

†

1.

1

1.

DC3000V

2.

2.1

15.6" LCD			1366 × 768		
120GB			4GB		
1		10/100Mbps 802.3u		2 USB	
16					
16					
24					
10K/s,20K/s,50K/s,100K/s					
3000VDC					
220V 50Hz,			-15% +15%		
220V			-15% +15%		
mm	407 () × 150() × 370()				
	10kg()				
	-5 +45		5		95%
	-5 +45		95rh%		

[REDACTED]

	RMS	
4 20mA		
	AC150V AC1000V	
		AC10A
		AC1A AC200A
	DC ± 100mV DC ± 2000V	
		DC ± 200mA
		DC ± 100A
	1:1 1:60	

“ A ”

“ B ”

[REDACTED]

d'

--	--

2.4

16

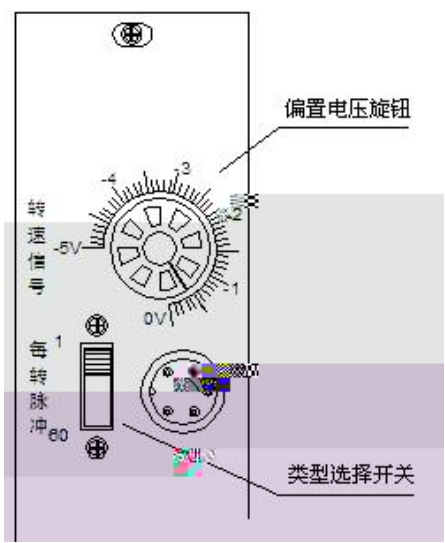
2.4

2.4

8	8		DC24 220V
8	4	4	DC24 220V AC220V/5A
16			/

2.5

2.5.0



2.5.0

3

DC-5 0V

1:1

± 300V “ ”

Vpp 1 5V

-3 -2V

1 60

60

60

0

1 1

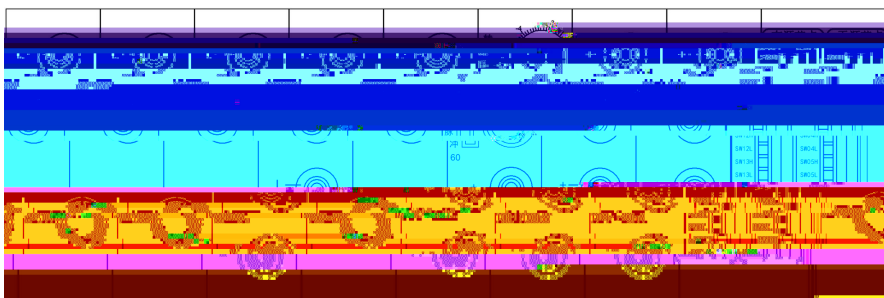
“ 6.1 -

”



3.2.0

3.2.1



3.2.1

4.

4.1

8

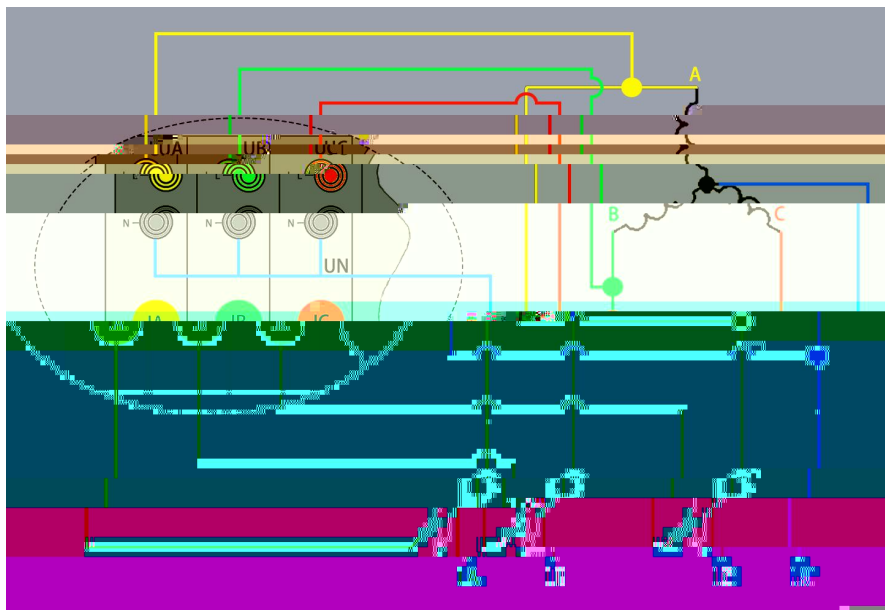
1

J

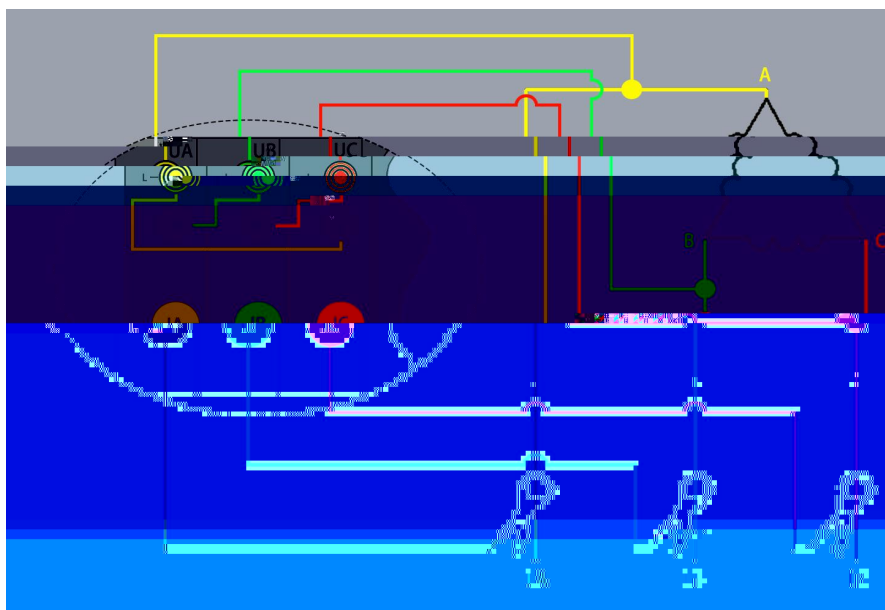
(AC10A)	< 0.1Ω		
(AC150V)	> 80kΩ		
	> 1MΩ	± 2000V	> 400kΩ ± 500V

4.2

4.2.1



4.2.0



4.2.1

4.2.2

DC ± 100mV

0 75mV

2

5.

5.1

5.1

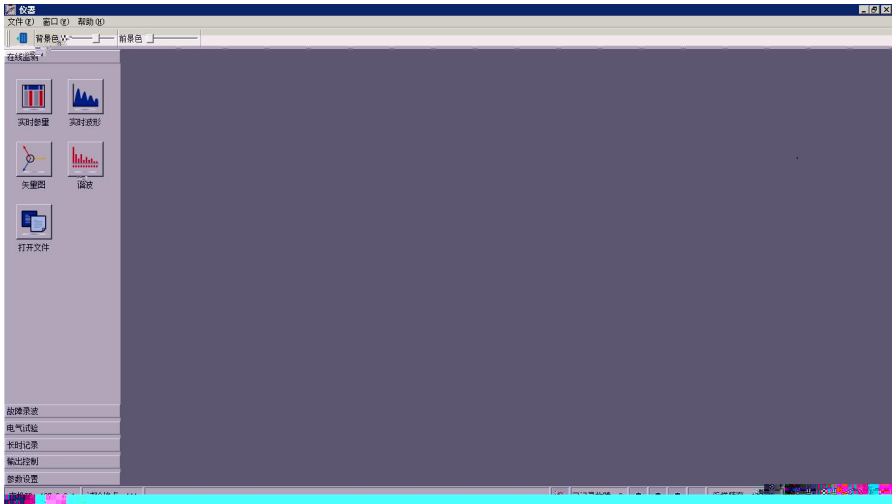
5.1

		20ms
		20ms
	Y	X
		- -
		10 100kHz

5.2

“ MR400L ” “ -

-PDM-04 ” 5.2.0

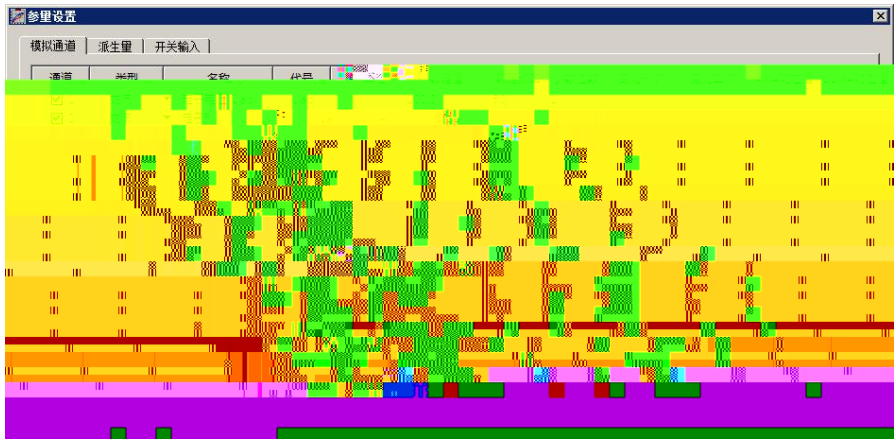


5.2.0

/

κρ€





6.1.0

6.1.0

“√” “□”

4 20mA

RMS PT CT
/ 15kV/100V 12kA/5A
20ms /
/ 1500A/75mV
4 20mA 20ms 4mA
20mA 4mA 20mA 4 20mA
45 55Hz 4mA /20mA 45 55
18
7
5

0
PT CT

0 3 4

PT	CT
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
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89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

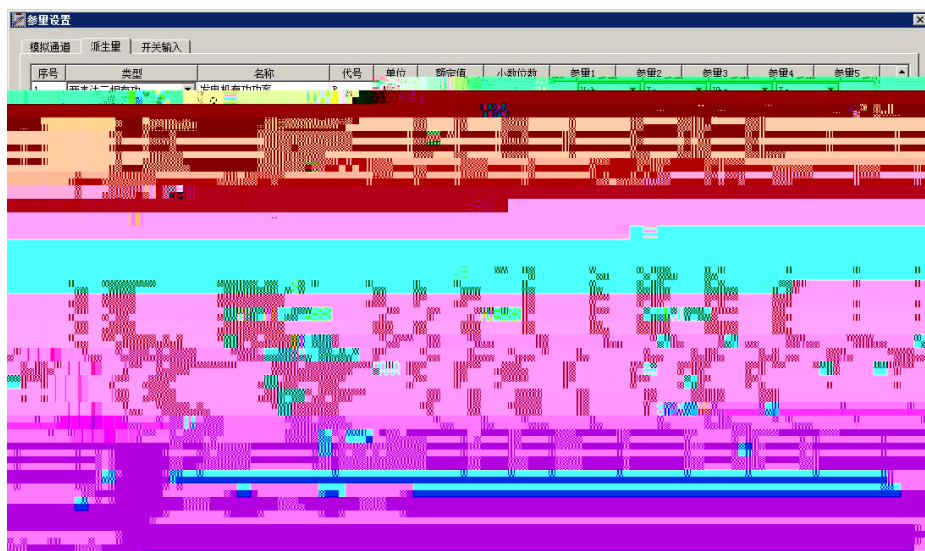
4mA	4	20mA	4mA
20mA	4	20mA	20mA
	“	”	“
			”

[illegible]

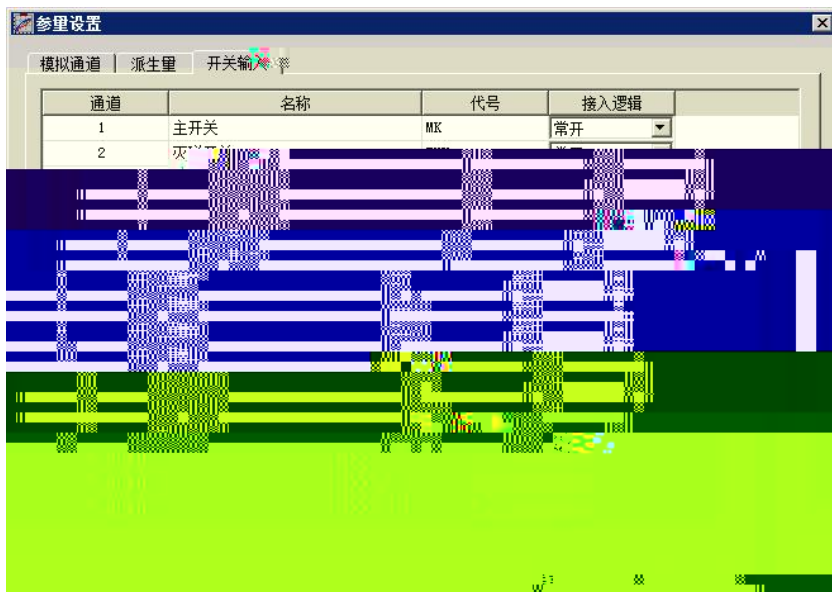
10kHz

- 1
- 2

6.1.1

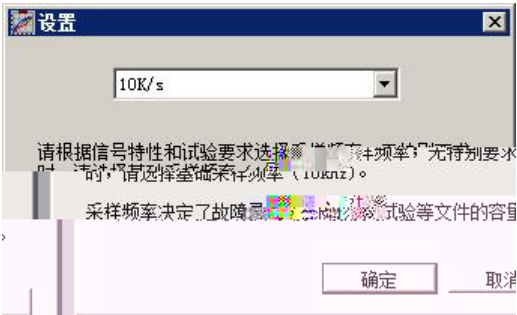


6.1.1



6.2

“ / ” 6.2.0



6.2.0

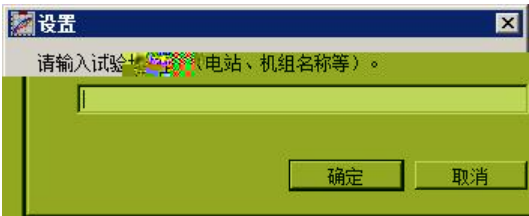
10kHz 20 kHz 50 kHz

100kHz

10kHz

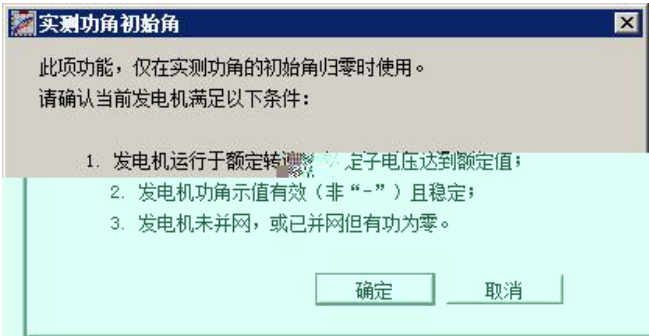
6.3

“ / ” 6.3.0



6.3.0

α_p α



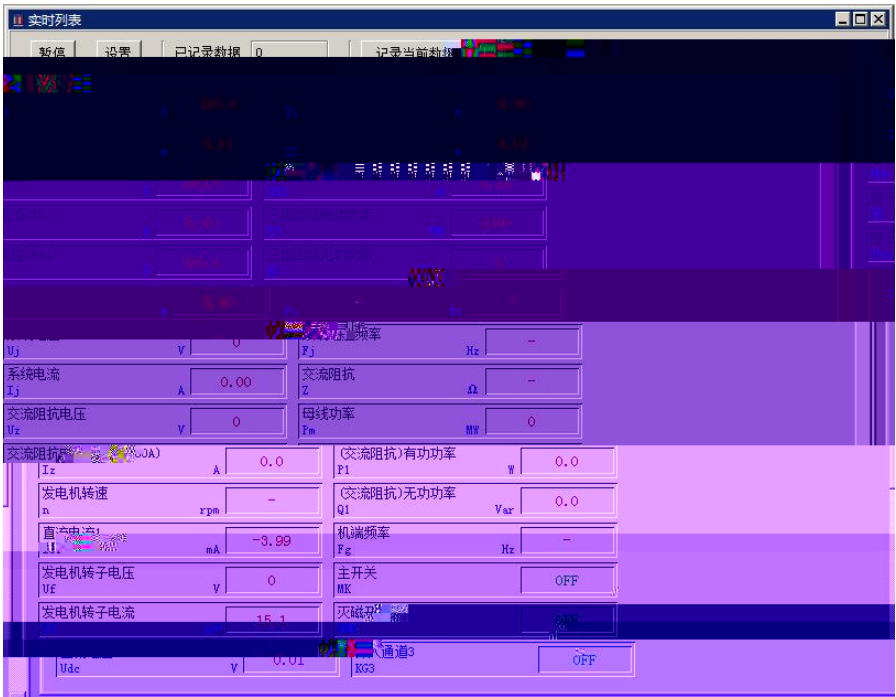
6.4.0

- 1)
- 2) “ - ”
- 3)

7.

7.1

“ / ” 7.1.0

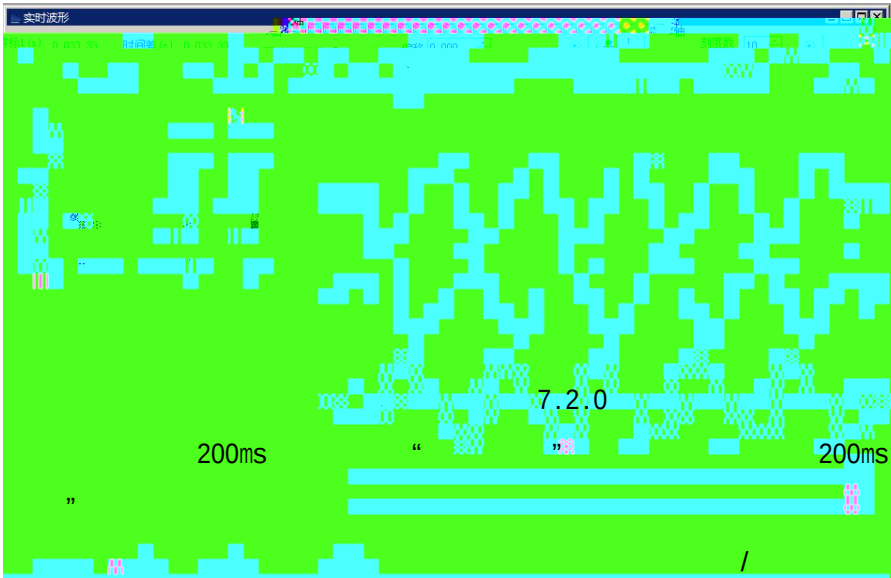


7.1.0

“ / ” “ / ” 7.1.1

7.2

“ / ” “ ” 7.2.0



“ T ”

游标1 (s)	0.333,33	时间差 (s)	0.333,33
游标2 (s)	0.666,67	频率 (Hz)	3.000

“ ”

Y轴

☐ 统一纵轴 ☒ 标么值 ☐ 有功 ☐ 无功 ☐ 电压 ☐ 电流

☐ 坐标线 ☒ 有名值 值格 100.000



X

X



X

X

Y

Y

Y

()

/

-1.0 +1.0()



/

.wvf

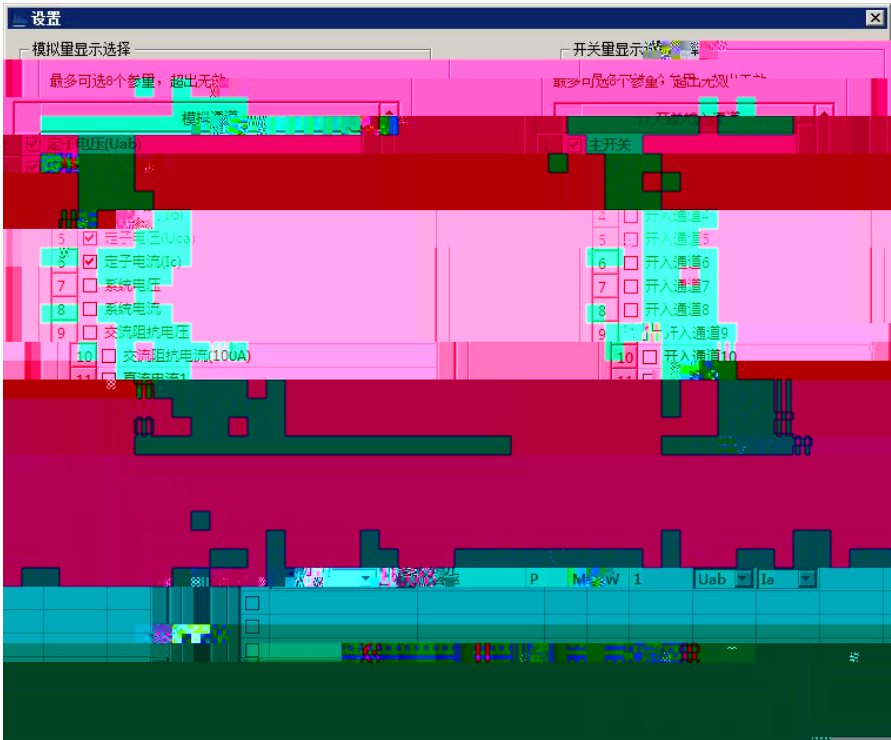
Excel /COMTRADE

“ ”

“

”

7.2.1

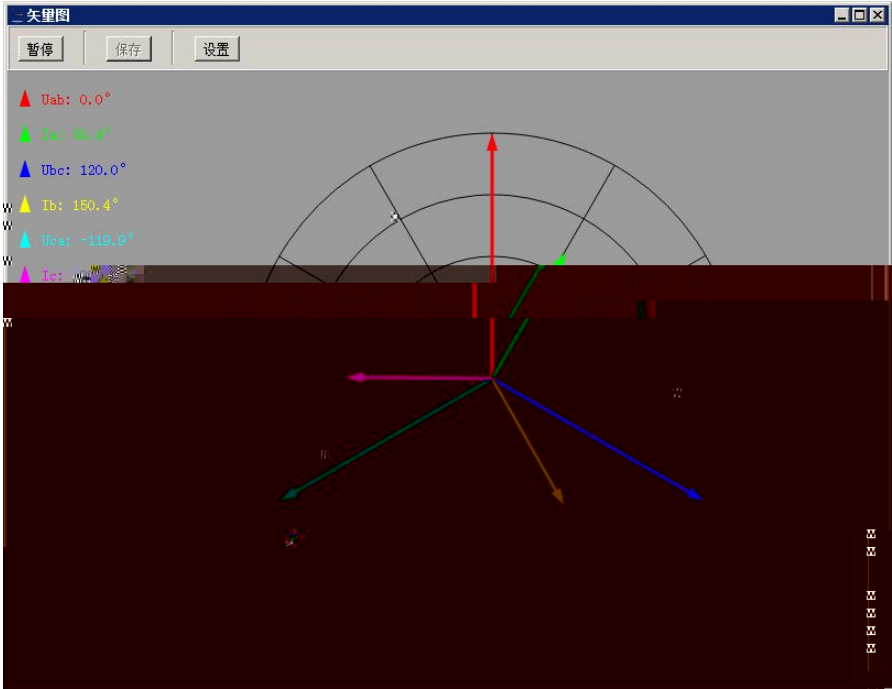


7.2.1

7.3

“ / ” “ ”

7.3.0



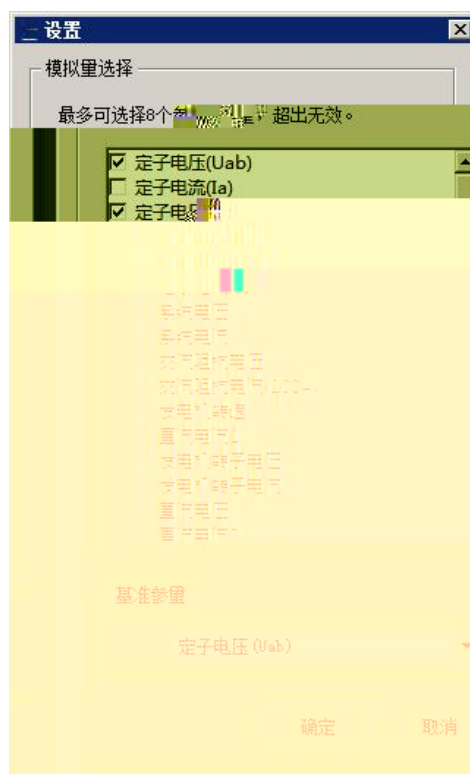
7.3.0

“ / ”

“ ”

“

”

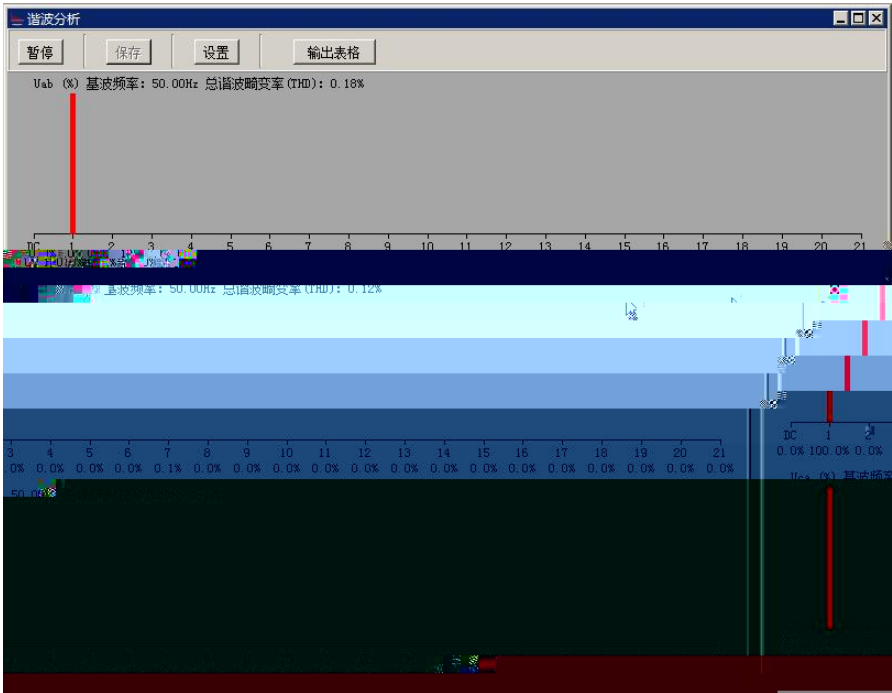


7.4

“ / ” “ ” 7.4.0 harmonic ratio /HR) 100%

“ ”

“ 9.1 ”



7.4.0

“ / ” “ ”
“ ”
“ / ” “ ” /
3 21 51

7.4.1

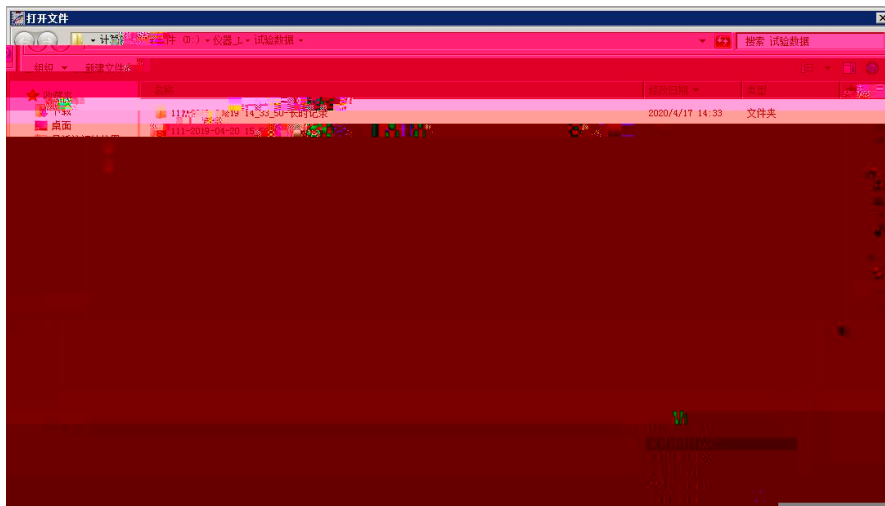
7.4.1

“ / ”

Excel

7.5

“ / ” “ ” 7.5.0



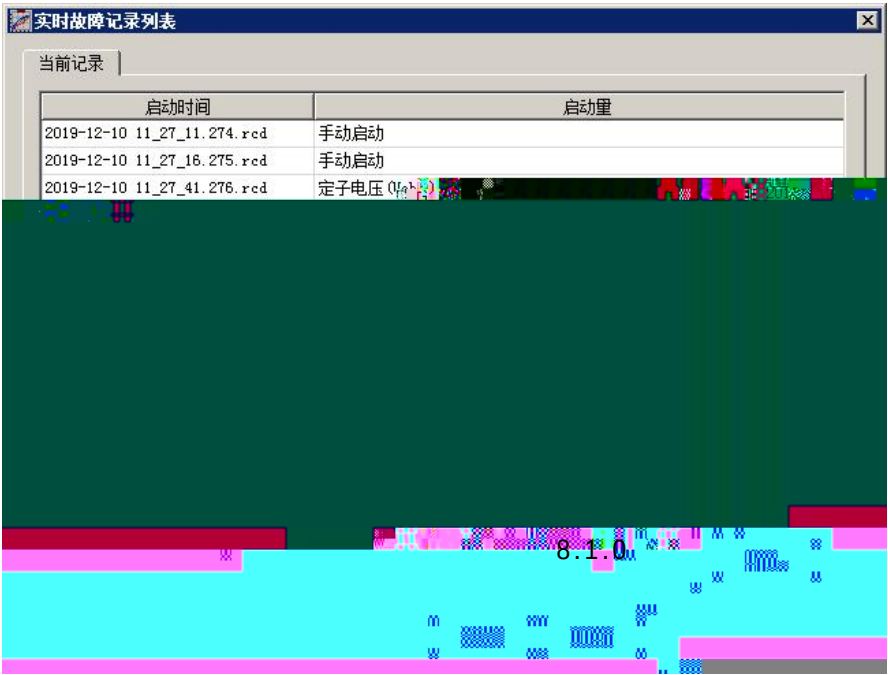
7.5.0

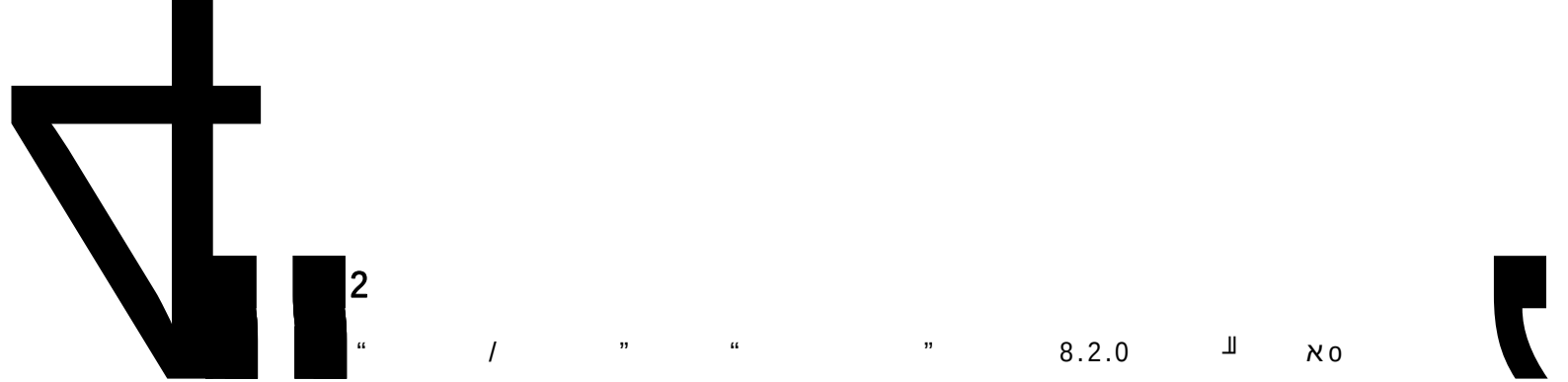
1000	1000	1000
1000	8.0	8.0
	:	2% 5%
	≤ 0.1ms	

8.1

“ / ”

” 8.1.0





8.2.0

16

24

16

16

24

17

“

”

“

”

“

”

“ ” Hm

Hm TO

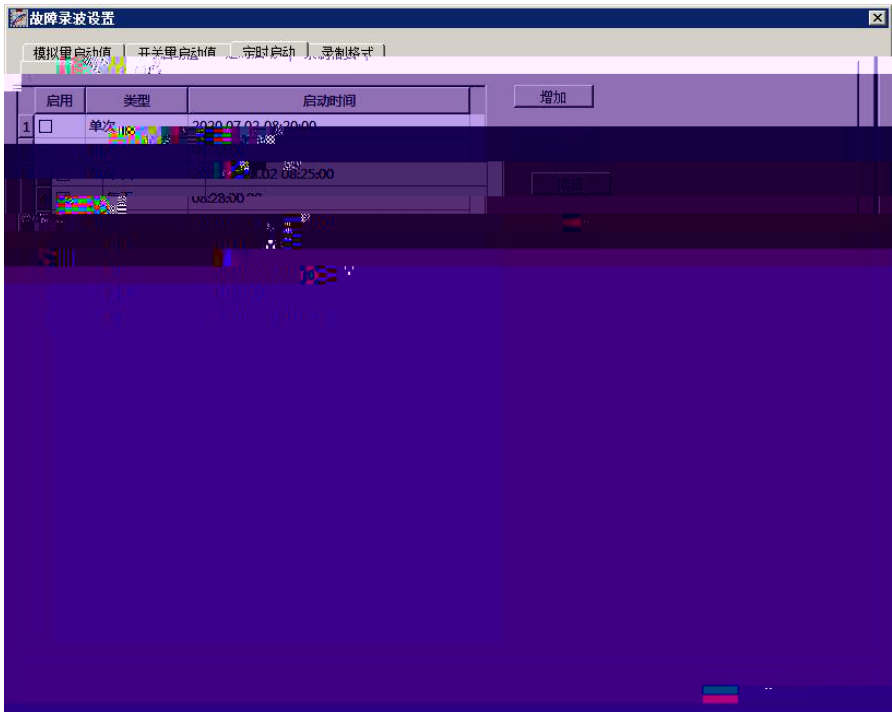
T

故障录波设置

模拟量启动值 开关量启动值 定时启动 录波格式

名称	代号	接入逻辑	闭合启动	断开启动
1 互锁		常开	☐	☐
2 开入通道3	FMK	常开	☐	☐
3 开入通道4	KG3	常开	☐	☐
4 开入通道5	KG4	常开	☐	☐
5 开入通道6	KG5	常开	☐	☐
6 开入通道7	KG6	常开	☐	☐
7 开入通道8	dCh 9	常开	☐	☐
8 开入通道9	dCh 10	常开	☐	☐
9 开入通道10	dCh 11	常开	☐	☐
10 开入通道11	dCh 12	常开	☐	☐
11 开入通道12	DOFB1	常开	☐	☐
12 开出通道2	DOFB2	常开	☐	☐
13 开出通道3	DOFB3	常开	☐	☐
14 开出通道4	DOFB4	常开	☐	☐

取消 确定

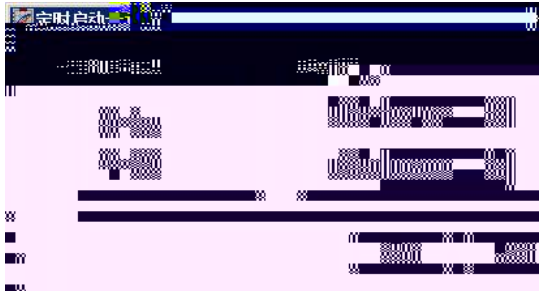


8.2.2

32

“ ”

8.2.3



8.2.3

8.2.4

故障录波设置

模拟量自动值 | 开关量自动值

模拟量波形

第一段记录
记录长度 (秒) 6.0

☒ 启用第二段记录

第二段记录
采样频率 2K/s
记录长度 (秒) 6.0

故障启动点前记录长度 (秒) 0.2

模拟量有效值

总记录长度 (秒) 6.0
故障启动点前记录长度 (秒) 1.0

开关量

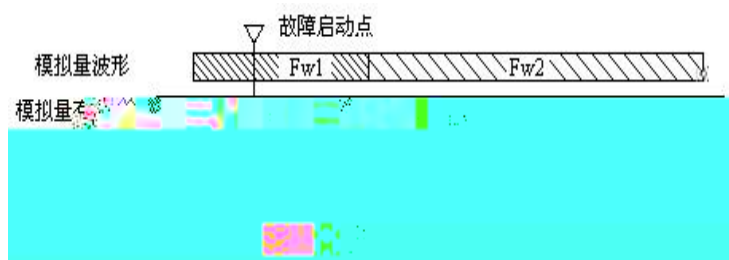
总记录长度 (秒) 5.0
故障启动点前记录长度 (秒) 0.2

当前故障记录文件数据量: 2.44M

故障记录文件上限: 80M

确定 取消

8.2.4



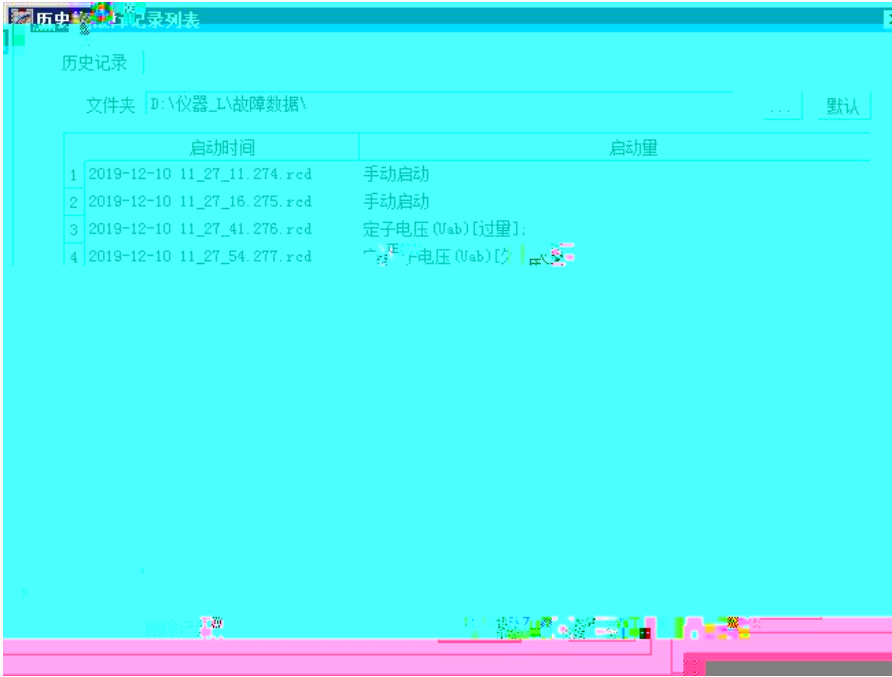
Fe 1 /20ms
Fd

8.3

“ / ” “ ” 8.1.0

8.4

“ / ” “ ” 8.4.0



8.4.0

8.5

8.5.0



8.5.0

2

“ ” “ / ” “ ”
/ “ √ ” “ □ ”

3

1 2

5 1 2

Excel COMTRADE

9.

1.

“ → → ”

“ ” “ → ”

2.

3.

4.

“ ** ** ”

“ ... ” “

.. ”

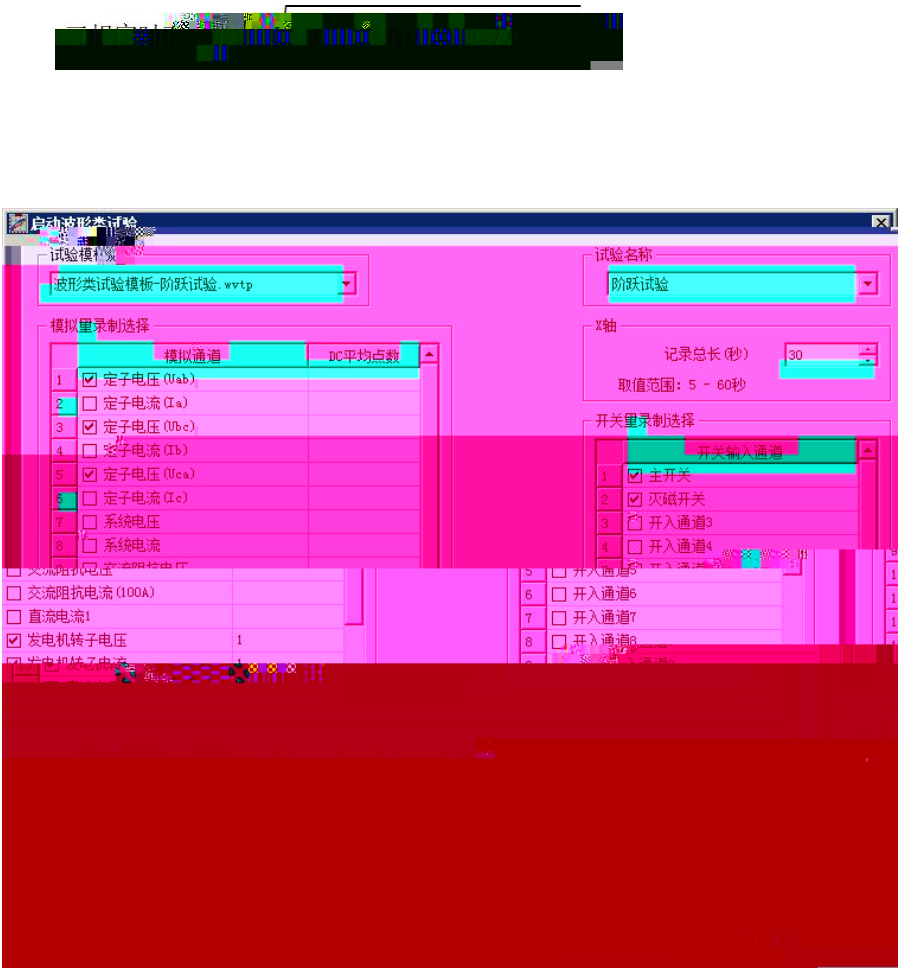
\
 \

9.1

60

PSS

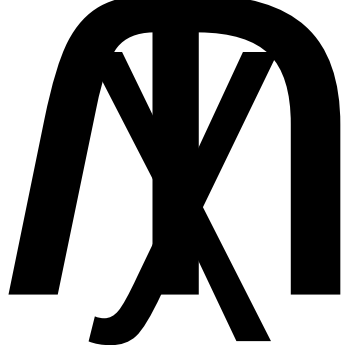
“ / ” “ x q



9.1.0

“ ”

	1	2	3	4	5	6
	U	I				
	Uab	Ia	Ubc	Ib	Uca	Ic
	Uab	Ia	Ubc	Ic		
	1					
	1	2				
	1	2	3			
	1	2				
	1	2	3	1~50		



“

”

“

”



9.1.1



9.1.1

“ 7.2

”

E

W

∇

∇

启动值设置

模拟量

开关量

	代号	单位	设定值	启动量
1	Uab	V	100.0	
2	Ia	A	5.00	
3	Uf	V	2000	
4	If	A	1870.0	

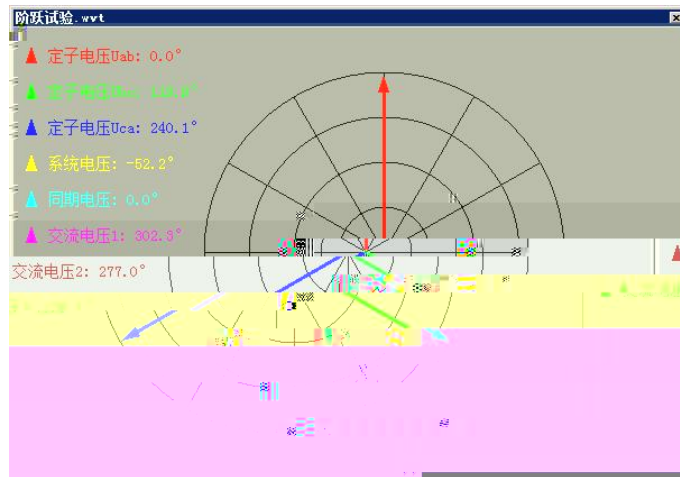
	代号	启动动作
1	MK	变位启动
2	FMK	不启动

Ua

Uvar

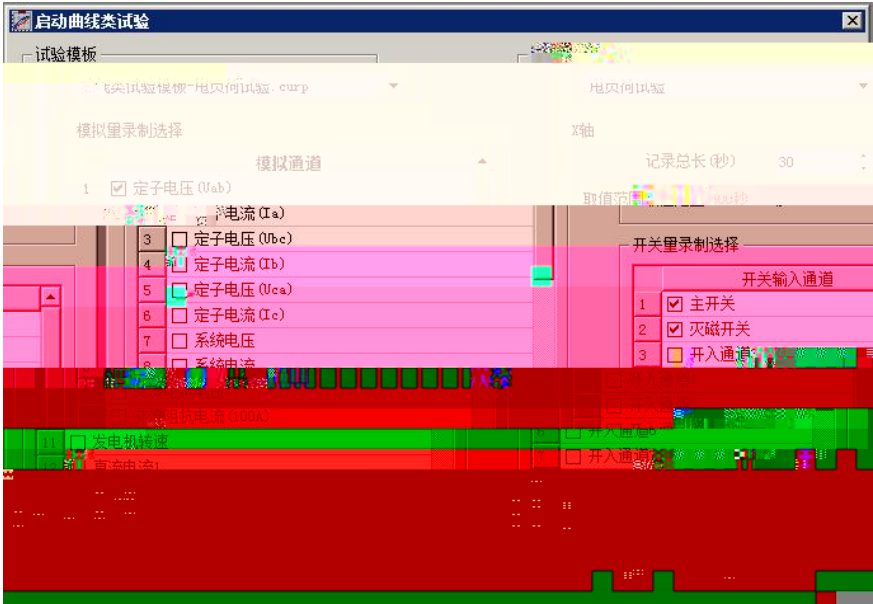
Hz

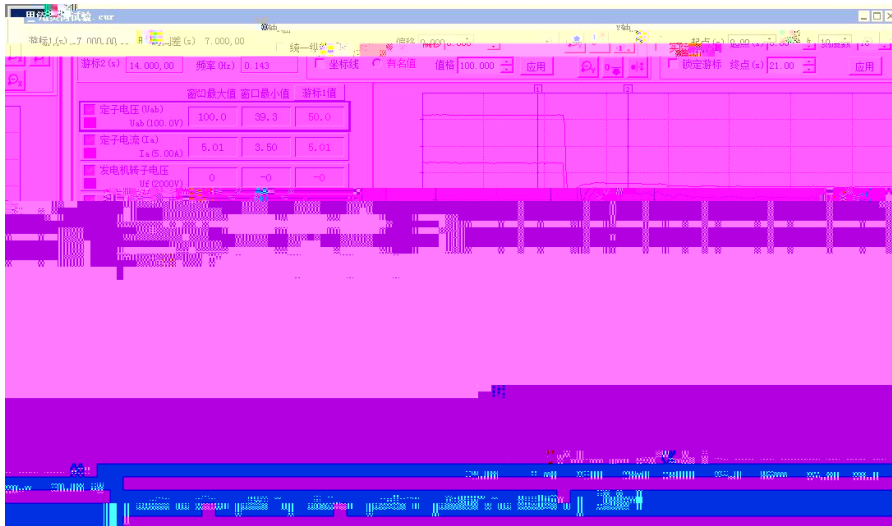
3



9.2

20ms





9.2.1

“ 7.2

”

\

“ ”

“ ”

“ ”

“ ”

“ ”

9.2.2

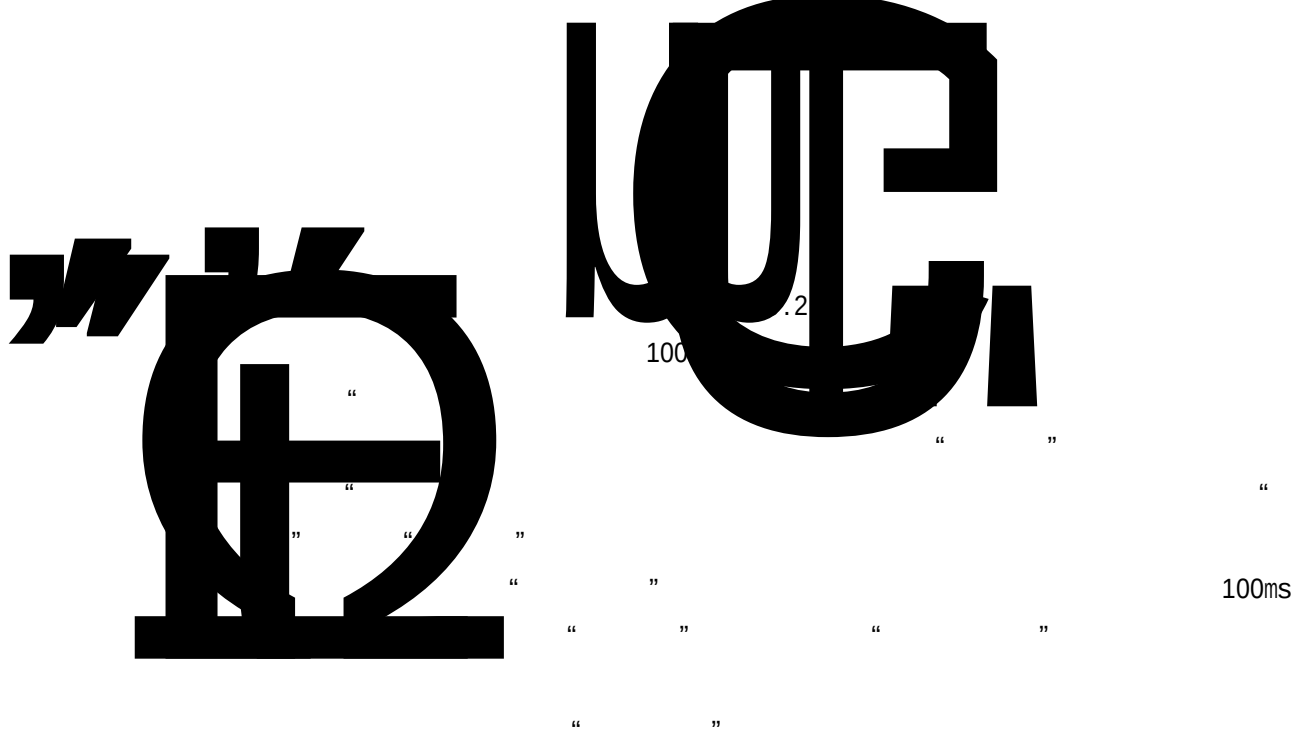
启动值设置

模拟量

序号	单位	启动值	启动量
1	V	100.0	
2	A	5.00	
3	V	2000	
4	mV	1870.0	

开关量

代号	启动动作
1 MK	变位启动
2 FMK	不启动



1 20ms 1 50

“ *20ms =

Excel COMTRADE

“ ”

“ / ” corp

ó ,

9.3

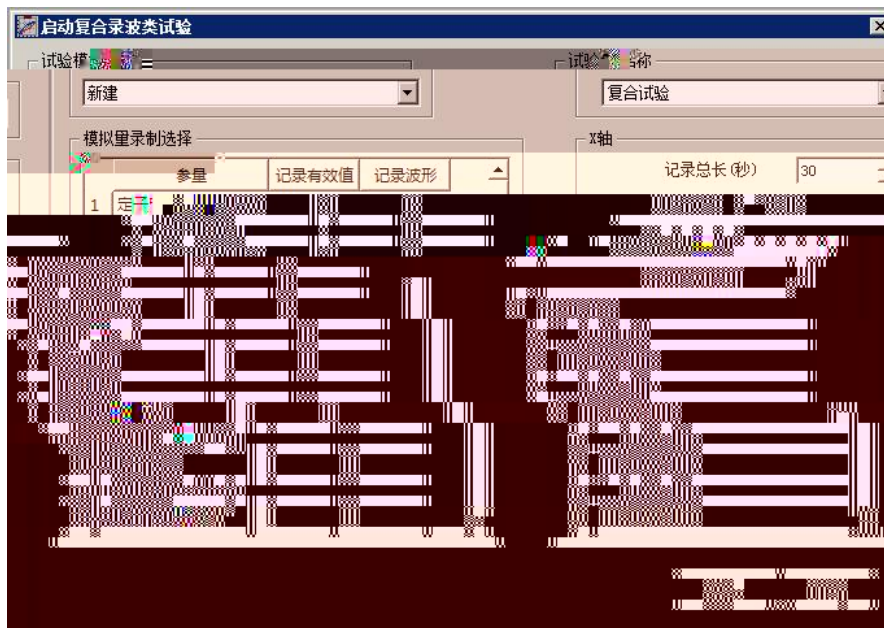
1	2	3	4	5
1	2	3	4	5
10kHz	2	3	4	5
50Hz	2	3	4	5
3	2	3	4	5

9.4

50Hz 20ms 10kHz

“ / ” “ ”

9.4.0



9.4.0

“ ”

“ / ”

“ ”

9.4.1



9.4.1

“ 9.2 ” E

W

“ ”

“ 9.1 ”

“ C ”

- ,

20ms 1 50

1

“ *20ms =

”

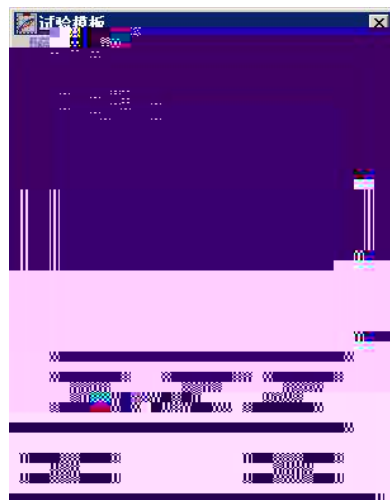
9.5

X-Y

“ ”

“ / ” “ ”

9.4.0

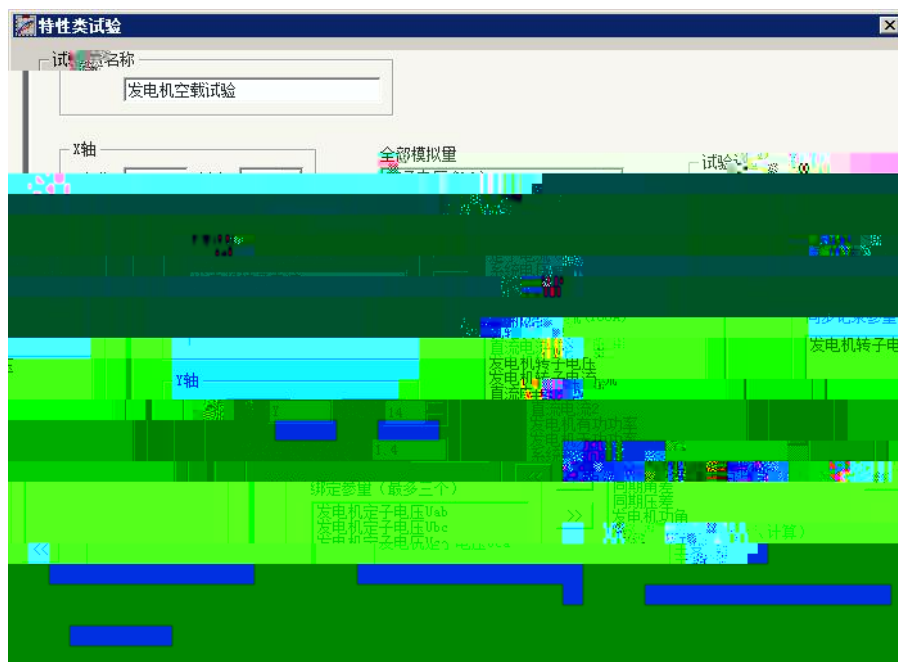


9.5.0

“ ” “ ”

”

9.5.1



9.5.1



9.5.3

9.5.3

-

20ms

1 50

1

“ *20ms =

”

“

-

”

/

“

”

“YÑ”

X

Y

A.

X Y

“

”

B.

“

1. “ ”

2.

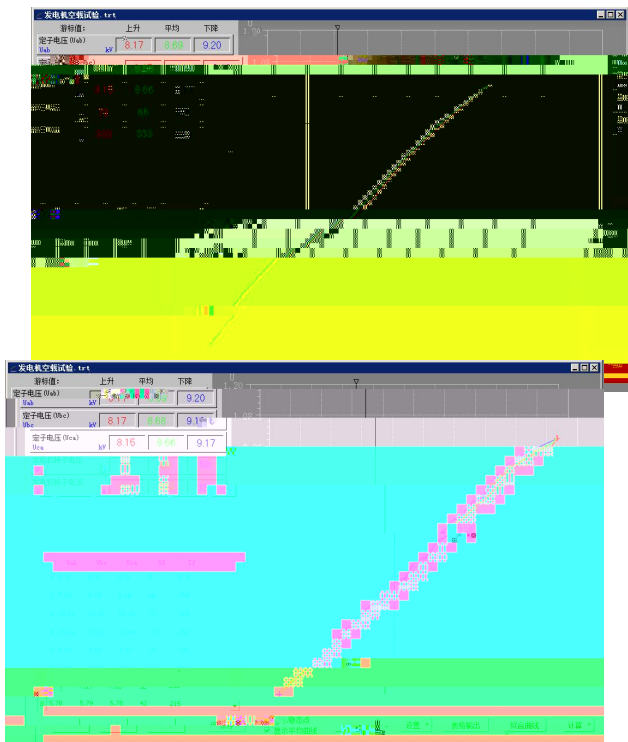
3.

/

10

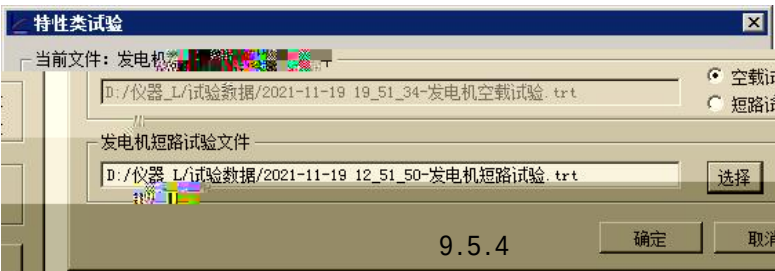
20

20



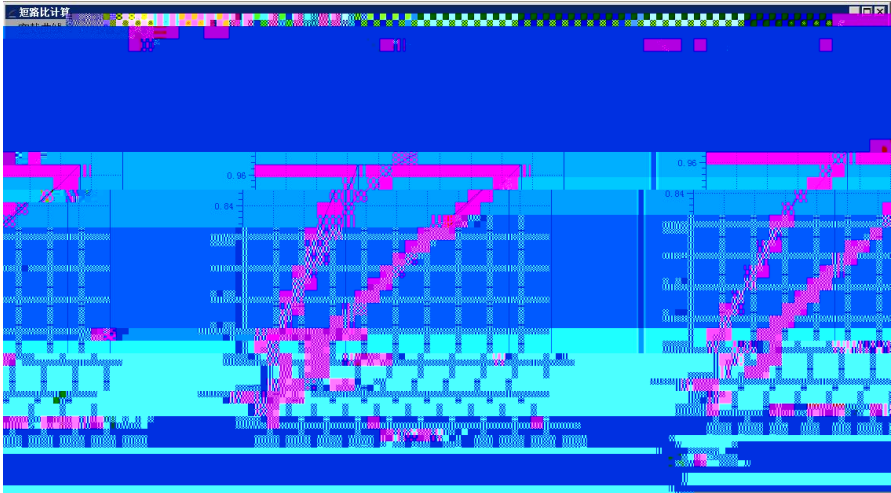
Xd

9.5.4



“ ” “ ”

9.5.5



9.5.5

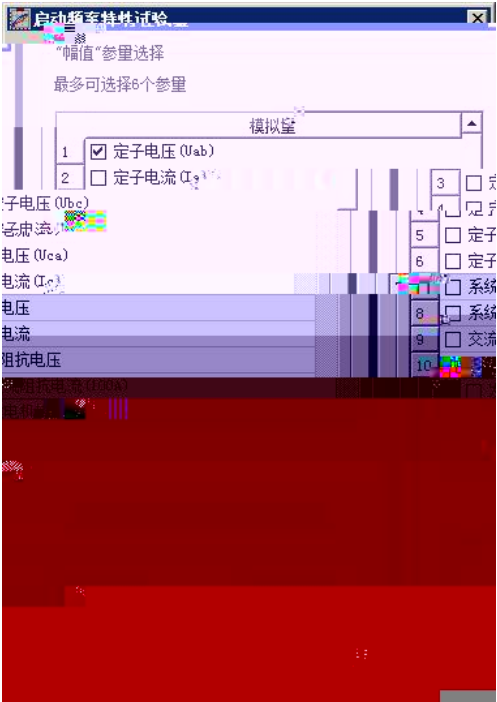
X_d

1.0

9.6

“ ” “ ”
“ / ” “ ”

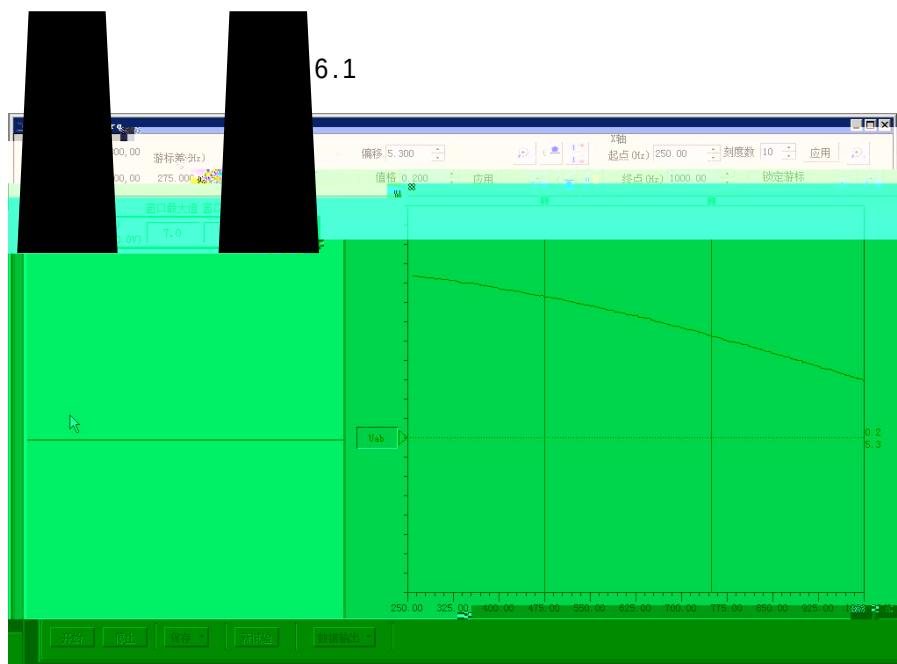
9.6.0



9.6.0

3 4 5 6

- 1. “ ”
- 2. “ ” “ ”



9.6.1

“ 7.2

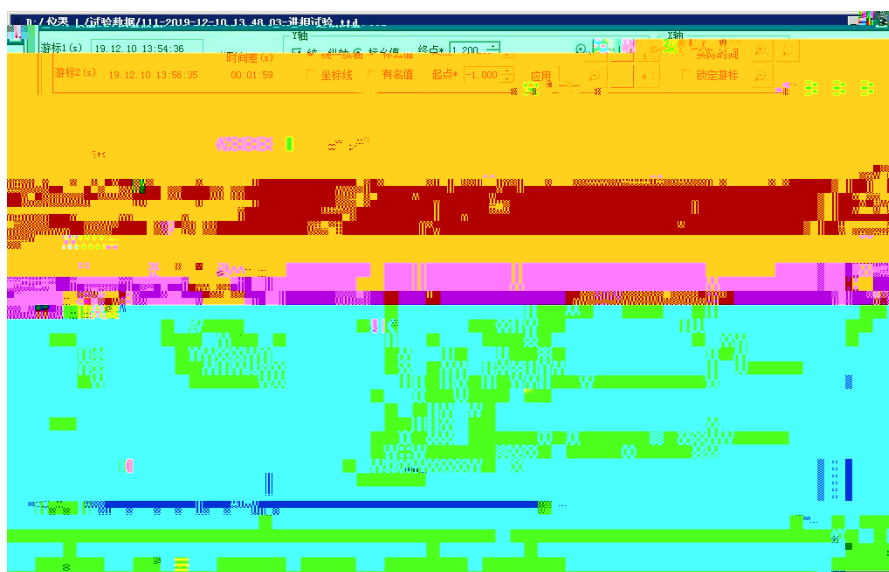
”

\

“ ”
“ ”
“ ”

“

9.7.0



		ΔU	U_s	U_j	A_{sj}
--	--	------------	-------	-------	----------

* 1 2

24V

“ ”

U_s

U_j U_s PT 100V

“ ” PT 100V 100

PT

U_j PT 57.735V

= 100 = 57.735

100V

U_s

U_j

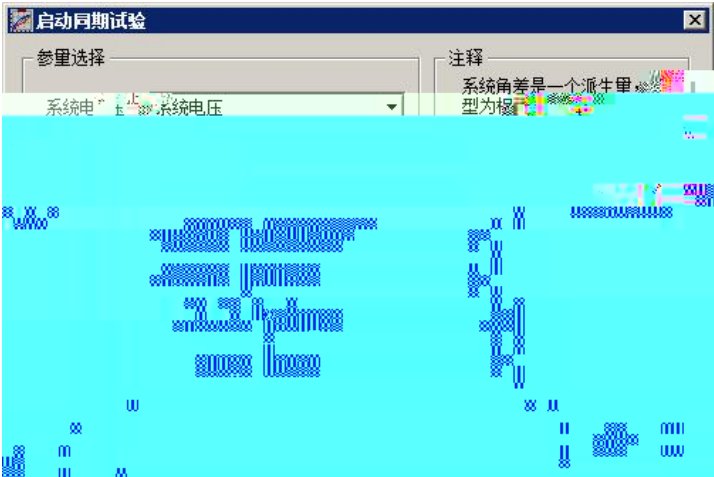
U_j

“ ”

“

” “ 3 ”

“ ” “ ” 9.8.0



9.8.0

“ ”

O

—

9.9



9.9.1



9.9.1

3

“ 0 ”

-

- Excel

Excel

-

“ ”

“ ”

0

“ ”

“ ”

” “ ”

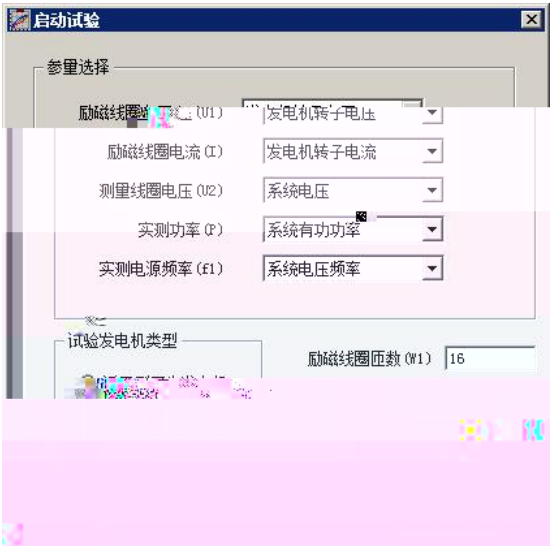
“ ”

9.9.2

9.9.2

9.10

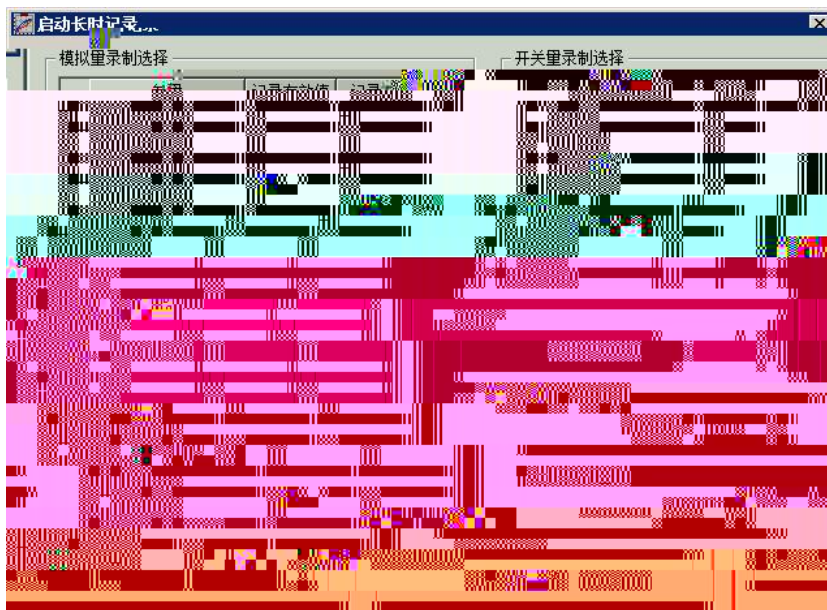
“ / ” “ ” 9.10.0



9.10.0

Ð ×

9.10.2





1 31

1 10kHz

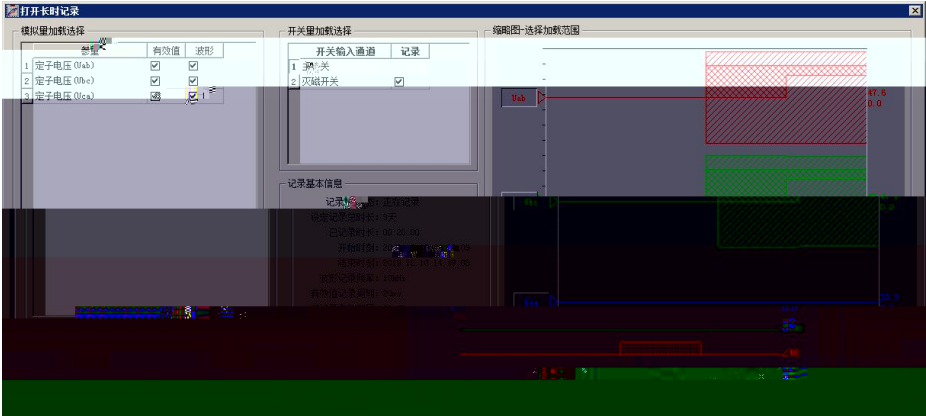
20ms 1s

“ Aà ” “ ”

10.3

“ ” “ ”

10.3.0

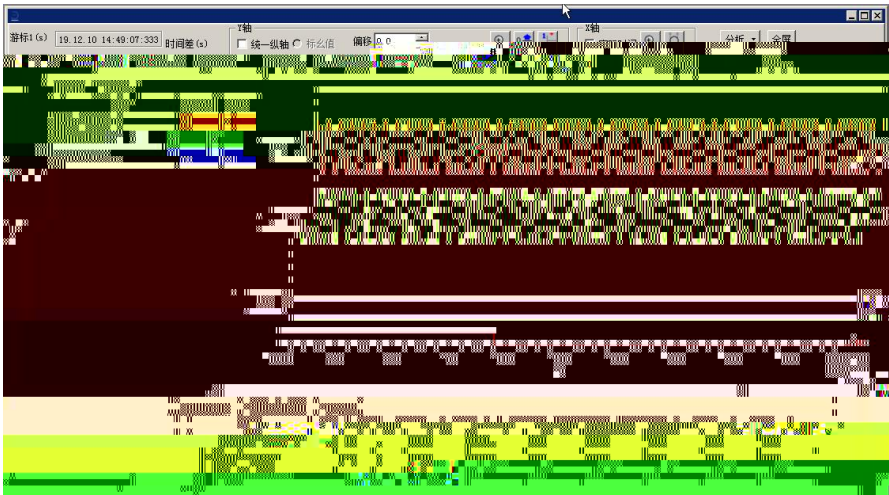


10.3.0

500MB

“ ”

10.3.1



10.3.1

“ 7.2 ” “ ”

11.

11.1.0

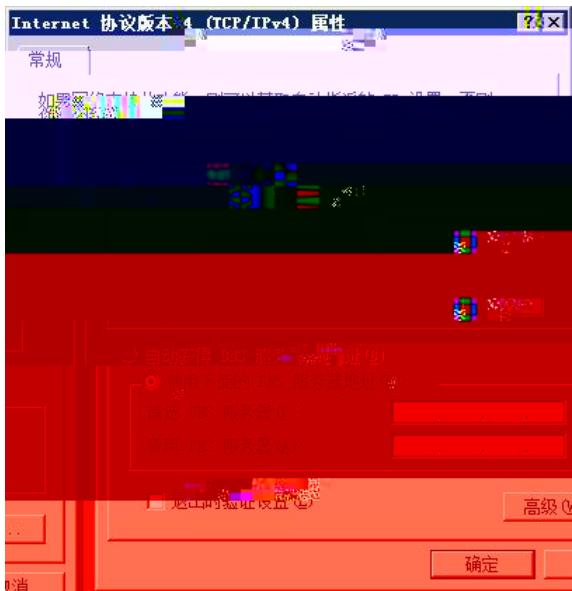


11.1.0

12.

10/100Mbps Windows

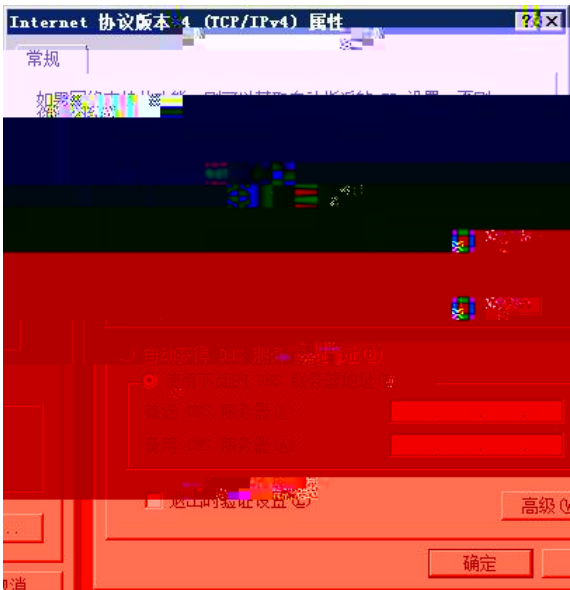
12.1 IP



IP

IP

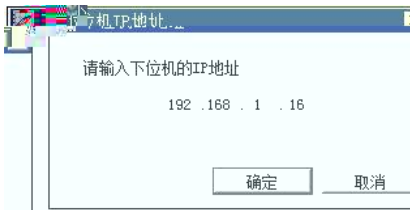
12.2 IP



” IP IP “ IP IP TCP/IP

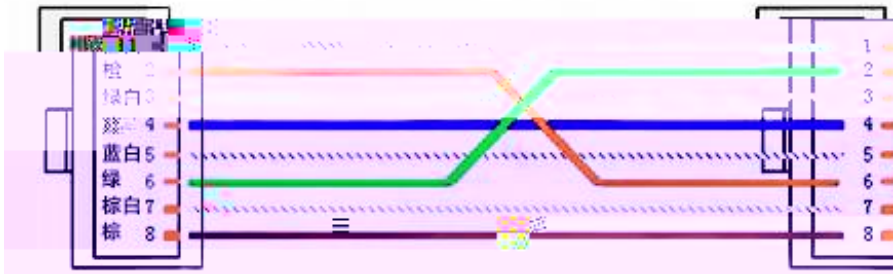
12.3

/ - IP



IP

12.3.0



A

	1	2
PDMM101	AC150V	AC10A
PDMM102	AC500V	AC10A
PDMM103	AC500V	AC100A
PDMM104	AC1000V	AC100A
PDMM105	AC200V	AC10A
PDMM106	AC500V	AC500V
PDMM107	AC500V	AC10A
PDMM108	AC150V	AC150V
PDMM109	AC150V	AC10A
PDMM111	DC ± 2000V	DC ± 100mV
PDMM112	DC ± 32V	DC4 20mA
PDMM113	DC ± 48V	DC4 20mA
PDMM114	DC ± 48V	DC ± 20mA
PDMM115	DC ± 1000V	DC ± 10V
PDMM116	DC0 200mA	DC4 20mA
PDMM117	DC ± 1000V	DC ± 100mV
PDMM118	DC ± 5V	DC ± 20mA
PDMM119	DC4 20mA	DC4 20mA
PDMM120	DC ± 250V	DC ± 100mV
PDMM121	. D	

QmV

PDMM131	DC $\pm$ 500V	DC4 20mA
PDMM132	AC180V	AC200A
PDMM133	AC/DC $\pm$ 600V	AC/DC $\pm$ 100mA
PDMM134	AC/DC $\pm$ 600V	AC/DC $\pm$ 300mV
PDMM135	AC/DC $\pm$ 100A	AC/DC $\pm$ 100A
PDMM136	AC150V	AC20A
PDMM211	(1:1/1:60)	DC4 20mA

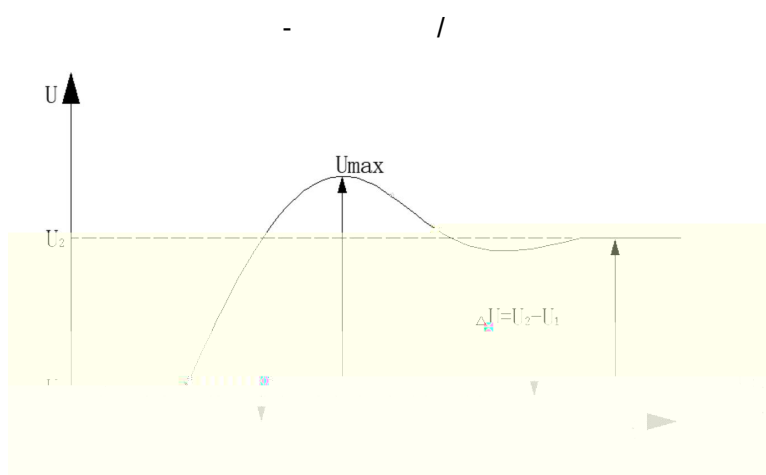
B

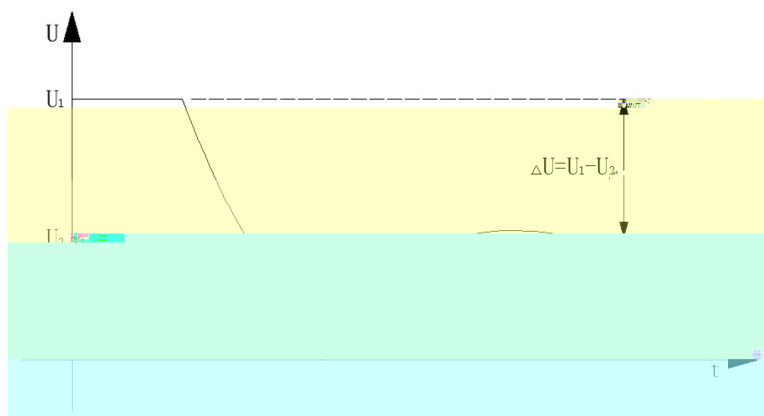
AC150V	> 80k Ω
AC180V AC200V	> 100k Ω
AC400V AC500V	> 300k Ω
AC/DC600V	> 1M Ω
AC1000V	> 500k Ω
AC1A AC10A AC20A AC100A AC200A	< 0.1 Ω

DC ± 2000V	> 2.0MΩ
DC ± 1000V	> 1MΩ
DC ± 500V	> 500kΩ
DC ± 250V	> 250kΩ
DC ± 200V	> 200kΩ
DC ± 100V	> 100kΩ
DC ± 48V	> 50kΩ
DC ± 32V	> 30kΩ
DC ± 20V DC ± 16V	> 20kΩ
DC ± 10V	> 15kΩ
DC ± 5V	> 7kΩ
AC/DC300mV DC ± 200mV DC ± 100mV	> 8kΩ
(1:1/1:60)	> 300kΩ (50Hz)
DC0 200mA	12Ω
AC/DC100mA	< 1Ω
DC ± 20mA DC4 20mA DC0 20mA	120Ω

C

1.

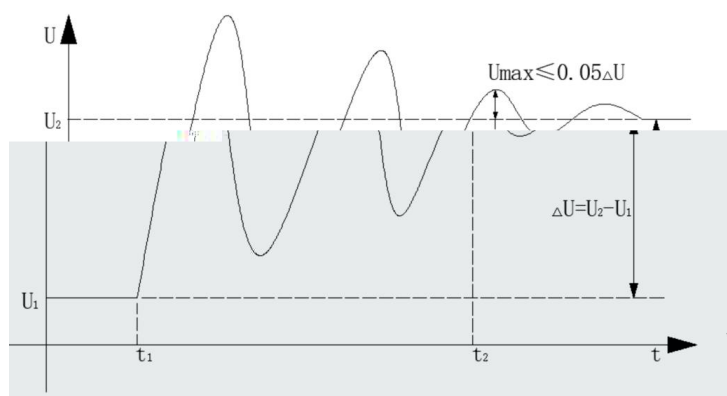




$$\text{负超调量} = \frac{U_1 - U_{\max}}{\Delta U} \times 100\% = \frac{U_1 - U_{\max}}{U_1 - U_2} \times 100\%$$

2.

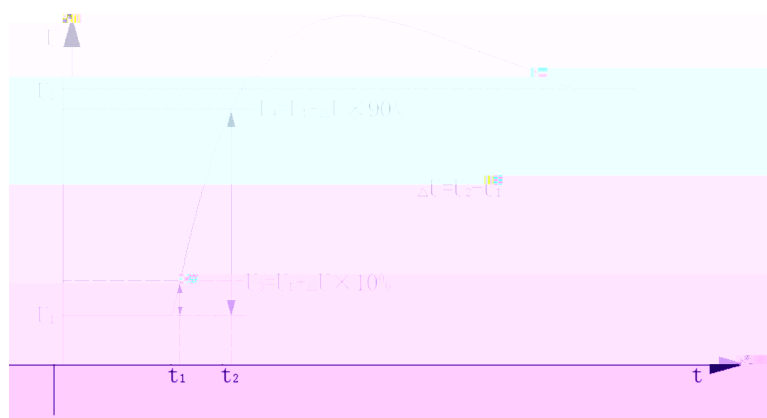
5%



$$\text{调节时间} = t_2 - t_1$$

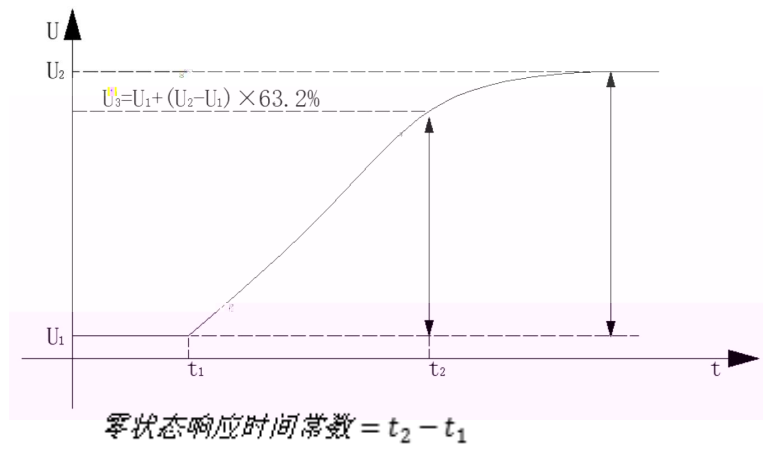
3.

10% 90%



6.

0.632



7.

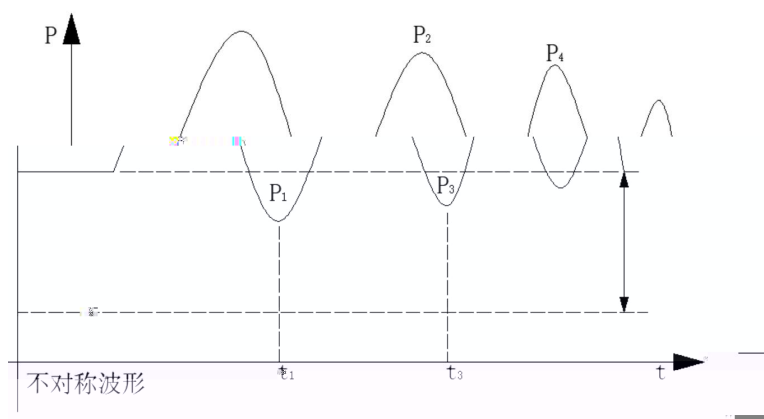
PSS (P₁)
 t_1 (P₃) t_3
 = ———

— $-\pi$ —



$$\text{阻尼比} D = \frac{1}{2} \pi \ln \frac{P_1}{P_3}$$

$$-\pi$$



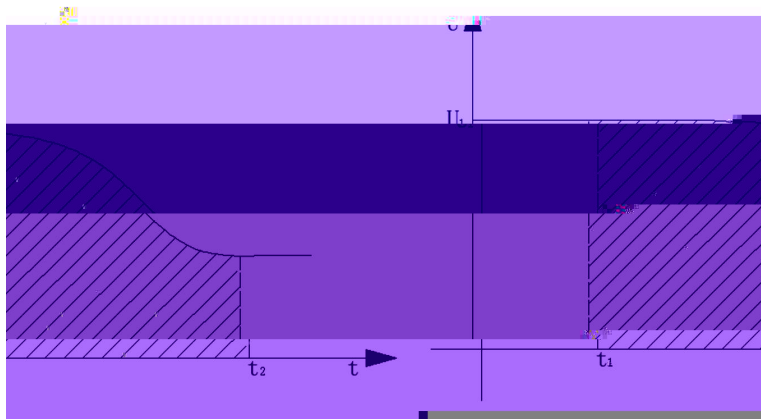
$$\text{阻尼比} D = \frac{1}{2} \pi \ln \frac{P_2 - P_1}{P_4 - P_3}$$

8.

$$= cd / 0.5 \times U f_n$$

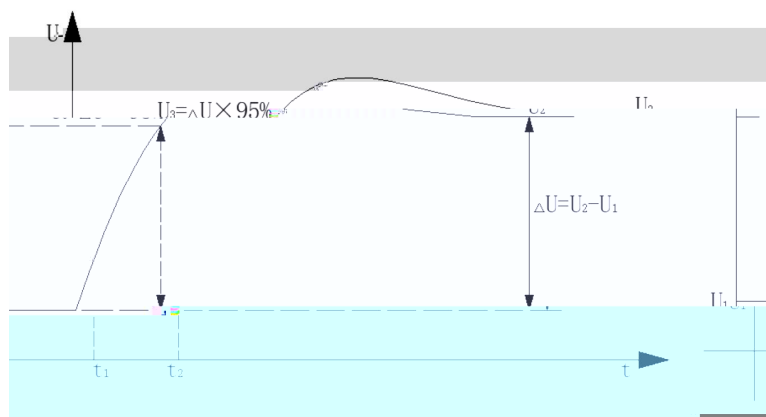


9.



10. 95%

95%



$$U_2 = U_1 \times 95\%$$

D

-

1

		Ea
1	Uab	X
2	Ubc	
3	Uca	
4		
5		Y

1	Ia	i m d i n x b Y
2	Ib	
3	Ic	
4		
5		X

2

1	Uab	
2	Ia	
3	Ubc	
4	Ib	
5	Uca	
6	Ic	
7		
8		

PSS

1	Uab	
2	Ia	
3	Ubc	
4	Ib	
5	Uca	
6	Ic	
7		
8		

3



- 1
- 2
- 3
- 4
- 5

~

2	100A	
3		
4		
5		