

1  
2  
3

ASR

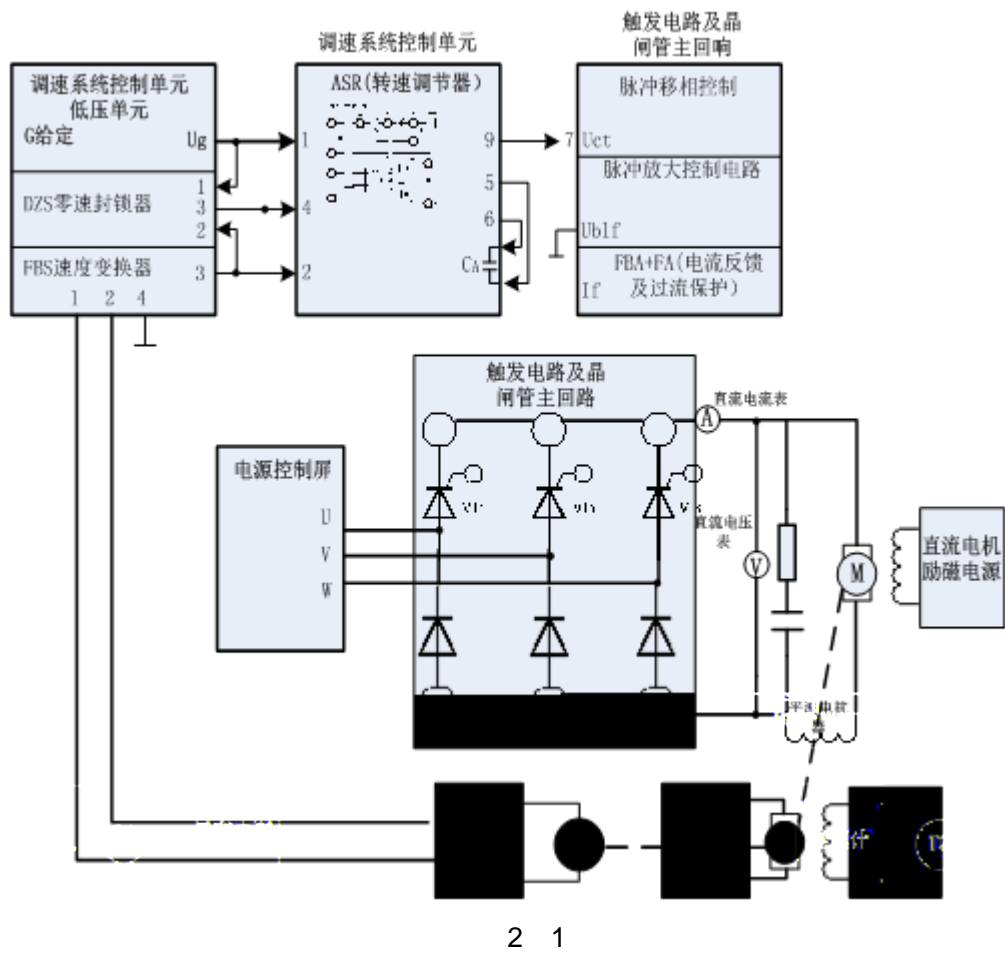
1  
2

—

—

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"

ASR RP3

1A

7 $\mu$ F

$U_g$

" "

1

a  $60^\circ$  6 " 1V 2V

b  $U_g=0$  " " Ub " 1" a  $150^\circ$  U  $180^\circ$

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

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 RP<sub>3</sub> 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 $\mu$ F ASR

b

$U_g$   $n_0=1500$  /  
3 5

2

$i_d$ 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

$a_{min}$

$b_{min}$

$U_g$

ASR

$U_g=U_{fn}$

ASR

1  
2  
3  
4  
5

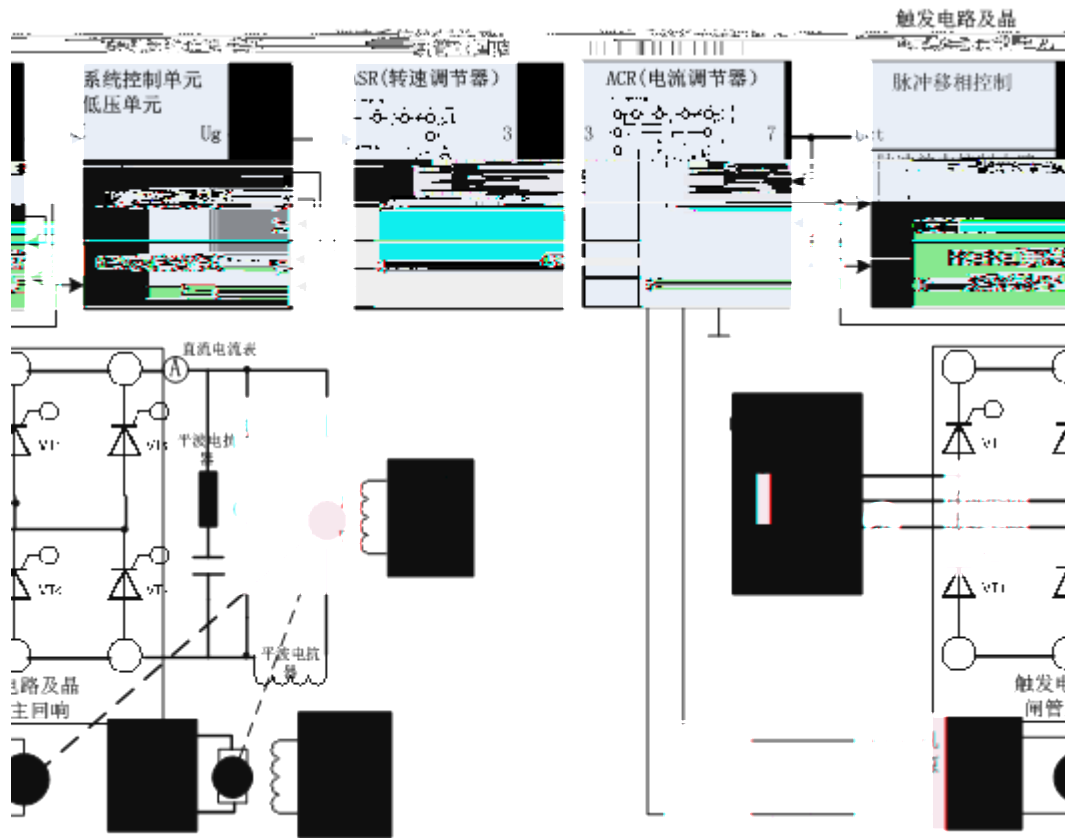
U<sub>g</sub>

“ ”

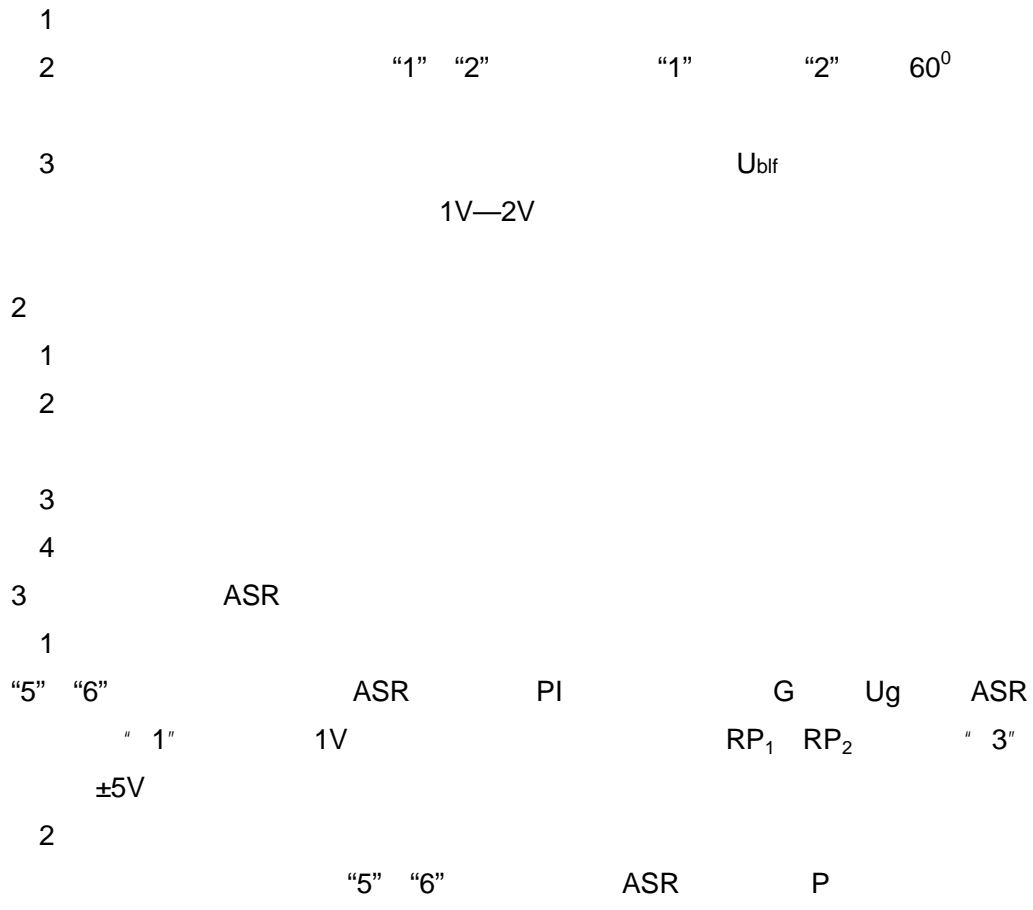
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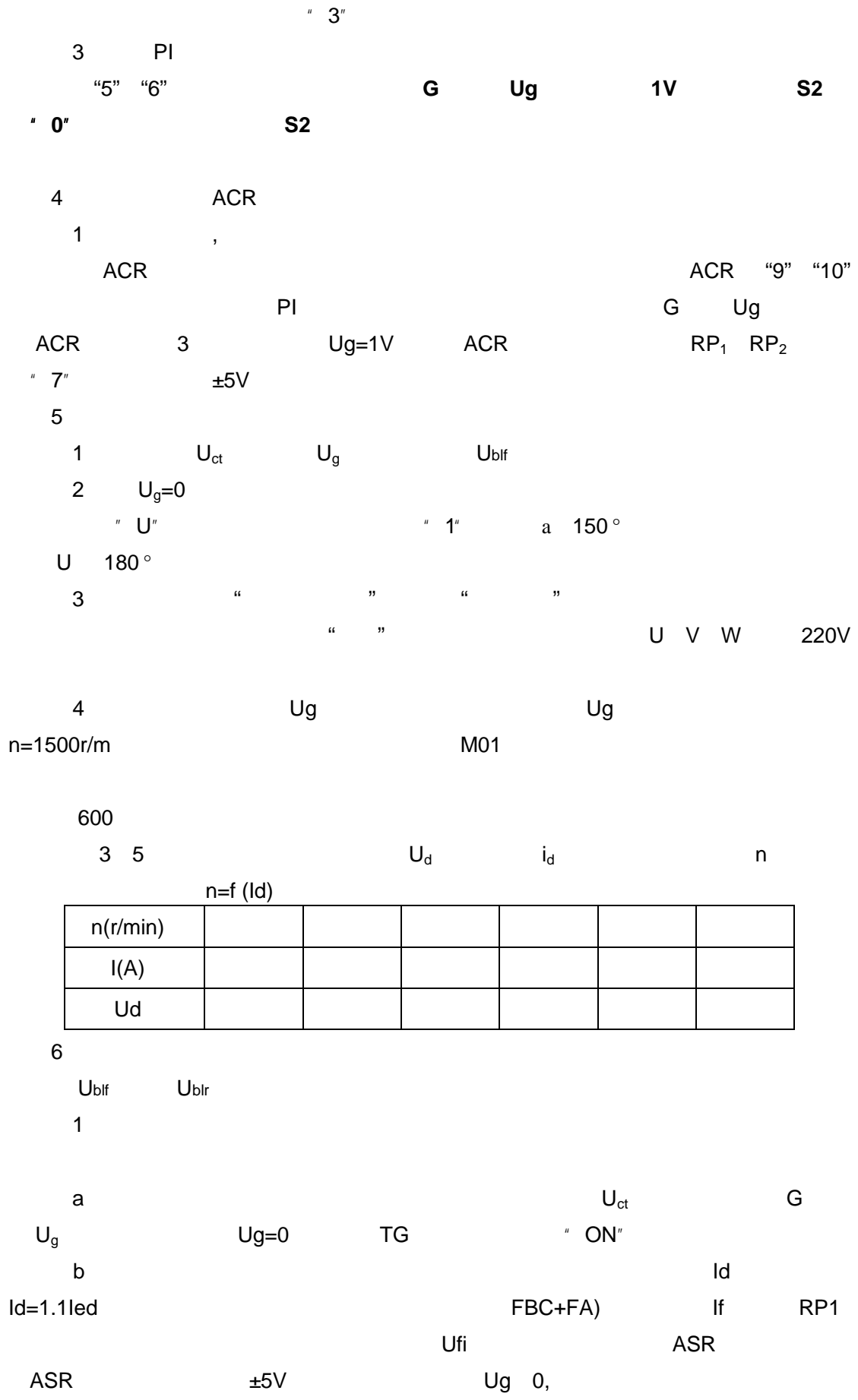
1

- 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







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

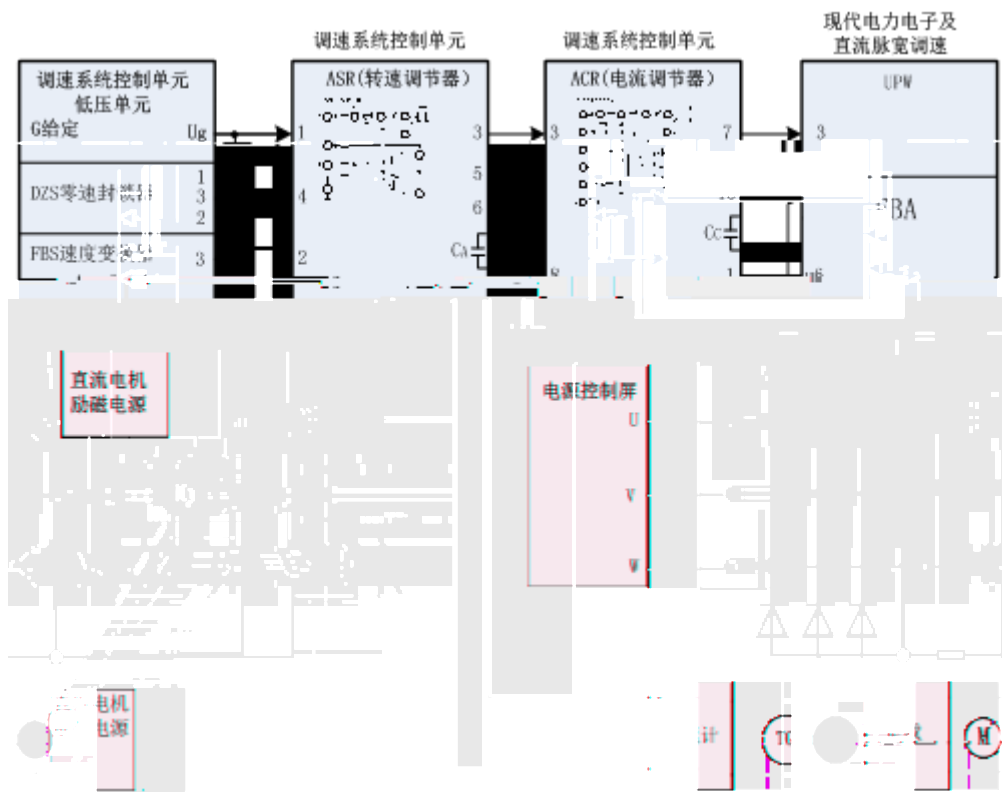
FA  
UPW

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 $\mu$ F

1A

U<sub>g</sub>

" "

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 $\mu$ F  
 c RP<sub>1</sub> RP<sub>2</sub>  $\pm 2.5V$   
 2  
 a RP3  
 b "5" "6" 5 7 $\mu$ F  
 c **G** **Ug** S<sub>2</sub> " " S<sub>1</sub>  
 RP<sub>1</sub> ACR ACR RP<sub>1</sub>  
 DLD "2"  
 S<sub>1</sub> " " RP<sub>2</sub> ACR  
 ACR RP<sub>2</sub> 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



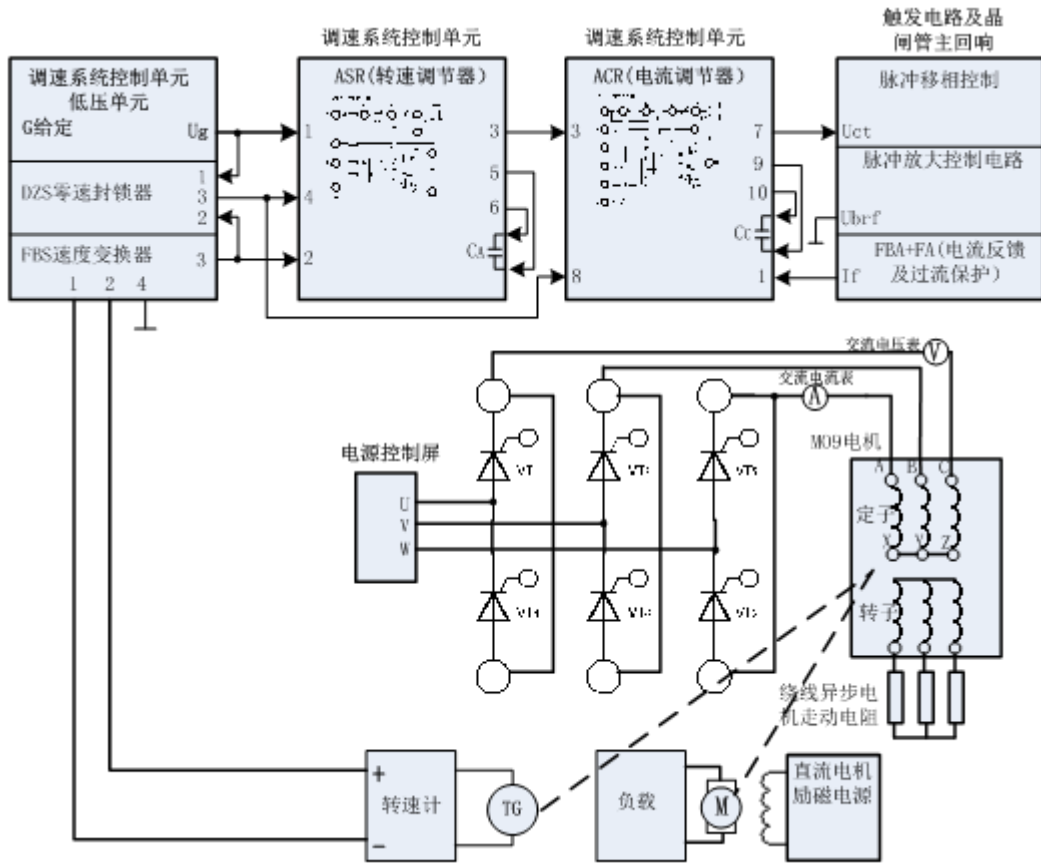
10)

NMCL-32 NMEL-18/2

11)

M01

NMEL-13A

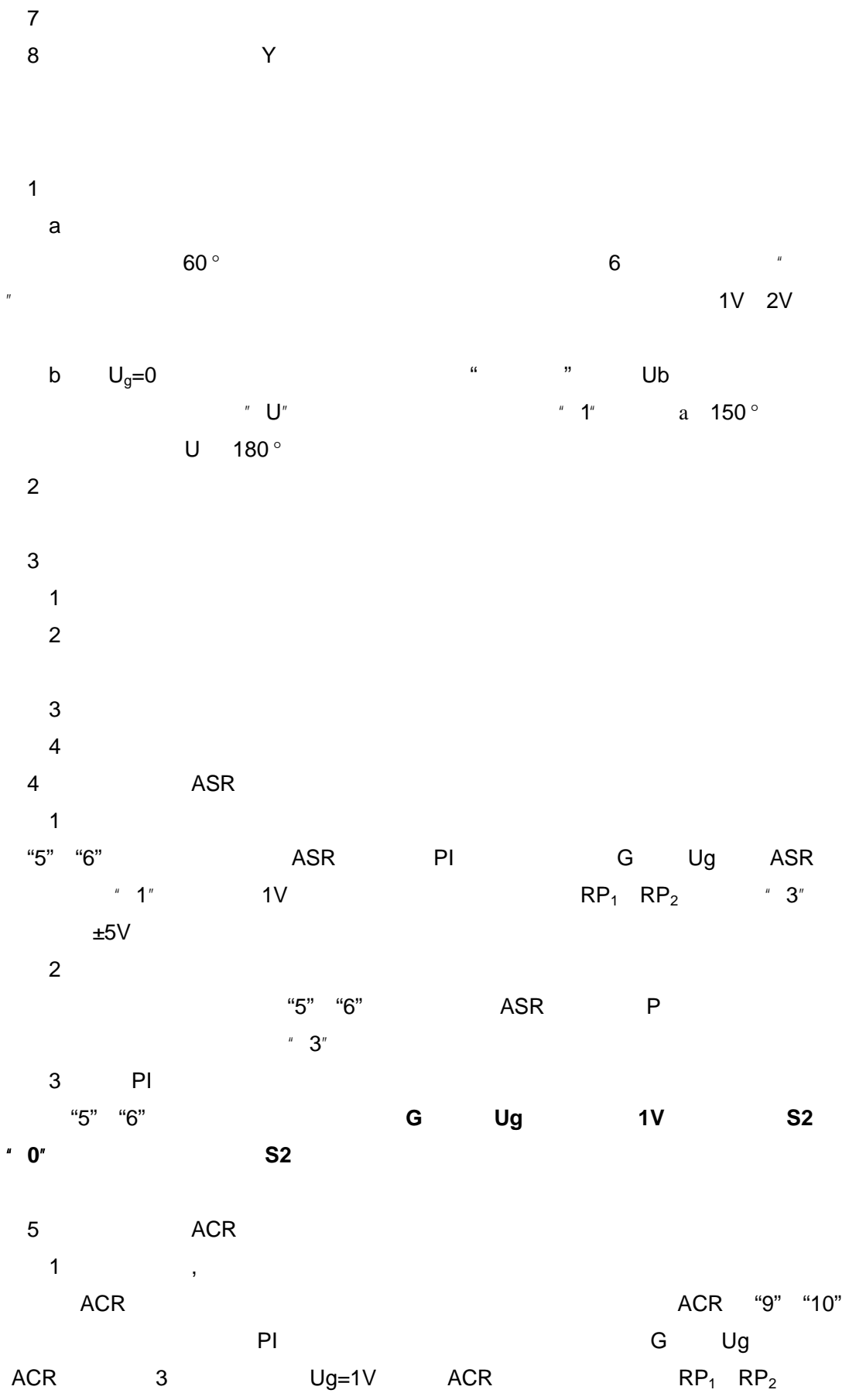


6 1

- 1
- 3
- 5
- 8

- 2
- 4
- 7

1	ASR		ASR	RP3	
		ASR	"5" "6"		7μF
2			0.55A		
3					
4		U <sub>g</sub>			
5			" "		
6					



" 7" ±5V  
 6  
 1 U<sub>ct</sub> U<sub>g</sub> U<sub>bif</sub>  
 2 U<sub>g</sub>=0  
 " U" " 1" a 150°  
 U 180°  
 3 " " " "  
 " " " " U V W 220V  
 4 U<sub>g</sub> U<sub>g</sub>  
 n=1400r/m M01

600  
 3 5 U<sub>d</sub> i<sub>d</sub> n

n=f(I<sub>d</sub>)

n(r/min)						
I(A)						
U <sub>d</sub>						

6  
 U<sub>bif</sub> U<sub>blr</sub>  
 1  
 a U<sub>ct</sub> G  
 U<sub>g</sub> U<sub>g</sub>=0 TG " ON"  
 b Id Id=1.1I<sub>ed</sub> FBC+FA) If RP1  
 U<sub>fi</sub> ASR  
 ASR ±5V U<sub>g</sub> 0,  
 c U<sub>g</sub> U<sub>ct</sub> U<sub>g</sub> ACR "3" If ACR 1  
 ACR "7" U<sub>ct</sub> PI ACR  
 ACR "9" "10" 1.5μF U<sub>g</sub> ASR  
 +5V 1.1I<sub>ed</sub> I<sub>d</sub>  
 If U<sub>fi</sub> Id<1.1I<sub>ed</sub> Id<I<sub>ed</sub>  
 U<sub>g</sub> 0,  
 2  
 a U<sub>g</sub> U<sub>ct</sub> U<sub>g</sub> U<sub>g</sub> 0,  
 TG " ON" U<sub>g</sub> n=1400r/min



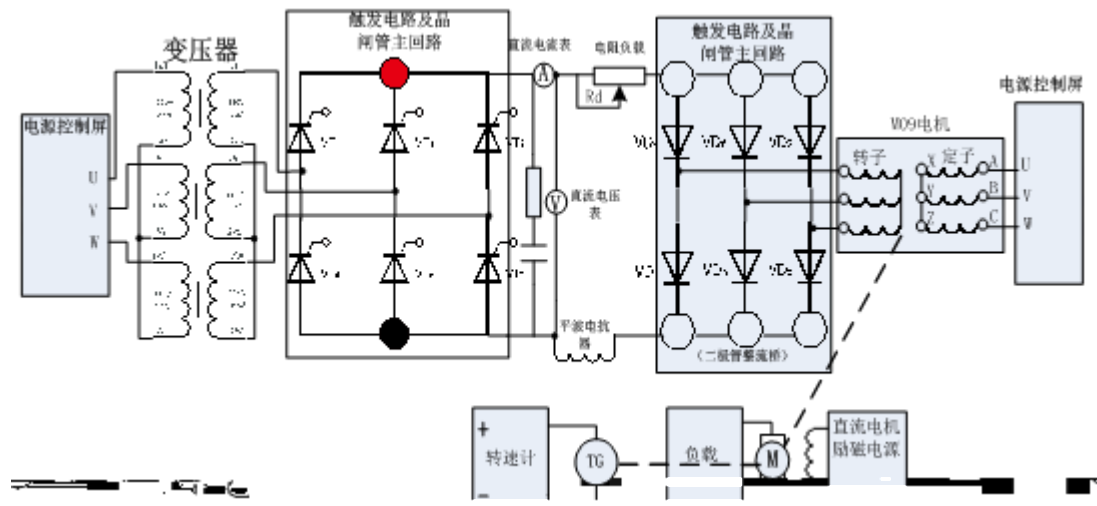
1  
2  
3

- 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
- 3
- 5
- 7

- 2
- 4
- 6
- 8

1

min

2

90° 150°

90°

3

4

1

4

ASR

ASR

RP3

ASR "5" "6"

7μF

5

0.55A

6

7

U<sub>g</sub>

8

" "

9

10

Y

1

a

b

c

2

3

$U_{brf}$

$U_b$

$U_{ct}=0$

a

$150^\circ$

1V 2V

$90^\circ$  a  $150^\circ$

ASR

ASR

0V

$a=150^\circ$

ASR

RP1

$a=90^\circ$



