$eF b ` P V ÞÝ÷ , & ò ô ßŒ M

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HF681

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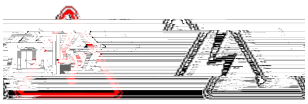
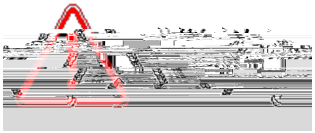
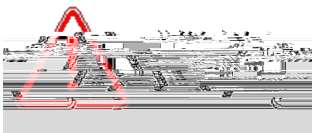
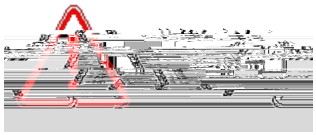


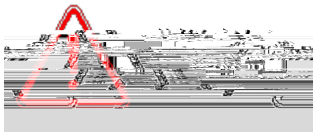
10

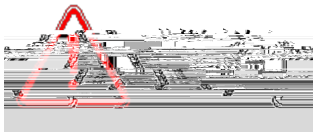
ESD











1

1.1

1.1.1

A	:HF681N
B	:01M 03M
C	:1R5=1.5kW 160=160kW
D	:4:400V
E	PC04

1.1.2

HF681N 22Kw

HF681N01M-022-4 HF681N 22kW

400V

AC

DC

3PH

380V-480V 50/60Hz

DC537V 679V

HF681N 7.5kW

HF681N03M-7R5-4 HF681N 7.5kW

400V

AC

DC

3PH

DC537V 679V

0-480V 0-300Hz

1.2

1.2.1 HF681N

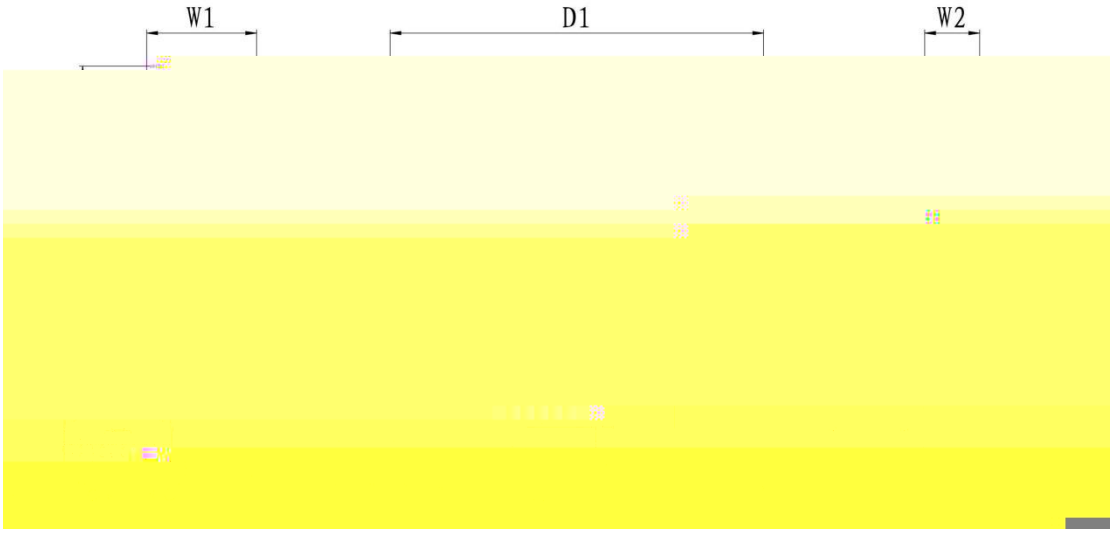
K2 22kW 45kW

1.2.2 HF681N

M1 1.5-7.5kW

M4 90-110kW

1.3 K2 K4,M1 M4

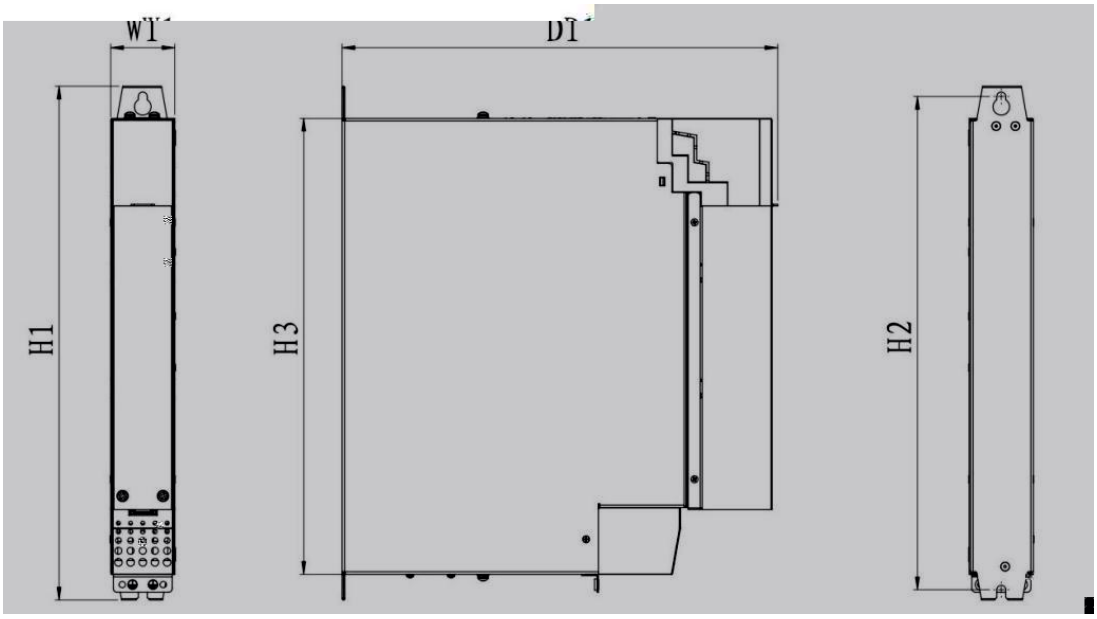


K2

	(mm)					(mm)			
	H1	H3	W1	D1	H2	W2	/	(mm)	(kg)
HF681N01M-22-4	400	355							

K4

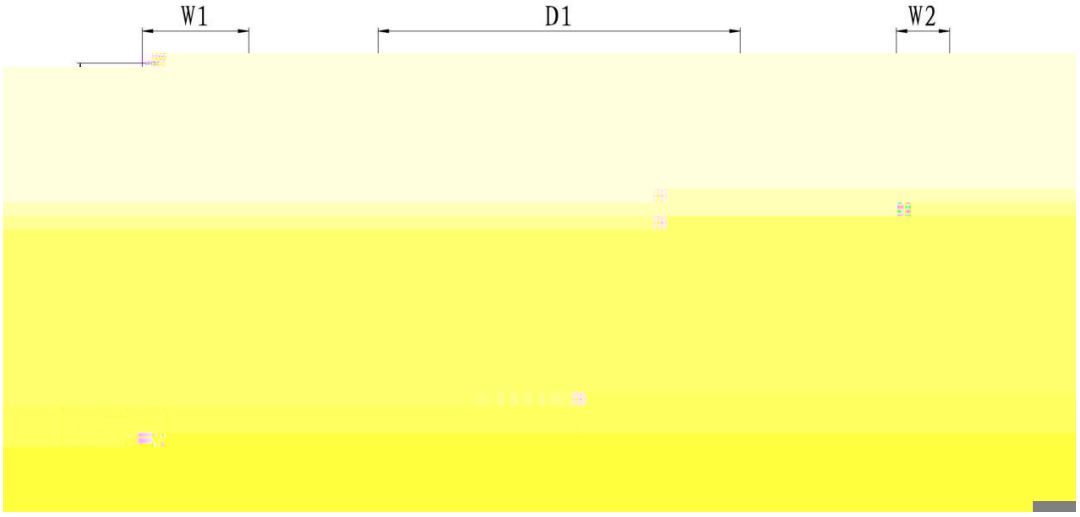
	(mm)				(mm)			(mm)	(kg)	
	H1	H3	W1	D1	H2	W2	W3			
HF681N01M-160-4	400	355	300	340	384	250	150	7	36	K4



M1

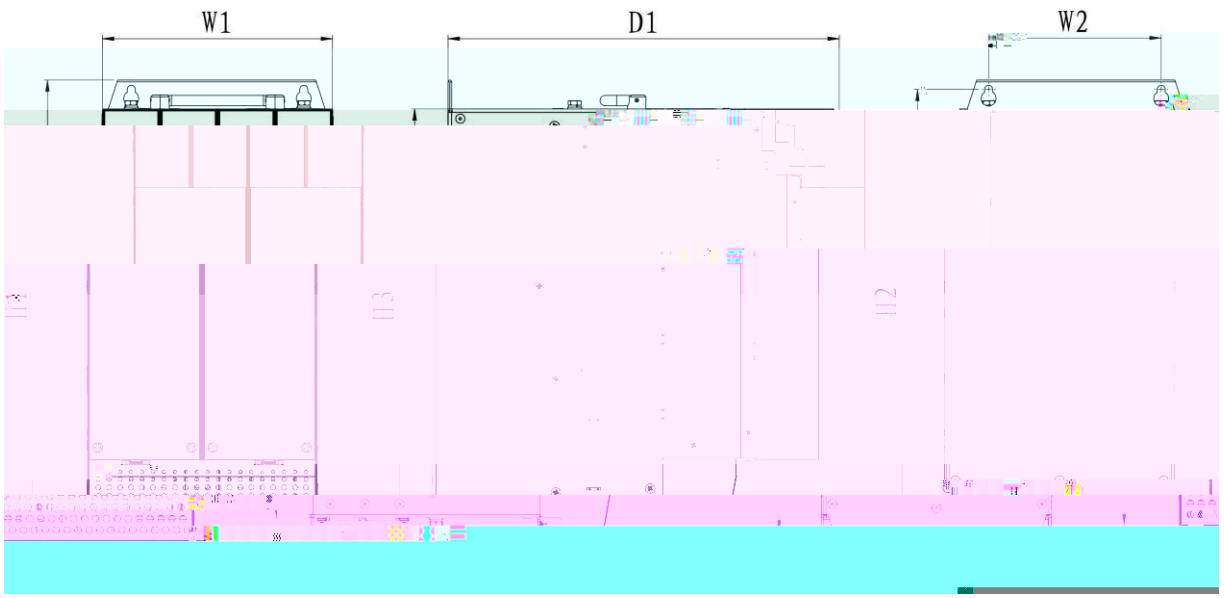
(mm)

HF681N03M-5R5-4	400	355	50	340	384	/	/	7		
HF681N03M-7R5-4	400	355	50	340	384	/	/	7		



M2

	(mm)						(mm)			
	H1	H3	W1	D1	H2	W2	/	(mm)	(kg)	
HF681N03M-011-4	400	355	100	340	384	50	/	7		
HF681N03M-015-4	400	355	100	340	384	50	/	7		
HF681N03M-018-4	400	355	100	340	384	50	/	7	9	M2
HF681N03M-022-4	400	355	100	340	384	50	/	7		
HF681N03M-030-4	400	355	100	340	384	50	/	7		
HF681N03M-037-4	400	355								



M3

	(mm)				(mm)			(mm)	(kg)	
	H1	H3	W1	D1	H2	W2	/			
HF681N03M-045-4	400	355	200	340	384	150	/	7	17	M3
HF681N03M-055-4	400	355	200	340	384	150	/	7		
HF681N03M-075-4	400	355	200	340	384	150	/	7		

M4

	(mm)				(mm)			(mm)	(kg)	
	H1	H3	W1	D1	H2	W2	W3			
HF681N03M-090-4	400	355	300	340	384	250	150	7	31	M4
HF681N03M-110-4	400	355	300	340	384	250	150	7		

1.4

1.4.1

		380V 480V
		50/60Hz
		-15% +10%
		fLN ± 2 ± 4 ≤ 2 fLN/s
		*1.414
		150% 5 1

		43 14 29
		30 10 20
		1 RS485 Modbus 1 CAN CANopen
	LED	
		1000 1000 100 1% 3000
		-10 +40 40 1 1% 50 -10
		95%RH
		-20 +60 10-30
		98%
		1 RJ45 2 RJ45
		IP20
		2
		≤80db

1.4.2

537V 679VDC

-15% +10%

0

8 2 0 +10V 0mA/4mA
20mA

5 3 2 2
1 0 +10V 0mA/4mA 20mA 1 0 +10V

LED

1.5

~ í • 200%

~ î • 50% HF681N

~ ï HF681N

1.6

1.6.1

		[kW]		[kW]
1	HF681N01M-22-4	22	K2	0.19
2	HF681N01M-45-4	45		0.33
3	HF681N01M-110-4	110	K3	0.73
4	HF681N01M-160-4	160	K4	1.1

1.6.2

		[kW]		[kW]
1	HF681N03M-1R5-4	1.5		0.05
2	HF681N03M-2R2-4	2.2		0.06
3	HF681N03M-3R7-4	3.7	M1	0.07

1.8

2

2.1

2.2

		( )
EMC		
		a) b) 100m

/ ( )

2.4

2.4.1

		2%	
		A	mH
HF681N01M-22-4	22kW	49	0.26
HF681N01M-45-4	45kW	89	0.15
HF681N01M-110-4	110kW	196	0.07
HF681N01M-160-4	160kW	292	0.05

2.4.2

		1%	
		A	mH
HF681N03M-1R5-4	1.5 kW	4	1.75
HF681N03M-2R2-4	2.2 kW	5.7	1.22
HF681N03M-3R7-4	3.7 kW	10.2	0.69
HF681N03M-5R5-4	5.5kW	15	0.47
HF681N03M-7R5-4	7.5kW	18	0.39
HF681N03M-011-4	11kW	24	0.29
HF681N03M-015-4	15kW	32	0.22
HF681N03M-018-4	18.5kW	38	0.18
HF681N03M-022-4	22kW	47	0.15
HF681N03M-030-4	30kW	65	0.11
HF681N03M-037-4	37kW	75	0.09

HF681N03M-045-4	45kW	94	0.07
HF681N03M-055-4	55kW	115	0.06
HF681N03M-075-4	75kW	155	0.05
HF681N03M-090-4	90kW	188	0.04
HF681N03M-110-4	110kW	215	0.03

2.5

	Ω	Ω	KW 30% Kc	KW 50% Kc
22kW	22	18	≥ 8	≥ 11
45kW	13	8	≥ 15	≥ 20
110kW	5.1	4.8	≥ 38	≥ 50
160kW	3.3	2.2	≥ 58	≥ 96

1 100%

2 Kc

3 Kc a 20 Kc=10% - 20%

b Kc=30%

c Kc=40 - 50%

4

2.6

HF681

$$I \geq 0.8 * \frac{I1+I2+I3+I4+I5+I6+...}{I1+I2+I3+I4+I5+I6+...} \leq 300A$$

$$I4+I5+I6+... \leq 100A$$

		I ≥ 0.8* I1+I2+I3+I4+I5+I6+... I3+I4+I5+I6+... ≤ 100*n A n I1+I2 ≤ 300A I4+I5+I6+... ≤ 100A

2-6

1 100A 300A

2 100A

3 80%

100% 150%

80%

4

5

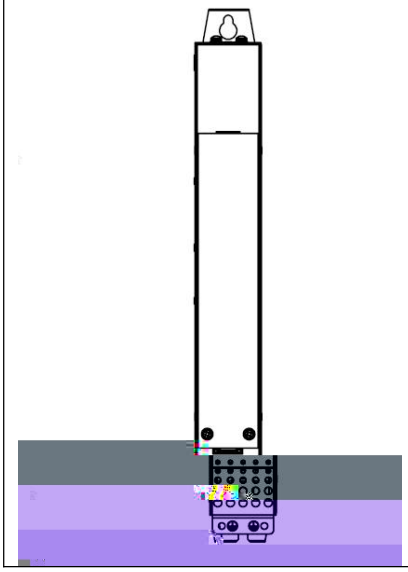
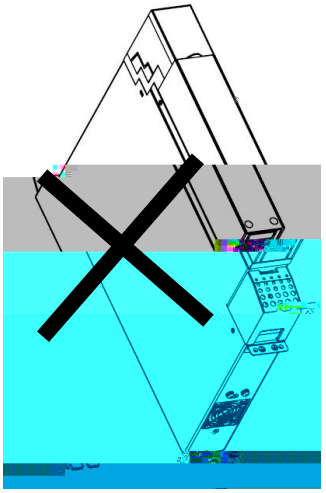
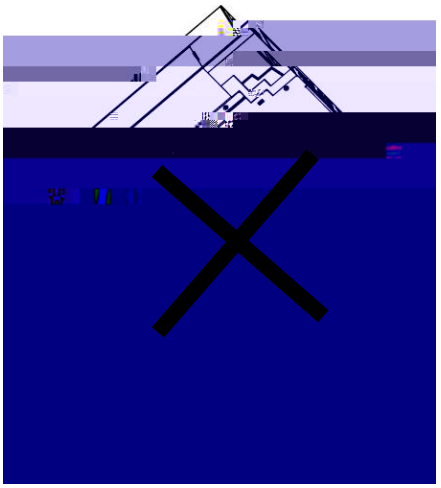
3

3.1

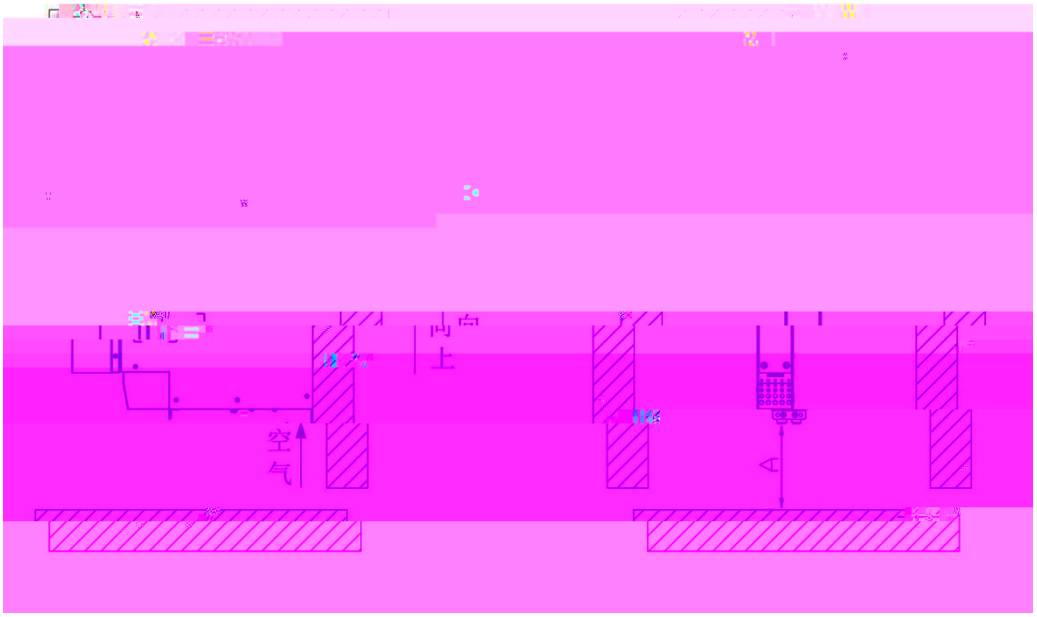
	10cm 5cm	6	
	-10 +40 40 1 1% 50 -10	-20 +60 1 /	-20 +60
	70 106 kPa 0.7 1.05	70 106 kPa 0.7 1.05	60 106 kPa 0.6 1.05
	10Hz ≤ f ≤ 57Hz 0.075mm 57Hz ≤ f ≤ 150Hz 9.8 m/s2	10Hz ≤ f ≤ 57Hz 0.075mm 57Hz ≤ f ≤ 150Hz 9.8 m/s2	I I
		100m/s² 11ms	100m/s² 11ms
		250mm <100kg 100mm ≥ 100kg	250mm <100kg 100mm ≥ 100kg
	95%RH		
	1000	1000 3000	100 1%
	2		

3.2

3.2.1

3.2.2



		(mm)	
K2	22kW 45kW	A ≥ 300	B ≥ 10
K3	110kW	A ≥ 300	B ≥ 10
K4	160kW	A ≥ 300	B ≥ 10
M1	1.5kW 7.5kW	A ≥ 300	B ≥ 10
M2	11kW 37kW	A ≥ 300	B ≥ 10
M3	45kW 75kW	A ≥ 300	B ≥ 10
M4	90kW 110kW	A ≥ 300	B ≥ 10

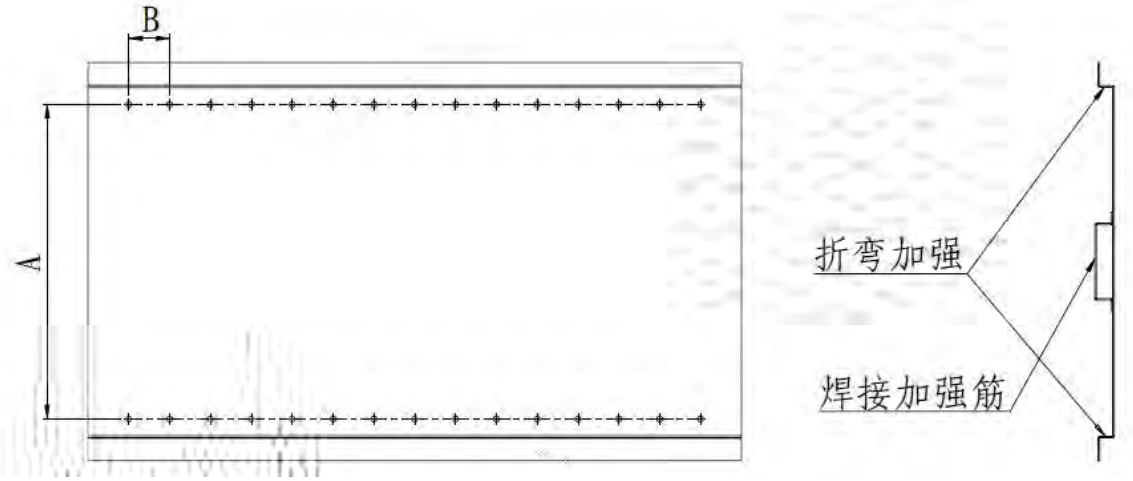
3.2.3

1	M1	1.5kW 7.5kW	2-M6X16
2	M2	11kW 37kW	4-M6X16
3	M3	45kW 75kW	4-M6X16
4	M4	90kW 110kW	8-M6X16
5	K2	22kW 45kW	4-M6X16
6	K3	110kW	4-M6X16
7	K4	160kW	8-M6X16

M6: 30 ± 3KGF.CM

:

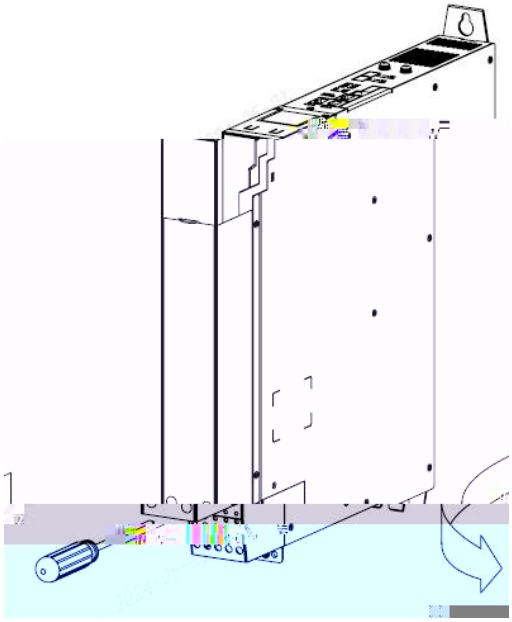
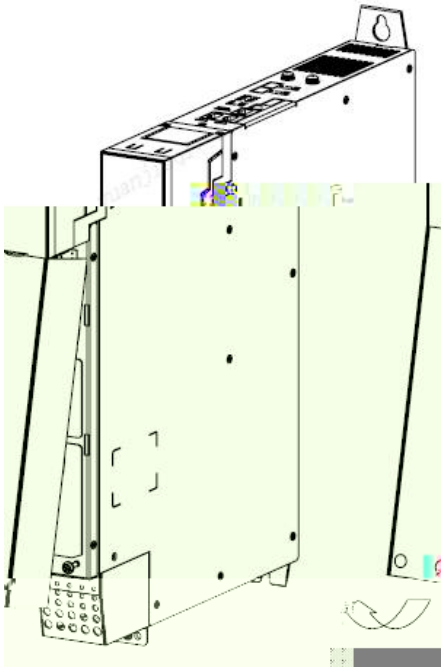
2mm



			mm		
			A	B	M
1			384	50	M6

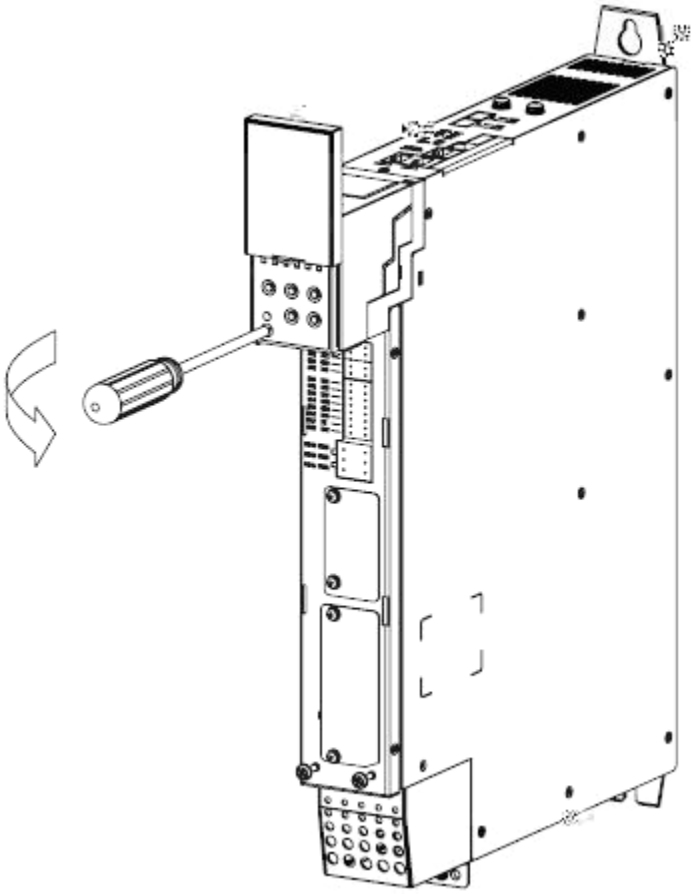
M4: 12 ± 1KGF.CM M5: 20 ± 2KGF.CM M6: 30 ± 3KGF.CM

3.2.4

1	
2	

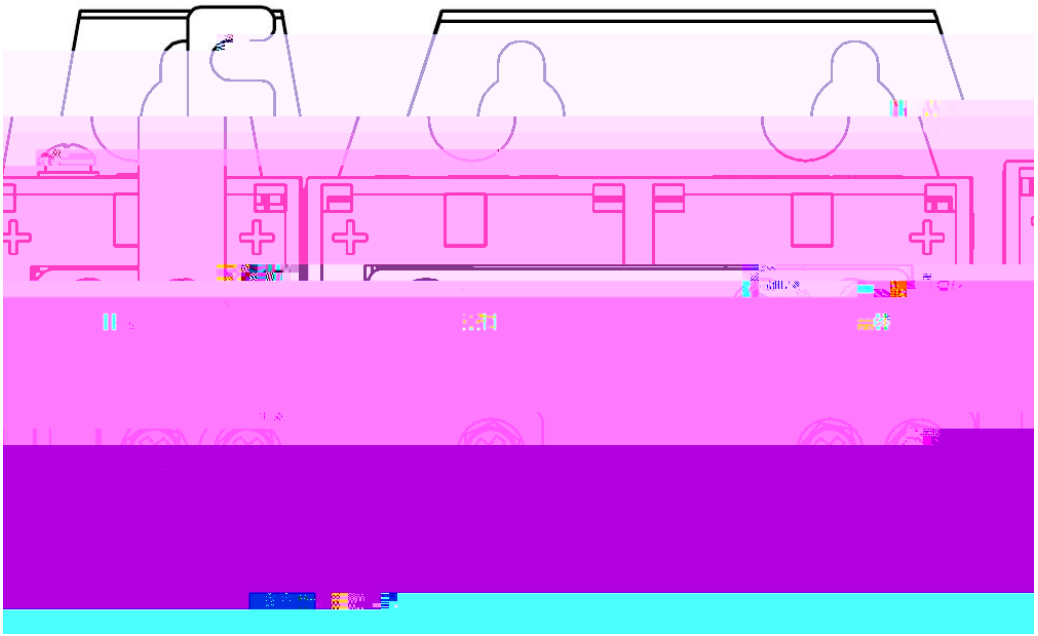
3.2.5

1.



2.

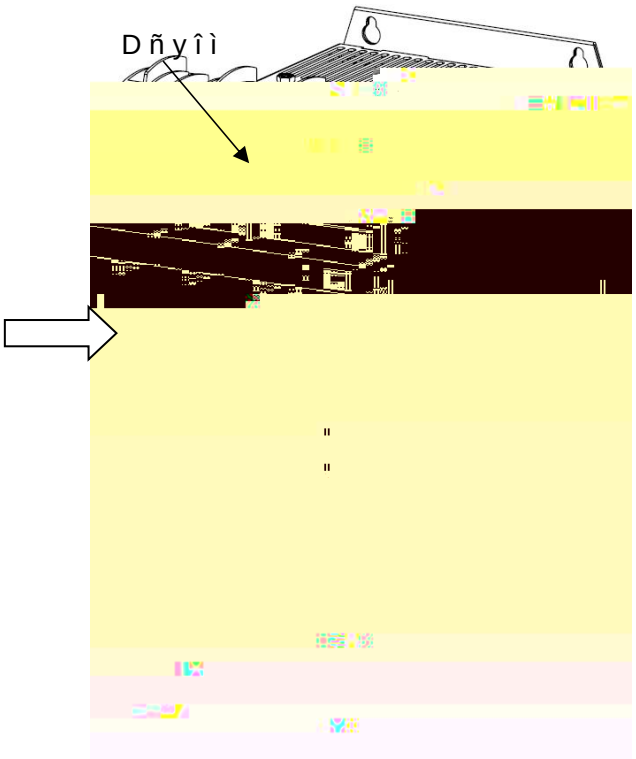
3.



3.2.6

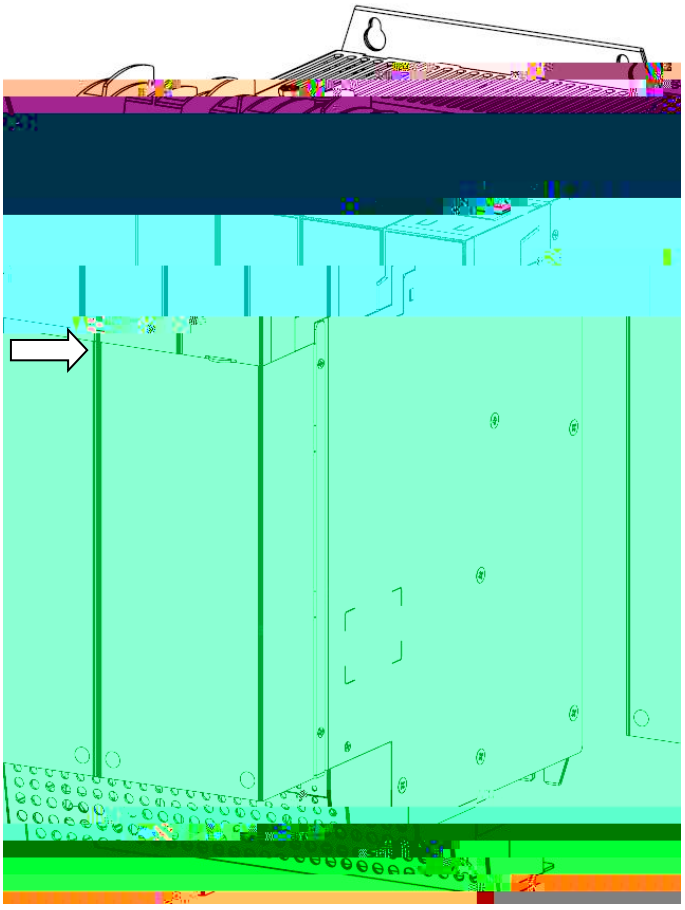
1.

2. M5X20



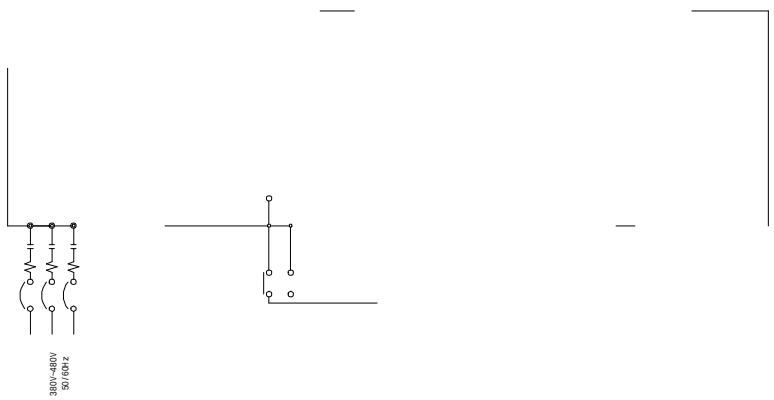
3.

4.

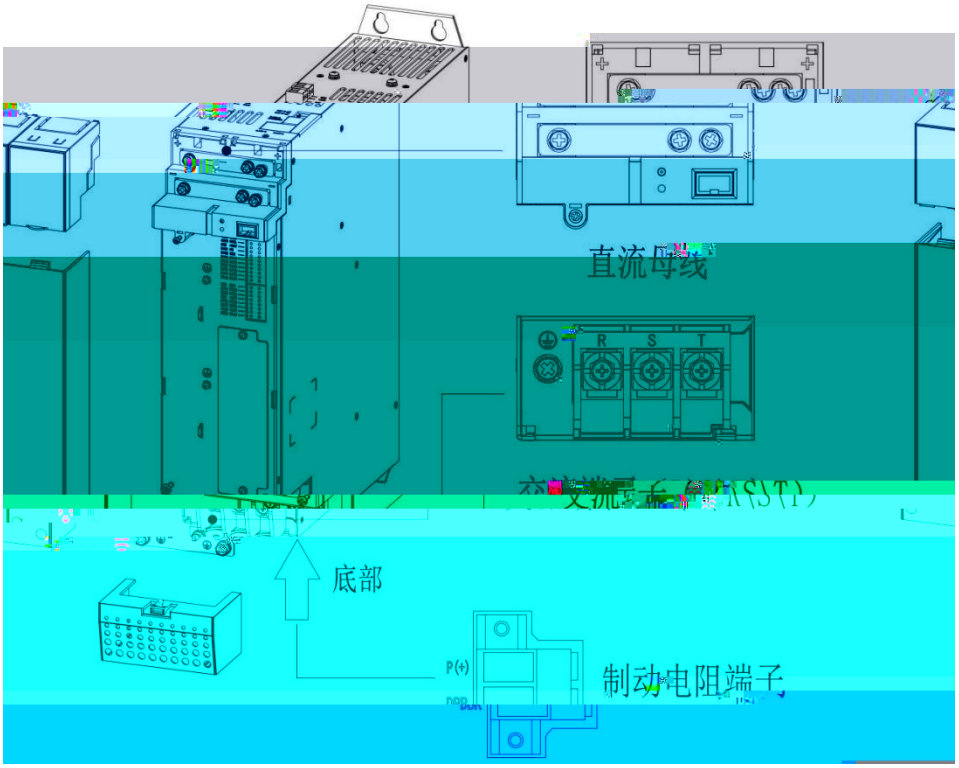


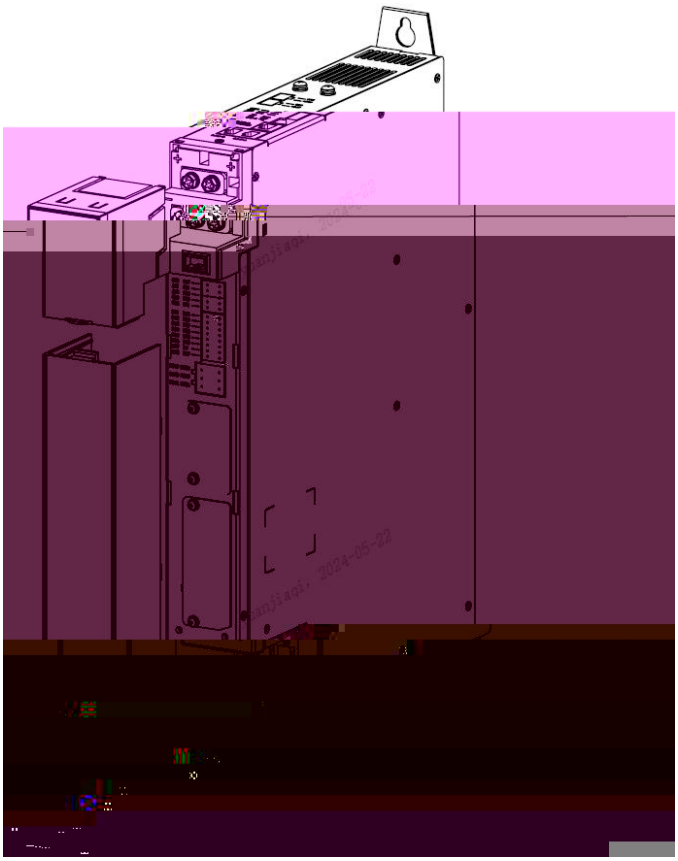
3.3

3.3.1

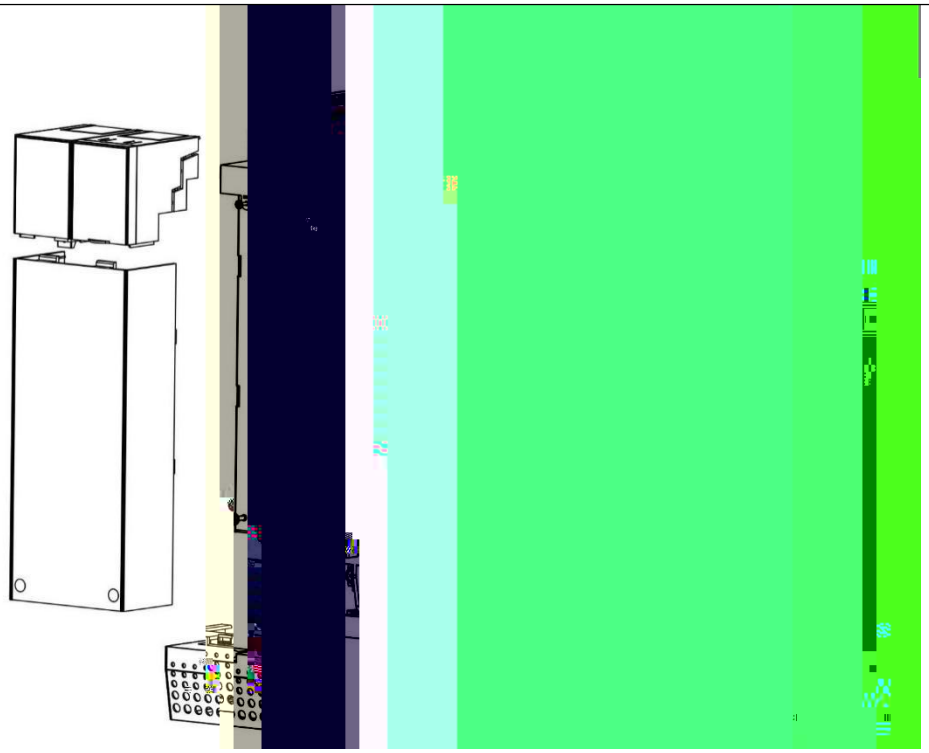


3.3.2

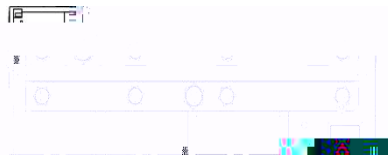
K2

K3

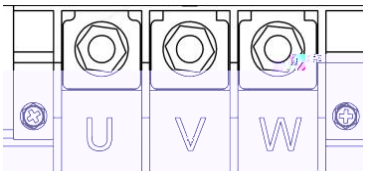
K4
M1 ⅝ ˛ r Ṇ r


M2



M3





M4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U V W	
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PE	

3.3.3

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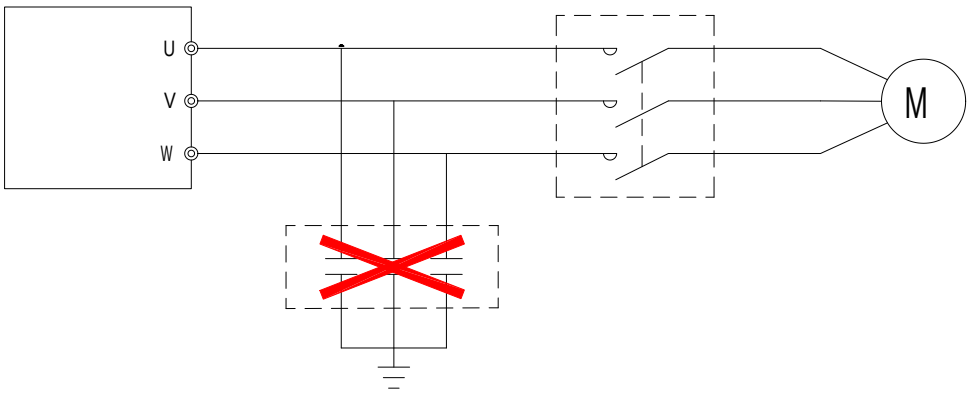
14		
15	30 m	



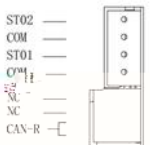
3.3.5

PG

	485A-485B	485	Modbus
	CANH-CANL	CAN	CAN CANopen

	RJ45-A		
	RJ45-B		
	RJ45-C		
	+24V--GND	24V	
	24V-COM	24V	24V ± 10% 200mA
	PW-COM		24V DI DO PW 24V
	DI1 DI14-COM		3.3kΩ
	DI15 DI43-COM		9V~30V 500Hz
	DO1 DO10-COM		0V~24V 0mA~50mA
	DO11 DO30-COM		

	485-R	485	ON OFF
	CAN-R	CAN	ON OFF



	RJ45-A		
	RJ45-B		
	RJ45-C		

	+24V--COM	24V	
	+10V-GND	10V	+10V 50mA 1kΩ~5kΩ
	24V-COM	24V	24V ± 10% 200mA
	PW-COM		24V DI DO PW 24V
	AI1--GND	1	-10VDC~10VDC /0mA~20mA 100k Ω 500 Ω
	AI2--GND	2	DC -10V~10V 100kΩ
	DI1 DI8--COM		3.3kΩ 9V~30V 500Hz DI5 20KHz
	STO1--COM	STO 1	STO STO 20 STO COM STO
	STO2--COM	STO 2	
	AO1--GND	1	0V~10V 0mA~20mA

AO2--GND 2 0V~10V

0V~10V

DO1 DO3--COM

	CAN-R	CAN	CAN ON OFF

4

4.1LED

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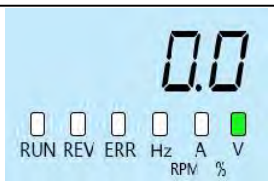
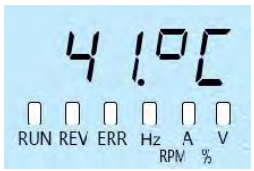
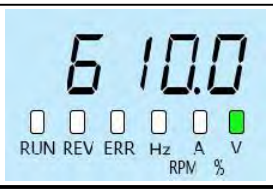
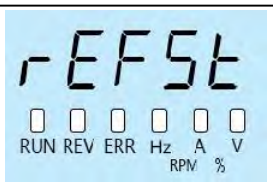
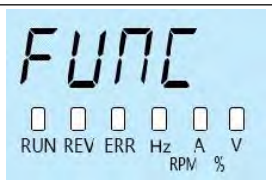
 0.0 RUN REV ERR Hz A V RPM %		s
 41.°C RUN REV ERR Hz A V RPM %		
 610.0 RUN REV ERR Hz A V RPM %		s

	D K E	~ / I K •
	Z & ^ d	
	& h E	
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1 /

2 V/F P16.11=0

V/F

3 P16.11=2 P16.11=1

5.2

AC380~460V 50/60Hz

U,V,W

PG PG

5.3

LED

5.5.2

					1]		
P16.11		[0]V/F [1] [2]	0	P7.4	[1]	0~300[%]	235%
P16.14	V/F	[0] V/F [1] V/F [2]	0	P7.19	[1]	100.0 720.0[%]	120%

5.6

1

P16.11	0	V/F	
	1		
	2		

2

HF681N

	V/F	

3

				1, 2, 3, “ ” 4, “ ” 5 VF
	V/F			
				1, 2, 3, 4, 5, “ ” 6, “ ”
			&	
			&	1, 2, 50% 3, 4, 5, 6, “ ” 7, “ ”

4

1		
2	LOC/REM LOCAL LOCAL	
3	ENTER [1] 5Hz	
4	RUN RUN	
5	4 50Hz	
6	STOP	

5

		STOP	
	1		
	2	LOC/REM LOCAL LOCAL	
	3	ENTER [1] 5Hz	
	4	RUN RUN	
	5	4 50Hz	
	6	STOP	

6

6.1

	P0	
	P3	
	P4	
	P5	
	P6	
	P7	
	P8	CANBus

6.1.1 P0

P0.0		[0] [1]	0 1	0	
P0.1			0 3	0	
P0.2		[0]380V [1]440V [2]480V	0 2	0	
P0.3		[0]50HZ [1]60HZ	0 1	0	
P0.4					
P0.5					

6.1.2 P1

P3.0	1		0 43	0	
P3.1	2		0 43	0	
P3.2	3		0 43	0	

P3.3	4	0 43	0
P3.4	5	0 43	0
P3.5	6		

10				1	
11					
12					1
13					1
14	2		2		
15	3		3		
16	4		4		
17	5		5		
18					
19					
20				1	
21				1	
22					1
23					1
24	2		2		
25	3		3		
26	4		4		
27	5		5		
28					
29					
30					
31	25%				
32	50%				
33	90%				
34	100%				
35	80%				
36	90%				
37	100%				
38	110%				
39					
40					
41					

42		1
43		1

0		DI DI
1		DI DI

6.1.3 P4

P4.0	1		0 32	0	
P4.1	2		0 32	0	
P4.2	3		0 32	0	
P4.3	4		0 32	0	
P4.4	5		0 32	0	
P4.5	6		0 32	0	
P4.6	6		0 32	0	
P4.7	7		0 32	0	
P4.8	8		0 32	0	
P4.9	9		0 32	0	
P4.10	10		0 32	0	
P4.11	11		0 32	0	
P4.12	12		0 32	0	
P4.13	13		0 32	0	
P4.14	14		0 32	0	
P4.15	15		0 32	0	
P4.16	16		0 32	0	
P4.17	17		0 32	0	
P4.18	18		0 32	0	
P4.19	19		0 32	0	
P4.20	20		0 32	0	

P4.21	21		0 32	0	
P4.22	22		0 32	0	
P4.23	24		0 32	0	
P4.24	25		0 32	0	
P4.25	26		0 32	0	
P4.26	27		0 32	0	
P4.27	28		0 32	0	
P4.28	29		0 32	0	
P4.29	30		0 32	0	

0		DO
1		
2		
3	1	
4	2	
5	3	
6	4	
7		
8		
9	1	
10	2	
11	3	
12		
13		
14	1	
15	2	
16	3	
17		DO
18		DO

19		
20		
21		
22		
23	Cab	
24	90%	90%
25	100%	100%
26	90%	90%
27	110%	110%
28		
29		
30		
31		
32		

6.1.4 P5

P5.0			0 1	0
P5.1	ID		0 10	0
P5.2	1	1	0 300	0
P5.3	2	2	0 300	0
P5.4	3	3	0 300	0
P5.5	4	4	0 300	0
P5.6				

P5.14	3	3	0 300	0	
P5.15	4	4	0 300	0	
P5.16	5	5	0 300	0	
P5.17	1	1	0 300	0	
P5.18	2	2	0 300	0	
P5.19	3	3	0 300	0	
P5.20	4	4	0 300	0	
P5.21	5	5	0 300	0	
P5.22	1	1	0 300	0	
P5.23	2	2	0 300	0	
P5.24	3	3	0 300	0	
P5.25	4	4	0 300	0	
P5.26	5	5	0 300	0	
P5.27	1	1	0 300	0	
P5.28	2	2	0 300	0	
P5.29	3	3	0 300	0	
P5.30	4	4	0 300	0	
P5.31	5	5	0 300	0	
P5.32	110%FwdMaxP	110%	0 6	0	
P5.33	110%RevMaxP	110%	0 6	0	
P5.34	100%FwdMaxP	100%	0 6	0	
P5.35	100%RevMaxP	100%	0 6	0	
P5.36	90%FwdMaxP	90%	0 6	0	
P5.37	90%RevMaxP	90%	0 6	0	
P5.38	80%FwdMaxP	80%	0 6	0	
P5.39	80%RevMaxP	80%	0 6	0	
P5.40	100%FwdMaxP	100%	0 6	0	
P5.41	100%RevMaxP	100%	0 6	0	
P5.42	90%FwdMaxP	90%	0 6	0	
P5.43	90%RevMaxP	90%	0 6	0	
P5.44	50%FwdMaxP	50%	0 6	0	
P5.45	50%RevMaxP	50%	0 6	0	

P5.46	25%FwdMaxP	25%	0 6	0	
P5.47	25%RevMaxP	25%	0 6	0	
P5.48	110%FwdMaxP	110%	0 6	0	
P5.49	110%RevMaxP	110%	0 6	0	
P5.50	100%FwdMaxP	100%	0 6	0	
P5.51	100%RevMaxP	100%	0 6	0	
P5.52	90%FwdMaxP	90%	0 6	0	
P5.53	90%RevMaxP	90%	0 6	0	
P5.54	80%FwdMaxP	80%	0 6	0	
P5.55	80%RevMaxP	80%	0 6	0	
P5.56			0 6553	0	
P5.57			0 6553	0	
P5.58			0 1	0	

6.1.5 P6

P6.0 320 4v

P7.5			0 1	0	
P7.6			30 100	0	
P7.7			30 100	0	
P7.8			0 30	0	
P7.9			0 1	0	
P7.10			0 200	0	
			0 12	0	

[redacted]

				1	0
P8.1	CanBus			0 1	0
P8.2	8 0n		8	0 1000 0 1000	[redacted]
P8.3					

P8.18	Rpdo Mapping 8	RPDO	8	0 9	0
P8.19	Rpdo Mapping 9	RPDO	9	0 9	0
P8.20	Rpdo Mapping 10	RPDO	10	0 9	0
P8.21	Rpdo Mapping 11	P8 11		0	

3	HZ	9.1.5	
4	%	9.1.5	
5	%	9.1.5	
6	%	9.1.5	
7	Hz	9.1.5	
8		9.1.5	
9		9.1.5	Ã ņ Ā ƚ

	P11	4		P31	CAN
	P12	1		P32	MODBUS
	P13	2		P33	
	P14	3			
	P15	4			

6.2.1 P0

[0]

P0.0 [1] 0 1 0

;

P0.1 ; 0 27 1

P0.3 [0]50HZ [1]60HZ 0 1

P3.13	HDI5	0.100 50.000	0.100
P3.14	HDI5	0.0 300.0	0.0
P3.15	HDI5	0.100 50.000	0.100

15	.NC			
16				
17	0	1	0	00

P4.17	2		0 500	0	
P4.18	3		0 500	0	
P4.19	4		0 500	0	

0		
1		7.2
2		ON
3		7.2
4		
5		
6	1	[6] [9]
7	2	
8	3	
9	4	
10	FUNC 10	
11		
12		
13		
14		
15		
16		7.7
17	0	1
18	1	2
19	2	3
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 1
52	PROFIBUS 4	PROFIBUS 4 1

53	PROFIBUS 5	PROFIBUS 5 1
54 56	FUNC 54 FUNC 56	
57	1	1 1
58	2	2 1
59	3	3 1
60	4	4 1
61	1	1 1
62	2	2 1
63	3	3 1
64	4	4 1

6.2.4 P5

P5.0	AI1	[0] [1]0 +10V [2]-10 +10V [3]0 20mA	0 3	1	
P5.1	AI1	AI1	0.0 1000.0 [ms]	0.0 [ms]	
P5.2	AI1	AI1	-10.00 10.00 [V]	0.000 [V]	7.3
P5.3	AI1	AI1	-20.00 20.00 [mA]	0.000 [mA]	7.3
P5.4	AI1	AI1	-10.00 10.00 [V]	0.000 [V]	7.3
P5.5	AI1	AI1	0.00 20.00 [mA]	0.000 [mA]	7.3
P5.6	AI1	AI1	-300.0 300.0 [%]	0.0 [%]	7.3
P5.7	AI1	AI1	-10.00 10.00 [V]	10.000 [V]	7.3

P5.8	AI1	AI1	0.00 20.00 [mA]	20.000 [mA]	7.3
P5.9	AI1	AI1	-300.0 300.0 [%]	100.0 [%]	7.3
P5.18	AI2	[0] [1]0 +10V [2]-10 +10V [3]0 20mA	0 3	3	
P5.19	AI2	AI2	0.0 1000.0 [ms]	0.0 [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 [%]	

6.2.5 P6

P6.0	AO1	7-1	0 14	2	
P6.2	AO1	AO1	-300.0 300.0 [%]	0.0 [%]	7.4

P6.3	AO1	AO1	-300.0 300.0 [%]	100.0 [%]	7.4
P6.4	AO1 [mA V]	AO1	0.0 100.0 [%]	0.0 [%]	7.4
P6.5	AO1 [mA V]	AO1	0.0 100.0 [%]	100.0 [%]	7.4
P6.6	AO1	AO1	-100.00 100.00 [%]	0.00 [%]	
P6.7	AO1	AO1 (P6.0 [13])	0.0 100.0 [%]	0.0 [%]	
P6.8	AO1	AO1	0.0 1000.0 [ms]	10.0 [ms]	
P6.14	AO2	7-1	0 14	4	
P6.16	AO2	AO2	-300.0 300.0 [%]	0.0 [%]	
P6.17	AO2	AO2	-300.0 300.0 [%]	100.0 [%]	
P6.18	AO2 [mA V]	AO2	0.0 100.0 [%]	0.0 [%]	
P6.19	AO2 [mA V]	AO2	0.0 100.0 [%]	100.0 [%]	
P6.20	AO2	AO2	-100.00 100.00 [%]	0.00 [%]	
P6.21	AO2	AO2 (P6.14 [13])	0.0 100.0 [%]	0.0 [%]	

P6.22	A02	A01	0.0 1000.0 [ms]	10.0 [ms]	

7-1

0

1

2

3

4

5

6

7

8 (%) ( )

9

10

P7.3	[4]	4	0.0 300.0 [%]	180.0 [%]	7.5
P7.4	[1]	1	0.0 300.0 [%]	235.0 [%]	7.5
P7.5	[2]	2	0.0 300.0 [%]	235.0 [%]	7.5
P7.6	[3]	3	0.0 300.0 [%]	235.0 [%]	7.5
P7.7	[4]	4	0.0 300.0 [%]	235.0 [%]	7.5
P7.8	[1]	1	0.0 100.0 [%]	20.0 [%]	7.5
P7.9	[2]	2	0.0 100.0 [%]	20.0 [%]	7.5
P7.10	[3]	3	0.0 100.0 [%]	20.0 [%]	7.5
P7.11	[4]	4	0.0 100.0 [%]	20.0 [%]	7.5
P7.12			600 820 [V]	800 [V]	7.5
P7.13			300 500 [V]	350 [V]	7.5
P7.14			60.0 100.0 [ ]	87.5 [ ]	7.5
P7.15			50.0 100.0 [ ]	80.0 [ ]	7.5
P7.19	[1]	1	100.0 720.0 [%]	120.0 [%]	7.5
P7.20	[2]	2	100.0 720.0 [%]	120.0 [%]	7.5
P7.21	[3]	3	100.0 720.0 [%]	120.0 [%]	7.5
P7.22	[4]	4	100.0 720.0 [%]	120.0 [%]	7.5
P7.23	1 M1	1	0.00 3.00 [s]	0.50 [s]	7.5
P7.24	1 M2	2	0.00 3.00 [s]	0.50 [s]	7.5
P7.25	1 M3	3	0.00 3.00 [s]	0.50 [s]	7.5
P7.26	1 M4	4	0.00 3.00 [s]	0.50 [s]	7.5

P7.27	1	1	0.00 [s]	3.00 [s]	2.00 [s]
P7.28	2	2	0.00 [s]	3.00 [s]	2.00 [s]
P7.29	3	3	0.00 [s]	3.00 [s]	2.00 [s]
P7.30	4	4	0.00 [s]	3.00 [s]	2.00 [s]
P7.31			0.0 [%]	100.0 [%]	25.0 [%]
P7.32			0.00 [s]	5.00 [s]	1 [s]
P7.33			0.0 > V @		

P7.69		[0] [1]	0 1	0	7.5
P7.70			-25 150 [V]	100 [V]	7.5
P7.71	1	[0] [1]	0 1	0	7.5
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]	

6.2.7 1 P8

P8.0		[0] [1] [2]DP [3]MODBUS [4] [5] CANBUS	0 4	0	
P8.3		[0] [1]	0 1	0	7.6

P8.4	2	[0] [1] [2]DP [3]MODBUS [4] [5] CANBUS	0 4	0	
P8.6			0.00 300.00 [s]	0.00 [s]	7.6
P8.7			0.00 300.00 [s]	0.00 [s]	7.6
P8.8			0.00 300.00 [s]	0.00 [s]	7.11
P8.9		[0] [1]	0 1	0	
P8.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6] [7] [8] CANBUS	0 6	0	
P8.12	2	[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6] [7] [8] CANBUS	0 6	0	
P8.15	1		0.0 300.0 [%]	100.0 [%]	7.6
P8.16	1	P8.15	0.0 300.0 [s]	3.00 [s]	7.6
P8.17	2		0.0 300.0 [%]	200.0 [%]	7.6

P8.18	2	P8.15	P8.17	0.0 [s]	300.0 [s]	4.00	7.6
P8.19	3			0.0 [%]	300.0 [%]	240.0	7.6
P8.20	3	P8.17	P8.19	0.0 [s]	300.0 [s]	7.00	7.6
P8.21	4			0.0 [%]	300.0 [%]	300.0	7.6
P8.22	4	P8.19	P8.21	0.0 [s]	300.0 [s]	10.00	7.6
P8.23	5			0.0 [%]	300.0 [%]	300.0	7.6
P8.24	5	P8.21	P8.23	0.0 [s]	300.0 [s]	10.00	7.6
P8.25	6			0.0 [%]	300.0 [%]	300.0	7.6
P8.26	6	P8.23	P8.25	0.0 [s]	300.0 [s]	10.00	7.6
P8.27	7			0.0 [%]	300.0 [%]	300.0	7.6
P8.28	7	P8.25	P8.27	0.0 [s]	300.0 [s]	10.00	7.6
P8.29	8			0.0 [%]	300.0 [%]	300.0	7.6
P8.30	8	P8.27	P8.29	0.0 [s]	300.0 [s]	10.00	7.6

P8.32 (

P8.37	2	P8.34	P8.36	0.0 [s]	300.0 [s]	4.00 [s]	7.6
P8.38	3			0.0 [%]	300.0 [%]	240.0 [%]	7.6
P8.39	3	P8.36	P8.38	0.0 [s]	300.0 [s]	7.00 [s]	7.6
P8.40	4			0.0 [%]	300.0 [%]	300.0 [%]	7.6
P8.41						.0	

P8.59			0.00 100.00	0.00	7.11
P8.60			0.00 50.00	0.00	7.11
P8.61		[0] [1]	0 1	0	7.11
P8.62			0 1	0.5	
P8.66			0.00 100.00 [ ]	0.00	7.11
P8.67		0	0.00 50.00	0.00	7.11
P8.68	16		0 65535	0	7.11
P8.69	16		0 65535	0	7.11
P8.70			0 1000	100	7.11
P8.71		[0] [1]	0 1	0	7.11
P8.72			0.00 200.00	60.00	

6.2.8 2 P9

P9.0		[0] [1] [2]DP [3]MODBUS [4] [5] CANBUS	0 4	0	
P9.3		[0] [1]	0 1	0	7.6
P9.4	2	[0] [1] [2]DP [3]MODBUS [4] [5] CANBUS	0 4	0	
P9.6			0.00 300.00 [s]	0.00 [s]	7.6

P9.7			0.00 300.00 [s]	0.00 [s]	7.6
P9.8			0.00 300.00 [s]	0.00 [s]	7.11
P9.9		[0] [1]	0 1	0	
P9.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6] [7] [8] CANBUS	0 6	0	
P9.12	2	[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6] [7] [8] CANBUS	0 6	0	
P9.15	1		0.0 300.0 [%]	100.0 [%]	7.6
P9.16	1	P8.15	0.0 300.0 [s]	3.00 [s]	7.6
P9.17	2		0.0 300.0 [%]	200.0 [%]	7.6
P9.18	2	P8.15 P8.17	0.0 300.0 [s]	4.00 [s]	7.6
P9.19	3		0.0 300.0 [%]	240.0 [%]	7.6
P9.20	3	P8.17 P8.19	0.0 300.0 [s]	7.00 [s]	7.6
P9.21	4		0.0 300.0 [%]	300.0 [%]	7.6

P9.22	4	P8.19	P8.21	0.0 300.0 [s]	10.00 [s]
P9.23	5			0.0 300.0 [%]	100.0 [%]
P9.24	5	P8.21	P8.23	0.0 300.0 [s]	10.00 [s]
P9.25	6			0.0 300.0 [%]	300.0 [%]
P9.26	6	P8.23	P8.25	0.0 300.0 [s]	10.00 [s]
P9.27	7			0.0 300.0 [%]	300.0 [%]
P9.28	7	P8.25	P8.27	0.0 300.0 [s]	10.00 [s]
P9.29	8			0.0 300.0 [%]	300.0 [%]
P9.30	8	P8.27	P8.29	0.0 300.0 [s]	10.00 [s]
P9.32		[0] [1]PROFIBUS [2]MODBUS [3]		0 3	

P9.41	4	P8.38	P8.40	0.0 [s]	300.0 [s]	10.00	7.6
P9.42	5			0.0 [%]	300.0 [%]	300.0	7.6
P9.43	5	P8.40	P8.42	0.0 [s]	300.0 [s]	10.00	7.6
P9.44	6			0.0 [%]	300.0 [%]	300.0	7.6
P9.45	6	P8.42	P8.44	0.0 [s]	300.0 [s]	10.00	7.6
P9.46	7			0.0 [%]	300.0 [%]	300.0	7.6
P9.47	7	P8.44	P8.46	0.0 [s]	300.0 [s]	10.00	7.6
P9.48	8			0.0 [%]	300.0 [%]	300.0	7.6
P9.49	8	P8.46	P8.48	0.0 [s]	300.0 [s]	10.00	7.6
P9.53		[0] [1]		0	1	0	7.6
P9.54				0.0 [%]	300.0 [%]	0.0	7.6
P9.55		[0] [1]		0	1	0	7.6
P9.56				0.00 [s]	300.00 [s]	1.50	7.6
P9.57		[0] [1]		0	1	1	
P9.58				0.00 [s]	300.00 [s]	1.50	
P9.59				0.00	100.00	0.00	7.11
P9.60				0.00	50.00	0.00	7.11
P9.61	لم						

P10.9		[0] [1]			0 1	0	
P10.10		[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6] [7] [8] CANBUS			0 6	0	
P10.12	2	[0]I/O [1] 1 [2] 2 [3] [4]DP [5]MODBUS [6] [7] [8] CANBUS			0 6	0	
P10.15	1				0.0 300.0 [%]	100.0 [%]	7.6
P10.16	1		P8.15		0.0 300.0 [s]	3.00 [s]	7.6
P10.17	2				0.0 300.0 [%]	200.0 [%]	7.6
P10.18	2	P8.15	P8.17		0.0 300.0 [s]	4.00 [s]	7.6
P10.19	3				0.0 300.0 [%]	240.0 [%]	7.6
P10.20	3	P8.17	P8.19		0.0 300.0 [s]	7.00 [s]	7.6
P10.21	4				0.0 300.0 [%]	300.0 [%]	7.6
P10.22	4	P8.19	P8.21		0.0 300.0 [s]	10.00 [s]	7.6

P10.24	5	P8.21 P8.23	0.0 300.0 [s]	10.00 [s]	7.6
P10.25	6		0.0 300.0 [%]	300.0 [%]	7.6
P10.26	6	P8.23 P8.25	0.0 300.0 [s]	10.00 [s]	7.6
P10.27	7		0.0 300.0 [%]	300.0 [%]	7.6
P10.28	7	P8.25 P8.27	0.0 300.0 [s]	10.00 [s]	7.6
P10.29	8		0.0 300.0 [%]	300.0 [%]	7.6
P10.30	8	P8.27 P8.29	0.0 300.0 [s]	10.00 [s]	7.6
P10.32		[0] [1]PROFIBUS [2]MODBUS [3]	0 3	0	7.6
P10.33			0.1 10.0	1.0	7.6
P10.34	1		0.0 300.0 [%]	100.0 [%]	7.6
P8.35	1	P8.34	0.0 300.0 [s]	3.00 [s]	7.6
P10.36	2		0.0 300.0 [%]	200.0 [%]	7.6
P10.37	2	P8.34 P8.36	0.0 300.0 [s]	4.00 [s]	7.6
P10.38	3		0.0 300.0 [%]	240.0 [%]	7.6
P10.39	3	P8.36 P8.38	0.0 300.0 [s]	7.00 [s]	7.6
P10.40	4		0.0 300.0 [%]	300.0 [%]	7.6
P10.41	4	P8.38 P8.40	0.0 300.0 [s]	10.00 [s]	7.6
P10.42	5		0.0 300.0 [%]	300.0 [%]	7.6

P10.43	5	P8.40 P8.42	0.0 300.0 [s]	10.00 [s]	7.6
P10.44	6		0.0 300.0 [%]	300.0 [%]	7.6
P10.45	6	P8.42 P8.44	0.0 300.0 [s]	10.00 [s]	7.6
P10.46	7		0.0 300.0 [%]	300.0 [%]	7.6
P10.47	7	P8.44 P8.46	0.0 300.0 [s]	10.00 [s]	7.6
P10.48	8		0.0 300.0 [%]	300.0 [%]	7.6
P10.49	8	P8.46 P8.48	0.0 300.0 [s]	10.00 [s]	7.6
P10.53		[0] [1]	0 1	0	7.6
P10.54			0.0 300.0 [%]	0.0 [%]	7.6
P10.55		[0] [1]	0 1	0	7.6
P10.56			0.00 300.00 [s]	1.50 [s]	7.6
P10.57		[0] [1]	0 1	1	
P10.58			0.00 300.00 [s]	1.50 [s]	
P10.59			0.00 100.00	0.00	7.11
P10.60			0.00 50.00	0.00	7.11
P10.61		[0] [1]	0 1	0	7.11
P10.62			0 1	0.5	
P10.66			0.00 100.00 [ ]	0.00	7.11
P10.67		0	0.00 50.00	0.00	7.11
P10.68	16		0 65535	0	7.11
P10.69	16		0 65535	0	7.11

P10.70			0 1000	100	7.11
P10.71		[0] [1]	0 1	0	7.11
P10.72			0.00 200.00	60.00	

6.2.10 4 P11

P11.0		[0] [1] [2]DP [3]MODBUS [4] [5] CANBUS	0 4	0	
P11.3		[0] [1]	0 1	0	7.6
P11.4	2	[0] [1] [2]DP [3]MODBUS [4] [5] CANBUS	0 4	0	
P11.6			0.00 300.00 [s]	0.00 [s]	7.6
P11.7			0.00 300.00 [s]	0.00 [s]	7.6
P11.8			0.00 300.00 [s]	0.00 [s]	7.11
P11.9		[0] [1]	0 1	0	

		[0]I/O			
		[1] 1			
		[2] 2			
		[3]			
P11.10		[4]DP	0 6	0	
		[5]MODBUS			
		[6]			
		[7]			
		[8] CANBUS			
		[0]I/O			
		[1] 1			
		[2] 2			
		[3]			
P11.12	2	[4]DP	0 6	0	
		[5]MODBUS			
		[6]	[%]	%]	7.6
		[7]	0 300.0	0.0	
		[8] CANBUS			
P11.15	1		0.0 300.0	100.0	7.6
			[%]	[%]	
		P8.15	0.0 300.0	3.000 ž 6	7.6
P11.16	1		[s]	[s]	
			0.0 300.0	200.0 0.0	7.6
P11.17	2		[%]	%] [%]	
P11.18	2	2			

P11.70		0	1000	100	7.11
P11.71	1.71				

P12.20	FCD _2X	m/min	m/min	0.0	100.0	5.0	7.11
P12.21				0	1	0	
P12.22				0.0 [%]	20.0	2.0 [%]	7.7
P12.23				0.0 [%]	20.0	0.0 [%]	7.7
P12.24				0.0 [%]	200.0	3	2

P12.57			0~10	0.10	

6.2.12 2 P13

P13.0		[0] [1]	0 1	1	7.7
P13.1		[0][%] [1][Hz] [2][rpm]	0 2	1	
P13.2	1		0.0 3000.0	10.0	
P13.3	2		0.0 3000.0	20.0	
P13.4	3		0.0 3000.0	35.0	
P13.5	4		0.0 3000.0	50.0	
P13.6	5		0.0 3000.0	50.0	
P13.7	6		0.0 3000.0	50.0	
P13.8	7		0.0 3000.0	50.0	
P13.9	8		0.0 3000.0	50.0	
P13.10	9		0.0 3000.0	50.0	
P13.11	10		0.0 3000.0	50.0	
P13.12	11		0.0 3000.0	50.0	
P13.13	12		0.0 3000.0	50.0	
P13.14	13		0.0 3000.0	50.0	
P13.15	14		0.0 3000.0	50.0	
P13.16	15		0.0 3000.0	50.0	
P13.17	16		0.0 3000.0	50.0	
P13.18	FCD LSW_2X	16	0 65535	1000	7.11
P13.19	FCD MSW_2X	16	0 100	2	7.11
P13.20	FCD m/min _2X	m/min	0.0 100.0	5.0	7.11
P13.21			0 1	0	

P13.22	0.0 20.0 [%]	2.0 [%]	7.7
P13.23	0.0 20.0 [%]	0.0 [%]	7.7
P13.24	0.0 200.0 [%]	30.0 [%]	7.7
P13.25	0.0 200.0 [%]	20.0 [%]	7.7
P13.26	0.00 2.00 [s]	0.00 [s]	7.7
P13.27	0.00 2.00 [s]	0.00 [s]	7.7
P13.28	0.00 2.00 [s]	0.07 [s]	7.7
P13.29	0.00 2.00 [s]	0.07 [s]	7.7
P13.30	@ -)) ts		

P13.41	0.00 100.00 [s]	0.10 [s]	7.11
P13.42	0 3000 [s]	3 [s]	7.11
P13.43	0.0 50.0 [%]	20.0 [%]	7.11
P13.44	0.00 5.00 [s]	0.20 [s]	7.11
P13.45	20.0 100.0 [%]	25.0 [%]	7.11
P13.46	0.00 5.00 [s]	0.10 [s]	7.11
P13.47	0 30.0 [%]	10.0 [%]	7.11
P13.48	0.00 5.00 [s]	0.00 [s]	7.11
P13.49	0.00~1.00	0.1	7.11
P13.50	0.0 10.0 [%]	10.0 [%]	7.11
P13.51	0~100	30	
P13.52	0~10	2	
P13.53	0~10	0.1	
P13.54	0~10	0.1	
P13.55	0~30	2.0	
P13.56	0~10	0.25	

6.2.13 3 P14

P14.0		[0] [1]	0 1	1	7.7
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	3		0.0 3000.0	35.0	
P14.5	4		0.0 3000.0	50.0	
P14.6	5		0.0 3000.0	50.0	
P14.7	6		0.0 3000.0	50.0	
P14.8	7		0.0 3000.0	50.0	
P14.9	8		0.0 3000.0	50.0	
P14.10	9		0.0 3000.0	50.0	
P14.11	10		0.0 3000.0	50.0	
P14.12	11		0.0 3000.0	50.0	
P14.13	12		0.0 3000.0	50.0	
P14.14	13		0.0 3000.0	50.0	
P14.15	14		0.0 3000.0	50.0	
P14.16	15		0.0 3000.0	50.0	
P14.17	16		0.0 3000.0	50.0	
P14.18	FCD LSW_2X	16	0 65535	1000	7.11
P14.19	FCD MSW_2X	16	0 100	2	7.11
P14.20	FCD m/min _2X	m/min	0.0 100.0	5.0	7.11
P14.21			0 1	0	
P14.22			0.0 20.0 [%]	2.0 [%]	7.7

P14.23			0.0 20.0 [%]	0.0 [%]	7.7
P14.24			0.0 200.0 [%]	30.0 [%]	7.7
P14.25			0.0 200.0 [%]	20.0 [%]	7.7
P14.26			0.00 2.00 [s]	0.00 [s]	7.7
P14.27			0.00 2.00 [s]	0.00 [s]	7.7
P14.28			0.00 2.00 [s]	0.07 [s]	7.7
P14.29			0.00 2.00 [s]	0.07 [s]	7.7
P14.30	@		0 1	0	
P14.31	@		0 2	0.3	
P14.32			0.0 20.0 [%]	0.0 [%]	7.7
P14.33			0.0 20.0 [%]	0.0 [%]	7.7
P14.34			0.00 2.00 [s]	0.00 [s]	7.7
P14.35			0.00 2.00 [s]	0.00 [s]	7.7
P14.36			0.00 2.00 [s]	0.50 [s]	7.7
P14.37			0.00 2.00 [s]	0.50 [s]	7.7
P14.38		[0] [1]	0 1	0	7.11
P14.39		[0] [1]	0 1	0	
P14.40			0.0 100.0 [%]	10.0 [%]	7.11
P14.41			0.00 100.00 [s]	0.10 [s]	7.11

P15.1

P15.25			0.0 200.0 [%]	20.0 [%]	7.7
P15.26			0.00 2.00 [s]	0.00 [s]	7.7
P15.27			0.00 2.00 [s]	0.00 [s]	7.7
P15.28			0.00 2.00 [s]	0.07 [s]	7.7
P15.29			0.00 2.00 [s]	0.07 [s]	7.7
P15.30	@		0 1	0	
P15.31	@		0 2	0.3	
P15.32			0.0 20.0 [%]	0.0 [%]	7.7
P15.33			0.0 20.0 [%]	0.0 [%]	7.7
P15.34			0.00 2.00 [s]	0.00 [s]	7.7
P15.35			0.00 2.00 [s]	0.00 [s]	7.7
P15.36			0.00 2.00 [s]	0.50 [s]	7.7
P15.37			0.00 2.00 [s]	0.50 [s]	7.7
P15.38		[0] [1]	0 1	0	7.11
P15.39		[0] [1]	0 1	0	
P15.40			0.0 100.0 [%]	10.0 [%]	7.11
P15.41			0.00 100.00 [s]	0.10 [s]	7.11

P15.42			0 3000 [s]	3 [s]	7.11
P15.43			0.0 50.0 [%]	20.0 [%]	7.11
P15.44			0.00 5.00 [s]	0.20 [s]	7.11
P15.45			20.0 100.0 [%]	25.0 [%]	7.11
P15.46			0.00 5.00 [s]	0.10 [s]	7.11
P15.47			0 30.0 [%]	10.0 [%]	7.11
P15.48			0.00 5.00 [s]	0.00 [s]	7.11
P15.49			0.00~1.00	0.1	7.11
P15.50			0.0 10.0 [%]	10.0 [%]	7.11
P12.51			0~100	30	
P12.52			0~10	2	
P12.53			0~10	0.1	
P12.54			0~10	0.1	
P12.55			0~30	2.0	
P12.56			0~10	0.25	
P12.57			0~10	0.10	

6.2.15 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]	7.8
P16.9		0 7200 [rpm]	1500 [rpm]	7.8
P16.11	[0]V/F [1] [2]	0 2	0	
P16.12		1.00 10.00 [kHz]	3.00 [kHz]	7.8
P16.14 V/F	[0] V/F [1] V/F [2]	0 2	0	7.8
P16.15	[0] [1]	0 1	0	7.8
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]	7.8
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 [%]	7.8

P16.27			0.0 200.0 [%]	100.0 [%]	7.8
P16.30			0.0 100.0 [%]	0.0 [%]	7.8
P16.33	V/F	V/F	0 6	2	

P16.52			0.00 5.00 [Hz]	0.00 [Hz]	7.8
P16.54			0.00 300.00 [s]	0.00 [s]	7.8
P16.55			0.0 150.0 [%]	75.0 [%]	7.8
P16.56			0.00 5.00 [Hz]	0.00 [Hz]	7.8
P16.59			0.0 1000.0 [%]	100.0 [%]	
P16.60			0.0 1000.0 [%]	100.0 [%]	
P16.61			0.0 1000.0 [%]	100.0 [%]	
P16.62			0.0 1000.0 [%]	100.0 [%]	
P16.64	V/F	V/F	0.0 1000.0 [%]	100.0 [%]	7.8
P16.66		V/F	0.0 1000.0 [%]	100.0 [%]	
P16.67			0.0 1000.0 [%]	100.0 [%]	
P16.68			0.0 1000.0 [%]	100.0 [%]	
P16.69			0.0 1000.0 [%]	100.0 [%]	
P16.70			0.0 1000.0 [%]	100.0 [%]	

6.2.16 2 V/F P17

P17.0			320 460 [V]	380 [V]	
P17.2			0.0 4000.0 [kW]	[kW]	
P17.3			320 460 [V]	380 [V]	
P17.4			0.0 6500.0 [A]	[A]	
P17.5			0.0 300.0 [Hz]	50.0 [Hz]	
P17.6			0 6000 [rpm]	1465 [rpm]	

P17.7	2 12 [pole]	4 [pole]	7.8
P17.9			

P17.36	V/F 2		0.0 300.0 [Hz]	50.0 [Hz]	
P17.37	V/F 2		0.0 125.0 [%]	100.0 [%]	
P17.38	V/F 3		0.0 300.0 [Hz]	50.0 [Hz]	
P17.39	V/F 3		0.0 125.0 [%]	100.0 [%]	
P17.40	V/F 4		0.0 300.0 [Hz]	50.0 [Hz]	
P17.41	V/F 4		0.0 125.0 [%]	100.0 [%]	
P17.42	V/F 5		0.0 300.0 [Hz]	50.0 [Hz]	
P17.43	V/F 5		0.0 125.0 [%]	100.0 [%]	
P17.44	V/F 6		0.0 300.0 [Hz]	50.0 [Hz]	
P17.45	V/F 6		0.0 125.0 [%]	100.0 [%]	
P17.46	V/F @		0~347	0	
P17.47	@		0~347	0	7.8
P17.48		[0] [1]PID 1 [2]PID 2 [3]	0 3	0	7.8
P17.49	@		0~347	0	7.8
P17.50			0.00 300.00 [s]	0.00 [s]	7.8
P17.51			0.0 150.0 [%]	70.0 [%]	7.8
P17.52			0.00 5.00 [Hz]	0.00 [Hz]	7.8
P17.54			0.00 300.00 [s]	0.00 [s]	
P17.55			0.0 150.0 [%]	75.0 [%]	
P17.56			0.00 5.00 [Hz]	0.00 [Hz]	
P17.59			0.0 1000.0 [%]	100.0 [%]	

P17.60			0.0 [%]	1000.0 [%]	100.0 [%]	7.8
P17.61			0.0 [%]	1000.0 [%]	100.0 [%]	
P17.62			0.0 [%]	1000.0 [%]	100.0 [%]	
P17.64	V/F	V/F	0.0 [%]	1000.0 [%]	100.0 [%]	

6.2.17 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]	7.8
3			
P18.9		0 7200 [rpm] 1500 [rpm]	7.8
	[0]V/F		
P18.11	[1]	0 2 0	
	[2]		
P18.12		1.00 10.00 [kHz] 3.00 [kHz]	7.8
	[0] V/F		
P18.14 V/F	[1] V/F		
	[2]		

P18.24

V/F

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]	7.8
P19.9	0 7200 [rpm]	1500 [rpm]	7.8
P19.11 [0]V/F [1] [2]	0 2	0	
P19.12	1.00 10.00 [kHz]	3.00 [kHz]	7.8
P19.14 V/F [0] V/F [1] V/F [2]	0 2	0	7.8
P19.15 [0] [1]	0 1	0	7.8
P19.16	2 500 [ms]	500 [ms]	
P19.17 V/F [0] [1]	0 1	0	
P19.18	10 1000 [ms]	200 [ms]	
P19.19 [0] [1]	0 1	0	
P19.22	0.00 100.00 [s]	0.00 [s]	7.8
P19.23 V/F	0.00 300.00 [Hz]	0.00 [Hz]	
P19.24 V/F	0.00 300.00 [Hz]	50.00 [Hz]	
P19.25	0.0 120.0 [%]	100.0 [%]	
P19.26 V/F V/F	0.00 10.00 [%]	0.75 [%]	7.8
P19.27	0.0 200.0 [%]	100.0 [%]	7.8

P19.30			0.0 100.0 [%]	0.0 [%]	7.8
P19.33	V/F	V/F	0 6	2	7.8
P19.34	V/F 1		0.0 300.0 [Hz]	5.0 [Hz]	
P19.35	V/F 1		0.0 125.0 [%]	11.5 [%]	
P19.36	V/F 2		0.0 300.0 [Hz]	50.0 [Hz]	
P19.37	V/F 2		0.0 125.0 [%]	100.0 [%]	
P19.38	V/F 3		0.0 300.0 [Hz]	50.0 [Hz]	
P18.39	V/F 3		0.0 125.0 [%]	100.0 [%]	
P19.40	V/F 4		0.0 300.0 [Hz]	50.0 [Hz]	
P19.41	V/F 4		0.0 125.0 [%]	100.0 [%]	
P19.42	V/F 5		0.0 300.0 [Hz]	50.0 [Hz]	
P19.43	V/F 5		0.0 125.0 [%]	100.0 [%]	
P19.44	V/F 6		0.0 300.0 [Hz]	50.0 [Hz]	
P19.45	V/F 6		0.0 125.0 [%]	100.0 [%]	
P19.46	V/F @		0~347	0	
P19.47	@		0~347	0	7.8
P19.48		[0] [1]PID 1 [2]PID 2 [3]	0 3	0	7.8
P19.49	@		0~347	0	7.8
P19.50			0.00 300.00 [s]	0.00 [s]	7.8
P19.51			0.0 150.0 [%]	70.0 [%]	7.8
P19.52			0.00 5.00 [Hz]	0.00 [Hz]	7.8

P19.54	0.00 300.00 [s]	0.00 [s]	
P19.55	0.0 150.0 [%]	75.0 [%]	
P19.56	0.00 5.00 [Hz]	0.00 [Hz]	
P19.59	0.0 1000.0 [%]	100.0 [%]	
P19.60	0.0 1000.0 [%]	100.0 [%]	7.8
P19.61	0.0 1000.0 [%]	100.0 [%]	
P19.62			

P20.22		0.0 300.0 [%]	160.0 [%]	
P20.23		0.0 200.0 [%]	20.0 [%]	
P20.24		0.0 300.0 [%]	100.0 [%]	
P20.25		0.0 200.0 [%]	100.0 [%]	
P20.26		0.0 1000.0 [%]	0.0 [%]	7.9
P20.27		0.00 15.00 [%]	2.00 [%]	7.9
P20.28	[0] P20.16 P20.17 [1] [2] [3]DP	0 3	0	
P20.30	[0] P20.31 P20.32 [1] 1 [2] 2 [3]	0 3	0	

P20.31

P20.40

P20.57			0.0 100.0 [%]	100.0 [%]	
P20.58			0.0 100.0 [%]	100.0 [%]	100%
P20.60	DROOP	0 DROOP	0.0 100.0 [%]	0.0 [%]	7.9
P20.61	DROOP	DROOP	30 2000 [ms]	50 [ms]	7.9
P20.62			0.0 1000.0 [%]	100.0 [%]	7.9
P20.63			0.0 1000.0 [%]	100.0 [%]	7.9
P20.64	2	2	0.0 100.0 [%]	0.0 [%]	7.9
P20.65	2	2	30 2000.0 ms	50 ms	
P20.98		( )	0.01 300.00 [s]	0.75 [s]	
P20.99			0.00 10.00 [%]	0.00 [%]	

6.2.20 2 P21

P21.0		[0] [1]	0 1	0	7.9
P21.1		[0] [1] 1 [2] 2 [3] [4] P20.3 [5]DP [6]MODBUS [7]	0 7	0	7.9
P21.2			0 7	0	
P21.3			-300.0 300.0 [%]	0.0 [%]	7.9
P21.5			0 1000 [ms]	0 [ms]	
P21.6			0.0 200.0 [%]	100.0 [%]	7.9
P21.7		[0] [1] P20.8 P20.9 [2] 1 [3] 2 [4] [5]DP [6]MODBUS [7]	0 7	0	7.9
P21.8		P20.7 [1]	0.0 300.0 [%]	200.0 [%]	7.9
P21.9		P20.7 [1]	0.0 300.0 [%]	200.0 [%]	7.9
P21.11			0 1000 [ms]	0 [ms]	
P21.13			20.0 500.0 [ms]	100.0 [ms]	7.9
P21.14		1	0 60000	1024	

P21.15		[0] [1]	0 1	0	7.9
P21.16			0.0 300.0 [%]	100.0 [%]	
P21.17			0.0 300.0 [%]	100.0 [%]	
P21.18			0.0 300.0 [%]	0.0 [%]	
P21.19			0.0 300.0 [%]	0.0 [%]	
P21.20		[0] [1]	0 1	0	
P21.21		[0] [1]	0 1	0	
P21.22			0.0 300.0 [%]	160.0 [%]	
P21.23			0.0 200.0 [%]	20.0 [%]	
P21.24			0.0 300.0 [%]	100.0 [%]	
P21.25			0.0 200.0 [%]	100.0 [%]	
P21.26			0.0 1000.0 [%]	0.0 [%]	7.9
P21.27			0.00 15.00 [%]	2.00 [%]	7.9
P21.28		[0] P20.16 P20.17 [1] [2] [3]DP	0 3	0	
P21.30		[0] P20.31 P20.32 [1] 1 [2] 2 [3]	0 3	0	
P21.31			0.0 100.0 [%]	5.0 [%]	

P21.32		0.0 100.0 [%]	5.0 [%]	
P21.34	[0] [1]	0 1	0	7.9
P21.35		0.0 100.0 [s]	0.0 [s]	
P21.36		50.0 150.0 [%]	110.0 [%]	
P21.37		0.0 150.0 [%]	100.0 [%]	7.9
P21.38		0.0 100.0 [%]	25.0 [%]	7.9
P21.39		0.0 120.0 [%]	100.0 [%]	7.9
P21.40		0.0 150.0 [%]	100.0 [%]	7.9
P21.41		0.0 150.0 [%]	135.0 [%]	
P21.42	[0] [1]	0 1	1	
P21.43		25 1000 [ms]	75 [ms]	
P21.44		25 1000 [ms]	250 [ms]	
P21.45		0.0 100.0 [%]	22.0 [%]	
P21.46		0.0 100.0 [%]	18.0 [%]	
P21.47		0.0 200.0 [%]	92.0 [%]	
P21.48		0.0 200.0 [%]	87.0 [%]	
P21.49	ụ			

P21.54	Ki		0.0 1000.0 [%]	100.0 [%]	
P21.55			0.0 1000.0 [%]	100.0 [%]	7.9
P21.56			0.0 1000.0 [%]	100.0 [%]	7.9
P21.57			0.0 100.0 [%]	100.0 [%]	
P21.58			0.0 100.0 [%]	100.0 [%]	100%
P21.60	DROOP	0 DROOP	0.0 100.0 [%]	0.0 [%]	7.9
P21.61	DROOP	DROOP	30 2000 [ms]	50 [ms]	7.9
P21.62			0.0 1000.0 [%]	100.0 [%]	7.9
P21.63			0.0 1000.0 [%]	100.0 [%]	7.9
P21.64	2	2	0.0 100.0 [%]	0.0 [%]	7.9
P21.65	2	2	30 2000.0 ms	50 ms	
P21.98		( )	0.01 300.00 [s]	0.75 [s]	
P21.99			0.00 10.00 [%]	0.00 [%]	

6.2.21 3 P22

P22.0		[0] [1]			0	1	0	7.9
P22.1		[0] [1] [2] [3] [4] [5]DP [6]MODBUS [7]	1 2	P20.3	0	7	0	7.9
P22.2					0	7	0	

P22.32		0.0 100.0 [%]	5.0 [%]
P22.34	[0] [1]	0 1	0

P22.54	Ki		0.0 1000.0 [%]	100.0 [%]	
P22.55			0.0 1000.0 [%]	100.0 [%]	7.9
P22.56			0.0 1000.0 [%]	100.0 [%]	7.9
P22.57			0.0 100.0 [%]	100.0 [%]	
P22.58			0.0 100.0 [%]	100.0 [%]	100%
P22.60	DROOP	0 DROOP	0.0 100.0 [%]	0.0 [%]	7.9
P22.61	DROOP	DROOP	30 2000 [ms]	50 [ms]	7.9
P22.62			0.0 1000.0 [%]	100.0 [%]	7.9
P22.63			0.0 1000.0 [%]	100.0 [%]	7.9
P22.64	2	2	0.0 100.0 [%]	0.0 [%]	7.9
P22.65	2	2	30 2000.0 ms	50 ms	
P22.98		( )	0.01 300.00 [s]	0.75 [s]	
P22.99			0.00 10.00 [%]	0.00 [%]	

6.2.22 4 P23

P23.0		[0] [1]	0 1	0	7.9
P23.1		[0] [1] 1 [2] 2 [3] [4] P20.3 [5]DP [6]MODBUS [7]	0 7	0	7.9
P23.2			0 7	0	
P23.3			-300.0 300.0 [%]	0.0 [%]	7.9
P23.5			0 1000 [ms]	0 [ms]	
P23.6			0.0 200.0 [%]	100.0 [%]	7.9
P23.7		[0] [1] P20.8 P20.9 [2] 1 [3] 2 [4] [5]DP [6]MODBUS [7]	0 7	0	7.9
P23.8		P20.7 [1]	0.0 300.0 [%]	200.0 [%]	7.9
P23.9		P20.7 [1]	0.0 300.0 [%]	200.0 [%]	7.9
P23.11			0 1000 [ms]	0 [ms]	
P23.13			20.0 500.0 [ms]	100.0 [ms]	7.9
P23.14		1	0 60000	1024	

P23.15		[0] [1]	0 1	0	7.9
P23.16			0.0 300.0 [%]	100.0 [%]	
P23.17			0.0 300.0 [%]	100.0 [%]	
P23.18			0.0 300.0 [%]	0.0 [%]	
P23.19			0.0 300.0 [%]	0.0 [%]	
P23.20		[0] [1]	0 1	0	
P23.21		[0] [1]	0 1	0	
P23.22			0.0 300.0 [%]	160.0 [%]	
P23.23			0.0 200.0 [%]	20.0 [%]	
P23.24			0.0 300.0 [%]	100.0 [%]	
P23.25			0.0 200.0 [%]	100.0 [%]	
P23.26			0.0 1000.0 [%]	0.0 [%]	7.9
P23.27			0.00 15.00 [%]	2.00 [%]	7.9
P23.28		[0] P20.16 P20.17 [1] [2] [3]DP	0 3	0	
P23.30		[0] P20.31 P20.32 [1] 1 [2] 2 [3]	0 3	0	
P23.31			0.0 100.0 [%]	5.0 [%]	

P23.32		0.0 100.0 [%]	5.0 [%]
P23.34	[0] [1]	0 1	0

6.2.23 CanBus P31

P31.0	CAN		[0] [1]			0 1	0
P31.1	Canopen	ID	ID			1 127	1
P31.2			[0] 20 Kbps [1] 50 Kbps [2] 125 Kbps [3] 250 Kbps [4] 500 Kbps [6] 1000 Kbps			0 6	5
P31.3			CAN			0 60 [s]	0 [s]
P31.4						0~1000	0
P31.5	Tpdo		TPDO			0~255	5
P31.6	Tpdo		TPDO			0~1000	0.0
P31.7	Tpdo Event		TPDO			0~2000	0
P31.8	Rpdo	1	RPDO	1		0~9	0
P31.9	Rpdo	2	RPDO	2		0~9	0
P31.10	Rpdo	3	RPDO	3		0~9	0
P31.11	Rpdo	4	RPDO	4		0~9	0
P31.12	Rpdo	5	RPDO	5		0~9	0
P31.13	Rpdo	6	RPDO	6		0~9	0
P31.14	Rpdo	7	RPDO	7		0~9	0
P31.15	Rpdo	8	RPDO	8		0~9	0
P31.16	Rpdo	9	RPDO	9		0~9	0
P31.17	Rpdo	10	RPDO	10		0~9	0
P31.18	Rpdo	11	RPDO	11		0~9	0
P31.19	Rpdo	12	RPDO	12		0~9	0
P31.20	Rpdo	13	RPDO	13		0~9	0
P31.21	Rpdo	14	RPDO	14		0~9	0
P31.22	Rpdo	15	RPDO	15		0~9	0
P31.23	Rpdo	16	RPDO	16		0~9	0
P31.24	Tpdo	1	TPDO	1		0~29	0
P31.25	Tpdo	2	TPDO	2		0~29	0
P31.26	Tpdo	3	TPDO	3		0~29	0
P31.27	Tpdo	4	TPDO	4		0~29	0
P31.28	Tpdo	5	TPDO	5		0~29	0
P31.29	Tpdo	6	TPDO	6		0~29	0
P31.30	Tpdo	7	TPDO	7		0~29	0
P31.31	Tpdo	8	TPDO	8		0~29	0
P31.32	Tpdo	9	T×	Ā ∉			

P31.37	Tpdo	14	TPDO	14	0~29	0	
P31.38	Tpdo	15	TPDO	15	0~29	0	
P31.39	Tpdo	16	TPDO	16	0~29	0	

RPDO

0		
1	0	9.1.5
2	1	9.1.5
3	HZ	9.1.5
4	%	9.1.5
5	%	9.1.5
6	%	9.1.5
7	Hz	9.1.5
8		9.1.5
9		9.1.5

TPDO

0		9.1.5
1	0	9.1.5
2	1	9.1.5
3	4	9.1.5
4		9.1.5
5		9.1.5
6		9.1.5
7		9.1.5
8	A	9.1.5

9	B	9.1.5
10	C	9.1.5
11		9.1.5
12		9.1.5
13	%	9.1.5
14	%	9.1.5
15	%	9.1.5
16		9.1.5
17		9.1.5
18		9.1.5
19	%	9.1.5
20	%	9.1.5
21	1%	9.1.5
22	2%	9.1.5
23		9.1.5
24	1	9.1.5
25	1	9.1.5
26	2	9.1.5
27	2	9.1.5
28	Kw	9.1.5
29	Kw	9.1.5

P33.5		[0] [1] [2] [3]	0 3	0
P33.6			0 1000 [ms]	50 [ms]
P33.7		[0] [1]	0 1	0
P33.8			0.0 10.0 [s]	3.0 [s]
P33.13	[WO]	7-2	0 37	0
P33.14	[WO]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	

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	
P33.31	[W9]	7-2	0 37	0	
P33.32	[W9]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.33	[W10]	7-2	0 37	0	
P33.34	[W10]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.35	[W11]	7-2	0 37	0	
P33.36	[W11]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	

P33.37	[W12]	7-2	0 37	0	
P33.38	[W12]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.39	[W13]	7-2	0 37	0	
P33.40	[W13]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.41	[W14]	7-2	0 37	0	
P33.42	[W14]	[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000	0 4	0	
P33.43	[W15]	7-2	0 37	0	
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	

P33.56	[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
P33.62	[W8]		[0] × 1 [1] × 10 [2] × 100 [3] × 1000 [4] × 10000 [5] [%] × 1 [6] [%] × 10 [7] [%] × 100	0 7	0

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	0 48	0	
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	

7-2

0

9	32_LSW
10	
11	
12	0 @32bit
13	1 @32bit
14	2 @32bit
15	3 @32bit
16	4 @32bit
17	5 @32bit
18	[Hz]
19	[rpm]
20	[%]
21	[%]
22	[%]
23	[Hz]
24	
25	
26	1[%]
27	2[%]
28	
29	
30 37	SET_W12 19

7-3

0	
1	0
2	1
3	2
4	3
5	4
6	5
7	0 @32bit
8	1 @32bit

9	2 @32bit
10	3 @32bit
11	4 @32bit
12	5 @32bit
13	[32]
14	[32]
15	32bit_MSW
16	32bit_LSW
17	
18	
19	
20	[rpm]
21	[rpm]
22	
23	
24	
25	
26	
27	A
28	B
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

7.1

7.1.1

1 XX XX=

2 XX Y XX= Y=2,3,4,5

3 XX / XX=

4 XX / XX=

5 Z% Z=25 50 90 100

6 Z% Z=80 90 100 110

7.1.2

1 XX XX=

DO DI

2 XX XX=

DO

3

4

DO

2	P5.8	0~300	HZ
3	P5.9	0~300	HZ
4	P5.10	0~300	HZ
5	P5.11	0~300	HZ
1	P5.12	0~300	HZ
2	P5.13	0~300	HZ
3	P5.14	0~300	HZ
4	P5.15	0~300	HZ
5	P5.16	0~300	HZ
1	P5.17	0~300	HZ
2	P5.18	0~300	HZ
3	P5.19	0~300	HZ
4	P5.20	0~300	HZ
5	P5.21		

		1 1
/ /		
/ /		
110% 1		P
		P
100% 2		P
		P
90% 3		P
		P
80% 4		P
		P
100% 5		P
		P
90% 6		P
		P
50% 7		P
		P
25% 8		P
		P
110% 9		P
		P
100% 10		P
		P
90% 11		P
		P
80% 12		P
		P
		P
		P
		P
		P

110% 1 ~ 80%

12 12 P27

0	
1	
2 1	1
3 2	2
4 3	3
5 4	4
6 5	5

7.2

7.2.1

1

P12.0 [0] [1]

A. [0]

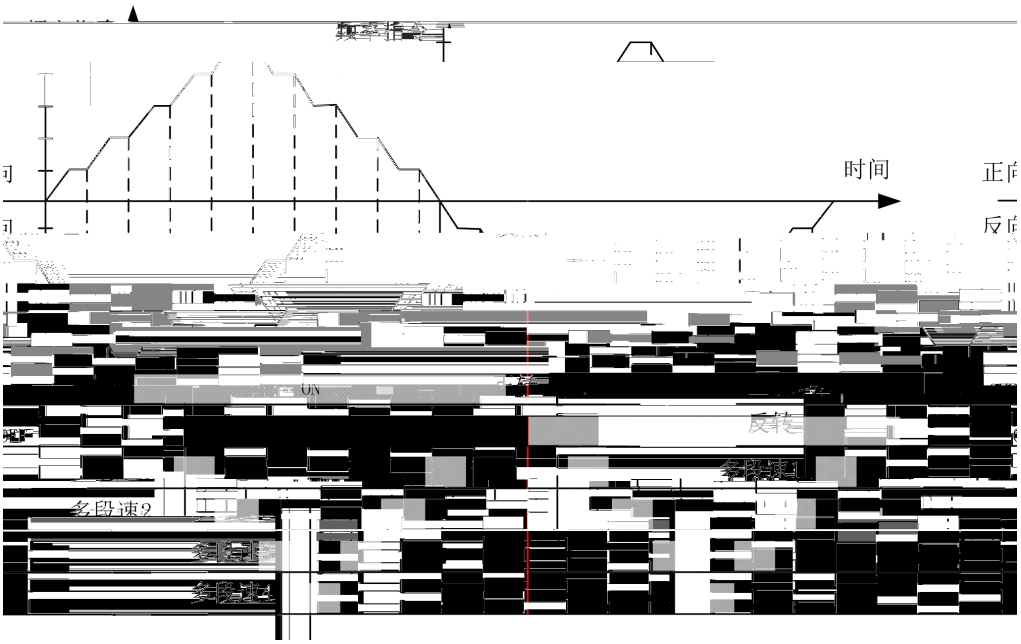
[1] [2] ---1

[6] 1 0 ---2

[7] 2 1 ---3

[8] 3 2 ---4

[9] 4 3 ---5



B. [1]

4 16 (8421)

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

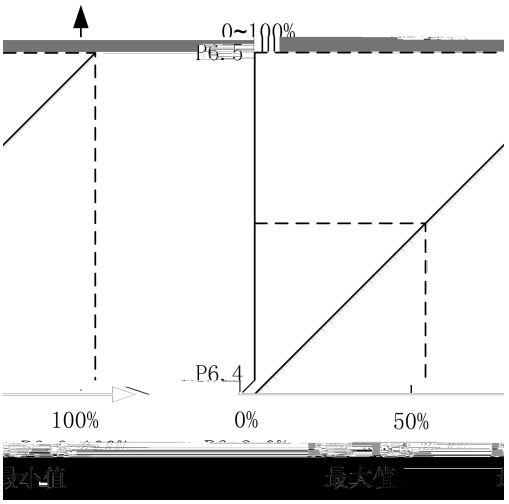
2

DI 22 “ ”

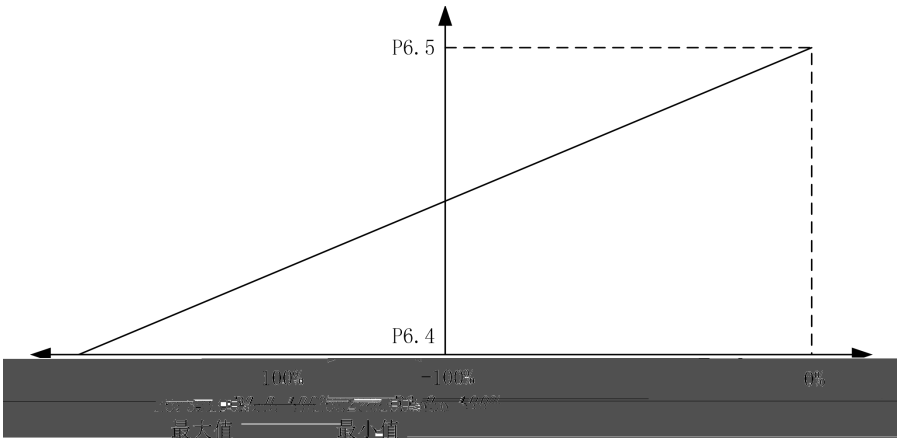
10Hz E106 “ 1 ”

10Hz 2s

E107 “ 2 ”



a 0~100% b 0~200%



c -100~100%

7.2.5

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

4

P7.12 P7.13 P7.12

P7.13

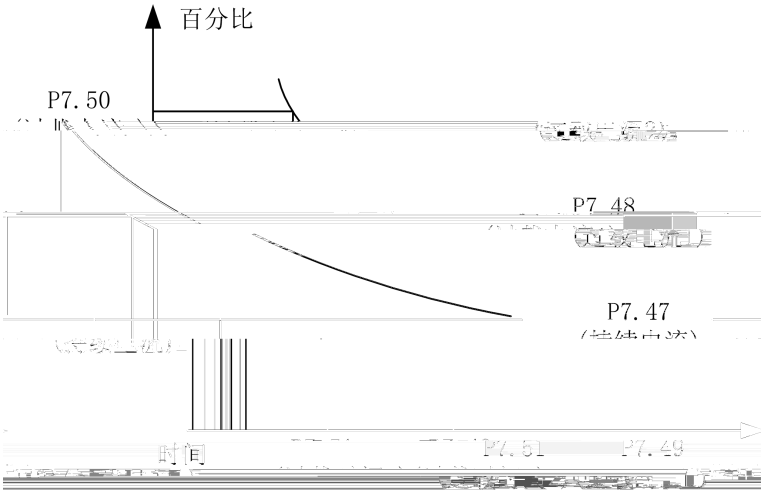
9

P7.33

P7.33

10

P7.48 P7.50



11

P7.64 P7.65 P7.66 HF681N

110kW P7.64 1

P7.65

P7.66

P7.66 ≥ P7.65 P16.0 380V P7.65 50V

647V P7.66 100V 697V

= √

= √

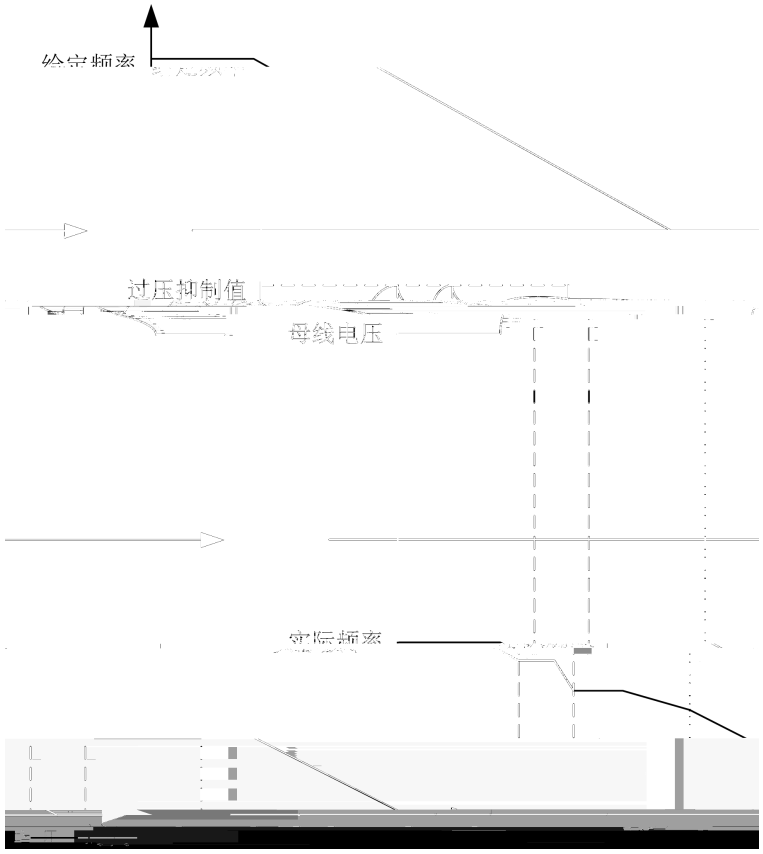
12

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

0 P16.0 380V P7.70

100V 711V =

√



P7.71 P7.71

7.2.6

1

P8.3

[0]

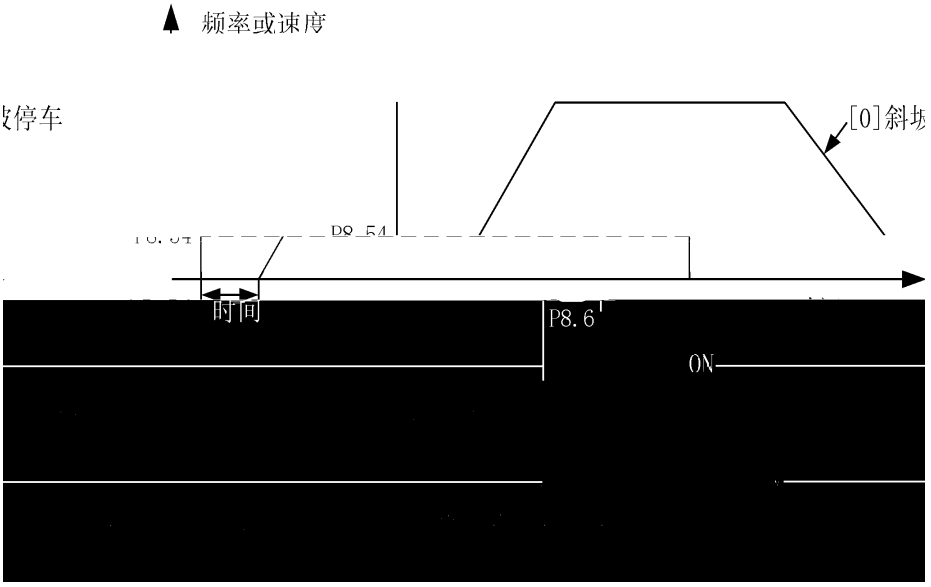
[1]

P8.6 P8.6

P8.7

P8.54 0 P8.3 [0]

P8.54



2

P8.14

P8.14 P8.33

P8.33

P8.15<P8.17<P8.19<P8.21<P8.23<P8.25<P8.27

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

7.2.7

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
6	1	0	1	0
7	0	1	1	0
8	1	1	1	0
9	0	0	0	1
10	1	0	0	1
11	0	1	0	1
12	1	1	0	1
13	0	0	1	1
14	1	0	1	1
15	0	1	1	1
16	1	1	1	1

P12.36 P12.37

P16

0.5Hz~2Hz >50Hz

1kHz			
5kHz			
10kHz			

	kHz
0.4kW 11kW	4
15kW 37kW	3.5
45kW 110kW	3

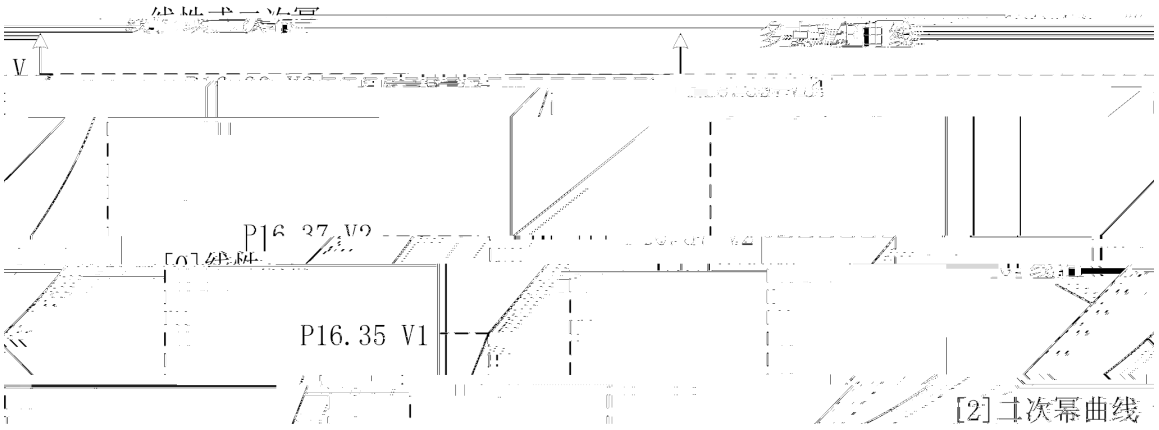
3 V/F

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

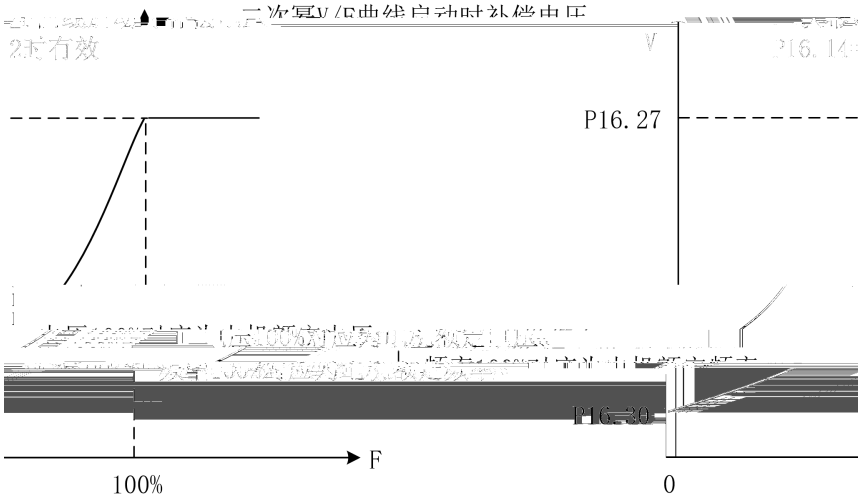
V/F

5

P16.14=[0] V/F V/F P16.26 P16.26

P16.27P·

P16.27



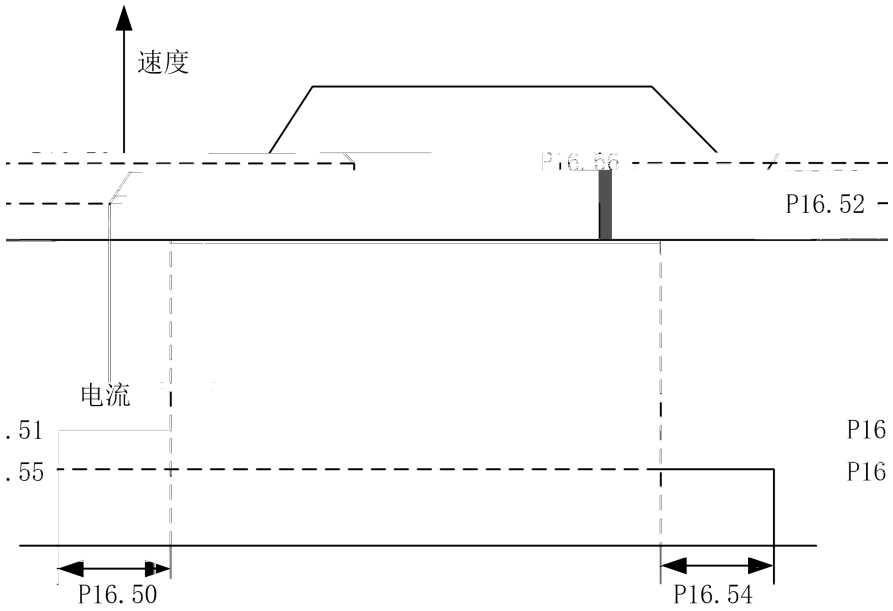
6

P16.50 P16.56

V/F

P16.50 P16.51 P16.52

P16.54 P16.55 P16.56



7

P16.64

7.2.9

1

P20.0

P20.0=0 P20.1=0 P20.2=0

P20.0=0 P20.1 ≠ 0 P20.2 ≠ 0

P20.0=1 P20.1 ≠ 0 P20.2 ≠ 0 1

0

P16.11 [1] [2]

P20.3 P20.1 [4]

2

P12.24 P12.25 0%

3

P20.7

P20.8 P20.9 P20.7=1

4

P20.15 A B

A B U V W

[0]

[1] A B

5

GDHF-PGD2 PG

0 DROOP P20.61 DROOP

7 **1**

8 **2**

P20.1 P20.2 [0]

9

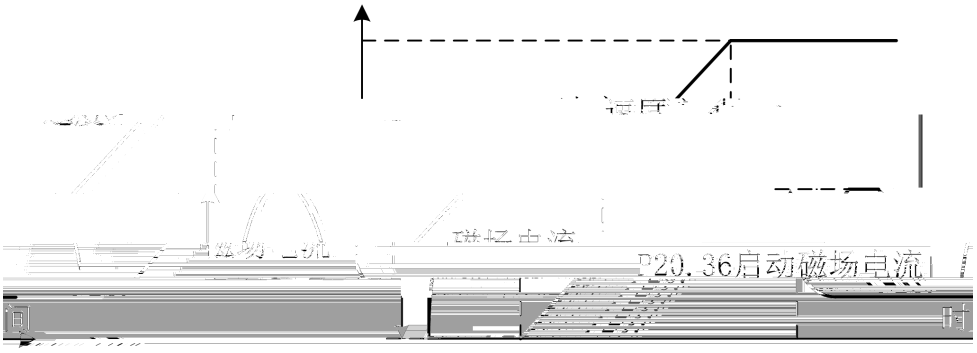
PGD1

PLC

DI DP CW0.10 “1”

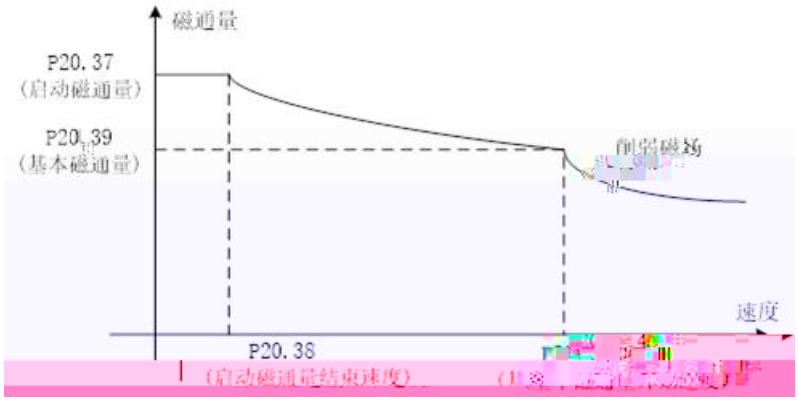
10

P20.36



11

P20.37 P20.40

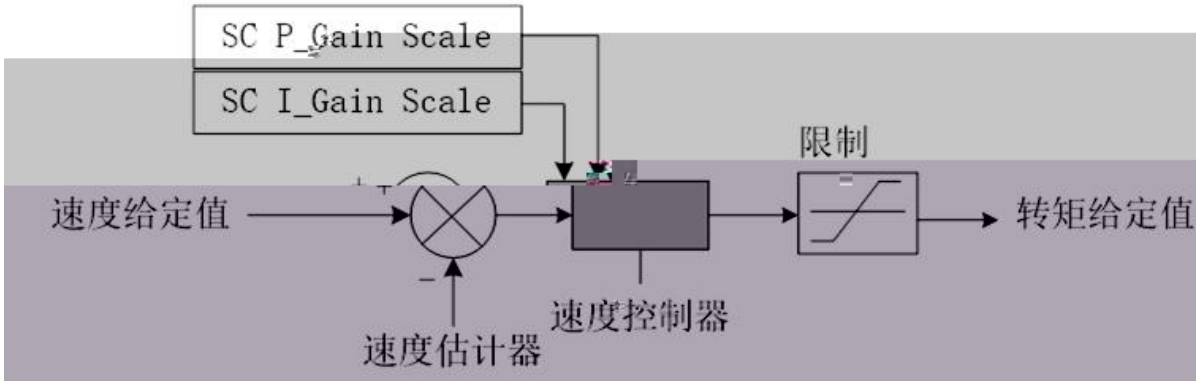


12

P20.55 ,

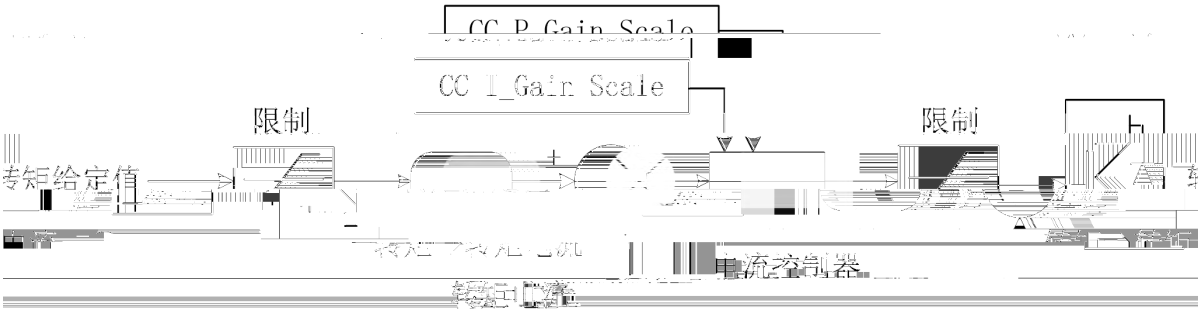
P20.56 ,

%



13

P20.62 P20.63 %



7.2.10

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	

7.2.11

1

P12.40 P12.41

P12.40

P12.41

P7.31		60	
P7.32		2	
P8.7		0.5	0.5
P12.22		0.8; 1.5;	0.8
P12.23		0.8; 1.5;	
P12.24		30; 5;	
P12.25		20; 5;	
P12.32		0.5%	0.5
P12.33		0.5%	0.5
P12.40		10	100% P16.6 10 %
P12.41		0.1s	0.3s 0.1s
P12.42		xxx s	3s P12.42 300s
P16.11		/	

1

P12.42

2

2

P20.21		0 “ ”	
P20.22		%	50HZ 85HZ 85/50*100%=170%
P20.23		P20.22 10%-40%	10T 4T P20.22 4/10*100=40 40 P20.22
P20.24		100%	
P20.25		100%	
P20.45		6%	
P20.46		5%	
P20.47		90%	
P20.48		77%	
P20.49		100%	
P20.20		1 “ ”	

3

P12.43	20%
P12.44	0.2s
P12.45	30%
P12.46	0.1s
P12.47	10%
P12.48	3s
P12.49	0.2
P12.50	3%
P12.38	1

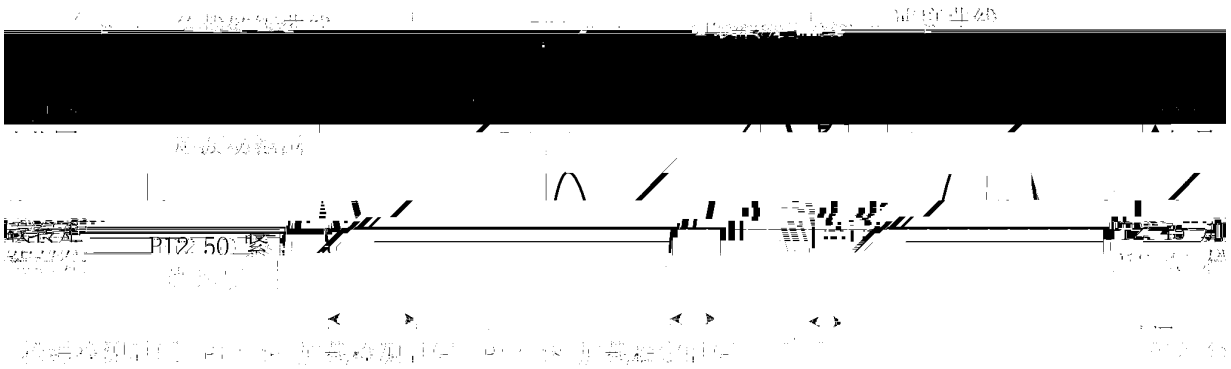
P12.43

P12.47

速度

负载转矩

P12.49 快速减速时间比例



4

V/F

P8.7		15	
P8.66		70	
P8.67		40%	0
P8.70			

1

2 PLC

3

5

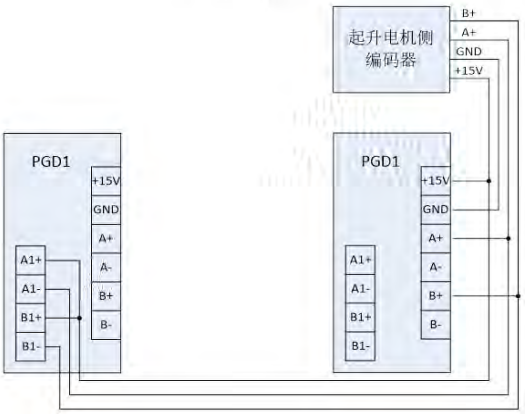
P3.5	6	30 /	COM COM
P3.6	7	40	COM 2
P3.7	8	41	COM
P12.18	FCD LSW_2X	2	1 16
P12.19	FCD MSW_2X	2	1 16
P12.20	FCD m/min _2X	2	

1 FCD LSW FCD MSW

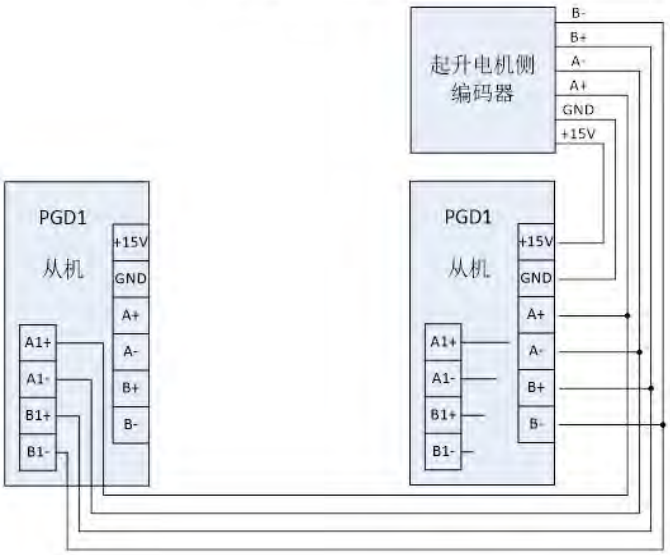
101.62 1 32 LSW 102.63 1 32 MSW

2

四线制编码器第二种接法



六线制编码器接法



P20.14

101.64 101.65

b

P3.6	7	21	DI

P3.7	8	29	1
P8.8		15s	8
P8.59			
P8.60		15	P8.60
P8.68	16		
P8.69	16		
P8.70		50ms	P8.70
P8.71		0	0 1

c

T

ʼEسي

[illegible] P8.59.

d

1) "  " 101.64 ' 2 32 LSW ' 101.65 ' 2 32 MSW '

P7.13( )

[E113]
MIP

[E120]
IGBT
OT

[E157]
PDP[DB]

[E204]
DI
DI
ERR DUPLICATE DI SET

[E210]
Panel Error

[E220]
CRC

W04	REMOTE_EM	[ ]	P3
W06	OT	P7.14( )	
W09	DP P/BALARM	DP	DP
W10	MODBUS MODBUS ALARM	Modbus	Modbus
W15	PARAMETER ERROR		
W18	Temp_Sensing Fail		
W26	CAN	CAN	RJ45

8.2.2

[E105]
UV

P7.13( )

[E106]
1 DI
Brake abnormal 1

[E107]
2 DI
Brake abnormal 2

[E110]
OC

P7.4( )

P7.48(
1) P7.49(1)

[E111]
OL

P7.48 P7.49

P7.8

[E112]
ZC

[E114]
MOP

P7.19

[E115]
P7.19
OS

[E116]

[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
[E171]	Ropeerror	
[E200]	LOCAL_EM	[ ] P3
[E201]	REMOTE_EM	[ ] P3
[E202]	Modbus MODBUS EMERGENCY	Modbus CW0.4
[E203]	DRIVE DISABLED	DP
[E204]	DI ERR DUPLICATE DI SET	DI
[E210]	Panel Error	

[E220]	CRC MEMORY CRC ERR	
[E221]	 PARAMETER ERROR	

8.2.3

		• • ON • COM	• • ON • COM
		•	• •
		•	• •
		•	•
		•	•
		•	• •
		•	•
		•	•
		•	•
		• ON	• ON
		•	• V W
		•	• /

	•	• •
	•	•
	• • •	• • •
	•	•
	•	•
	•	•
	•	•
	•	•

9

9.1 CANopen

9.1.1 CANopen

CANOpen CAN CAN Controller Area Network

1 ISO11898-2

CAN

CAN

CANopen

CANopen

CANopen CANopen CAN

9.1.2

1

CANopen

COB-ID	DLC	Byte0
0x700+ ID	1	5

2

TPDO CANopen

TPDO = * TPDO

COB-ID	DLC
0x80	0

3 TPDO

COB-ID	DLC	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
(0x180~0x480)+Node-ID	8	ParaX		ParaX		ParaX		ParaX	

4 RPDO

COB-ID	DLC	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
(0x200~0x500)+Node-ID	8	ParaX		ParaX		ParaX		ParaX	

9.1.3

1

PLC / CANopen
ID TPDO/RPDO PLC CANopen
RJ45

2

PLC CANopen CANopen
ID

2

P31.0	CanBus	0 1	0~1	0
P31.1	CanBus ID	Node ID	1~127	1
P31.2	CanBus	0 50kbps 1 100kbps 2 125bps 3 250kbps 4 500kbps 5 1000kbps	0~5	3
P31.3		CAN	0~5000	1000
P31.4			0~1000	100
P31.5	TPDO	TPDO	0~255	5
P31.6	TPDO	TPDO	0~1000	0
P31.7	TPDO EVENT	TPDO	0~2000	0
P31.8~P31.23	RPDO x	RPDO	0~9	0
P31.24~P31.39	TPDO x	TPDO	0~29	0

9.1.5 CANOpen

1

a) CanBus CANopen

b) CanBus

c)

TPDO

d) HB

2

a) CanBus CANopen

b)

c) TPDO

TPDO TPDO 4 16

TPDO TPDO TPDO

TPDO x TPDO

TPDOx	COB-ID	DLC	1	2	3	4
TPDO1	0x180+ ID	8	TPDO 1	TPDO 2	TPDO 3	TPDO 4
TPDO2	0x280+ ID	8	TPDO 5	TPDO 6	TPDO 7	TPDO 8
TPDO3	0x380+ ID	8	TPDO 9	TPDO 10	TPDO 11	TPDO 12
TPDO4	0x480+ ID	8	TPDO 13	TPDO 14	TPDO 15	TPDO 16

TPDO

0		
1	0	
2	1	
3	4	
4		

0.6	M_STEP0	1 ‘0’: 1 ‘1’: 1
0.7	M_STEP1	2 ‘0’: 1 ‘1’: 1
0.8	M_STEP2	3 ‘0’: 1 ‘1’: 1
0.9	M_STEP3	4 ‘0’: 1 ‘1’: 1
0.10	Reserved	
0.11	Reserved	
0.12	REMOTE/LOCAL	/ ‘0’ ‘1’
0.13	Reserved	
0.14	MOTION SEL	‘00’ 1 ‘01’ 2 ‘10’ 3 ‘11’ 4

4

Bit0~Bit7	Bit8~Bit15

d) RPDO

4 RPDO RPDO 4 16
RPDO RPDO RPDO
RPDO x RPDO

RPDOx	COB-ID	DLC	1	2	3	4
RPDO1	0x200+ ID	8	RPDO 1	RPDO 2	RPDO 3	RPDO 4

RPDO4	0x500+ ID	8	RPDO 13	RPDO 14

10


1. 2. 3. 4.

1. CMOS 2. 3.

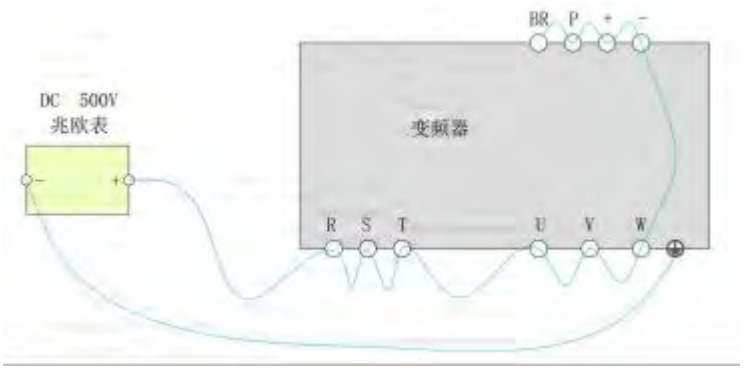
10.1

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.

(>500V) ( )

(500V)



5 MΩ

VDR

10.3

A MODBUS

A1

MODBUS ASCII RTU

MODBUS

GUIDE RTU

A2 CRC

CRC Cyclic Redundancy Check

CRC

CRC K R

N N K N K

N-K=R G(x) G(x) K

G(x) CRC

C(x) C(x) R

" R' î qb ı ”

```
        0X8801, 0X48C0, 0X4980, 0X8941, 0X4B00, 0X8BC1, 0X8A81, 0X4A40,
        0X4E00, 0X8EC1, 0X8F81, 0X4F40, 0X8D01, 0X4DC0, 0X4C80, 0X8C41,
        0X4400, 0X84C1, 0X8581, 0X4540, 0X8701, 0X47C0, 0X4680, 0X8641,
        0X8201, 0X42C0, 0X4380, 0X8341, 0X4100, 0X81C1, 0X8081, 0X4040 };

    INT8U nTemp;
    INT16U wCRCWord = 0xFFFF;

        while (wLength--)
        {
            nTemp = *nData++ ^ wCRCWord;
            wCRCWord >>= 8;
            wCRCWord  ^= wCRCTable[nTemp];
        }
        return wCRCWord;
} // End: CRC16
```

A3 MODBUS

MODBUS

MODBUS —

T3.5

0...9 A...F

3.5

1.5

3.5

CRC

MODBUS

MODBUS

				CRC	
T3.5	1Byte	1Byte	NBytes	2Bytes	T3.5

MODBUS 1

A4 MODBUS

0x01(HEX) (Read Coils)

0			1 ~ 247
1			0x01
2		[ ]	
3		[ ]	
4		[ ]	<N>
5		[ ]	
6	CRC	[ ]	CRC16
7	CRC	[ ]	

0x02(HEX) (Read Discrete Inputs)

0		1 ~ 247
1		0x02
2	[ ]	
3	[ ]	
4	[ ]	Input <N>
5	[ ]	
6	CRC [ ]	CRC16
7	CRC [ ]	
8		

0		1 ~ 247
1		0x02
2		N / 8
3	Input[8-0]	Input
4	Input [16-9]	
.....	CRC [ ]	CRC16
.....	CRC [ ]	
(N / 8 + 5)		

0x03(HEX) (Read Holding Registers)

0		1 ~ 247
1		3
2	[ ]	
3	[ ]	
4	[ ]	<N>
5	[ ]	
6	CRC [ ]	CRC16
7	CRC [ ]	
8		

0x06(HEX) (Write Single Holding Registers)

0		1 ~ 247
1		6
2	[ ]	
3	[ ]	
4	1 [ ]	
5	1 [ ]	
6	CRC [ ]	CRC16
7	CRC [ ]	
8		

0		1 ~ 247
1		6
2	[ ]	
3	[ ]	
4	1 [ ]	
5	1 [ ]	
6	CRC [ ]	CRC16
7	CRC [ ]	
8		

0x10(HEX) (Write Multiple Holding Registers)

0		1 ~ 247
1		16
2	[ ]	
3	[ ]	
4	[ ]	<N>
5	[ ]	
6		

A5 MODBUS

0x01 Coils		
0	0 1	
1	0 1	
2	1	
3	1	
4	0 1	
5	0 1	
6	00 01 10	1 2 3
7	11	4
8		

0x04 Input Regs		
0	DI	[R]
50	AI 1 [V]	[R] : 100 => 1.0[V], -10 ~ +10[V]
51	AI 1 [I]	[R] : 100 => 1[mA], 0 ~ 20[mA]
52	AI2 [V]	[R] : 100 => 1.0[V], -10 ~ +10[V]
53	AI2 [I]	[R] : 100 => 1[mA], 0 ~ 20[mA]

B

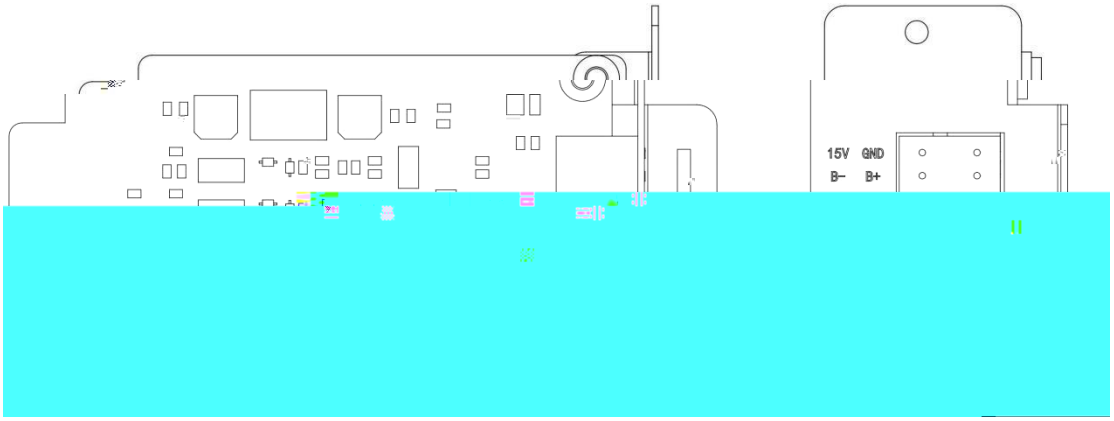
B1 PG

B1.1

1.1.1

PG PG01

1.1.2



B1.2

1.2.1

PG PG

+15V

1.2.2

PG 10

15V	GND
B-	B+
A-	A+
B1-	B1+
A1-	A1+

+15V GND A+ A- B+ B- A1+ A1- B1+ B1-

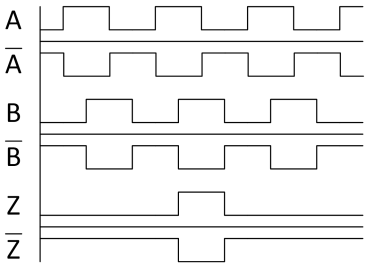
PE PE

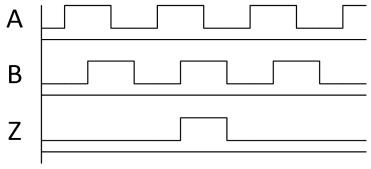
1.2.3

A B 1 2

90

1 2





A

B

Z N 0 GDHF-

APGX1

1.2.4

PG

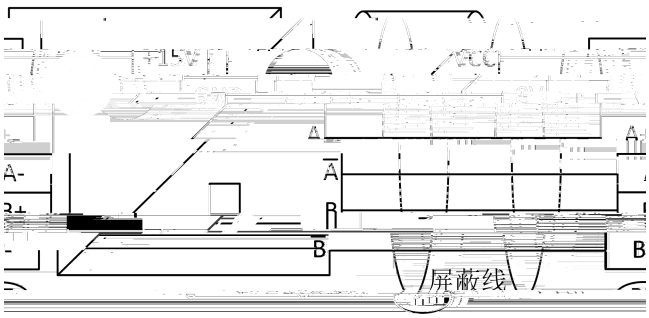
PG

PE

B1.3

PG

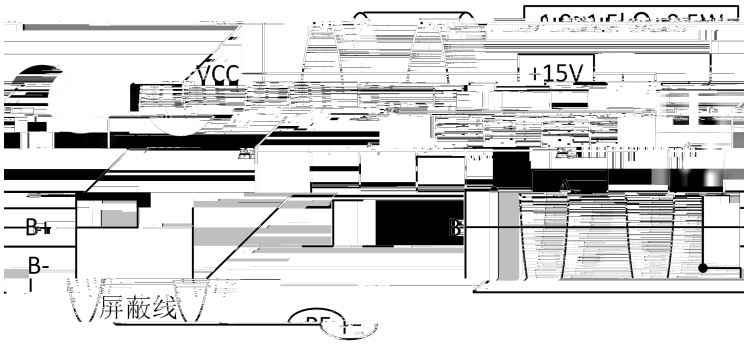
1.3.1



	HLE45-1024L-6F.AC
	RHI90N-ONAK1R61N-1024
	EC120P45-H6PR-1024

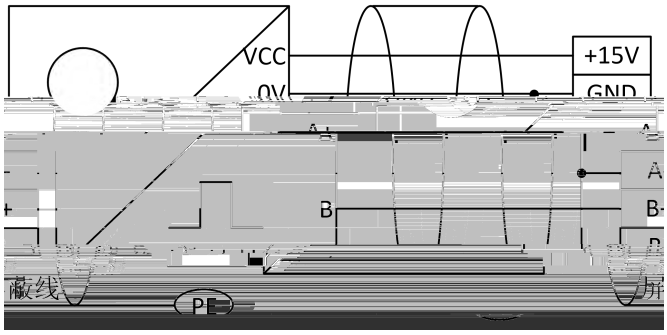
	HLE45-600L-3F.AC
	RVI78N-10CALA31N-1024
	EC120P45-P6PR-1024

1.3.2



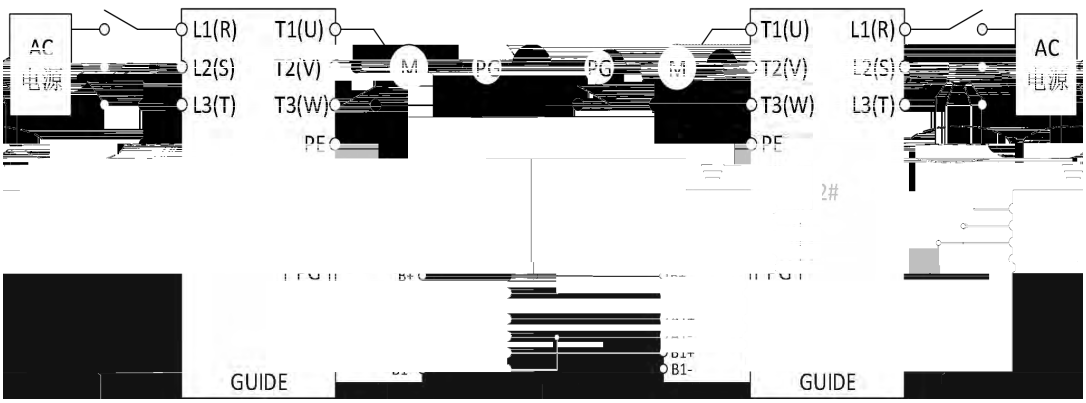
HLE45-1024L-30C.AC
EB38A6-C4PR-1024

1.3.3



	HLE45-600L-3R.AC
	EB50A8-N4PR-1024

1.3.4

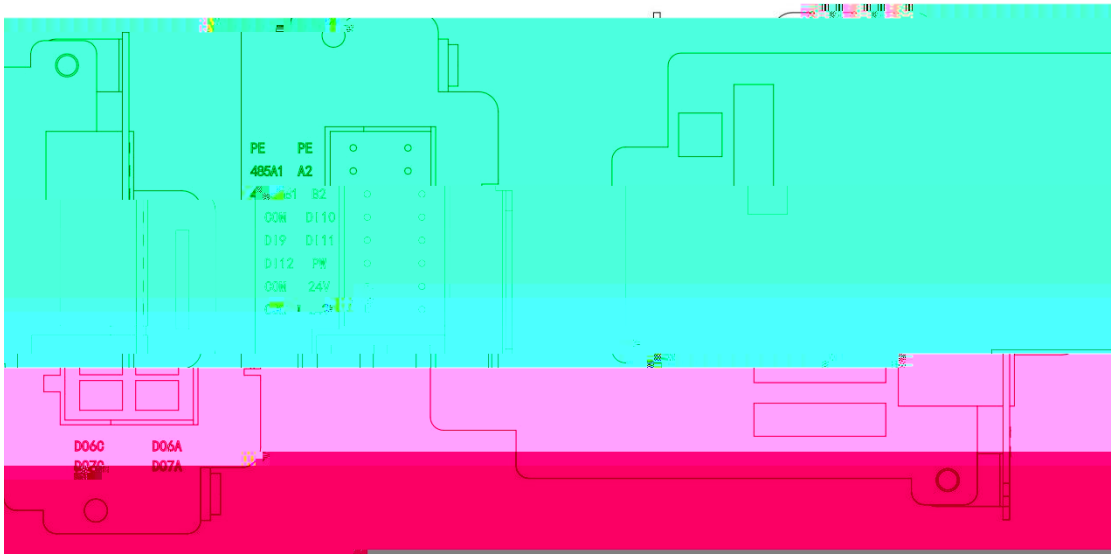


B2 IO

IO I001

IO HF681N IO 4

2 1 485



IO I001

PE	PE
485A1	A2
485B1	B2

COM	DI10
DI9	DI11
DI12	PW
COM	24V
COM	24V
DO6C	DO6A
DO7C	DO7A

B2.1

IO IO01 1 IO IO01

EMC IO IO01 IO

IO

B2.2 IO

IO

	24V	24VDC	24VDC 24V 24V
	COM	24VDC	24VDC
	PW		24V
	DI9-PW	9	1 2 3.3KΩ 9~30V
	DI10-PW	10	
	DI11-PW	11	
	DI12-PW	12	
	DO6A- DO6C	6	AC 250V,3AC,COS =0.4 DC 30V,1A
	DO7A-DO7C	8	

B2.3 I0

MODBUS J1 RS485 A2 B2

RS485 RS485

A2 B2 MODBUS

ON

Y xp ∃ ζ η

íX MODBUS ID

MODBUS

îX

MODBUS

ïX MODBUS

[1] RS485

B2.6 IO

I001

MODBUS 2

= ×

× 1	
× 10	1
× 100	2
× 1000	3

MODBUS		
1	1	× 1
1	0.1	× 10
1	0.01	× 100
1	0.001	× 1000

Hz ×10

49.9Hz I001 49.9 × 10 = 499

499 49.9Hz

B2.7 I0

MODBUS EIA/TIA 485-A

RS485 127 31 1

RS-485

RS485			
	LINE A	LINE B	
	135~165(3~20MHz)	100~130(f>100KHz)	Ω
	<30	<60	PF/m
	<110	--	Ω/Km
	>0.64	>0.53	mm
	>0.34	>0.22	mm^2
Kbit/s	<93.75	115.2	
LINE A ( )	1200	1000	
LINE B ( )	1200	600	

RS485

RS485

9.6kbit/s 14.4kbit/s 19.2kbit/s 38.4kbit/s 56kbit/s
57.6kbit/s 115.2kbit/s

MODBUS RTU

B

MB01 J25 MB01

MB01

- MB01
- MB01
-

EMC MB01

MB01 PE

A1	RS485_A1
B1	RS485_B1
PE	

MODBUS

MODBUS GND

WîXò	DK h^	€ìðòìì W^ €íðñðìì W^ €îðõîìì W^ €ïðôðìì W^ €ðñòìì W^ €ññóòìì W^ €òíðñîìì W^ €óíðôìì W^ €ôîðñòìì W^	ì ô	ï
WîXó	DK h^	€ìžî^îïî €íž^ðôñ	ì í	í

ðX MODBUS ID

MODBUS

ñX

MODBUS

òX MODBUS

[1]RS485

B3.5

MB01

MODBUS 2

= ×

Kbit/s	<93.75	115.2
LINE A ( )	1200	1000
LINE B ( )	1200	600

RS485

RS485

9.6kbit/s 14.4kbit/s 19.2kbit/s 38.4kbit/s 56kbit/s
57.6kbit/s 115.2kbit/s

MODBUS RTU