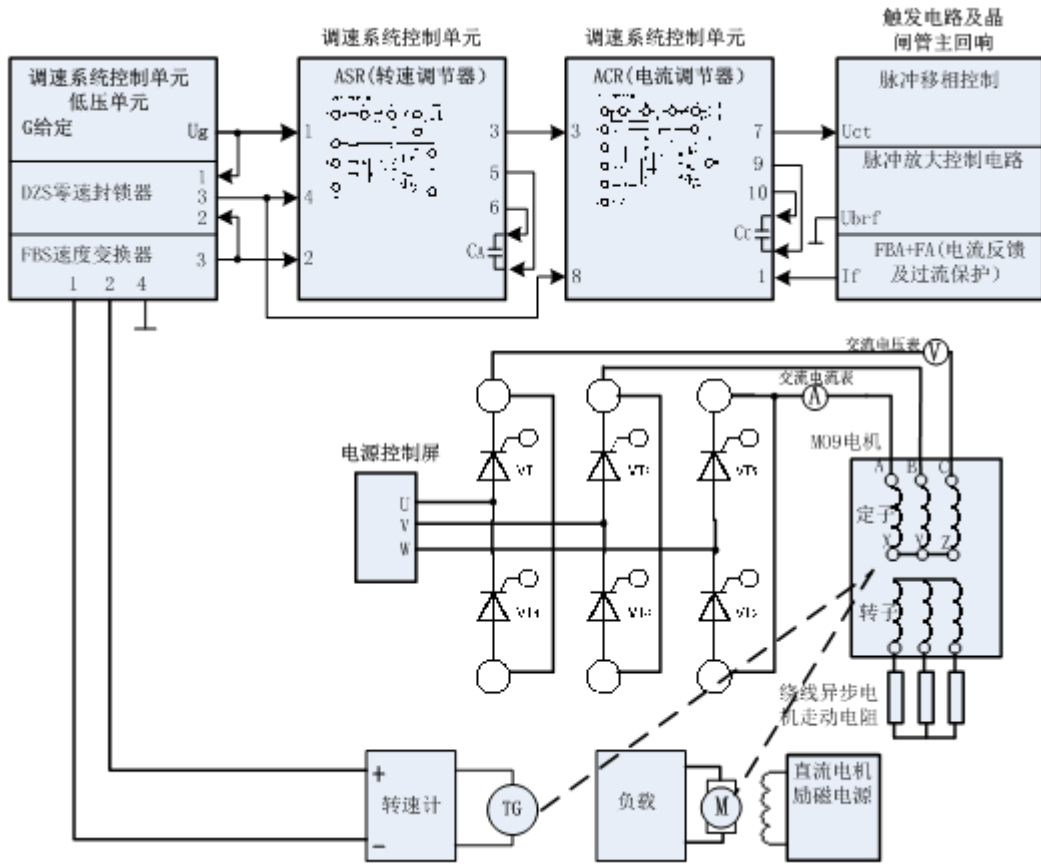
10)

NMCL-32 NMEL-18/2

11)

M01

NMEL-13A



6 1

- 1
- 3
- 5
- 8

- 2
- 4
- 7

1 ASR

ASR RP3

ASR "5" "6"

7 μ F

2

0.55A

3

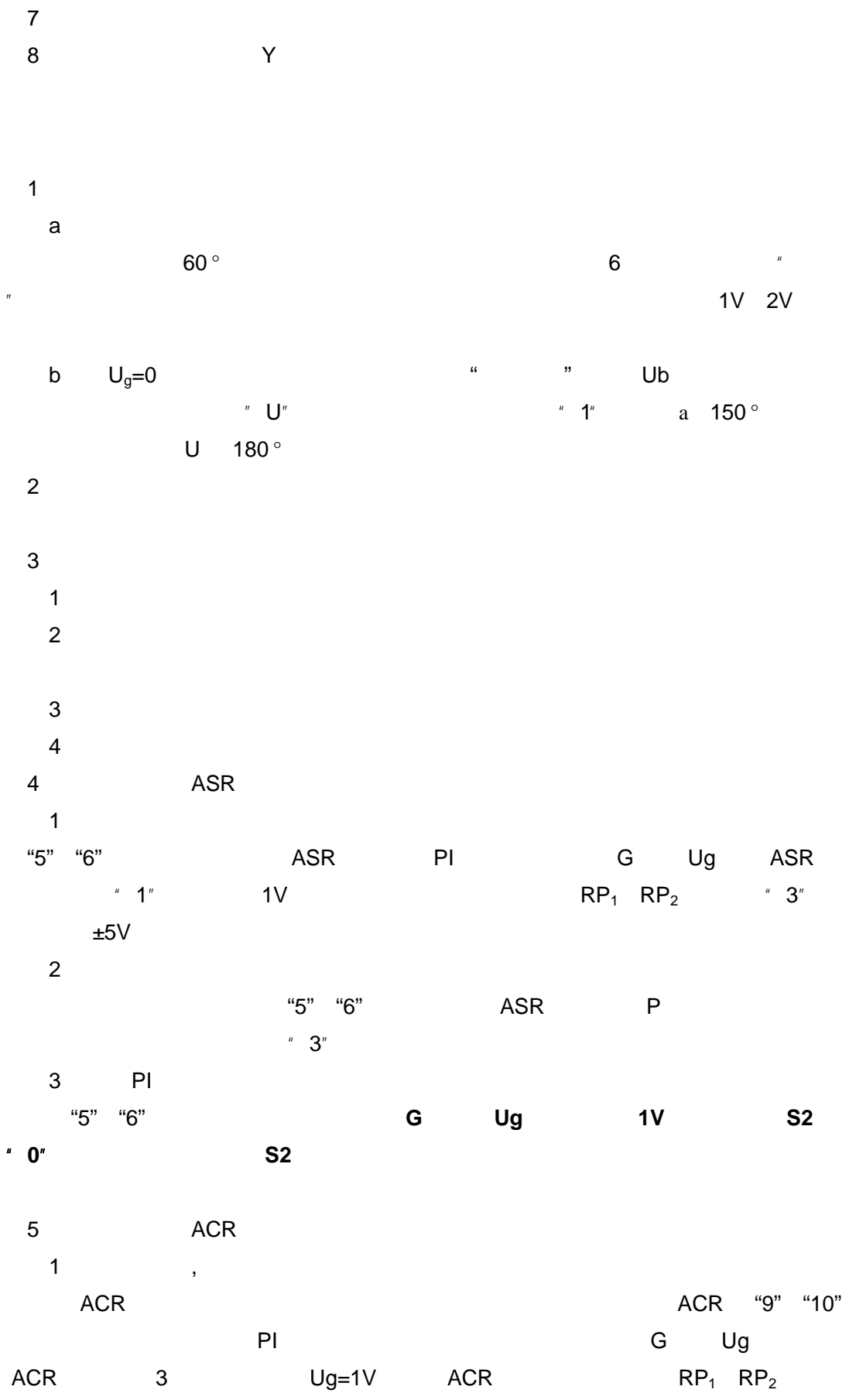
4

U_g

5

" "

6



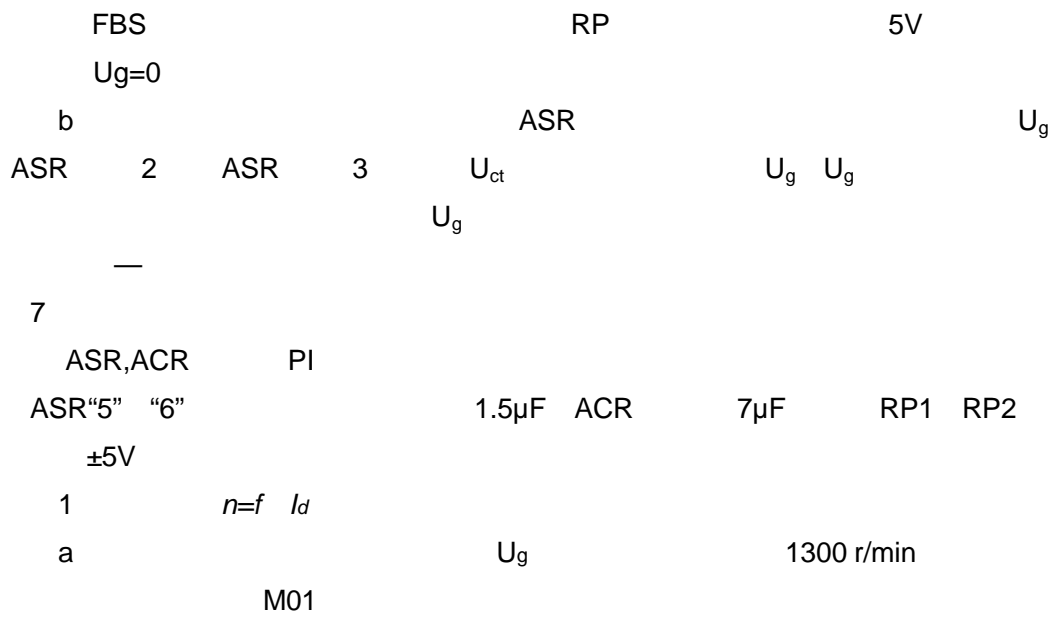
" 7" ±5V
 6
 1 U_{ct} U_g U_{bif}
 2 U_g=0
 " U" " 1" a 150°
 U 180°
 3 " " " "
 " " " " U V W 220V
 4 U_g U_g
 n=1400r/m M01

600
 3 5 U_d i_d n

n=f(I_d)

n(r/min)						
I(A)						
U _d						

6
 U_{bif} U_{blr}
 1
 a U_{ct} G
 U_g U_g=0 TG " ON"
 b Id Id=1.1I_{ed} FBC+FA) If RP1
 U_{fi} ASR
 ASR ±5V U_g 0,
 c U_g U_{ct} U_g ACR "3" If ACR 1
 ACR "7" U_{ct} PI ACR
 ACR "9" "10" 1.5μF U_g ASR
 +5V 1.1I_{ed} I_d
 If U_{fi} I_d<1.1I_{ed} I_d<I_{ed}
 U_g 0,
 2
 a U_g U_{ct} U_g U_g 0,
 TG " ON" U_g n=1400r/min



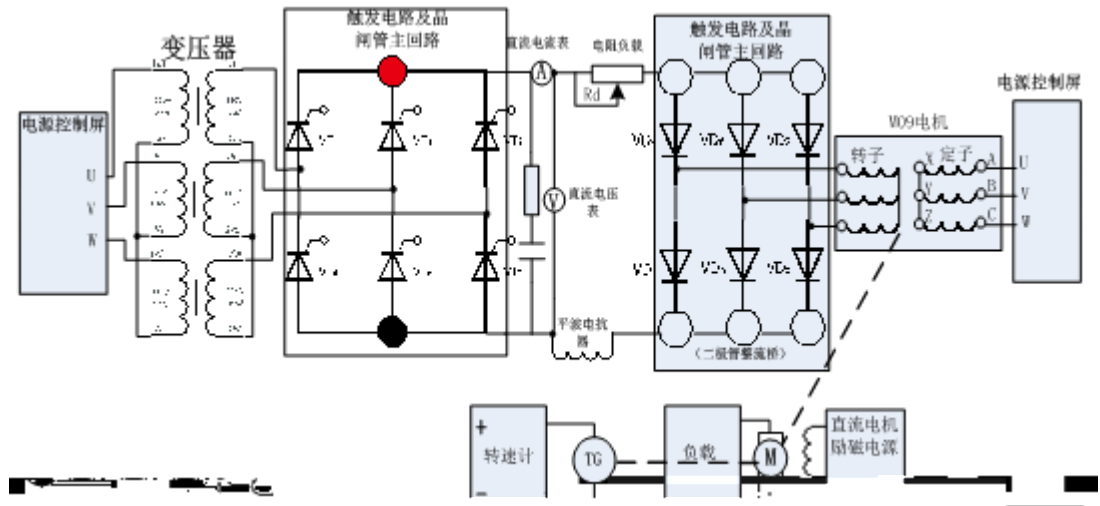
1
2
3

- 1
- 2
- 3

- 1
- 2
- 3
- 4

ACR	GT	MF	FBS	ASR
	5-1		7 1	FBC

- 1) NMCL-32/MEL-002T
- 2) M09/M08
- 3) **Rd** NMEL-03/4 NMCL-03
- 4) **G Ug** NMCL-31 NMCL-31A SMCL-01
- 5) **Uct** NMCL-33 NMCL-33F
- 6) NMCL-33 NMCL-33F
- 7) **ACR ASR** NMCL-18
- 8) **TG**
- 9) NMEL-13A/F/C
- 10) NMCL-32 NMEL-18/2
- 11) **M01** NMEL-13A



7 1

- | | |
|---|---|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |

- | | | | | |
|----|-----|----------------|---------|---------|
| 1 | | | | |
| | | min | | |
| 2 | | 90° | 150° | 90° |
| 3 | | 4 | 1 | |
| 4 | ASR | | | ASR RP3 |
| | | ASR | "5" "6" | 7μF |
| 5 | | | 0.55A | |
| 6 | | | | |
| 7 | | U _g | | |
| 8 | | | " " | |
| 9 | | | | |
| 10 | Y | | | |

1

a

b

c

2

3

U_{brf}

U_b

$U_{ct}=0$

a

150°

1V 2V

90° a 150°

ASR

ASR

0V

$a=150^\circ$

ASR

RP1

$a=90^\circ$

