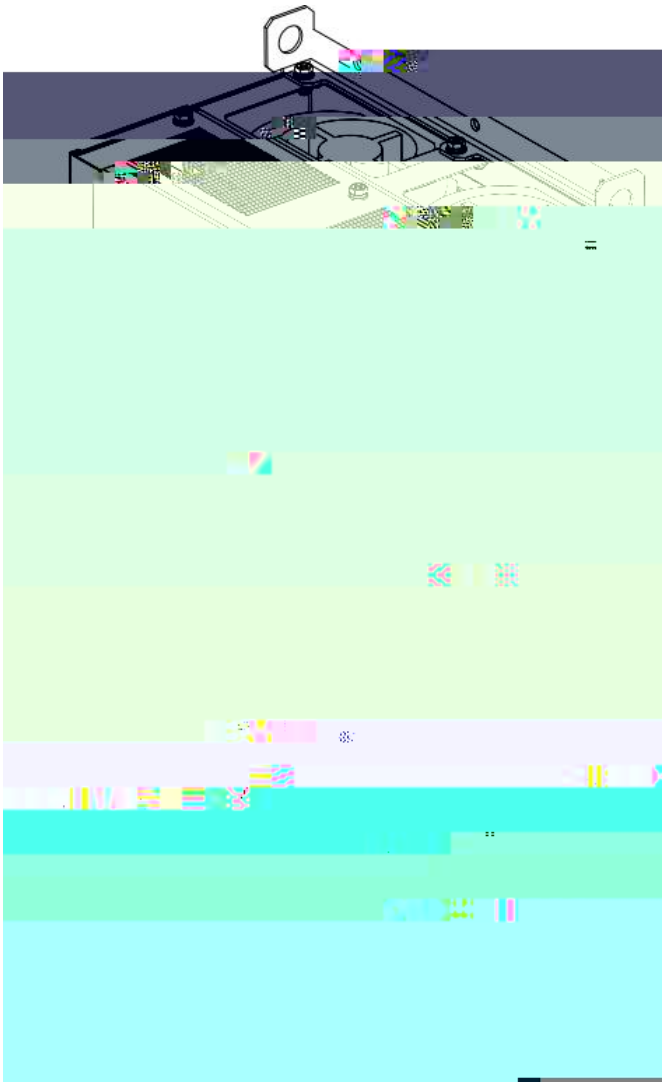
HF650

1.07

Wuhan Guide Technology Co.,Ltd.



1.

1.1

1.2

(1)

(2)

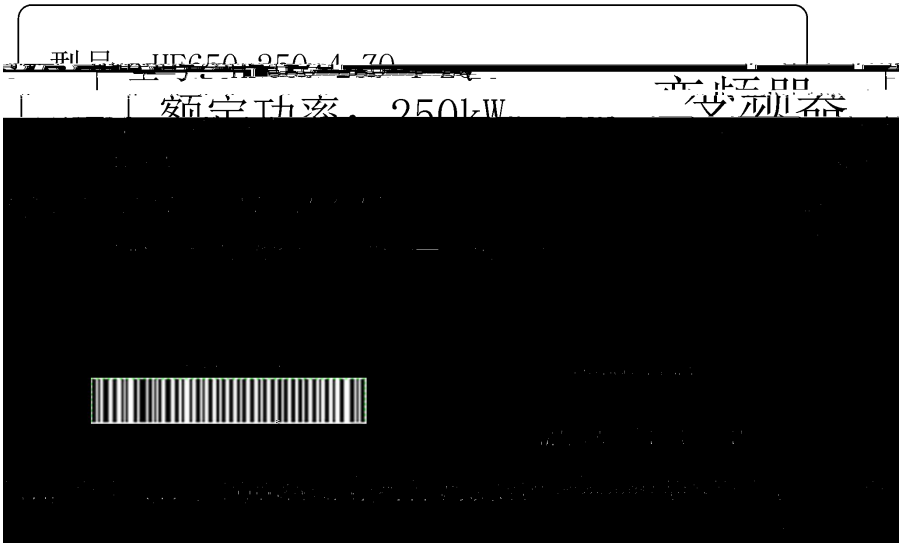
(3)

(4)

LVD	2014/35/EU	EN 61800-5-1
EMC	2014/30/EU	EN 61800-3

1.3

HF650 2-2 250kW



2-2

HF650-250-4-ZQ HF650 250kW 400V,ZQ

2

AC 3PH

380V-480V 50/60Hz

0-480V 0-300Hz

2.3

2-3 HF650

2 2

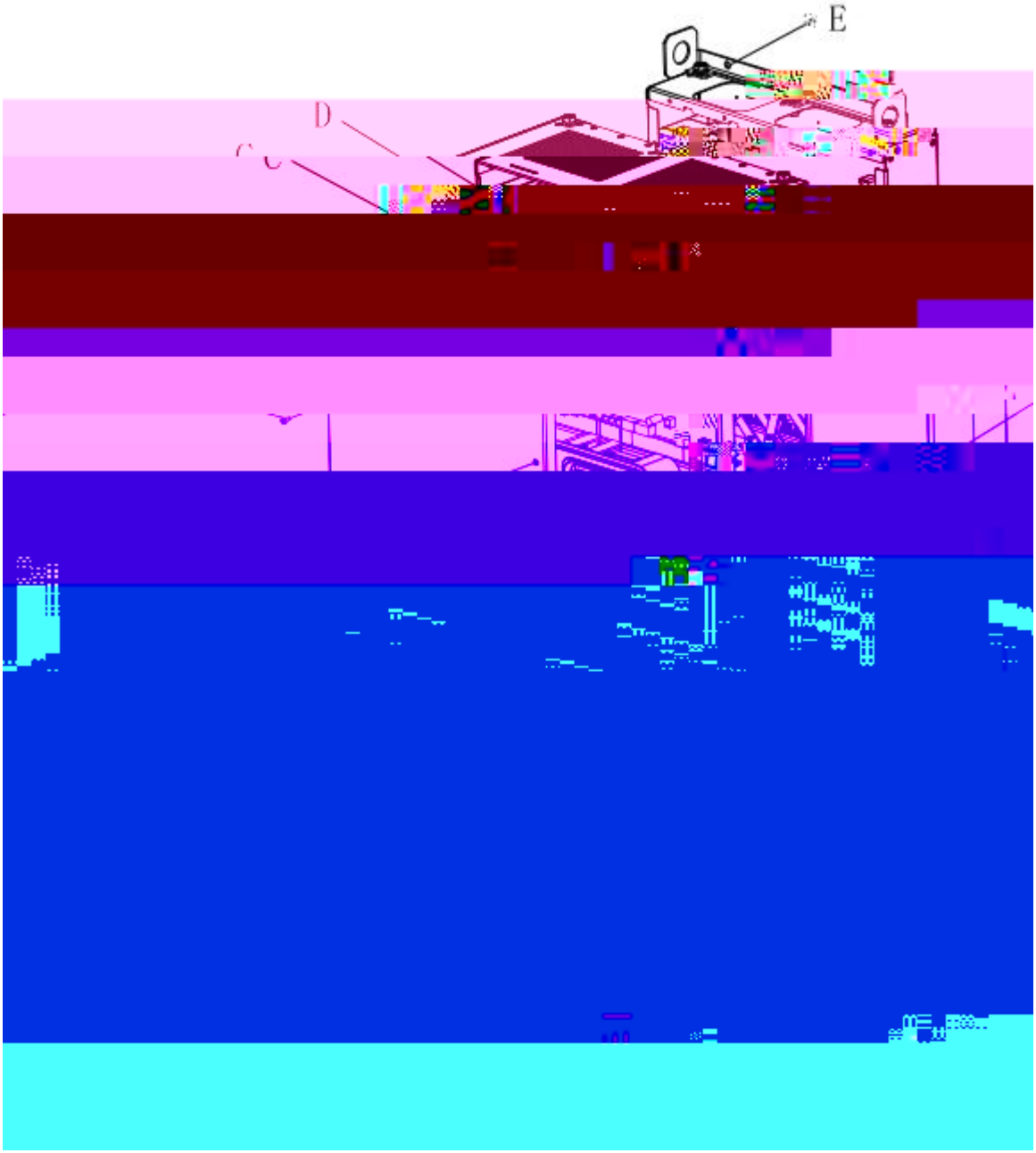
HF650-160-4-ZQ	330	160	265	132		
HF650-185-4-ZQ	365	185	330	160	I8	146
HF650-220-4-ZQ	438	220	365	185		
HF650-250-4-ZQ	485	250	438	220		
HF650-280-4-ZQ	545	280	485	250		
HF650-315-4-ZQ	610	315	545	280	I9	210
HF650-355-4-ZQ	668	355	610	315		
HF650-400-4-ZQ	720	400	668	355		

150%	5	1
200%	5	5

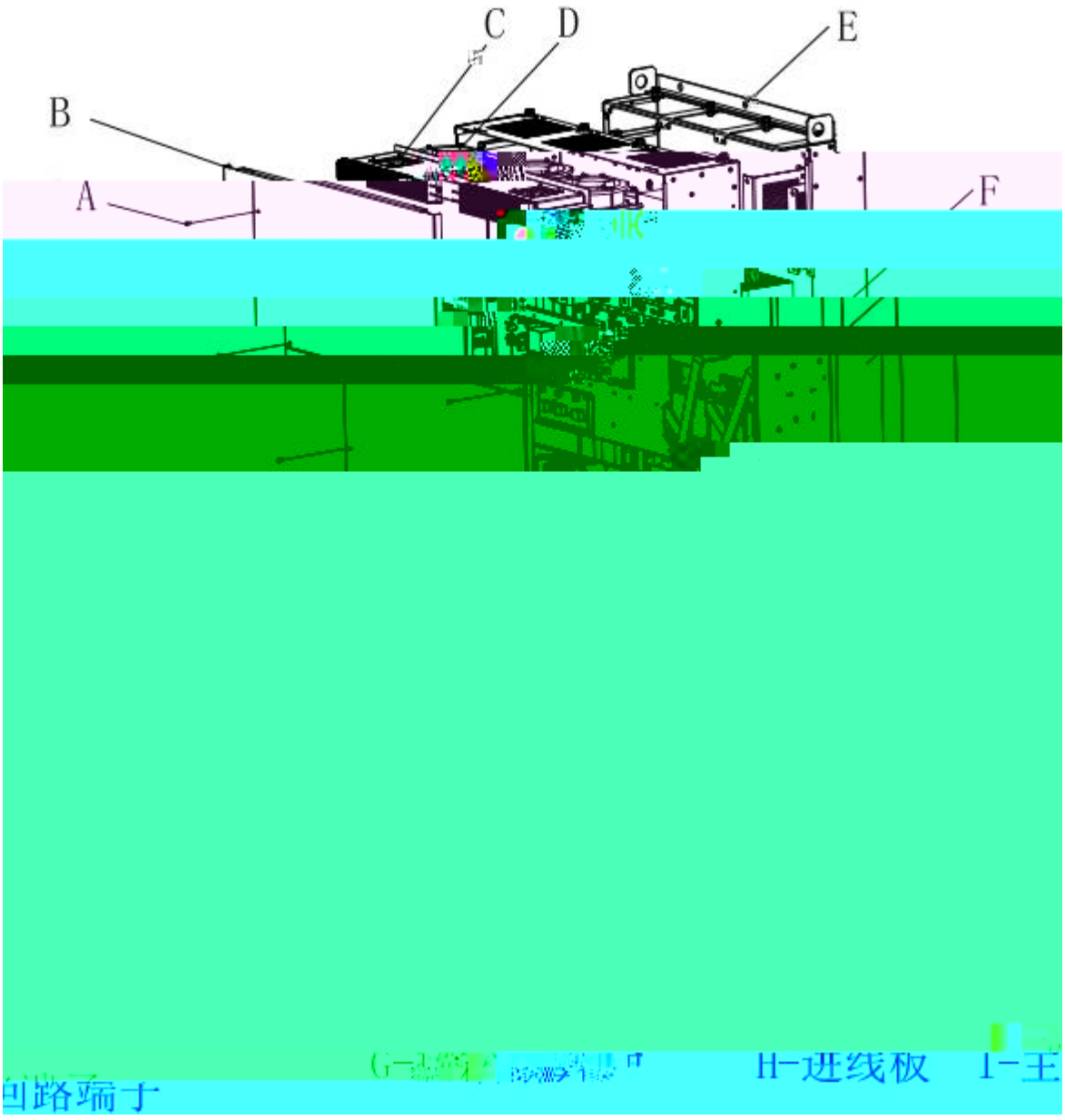
2.4

HF650

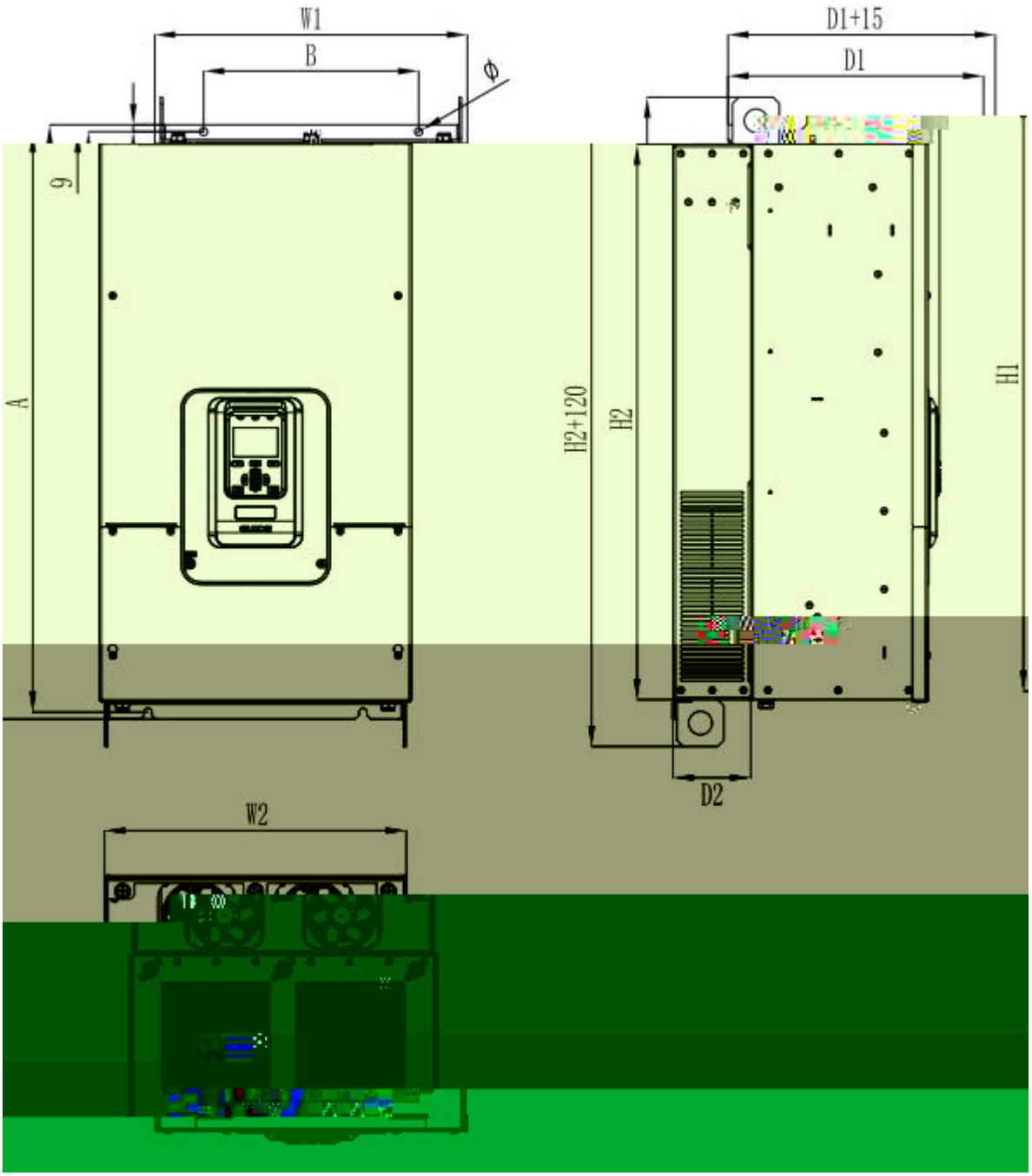
HF650-037-4-ZQ　　HF650-090-4-ZQ



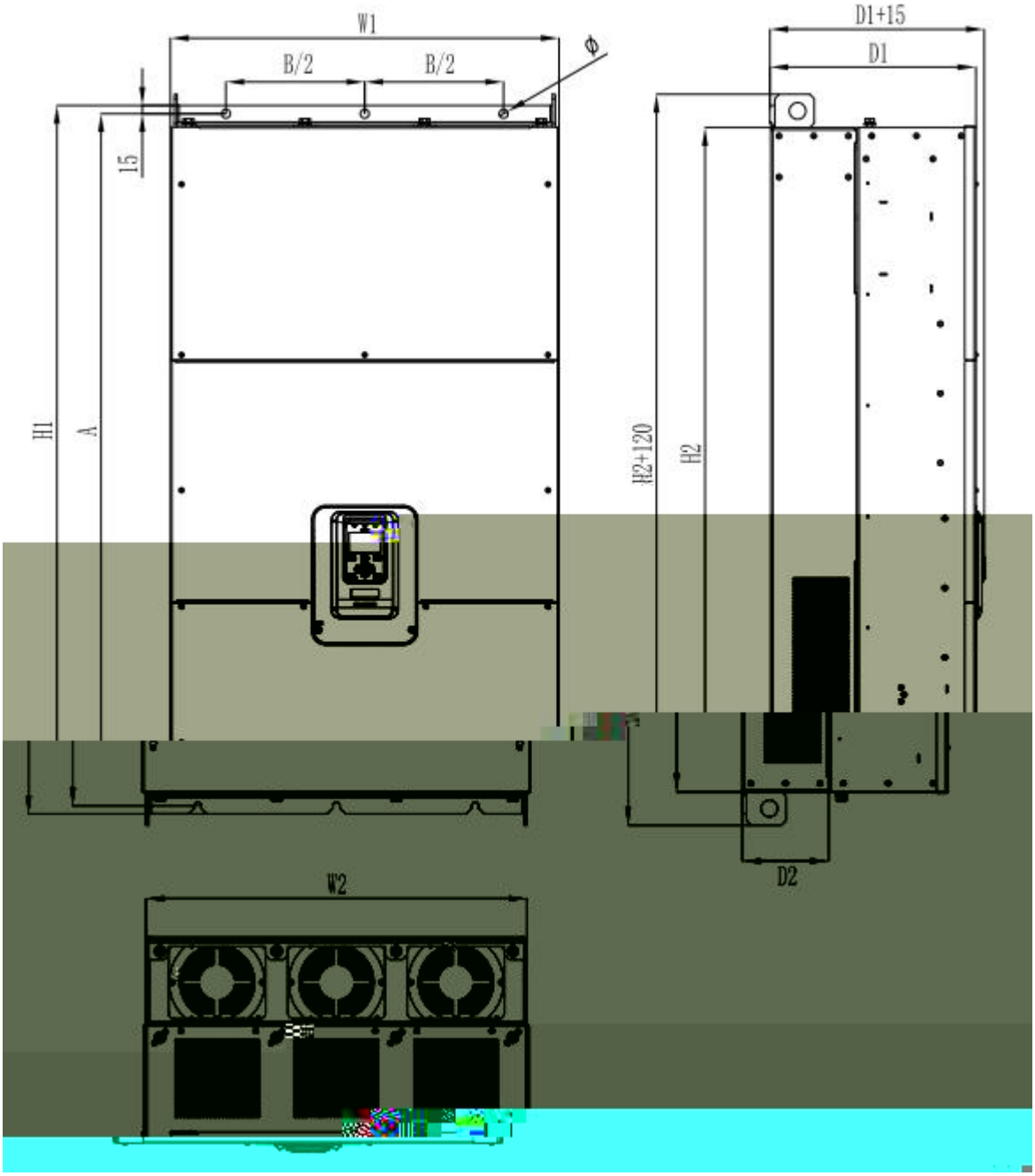
HF650-110-4-ZQ　　HF650-400-4-ZQ



2.5



15-16



17-19

		(mm)						mm			8.8	Kg
		H1	H2	W1	W2	D1	D2	A	B	φ	M	
I5	37 KW 45 KW 55 KW	600	565	340	326	282	110	585	225	2-φ9	4-M8	35
I6	75 KW 90 KW	760	710	400	386	327	100	742	275	2-φ9	4-M8	52
I7	110 KW 132 KW 160 KW	930	850	490	476	335	155	900	350	3-φ13	6-M12	108.5
I8	185 KW 220 KW 250 KW 280 KW	1140	1060	500	486	355	155	1110	350	3-φ13	6-M12	146
I9	315 KW 355 KW 400 KW	1275	1195	700	686	370	155	1245	500	3-φ15	6-M14	210

2.6

		380V 480V
		50/60Hz
		-15% +10%
		fLN ± 2 ± 4 ≤ 2 fLN/s
		0
		1
		0 300Hz

1kHz 10kHz

0.01Hz x0.1%

(VC) (SVC) V/F

V/F

PG PG

300Hz

0Hz/200%(VC SVC) 0.8Hz/150%(V/F)

<5ms(SVC) <5ms(VC)

±5%(SVC) ±3%(VC)

1:500(SVC) 1:1000(VC)

±0.02% (VC) ±0.2% (SVC) ±0.5% (V/F)

5 150% 1 200% 5

PID

DP CAN Modbus Ethernet Profinet

PID

/

		3000
		+40 40
		1 1% 50
		-10
		95%RH
		-20 +60
		>0.85 >0.999
		98%
		3 J14 I0 J15 I0 J13 PG
		IP20
		2
		≤80db

2

2.7

1

200%

2

3.75Hz

50%

3

2.8

	[kW]	[kW]		[kW]	[kW]
HF650-037-4-ZQ	37	1.128	HF650-185- 0-		

3.

1. / “ ”

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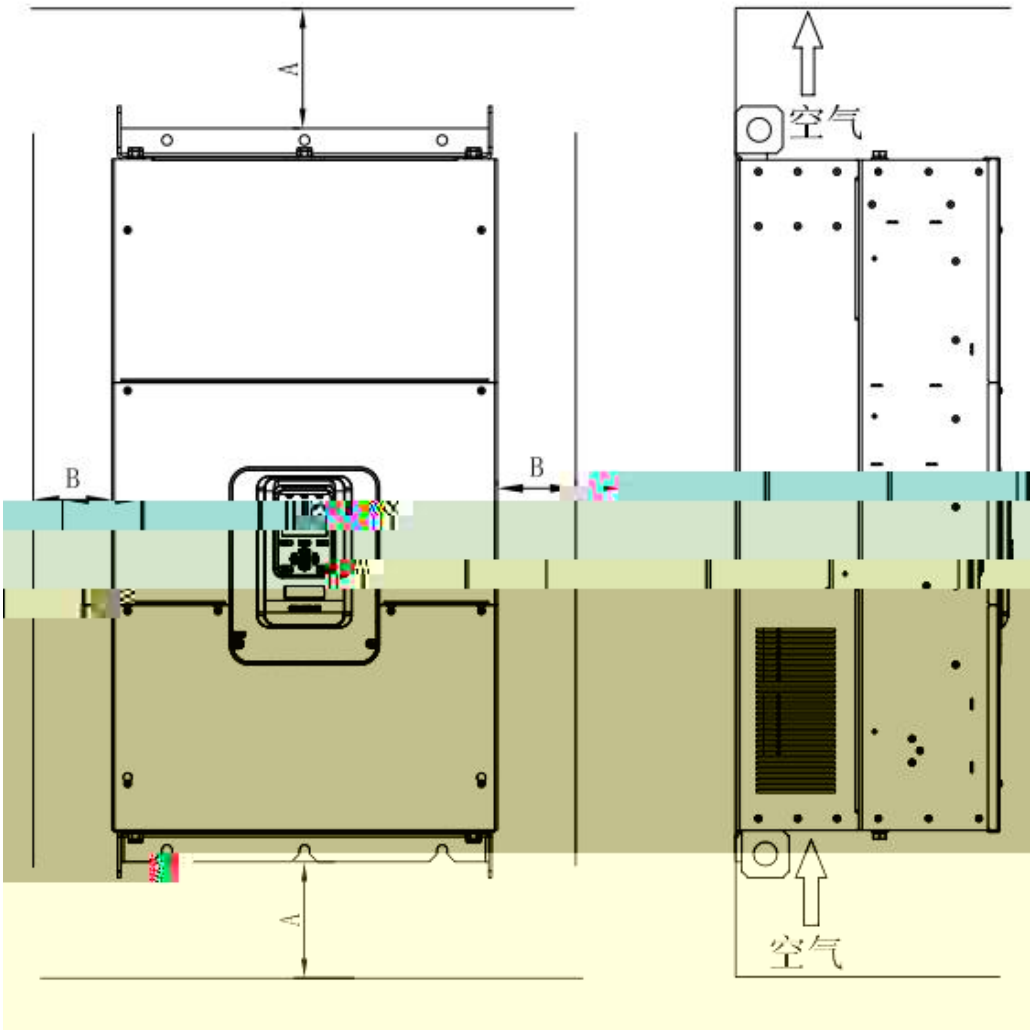
3

3.2

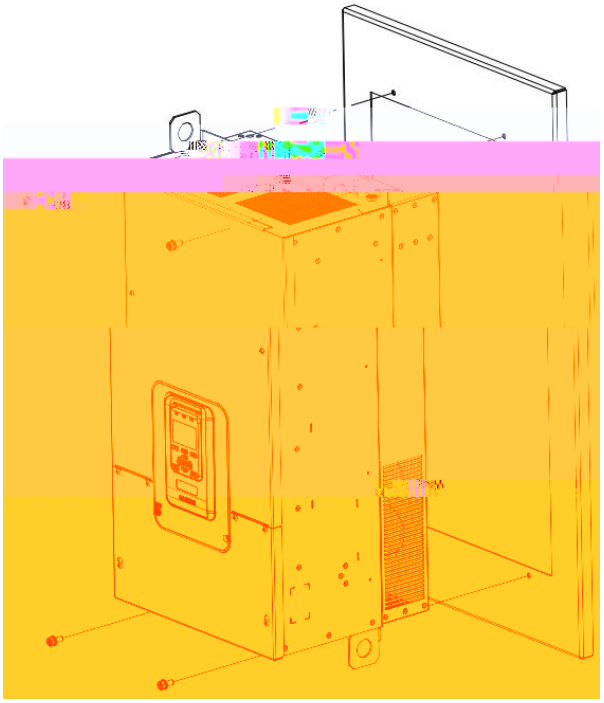
3.2.1

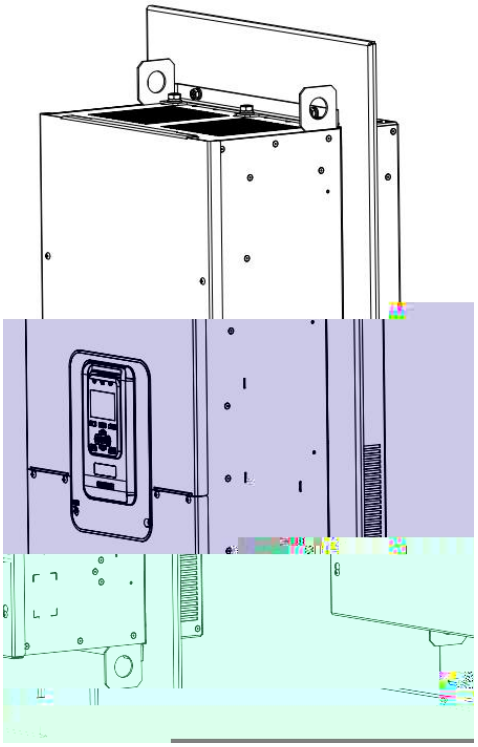
1



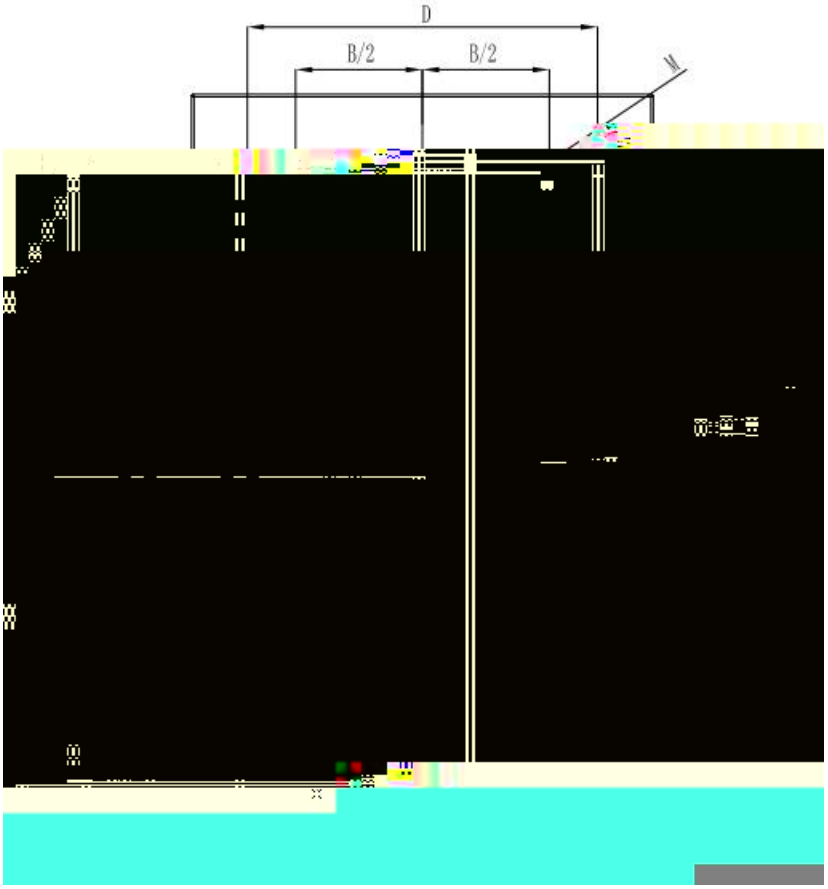
3-1

Ä [illegible]





3

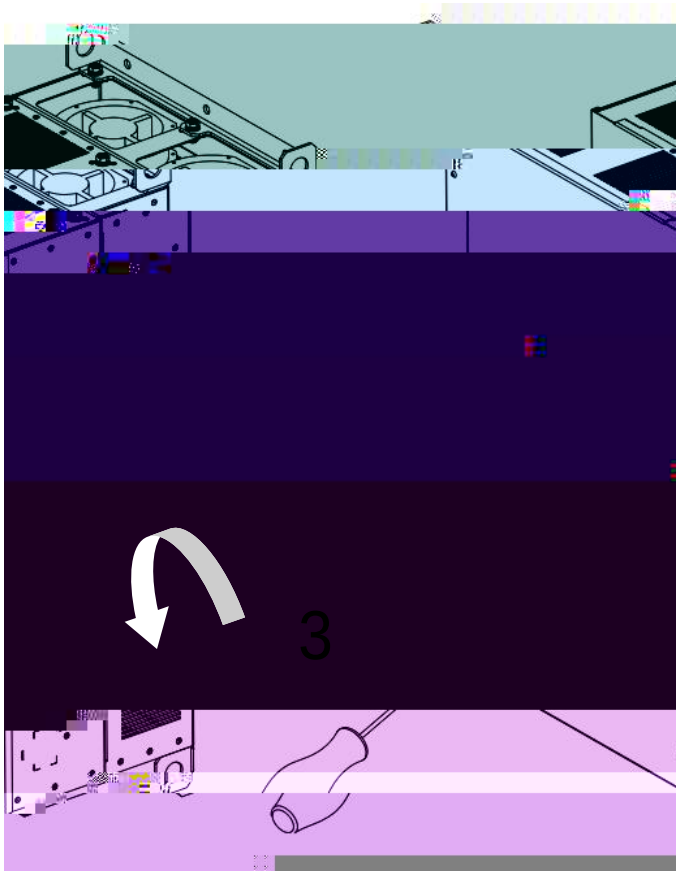


3-5 I7-I9

	(mm)		(mm)		
	A	B	C	D	
I5	585	275	570	330	4-M6
I6	742	275	715	390	4-M8
I7	900	350	855	480	6-M12
I8	1110	350	1065	490	6-M12
I9	1245	500	1200	690	6-M14

3.3

1	1	4	5mm
2	2		
3	3		



3-6

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4.

4.1

1
2 10
3 U V W
4
5
6 Ж

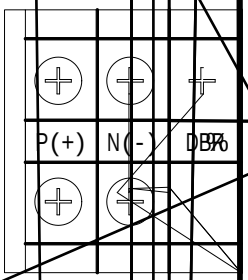
14

15 30 m

4.2

1

37kW ~ 75kW +



4

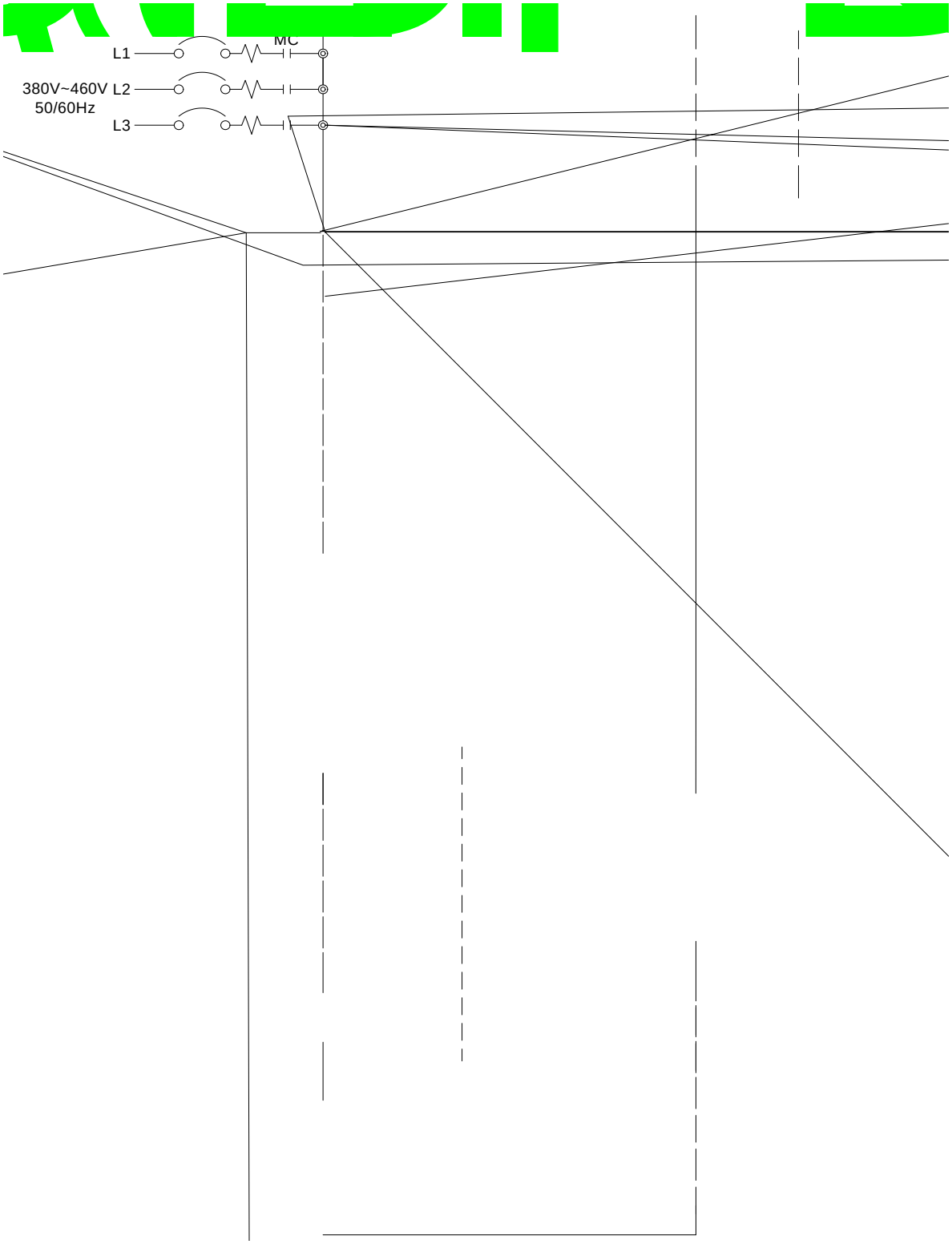
3

1	+10V			10V									
2	GND						,						
3	AI1+/AV1			1							0/4	20mA	
					1						-10	10V	
4	AI1-			1									
5	AI2+/AV2			2							0/4	20mA	
					2						-10	10V	
6	AI2-			2									
7	AO1			1							0/4	20mA	J1
			I	a			0	10V	J1		V	b	
8	AO2			2							0/4	20mA	J2
			I	a			0	10V	J2		V	b	
9	DI1				1								
10	DI2				2								
11	DI3				3								
12	DI4				4								
13	DI5				5								
14	DI6				6								
15	DI7				7								
16	DI8				8								
17	PW												
18	COM	24V											
19	PW												
20	+24V	24V			+								
21	+24V	24V											
22	DO1				1						DC24V	50mA	
23	+24V	24V											
24	DO2				2						DC24V	50mA	

4

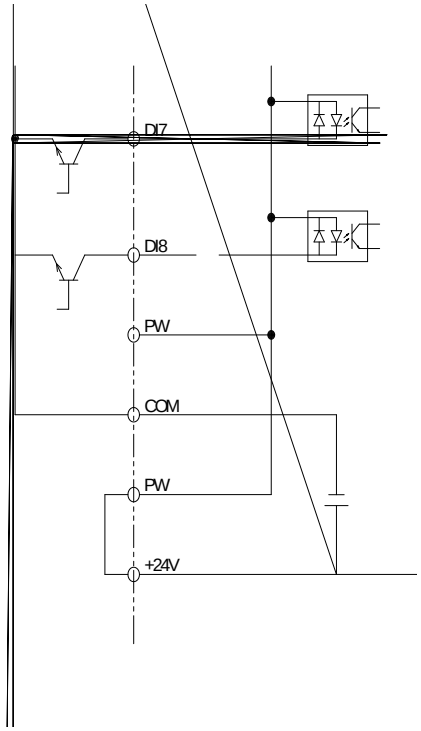
25	+24V	24V		
26	DO3		3	DC24V 50mA
27	DO4A		4	
28	DO4C		4	
29	DO4B		4	
30	DO5A		5	
31	DO5C		5	

4.4

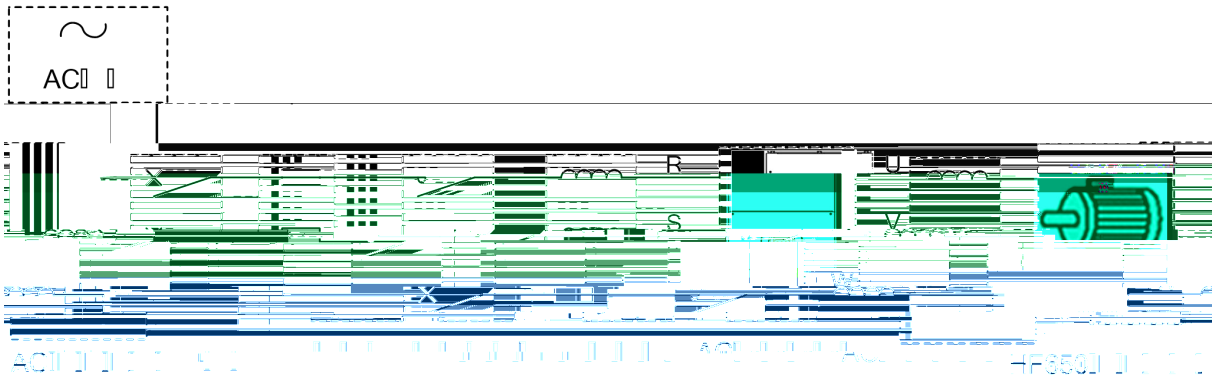


4.5

0V NPN



4.6



AC	
	1 2
	( )
AC	1 2 3
	1 2 3 HF650
AC	1 2 50m

4

4.7

	A	/ mm² CEFR 40%	A (AC-3)
HF650-037-4-ZQ	94	16	95
HF650-045-4-ZQ	115	16	115
HF650-055-4-ZQ	155	25	150
HF650-075-4-ZQ	188	35	205
HF650-090-4-ZQ	215	50	245
HF650-110-4-ZQ	265	70	300
HF650-132-4-ZQ	330	95	410
HF650-160-4-ZQ	365	95	410
HF650-185-4-ZQ	438	120	475
HF650-220-4-ZQ	485	150	620
HF650-250-4-ZQ	545	70*2	620
HF650-280-4-ZQ	610	95*2	620
HF650-315-4-ZQ	668	120*2	2*410
HF650-355-4-ZQ	720	120*2	2*410
HF650-400-4-ZQ	820	150*2	2*475

4.8

		2%		1%	
HF650-037-4-ZQ	37kW	88A	159 uH	88A	79 uH
HF650-045-4-ZQ	45kW	113A	123 uH	113A	62 uH
HF650-055-4-ZQ	55kW	131A	106 uH	131A	53 uH
HF650-075-4-ZQ	75kW	178A	78 uH	178A	39 uH
HF650-090-4-ZQ	90kW	227A	62 uH	227A	31 uH

RUN STOP

LOCAL/REMOTE /

5.3

5

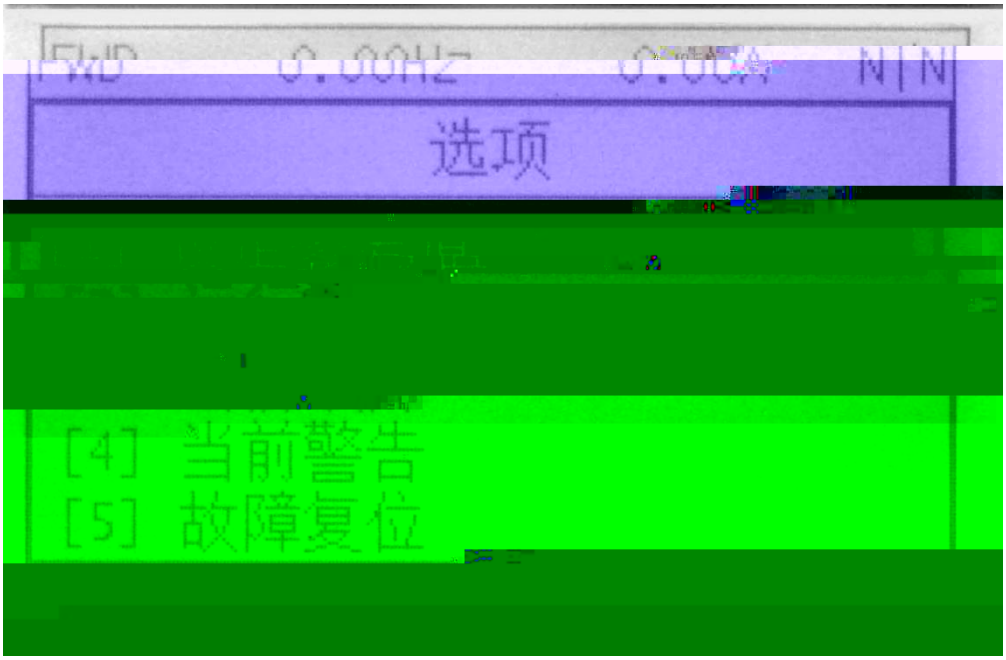
|

	FWD REV
	:HZ
	A
	N|N W E

3

F1 F2 “ ” “ ” “ ” “ ” “ ”

ENTER



Reference Set

1

Change Direction

2

Current Error

3

Current Warnning

4

Reset Error

5

Monitor Setting

6

Firmware Version

7

5

ñ !Ñ° ðÝ- × +|

2

5

▼ ▲ “Enter”

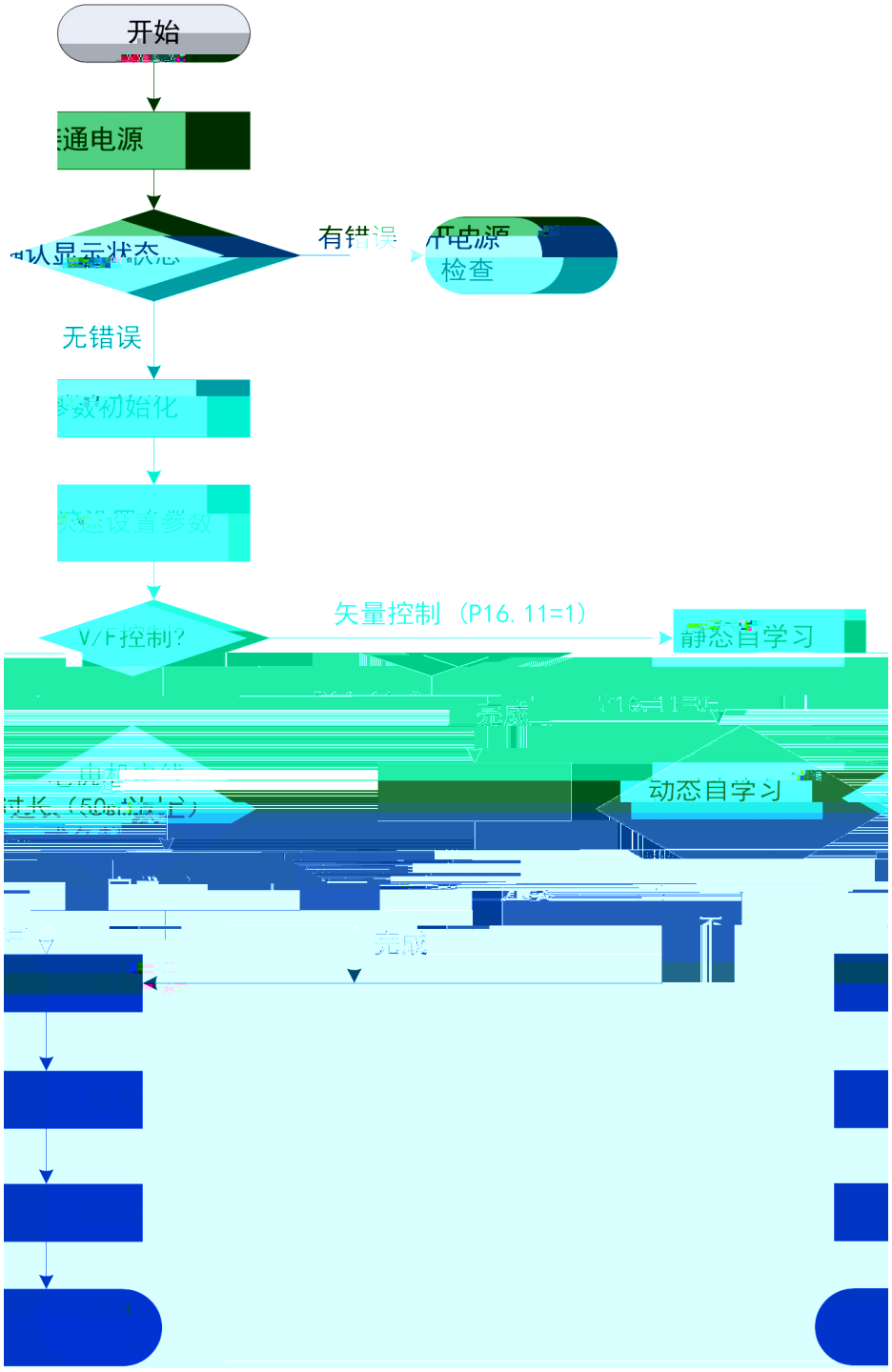
3 Fault Record

4 Access Permissions

5 Display Setting

6.

6.1



/

V/F P16.11=0 V/F

P16.11=2 P16.11=1

6.2

6.2.1

1

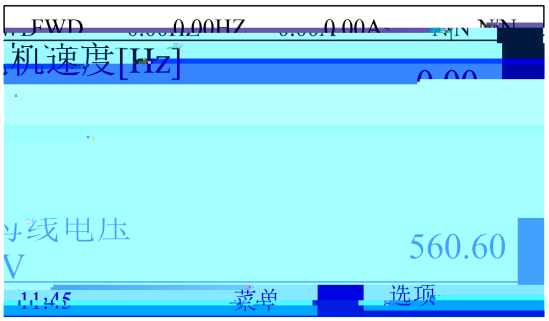
AC380~480V 50/60Hz

2 U,V,W

3

4

6.2.2



		[4]DP [5]MODBUS [6]	
P8.3		[0] [1]	1
P7.0	[1]	0~300[%]	180%
P7.4	[1]	0~300[%]	235%
P7.19	[1]	100.0 720.0[%]	120%

6.2.5

1

P16.11 [1] [2]

[0] V/F

2

V/F

“

” “ ”

3

“

” “ ”

4

50%

6.2.6

HF650

	7.5% 50% 50%
	1/5
	P16
	V/F

6.2.7

1

2 LOC/REM LOCAL LOCAL

3 ENTER [1] RUN

RUN 5Hz

4

5 4 50Hz

6 STOP

6.2.8

1

2

3

4

5

6 STOP

1

2

1

2

6.2.9

7.

7.1 P0

[0]

P0.0 [1] 0 1 0

P0.

23		8.10
24		
25	FUNC 25	
26		
27	FUNC 27	
28		8.10
29 64	FUNC 29 FUNC 64	

7.4 P4

P4.0	1		0 64	0	
P4.1	2		0 64	0	
P4.2	3		0 64	0	
P4.3	4		0 64	0	
P4.4	5		0 64	0	
P4.16	1		0 500	0	
P4.17	2		0 500	0	
P4.18	3		0 500	0	
P4.19	4		0 500	0	

7

0

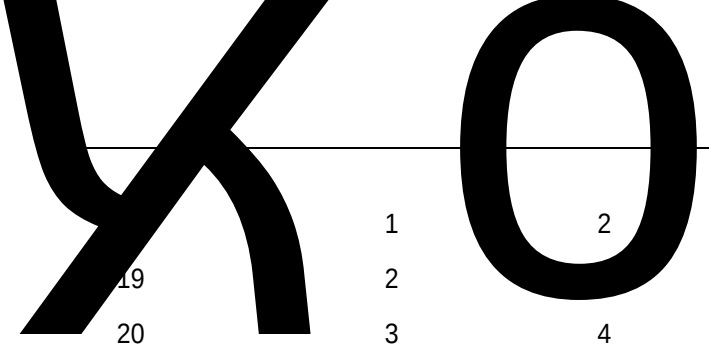
1 8.3

2

3 8.3

4

5



1 2

19 2

20 3 4

21 31 FUNC 21 FUNC 31

32 AFE

33 48 FUNC 33 FUNC 48

49 PROFIBUS 1 PROFIBUS 1 1

50 PROFIBUS 2 PROFIBUS 2 1

51 PROFIBUS 3 PROFIBUS 3

7.5 P5

P5.0	AI1	[0] [1]0 +10V [2]-10 +10V [3]0 20mA AI1	0 3	1	
P5.1	AI1		0.0 1000.0 [ms]	25.0 [ms]	
P5.2	AI1	AI1	-10.00 10.00 -300.0[V]	0.000 [V]	8.4
P5.3	AI1	AI1	-20.00 20.00 [mA] 0.00	0.000 [mA]	8.4
P5.4	AI1	AI1	-10.00 10.00 [V]	0.000 [V]	8.4
P5.5	AI1	AI1	0.00 20.00 [mA]	0.000 [mA]	8.4
P5.6	AI1	AI1	-300.0		

P5.19	AI2	AI2	0.0 1000.0 [ms]	25.0 [ms]	
P5.20	AI2	AI2	-10.00 10.00 [V]	0.000 [V]	
P5.21	AI2	AI2	-20.00 20.00 [mA]	0.000 [mA]	
P5.22	AI2	AI2	-10.00 10.00 [V]	0.000 [V]	
P5.23	AI2	AI2	0.00 20.00 [mA]	0.000 [mA]	
P5.24	AI2	AI2	-300.0 300.0 [%]	0.0 [%]	
P5.25	AI2	AI2	-10.00 10.00 [V]	10.000 [V]	
P5.26	AI2	AI2	0.00 20.00 [mA]	20.000 [mA]	
P5.27	AI2	AI2	-300.0 300.0 [%]	100.0 [%]	

7.6 P6

P6.0 A01 7-1 0 14 2

P6.2 A01 A01

7

P6.22	AO2	AO1	0.0 1000.0 [ms]	10.0 [ms]	

7-1

0 (,

7.7 P7

P7.0	[1]	1	0.0 300.0 [%]	180.0 [%]	8.6
P7.1	[2]	2	0.0 300.0 [%]	180.0 [%]	8.6
P7.2	[3]	3	0.0 300.0 [%]	180.0 [%]	8.6
P7.3	[4]	4	0.0 300.0 [%]	180.0 [%]	8.6
P7.4	[1]	1	0.0 300.0 [%]	235.0 [%]	8.6
P7.5	[2]	2	0.0 300.0 [%]	235.0 [%]	8.6
P7.6	[3]	3	0.0 300.0 [%]	235.0 [%]	8.6
P7.7	[4]	4	0.0 300.0 [%]	235.0 [%]	8.6
P7.8	[1]	1	0.0 100.0 [%]	20.0 [%]	8.6
P7.9	[2]	2	0.0 100.0 [%]	20.0 [%]	8.6
P7.10	[3]	3	0.0 100.0 [%]	20.0 [%]	8.6
P7.11	[4]	4	0.0 100.0 [%]	20.0 [%]	8.6
P7.12			600 820 [V]	800 [V]	8.6
P7.13			300 500 [V]	350 [V]	8.6
P7.14			60.0 100.0 [ ]	87.5 [ ]	8.6
P7.15			50.0 100.0 [ ]	80.0 [ ]	8.6
P7.19	[1]	1	100.0 720.0 [%]	120.0 [%]	8.6
P7.20	[2]	2	100.0 720.0 [%]	120.0 [%]	8.6
P7.21	[3]	3	100.0 720.0 [%]	120.0 [%]	8.6

P7.22	[4]	4		100.0 [%]	720.0	120.0 [%]

P7.60			0.10 3.00 [s]	0.30 [s]	
P7.64		[0] [1]	0 1	0	8.6
P7.65			-25 100 [V]	0 [V]	8.6
P7.66			-25 100 [V]	0 [V]	8.6
P7.69		[0] [1]	0 1	0	8.6
P7.70			-25 100 [V]	0 [V]	8.6
P7.71	1	[0] [1]	0 1	0	8.6
P7.73		[0] [1]	0 1	0	
P7.74			300 500 [V]	460 [V]	
P7.75			0.0 1000.0 [%]	100.0 [%]	
P7.76			0.00 300.00 [s]	1.00 [s]	
P7.77			0.0 200.0 [%]	15.0 [%]	
P7.94		[0] [1]	0 1	1	
P7.95		AFE	0.0 3000.0 [s]	15.0 [s]	
P7.96			0.00 300.00 [s]	0.00 [s]	

7.8 1 P8

P8.0		[0] [1] [2]DP [3]MODBUS [4]	0 4	0	
P8.3		[0] [1]	0 1	0	8.7
P8.6			0.00 300.00 [s]	0.00 [s]	8.7
P8.7			0.00 300.00 [s]	0.00 [s]	8.7
P8.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6]	0 6	0	
P8.13		[0] [1]PROFIBUS [2]MODBUS [3]	0 3	0	8.7
P8.14			0.1 10.0	1.0	8.7
P8.15	1		0.0 300.0 [%]	100.0 [%]	8.7
P8.16	1	P8.15	0.0 300.0 [s]	3.00 [s]	8.7
P8.17	2		0.0 300.0 [%]	200.0 [%]	8.7
P8.18	2	P8.15 P8.17	0.0 300.0 [s]	4.00 [s]	8.7
P8.19	3		0.0 300.0 [%]	240.0 [%]	8.7

]

7.9 2 P9

P9.0		[0] [1] [2]DP [3]MODBUS [4]	0 4	0	
P9.3		[0] [1]	0 1	0	8.7
P9.6			0.00 300.00 [s]	0.00 [s]	8.7
P9.7			0.00 300.00 [s]	0.00 [s]	8.7
P9.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6]	0 6	0	
P9.13		[0] [1]PROFIBUS [2]MODBUS [3]	0 3	0	8.7
P9.14			0.1 10.0	1.0	8.7
P9.15	1		0.0 300.0 [%]	100.0 [%]	8.7
P9.16	1	P9.15	0.0 300.0 [s]	3.00 [s]	8.7
P9.17	2		0.0 300.0 [%]	200.0 [%]	8.7
P9.18	2	P9.15 P9.17	0.0 300.0 [s]	4.00 [s]	8.7
P9.19	3		0.0 300.0 [%]	240.0 [%]	8.7

P9.20	3	P9.17	P9.19	0.0 [s]	300.0 [s]	7.00	8.7
P9.21	4			0.0 [%]	300.0 [%]	300.0	8.7
P9.22	4	P9.19	P9.21	0.0 [s]	300.0 [s]	10.00	8.7
P9.23	5			0.0 [%]	300.0 [%]	300.0	8.7
P9.24	5	P9.21	P9.23	0.0 [s]	300.0 [s]	10.00	8.7
P9.25	6			0.0 [%]	300.0 [%]	300.0	8.7
P9.26	6	P9.23	P9.25	0.0 [s]	300.0 [s]	10.00	8.7
P9.27	7			0.0 [%]	300.0 [%]	300.0	8.7
P9.28	7	P9.25	P9.27	0.0 [s]	300.0 [s]	10.00	8.7
P9.29	8			0.0 [%]	300.0 [%]	300.0	8.7
P9.30	8	P9.27	P9.29	0.0 [s]	300.0 [s]	10.00	8.7
P9.32		[0] [1]PROFIBUS [2]MODBUS [3]		0	3	0	8.7
P9.33				0.1	10.0	1.0	8.7

P9.36 P9.38 0.0 300.0
P9.39 3
[se.00

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7.10 3 P10

P10.0		[0] [1] [2]DP [3]MODBUS [4]	0 4	0	
P10.3		[0] [1]	0 1	0	8.7
P10.6			0.00 300.00 [s]	0.00 [s]	8.7
P10.7			0.00 300.00 [s]	0.00 [s]	8.7
P10.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6]	0 6	0	
P10.13		[0] [1]PROFIBUS [2]MODBUS [3]	0 3	0	8.7
P10.14			0.1 10.0	1.0	8.7
P10.15	1		0.0 300.0 [%]	100.0 [%]	8.7
P10.16	1	P10.15	0.0 300.0 [s]	3.00 [s]	8.7
P10.17	2		0.0 300.0 [%]	200.0 [%]	8.7
P10.18	2	P10.15 P10.17	0.0 300.0 [s]	4.00 [s]	8.7
P10.19	3		0.0 300.0 [%]	240.0 [%]	8.7

7.11 4 P11

P11.0		[0] [1] [2]DP [3]MODBUS [4]	0 4	0	
P11.3		[0] [1]	0 1	0	8.7
P11.6			0.00 300.00 [s]	0.00 [s]	8.7
P11.7			0.00 300.00 [s]	0.00 [s]	8.7
P11.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6]	0 6	0	
P11.13		[0] [1]PROFIBUS [2]MODBUS [3]	0 3	0	8.7
P11.14			0.1 10.0	1.0	8.7
P11.15	1		0.0 300.0 [%]	100.0 [%]	8.7
P11.16	1	P11.15	0.0 300.0 [s]	3.00 [s]	8.7
P11.17	2		0.0 300.0 [%]	200.0 [%]	8.7
P11.18	2	P11.15 P11.17	0.0 300.0 [s]	4.00 [s]	8.7
P11.19	3		0.0 300.0 [%]	240.0 [%]	8.7

P11.39	3	P11.36	P11.38	0.0	300.0 [s]	7.00 [s]	8.7
P11.40	4			0.0	300.0 [%]	300.0 [%]	8.7
P11.41	4	P11.38	P11.40	0.0	300.0 [s]	10.00 [s]	8.7
P11.42	5			0.0	300.0 [%]	300.0 [%]	8.7
P11.43	5	P11.40	P11.42	0.0	300.0 [s]	10.00 [s]	8.7
P11.44	6			0.0	300.0 [%]	300.0 [%]	8.7
P11.45	6	P11.42	P11.44	0.0	300.0 [s]	10.00 [s]	8.7
P11.46	7			0.0	300.0 [%]	300.0 [%]	8.7
P11.47	7	P11.44	P11.46	0.0	300.0 [s]	10.00 [s]	8.7
P11.48	8			0.0	300.0 [%]	300.0 [%]	8.7
P11.49	8	P11.46	P11.48	0.0	300.0 [s]	10.00 [s]	8.7
P11.54				0.0	300.0 [%]	0.0 [%]	
P11.55		[0] 1 خه					

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7.12 1 P12

P12.0		[0] [1]	0	1	1	8.8
P12.1		[0][%] [1][Hz] [2][rpm]	0	2	1	
P12.2	1		0.0	3000.0	10.0	
P12.3	2		0.0	3000.0	20.0	
P12.4	3		0.0	3000.0	35.0	
P12.5	4		0.0	3000.0	50.0	
P12.6	5		0.0	3000.0	50.0	
P12.7	6		0.0	3000.0	50.0	
P12.8						

P12.27			0.00 2.00 [s]	0.00 [s]	8.8
P12.28			0.00 2.00 [s]	0.07 [s]	8.8
P12.29			0.00 2.00 [s]	0.07 [s]	8.8
P12.32			0.0 20.0 [%]	0.0 [%]	8.8
P12.33			0.0 20.0 [%]	0.0 [%]	8.8
P12.34			0.00 2.00 [s]	0.00 [s]	8.8
P12.35			0.00 2.00 [s]	0.00 [s]	8.8
P12.36			0.00 2.00 [s]	0.50 [s]	8.8
P12.37			0.00 2.00 [s]	0.50 [s]	8.8

7.13 2 P13

P13.0		[0] [1]	0	1	1	8.8
P13.1		[0][%] [1][Hz] [2][rpm]	0	2	1	
P13.2	1		0.0	3000.0	10.0	
P13.3	2		0.0			

P13.27			0.00 2.00 [s]	0.00 [s]	8.8
P13.28			0.00 2.00 [s]	0.07 [s]	8.8
P13.29			0.00 2.00 [s]	0.07 [s]	8.8
P13.32			0.0 20.0 [%]	0.0 [%]	8.8
P13.33			0.0 20.0 [%]	0.0 [%]	8.8
P13.34			0.00 2.00 [s]	0.00 [s]	8.8
P13.35			0.00 2.00 [s]	0.00 [s]	8.8
P13.36			0.00 2.00 [s]	0.50 [s]	8.8
P13.37			0.00 2.00 [s]	0.50 [s]	8.8

7.14 3 P14

P14.0		[0] [1]	0	1	1	8.8
P14.1		[0][%] [1][Hz] [2][rpm]	0	2	1	
P14.2	1		0.0	3000.0	10.0	
P14.3	2		0.0	3000.0	20.0	
P14.4						

P14.27			0.00 2.00 [s]	0.00 [s]	8.8
P14.28			0.00 2.00 [s]	0.07 [s]	8.8
P14.29			0.00 2.00 [s]	0.07 [s]	8.8
P14.32			0.0 20.0 [%]	0.0 [%]	8.8
P14.33			0.0 20.0 [%]	0.0 [%]	8.8
P14.34			0.00 2.00 [s]	0.00 [s]	8.8
P14.35			0.00 2.00 [s]	0.00 [s]	8.8
P14.36			0.00 2.00 [s]	0.50 [s]	8.8
P14.37			0.00 2.00 [s]	0.50 [s]	8.8

7.15 4 P15

P15.0		[0] [1]	0	1	1	8.8
P15.1		[0][%] [1][Hz] [2][rpm]	0	2	1	
P15.2	1		0.0	3000.0	10.0	
P15.3	2		0.0	3000.0	20.0	
P15.4	3		0.0			

P15.27			0.00 2.00 [s]	0.00 [s]	8.8
P15.28			0.00 2.00 [s]	0.07 [s]	8.8
P15.29			0.00 2.00 [s]	0.07 [s]	8.8
P15.32			0.0 20.0 [%]	0.0 [%]	8.8
P15.33			0.0 20.0 [%]	0.0 [%]	8.8
P15.34			0.00 2.00 [s]	0.00 [s]	8.8
P15.35			0.00 2.00 [s]	0.00 [s]	8.8
P15.36			0.00 2.00 [s]	0.50 [s]	8.8
P15.37			0.00 2.00 [s]	0.50 [s]	8.8

7.16 1 V/F P16

P16.0			320 460 [V]	380 [V]	
P16.2			0.0 4000.0 [kW]	 [kW]	
P16.3			320 460 [V]	380 [V]	
P16.4			0.0 6500.0 [A]	 [A]	
P16.5			0.0 300.0 [Hz]	50.0 [Hz]	
P16.6			0 6000 [rpm]	1465 [rpm]	
P16.7			2 12 [pole]	4 [pole]	8.9
P16.9			0 7200 [rpm]	1500 [rpm]	8.9
P16.11		[0]V/F [1] [2] [3] [4]	0 4	0	
P16.12			1.00 10.00 [kHz]	3.00 [kHz]	8.9
P16.14	V/F	[0] V/F [1] V/F [2]	0 3	0	8.9
P16.15		[0] [1]	0 1	0	8.9
P16.16			2 500 [ms]	500 [ms]	
P16.17	V/F	[0] [1]	0 1	0	
P16.18			10 1000 [ms]	200 [ms]	
P16.19		[0] [1]	0 1	0	

P16.22			0.00 100.00 [s]	0.00 [s]	8.9
P16.23		V/F	0.00 300.00 [Hz]	0.00 [Hz]	
P16.24		V/F	0.00 300.00 [Hz]	50.00 [Hz]	
P16.25			0.0 120.0 [%]	100.0 [%]	
P16.26	V/F	V/F	0.00 10.00 [%]	0.75 [%]	8.9
P16.27			0.0 200.0 [%]	100.0 [%]	8.9
P16.30			0.0 100.0 [%]	0.0 [%]	8.9
P16.33	V/F	V/F	0 6	2	8.9
P16.34	V/F 1		0.0 300.0 [Hz]	5.0 [Hz]	
P16.35	V/F 1		0.0 125.0 [%]	11.5 [%]	
P16.36	V/F 2		0.0 300.0 [Hz]	50.0 [Hz]	
P16.37	V/F 2		0.0 125.0 [%]	100.0 [%]	
P16.38	V/F 3		0.0 300.0 [Hz]	50.0 [Hz]	
P16.39	V/F 3		0.0 125.0 [%]	100.0 [%]	
P16.40	V/F 4		0.0 300.0 [Hz]	50.0 [Hz]	
P16.41	V/F 4		0.0 125.0 [%]	100.0 [%]	
P16.42	V/F 5		0.0 300.0 [Hz]	50.0 [Hz]	
P16.43	V/F 5		0.0 125.0 [%]	100.0 [%]	
P16.44	V/F 6		0.0 300.0 [Hz]	50.0 [Hz]	
P16.45	V/F 6		0.0 125.0 [%]	100.0 [%]	

P16.48	[0] [1]PID 1 [2]PID 2 [3]	0 3	0	
P16.50		0.00 300.00 [s]	0.00 [s]	8.9
P16.51		0.0 150.0 [%]	70.0 [%]	8.9
P16.52		0.00 5.00 [Hz]	0.00 [Hz]	8.9
P16.54		0.00 300.00 [s]	0.00 [s]	8.9
P16.55		0.0 150.0 [%]	75.0 [%]	8.9
P16.56		0.00 5.00 [Hz]	0.00 [Hz]	8.9
P16.59		0.0 1000.0 [%]	100.0 [%]	
P16.60		0.0 1000.0 [%]	100.0 [%]	
P16.61	“ א o ų ך			

[№]

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7.17 2 V/F P17

P17.22		0.00 100.00 [s]	0.00 [s]	8.9
P17.23	V/F	0.00 300.00 [Hz]	0.00 [Hz]	
P17.24	V/F	0.00 ¥		

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7.18 3 V/F P18

P18.0			320 460 [V]	380 [V]	
P18.2			0.0 4000.0 [kW]	 [kW]	
P18.3			320 460 [V]	380 [V]	
P18.4			0.0 6500.0 [A]	 [A]	
P18.5			0.0 300.0 [Hz]	50.0 [Hz]	
P18.6			0 6000 [rpm]	1465 [rpm]	
P18.7			2 12 [pole]	4 [pole]	8.9
P18.9			0 7200 [rpm]	1500 [rpm]	8.9
P18.11		[0]V/F [1] [2] [3] [4]	0 4	0	
P18.12			1.00 10.00 [kHz]	3.00 [kHz]	8.9
P18.14	V/F	[0] V/F [1] V/F [2]	0 3	0	8.9
P18.15		[0] [1]	0 1	0	8.9
P18.16			2 500 [ms]	500 [ms]	
P18.17	V/F	[0] [1]	0 1	0	
P18.18			10 1000 [ms]	200 [ms]	
P18.19		[0] [1]	0 1	0	

P18.22		0.00 100.00 [s]	0.00 [s]	8.9
P18.23	V/F	0.00 300.00 [Hz]	0.00 [Hz]	

P18.48	[0] [1]PID 1 [2]PID 2 [3]	0	3	0	
P18.50		0.00	300.00 [s]	0.00 [s]	8.9
P18.51		0.0	150.0 [%]	70.0 [%]	8.9
P18.52		0.00	5.00 [Hz]	0.00 [Hz]	8.9
P18.54		0.00	300.00 [s]	0.00 [s]	8.9
P18.55		0.0	150.0 [%]	75.0 [%]	8.9
P18.56		0.00	5.00 [Hz]	0.00 [Hz]	8.9
P18.59		0.0	1000.0 [%]	100.0 [%]	
P18.60		0.0	1000.0 [%]	100.0 [%]	
P18.61		0.0	1000.0 [%]	100.0 [%]	
P18.62		0.0	1000.0 [%]	100.0 [%]	
P18.64 V/F	V/F	0.0	1000.0 [%]	100.0 [%]	8.9
P18.66	V/F	0.0	1000.0 [%]	100.0 [%]	
P18.67		0.0	1000.0 [%]	100.0 [%]	
P18.68		0.0	1000.0 [%]	100.0 [%]	
P18.69		0.0	1000.0 [%]	100.0 [%]	
P18.70		0.0	1000.0 [%] ≤	100.0 [%]	

7.19 4 V/F P19

P19.0	320 460 [V]	380 [V]	
P19.2	0.0 4000.0 [kW]	[kW]	
P19.3	320 460 [V]	380 [V]	
P19.4	0.0 6500.0 [A]	[A]	
P19.5	0.0 300.0 [Hz]	50.0 [Hz]	
P19.6	0 6000 [rpm]	1465 [rpm]	
P19.7	2 12 [pole]	4 [pole]	8.9
P19.9	0 7200 [rpm]	1500 [rpm]	8.9
P19.11	[0]V/F [1] [2] [3] [4]	0 4	0
P19.12		1.00 10.00 [kHz]	3.00 [kHz] 8.9
	[0]]k		

P19.14 V/F

7.20 1 P20

P20.0		[0] [1]	0 1	0	8.10
P20.1		[0] [1] 1 [2] 2 [3] [4] P20.3 [5]DP [6]MODBUS [7]	0 7	0	8.10
P20.2			0 7	0	
P20.3			-300.0 300.0 [%]	0.0 [%]	8.10
P20.5			0 1000 [ms]	0 [ms]	
P20.6			0.0 200.0 [%]	100.0 [%]	8.10
P20.7		[0] [1] P20.8 P20.9 [2] 1 [3] 2 [4] [5]DP [6]MODBUS [7]	0 7	0	8.10
P20.8		P20.7 [1]	0.0 300.0 [%]	200.0 [%]	8.10
P20.9		P20.7 [1]	0.0 300.0 [%]	200.0 [%]	8.10
P20.11			0 1000 [ms]	0 [ms]	
P20.12	2x		0.0 300.0 [%]	100.0 [%]	

P20.31			0.0	100.0 [%]	5.0 [%]	
P20.32			0.0	100.0 [%]	5.0 [%]	
P20.34	[0] [1]		0	1	0	
P20.35			0.0	100.0 [s]	0.0 [s]	
P20.36			50.0	150.0 [%]	110.0 [%]	
P20.37			0.0	150.0 [%]	100.0 [%]	8.10
P20.38			0.0	100.0 [%]	25.0 [%]	8.10
P20.39			0.0	120.0 [%]	100.0 [%]	8.10
P20.40			0.0	150.0 [%]	100.0 [%]	8.10
P20.41			0.0	150.0 [%]	135.0 [%]	
P20.42	[0] [1]		0	1	1	
P20.43			25	1000 [ms]	75 [ms]	
P20.44			25	1000 [ms]	250 [ms]	
P20.45						

P20.53	Kp		0.0 1000.0 [%]	100.0 [%]	
P20.54	Ki		0.0 1000.0 [%]	100.0 [%]	
P20.55			0.0 1000.0 [%]	100.0 [%]	8.10
P20.56			0.0 1000.0 [%]	100.0 [%]	8.10
P20.59	DROOP	DROOP	0.0 100.0 [%]	5.0 [%]	
P20.60	DROOP	0 DROOP	0.0 100.0 [%]	0.0 [%]	8.10
P20.61	DROOP	DROOP	30 2000 [ms]	50 [ms]	8.10
P20.62			0.0 1000.0 [%]	100.0 [%]	8.10
P20.63			0.0 1000.0 [%]	100.0 [%]	8.10
P20.98		( )	0.01 300.00 [s]	0.75 [s]	
P20.99			0.00 10.00 [%]	0.00 [%]	

P21.53	Kp		0.0 1000.0 [%]	100.0 [%]	
P21.54	Ki		0.0 1000.0 [%]	100.0 [%]	
P21.55			0.0 1000.0 [%]	100.0 [%]	8.10
P21.56			0.0 1000.0 [%]	100.0 [%]	8.10
P21.59	DROOP	DROOP	0.0 100.0 [%]	5.0 [%]	
P21.60	DROOP	0 DROOP	0.0 100.0 [%]	0.0 [%]	8.10
P21.61	DROOP	DROOP	30 2000 [ms]	50 [ms]	8.10
P21.62			0.0 1000.0 [%]	100.0 [%]	8.10
P21.63			0.0 1000.0 [%]	100.0 [%]	8.10
P21.98		( )	0.01 300.00 [s]	0.75 [s]	
P21.99			0.00 10.00 [%]	0.00 [%]	

P22.0	[0] [1] [0] [1] 1 [2] 2 [3] [4] P22.3 [5]DP [6]MODBUS [7]	0	1	0	8.10
P22.1		0	7	0	8.10
P22.2		0	7	0	
P22.3		-300.0 [%]	300.0 [%]	0.0 [%]	8.10
P22.5	[redacted]	0	1000	0	
P22.6		0.0	200.0	100.0	

P22.13			20.0 500.0 [ms]	100.0 [ms]	8.10
P22.14		1	0 60000	1024	
P22.15	[0] [1]		0 1	0	8.10
P22.16			0.0 300.0 [%]	100.0 [%]	
P22.17			0.0 300.0 [%]	100.0 [%]	
P22.18			0.0 300.0 [%]	0.0 [%]	
P22.19			0.0 300.0 [%]	0.0 [%]	
P22.20	[0] [1]		0 1	0	
P22.21	[0] [1]		0 1	0	
P22.22			0.0 300.0 [%]	160.0 [%]	
P22.23			0.0 200.0 [%]	20.0 [%]	
P22.24			0.0 300.0 [%]	100.0 [%]	
P22.25			0.0 200.0 [%]	100.0 [%]	
P22.26			0.0 1000.0 [%]	0.0 [%]	
P22.27			0.00 15.00 [%]	2.00 [%]	
P22.28					

P22.53			0 [%]	100.0 [%]	
P22.54	Ki		0.0 [%]	1000.0 [%]	100.0 [%]	
P22.55			0.0 [%]	1000.0 [%]	100.0 [%]	8.10
P22.56			0.0 [%]	1000.0 [%]	100.0 [%]	8.10
P22.59	DROOP	DROOP	0.0 [%]	100.0 [%]	5.0 [%]	
P22.60	DROOP	0 DROOP	0.0 [%]	100.0 [%]	0.0 [%]	8.10
P22.61	DROOP	DROOP	30 [ms]	2000 [ms]	50 [ms]	8.10
P22.62			0.0 [%]	1000.0 [%]	100.0 [%]	8.10
P22.63			0.0 [%]	1000.0 [%]	100.0 [%]	8.10
P22.98		( )	0.01 [s]	300.00 [s]	0.75 [s]	
P22.99			0.00 [%]	10.00 [%]		

7 4 P23

P23.0	[0] [1] [0] [1] 1 [2] 2 [3] [4] P23.3 [5]DP [6]MODBUS [7]	0 1	0	8.10
P23.1		0 7	0	8.10
P23.2		0 7	0	
P23.3		-300.0 300.0 [%]	0.0 [%]	8.10
P23.5	[redacted]	[redacted]		
P23.6				

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P23.13

P23.53	Kp		0.0 [%]	1000.0 [%]	100.0 [%]	
P23.54	Ki		0.0 [%]	1000.0 [%]	100.0 [%]	
P23.55			0.0 [%]	1000.0 [%]	100.0 [%]	8.10
P23.56			0.0 [%]	1000.0 [%]	100.0 [%]	8.10
P23.59	DROOP	DROOP	0.0 [%]	100.0 [%]	5.0 [%]	
P23.60	DROOP	0 DROOP Ri	0.0 [%]	100.0 [%]	0.0 [%]	8.10
P23.61	DROOP	v 2 (, m " ŕ				

7

P33.18	[W2]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.19	[W3]	7-2	0 37	0	
P33.20	[W3]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.21	[W4]	7-2	0 37	1	
P33.22	[W4]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.23	[W5]	7-2	0 37	18	
P33.24	[W5]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	2	
P33.25	[W6]	7-2	0 37	21	
P33.26	[W6]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	1	
P33.27	[W7]	7-2	0 37	22	
P33.28	[W7]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	1	
P33.29	[W8]	7-2	0 37	23	
P33.30	[W8]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	1	

P33.44	[W15]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.45	[W0]	7-3	0 48	0	
P33.46	[W0]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.47	[W1]	7-3	0 48	0	
P33.48	[W1]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.49	[W2]	7-3	0 48	0	
P33.50	[W2]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.51	[W3]	7-3	0 48	0	
P33.52	[W3]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.53	[W4]	7-3	0 48	1	

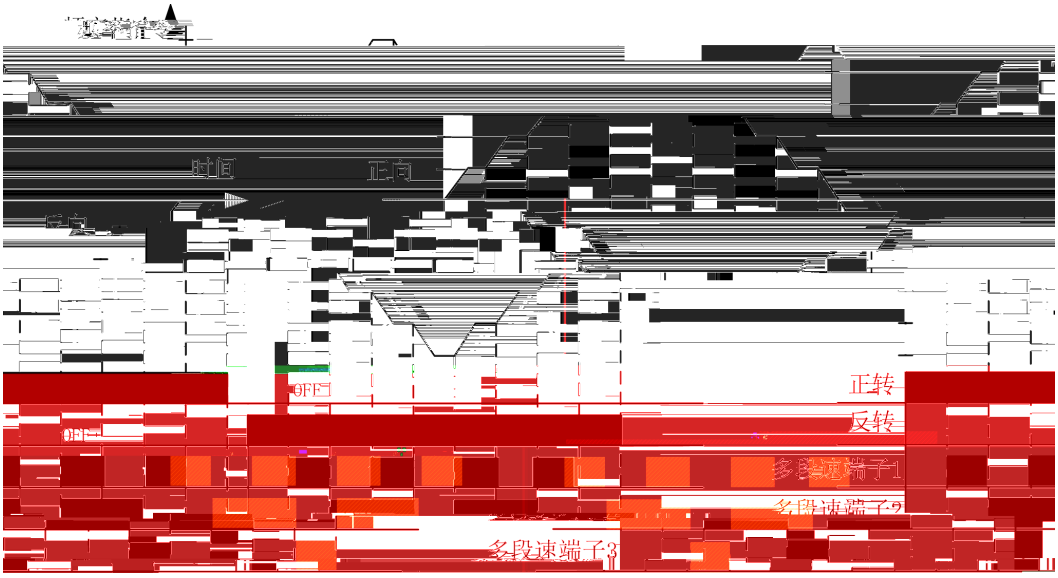
P33.54	[W4]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.55	[W5]	7-3	0 48	19	
P33.56	[W5]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	2	
P33.57	[W6]	7-3	0 48	26	
P33.58	[W6]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	6	
P33.59	[W7]	7-3	0 48	30	
P33.60	[W7]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	1	
P33.61	[W8]	7-3	0 48	14	

		[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100			
P33.62	[W8]		0	7	0
P33.63	[W9]	7-3	0	48	13
P33.64	[W9]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0	7	0
P33.65	[W10]	7-3	0	48	40
P33.66	[W10]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0	7	6
P33.67	[W11]	7-3	0	48	0
P33.68	[W11]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0	7	0
P33.69	[W12]	7-3			

29	C
30	
31	
32	
33	1
34	2
35	
36	
37	
38	
39	
40	
41	Mwh
42	Kwh
43	Mwh
44	Kwh
45 48	AW26 29

4 16 (8421)

(FORWARD) (REVERSE) P12.2(1)



2

DI 22 “ ”

10Hz E106 “ 1 ”

10Hz 2s E107

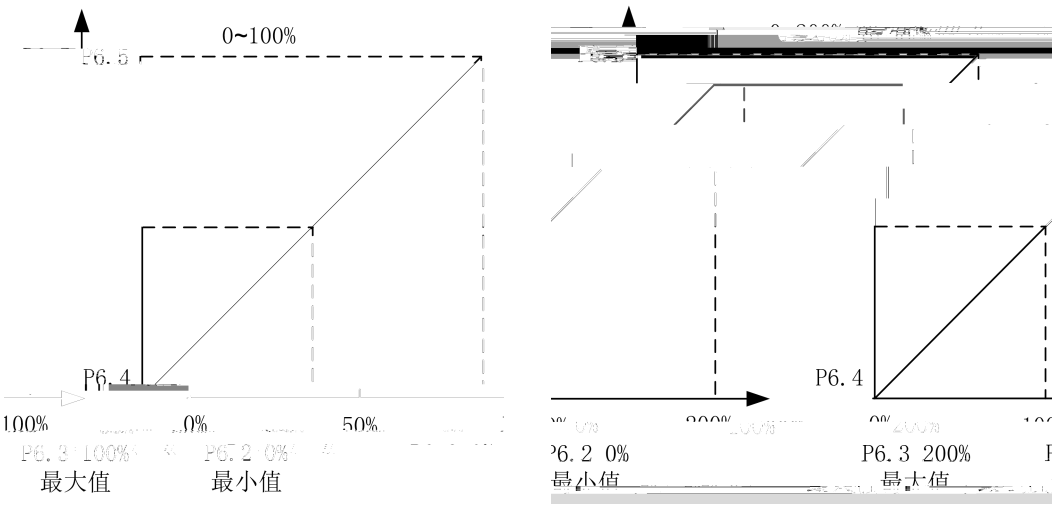
“ 2 ”

8.3

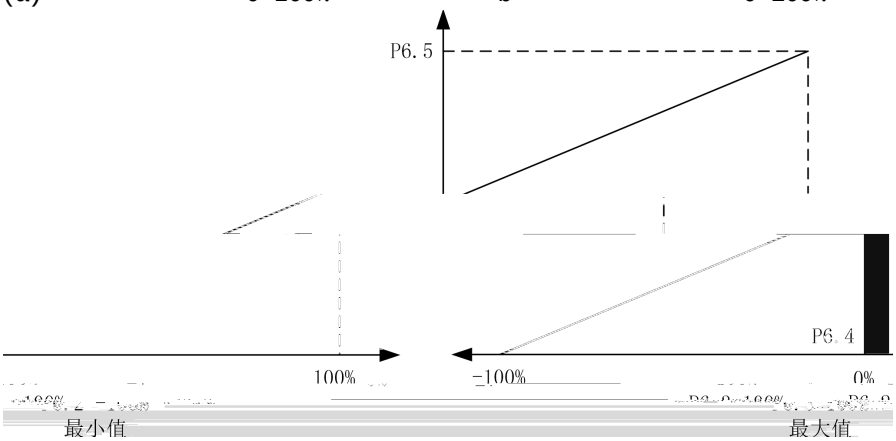
/

[1] [3] [3]

[1] [3]



(a) 0~100% b 0~200%



c -100~100%

8.6

1

P7.0 P7.1 P7.2 P7.3

2

P7.4 P7.5 P7.6 P7.7 P7.4 P16.4

3

P7.8 P7.9 P7.10 P7.11

P16.4 $\frac{(\quad)}{3}$ 7.8 16.4 1.414

4

P7.12 P7.13 P7.12

P7.13

5

P7.14 IGBT P7.14

P7.15 IGBT P7.15

8

6

P7.19 P7.20 P7.21 P7.22 P7.19

P7.19 P7.22

7

P7.23 P16.11=1 P7.23

P7.23

P7.24 P7.26 P17.11=1 P18.11=1 P19.11=1

8

P7.31 P7.32 P16.11=2

P7.31 100% P7.32

P7.31 P7.32

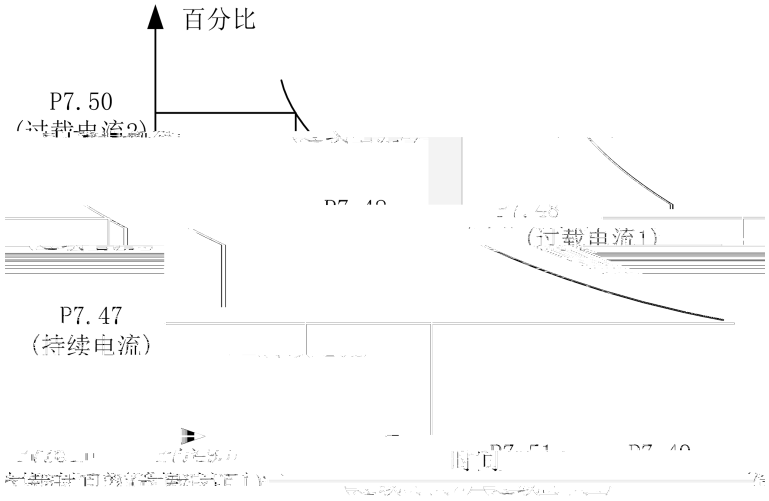
9

P7.33

P7.33

10

P7.48 P7.50



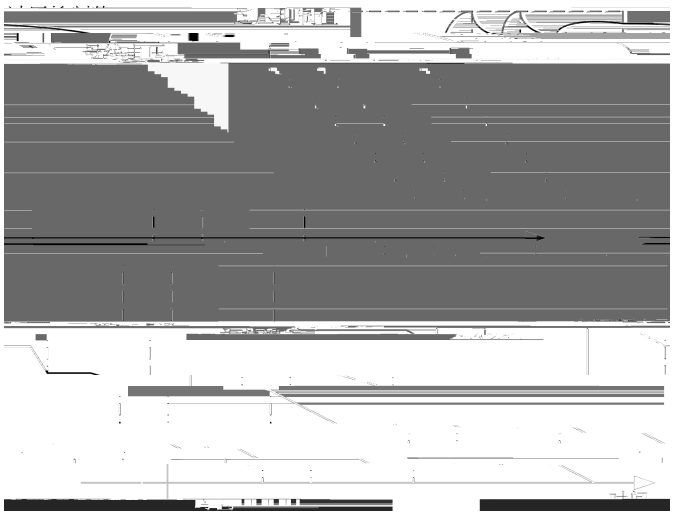
11

P7.69 P7.70 P7.71 P7.69

0 P16.0 380V P7.70 0V

611V = 1.1 $\sqrt{2}$ P16.0 20 P7.70

8



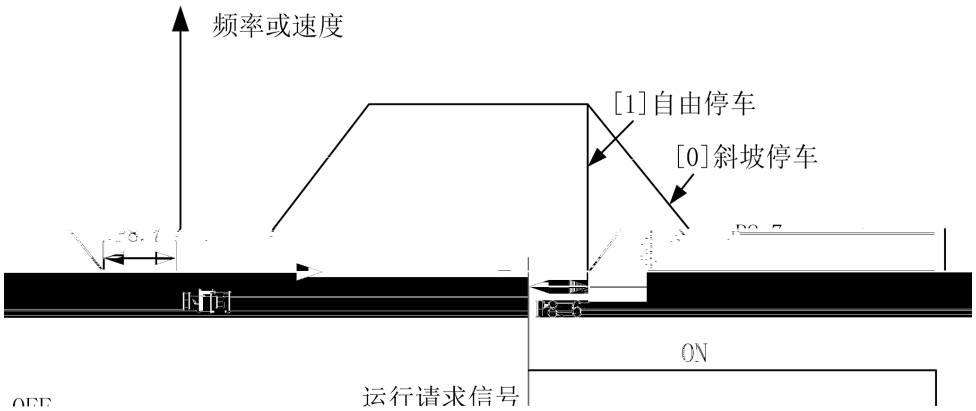
P7.71

8.7

1

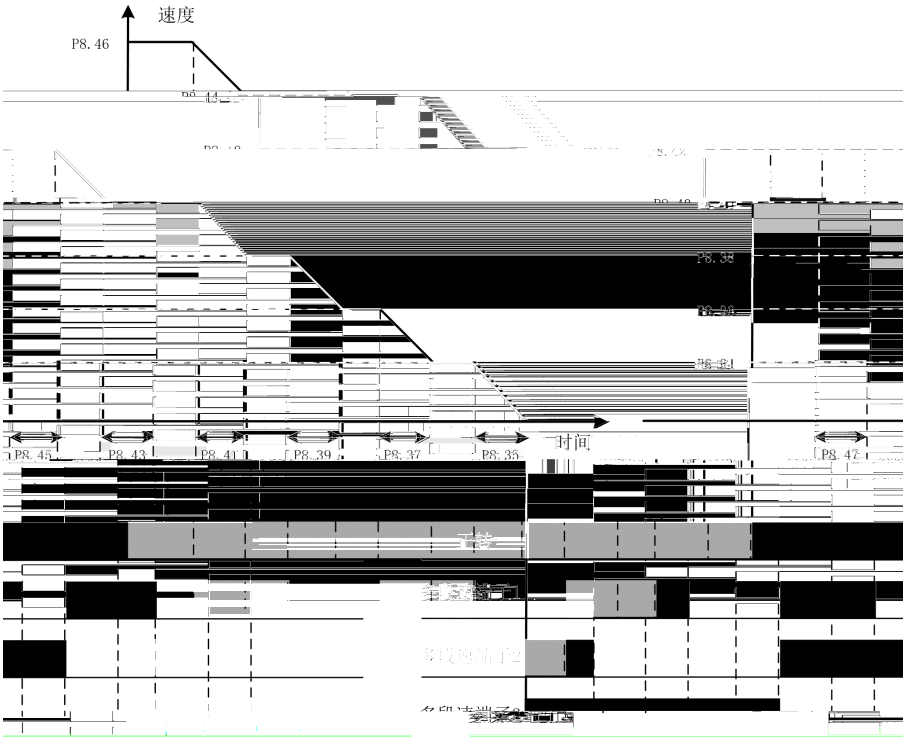
P8.3

[1]



2 % t

P8.15	P8.17	P8.19	P8.21	P8.23	P8.25	P8.27
10%	20%	30%	50%	60%	80%	100%



P8.34 < P8.36 < P8.38 < P8.40 < P8.42 < P8.44 < P8.46

P8.34	P8.36	P8.38	P8.40	P8.42	P8.44	P8.46
10%	20%	30%	50%	60%	80%	100%

3

PROFIBUS MODBUS

P8.13 P8.32

1 =P8.14 × P8.16 × (× 0.001)

1 =P8.33 × P8.35 × (× 0.001)

8.8

1

P12.2 P12.17

P12.0=[1]

	1	2	3	4
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	0	0
5	0	0	1	0

0

P16.12

0.5Hz~2Hz >50Hz

1kHz			
5kHz			
10kHz			

	kHz
0.4kW 30kW	5
37kW 132kW	3
160kW 400kW	2

3 V/F

P16.14 V/F P16.11=0

[0] V/F

[1] V/F P16.33 P16.45 V/F

[2]

P16.34 P16.45 V/F V/F

V1 V2 V3 F1 F2 F3

4

P16.15 V/F

V/F

5

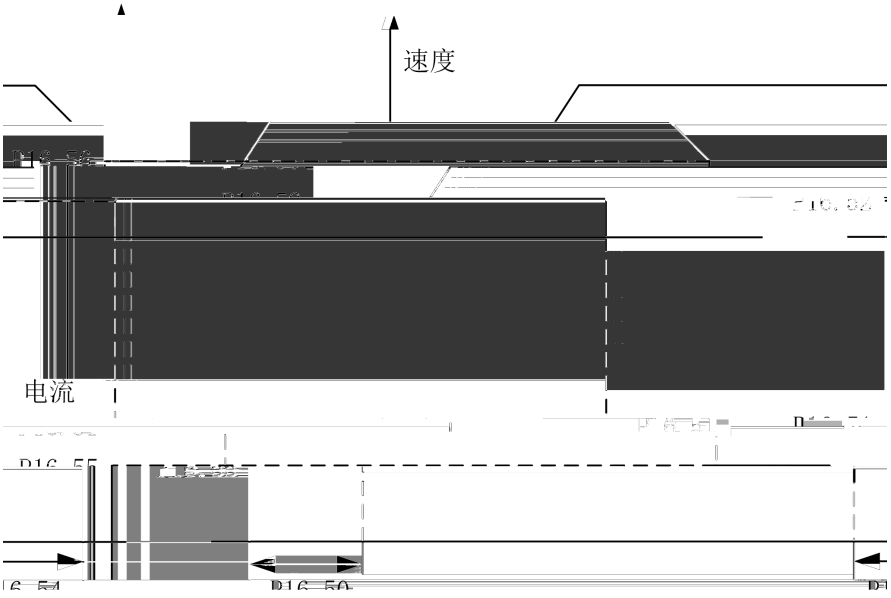
6

P16.50 P16.56

V/F

P16.50 P16.51 P16.52

P16.54 P16.55 P16.56



8

DROOP DROOP

P20.60 0

DROOP P20.61 DROOP

P20.59 DROOP

5

P20.36

6

P20.37 P20.40

b

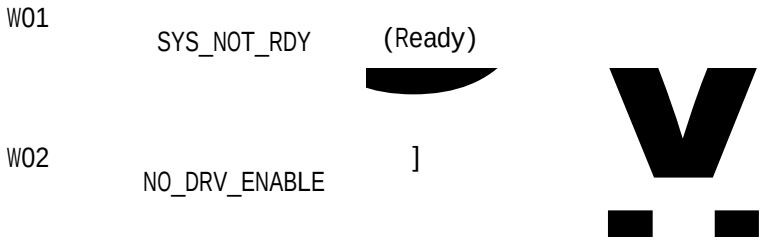
%

8.11

V/F	P16.64 V/F	(10 40Hz)	100	80 150	
	P16.12				
	P16.15				
	P16.26 V/F		0.75	0.5 1.2	
	P7.0		150	150 220	
	P16.12				
	P7.0		150	150 220	
	P20.43		75	50 100	
	P20.56		100	80 150	

9.

9.1



9.2

[E051]	U IGBT ERR_UT not reset	IGBT IGBT
[E053]	V IGBT ERR_UT not reset	IGBT IGBT
[E054]	W IGBT ERR_UT not reset	IGBT IGBT
[E056]	ERR_SLAVE_FAULT not reset	
[E057]	ERR_DB not reset	IGBT

9

[E112]	ZC	P7.8
[E113]	MIP	
[E114]	MOP	
[E115]	OS	P7.19 P7.19
[E116]	SLVC Fail	P7.23
[E117]	MOTOR STALL	P20.14 P20.15
[E118]	PG ERROR	P20.14 P20.15
[E119]	SPEED ABNORMAL	P20.14 P20.15 P7.31 P7.32
[E120]	IGBT OT	
[E138]	TEMP_SENSING FAIL	
[E152]	U IGBT PDP [U]	IGBT IGBT
[E154]	V IGBT PDP[V]	IGBT IGBT
[E155]	W IGBT PDP [W]	IGBT IGBT
[E156]	Hardware OC	
[E167]	CAN CAN_ERR	
[E170]	MOTOR TUNING FAIL	P7.33
[E180]	DP P/B ERROR	

[E181]	DP P/B_EM	CW0.4 [ ]
[E200]	LOCAL_EM	P3 [ ]
[E201]	REMOTE_EM	P3
[E202]	Modbus MODBUS EMERGENCY	Modbus"

9

9.3

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- ON
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-
- ON
- COM

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10.

1.

2.

3.

4.

1. CMOS

2.

3.

10

10.1

10.2

	1. 2.	1. > 40 < 95% 2.
	1. 2.	1. 2.
	1. 2. 3.	1. 2. 3.
	1. 2.	1. 2.
	1. 2.	1. 2.

10.3

	2	1 2
PCB		

10.4

5

5

(400-0077-570)

1 40

2 80%

3 24 /

10

10.5

1

2

5

HF650

1

2

3

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