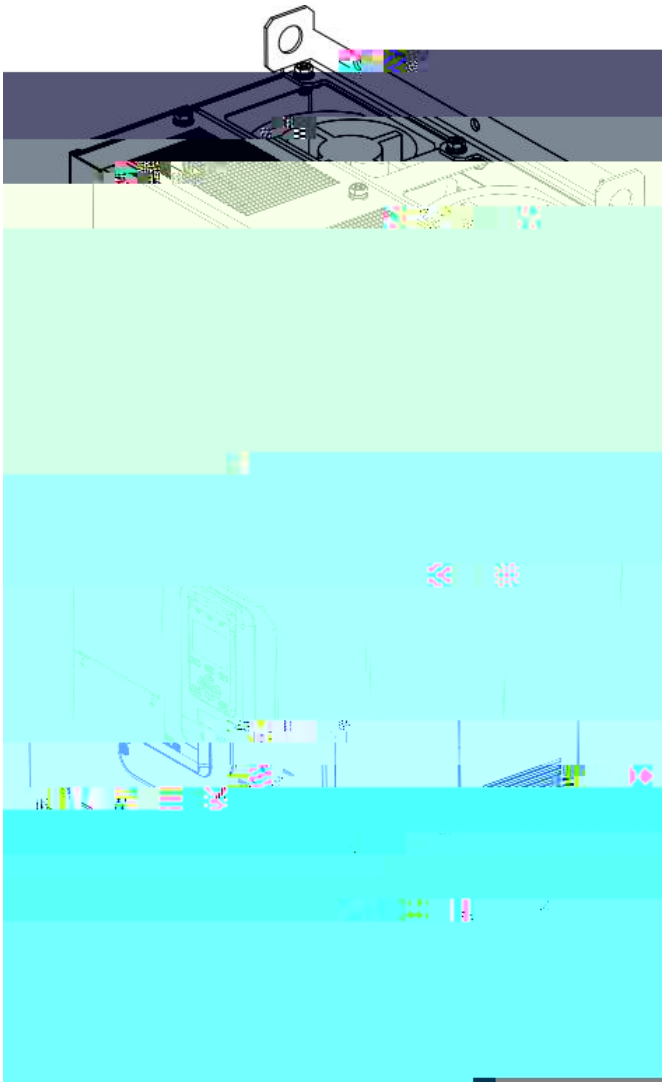
HF650

1.07

Wuhan Guide Technology Co.,Ltd.



1. 1
1.1 1
1.2 2
1.3 2
2. 3
2.1 3
2.2 3
2.3 4
2.4 6
2.5 8
2.6 10
2.7 12
2.8 13
2.9 13
3. 14
3.1 14
3.2 16
3.2.1 16
3.3 20
3.4 21
4. 22
4.1 22
4.2 23
4.3 25
4.4 28
4.5 29
4.6 30
4.7 31
4.8 31
4.9 EMC 32
5. 35
5.1 35
5.2 35
5.3 36

5.4 39
5.5 40
6. 43
6.1 43
6.2 44
6.2.1 44
6.2.2 44
6.2.3 45
6.2.4 45
6.2.5 46
6.2.6 47
6.2.7 47
6.2.8 48
6.2.9 48
7. 49
7.1 P0 49
7.2 P2 49
7.3 P3 49
7.4 P4 52
7.5 P5 54
7.6 P6 56
7.7 P7 58
7.8 1 P8 61
7.9 2 P9 64
7.10 3 P10 67
7.11 4 P11 70
7.12 1 P12 73
7.13 2 P13 75
7.14 3 P14 77
7.15 4 P15 79
7.16 1 V/F P16 81
7.17 2 V/F P17 84
7.18 3 V/F P18 87
7.19 4 V/F P19 90
7.20 1 P20 93

7.21 2 P21 97
7.22 3 P22 101
7.23 4 P23 105
7.24 MODBUS P32 109
7.25 P33 110
8. 120
8.1 120
8.2 120
8.3 121
8.4 122
8.5 122
8.6 123
8.7 126
8.8 129
8.9 V/F 129
8.10 133
8.11 136
9. 137
9.1 137
9.2 138
9.3 141
10. 142
10.1 142
10.2 143
10.3 143
10.4 144
10.5 144

1.

1.1





1.2

(1)

(2)

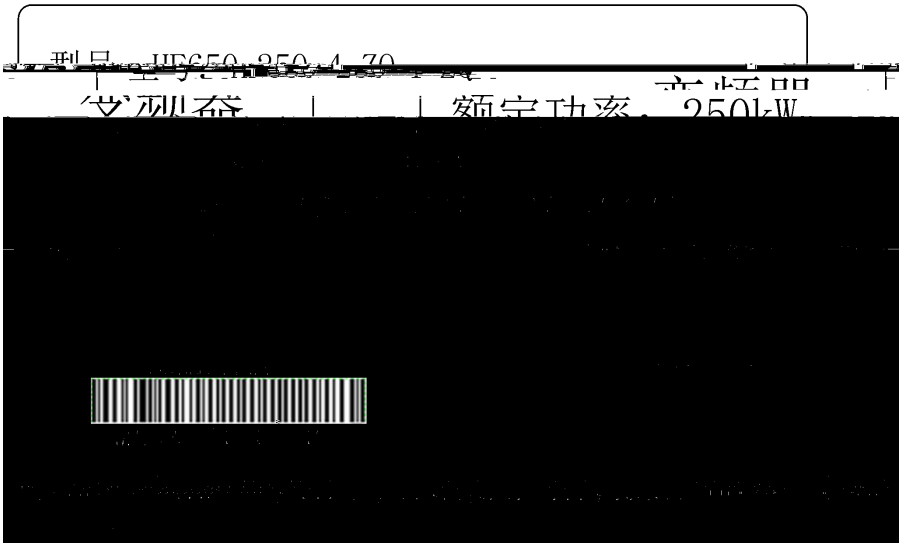
(3)

(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

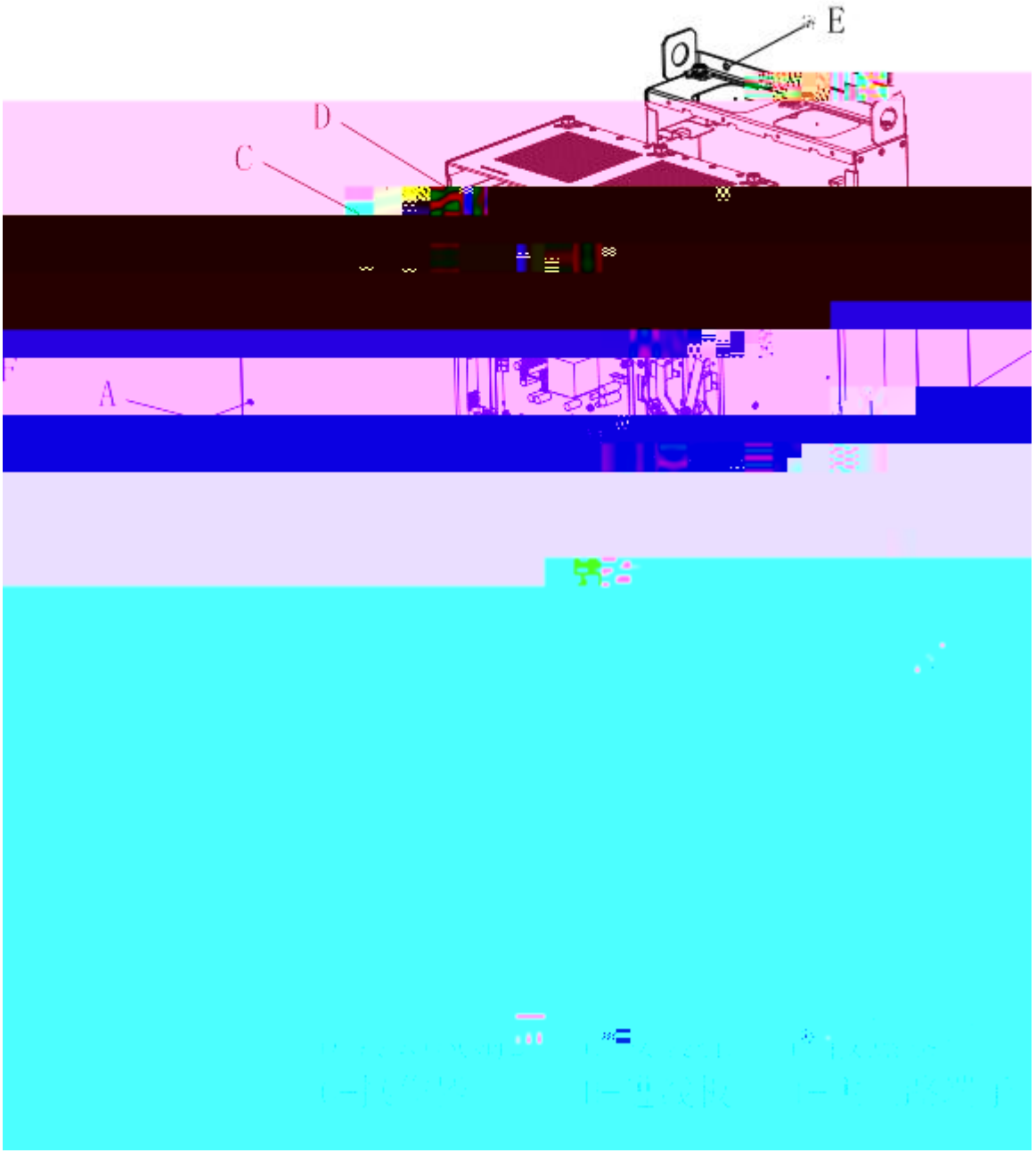
HF650-160-4-ZQ	330	160	265	132		
HF650-185-4-ZQ	365	185	330	160	I8	146
HF650-220-4-ZQ	438	220	365	185		
HF650-250-4-ZQ	485	250	438	220		
HF650-280-4-ZQ	545	280	485	250		
HF650-315-4-ZQ	610	315	545	280	I9	210
HF650-355-4-ZQ	668	355	610	315		
HF650-400-4-ZQ	720	400	668	355		

150%	5	1
200%	5	5

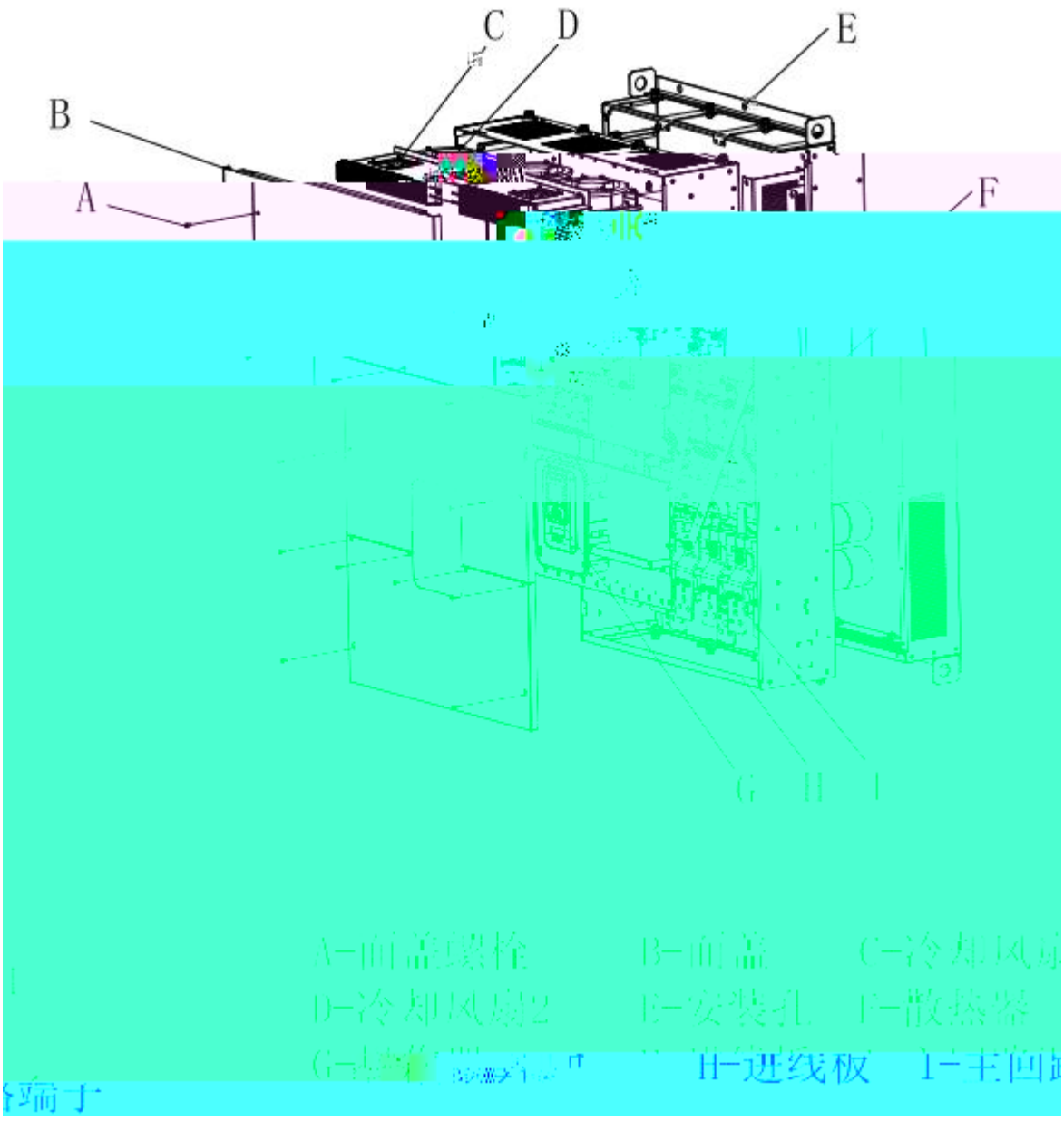
2.4

HF650

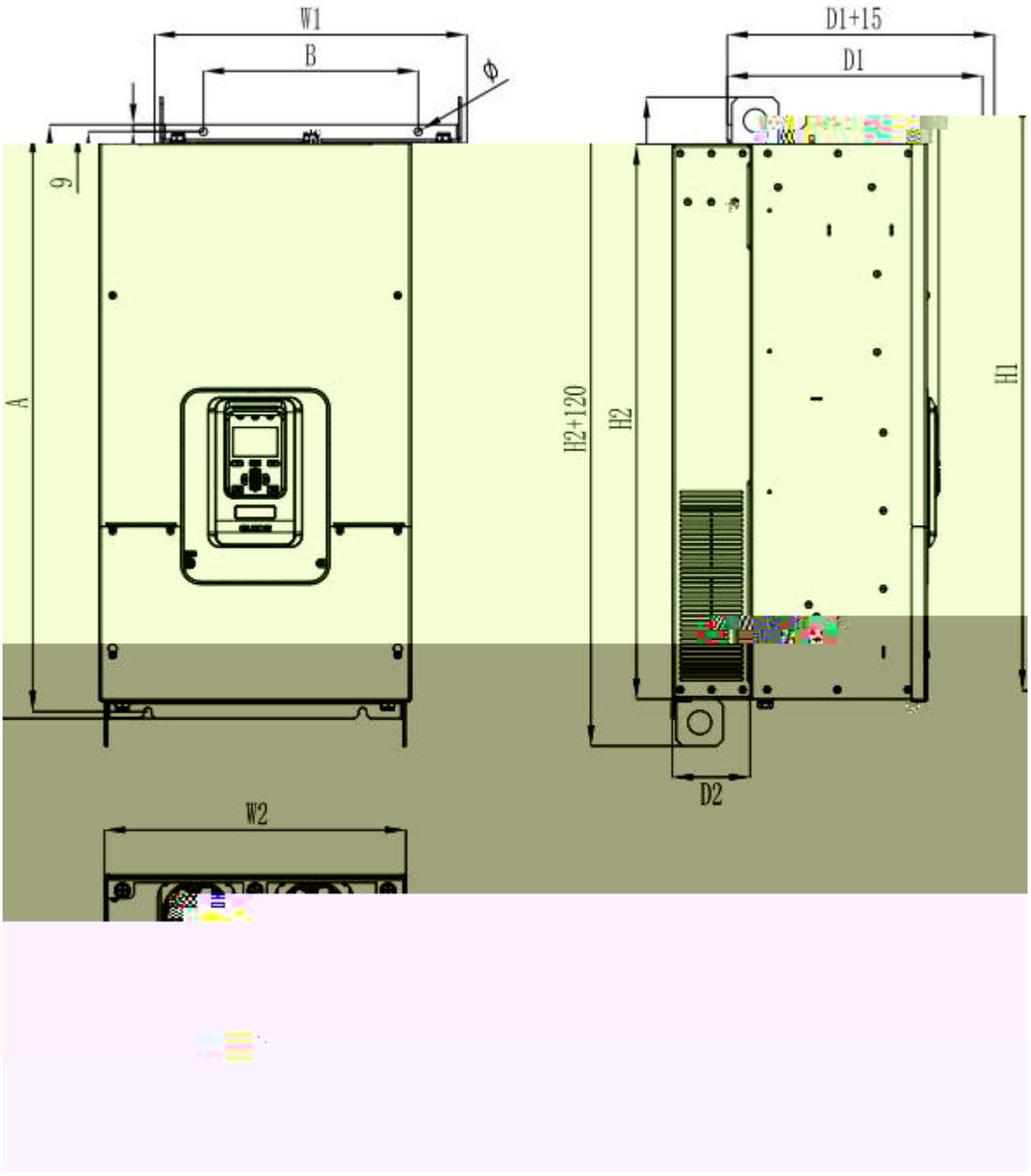
HF650-037-4-ZQ　　HF650-090-4-ZQ



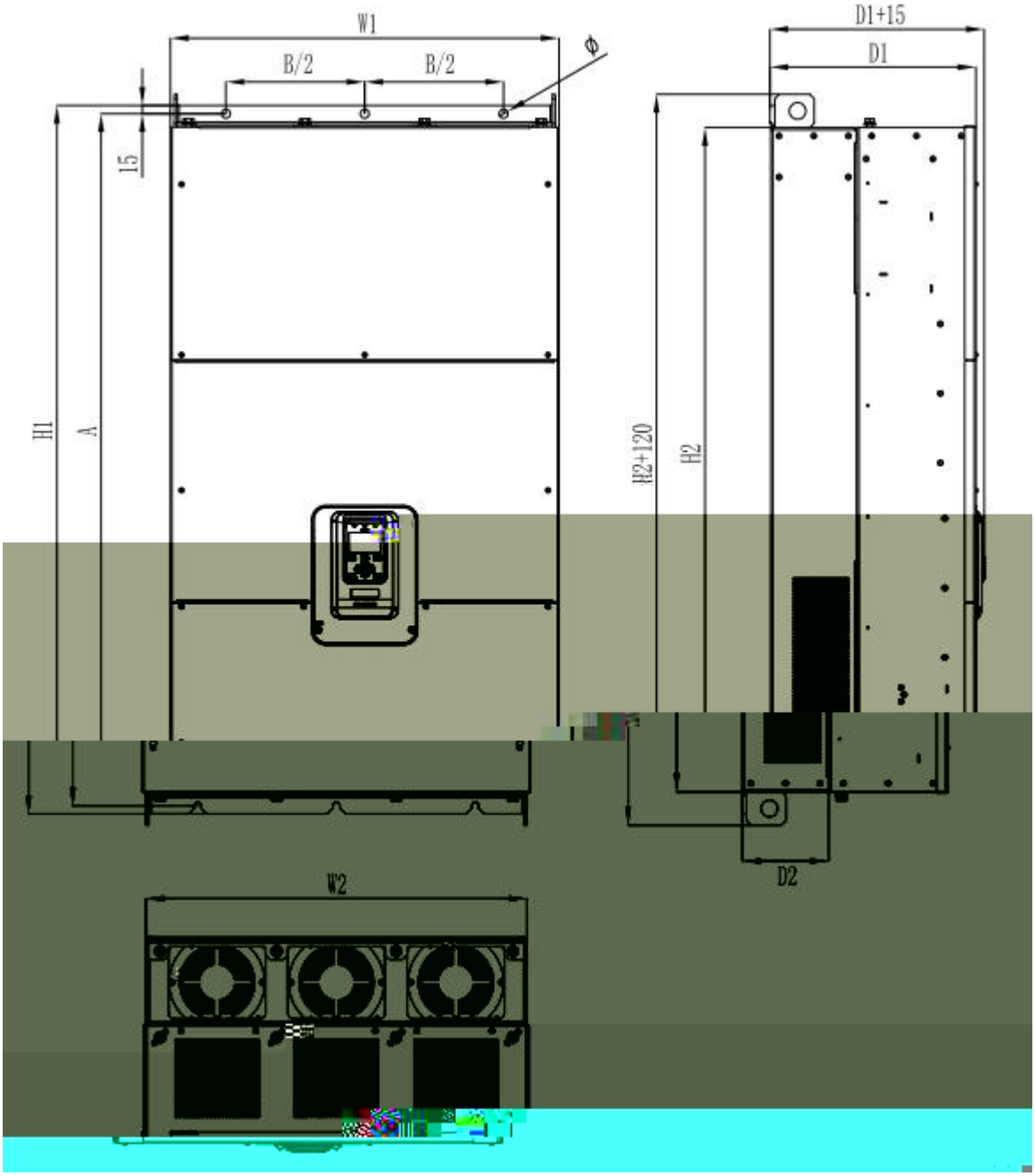
HF650-110-4-ZQ　　HF650-400-4-ZQ



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		

3.

1. / “ ”

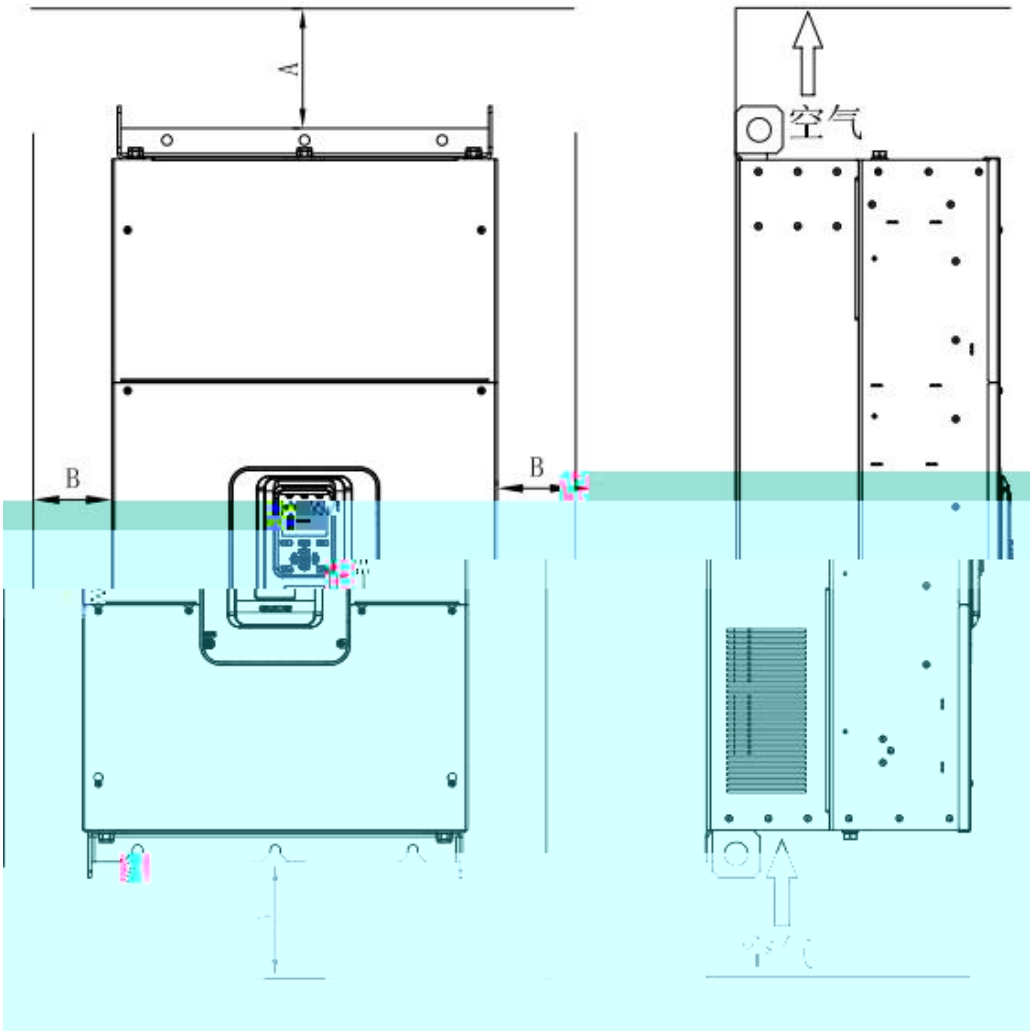
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3

3.2

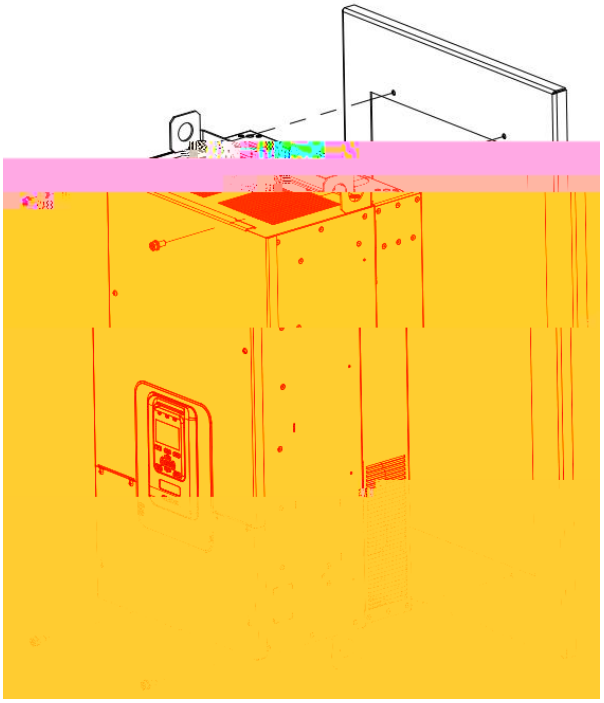
3.2.1

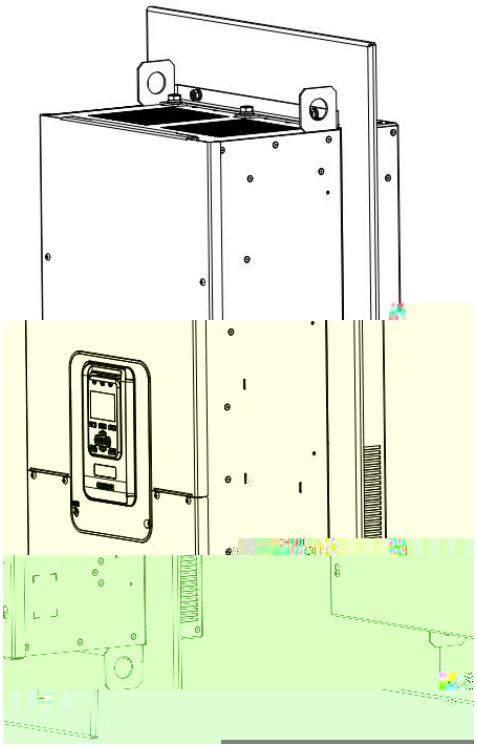
1



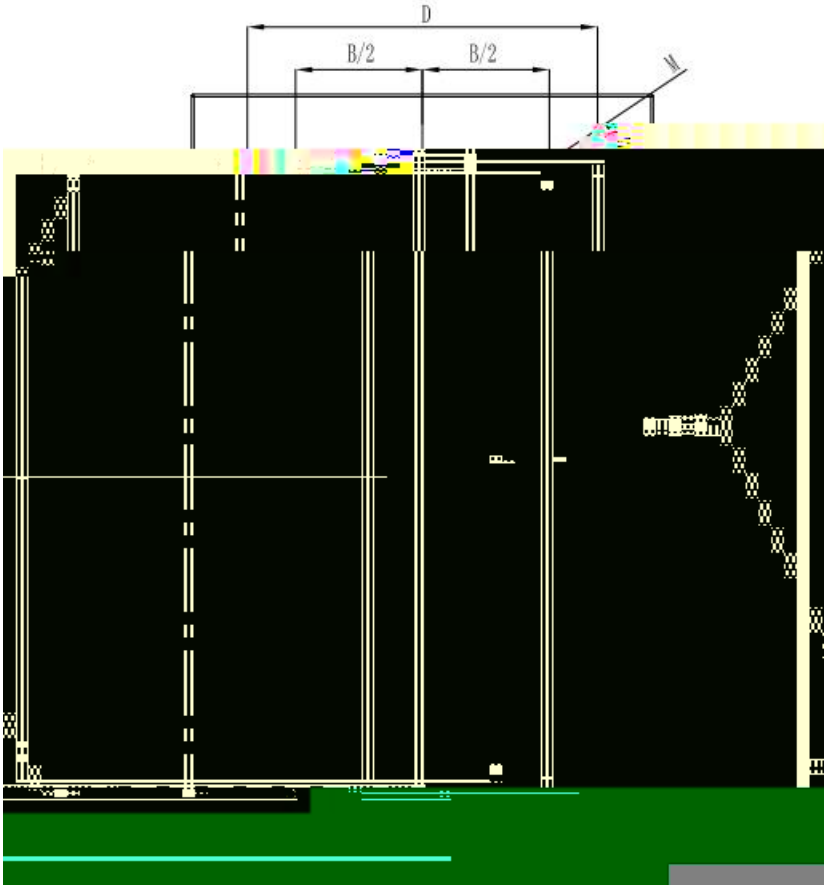
3-1

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3

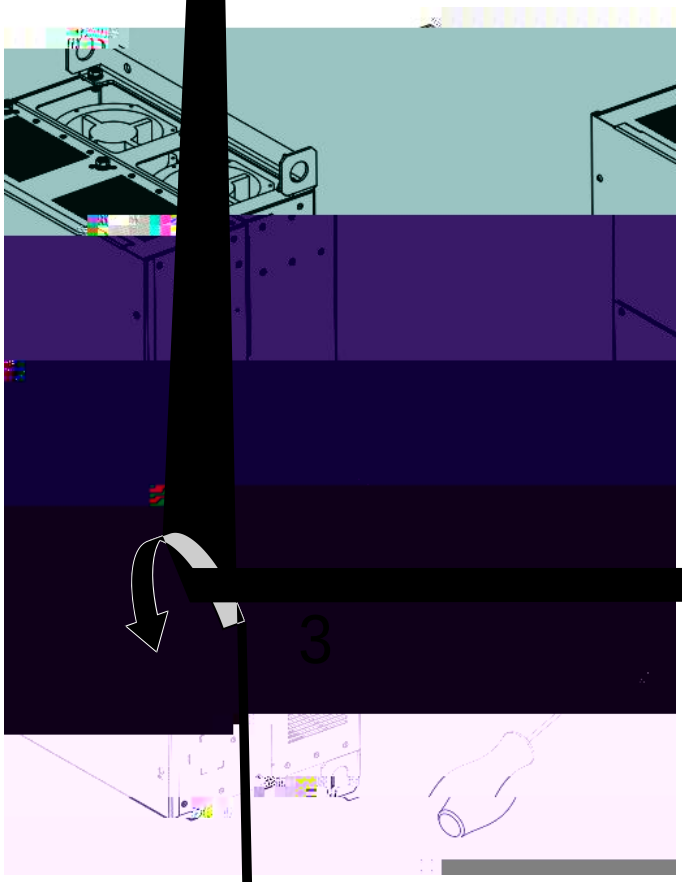


3-5 I7-I9

	(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

* ₪† * †

4.

4.1

1

2 10

3 U V W

4

5

6 Ж

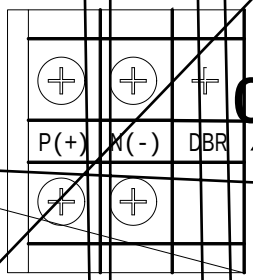
14

15 30 m

4.2

1

37kW ~ 75kW +



%

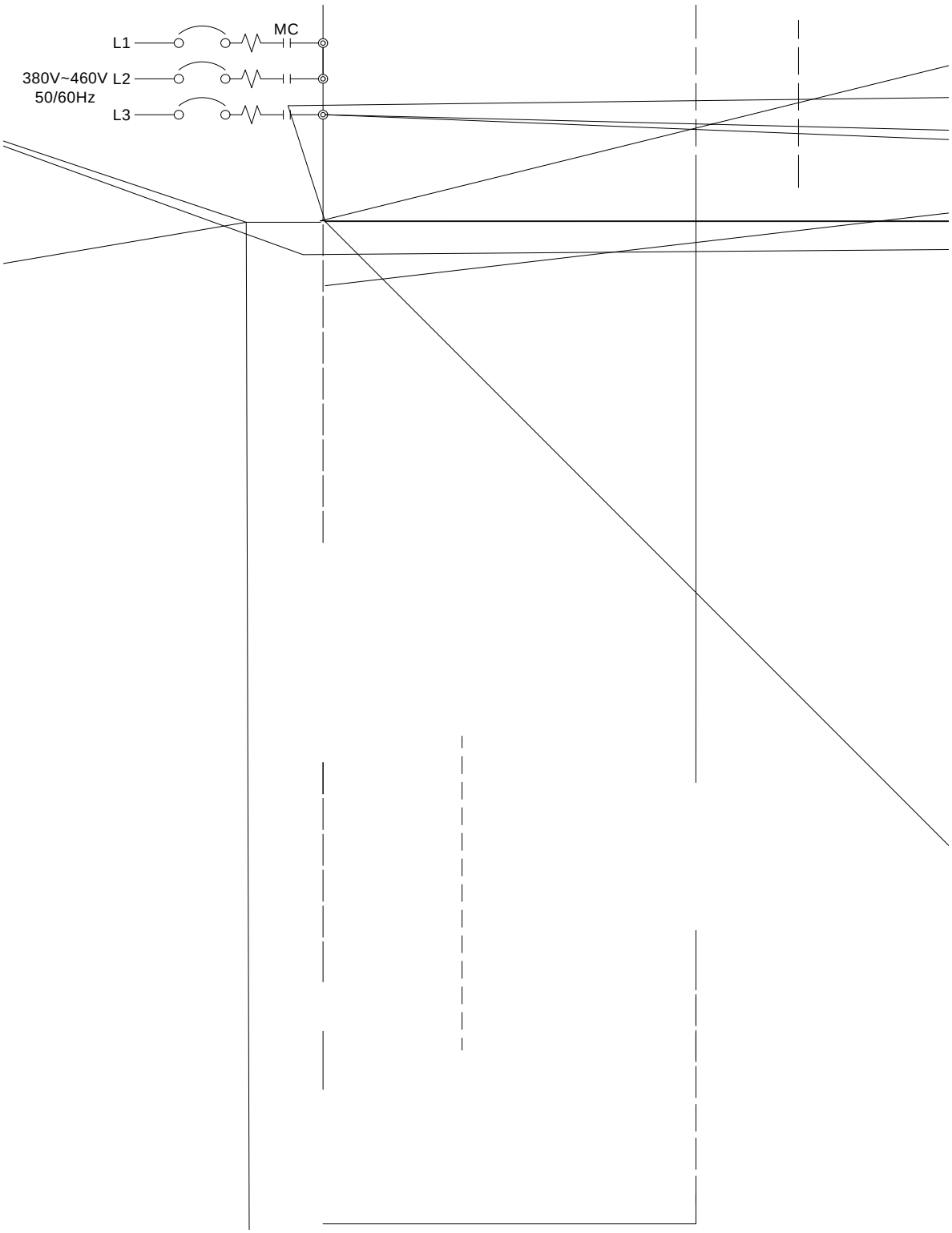
3

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

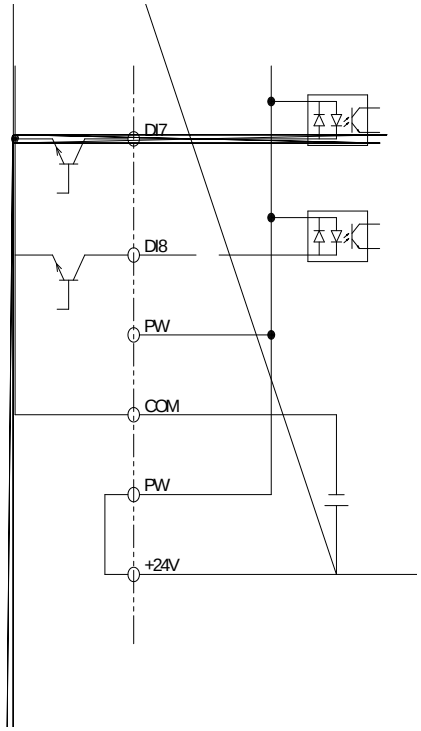
25	+24V	24V		
26	DO3		3	DC24V 50mA
27	DO4A		4	
28	DO4C		4	
29	DO4B		4	
30	DO5A		5	
31	DO5C		5	

4.4

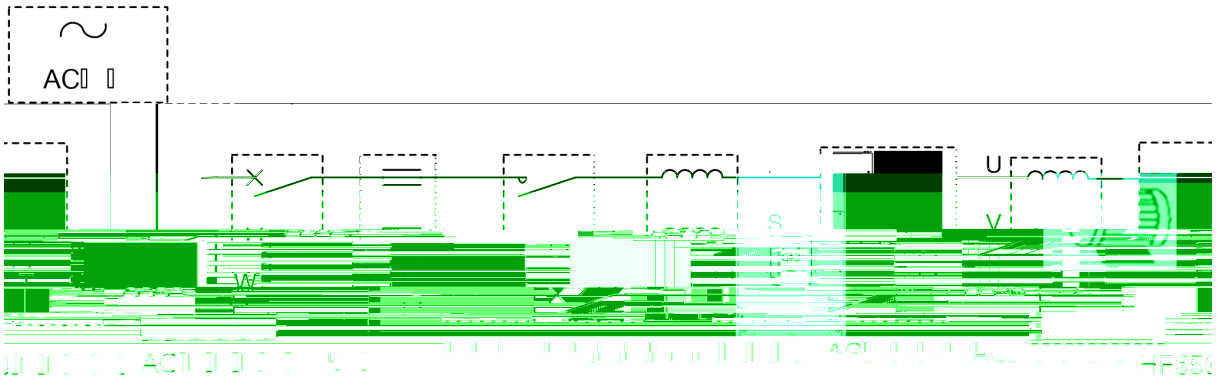


4.5

0V NPN



4.6



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

4.7

	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

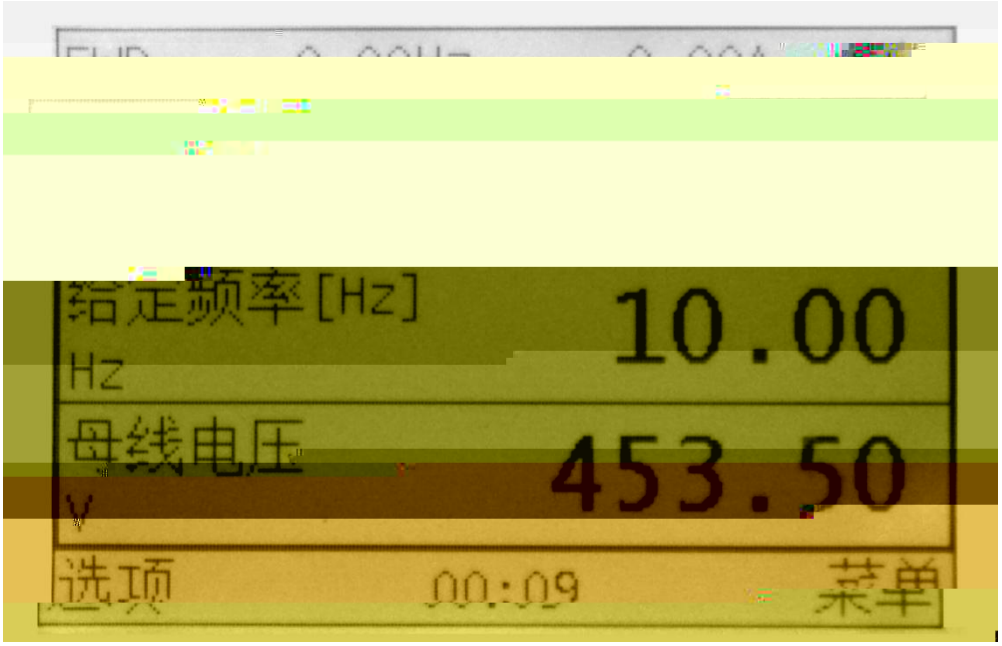
4.8

		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

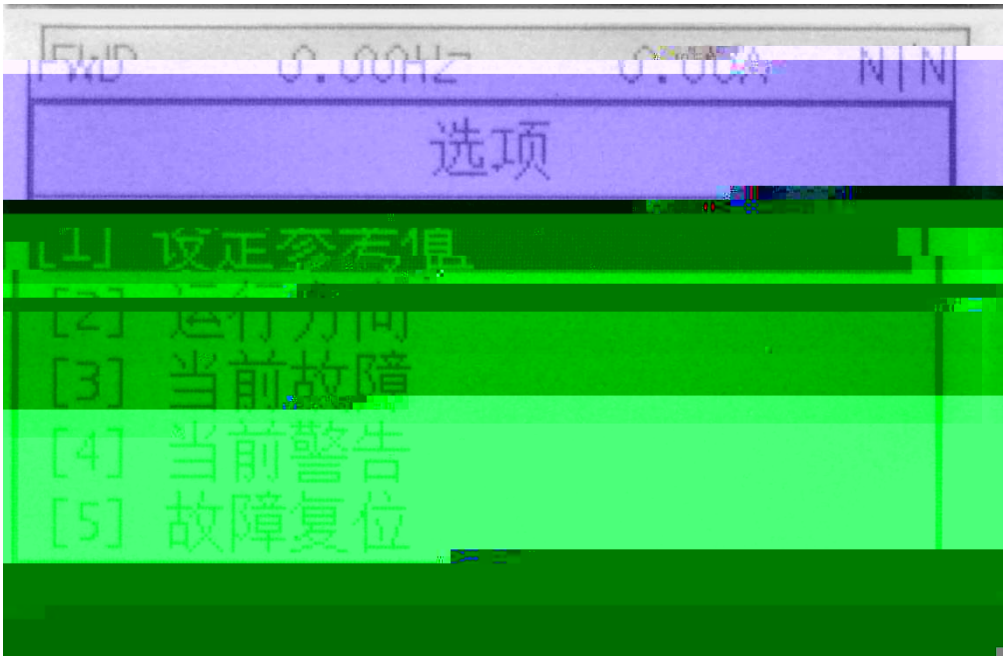
|

	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 Ń

7

2

5

▼ ▲ “Enter”

3 Fault Record

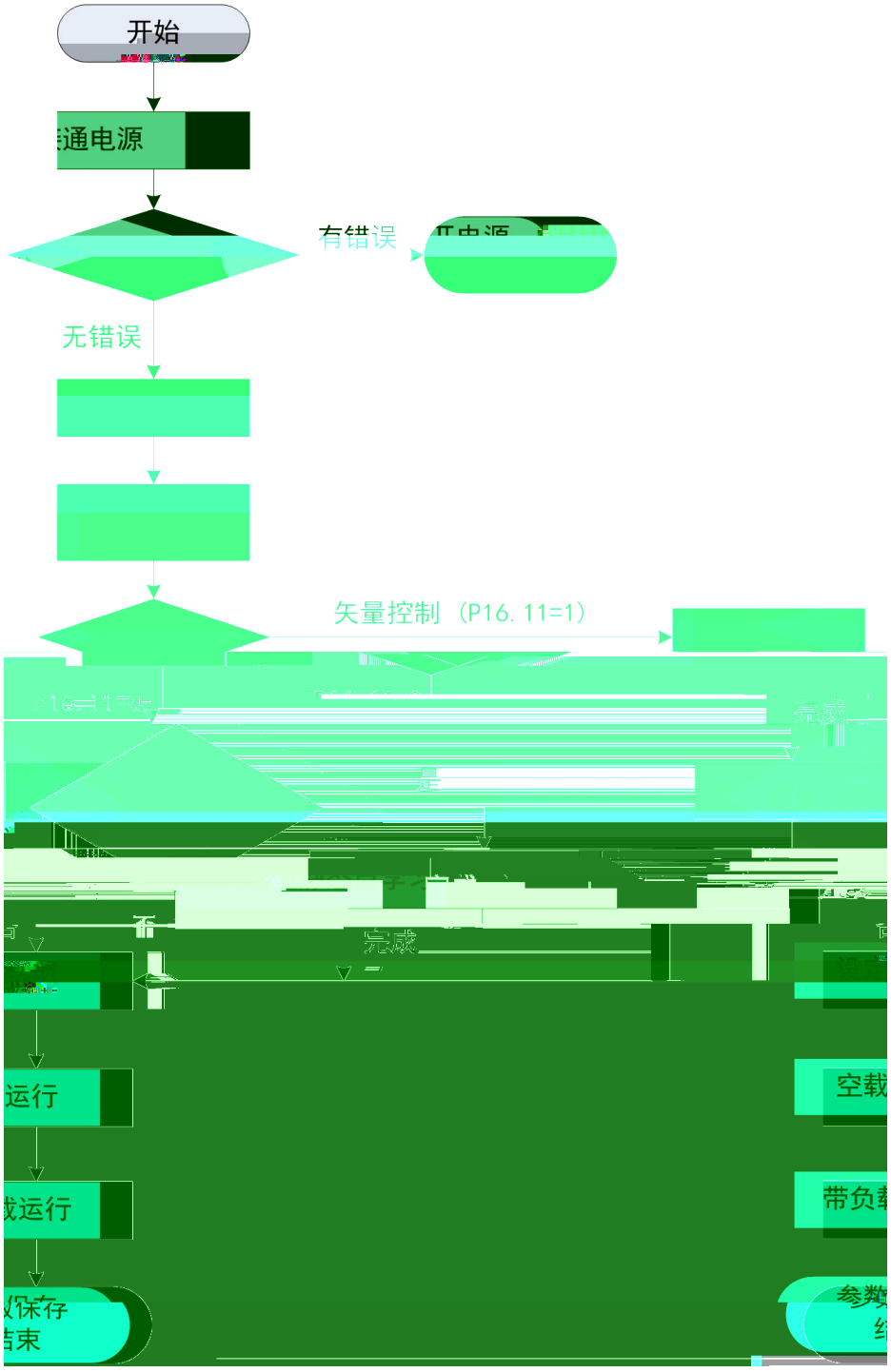
4 Access Permissions

5 Display Setting

5

6.

6.1



/

V/F P16.11=0 V/F

P16.11=2 P16.11=1

6.2

6.2.1

1

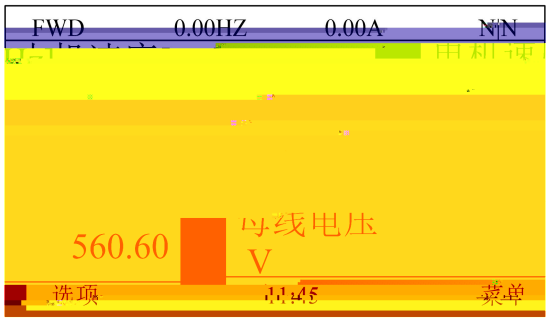
AC380~480V 50/60Hz

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]	0.000 [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 AO1 7-1 0 14 2

P6.2 AO1 AO1

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

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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

P	0	3	P9.17	P9.19	0.0 300.0 [s]	7.00 [s]	8.7
	.21	4			0.0 300.0 [%]	300.0 [%]	8.7
P9.22		4	P9.19	P9.21	0.0 300.0 [s]	10.00 [s]	8.7
P9.23		5			0.0 300.0 [%]	300.0 [%]	8.7
P9.24		5	P9.21	P9.23	0.0 300.0 [s]	10.00 [s]	8.7
P9.25		6			0.0 300.0 [%]	300.0 [%]	8.7
P9.26		6	P9.23	P9.25	0.0 300.0 [s]	10.00 [s]	8.7
P9.27		7			0.0 300.0 [%]	300.0 [%]	8.7
P9.28		7	P9.25	P9.27	0.0 300.0 [s]	10.00 [s]	8.7
P9.29		8			0.0 300.0 [%]	300.0 [%]	8.7
P9.30		8	P9.27	P9.29	0.0 300.0 [s]	10.00 [s]	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

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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

P10.20	3	P10.17	P10.19	0.0 [s]	300.0 [s]	7.00 [s]	8.7
P10.21	4			0.0 [%]	300.0 [%]	300.0 [%]	8.7
P10.22	4	P10.19	P10.21	0.0 [s]	300.0 [s]	10.00 [s]	8.7
P10.23	5			0.0 [%]	300.0 [%]	300.0 [%]	8.7
P10.24	5	P10.21	P10.23	0.0 [s]	300.0 [s]	10.00 [s]	8.7
P10.25	6						

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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					

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					

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	

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			0.0 100.0 [%]	22.0 [%]	
P20.46			0.0 100.0 [%]	18.0 [%]	
P20.47			0.0 200.0 [%]	92.0 [%]	
P20.48			0.0 200.0 [%]	87.0 [%]	
P20.49			0.0 150.0 [%]	100.0 [%]	
P20.51			0.0 1000.0 [%]	100.0 [%]	
P20.52			0.0 1000.0 [%]	100.0 [%]	

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]	[redacted]			
P22.6	[illegible]	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	Kp		0.0 1000.0 [%]	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 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		( )	0.01 300.00 [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				

7

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			

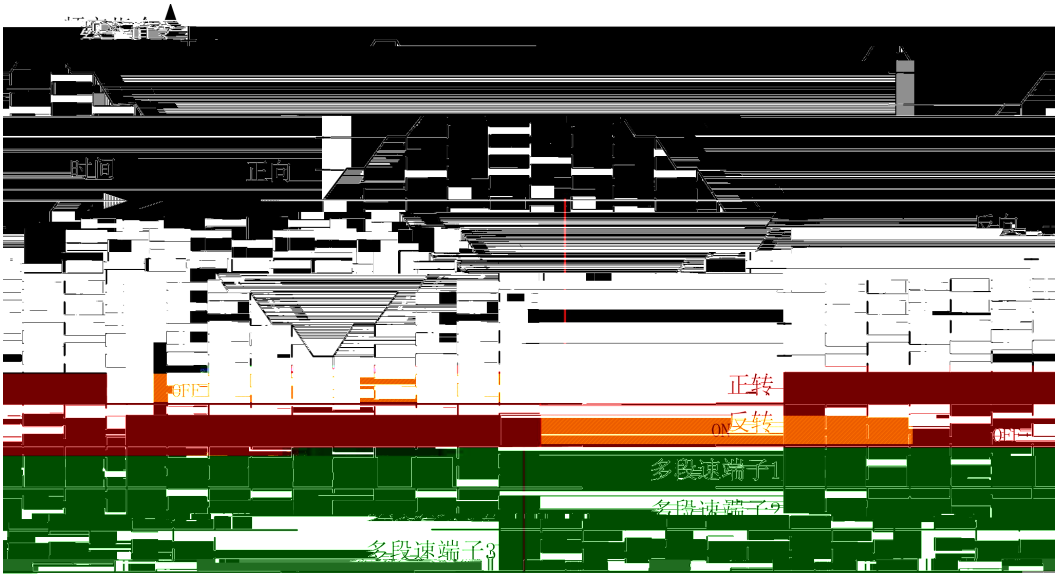
P33.70	[W12]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.71	[W13]	7-3	0 48	0	
P33.72	[W13]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.73	[W14]	7-3	0 48	0	
P33.74	[W14]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	
P33.75	[W15]	7-3	0 48	0	
P33.76	[W15]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0	

P33 DP Ethernet Profinet

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

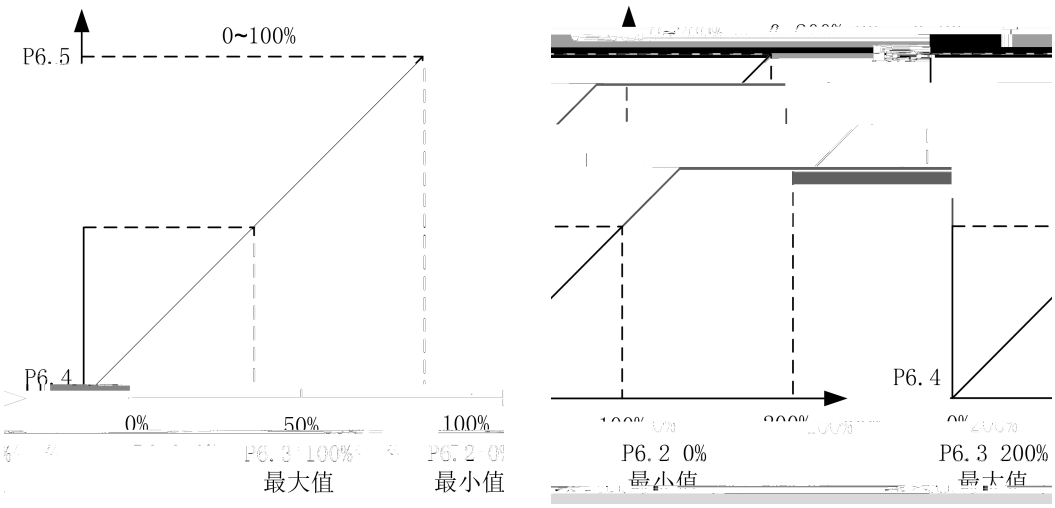
“ 2 ”

8.3

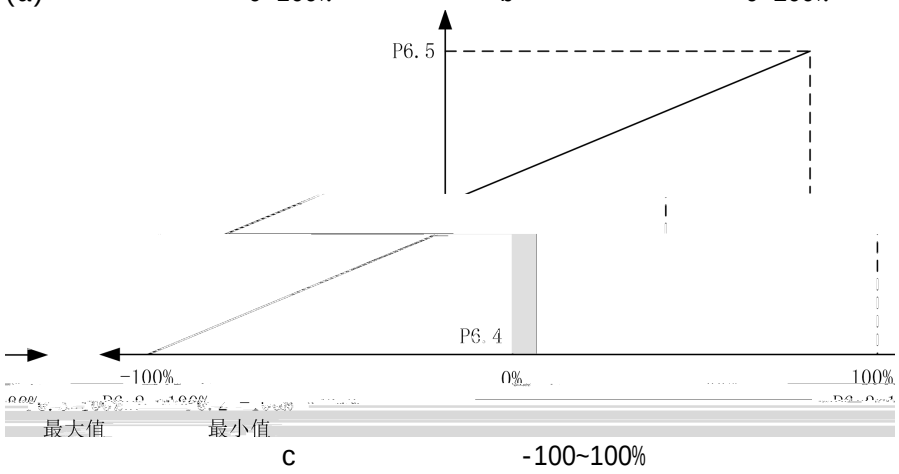
/

[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

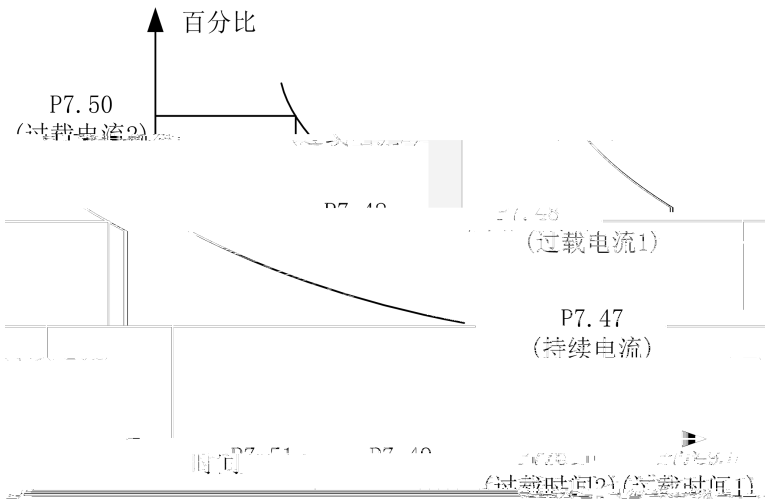
9

P7.33

P7.33

10

P7.48 P7.50

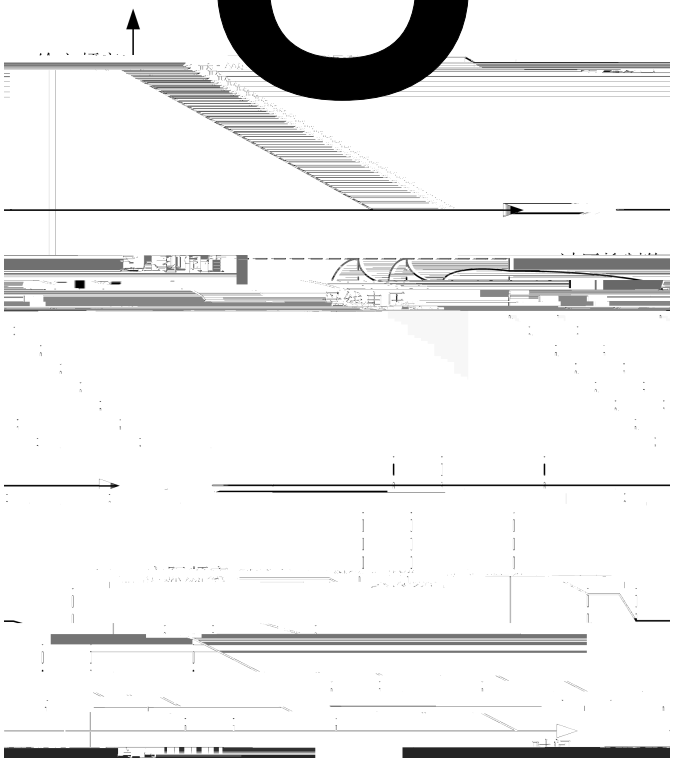


11

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



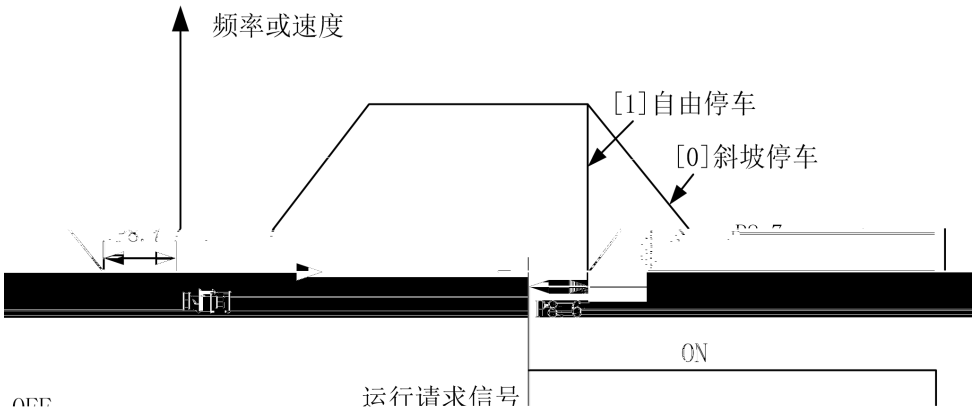
P7.71

8.7

1

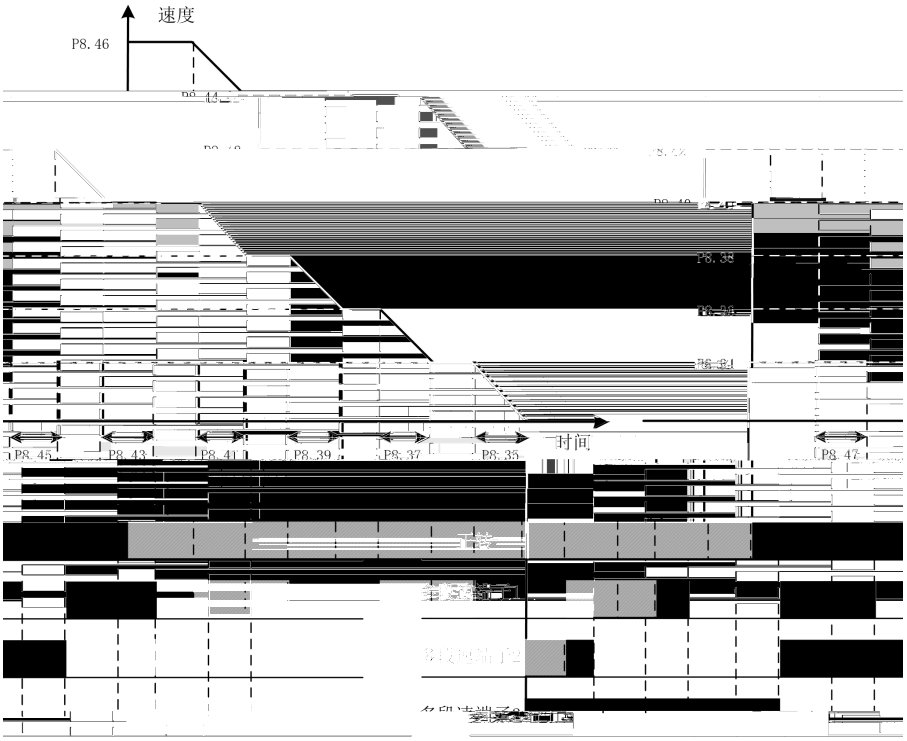
P8.3

[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

P16.12

0.5Hz~2Hz >50Hz

1kHz			
5kHz			
10kHz			

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

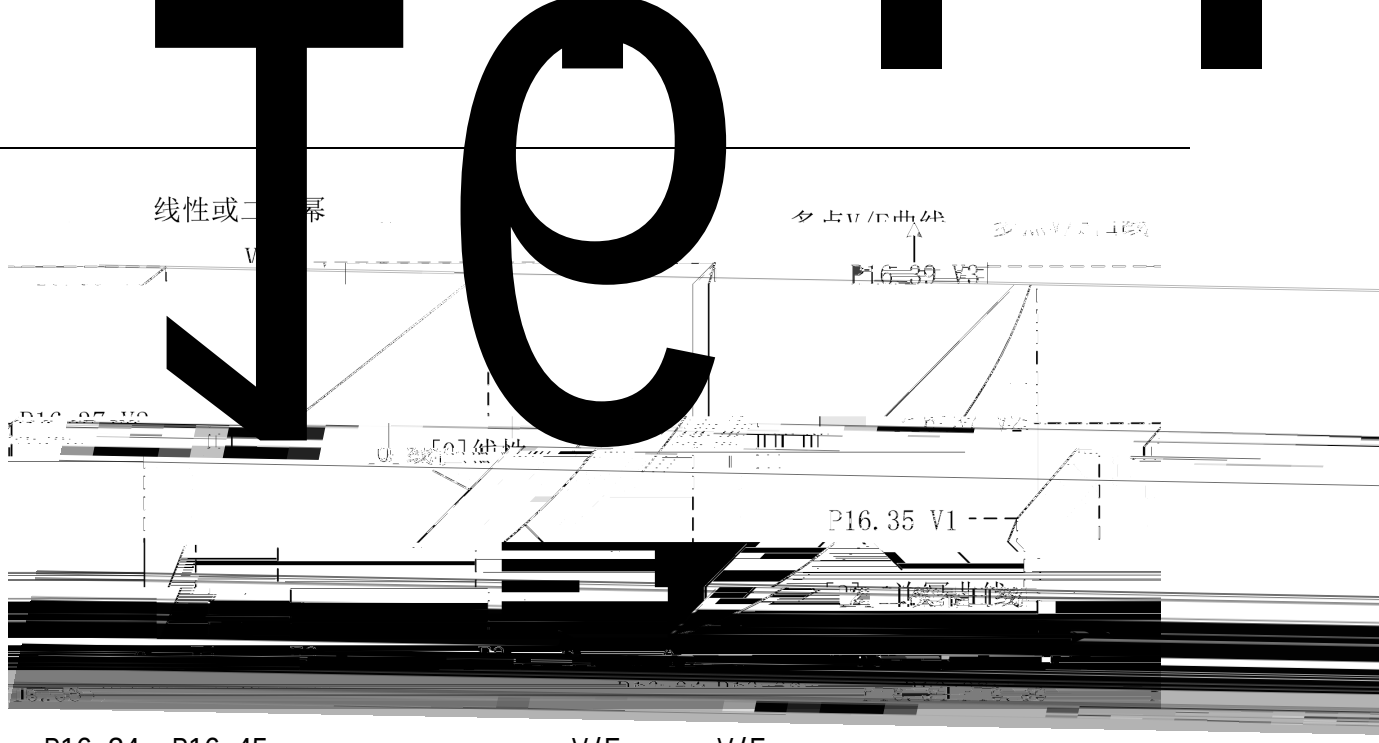
3 V/F

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

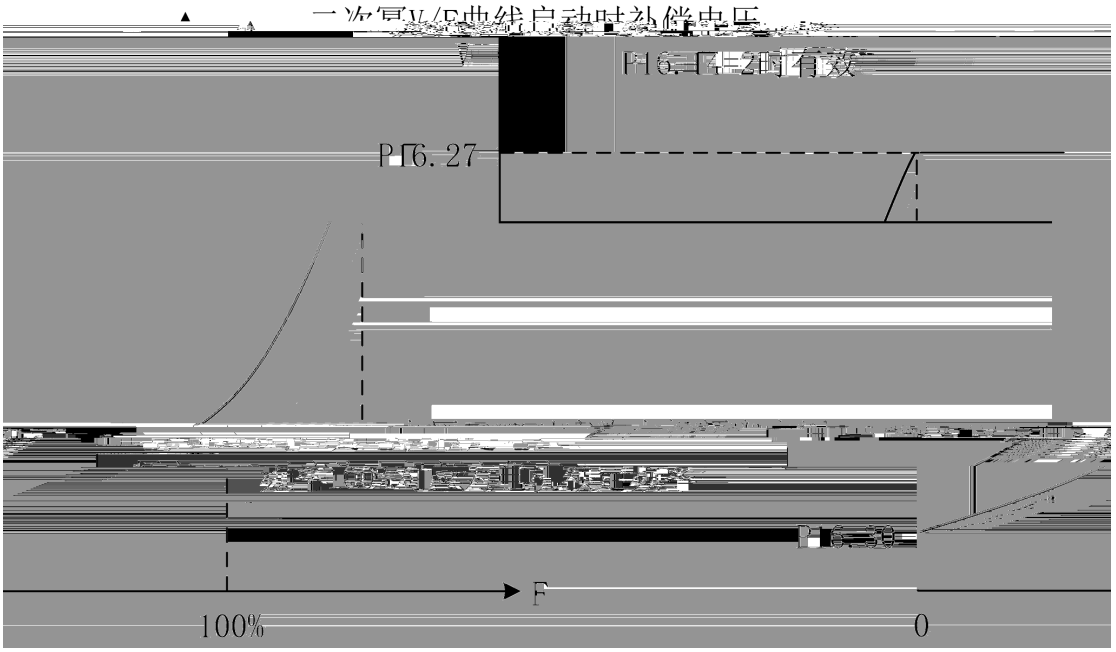
V1 V2 V3 F1 F2 F3

4

P16.15 V/F

V/F

5



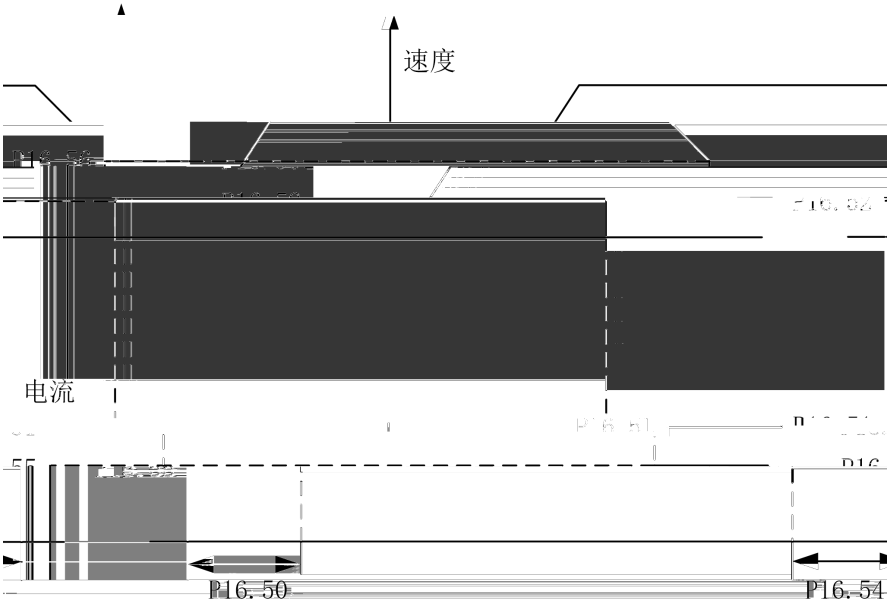
6

P16.50 P16.56

V/F

P16.50 P16.51 P16.52

P16.54 P16.55 P16.56



DROOP DROOP

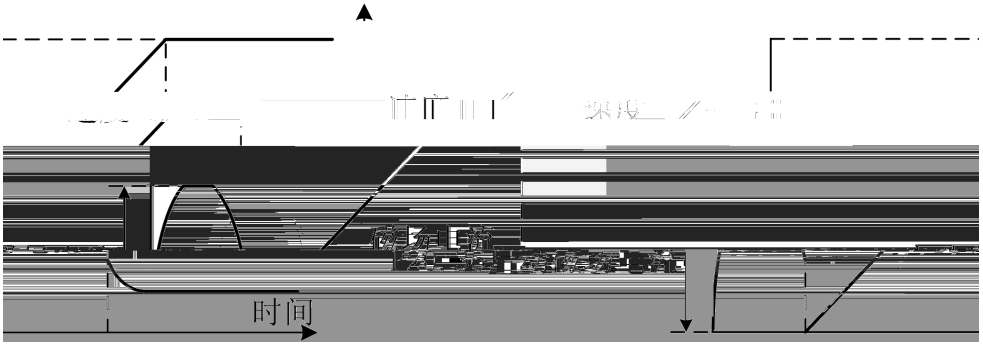
P20.60 0

DROOP P20.61 DROOP

P20.59 DROOP

5

P20.36



6

P20.59 P20.40

%

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

WO1 SYS_NOT_RDY (Ready)

[

WO2 NO_DRV_ENABLE]

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 IGBT
[E100]	OV	P8.35(1) P7.12( )
[E105]	UV	P7.13( )
[E108]	DC switch open	
[E109]	15V DC15V fail	15V 15V
[E110]	OC	P7.4( )
[E111]	OL	P7.48(1) P7.49(1) P7.48 P7.49

[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	

9

9.3

-
- ON
- COM

- Ɱ Ɯ

-

-
- ON
- COM

-
-
-

- _

9

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10.



1.

2.

3.

4.



1. CMOS

2.

3.

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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