GUIDE

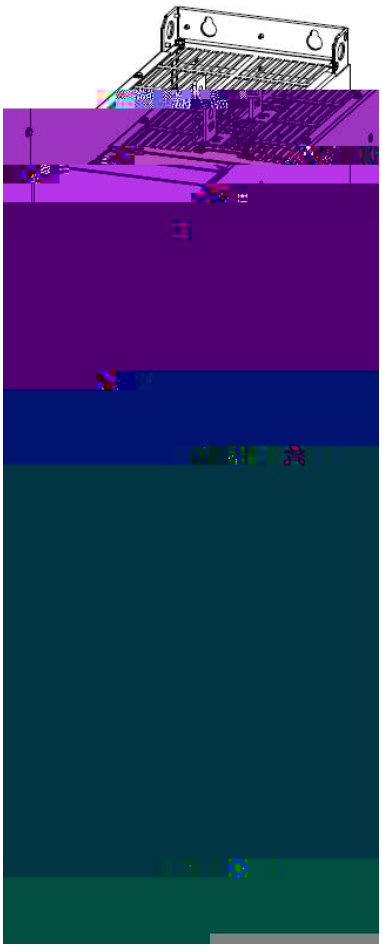
D¬ HF680N ↓

DC-DC ﺵﺒﺟ ﺝ ą й

' V1.00

м `Eˆ

Wuhan Guide Technology Co.,Ltd.





ĭ h DC-DC

1. ŋ Ԋ
   1.1 ˜
   1.2 ˚
   1.3 Ԋ
2.
   2.1
   2.2 w˙
   2.3 Ð
   2.4 ǐ h DC-DC ǐ ˚ ˚ ę Ũ ė
3. ˚ ę Ḥ
   3.1 ˜ Ь
   3.2 ˚ ę
   3.3 Ð
   3.4 [illegible]
4. Ь 0ó(ñ …%” PÐ
   4.1 DQ-DC Ð˚ ę à Ũ ǐ
   4.2 [illegible] í4ïm ñ Y
   4.3˚ ę Φ Φ

11. Ь Ḡ Ī

11.1 Ḡ Ī ¿

11.2

11.3

11.4 Ð

11.5 Ь Ḡ ќ

Hu

1˜ Ḡ

ضي Ţ Ψ Ḡ ضر ر ˘ ą Ḡ ˆ RCD˜

ڜ RCM˜˘ ą Í ڈ Ḡ ˆ RCD˜

ڜˆ RCM˜ Â

ضي ῡ ت B مقم Ḡ ڜˆ RCD˜ ˘ ضي Ḡ ڜˆ RCD˜

Ω˗ غ ˆ ₣ غ ضر ˘ Í L

₣ RCD˘ ▼ φ RCD Â

2˜ ۱ ۷ ۲ ą

ضي ﻱ Ţ ¨Ḥ ƀ ۱ مخ ң ą ° ج˘ ° ج ṗ شخ Â

˘ ą ٦ ۱ ۱ Í ۱ U ˜ ∫ Ĭ h DC-DC Í ڜ Â

1.2 ﻣﺨ

(1) ﺞ ǐ h - ǐ ﺝ G ǐ h ﺒ ﻲﺸ Â

(2) ﻎ ǐ h DC-DC ǐ ﺝ ﻢ ﺞ ﻤ ﺒ H` ^ à ﺒ L

à à ŋ ǐ ɲ ~ ˘ ˘

2.4 ĭ h DC-DC ĭ ڪ ج Ũ غ

ƿ ۔

1. ... ¬ 2 ض ĭ h DC-DC ĭ ک ک ƀ / ⁘ ƀ ƀ ĭ ƿ Ŀ Ţ ˇ ˘
˜ Ψ H¯ ¬ H °° Â7 ض à à ę
ĭ ... F ʒ¬ 2 ˜Ḥ ض / ⁘ ƀ Â
2. ˜ 7 ˜Ḥ

ﻉ ﺡ ﺍ ﻉ ﻁ Â

2.4.2

ﻣﻣ ﺽ ﺭ˘ ﻑ ﺭ Â

ﯗ ˘ G 95%RH˘ Ь¨Ң o ˘ Â

Ⓟ˜ ﺽ ﺭ;'; Â

ﯗ Â

à r غ r Â

à à ï Â

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ﻁ G 1000 ˘ Â 1000 ﺵ ˘ ﻫ 100

ﻁ 1% ˘ ﻁ ﻉ ï ₣ Â 3000 h ﻥ

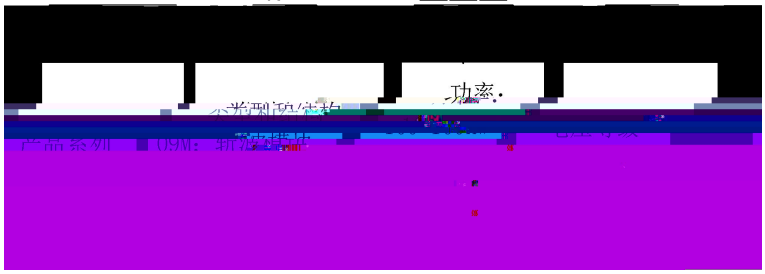
ﻣ Â

' ﺵ ,˘ ذ ą ث Â

3. ﾟﾟ ج Ḥ

3.1 ﻡ ﺏ

HF680N 09F __ □□□ __ 4

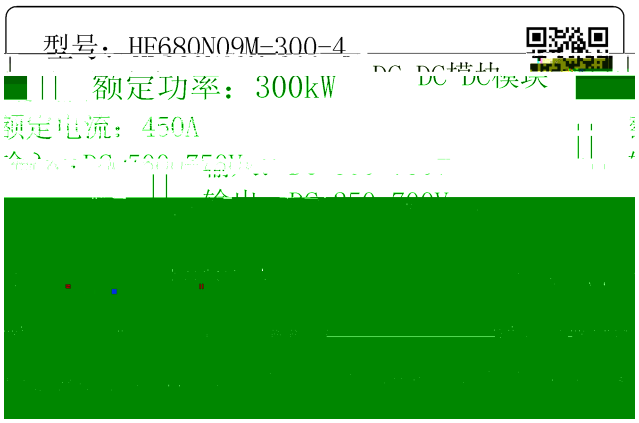


3.1.1 ﾟﾟ ج ﻡ ث O

A	ﾟﾟ ج ↓' 680N ↓
B	ﾟﾟ ج ﻡ' 09M' DC-DC ﺵ 09F' DC-DC Ð
C	W' ' 3 β
D	ﺍ ' ﺍ ﻫ 400V

3-1' ﾟﾟ ج ﻡ

3.1.2 ﾟﾟ ج



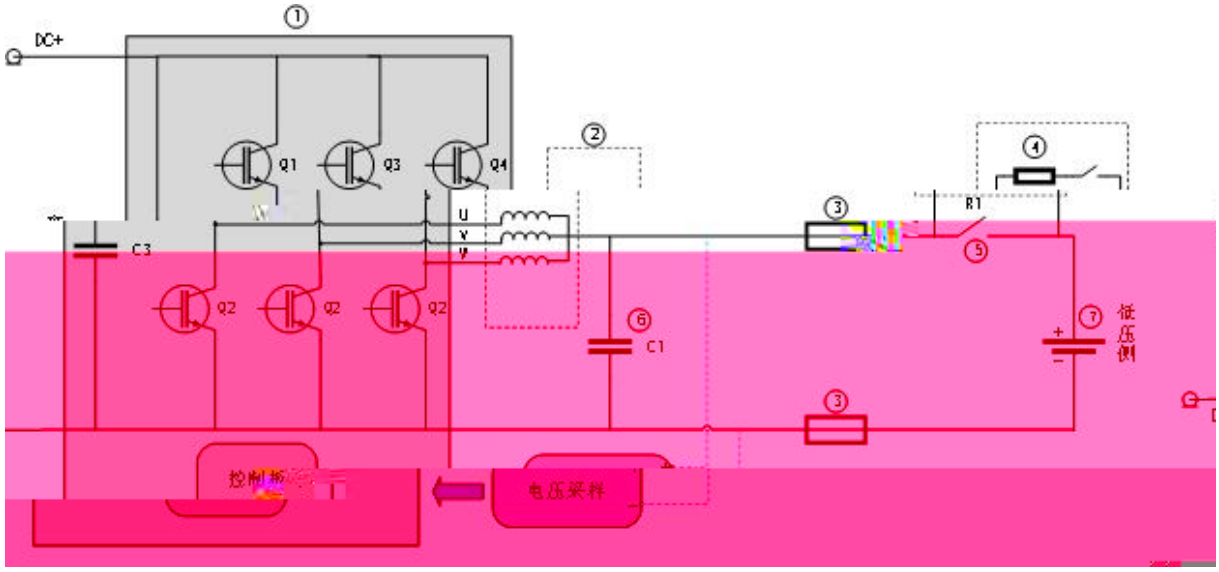
3.1.3 DC-DC Ð ﻡ ﺁ

DC-DC Ð ﻡ	ﺵ C	ﺍ υ VDC ^ V	υ (A)	W (kW)	ﺍ υ VDC(V)
HF680N09F-100-4	HF680N09M-100-4	250-700	150	100	500-750
HF680N09F-200-4	HF680N09M-200-4	250-700	300	200	500-750
HF680N09F-265-4	HF680N09M-265-4	250-700	400	265	500-750
HF680N09F-300-4	HF680N09M-300-4	250-700	450	300	500-750
HF680N09F-400-4	HF680N09M-400-4	250-700	600	400	500-750

ʊ ﺝ ﺭ ﺍ ʊ Â

3.3.2

HF680N09F ↓ DC-DC Ð ЙĮ'



ﺭ 1-2 HF680N09F DC-DC Ð ﺭ

˜	W			
1	HF680N09M W ﺷﺠ	1		
2	ﺝ	3		
3	ﻴ ﺍ ʊ ﺝ	-	Ꮋ	G Ḡ
4	˜Ḥ	1		ч ... ʟ ˜Ḥ
5	₣ h ﺝ	-		˜ ₣ h ﺝ
6	ﺝ	-		
7		-	Ꮋ	˘ ˜ à

' ˘ Ð DC-DC ﺍ˜ ˘ ˘ ˜ ă ⁘ Ţ
ᵛ W Â
ᵽ Ľ Ŀ ﺝ Ð ч ₣ ﺍ ﺍ ' Ľ Ŀ ﺝ Ð ﺽ ' ЙĮ ˘ Ь
‰ ﺝ Ŭ ˘ ˜ ﺍ Â Ľ Ꮋ Ŀ ﺝ Ð ﺽ ' ЙĮ ˘ ...
ﺝ Ð Â
ᵽ G ˘ ﺷﺠ ˜ ﺍ G ₣ ﺍ˘ ϒ Ꮋ
˜ ч ﺍ ʊ˘ ₣ ч ﻴ ﺍ ʊ Â ɾ ˜ ﺍ ʊ h ₣ ﻴ ﺍ ʊ ч h˘ ϒ
˘ ɾ ₣ ﻴ ﺍ ʊ h ˜ ﺍ ʊ ч h˘ ϒ Â

3.3.3 Ĩ ﻓﻤ D⌐

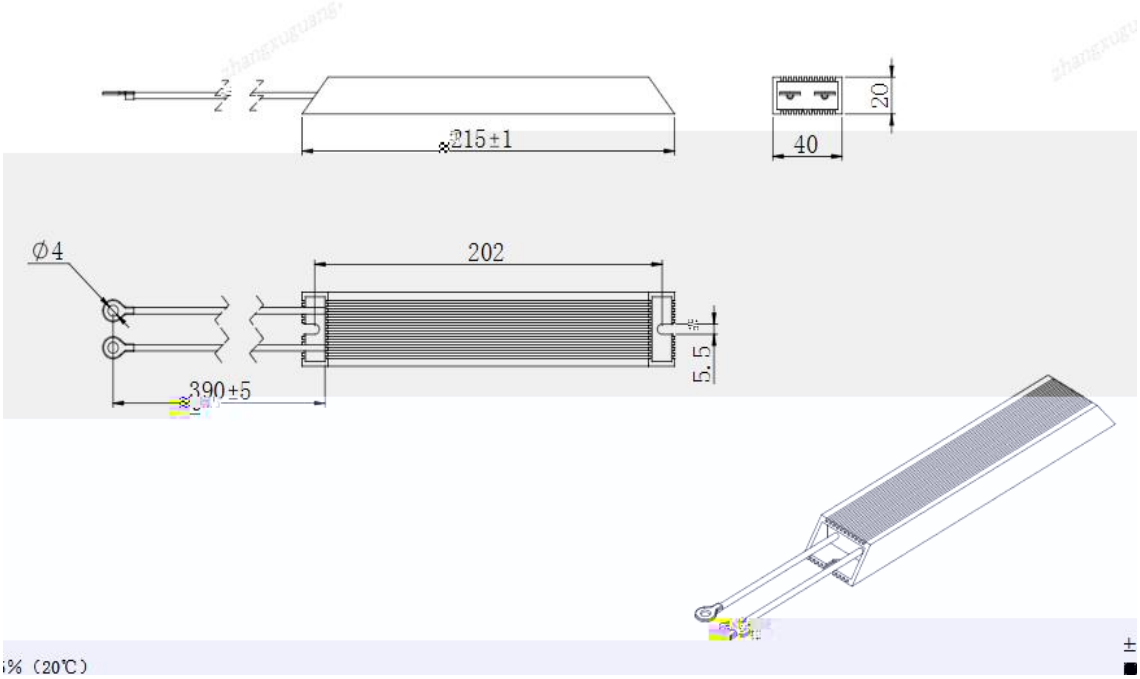
DC
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AC
~
DC
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AC
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DC
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AC
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DC
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AC
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DC
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DC
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M

3.4 ﻡﻤﻗ Ь

4.2.1 ﺞﺸﺠ Ь ﻡﻤﻗ

DC-DC ﺩ ﺞﺸﺠ C ∓ ا ﺩ

3.4.4 ll Ð ممم آ



DC-DC Ð ll Ð ممم Ɔ ك Ð

w

HF680N09F-100-4 GDHF680NHC-100-800

4. Ь

4.1 DC-DC Ð ç à Ũ ĭ

Ũ

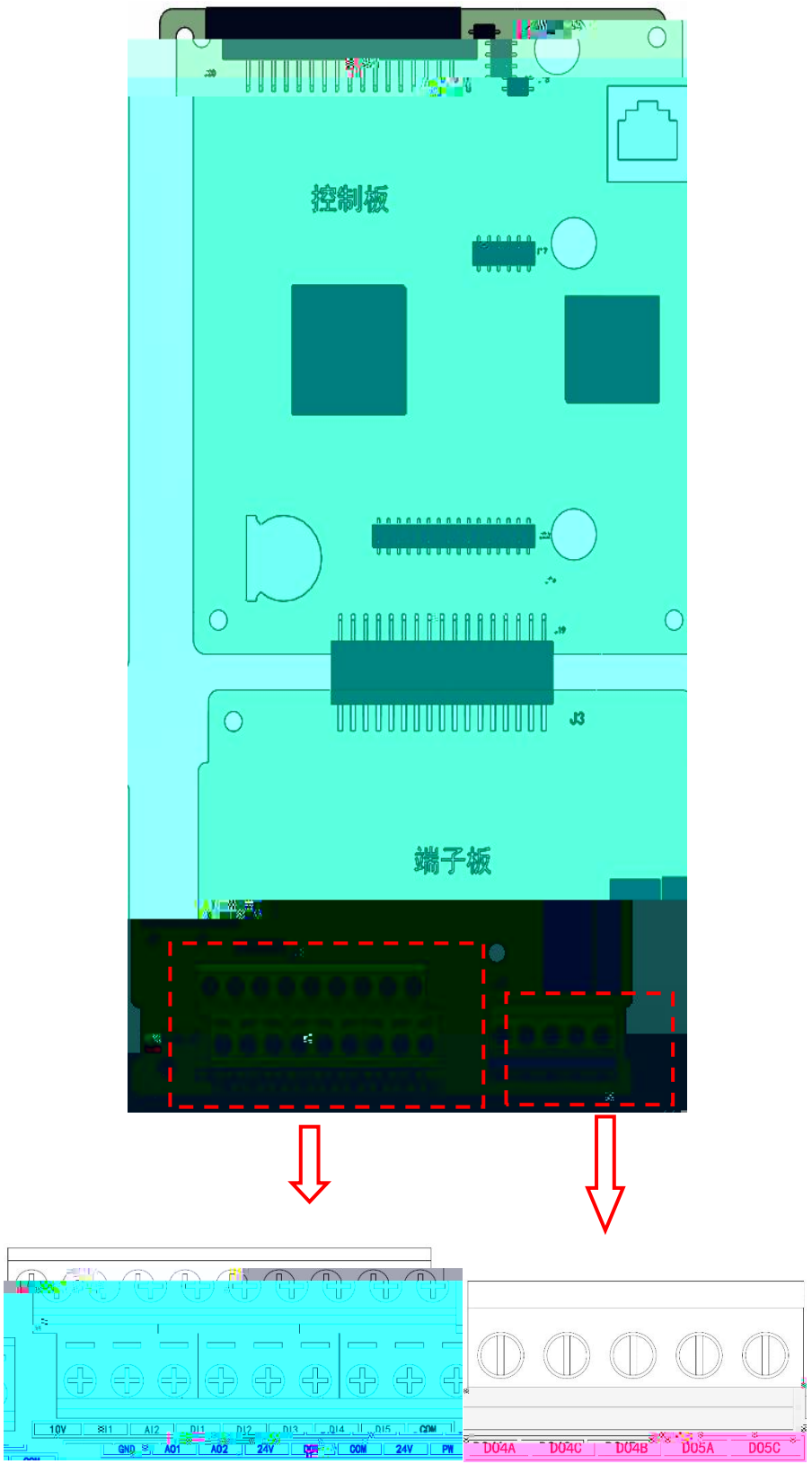
	10cm à 5cm	Ũ à	à à
	-10Ņ +40Ņ	-20Ņ +60Ņ	-20Ņ +60Ņ
	70 106 kPa	70 106 kPa	60 106 kPa
	0.7 1.05	0.7 1.05	0.6 1.05
	10Hz Ů f Ů 57Hz 57Hz Ů f Ů 67Hz	0.075mm	

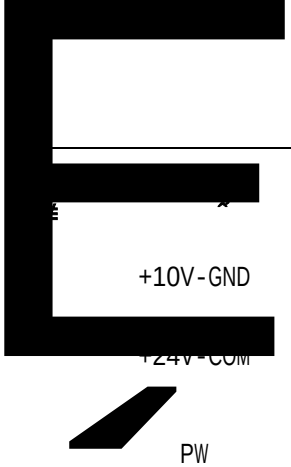
4.2.2 h ⁄

˘ ÈÊ

4.2.4 L

L Й Â


控制板
J3
端子板
10V
AI1
AI2
DI1
DI2
DI3
DI4
DI5
COM
GND
AO1
AO2
24V
DO
COM
24V
PW
DO4A
DO4C
DO4B
DO5A
DO5C

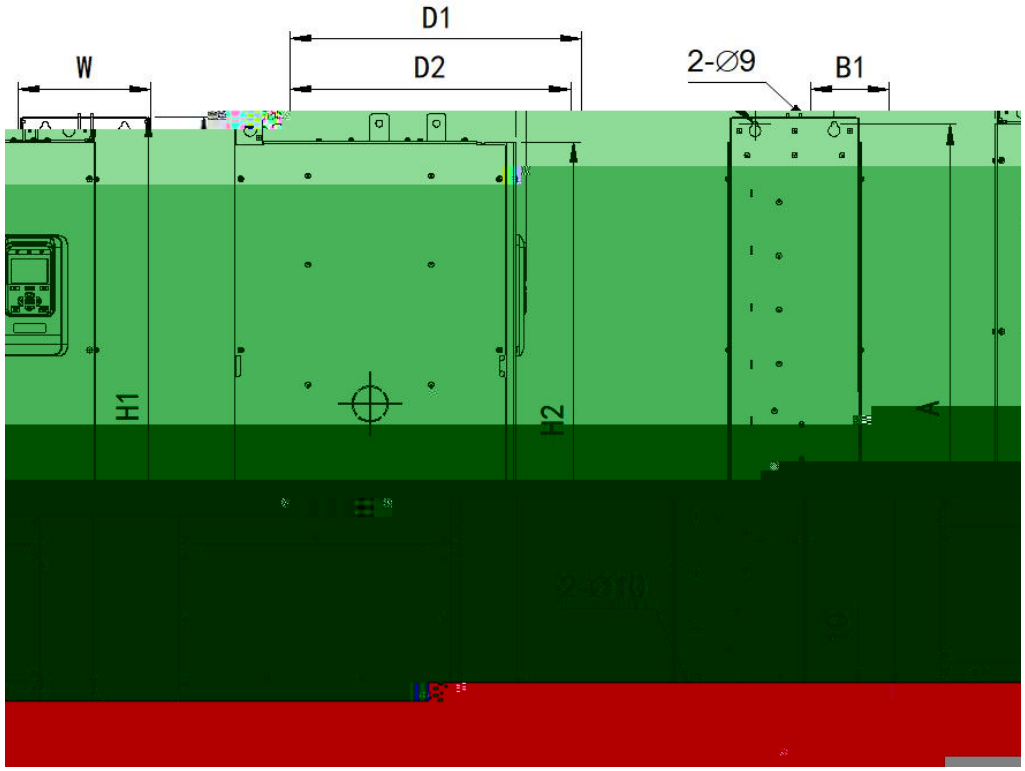


	O	w
+10V-GND	— 10V	h ᴸ +10V ˇ Ŧ ' 50mA Â ŵ ƀ ᵝ ᶊ ƀ ˇ ᵝ ᶊ ỵ ﻍ' 1kß -5kß
+24V-COM	— 24V	h ᴸ +24V ˇ ŵ ƀ ~ Ŧ ƀ ė ᴰ ᶊ Ŧ ' 200mA
PW	~	Ŧ ᴻ Ь¯ 24V ≠ Ḥ˚ ¬ DI1~DI5 àDO1 ˇ PW Ь ˇ ᵻ Ь¯ 24V

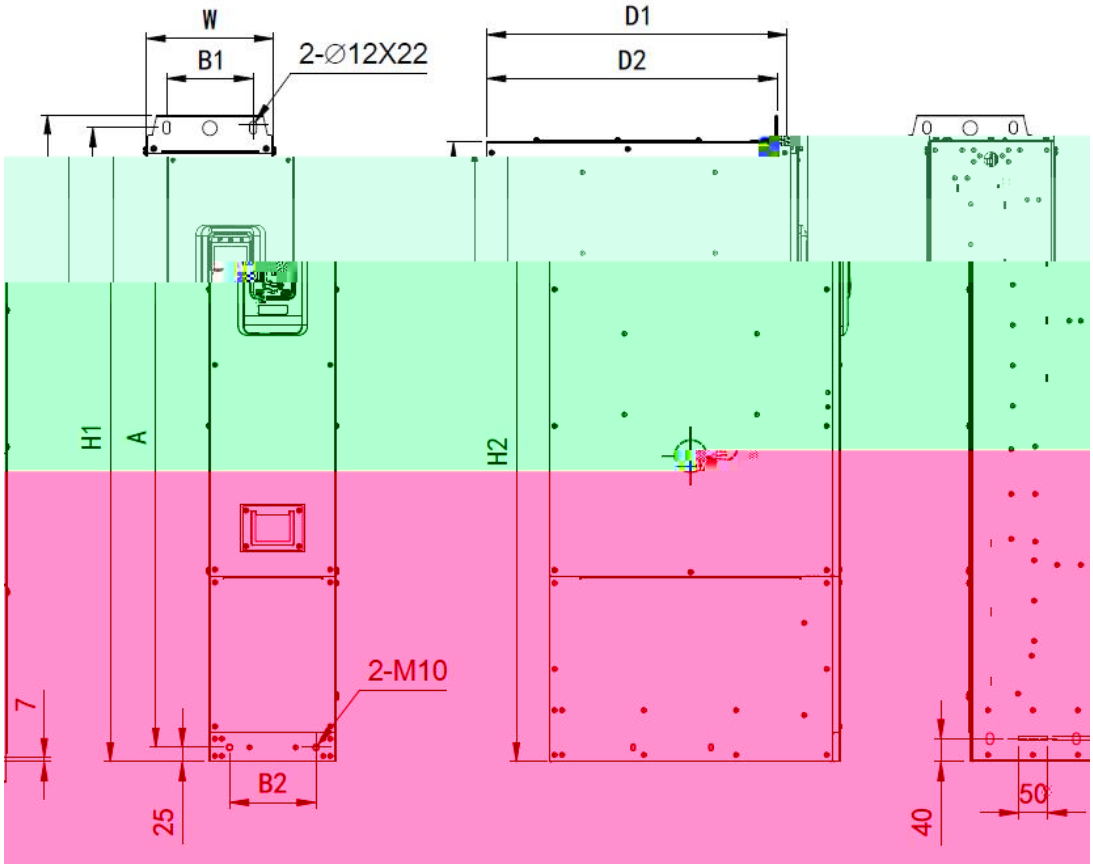
≠ ˝ O w˙

DC+24V

4.3 ج



B4 قمم يد



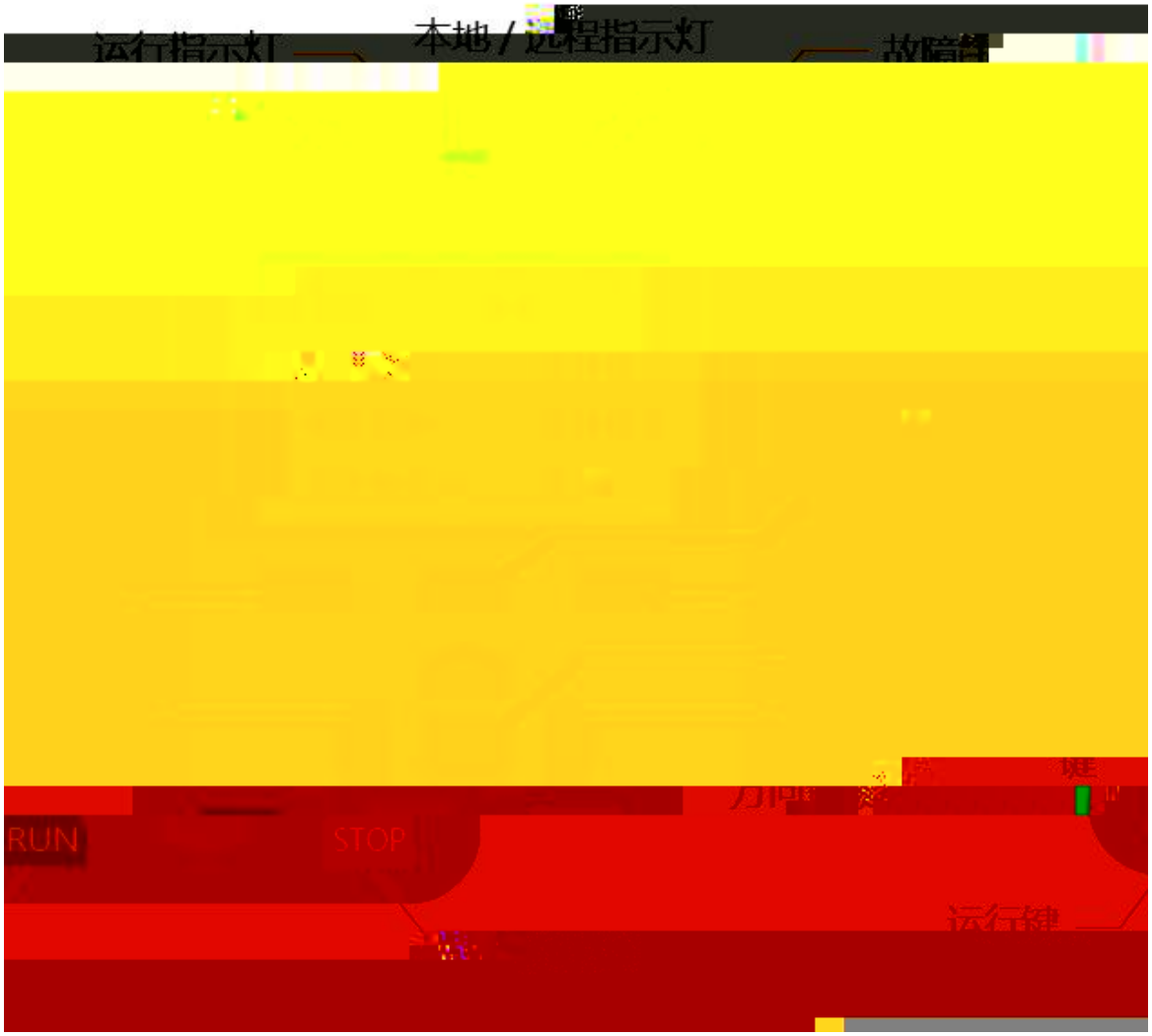
B5

HF680N09M-100-4	B4	920	880	210	462	444	899	125	150	4-M8	55
HF680N09M-200-4											
HF680N09M-265-4											
HF680N09M-300-4											
HF680N09M-400-4	B5	1122	1075	221	522	505	1075	150	150	4-M10	80

5. ƀ

5.1 ƀ

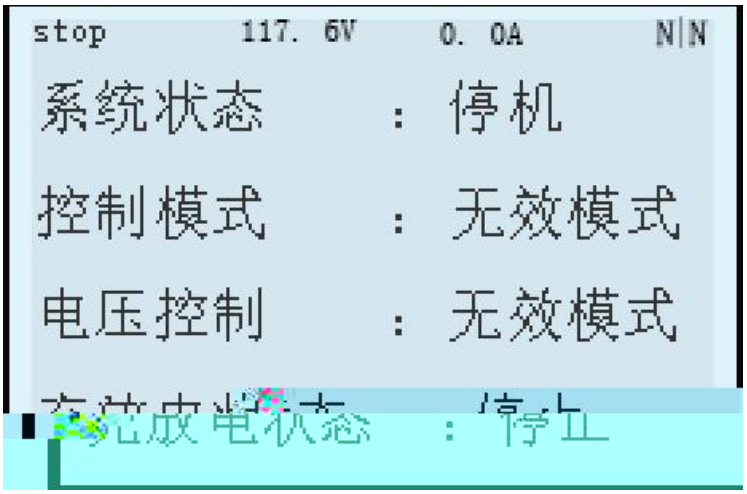
HF680N09M ǐ h DC-DC ǐ ƍ ƀ ˆ ƺ ч ƀ ƍ˜ Ǘ ƶ Â´ Ơ F1 à LOCAL/REMOTE à F2 à RUN à STOP à ; Ǘ à /RESET à ˚ ɛ ENTER ˘ ˆ ≠ ˈ DC-DC ǐ ƍ ǎ ˘ ˘ L ɛ Å Â



5.2 ƀ

ỵ h ɬ ɇ Ӣ β ɬ Â ɛ; β ɬ ⌠ Ӣ β ɬ˘ ɳ Ӣ
Â ɾ Ӣ β ɬ ɜ ∫; β ɬ˘ ǵ; Â3 ɣ ; Ӣ ɐ ⋮ ỵ˘
ỵ ɦ U˘ ENTER Â ǟ ą ˗ β Â
ƀ D˗ ° ҷ ˘ ą RUN ɇ STOP Ω˗ ɇ Å DCDC ѽ ǟ
ғ Ⓟ ⌠ ض ~ ˘ LOCAL/REMOTE Ⓟ ض/ Â

5.3 Δ



Δ Ţ˘ ´ Ơ ľ Ŀ ɇ ľ o Ŀ˘ 2 ѡ w Ч Â
' ш ê ˜Ḥ Ì à ê ɻ Ì à ê ∓ Ì à ê ҏ| Ì

w

˜Ḥ stop Å ~ à charge ˜Ḥ ~ à
Discharge ~;

ɻ ɻ˘ ɻ β :V

∓ ╠ ∓ ˘ ɻ β' A

ҏ

ҏ|

ο ' ₩ 4 ₡ ˘ ⁚⁚ Й ¬ ˘ ɣ Ь □ ₫ '

ﻀ Δ Й˘ Й ENTER ˆ ɣ Ґ ɻ [%] Ŀ Â Й F1/F2 ₹ Δ

˘ ~ h ɻ Â

5.4 ê h ɻ Ì

ê h ɻ Ì Ţ˘ ´ Ƈ Ţ Ɣ ɻ˘ №≠ ~ Ɣ w ƀ Â

h ɻ

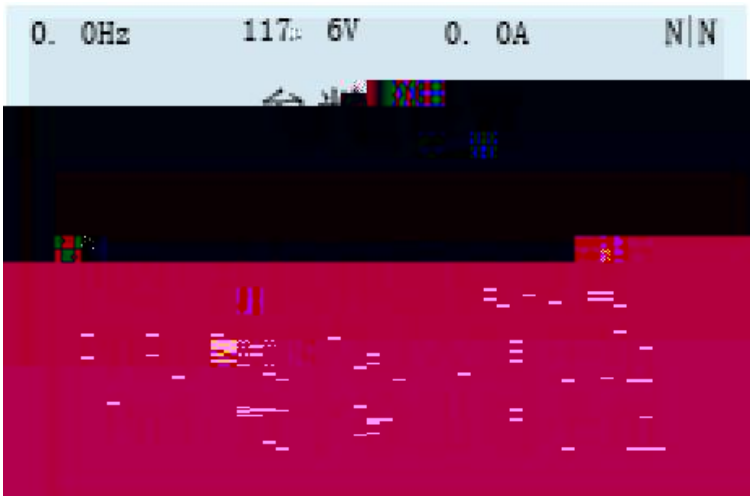
ɻ ˆ	ɻ	w
1	Reference Set ₫ ₫ ẏ	₫ ₫ ẏ
2	Parameter Edit ₫	₫ /
3	Current Error ╠	╠ Ḥ
4	Current Warning ╠ ᵽ	╠ ᵽ Ḥ
5	Error Event Log Ḡ	ɻ˘ r A

7 Option Set ẅ ė ẅ Ḥ

8

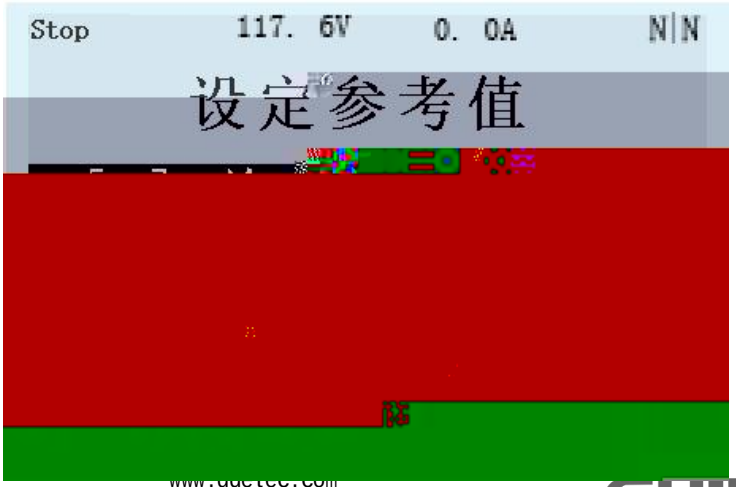
5	Version ˆ	L ϕ Ð ˆ Ė ƀ ϕ Ð ˆ
6	Disp Work Time	

5.4.2ê ǎ Ì ٧



ǎ
ˆ Parameter Setting˜
˜ ٧˘ ĸ ° ج ٧ ǎ Â

5.4.3ê ǎ ٧ Ì ٧



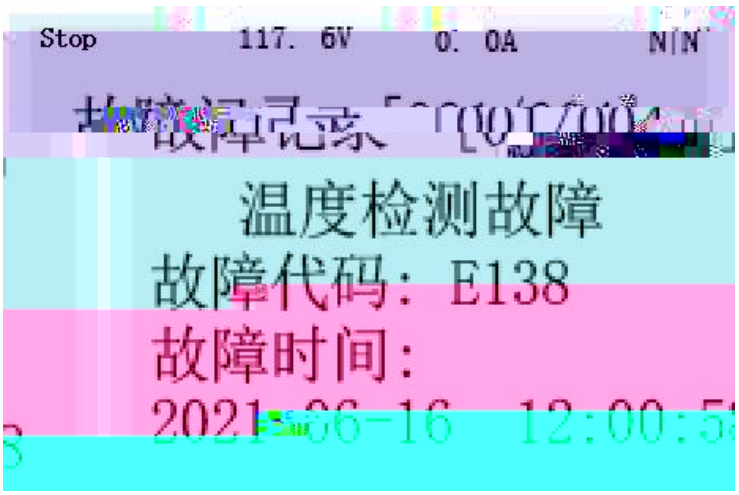
ắ ṿ̂ Reference Set˜
ᵴᵴ ᶜ ↳ ṿ Â

´ ↄ ↳ ˜ w Â

˜	↳	w
1	Parameter Initialization ă Δ .	ă Δ . ч Δ ụ Â
2	Delete Fault	
3	System Restart β 3 ⋇ↄ ↄ	L β˘ G
4	Backup Para Pad ă м ⌠	ضي ă м
5	Restore Para Pad ă ⌠ DSP	∕ ң ╠ м ă
6	Compare Para Pad ṗ ă	ă ė м ă ˘ U ↓ ∓ ḱ ă ^ м ă ч Δ . U ∓ ∧ ụ ˘ ∓ ă ĵн ∓ ∧ ụ ĩ ă ~
7	Admin Password	ă Δ . ч Δ ụ Â

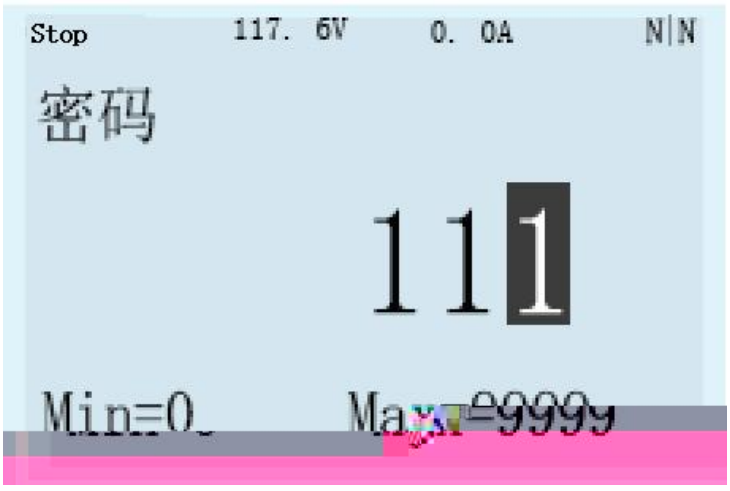
Ì Enter Ł ˆ γ ˜ ќ ă Â ' ă ₩ Ψ ă
˘ ғ м ў˘ Þ ˘ Ł

5.4.5ê Ì ϒ



ˆ Fault Record˜
˘ ˆ γ Ηυ Đ Ḥ Â Đ ρ ˘ ˆ γ
Ηυ Đ Ḥ ˘ ´ ˘ ˘ ˘ Ű Ỵ
Â

5.4.6ê ŋ Ì ϒ



ŋ ˆ Access Permissions˜
ϒ Ţ ˆ ą à ă ≠

6. :

6.1. ƀ

DCDC ƀ ا à à w ̃ w P09.03 ò └ Ô DCDC
ج ƀ ض ا ˘ w

1. DCDC ج ~ ʊ ң ч ا ʊ˘ ₮ ч ʊ
2. DCDC ƀ ض ˘ w Й ˘ w ɒ h˘ à w ɒ ч
˘ ج ˜Ң , ˘ w ɒ ч ע ˘ ج ,

6.1.1 ا

DCDC ج̃ γ ƀ ض ا ˘ ج ʊ ا ا ʊ ا └ ч ا ע˘ ض w
ж ң ṕ̃ γ ч U ˪̃ ا Â ا ̃ γ № ч ˜Ң , ˘
˩ Â

˜Ң

ض P9.03ò └ Ô ч [1] ا ╠ Й˘ P9.04ò ا └ Ô ч [1]˜Ң ,
DCDC ج̃ ע ا ʊ ا └ض ا ע , ɾ ʊ˜Ң Â

ا , ,w ɢ ע ˘ ע Ь ₩ ˘

ă Ь □˘ Ї ɾ : ă 8 ľ v Ŀ Â

ض P9.03ò └ Ô ч [1] ا ╠ Й˘ P9.04ò ا └ Ô ч [2] ,
DCDC ج̃ ا ʊ ا └ض ا ע , ʊ ɢ ا ʊ ˜Ң ,

ا , ,w ɢ ע ˘ ע Ь ₩ ˘

ă Ь □˘ Ї ɾ : ă 8 ľ v Ŀ Â

˩

ض P9.03 ò └ Ô ч 1 ò ا Ô ╠ Й˘ P9.04 ò ا └ Ô ч 3 ò ˩
Ô, DCDC ج ا ʊ ا └ض ا ע , ʊ ˩ ˜Ң Â
ا ʊ ا ע ɢ ע ˘ , ا ʊ ا ɢ ע ˘ ˜Ң ,

ا , ,w ɢ ע ˘ ע Ь ₩ ˘

ă Ь □˘ Ї ɾ : ă 8 ľ v Ŀ Â

P9v03ὸ₮ ч└ Ô ч 2ὸ Ô˘ DCDC ﻍﺸ ₮ ч Â ˆ 8.2.2

[ľ Ł·](#) ˘ ч ˘ DCDC ﻍﺸ ʊ ˜Ḥ ˘ ▯ ﺍ

ʊ ’ ч ˘ DCDC ﻍﺸ ʊ ˘ ▯ ﺍ ʊ ˜Ḥ

ʻ

ʊ G˜Ḥ ˘ ₣ ʊ ﺍ G P09.40ὸ ʊ ﺍ └Ô ˘ DCDC ﻍﺸΨ
˩ ₮ ˘ └˜Ḥ ˘ Ḡ ʊ ﺍЪ P09.40 ỵ

ʊ G ˘ ₣ ʊ ﺍʏ G P09.39ὸ ʊ ﺍ └Ô ˘ DCDC ﻍﺸΨ
˩ ₮ ˘ └ ˘ Ḡ ʊ ﺍЪʏ G P09.39 ỵ

6.1.3 w

w ₮
DCDC ﻍﺸˆ ₮ ˆ ʏ ﺍ ʊ ~ └ ч ỵ˘ ﺽ w ﺥ ӈ ṗˆ ɣ ч U
˩ˆ w Â

P9.03ὸ └ Ô ч v03Ŏ

ㄱㅎ ㄱㅕ. U2

‰ È йў' $K = \frac{1}{2}$

ќ ㄱㅎ ㄱ ‰ ' P01.0 = K

6.2.2 ㅎ ㄱ ‰

ㅎ ㄱㅕ. U1

ㅎ ㄱㅕ. U2

‰ È йў' $K = \frac{1}{2}$

ќ ㅎ ㄱ ‰ ' P01.22 = K

6.2.3 ‰

A ㄱㅕ. Ia1

A ㄱㅕ. Ia2

‰ È йў' $Ka = \frac{1}{2}$

ќ ㅎ ㄱ ‰ ' P01.2 = Ka

B ㄱㅕ. Ib1

B ㄱㅕ. Ib2

‰ È йў' $Kb = \frac{1}{2}$

ќ ㅎ ㄱ ‰ ' P01.3 = Kb

B ㄱㅕ. Ic1

B ㄱㅕ. Ic2

‰ È йў' $Kc = \frac{1}{2}$

ḱ ʊ ㄱ ‰ ' P01.4 = Kc

6.3.Ḡ

DCDC ⱳ ᴸ Ḡ ˇ ғ Ḡ ˆ ą Ь ' ₣ ˇ DCDC ⱳΨ Å
ˇ ғΨ℗ h ᶎ ɣ Ḡ ŋ Â

6.3.1 ㄱʊ ˇ ㄱḠ

w	O		
P7.00	ㄱʊ ㄱ ẏ	400V ㄱʊ ㄱ ㄱ	**[800V]**
P7.01	ㄱʊ ㄱ ẏ		

6.3.6 h ศ(ศ) ∞

w	O	
P7.18	h ศ(ศ) ∞	h ศ(ศ) ∞ [2.0s]

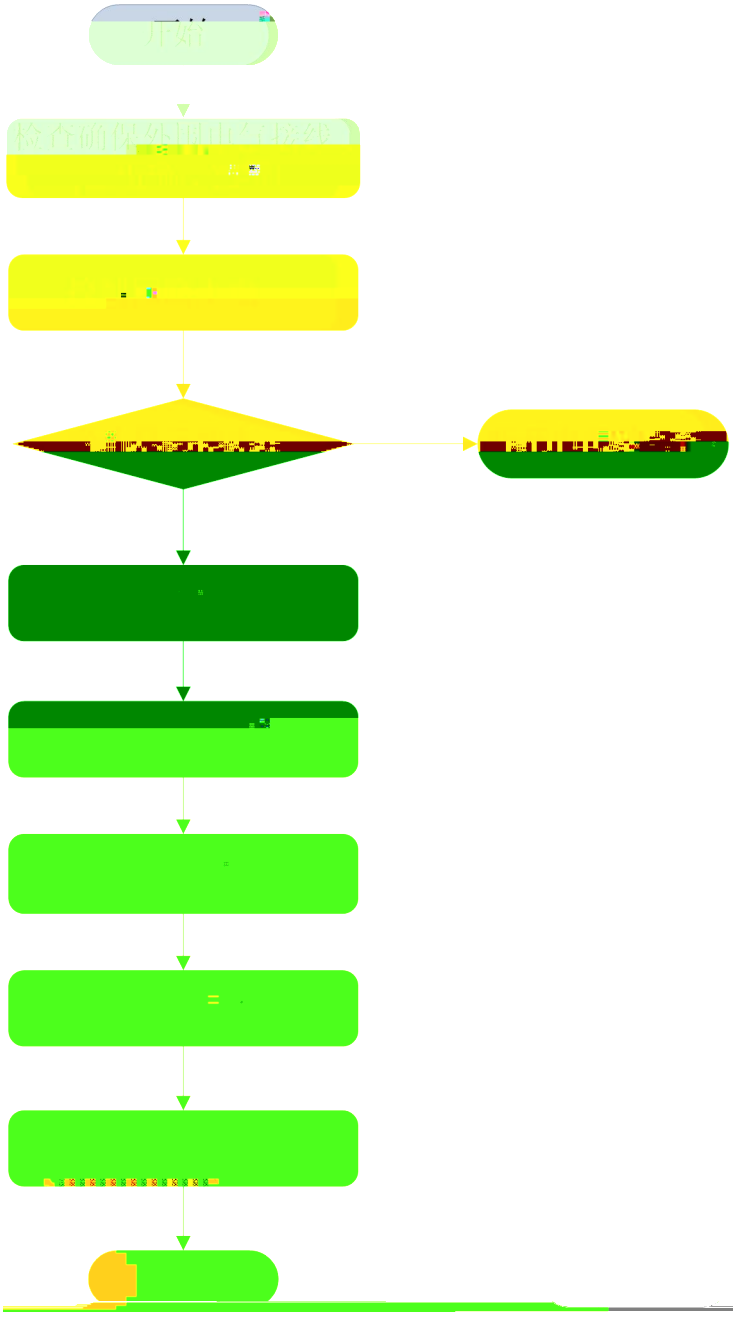
6.3.7 Ḡ ą

w	O	
P7.21	۱ ט ۱Ḡ ą	[0] [1] ą
P7.23	۲ ۱ ט ۱Ḡ ą	[0] [1] ą
P7.24	Ḡ ą	[0] [1] ą
P7.25	Ḡ ą	[0] [1] ą
P7.26	h ศ Ḍ	[0] [1] ą
P7.27	h ศ	[0] [1] ą
P7.28	ศ Ḍ	[0] [1] ą
P7.29	ศ	[0] [1] ą

7. ㅓ

h : ᵒᵒ ᴇ ˘ ˊ ˩ ᶄ ⁛ à ɇ

ЙҸ ᵡ ˈ



7.1. ъо

└ ⁛ ╠˘ ⊢ ⁛ ╠‰ ƀ ˫

7.2. ₹ ∧

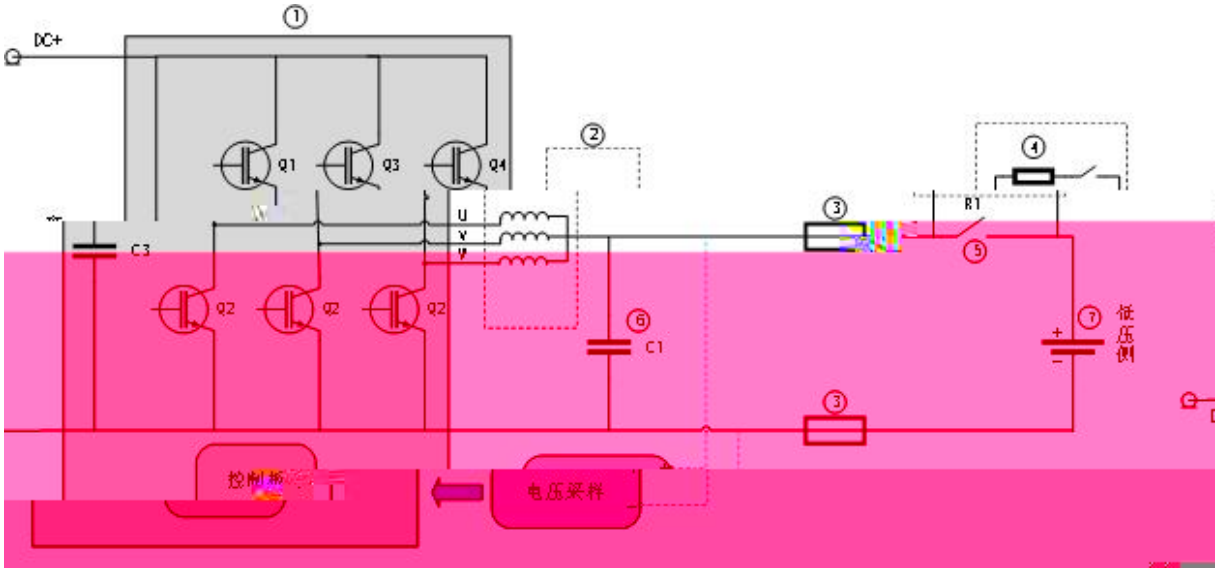
└ъ⁛ U˘ ѽ ₹ ∧ ν Â ΐ ᵣ ƀ ǟ Ґ5.4.4 ê w Ì Ł

, ǟ Δ ˫ U, Ψ ~ Ω

7.3.2 ǎ

ɢ DCDC ˘ ą ,˘ Ḥ Â

w̄ ' Й Ь Â



7.4. ǎ

7.4.1 ƀ

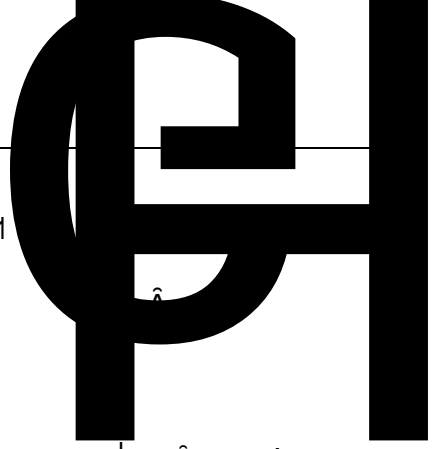
L ч ⁄ Ţ ˜Ḥ à˜ w P09.03 ò L Ô ɛ

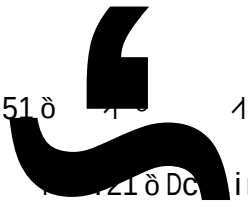
P09.04

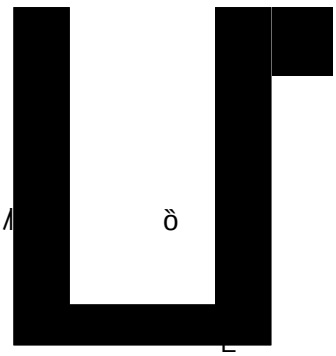
ò ⁄ L Ô Ь ƀ

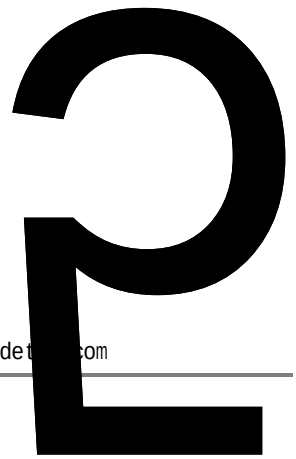
L ˆ P09.03˜ ⁄ L ˆ P09.04˜

⁄ ˆ ˜Ḥ ˜









ψ ⁻ ˜Ң ˇ Ḡ ʊ ㄱ Ь ψ P09.40 Â ʊ ㄱ

P09.40 ˇ ˜Ң ч 0

2. ʊ ㄱ Lˈ ㄱ Ӣ P09.39ð ʊ ㄱ L Ô ˇ DCDC

ψ ⁻ ˇ Ḡ ʊ ㄱ Ь ψ ʏ ɢ P09.39 Â ʊ ㄱ

ʏ ɢ P09.30 ˇ ч 0

3. ㄱ ʊ ㄱ Lˈ ㄱ Ӣ ㄱ ẏˇ ضي Ӣ L ƀ

ˆ

ẇ Ḡ ˜

4. ㄱ ʊ ㄱ Lˈ ㄱ Ӣ ㄱ ẏˇ ضي Ӣ L ƀ ˆ ẇ

Ḡ ˜

ˈ ʊ ㄱ L , ㄱ ʊ ㄱ L ẏ ч ㄱ

Ӣ ㄱ ẏ Â

7.4.4 h ⸮ ă̋

h ⸮ ˜ ă̋ Ӣ ˈ

ẇ	O	ẏ	
P3.03	˜ 4	10 [h ⸮]	h ⸮ ǐ Ң̊
P3.04	˜ 5	9 [⸮]	⸮ ǐ Ң̊
P4.03	₹ 4	8 [h ⸮ Ң̊]	h ⸮ ₹ Ң̊
P4.04	₹ 5	7 [⸮]	⸮ ₹ Ң̊
P8.16	h ⸮ ˜	1.0	-
P8.17	h ⸮ Ꝑ	2.5	-
P7.17	h ⸮ Ꝑ ∞	5.0	-
P7.18	h ⸮ ∞	2.0	-

		]	
P9.03	L	1 [⁄]	-
P9.04	⁄ L	1 [ˇH]	-
P33.0	ProfiNet ą	0' 1' ą	ч1ą
P33.21	~ [W4]	1 [L 0]	L Й,
P33.23	~ [W5]	18 [⁄V]	⁄

L Й, '

β	1	0	
Bit0		Å	⁄ Ω˘ ˇ Ḡ
Bit1	Ḡ	Ḡ	-
Bit2	Ḡ	Ḡ	-
Bit3	β		-
Bit4			⁄ ˇ Ḡ
Bit5	ϼ		ϼ ⁄ ˇ Ḡ
Bit6	L .A		L .A
Bit7	L .B		L .B
Bit8	⁄ L .A		⁄ L .A
Bit9	⁄ L .B		⁄ L .B
Bit10	Ḡ	Ḡ	-
Bit11	Ḡ	Ḡ	-
Bit12	Ḡ	Ḡ	-
Bit13	Ḡ	Ḡ	-
Bit14	Ḡ	Ḡ	-
Bit15	Ḡ	Ḡ	-

Й, '

β	1	0	
Bit0	‰		-
Bit1			-
Bit2			-
Bit3	ϼ		-
Bit4-5	ˇH		00' Å 01' ˇH 10'
Bit6-7	L		00' 01' ⁄ L 10' L 11' w L
Bit8-9	⁄ L		00' 01' ˇH 10' 11' ¬
Bit10	Ḡ	Ḡ	-
Bit11	Ḡ	Ḡ	-
Bit12	L	ض L	1ч ˇ 0ч ض L

Bit13-15			000' Δ . 001' Å 010' 011' 100' þ 101' ˜Ḥ 110' ‰ 111' PB Δ .

⁘ β Ω ˜ [W4] bit0 =1 ˇ DCDC ˇ bit0=0 ˇ DCDC Å
⁘ β Ω ˜ [W5] ∤ ẏˇ 0-1000 0 ~ 1000V

7.5.4 ą Modbus └Ω Å

ą Modbus └Ω Å Ӣ '

w	O	ẏ	
P8.00	Ω˙	3 [MODBUS]	-
P8.01	└	1 [ƀ]	-
	∤ └	1 [ƀ]	-
P8.03	Å	1 [Å]	-
P8.04	ɒ	3 [Modbus]	-
P9.03	└	1 [∤]	-
P9.04	∤ └	1 [˜Ḥ]	-

Modbus └ Ӣ '

β	1	0	
Bit0		Å	⁘ ˥ Ω˙ ˇ Ḡ
Bit1	Ḡ	Ḡ	-
Bit2	LOCAL	REMOTE	ˇ ضر Ⓟ
Bit3	FAULT_RESET		-
Bit4	EXT_FAULT		⁘ ˥ ˇ Ḡ
Bit5	EXT_ALARM		⁘ ˥ ˇ Ḡ
Bit6	CtrlMode.A		└ .A
Bit7	CtrlMode.B		└ .B
Bit8	VoltCtrlType.A		∤ └ .A

Bit0	Ready	
Bit1	RUN	Sto

1 01 Address = 1 01

8. W جشم

8.1. L ь

L L جشم h ˘ جشم L β ɒ ضي لإ ® ΐ Ω
˜ W Â
جشم G ˢ ₩ ↓ β Â

8.1.1 Ω¨ ь ↓ ¡

1> ↑ ק ... P7.17 5 ~ ˇ P7.18
ч 2 ~ ˇ ↕ ↑ ק ... /
2> h ק ... P7.17 5 ~ ˇ P7.18
ч 2 ~ ˇ ↕ ↑ ק ... /
3> ↑ ק └Ḥ ч D04 ˇ ↑ ק ĩ Ḥ ч DI4
4> h ק └Ḥ ч D05 ˇ h ק ĩ Ḥ ч DI5
5> شي ą ٧ ١ ט h ק c ˇ h

Bit6	└ .A		└ .A
Bit7	└ .B		└ .B
Bit8	↑ └ .A		↑ └ .A
Bit9	↑ └ .B		↑ └ .B
Bit10	Ḡ	Ḡ	-
Bit11	Ḡ	Ḡ	-
Bit12	Ḡ	Ḡ	-
Bit13	Ḡ	Ḡ	-
Bit14	Ḡ	Ḡ	-
Bit15	Ḡ	Ḡ	-

8.1.3

β	1	0	
Bit0	‰		-
Bit1			-
Bit2			-
Bit3	ϸ		-
Bit4-5	˜Ḥ		00' Å
			01' ˜Ḥ
			10'
Bit6-7	└		00'
			01' ↑ └
			10' └
			11' w └
Bit8-9	↑ └		00'
			01' ˜Ḥ
			10'
			11' ˫
Bit10	Ḡ	Ḡ	-
Bit11	Ḡ	Ḡ	-
Bit12	└	㎜" ↄ	

8.1.4

bit13-15	O	
000(S1)	Δ .	Δ . └ ﺍ ˇ Ð ~ S2
001(S2)	Å	Ƣ˥ ɒ U˘ ~ S3
101(S3)	˝Ḥ	˝Ḥ U˘ ~ S4. ₹ ~ S6
110(S4)	‰	└ ɒ ǐ ﺍ˘ ˇ w Ŀ ˇ ~ S5
010(S5)		Å ɒ ˇ ~ S2˝ ₹ ~ S6˝ ɒ ~ S7
011(S6)		β ɒ ˇ ~ S2
100(S7)	ɒ	ɒ U˘ ~ ╠ ₩ ⊥
111(S8)	PB Δ .	PN ą ˇ ~ S8˝ Δ . U˘ ~ S2

8.2. Ỵ

8.2.1 ﺍ

ﺍ ﺽ Ь ƀ Ţ˘ Ь Ь
ƀ ﺽ˝Ḥ Ӣ '
Ӣ ҥ ҩ ﺍ ˇ ﺍ ˆ ɣ № ˇ Ӟˆ ɣ Â
ﺍ Ỵˆ ɣ P10.00 Â

w	O	
P8.01	└	[0]IO **[1] ƀ ɣ └ ҷ ɒ** [2]Modbus [3]Dp
P8.02	ﺍ └	[0]IO **[1] ƀ ɣ └ ҷ ɒ** [2]Modbus [3]Dp
P9.03	└	[0] **[1] ﺍ ҷ ﺍ └** [2] [3]w
P9.04	ﺍ └	[0] **[1]˝Ḥ ҷ˝Ḥ** [2] [3] ˩
P9.00	ﺍ	ﺍ ﺍ Ỵ

		(ʏ)
P8.04	Ɒ	[0] [1]AI1 [2]AI2 [3]Modbus [4]Dp
P8.08	ʏ	ʏ ЙĮ ;ː ʔ Ь ЙĮ ₩ ; Ч5.0%/s, ɣ ʏ Ч ẏ

' P8.04 Ɒ Ч 0' ˜ Â Ï ɾ ă̈

Ľ5.4.3ê ă ẏ Ì Ŀ

ƀ ض Й '
Й ʏ ˙ ɾ ʏ ᵾ ʏ Â

W	O	
P8.01	Ŀ	[0]IO **[1] ƀ ɣ Ŀ Ч ɒ** [2]Modbus [3]Dp
P8.02	ʏ Ŀ	[0]IO **[1] ƀ ɣ Ŀ Ч ɒ** [2]Modbus [3]Dp
P9.03	Ŀ	[0] **[1] ʏ Ч ʏ Ŀ** [2] [3]W
P9.04	ʏ Ŀ	[0] [1]˜Ḥ **[2] Ч** [3] ˫
P9.00	ʏ	ʏ ẏ (ʏ ẏ)
P8.08	ʏ ʖ	ʏ ЙĮ ;ː ʔ Ь ЙĮ ₩ ; Ч5.0%/s, ɣ ʏ Ч ẏ
P9.21	Dc-Link ʏ Ŀ ẏ	Й˘ ʏ ᵾ ʏ
P9.26	Dc-Link ʏ Ŀ ẏ	Й˘ ʏ ᵾ ʏ
P9.51	ʏ ᵾ ʏ Ŀ	0: ƀ 1' Modbus 2' Dp
P9.52	ʏ ᵾ ʏ Ŀ	0: ƀ 1' Modbus 2' Dp

		[1] ۱ [2] ! ꭓ ч L [3]w
P9.01		ă , ŷ ẏ˜
P8.04	ɒ	[0] [1]AI1 [2]AI2 [3]Modbus [4]Dp
P8.06	ă	0: ɒ P8.04 1: ۱ ᵾ
P8.09	ж	˘ w ;:;:ˆ ۱ ь Ѝ, □ ; ч5.0%/s, ү ч ẏ

'

P8.04 ɒ ₩ч0 ₩ ˜ Ǝ Â ĺ ᵣ ă

ľ5.4.3ê ă ẏ Ì Ŀ ; ч ľ %Ŀ ˘ ă ч №

,

ч ľ A Ŀ ˘ ă ч ;

P8.06 ă ч 0 ˘ ɒ P8.04 ' ч 1 ˘ ɒ

۱ ۽ ' ۱ ۽ ĺ ᵣ ă ľ8.3.1 ۱ ۽ Ŀ

8.2.3 w

w	O
P8.01	L

		[4]Dp
P8.09		W ;:;: ^1 Ь Й, ; ч5.0%/s, Y ч V

P8.04 Б ч 0' Â í r ă

l'5.4.3ê ă v Ì L ;

P8.12 =2 Ь ă ˇ ĭ ų ƀ ч Ω¯ ∤ ă
P8.12 =3 Ь ă ˇ ą ų 80% ƀ ч Ω¯ ∤ ă

8.3. W

8.3.1 ∤ ڪ

DCDC جشـ ι ∤ ט ∤ ڪ W ' ضي ƀ ч ЙĮˇ ∤^ ∤ ט ∤~ ĩ
. ˇ ¯ DCDC جشـ ٧ ∤ ט ˇ ∫ ∤ ضي W ∤ مخ ṗ Â ∤ ט
∤ ڪ W Ţˇ ∤ ט ∤ Ь ∤ ט ∤ ڪ ų ˜ ЙĮ يح '

ك

8.4.1 Modbus

Modbus Йį'

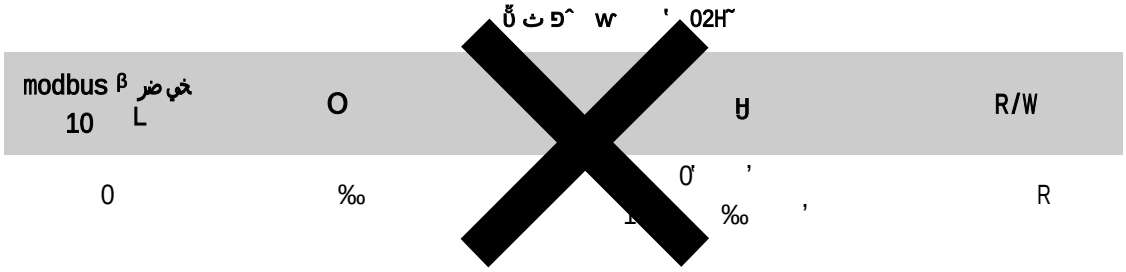
w	O	
P32.01	MODBUS ID	Min=1 à Max=255 ч 1
P32.02	MODBUS فمم	[0]:RS485; [1]:RS232 ч RS485
P32.03	MODBUS	[0] 9600 BPS [1] 14400 BPS [2] 19200 BPS [3] 38400 BPS [4] 56000 BPS [5] 57600 BPS [6] 115200 BPS
P32.4	β	[0] None_8_1_CFG [1] Even_8_1_CFG [2] Odd_8_1_CFG [3] None_8_2_CFG [4] Even_8_2_CFG [5] Odd_8_2_CFG
' ¥o ă US Â	U ĭ ح ˘ ĭ ح	U 'P ˘ MODB

Modbus ٦ ضي خ '

ɒ Ω ˜ ث ɒ^ w ' 05Н˜

modbus β ضي خ 10 L	O	Ч	R/W
0	Å	0: Å ' 1' '	W
1	Ḡ	Ḡ	-
2	ض Ⓟ	1' Ⓟ	W
3	β	1' β'	W
4		0' ' 1' '	W
5	ɒ	0' ' 1' ɒ'	W
6	ƀ .A	00: 01: ٨ 10:	W
7	ƀ .B		W

		11: W	
8	ا .A	00: 01: ~H	W
9	ا .B	10: 11: ـ	W
10-15	Ḡ	Ḡ	-



7 -

OX ـ ـ ـ

modbus 10	O	H	R/W
0	DI ~	DI ~	R
50	~ 1[V]	100 => 1.0[V], -10 ~ +10[V]	R
51	~ 1[I]	100 => 1[mA], 0 ~ 20[mA]	R
52	₹ 2[V]	100 => 1.0[V], -10 ~ +10[V]	R
53	₹ 2[I]		

12	₣ B	100=>10.0A	R
13	₣ C	100=>10.0A	R
17	۱	100=>10.0V	R
18	۱	100=>10.0V	R
19		100=>10.0	R
21	۱%	100=>1.0%	R
22	₣w %	100=>1.0%	R
23	₣ %	100=>1.0%	R
50	A01 ₣ 1	10 => 1.0[%]	R/W
51	A02 ₣ 2	10 => 1.0[%]	R/W
60	٦	[07..00] : ٦ [15..08] : ɒ ٦	R
62	ǎ	[07..00] : ٦ [15..08] : ɒ ٦	R
100	۱ [0.1%]	10 => 1.0%	R/W
101	۱ 0.1V]	10 =>1.0V	R/W
102	0.1%	10 =>1.0%	R/W
103	0.1A	10 =>1.0A	R/W
104	w 0.1%		R/W
105			

8.4.2 PN

DCDC جشہ ᴸ PN ᵒ ˇ PN ∖. ą PN w , ą
PN DCDC جشہ Ω˝ ˇ ь ɒ Â ᴰ Ţ ч ƀ Â

L

β	1	0
Bit0		Å
Bit1	Ḡ	Ḡ
Bit2	Ḡ	Ḡ
Bit3	β	
Bit4		
Bit5	ɒ	
Bit6	L .A	

			101' ˜H 110' ‰ 111' PB Δ .

'

ƀ ą ƀ ضي ® W ˘ ضي DCDC شجـ ~ ҥ ╠ ą ضر
DCDC شجـ ƀ ' DCDC غجـشجـ ɒ ® ƀ

9. ă

9.1. w ă №

ă ~ Ь ₹	P0 ă L P2 P3 ~ P4 ₹
~ Ь ₹ Ğ ă	P5 ~ P6 ₹ P7 Ğ ă
Ω Å L	P8 Ω ă
DCDC ˜ ă ヽ ¨Ḥ ﺷﺠ ă Modbus	P9 DCDC L P10 ﺷﺠ ă P32 Modbus

		ч ˘ ˥ ƀ
1		L
3	L .a	β 1 ɛ β 0 L Ḥ ˘ 00
4	L .b	˘ 01 ∧ ˘ 10 ˘ 11 w
5	∧ L .a	β 1 ɛ β 0 ∧ L Ḥ ˘ 00
6	∧ L .b	˘ 01 ˇḤ ˘ 10 ˘ 11 ˥
7	Å	L Å
8	β	β w
9	Ø ح	Ø ح Ɒ
10	h ح	h ح Ɒ
11	Å Ḥ	~ ч
12	Å Ḥ .NC	~ ∨ ч
13	FUNC 12	
14	FUNC 13	
15	FUNC 14	
16	FUNC 15	

9.2.2 ₣ P4

w	O		₀	∨
P4.0	₣ 1	w ˇ ₣	0˙ 15	0
P4.1	₣ 2	w ˇ ₣	0˙ 15	0
P4.2	₣ 3	w ˇ ₣	0˙ 15	0
P4.3	₣ 4	w ˇ ₣	0˙ 15	0
P4.4	₣ 5	w ˇ ₣	0˙ 15	0

w ˇ ₣ w Й ˈ

∨	w	
0		κ ∨ w
1	Ḥ	ч
2	₣	˚ ح Ü ˘ ₣ ON Ḥ
3		˚ ح ‰

ă

P5.6	AI1 ỵ	AI1 ỵ	-300.0˙ 300.0 [%]	0.0 [%]
P5.7	AI1 ۱	AI1 ۱	-10.00˙ 10.00 [V]	10.000 [V]
P5.8	AI1	AI1	0.00˙ 20.00 [mA]	20.000 [mA]
P5.9	AI1 ỵ	AI1 ỵ	-300.0˙ 300.0 [%]	100.0 [%]
P5.18	AI2 قمم	[0] [1]0˙ +10V [2]-10˙ +10V [3]0˙ 20mA	0˙ 3	3
P5.19	AI2	AI2 Â ỵ ǐ ևڅ ǐ ˫ ą Â ỵ ↕ Ψ ỵ;; Й ˫ p ڑ Ψ ǐ Â	0.0˙ 1000.0 [ms]	25.0 [ms]
P5.20	AI2 ۱ Ẓ	AI2 ۱ Ẓ	-10.00˙ 10.00 [V]	0.000 [V]
P5.21	AI2 Ẓ	AI2 Ẓ	-20.00˙ 20.00 [mA]	0.000 [mA]
P5.22	AI2 ۱	AI2 ۱	-10.00˙ 10.00 [V]	0.000 [V]
P5.23	AI2	AI2	0.00˙ 20.00 [mA]	0.000 [mA]
P5.24	AI2 ỵ	AI2 ỵ	-300.0˙ 300.0 [%]	0.0 [%]
P5.25	AI2 ۱	AI2 ۱	-10.00˙ 10.00 [V]	10.000 [V]
P5.26	AI2	AI2	0.00˙ 20.00 [mA]	20.000 [mA]
P5.27	AI2 ỵ	AI2 ỵ	-300.0˙ 300.0 [%]	100.0 [%]

9.2.4 î ¡ Aq

P6.21	A02 ₡ ₹	A02 ₡ ₹ (P6.14 ч [13] ų)	0.0˙ 100.0 [%]	0.0 [%]
P6.22	A02	A01 Â ₹ ų Ї Ш ҵ Ї ⁻ ą Â ų ↕ Ψ ₹ ų ; Й ⁻ p ڑ Ψ Ї Â ₀ ∨ ¦ " ∧ ⁻ ₥ Ո	0.0˙ 1000.0 [ms]	10.0 [ms]

30

ų	O	
0	₹	ү ∕ ט ₹
1	ү ∕ ט ∕	ү ∕ ט ₹ ∕
2	₹ w	₹ w
3	ט ∕ ų	∕ (№ ₹)
4	D8 ₀ ∨ ∧	° ڊ (150Ņ № ₹)
5	DP ₦ ∨ ∧	Profibus
6	ă	ү ă P6.7 P6.21 ų ₹
7	ض	; β Ð ; ų ₹

9.2.5 Ḡ ă P7

w	O		₀	ų
P7.00	∕ ט ∕ ų	∕ ט ∕ ∕	600˙ 820 [V]	800 [V]
P7.01	∕ ט ∕ ų	∕ ט ∕ ∕	300˙ 500 [V]	380 [V]
P7.02	ט ∕ ų	ט ∕ 0 ă "		

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JDE
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9.2.6 Ø¬ L P8

w	O		ж	ų
P8.00	Ø¬	[0] ~ [1] ƀ [2]Dp [3]MODBUS [4]Ḡ	0˙ 4	1
P8.01	L	[0]IO [1] ƀ [2]Modbus [3]Dp	0˙ 3	1
P8.02	۱ L	[0]IO [1] ƀ [2]Modbus [3]Dp	0˙ 3	1
P8.03	Å	[0] Å (Ḡ) [1] Å	0˙ 1	1
P8.04	ɒ	[0] [1]AI1 [2]AI2 [3]Modbus [4]Dp	0˙ 4	0
P8.06	ă	0: ɒ P8.04 1: ۱ ʊ	0˙ 1	0
P8.08	۱ ж	۱ Ѝ,	0.0˙ 300.0 [%/s]	5.0 [%/s]
P8.09	ж	˘ w	0.0˙ 300.0 [%/s]	5.0 [%/s]
P8.11	L Ø¬	[0] [1]Ø	0˙ 1	1
P8.12	Ø¬ ۱	[0] ۱ ų [1]Ø¬ ۱ ă [2] ĭ ų [3] ų 80%	0˙ 3	3
P8.13	Ø¬ ۱	P8.12=1 ˘ Ø¬ ۱ ų P8.13 ų	0˜ 300 [%]	90 [%]
P8.14	ֆ ĭ Ḥ	ֆ ĭ Ḥ	0.01˙ 5.000 [s]	0.1 [s]
P8.15	h ֆ ĭ Ḥ	h ֆ ĭ Ḥ	0.01˙ 5.00 [s]	0.5 [s]
P8.16	h ֆ ˜	h ֆ ˜	0.1˙ 6000.0 [s]	1 [s]
P8.17	h ֆ Ɋ	h ֆ Ɋ	0.1˙ 10.0 [s]	2.5 [s]

ă

		1: Even_8_1_CFG 2: Odd_8_1_CFG 3 None_8_2_CFG 4: Even_8_2_CFG 5: Odd_8_2_CFG		
P32.05			0, 100 [s]	0 [s]

9.2.10 P33

w	O		مخ	٧
P33.0	Profibus ą	[0] [1] ą	0˙ 1	0
P33.1	خي ضر	PLC	1˙ 255	1
P33.2	قمم	[0]PPO 1 [1]PPO 2 [2]PPO 5 [3]GUIDE	0˙ 3	2
P33.3	~ ٧ ṗ	٧	0˙ 16	14
P33.4	₹ ٧ ṗ	٧	0˙ 16	14
P33.5	˗ ƀ	[0] Å [1] ⁞ Å [2] ᵽ ⁞ Å [3]		

			[4] ¦ 10000			
P33.17		~ [W2]	7-2		0˙ 38	0
			[0] ¦ 1 , m " _ ¡ ∧o			1
		~	[1] ¦ 10 m " ^M Ů			
P33.18	[W2]		[2] ¦ 100		0˙ 4	0
			[3] ¦ 1000, m " d			
			[4] ¦ 10000 ∧o ě 0			
P33.19		~ [W3]	7-2		0˙ 38	0
			[0] ¦ 1			
		~	[1] ¦ 10			
P33.20	[W3]		[2] ¦ 100		0˙ 4	0
			[3] ¦ 1000			
			[4] ¦ 10000			
P33.21		~ [W4]	7-2		0˙ 38	1
			[0] ¦ 1			
		~	[1] ¦ 10			
P33.22	[W4]		[2] ¦ 100 E		03.43	0
			[3] ¦ 1000			
			[4] ¦ 10000			
P33.23		i ~ [W5]	7-2		0˙ 38	18
P33.13						
			[0] ¦ 1000			
			¦ ¡ ∧o ¡ D J			
			3			
			¦ ∧o c 0			
			-S			
			¦ E			
			d E			
			[0] ¦ m " o ¡¡ ∧∧oo			

			[3] ¦ 1000 [4] ¦ 10000		
P33.31	~	[W9]	7-2	0˙ 38	0
P33.32	~ [W9]		[0] ¦ 1 [1] ¦ 10 [2] ¦ 100 [3] ¦ 1000 [4] ¦ 10000	0˙ 4	0
P33.33	~	[W10]	7-2	0˙ 38	0
P33.34	~ [W10]		[0] ¦ 1 [1] ¦ 10 [2] ¦ 100 [3] ¦ 1000 [4] ¦ 10000	0˙ 4	0
P33.35	~	[W11]	7-2	0˙ 38	0
P33.36	~ [W11]		[0] ¦ 1 [1] ¦ 10 [2] ¦ 100 [3] ¦ 1000 [4] ¦ 10000	0˙ 4	0
P33.37	~	[W12]	7-2	0˙ 38	0
P33.38	~ [W12]		[0] ¦ 1 [1] ¦ *6		

		[2]¦100 [3]¦1000 [4]¦10000		
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	₮	[0]¦1 [1]¦10	0˙7	0

ă

P33.63 [W9] 7-3 0˙ 48 13
[0] ¦ 1

P33.64 [W9]

22	w [Kw]
23	w [%]
24	˜Ḥ [A]
25	[A]
26	[A]
27	₣ 1[%]
28	₣ 2[%]
29	∨ └[%]
30	⋮ └[%]
31	˜Ḥ └ [V]
32	└ [V]
33	∧ ∧ └ [V]
34	∧ ∧ └ [V]
35	∧ ☋˜Ḥ ∧ 1[V]
36	∧ ☋˜Ḥ ∧ 2[V]
37	∧ ☋ ∧ 1[V]
38	∧ ☋ ∧ 2[V]

7-3 ₣

∨	
0	
1	0
2	1
3	2
4	3
5	4
6	5
7	ă 0 32bit
8	ă 1 32bit
9	ă 2 32bit
10	ă 3 32bit
11	ă 4 32bit
12	ă 5 32bit
13-16	Ḡ
17	˜
18	₣
19	∧
20	∧
21	₣ A
22	∧
23	₣w Kw
24	A ₣
25	B ₣
26	C ₣
27	₣ A ∧

10. ï

10.1 ɒ ɳ

ض Å ɒ ɳ '

ɒ ɳ	ɒ Ḥ	ɒ ʌ ɡ
WO1	‰ :;: SYS_NOT_RDY (Ready)	⌠ ‰ ~ ʌ˘

ϸ ϥ	ϸ Ḥ	ϸ ∕ ⁄	
W25	ɾ 5 SLV5_CAN_ERR	˘ ɾ 5	˘ ɾ 5 ϥ

10.2 ϥ

Ӣ ϥ '

ϥ	Ḥ	
[E050]	U ^ Ь˜ β˜ ERR_UT not reset	IGBT ϥ IGBT ⌟ ï ⌟ ϥ U ⁘
[E052]	V ^ Ь˜ β˜ ERR_UT not reset	IGBT ϥ IGBT ⌟ ï ⌟ ϥ U ⁘
[E054]	W ^ Ь˜ β˜ ERR_UT not reset	IGBT ϥ IGBT ⌟ ï ⌟ ϥ U ⁘
[E065]	h ϲϨ Ҩ…	h ϲϨ ϥ h ϲϨ DO Ḥ˜ ϥ h ϲϨ DO Ḥ˜ ϥ DCDC ϣϫ DO ă ϥ DCDC ϣϫ DI ă ϥ
[E066]	ϲϨ Ҩ…	ϲϨ ϥ ϲϨ DO Ḥ˜ ϥ ϲϨ DO Ḥ˜ ϥ DCDC ϣϫ

[E220]	Ũ ᵹ CRC MEMORY CRC ERR	L
[E221]	ᾰ PARAMETER ERROR	ᾰ ϩ ¨

10.3

	ʜʊ	
	o L Ղ	o L DC24V
	oʹḢ ᶎ Ղ ₾	o DO Ṿ o DO ⌡ʹḢ ᶎ
	oh ᶎ Ղ ₾	o DO ⌡ h ᶎ
	o ~ Ղ№	o ~ №
	o ɒ Ḣʹ Ղ ч ON	o ɒ Ḣʹ ч ON
ʏ ʅ ʊ	o Ղ ɻ COM	o COM
₣	o ʅ Ղ	o

11. Ь Ḡ Ī

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1. ~ ᴅ⁻ ᵊᵖ ᓫ

11.2

ԋ ϑ D⌟ ᵒᵒ ҷ Ṵ ˇ Ḡ ˇ D⌟ ᵒᵒ ҷ ą ت ˇ

D⌟ ᵒᵒ ҷ ˇ ṗ Ѝ ˈ

	ṗ	∞≠ ‰
	1. à 2. à r	1. > 40Ṇ Å ϒ < 95%˜ o 2. ء ˇ à r
ˈ ˩	1. 2. D⌟ ᵒᵒ ҷ r	1. ˇ 2. r ˇ ك
D⌟ ᵒᵒ ҷ r	1. ⁻ à ˥ 2.ك 3. à	1. ⁻ à ∓ o 2. ك à ء 3. ⁻
˜ à ∓ ă	1. ˜ ˥ 2. ∓	1. ˜ ˥ ض ṁ ṗ 2. ∓ ض ṿ ϒ Ѝ

11.3

ԋ ϑ DC-DCᵒᵒ ҷ Ṵ ˇ Ḡ ỉ ˇ ^ ˥

ϒ ṗ˜ ᵒᵒ ҷ ˇ ṗ Ѝ ˈ

	ṗ	
Ⱪ	Ⱪ ˥ ⁻	
w ˝Ḥ ð	à	˥ ŋ
	à	˥ ŋ
	˥ ĭ à ء	
	ك ġ ⁻ ˥ 2’	1¨ 2¨
PCB	à	˥ ŋ

ˇ È˜ '

Hu

1à ą ǐ h DC-DC ǐ ڪ ج ╠ Ⱶ й Â

2à ч ъ ŋ˘ Ғ ʒ¸ 2 ǐ Â

3à й ṗ ˆ ǐ˙ ˘ Ьз Â

M Ȅ˜

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