



FATEC

-
- AC
 - AC



(

)

【

】



OFF

FATEC

가

1.	.....	1-1
1.1	.....	1-1
1.1.1	.....	1-1
1.1.2	.....	1-2
1.2	.....	1-3
1.2.1	.....	1-3
1.2.2	3 ().....	1-4
1.2.3	AC ().....	1-4
1.2.4	.....	1-4
1.3	.....	1-5
1.3.1	.....	1-5
1.3.2	.....	1-6
1.3.3	.....	1-7
1.3.4	.....	1-8
1.4	.....	1-9
1.4.1	.....	1-9
1.4.2	.....	1-10
1.4.3	.....	1-11
1.4.4	.....	1-12
2.	.....	2-1
2.1	.....	2-1
2.1.1	.....	2-1
2.1.2	.....	2-1
2.2	.....	2-2
2.2.1	().....	2-2
2.2.2	.....	2-3
2.2.3	.....	2-3
2.2.4	.....	2-3
2.3	.....	2-4
2.3.1	.....	2-4
2.3.2	.....	2-4
2.3.3	.....	2-5
2.3.4	3.....	2-5
2.3.5	.....	2-6
2.3.6	V/F.....	2-6
2.4	.....	2-7

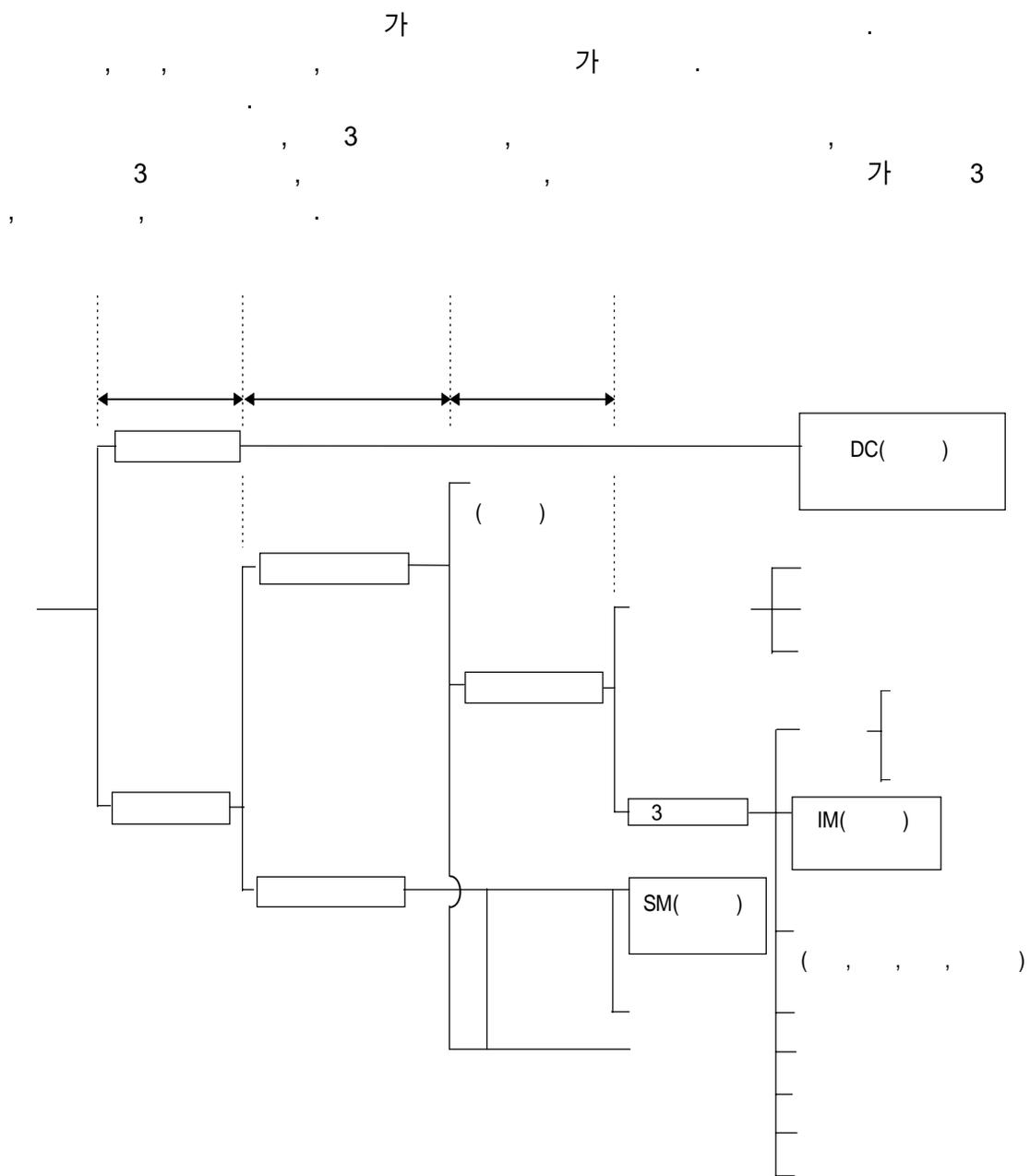
2.5	AC	2-8
2.6		2-9
2.6.1		2-9
2.6.2		2-10
2.6.3		2-11
3.		3-1
3.1	(FR - A520)	3-1
3.1.1		3-1
3.1.2		3-2
3.1.3		3-5
3.2	AC (MR - J3 - A)	3-7
3.2.1		3-7
3.2.2		3-8
3.2.3		3-15
3.2.4		3-15
4.		4-1
4.1		4-1
4.1.1		4-1
4.1.2		4-3
4.1.3		4-4
4.1.4		4-6
4.2		4-7
4.2.1		4-7
4.2.2		4-7
4.2.3	가 가	4-8
4.2.4	PC	4-12
4.2.5		4-16
4.2.6	SSC - NET	4-18
4.3		4-19
4.3.1		4-19
4.3.2		4-20
4.3.3	AC	4-21
4.3.4		4-22
4.4		4-23
4.4.1		4-23

4.4.2	.	.....	4-24
4.5		.....	4-25
4.5.1		.....	4-25
4.5.2	,	.....	4-26
1.		.....	-1
2.		.....	-10
2.1	.	.....	-10
2.2		.....	-11
2.3		.....	-12
2.4		.....	-13

1.

1.1

1.1.1



1.

1.1.2

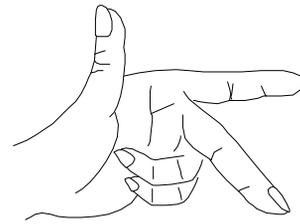
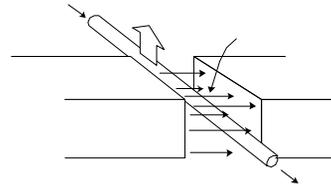
, 가 .

	(kW)					(r/min)		가 () 1 :	/	가 (可/否)	() (mm)				
	0.01	0.1	1	10	100	100	1000	20		200	2000	1/1000	1/100	1/10	1	10
3			↔				→	↔		가					↔
3 ()			↔				→	↔		가					↔
DC ()			↔				→	↔		가					↔
			↔				→	↔		가					↔
(5)			↔				→	↔		가					↔
IM ()			↔				→	↔		가					↔
DC ()			↔				→	↔		가					↔
SM ()			↔				→	↔		가					↔

1.

1.2

1.2.1



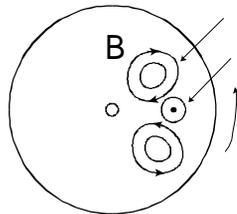
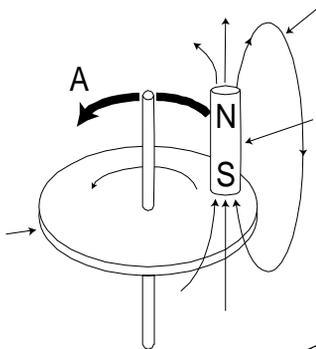
1.1

A

()가

()

f



i

i가

f

1.2

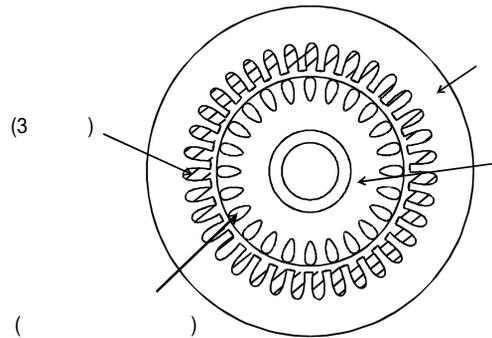
1.

1.2.2 3 ()

3 ()

1.2 가
3

()
()



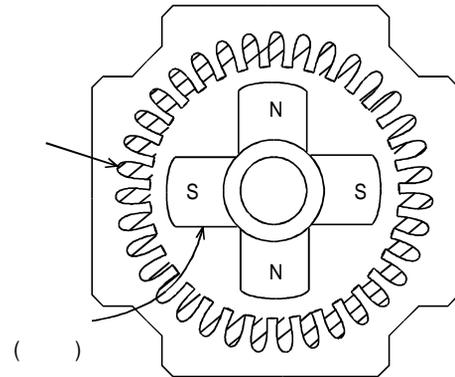
1.3 3 ()

가

1.2.3 AC ()

AC ()

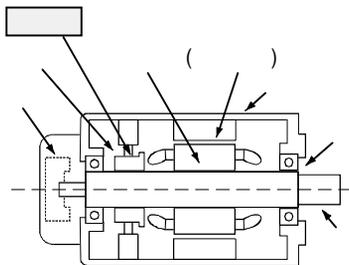
1.4
(, ,)



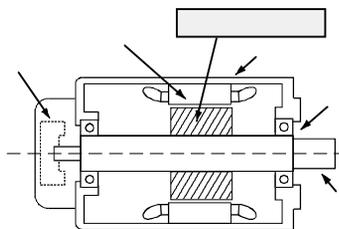
1.4 SM () AC

1.2.4

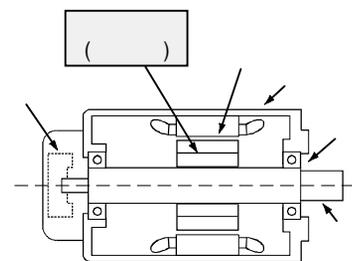
, DC , AC , AC 가 .



(a) DC



(b) IM () AC



(c) SM () AC

1.

1.3

1.3.1

, , , 가 가
E, B, F, H 4 가 , 가 1.1 .
(+) < 40
가 . 50Hz
1.1 가

1.1

E	120	75
B	125	80
F	155	100
H	180	125

E 40 () + 75 () < 120 () 115 < 120

1.

1.3.2

가 , (), , ,
 , (),
 , (duty) .
 , 1 가 가 1 가
 (duty) , 가 .

$$T_M = 9550 \times \frac{[kW]}{[r/min]} [N \cdot m]$$

..... (1.1)

3.7kW 4P 1730[r/min] ?

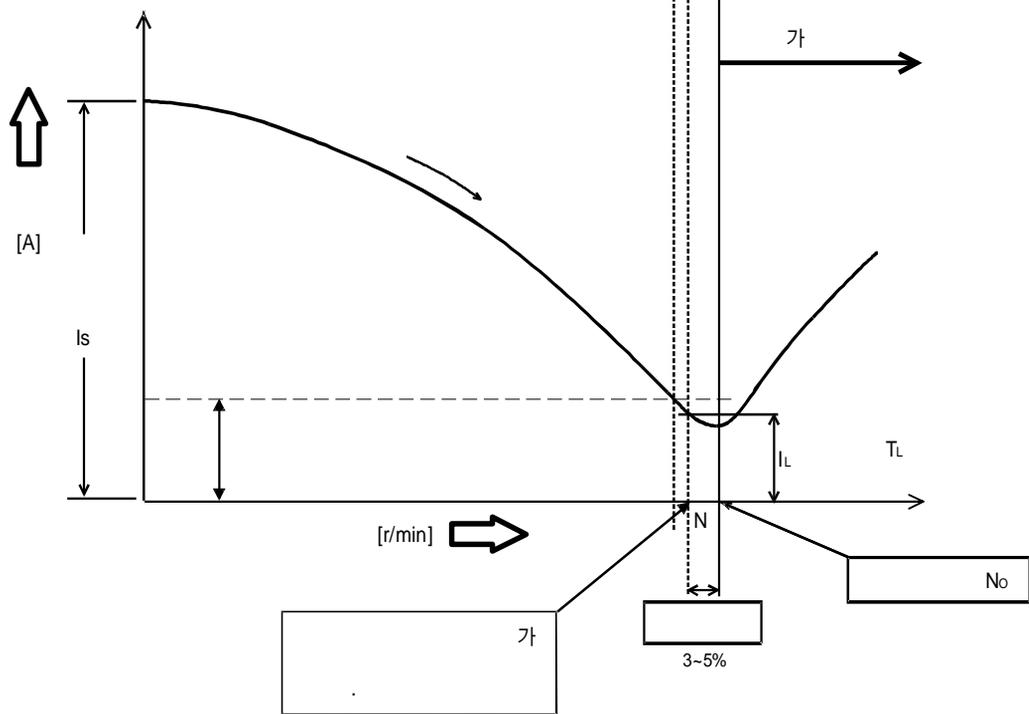
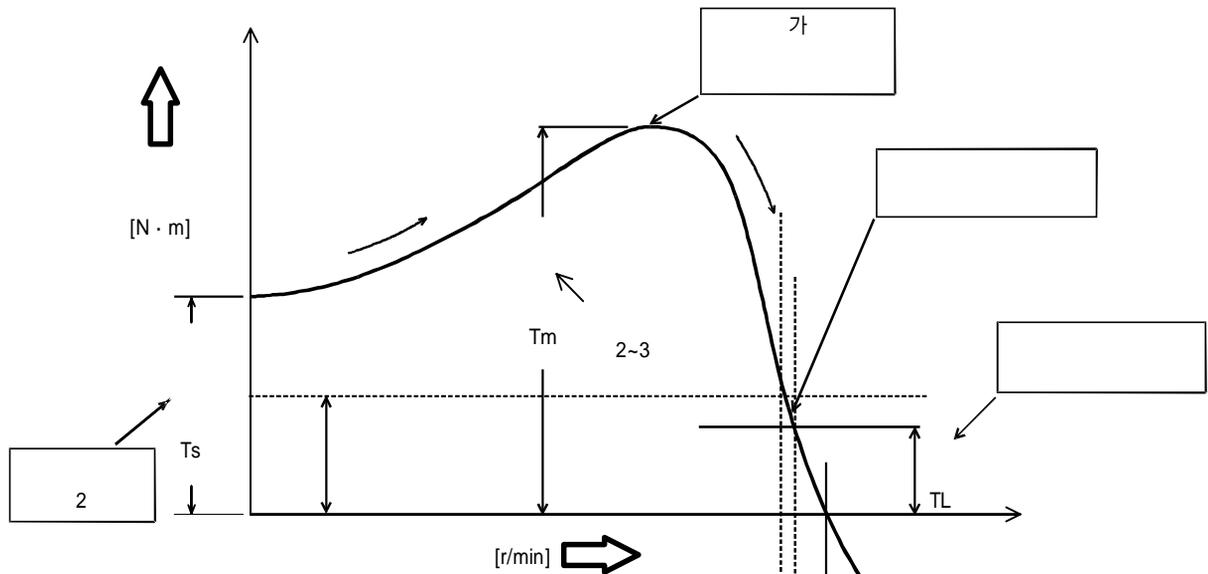
$$T_M = 9550 \times \frac{3.7 [kW]}{1730 [r/min]} = 20.4 [N \cdot m]$$

1.3.3

3

1.5,

1.6



1.6

1.

, 가 TL ,

$$= \frac{120 \times f \text{ (Hz)}}{P} \times (1-S) \text{ [N} \cdot \text{m]} \dots\dots\dots (1.2)$$

No

()

f , 가

1.3.4

, 가 15, 16 , () 가

$$S = \frac{No - N}{No} \dots\dots\dots (1.3)$$

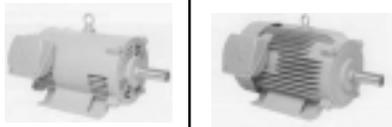
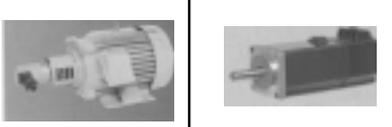
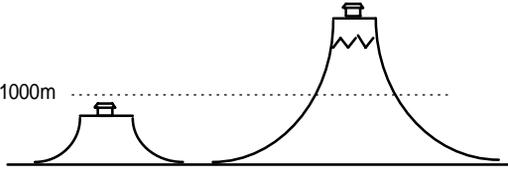
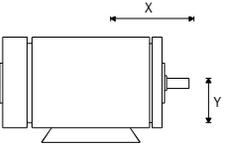
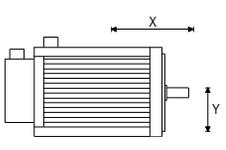
, 가0 「 」 100% , 「 」 ,3~5%가 가 가 「 」 , 가 , 가

1.

1. 4

1.4.1

()가

	<p>20 ~ 40</p>   <p>85%RH 95%RH</p>	<p>0 ~ 40</p>   <p>85%RH</p>
	 <p>1000m 1000m</p>	
	 <p>() 가 가 가 } 가</p>	
	 <p>X · Y 4.9m/S² (0.5G)</p>	 <p>X · Y 19.6m/S² (2G)</p>

1.

1.4.2 (外被)

() , JIS 가 , IEC
 JIS IEC ;

(1) JIS

(2) IEC

JP
 1 2

IP
 1 2



1 :

		JIS		IEC	
0	(無) (非)	3	2.5mm	6	
1	.50mm	4	1.0mm		
2	1 12mm	5			

2 :

		JIS		IEC	
0	(無) (非)	3	(防雨) 60	6	(防波浪) (噴流水)
1	(復水)	4	(防沫) (飛沫水)	7	(防浸) 150mm 1m
2	(防滴) 15	5	(防噴流) (噴流水)	8	(水中) 가 . 가 .

1.

1.4.3

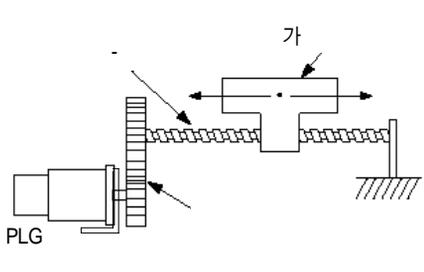
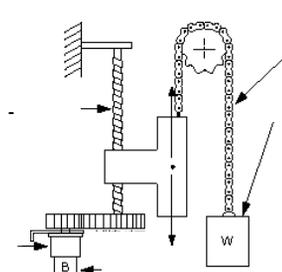
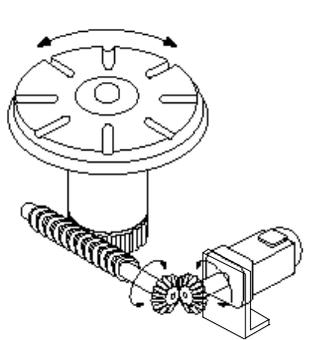
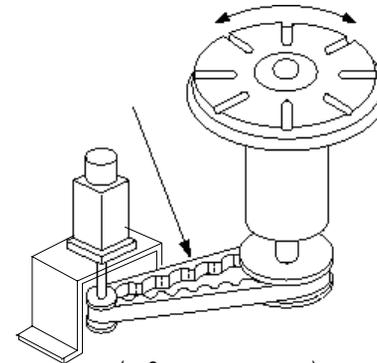
AC 가 , () 가

	<p>(開放)</p>	<p>(全閉)</p>	<p>(他冷)</p>

1.

1.4.4

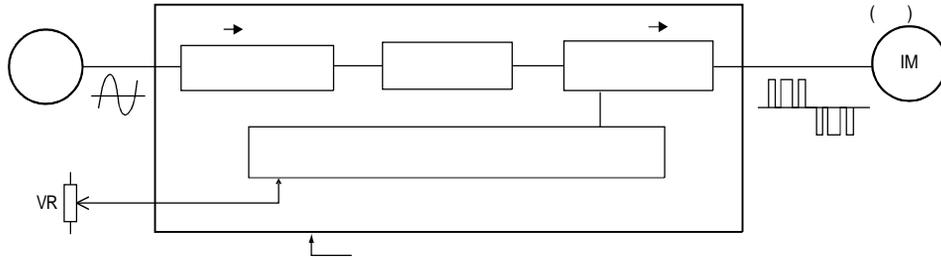
가 , (, , ,)
 , mm, 가

	()
	
<p>- & , 가</p>	
 <p>(1.)</p>	 <p>(2.)</p>
<p>()</p>	

2.

2.1

2.1.1

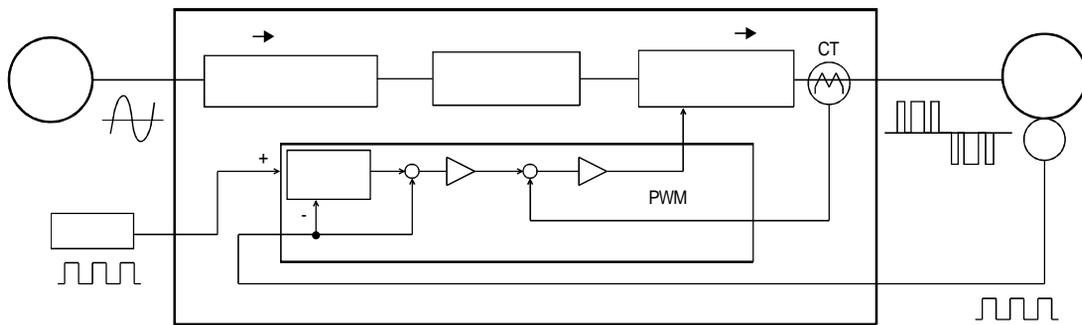


2.1

-
-
-
-

가

2.1.2



2.2

-
-
-
-
-

가

()
()
()

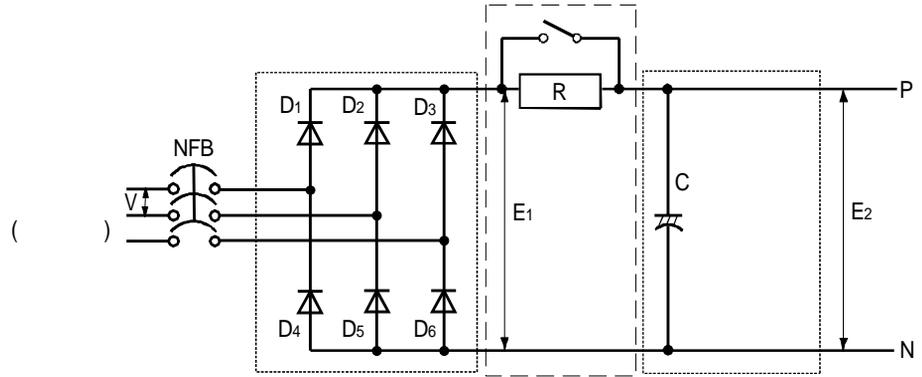
가

(, ,) , .

2.

2. 2

2.3



2.3

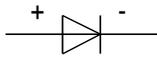
2.2.1 ()

가

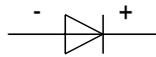
2.5

2.4

가



(導通)



(不導通)

2.4

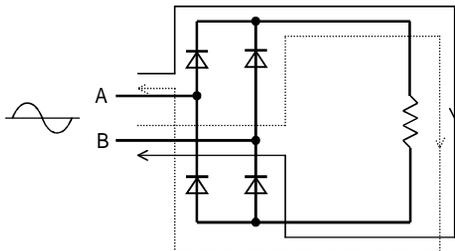
2.5 A, B

가 2.1

가 , 가

(

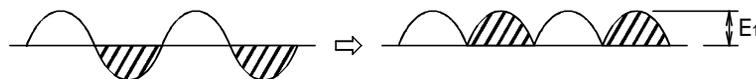
.)



2.5

2.1

	가	

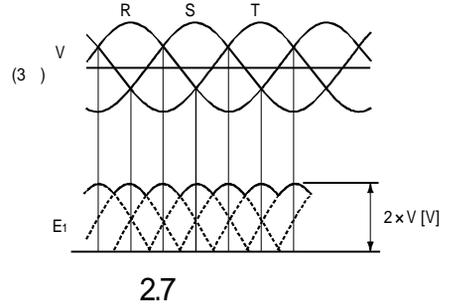


2.6 (2.1)

3

6

2.7

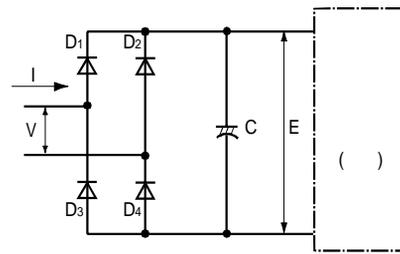
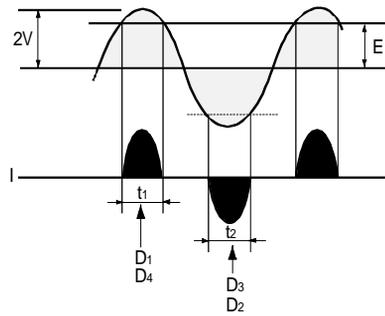


2.2.2

가 가

(以上)

2.8



2.8

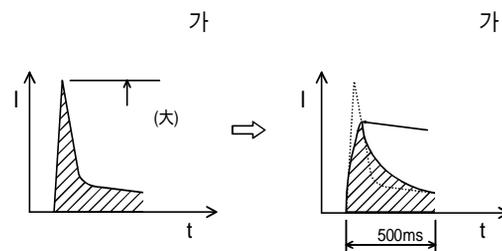
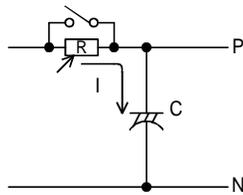
2.2.3

가 가

가

가

0.5



2.9

2.2.4



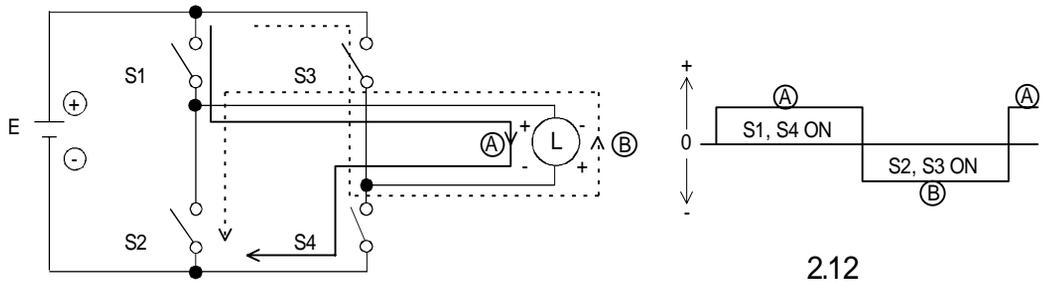
2.10

2.

2.3

2.3.1

2.11 가 , S1 S4 1 , S2 S3 1 ON - OFF
 2.12 가



- S1 S4 ON A 가 .
 - S2 S3 ON B 가 .
- 가 .

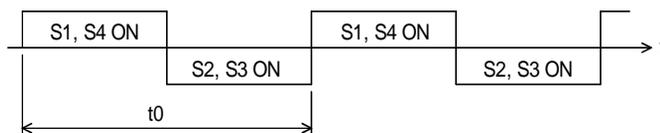
2.3.2

S1~S4 ON - OFF 가 .
 , S1 S4 0.5 ON, S2 S3 0.5 ON
 1 1 , 가 [Hz] 가 .



2.13 1Hz

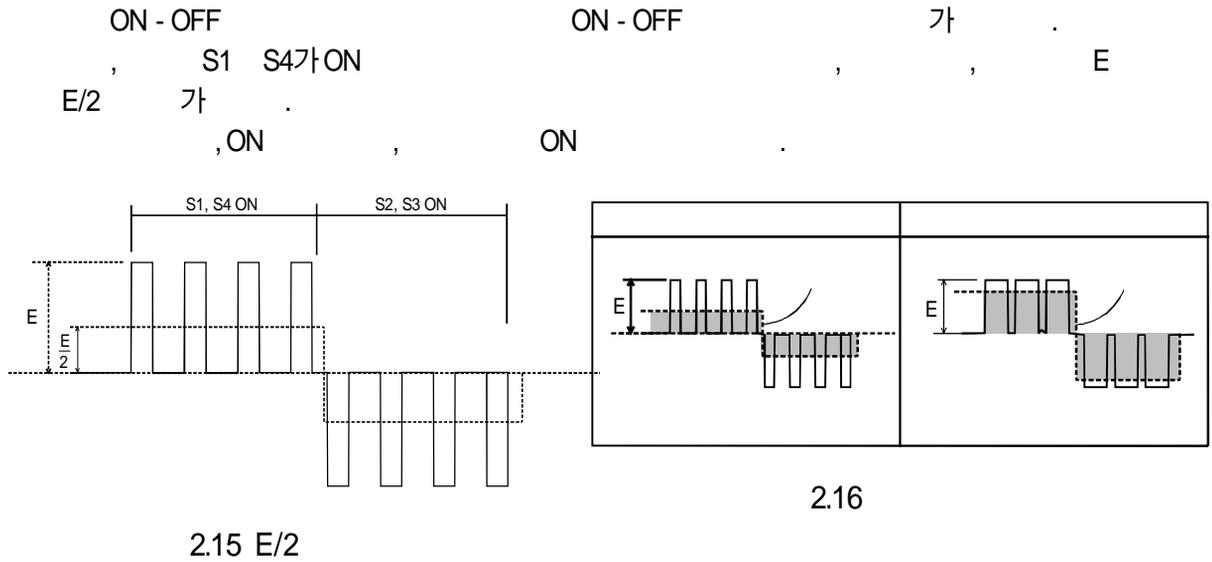
, S1 · S4 S2 · S3 ON , 1 t0 ,
 $f = 1/t_0$ [Hz] 가 .



2.14

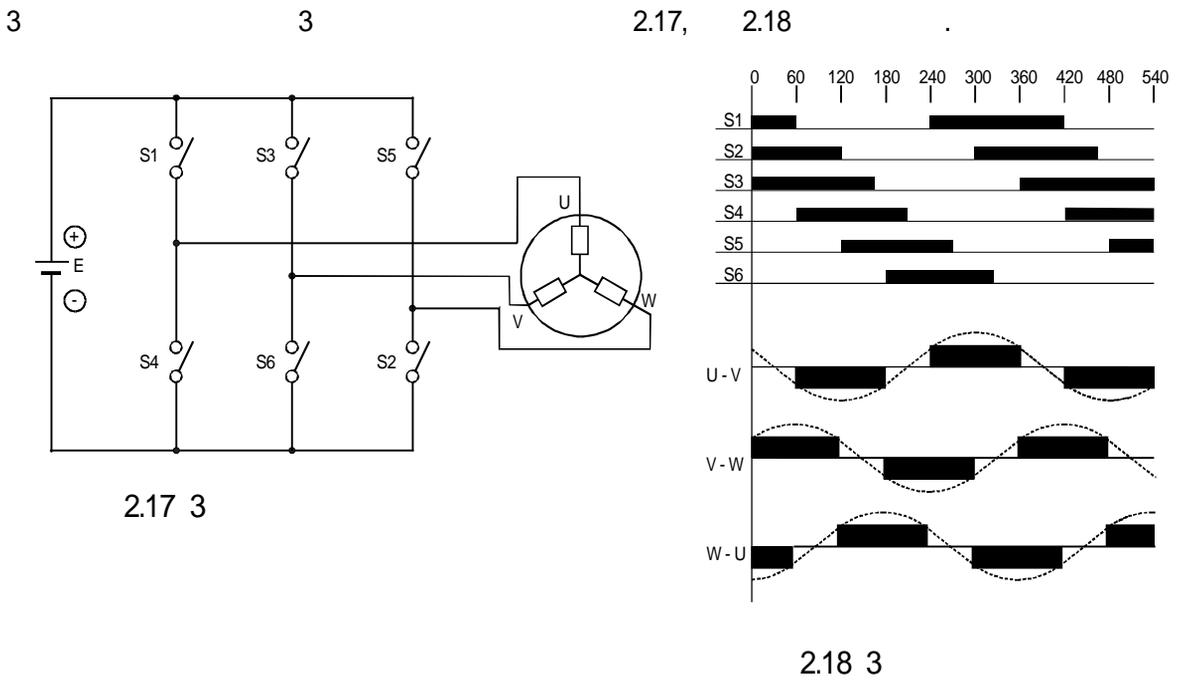
2.

2.3.3



, PWM(Pulse Width Modulation)

2.3.4 3



3 S1~S6 , 6 2.18 ON/OFF
6 ON/OFF , U - V, V - W, W - U 가 ,
가 .

2.

2.3.5

, IGBT(Insulated Gate Bipolar Transistor)

가

2.3.6 V/F

가

1.2

()

(I)

(

)

$$T_M = K \times I = K \times \left(\frac{V}{F} \right) \times I \dots\dots\dots (2.1)$$

()

가

(V),

(F)

=V/F가

(200V)

()

가

,

가

(V),

(F)

가

()

2

가

,

가

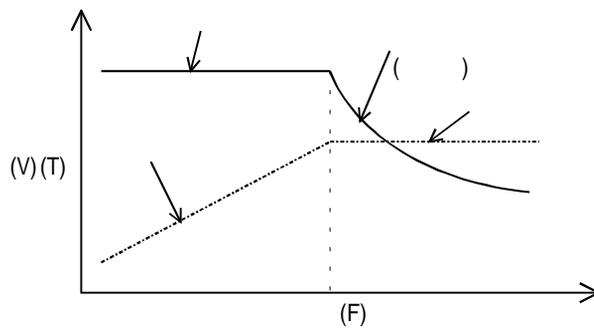
,

,

V/F

AC
V/F

()



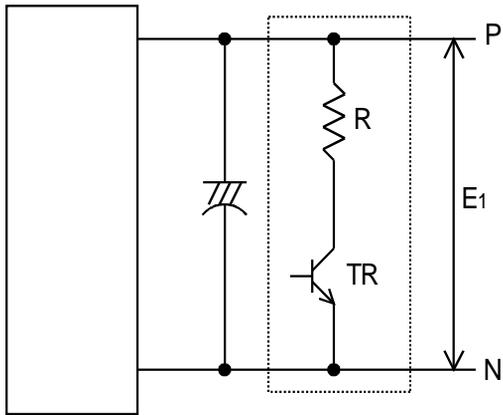
2.19 V/F

2.

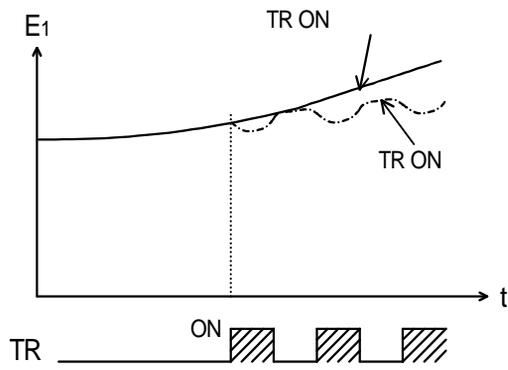
2. 4

가 , 가 , ()가 .
) , 가 , 가 , ()가 .
 가 (2.20 E1) , (200V
 DC370V) IGBT
 2.20 , (P-N)
 2.21 , ON

가 ,



2.20

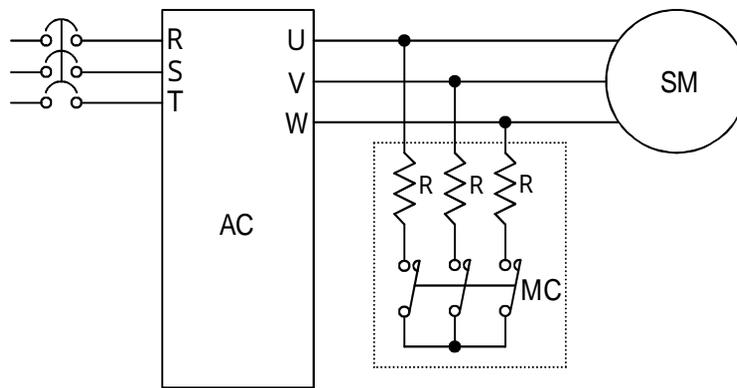


2.21

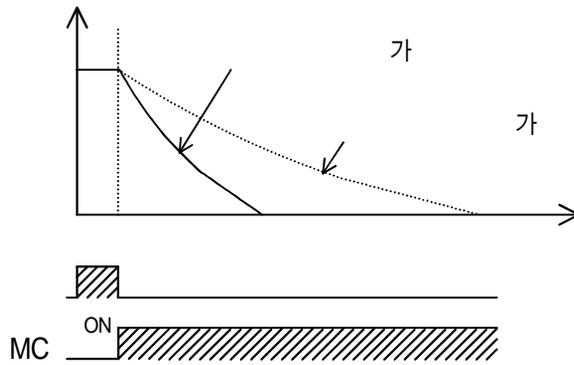
(P-N)

2.5 AC

(想定)
 , - 가 . -
 , ~ 10 . ,
 가 2.22 .
 가 - , ,
 , . 가 .
 가 , .



2.22



2.23

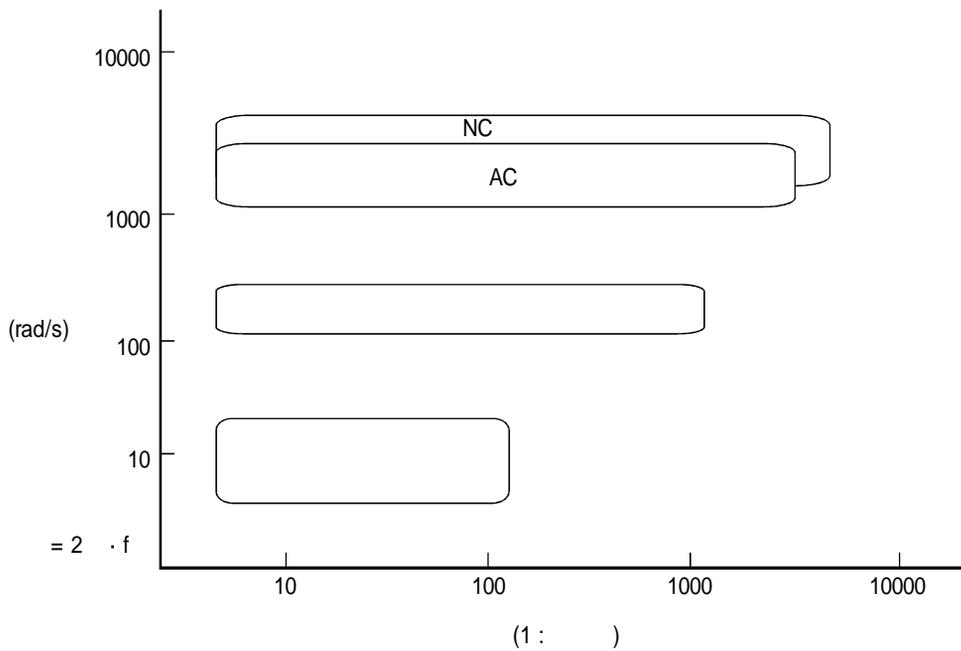
2.

2. 6

2.6.1

2.2

			AC
	100W~280kW	1.5~250kW	10W~55kW
()	1 : 10 ~1 : 20~120	1 : 1000 ~1 : 1500	1 : 1000 ~1 : 5000
(%)	3~4% (1%)	0.03% (0~100%)	0.03% (0~100%)
	1~5Hz	30~50Hz	200~550Hz
	15 /	100 /	150 /
	1~5mm	10 μm~100 μm	1 μm~10 μm
	() 가	(0~)	(0~)
	()	(PLG)	
()	FR - E500 FR - A024 FR - A500 FR - F500 FR - S500	FR - V200 MT - V200	MR - C MR - J2 - 03A5 MR - J2S MR - J3



2.24

2.

2.6.2

가

(1)

2.3

	<ul style="list-style-type: none"> 가 가 	<ul style="list-style-type: none"> 가
()	<ul style="list-style-type: none"> MR - C MR - J2S 	<ul style="list-style-type: none"> MR - J2 - Jr MR - J3
		<ul style="list-style-type: none"> MR - SA

(2)

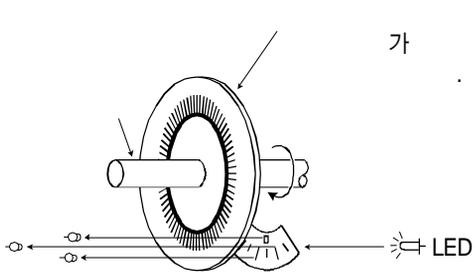
가

2 가

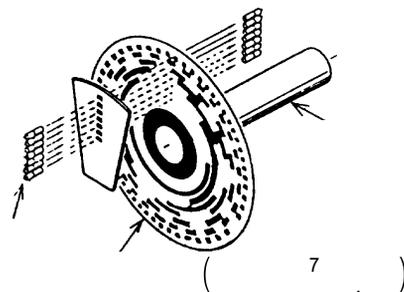
2.4

<ul style="list-style-type: none"> 가. 가 가 	<ul style="list-style-type: none"> 1 가 가.
--	--

(3)



2.25



2.26

2.

2.6.3

, AC

가

3

(1)

3~5%

1%

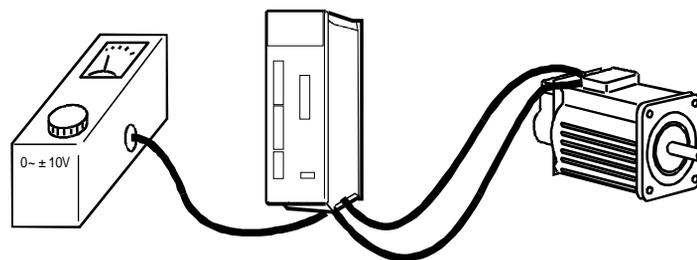
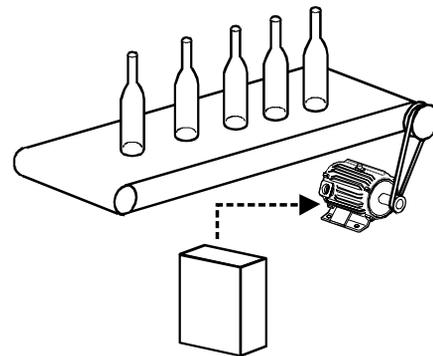
, TG(

가

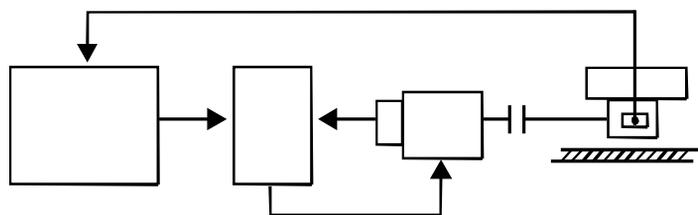
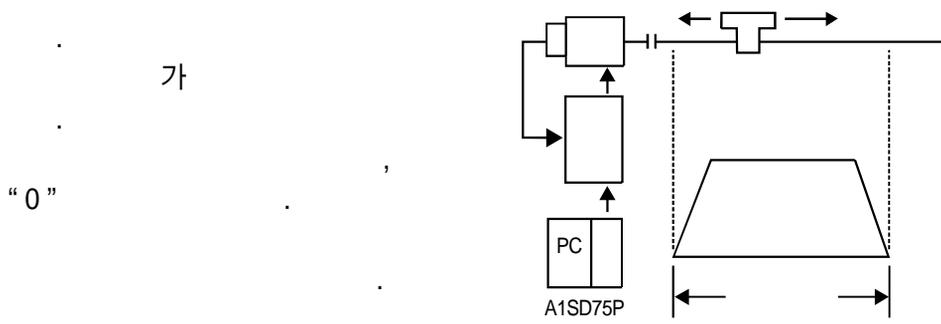
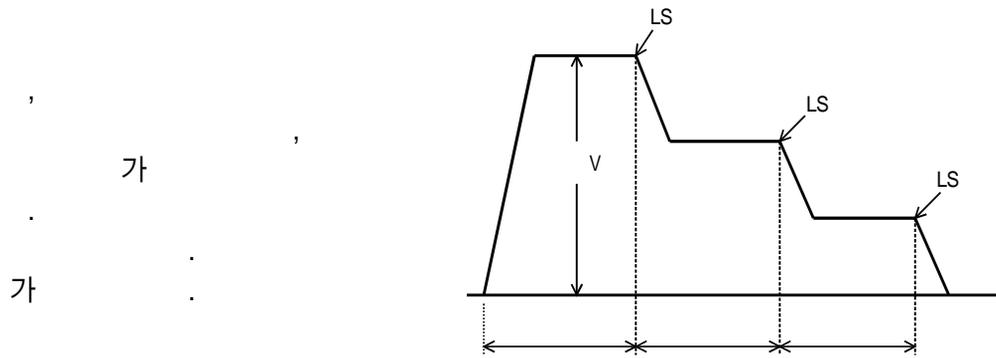
175r/min~1750r/min(1 : 10~1 : 1000)

(,)

가



(2)

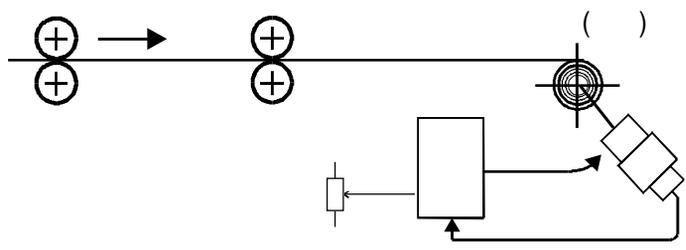


(3)

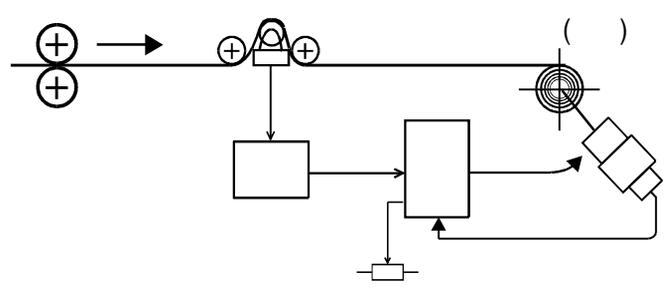
, 가 ()
 가
 () , 가
 , 0,
 , 가
 , 가
 , 가

(), ()

가 () 가



가 (,) (), ()

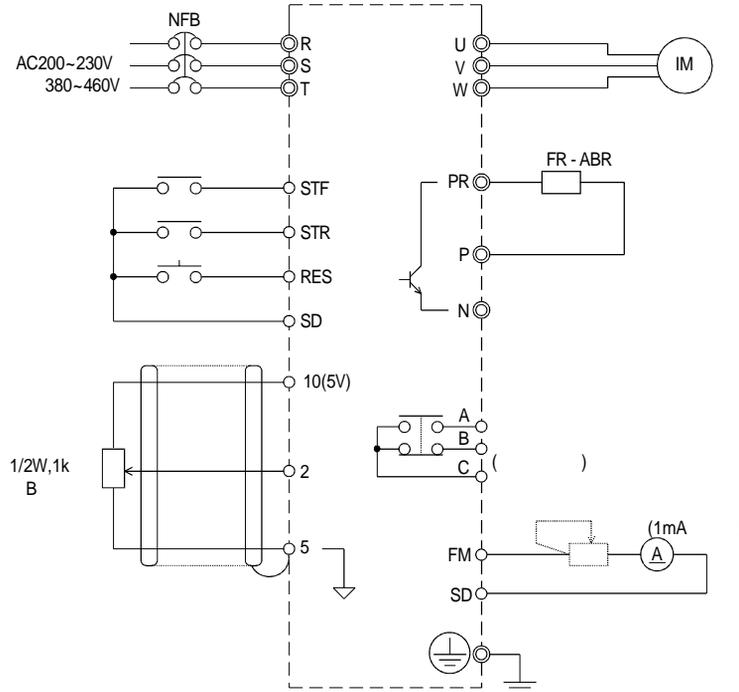


3.

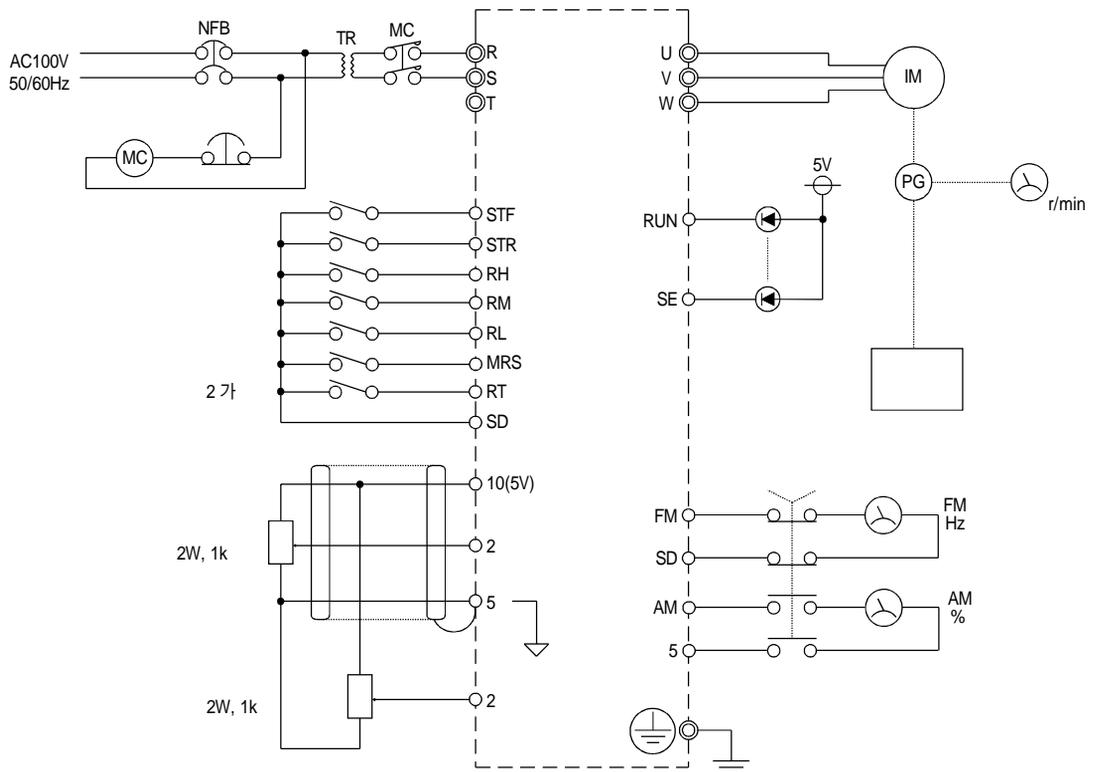
3.1 (FR - A520)

3.1.1

(1) FR - A520



(2)



3.

3.1.2

(1)

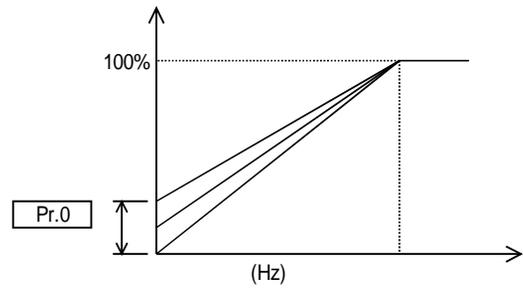
			(7.5kW)
0			6/4/3/2%
1			120Hz
2			0Hz
3			60Hz
4	3 ()		60Hz
5	3 ()		30Hz
6	3 ()		10Hz
7	가	가	5
8		0	5
9			

가

() Pr. 「 (Parameter)」

Pr0
V/F

가 ,
가 ,
가

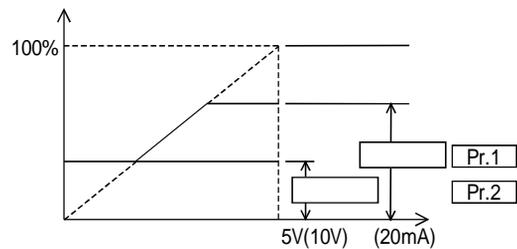


가

Pr1 , Pr2

가

Pr1 : 120Hz
Pr2 : 0Hz

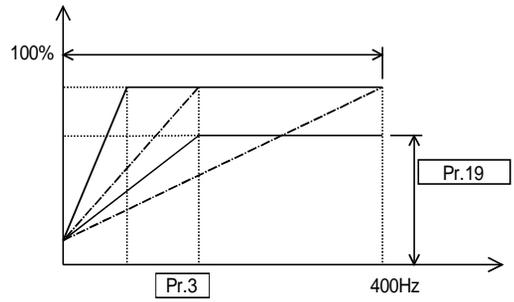


3.

Pr3

Pr3 : 60Hz

60Hz



Pr.19 「9999」()

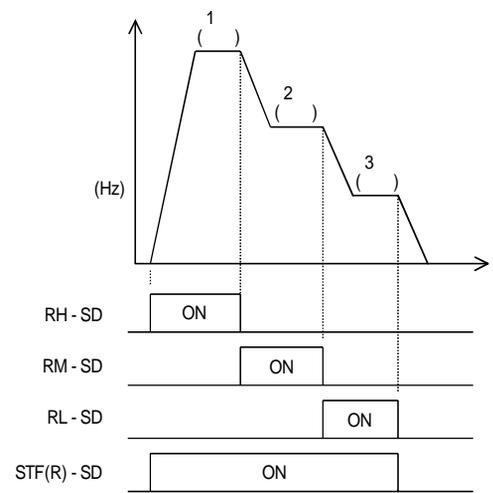
Pr4, Pr5, Pr6 3

3

Pr4 : 60Hz ()

Pr5 : 30Hz ()

Pr6 : 10Hz ()

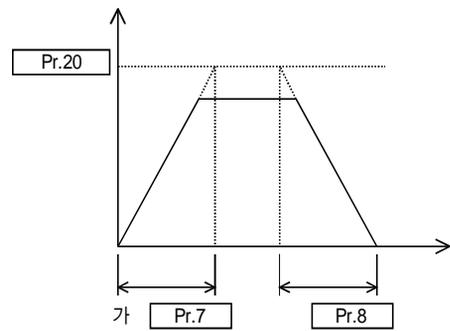


Pr7 가 , Pr8

가

Pr7 : 5

Pr8 : 5



Pr9

50Hz

3.

(2)



(PU)

PU ,PU

SET

< >

No.

< >

No.

1

READ

1 f

120Hz

0~120

1 f

120Hz

60

0~120

6 0

WRITE

1 f

60Hz

0~120

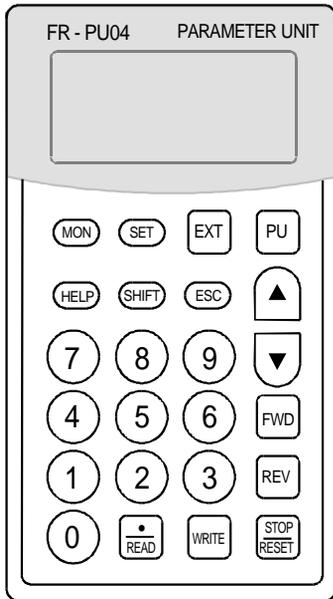
120 60

3.

3.1.3

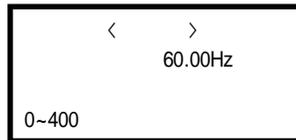
PU (PU)

(1) (PU)



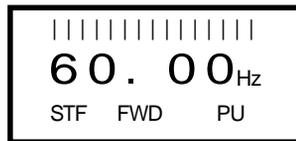
PU ,PU

6 0 WRITE



FWD

REV



PU

WRITE

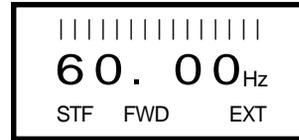
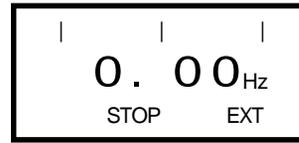
STOP
RESET

,PU

3.

(2)

(60Hz)
“ ” ON
“ ” OFF



“ ” 가 , ()

“ ” “ ” ON/OFF

가

Pr7, Pr8 가

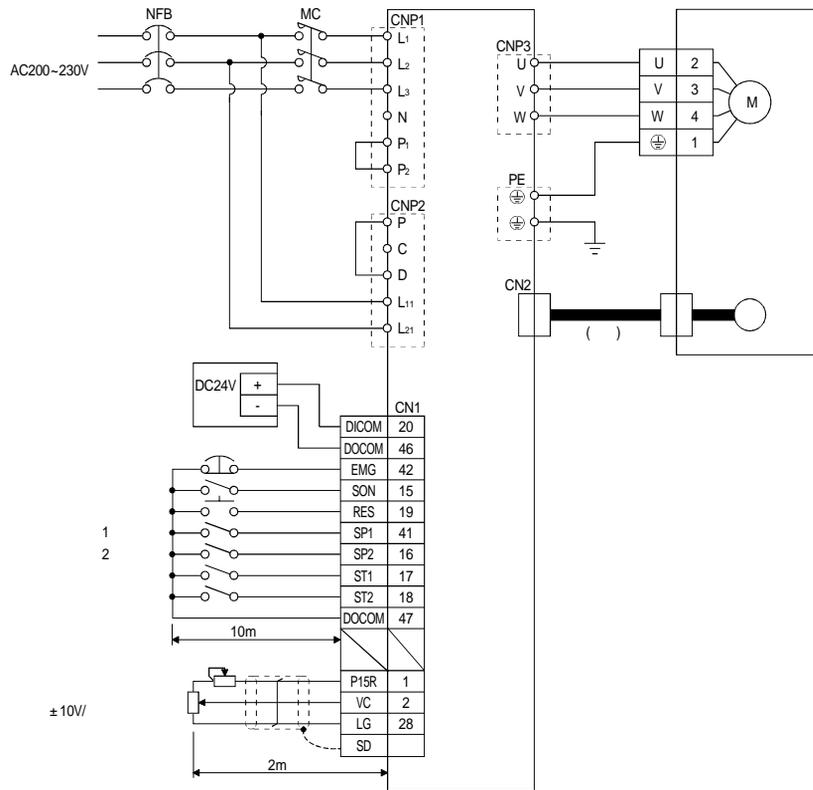
가 ,

3.

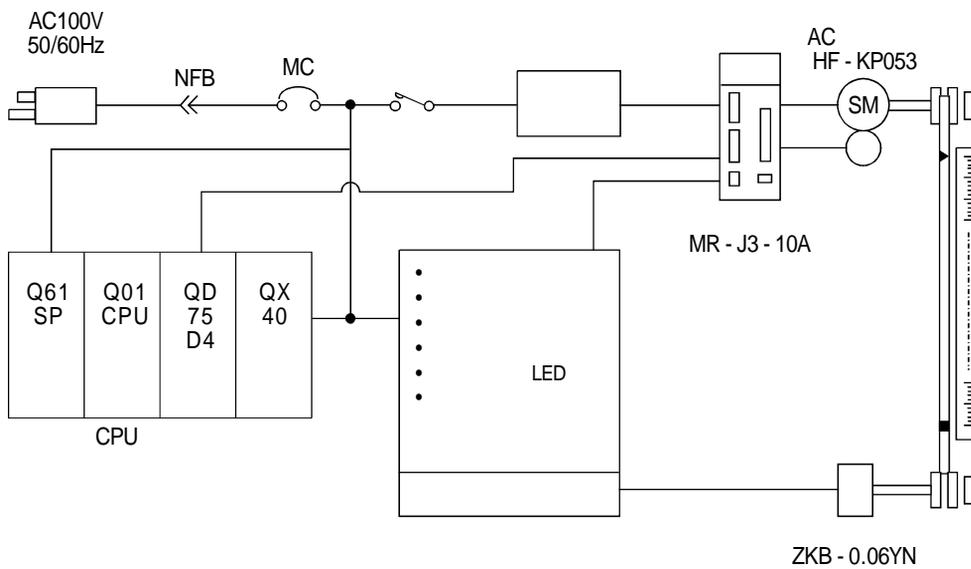
3.2 AC (MR - J3 - A)

3.2.1

(1) MR-J3-A



(2)



3.

3.2.2

⚠ 주의 가

MR - J3 - A

(No.PA)	
(No.PB)	
(No.PC)	
(No.PD)	

, * 가
OFF ,

No.							
PA01	*STY			0000h			
PA02	*REG			0000h			
PA03	*ABS			0000h			
PA05	*FBP	1		0			
PA06	CMX	()		1			
PA07	CDV	()		1			
PA08	ATU			0001h			
PA09	RSP			12			
PA19	*BLK			000Bh			
PC01	STA	가		0	ms		
PC02	STB			0	ms		
PC05	SC1	1		100	r/min		
		1					
PC06	SC2	2		500	r/min		
		2					
PC07	SC3	3		1000	r/min		
		3					

(1) No.PA19 ()

가 No. PA19 , , 가

No. PA19 , .

3.

No.PA19		No.PA	No.PB	No.PC	No.PD
0000h					
000Bh ()					
000Ch					
100Bh		No.PA19			
100Ch		No.PA19			

(2) No.PA01 ()

파라미터 No.PA01

0	0	0	
---	---	---	--

- 0 :
- 1 :
- 2 :
- 3 :
- 4 :
- 5 :

(3) No.PA02 ()

	가	(AL.37)
--	---	---------

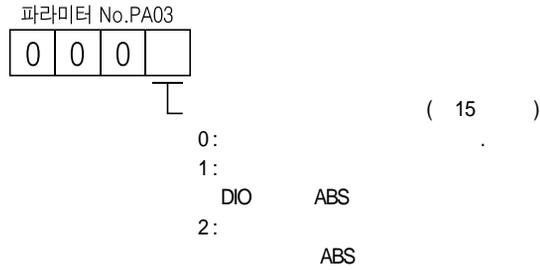
파라미터 No.PA02

0	0		
---	---	--	--

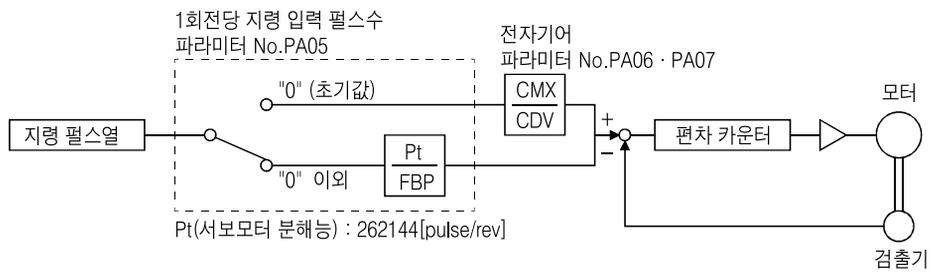
- 00 :
 - MR-J3-10A
 - MR-J3-20A 700A
 - MR-J3-11KA(4)
- 01 : FR-BU(-H) · FR-RC(-H) · FR-CV(-H)
- 02 : MR-RB032
- 03 : MR-RB12
- 04 : MR-RB32
- 05 : MR-RB30
- 06 : MR-RB50
- 08 : MR-RB31
- 09 : MR-RB51
- FA : MR-J3-11KA(4)

3.

(4) No.PA03 ()



(5) No.PA05 (1)
No.PA05 “0” () (No.PA06 · No.PA07)가
“0” 1 가
가



No.PA05	
0	(No.PA06 · No.PA07)가
1000 ~ 50000	1 [pulse]

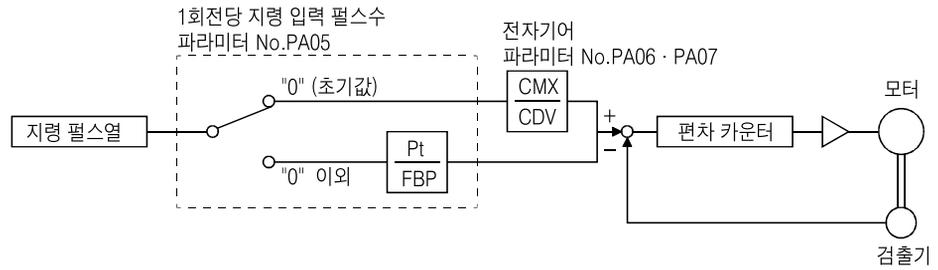
(6) No.PA06 · PA07 ()

⚠ 주의

$\frac{1}{10} < \frac{CMX}{CDV} < 2000$
가 ,가 가 가
가 OFF

3.

(a)

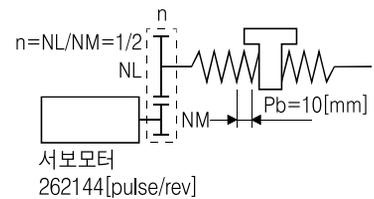


$$\frac{CMX}{CDV} = \frac{No.PA06}{No.PA07}$$

		가
Pb :		[mm]
n :		
Pt :		[pulse/rev]
o :	1	[mm/pulse]
S :	1	[mm/rev]
o :	1	[%pulse]
:	1	[%rev]

1 10 μ m

: Pb = 10[mm]
 : n = 1/2
 : Pt = 262144[pulse/rev]



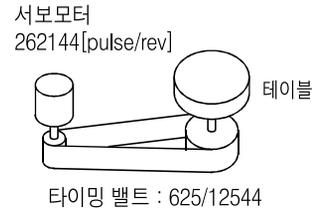
$$\frac{CMX}{CDV} = \frac{Pt}{S} = \frac{Pt}{n \cdot Pb} = 10 \times 10^{-3} \cdot \frac{262144}{1/2 \cdot 10} = \frac{524288}{1000} = \frac{65536}{125}$$

, CMX=65536, CDV=125

3.

1 0.01.

: 360°/rev
 : n = 625/12544
 : Pt = 262144[pulse/rev]



$$\frac{CMX}{CDV} = \dots \cdot \frac{Pt}{625/12544 \cdot 360} = \frac{102760448}{703125} \dots \dots \dots (3.1)$$

CMX가 가 가 .

$$\frac{CMX}{CDV} = \frac{102760448}{703125} = \frac{822083.6}{5625} = \frac{822084}{5625}$$

, CMX=822084, CDV=5625 .

가 가 .

36000pulse

$$36000 \cdot \frac{822084}{5625} \cdot \frac{1}{262144} \cdot \frac{625}{12544} \cdot 360 = 360.00018,$$

(b)

가 가 .
 (1)(b) , CDV 가 , 가 .
 (3.1) .

$$\frac{CMX}{CDV} = \frac{102760488}{7023125} = 146.1481927 \dots \dots \dots (3.2)$$

CMX 가 , .

$$\frac{CMX}{CDV} = \frac{102760488}{7023125} = \frac{917504}{6277.9} = \frac{917504}{62778} = 146.1459063 \dots \dots \dots (3.3)$$

CDV 가 , .

$$\frac{CMX}{CDV} = \frac{102760488}{7023125} = \frac{822083.6}{5625} = \frac{822084}{5625} = 146.1482667 \dots \dots \dots (3.4)$$

, (3.2) (3.4) .
 (6)(a) CMX=822084, CDV=5625 .

3.

(7) No.PA08 · PA09 ()

(a) No.PA08 ()



		No.()
0		PB06 · PB08 · PB09 · PB10
1	1	PB06 · PB07 · PB08 · PB09 · PB10
2	2	PB07 · PB08 · PB09 · PB10
3		

()

No.	
PB06	
PB07	
PB08	
PB09	
PB10	

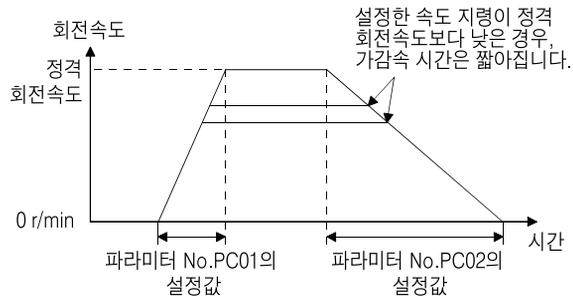
(b) No.PA09 ()

가

		[Hz]			[Hz]
1	↑ ↓	10.0	17	↑ ↓	67.1
2		11.3	18		75.6
3		12.7	19		85.2
4		14.3	20		95.9
5		16.1	21		108.0
6		18.1	22		121.7
7		20.4	23		137.1
8		23.0	24		154.4
9		25.9	25		173.9
10		29.2	26		195.9
11		32.9	27		220.6
12		37.0	28		248.5
13		41.7	29		279.9
14		47.0	30		315.3
15		52.9	31		355.1
16		59.6	32		400.0

3.

(8) No.PC01 · PC02 (가 .)
 1~3 0r/min 가
 .(: 0ms, : 0~50000ms)



, 가 3000r/min , 0r/min 1000r/min 1s 가
 3000(3s) .

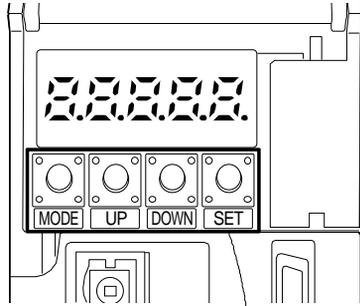
(9) No.PC05 · PC06 · PC07 (1 · 2 · 3, 1 · 2 · 3)

No.	()	()		
PC05	1	1	100r/min	0~
PC06	2	2	500r/min	
PC07	3	3	1000r/min	

3.

3.2.3

MR - J3



MODE	Low/High
UP	.
DOWN	.
SET	.

No.PA01

OFF, ON

UP

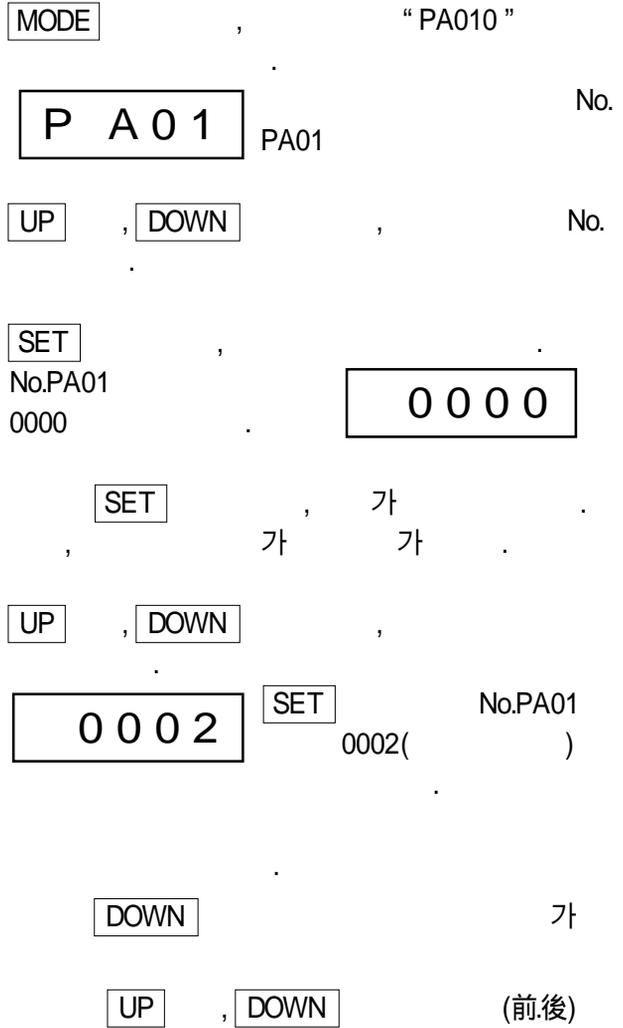
DOWN

가

UP

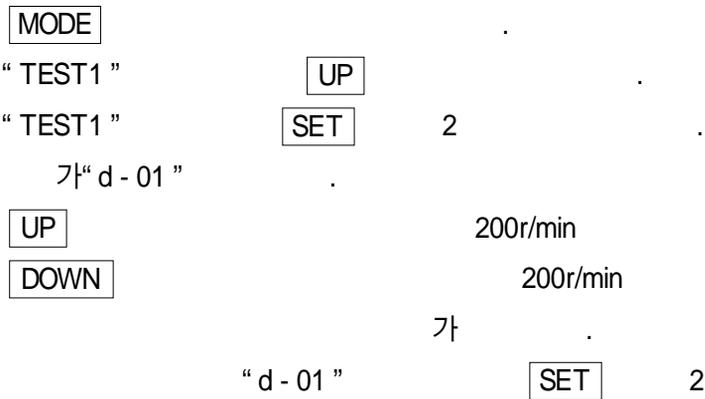
DOWN

(前後)



3.2.4

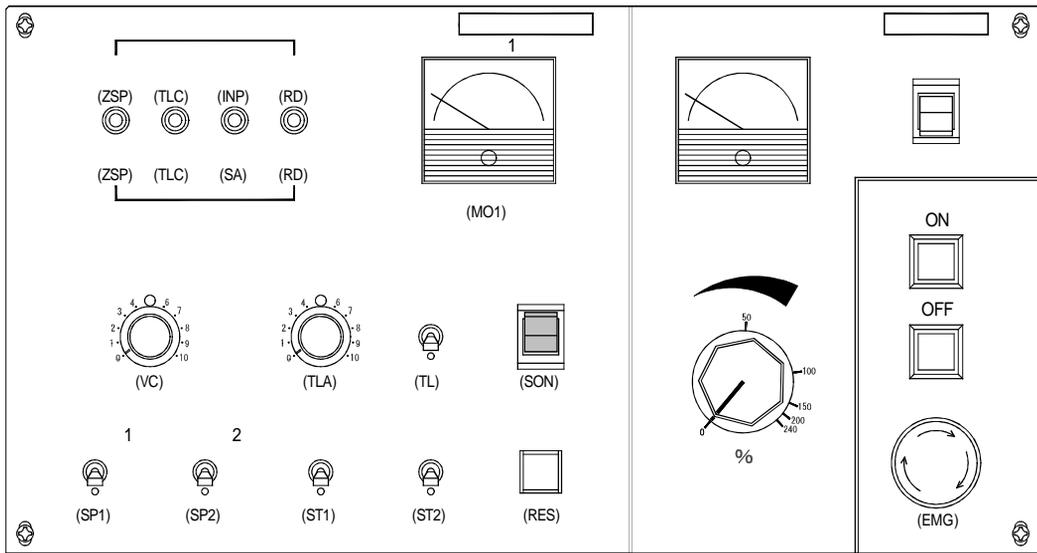
(1) JOG



3.

(2)

No.Pr01 " 0002 "
 OFF/ON
 OFF
 ON



1

1 " 1 " ON , " " ON

" " OFF, " " ON

" 1 " 2 " 3

1	ON	OFF	ON
2	OFF	ON	ON
	1 ()	2 ()	3 ()
	No.PC05	No.PC06	No.PC07

No.PC05~PC07

No.PC01(가), No.PC02() 가 ,

" 1 " 2 " OFF 0~10V

1

OFF
 (AL.10) , 가

4.

4.1

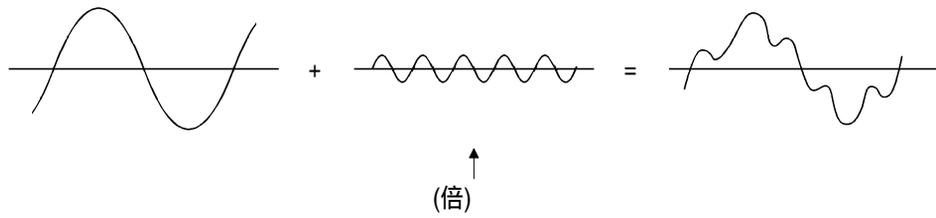
4.1.1

(1)

(a)

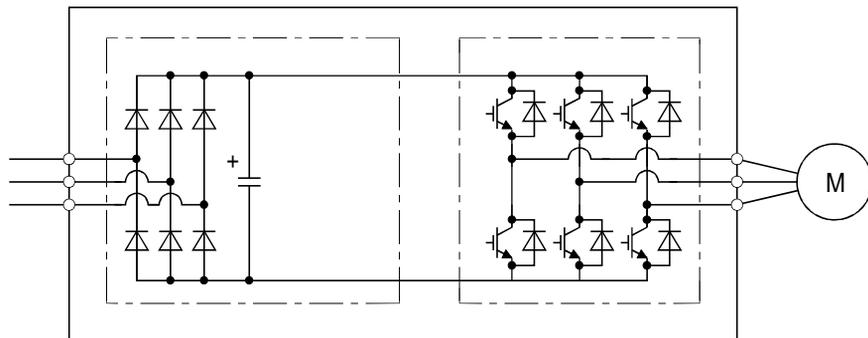
가
()

가 , ,
가 , , 가



(b)

가



(c)

가

(1)

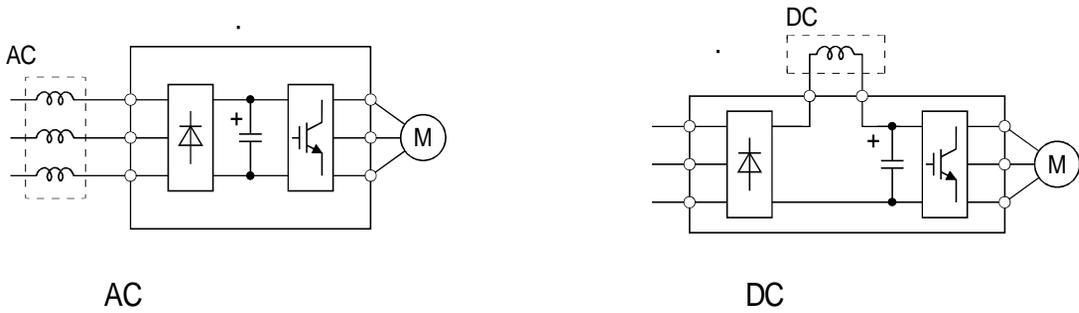
(2)

4.

(2)

100V		1994 9 () () 가 가 . ' . (()) •r 가 •r 가 JEM - TR225 - 2003
200V		
200V		
400V		

(3)



가 가 , ,

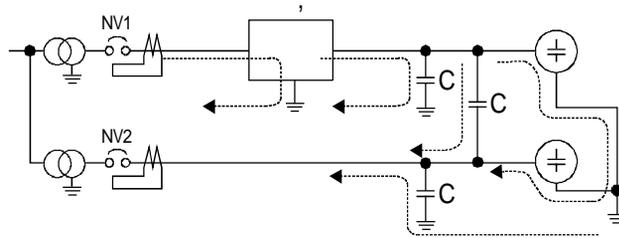
4.

4.1.2

가 (浮游) C , (浮游) C가 , (浮游) C
 , , 가 가 .

(1)

,
 ,
 가 (數帶) 가
 가 .
 가 , 가 가 .
 (線) . (線)
 가 , 가 .



- (, 가)
- (自) (他) .
- (가)
- (浮游) .
- ()

(2)

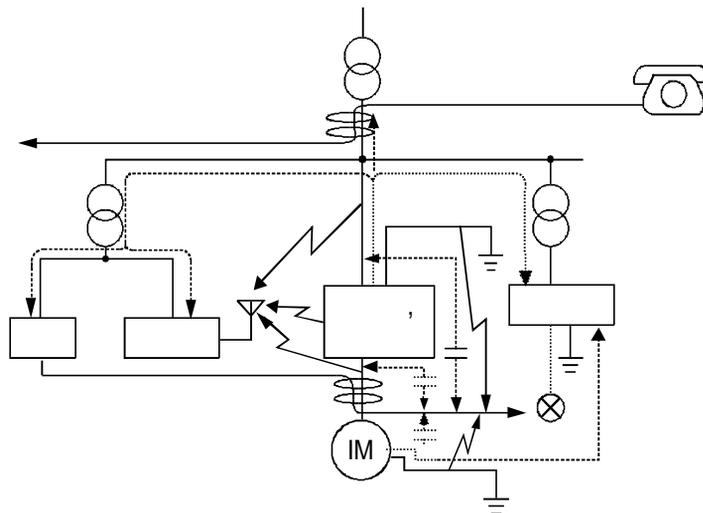
4.

4.1.3

· , PWM (2.3.3)
 · , (源)

() , , 40~50 (次)(2.4~3kHz)
 , 10kHz

(1)



(a). (~) 가
 3

(b). (,) (交鎖)

(c). ()

4.

(d). ()

30MHz

(後者)

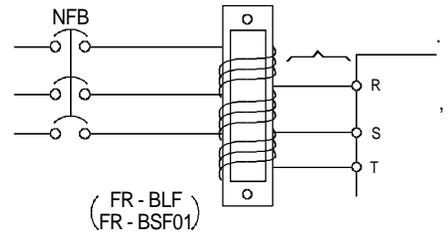
(前者)

(2)

3

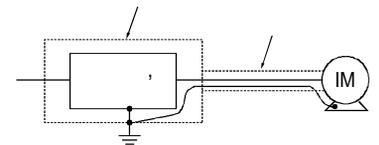
(a)

FR-BIF (200V),
 FR-BIF-H (400V)
 FR-BSF01 ,FR-BLF
 FR-BIF(-H) FR-BLF ,FR-BSF01
 VDE FR-ALF



(b)

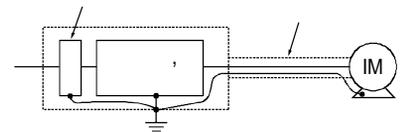
FR-BLF, FR-BSF01



(c)

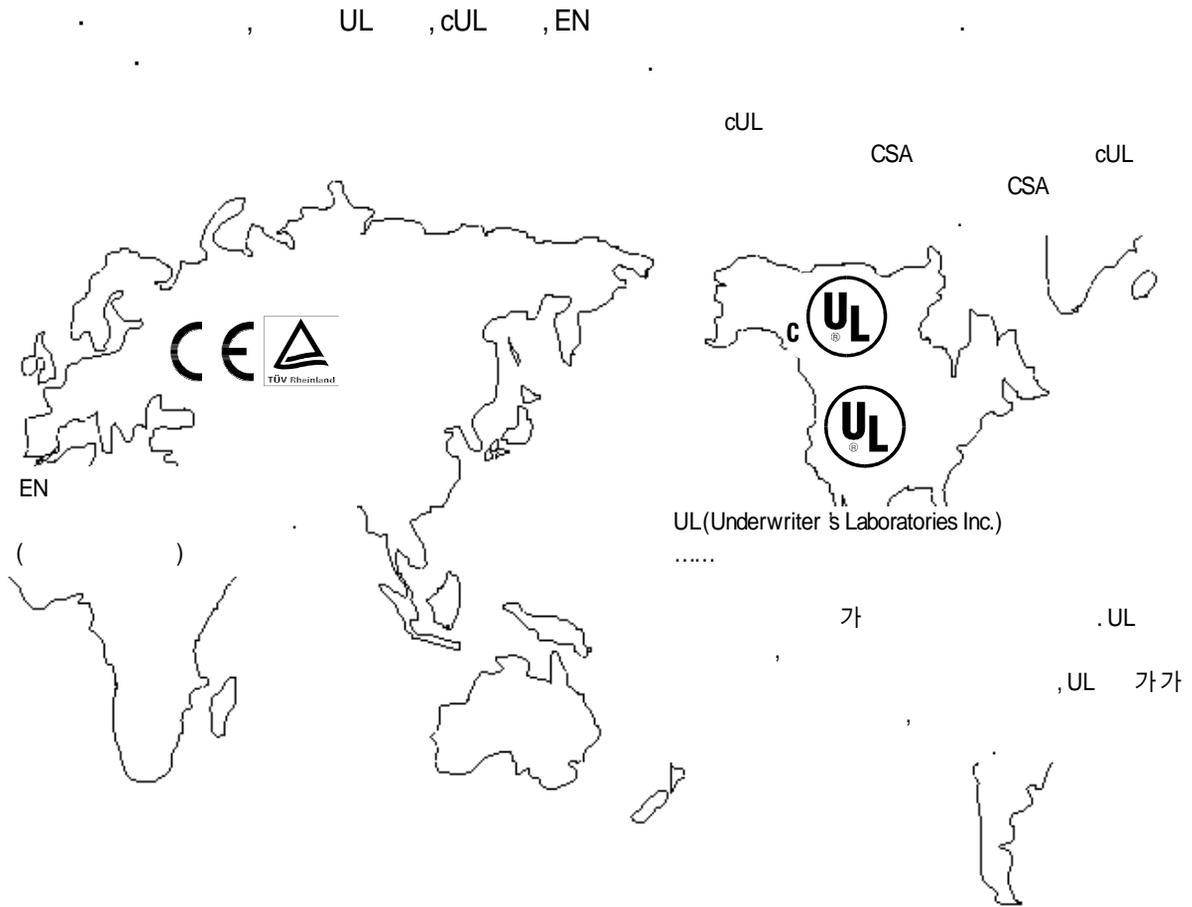
가

가



4.

4.1.4



EN

EC

가 ,CE

3

13

CE

가 가

(1)

가

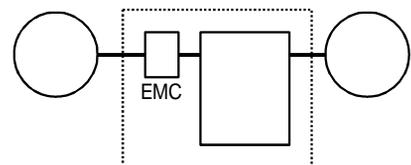
(2) EMC

(EMC

.)

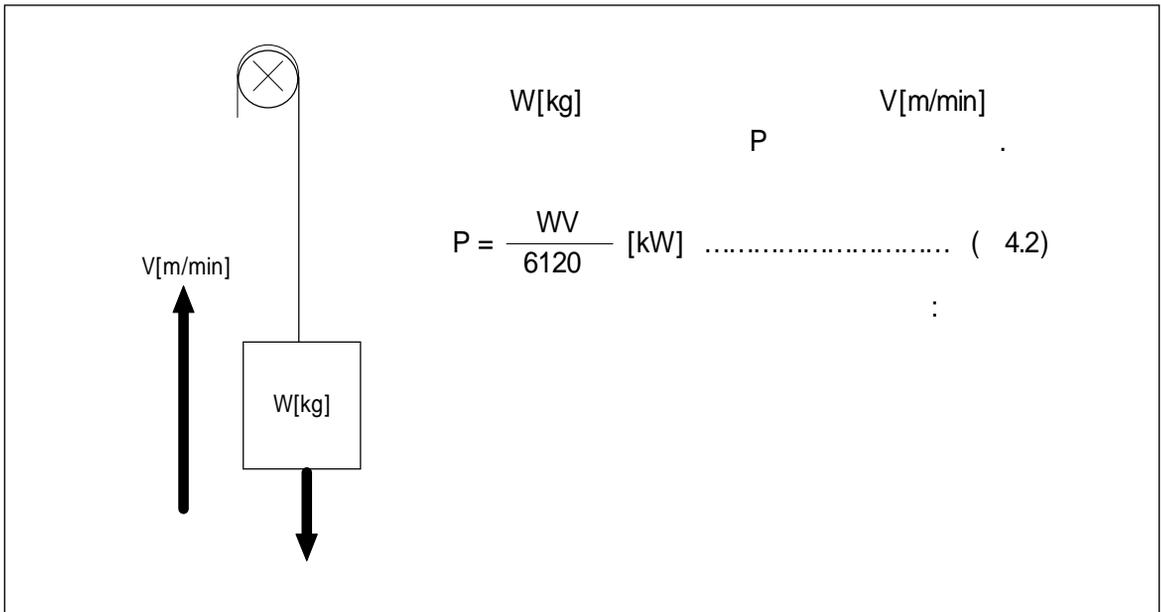
(3)

가



4.

(2)



2

50 kg 60 m/min 0.8 ,

$$P = 50 \times 60 / (6120 \times 0.8)$$

$$= 0.61\text{kW}$$

4.2.3 가 가

,가

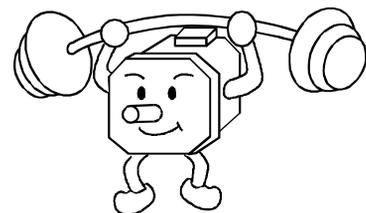
(1)

?

(2)

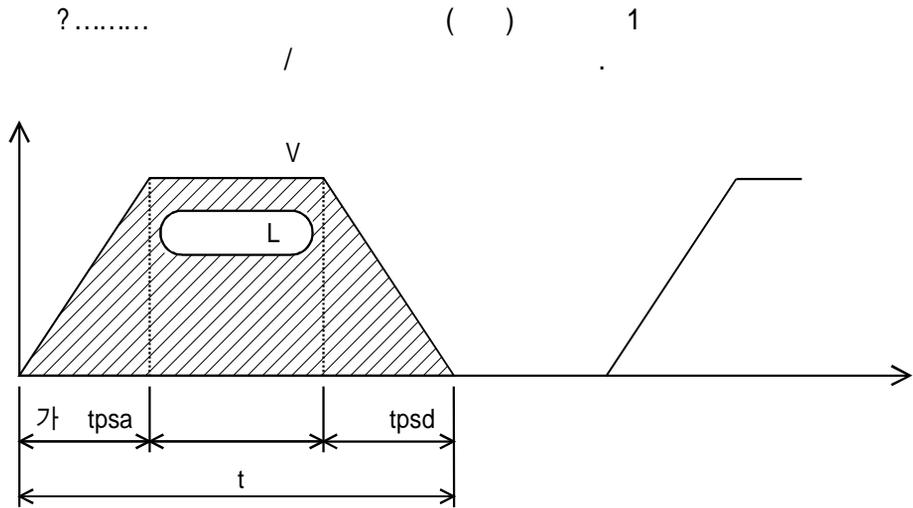
(J)

J ?



4.

(3)



, $V[\text{mm/s}]$, $t[\text{s}]$, 가 , $tpsa[\text{s}]$, $tpsd[\text{s}]$, $L[\text{mm}]$
 , $tpsa=tpsd$

$$L = V [\text{mm/s}] \times (t - tpsa) [\text{mm}] \dots\dots\dots (4.3)$$

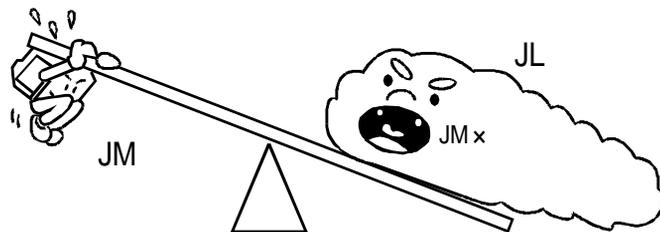
(4)

?..... J
 가



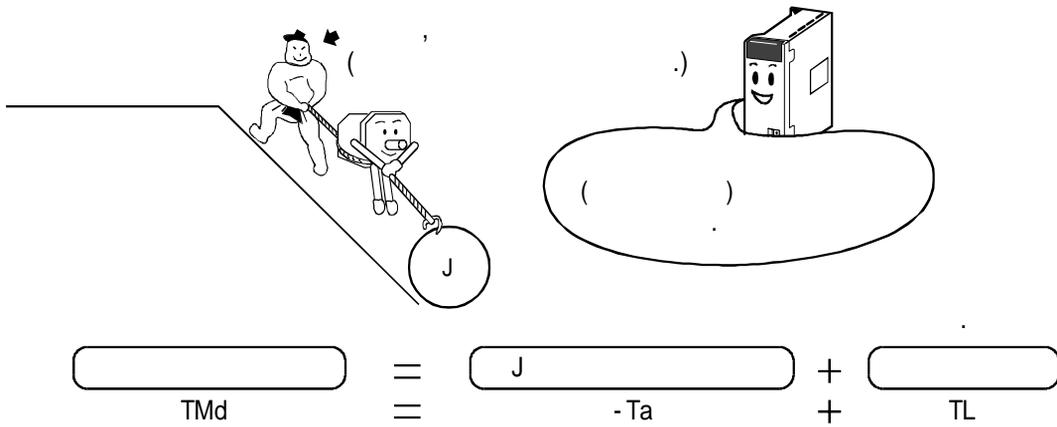
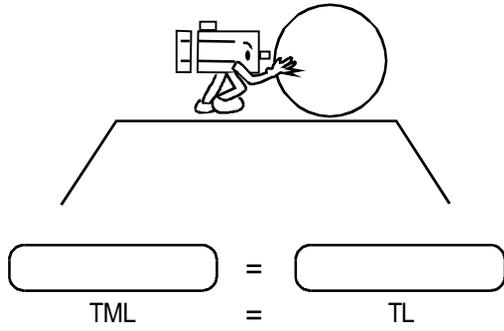
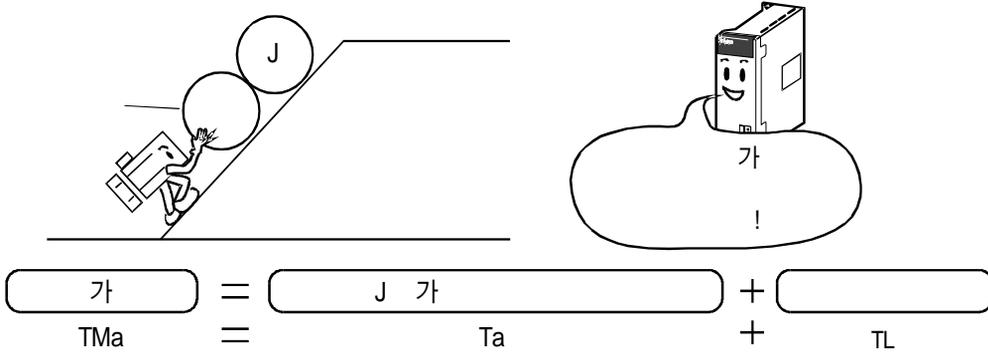
J_L J_M 10

.(; .)



(5)

?..... ,4 .(가)
(가),

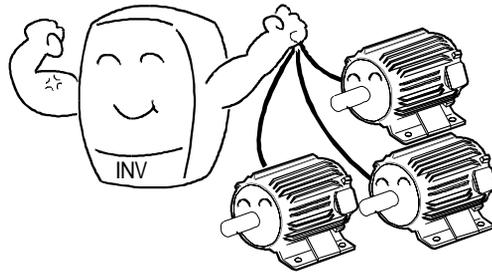


4.

(가) 100% (70~80%)가

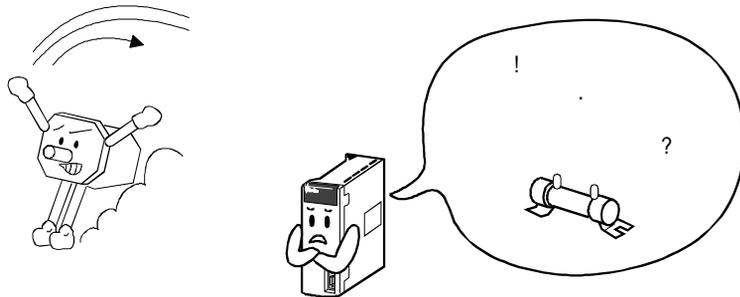
$$(T_{rms}) = \sqrt{\frac{(T_{Ma})^2 \times 가 + (T_L)^2 \times 1 + (T_{Md})^2 \times \dots}{1}} \quad (4.4)$$

() 가 () × (1.05~1.1) 가



(6)

가 () ()

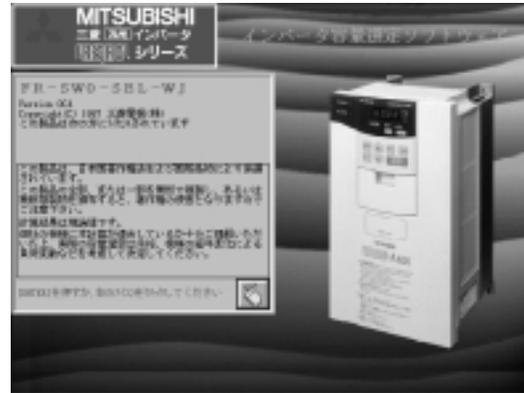


(1)~(6)

4.

4.2.4 PC

(1) (FR-SW0-SEL-WJ)



		(,), & ,
		, , ,
		, , ,
GD ²		, , , (), 5

()

台車 | 部品搬送ライン用

①ファイル ②機械 ③インバータ ④モータ ⑤単位系 ⑥GD2計算

パラ設定

台車質量	WB :	3000 kg
負荷質量	WL :	200 kg
車輪質量	WW :	100 kg
車輪径	DW :	0.5 m
駆動車輪数	Z :	4
減速比	i (=1/n) :	0.1
減速機GD2 (モータ軸換算値)	GDG :	0.05 kg.m ²
機械効率	η :	0.7
摩擦係数	μ :	0.1
最大摩擦係数	μmax :	0.15
高速移動速度	Vmax :	50 m/min
高速回転速度 (モータ軸換算値)	Nmax :	1800 r/min
その他のモータ軸換算値GD2	GD20 :	0 kg.m ²

減速機 モータ

DW WW WL WB

運転パターン選択

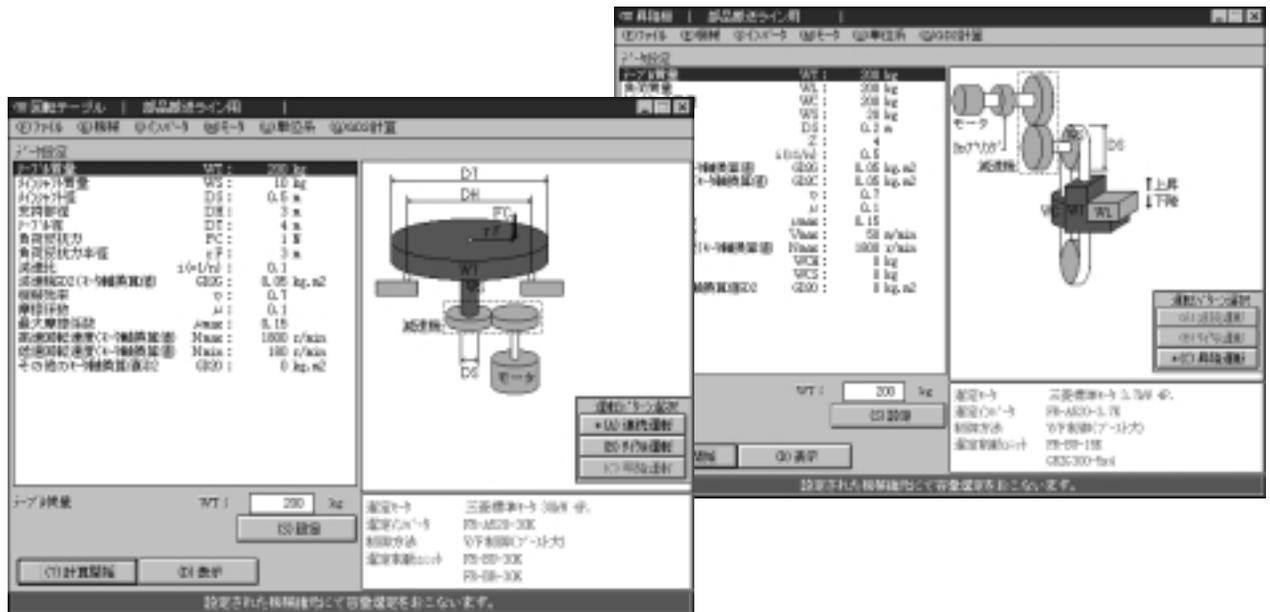
- * (A) 連続運転
- (B) 停止運転
- (C) 昇降運転

台車質量 WB : 3000 kg (S) 設定

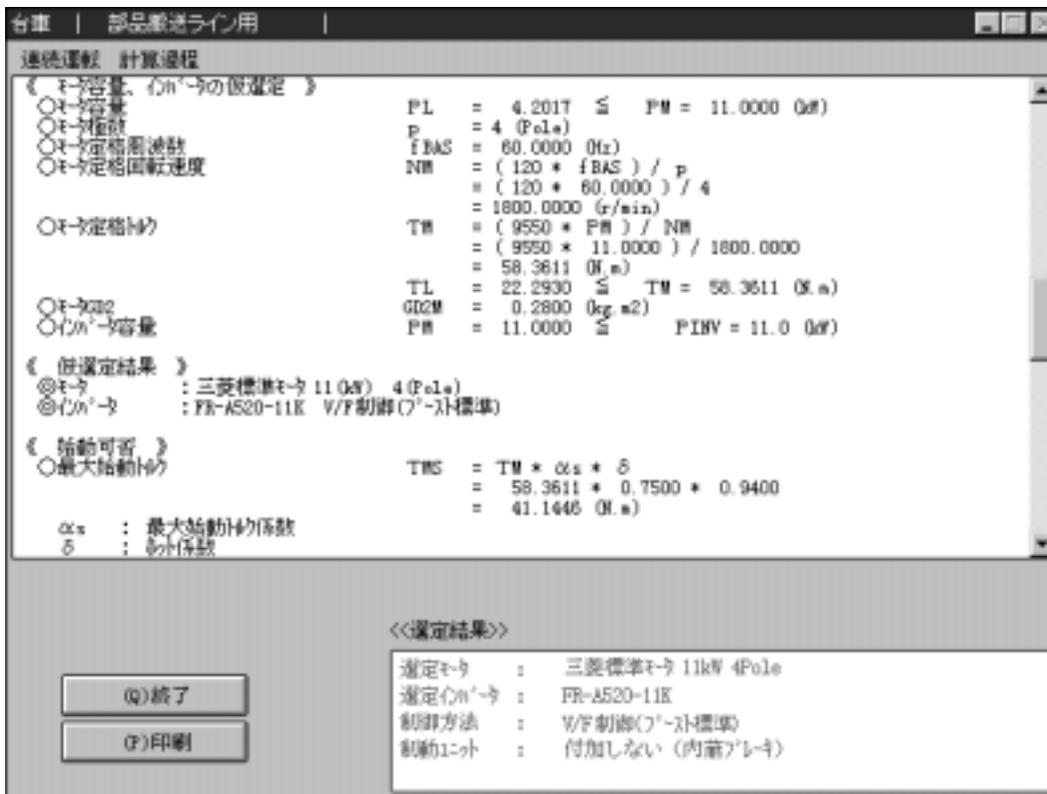
(?) 計算開始 (D) 表示

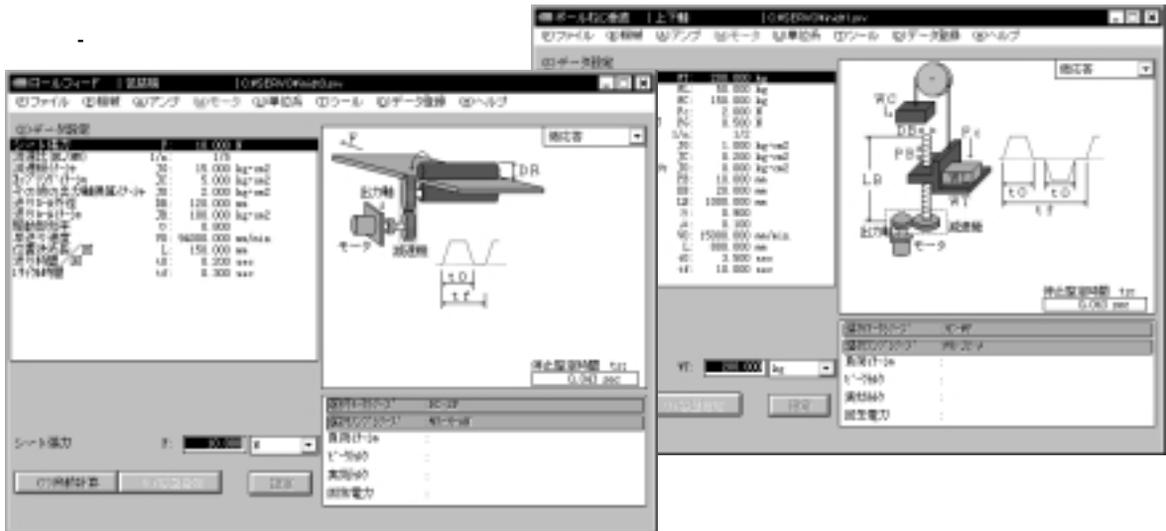
選定モータ 三菱標準モータ 11kW 4P.
選定インバータ FR-A520-11K
制御方法 V/F制御(フット標準)
選定制動コイル 付加しない(内蔵ブレーキ)

設定された機械諸元にて容量判定をおこないます。

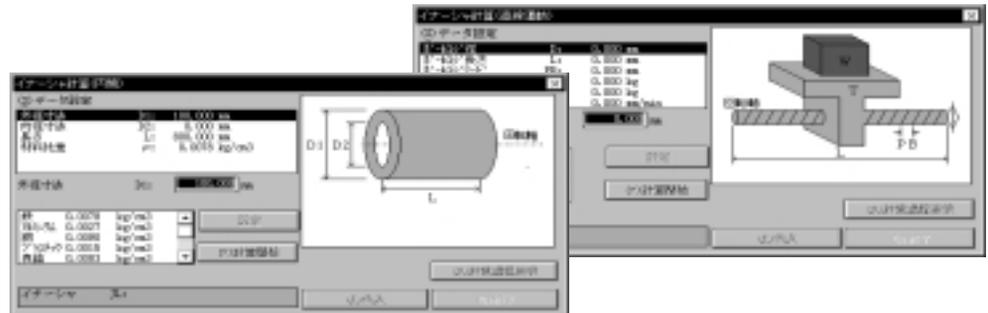


が





()



が

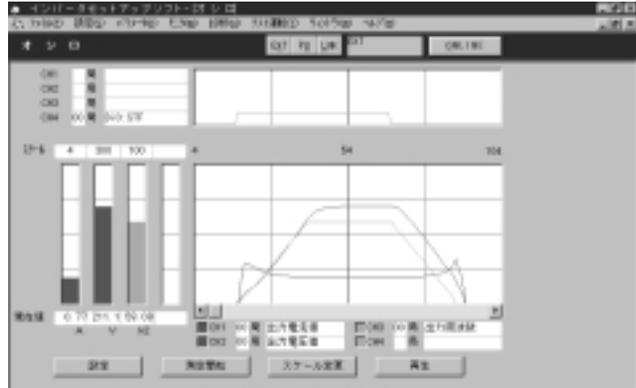


4.

4.2.5

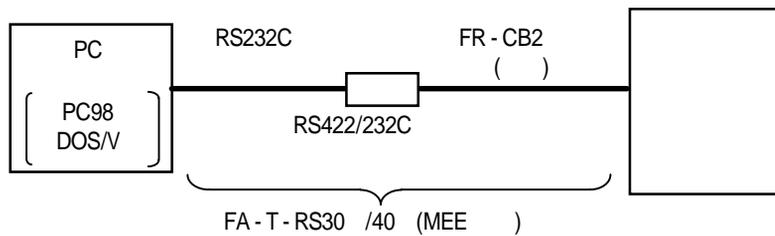
(1) (FR-SWO-SETUP-WJ)

PC , PC
 , PC
 () , 가



- FREQROL - A500
- FREQROL - E500
- FREQROL - F500
- FREQROL - S500

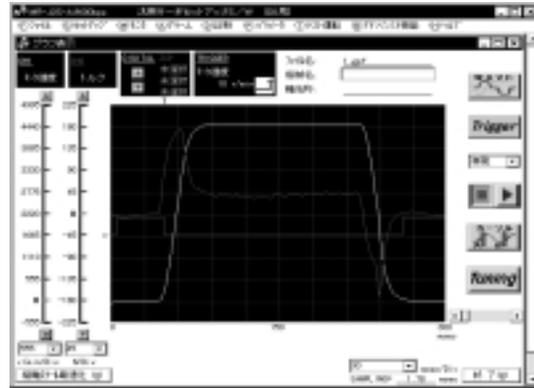
- : , ,
- : ,
- : ,
- : ,
- : ,
- : ,



4.

(2) MR-Configurator(MRZJW3 - SETUP2 1)

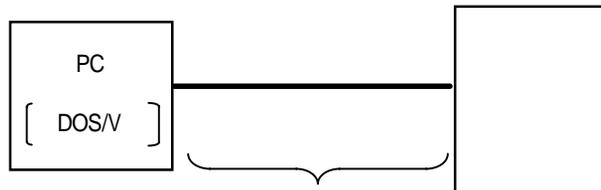
AC PC ,
 PC , PC , ()
 , 가 .



AC

MR-Configurator		
MRZJW3 - SETUP 1	<ul style="list-style-type: none"> • MR - C • MR - J2 - 03A5 	<ul style="list-style-type: none"> • •
MRZJW3 - SETUP1 1	<ul style="list-style-type: none"> • MR - J2S 	<ul style="list-style-type: none"> •
MRZJW3 - SETUP2 1	<ul style="list-style-type: none"> • MR - J3 	<ul style="list-style-type: none"> •

- : , ,
- : ,
- : DI/DO ,
- : ,
- : JOG , ,
- : , ,
- : (MRZJW3 - SETUP1 1/2 1)



DOS/V : MR - J3USBCBL3M(MR - J3 - A)
 MR - CPCATCBL3M(MR - C, MR - J2S - A)
 MR - JRPCATCBL3M(MR - J2 - 03A5)

.MR - C , RS - 232C (MR - C - T01) .

4.

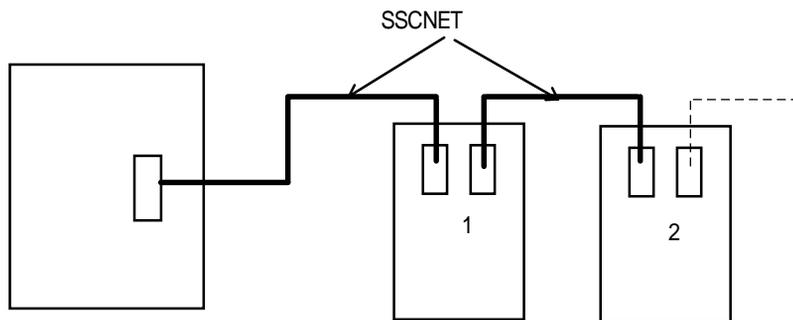
4.2.6 SSCNET

AC (A171SHCPU, A172SHCPU, A173UHCPU, A273UHCPU),
(A1SD75M /AD75M) SSCNET
.SSCNET , , .

(1)

MR - J2 - B			
MR - J2	SSCNET	.	J2
MR - J2S - B			
MR - J2S	SSCNET	.	J2S
MR - J3 - B			
MR - J3	SSCNET	.	J3

(2)

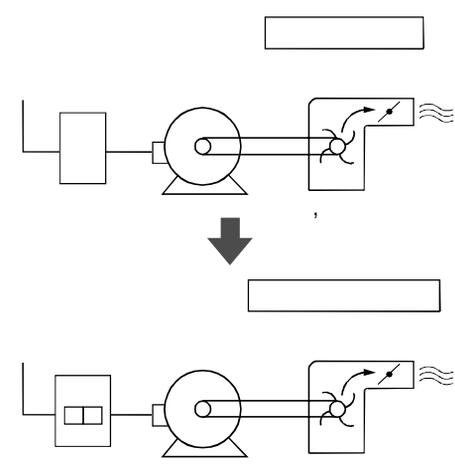
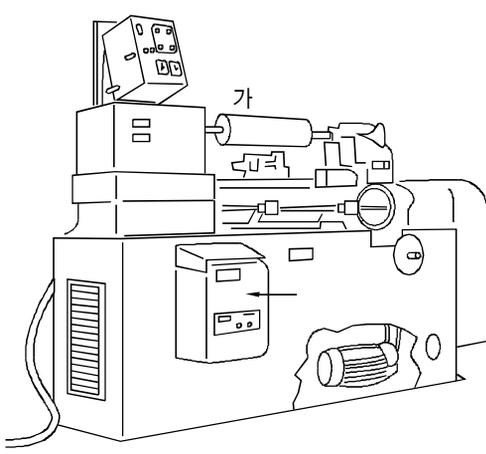
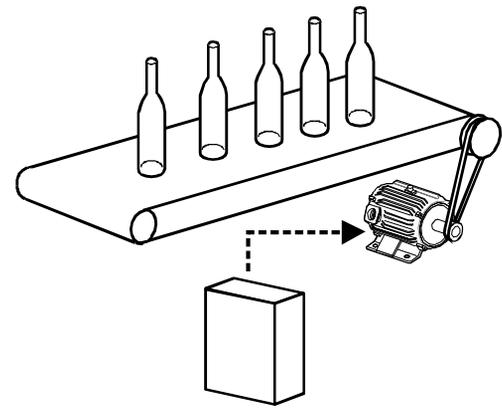


4.

4. 3

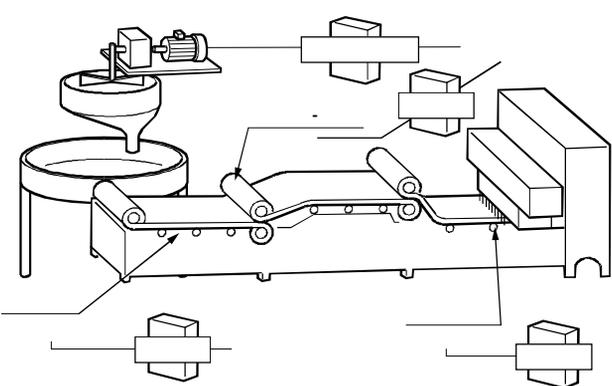
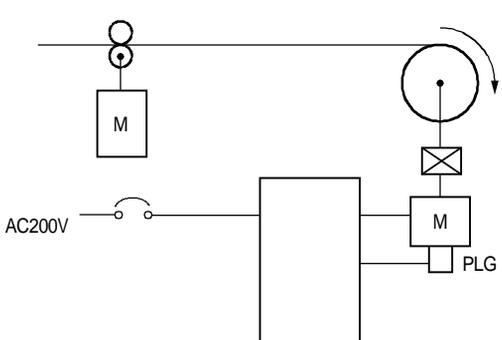
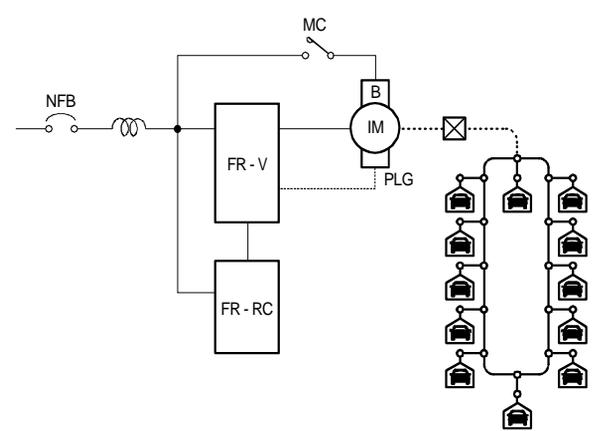
4.3.1

, 가 .

<p>()가 () 가 .</p>	<ul style="list-style-type: none"> • • , • • • () 
<p>가 , 가 가 .</p>	<ul style="list-style-type: none"> • • • • 
<p>가 .</p>	<ul style="list-style-type: none"> • • • • • 

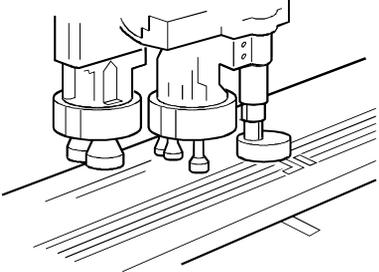
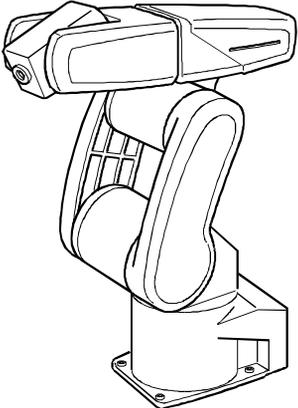
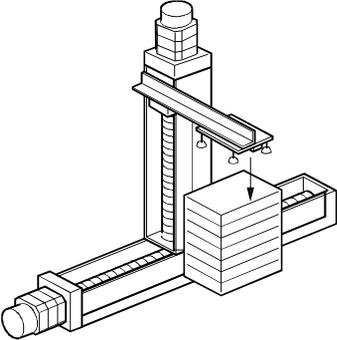
4.

4.3.2

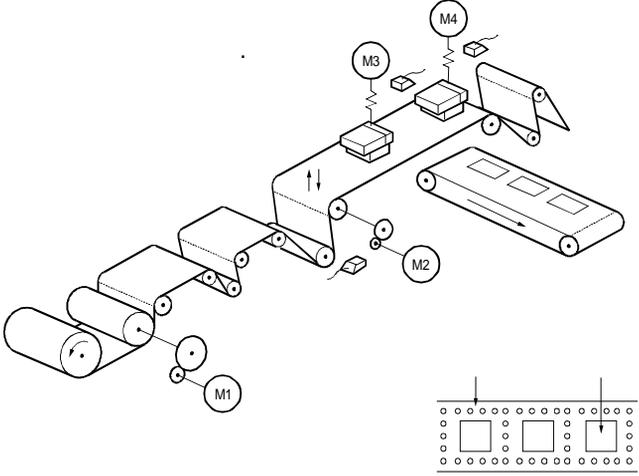
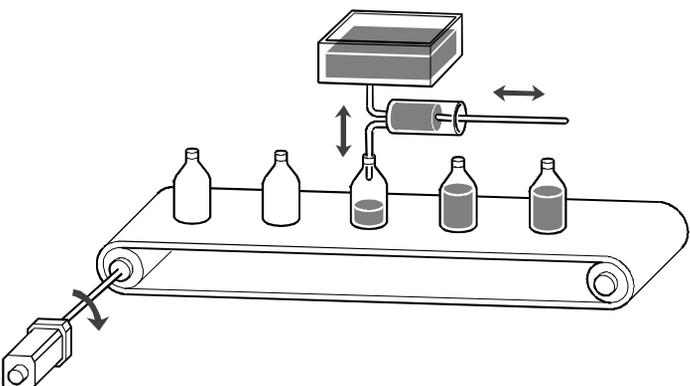
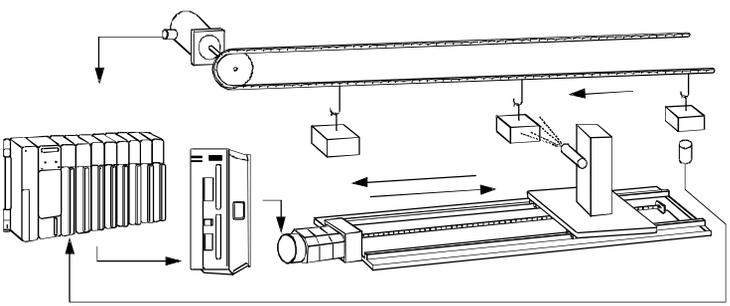
<p>가 가 (가)</p>	<ul style="list-style-type: none"> • • • 
<p>가</p>	<ul style="list-style-type: none"> • • 
<p>가 가 가 FR - RC()</p>	<ul style="list-style-type: none"> • • • • 

4.

4.3.3 AC

	<ul style="list-style-type: none"> • • • • • • 
<p>가가</p>	<ul style="list-style-type: none"> • • LCD • • • • X-Y • • 
<p>가가</p> <p>IP65</p>	<ul style="list-style-type: none"> • • • • • • X-Y • • • 

4.3.4

<p>() () 가 (32 가)</p>	
	<p>(90%) ()</p> 
	

4.

4. 4

4.4.1

AC , 3 , AC .
 , (後) ,
 , 가 . ,

(1)

가 .
 , 가 .
 , 가 가 ,
 가 가 .

(2)

가

		2~3	가
		2~3	
		1~3 (2~3)	
		2~3	
		2~3	
		5000	
		1~3 (2~3)	
		2~3	
		2~3	
	. V	5000	
		1~3 (2~3)	

4.

4.4.2

(靜止)

가

⚠ 주의

가

P-N

DC30V

가

(1)

가

가

가

가

(2)

가.....

()

가

가

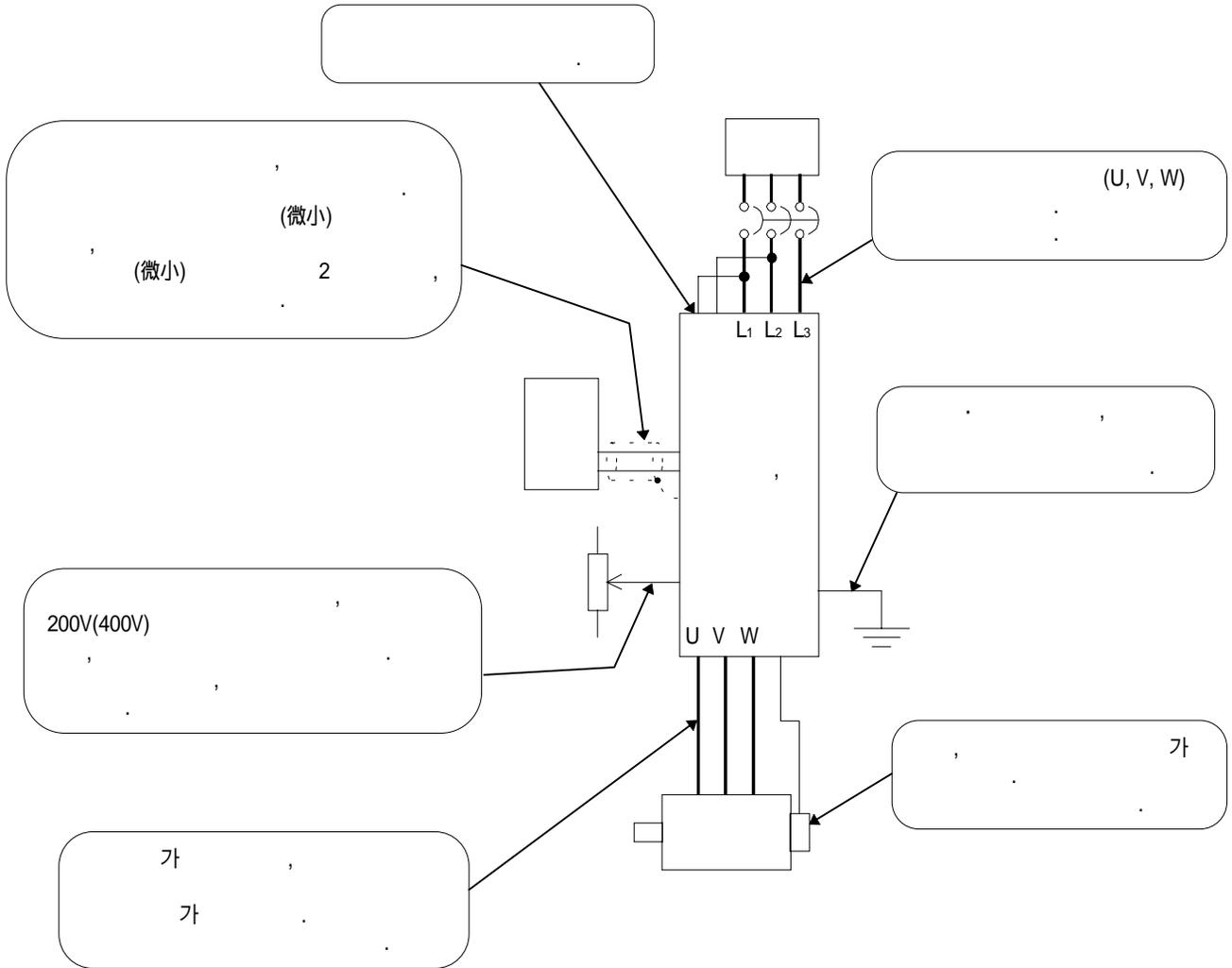
(3)

가

	2~3	가
	5~10	
	5~10	
	-	

4.

4.5.2



1.

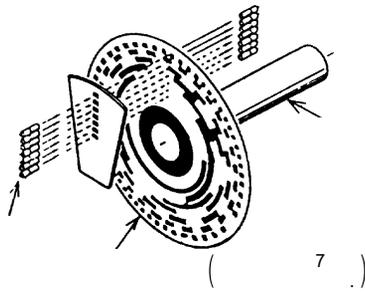
• $\frac{1}{1} < ; >$

• $\frac{1}{1} () < ; >$

,360 8~12

, 1 가

, 7



• $()$

• 1

63%

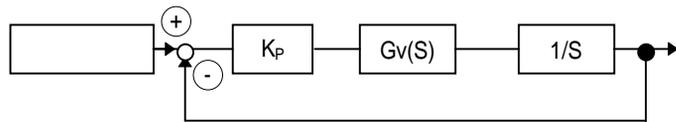
(-3 「가 」)

• $\frac{1}{1}$

Gv(s)

$$= K_p \cdot G_v(s)$$

$$= K_p (1/sec)$$



Gv(s) 1

$K_p = P[\text{rad/sec}]$ 가

• $\frac{1}{-4} < >$

• _____ ()

, () ,
.

• IGBT(Insulated Gate Bipolar Transistor)

, 가 , .

• _____

, , 가 .

• _____

, , 가 ,
가 .

• _____ ()

, , ,
.

• _____ ()

가 (,) , (,) .
가 가 ,

, 가 .

가 .

• _____

가 , , 가

• _____ ()

LSI IC .

• _____ , (,) , 가
가 . , , .

• _____ , , 가 , , .
가 , , .

• _____ , . 가가 ,
가 . 가 .

• _____ , .

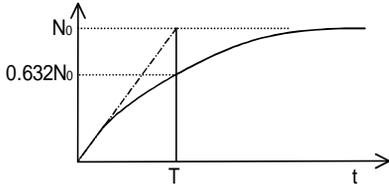
• _____ ()
f[Hz] 2 f[rad/sec] Hz() ()

•가 _____ , .

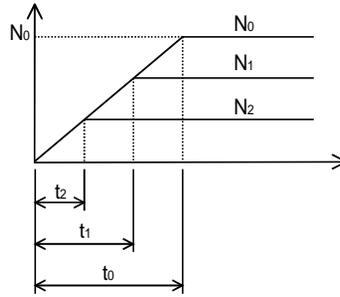
•가

가 (,) 가 ,가

1 가 , 가 63.5%



1 가 가 가



t₀ : 가 =가
 t₁ : N₁ 가
 t₂ : N₂ 가

•가

,가 , 가 [m/s²]

• ()

$$J = m \cdot r^2$$

J : [kg · cm²]

m : [kg]

r : [cm]

GD²가 , , r()

$$2r()$$

$$GD^2 = m \cdot (2r)^2 = 4J$$

가 .

•

가 가 .()

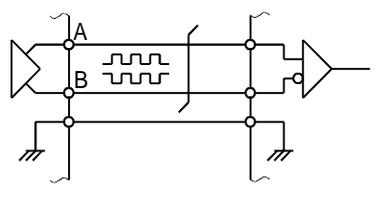
가 .

•

가 , 가 ,

, 가 ,

• _____ , , 가 , ,
 • _____ , , (耐) , IC가 .



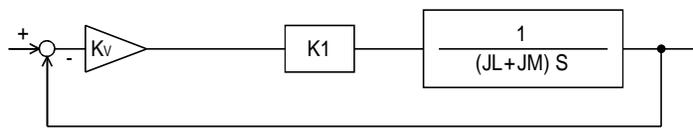
• _____ , ,
 • _____ () , 10r/min , c[rad/sec] , fc[Hz]
 , 가 , ,

• _____ (, 15msec) , ,
 (, 100msec) OFF , 가 .
 15msec , 100msec , 가

•

$$= \frac{\quad - \text{(無)}}{\quad} \times 100 [\%]$$

K1



•

$$= \frac{K1 \times Kv}{JM + JL}$$

Kv :
JL :
JM :

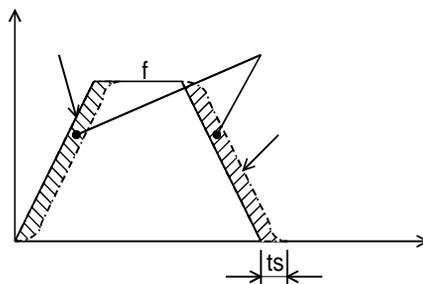
IM

(整定)

가

가

(整定)



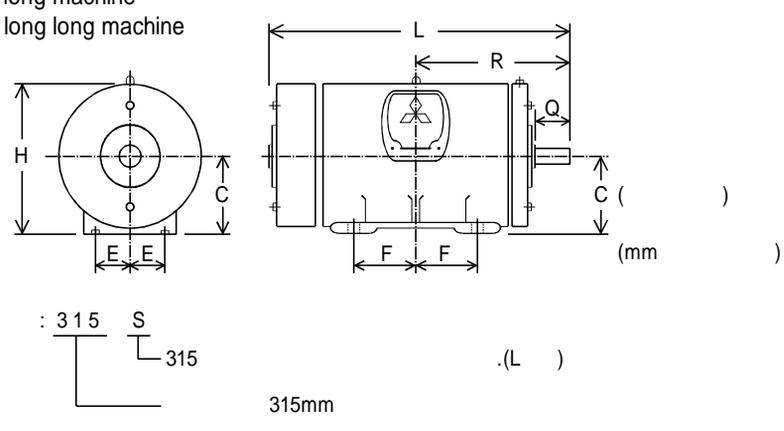
• _____ , () ,
) () , (가

• _____ 가 0.1~2 가 (加振) ,
 , MR Configurator가
 , 가 가 가

• _____ ,
 , (無勵)

• _____ , , JIS
 , 가
 C mm ,
 S, M, L, LL

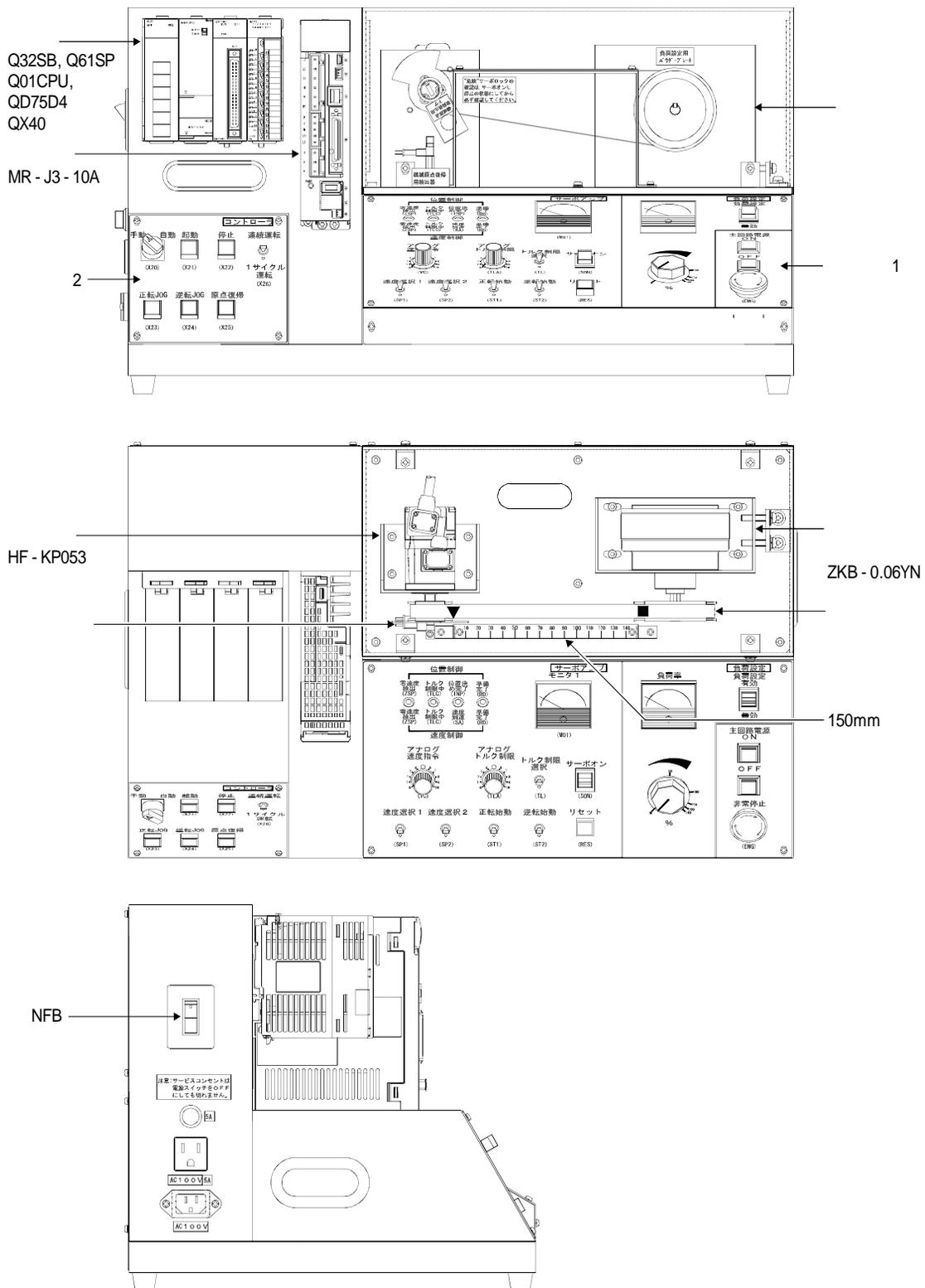
S : short machine
 M : medium machine
 L : long machine
 LL: long long machine



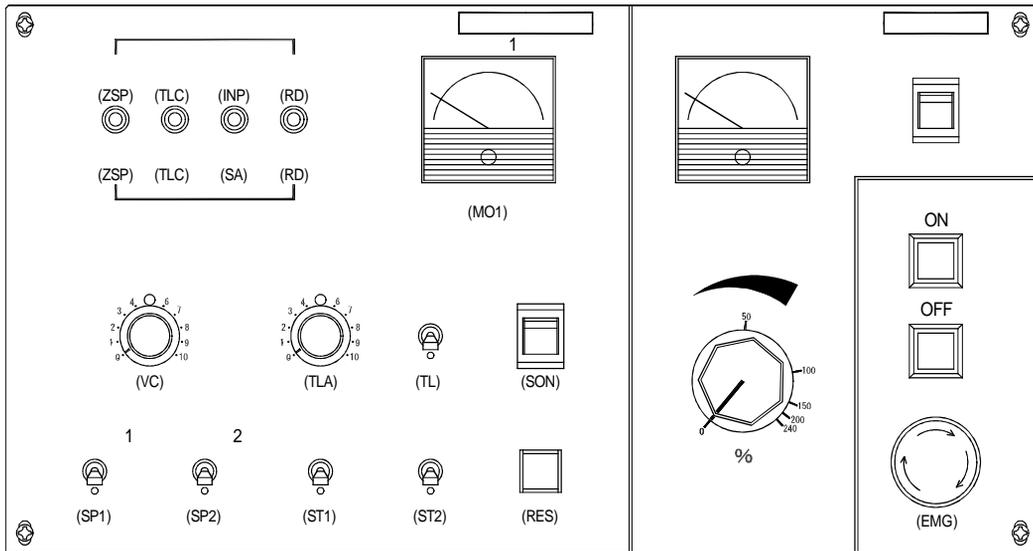
• _____ MR - J3, MR - J2S, MR - J2 - 03A5, MR - C ,
 (,) ,

2

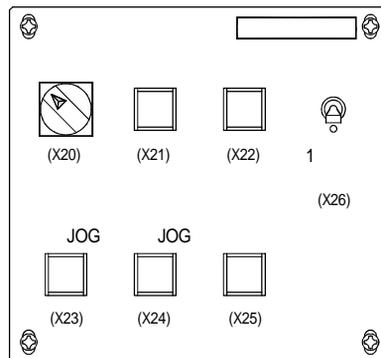
2.1



2.2



1

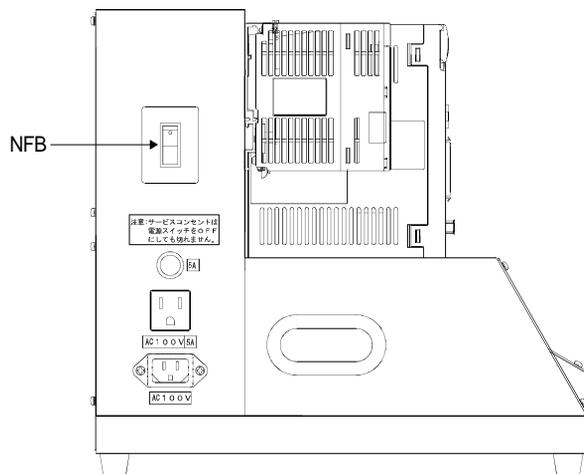


2

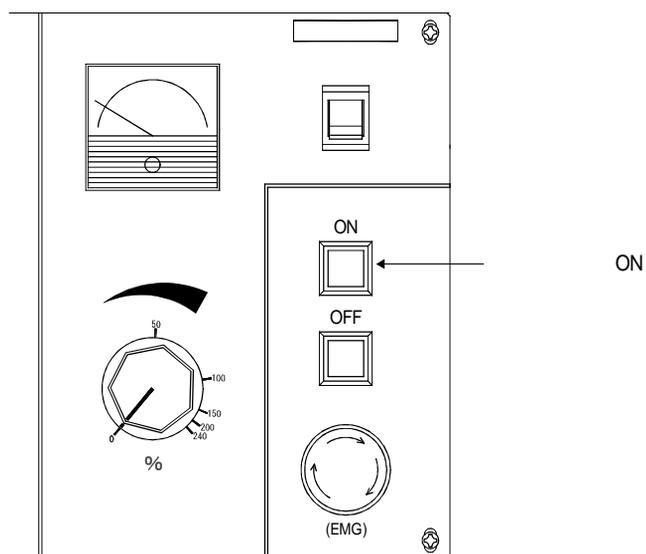
2.3

AC100V (2 2)

NFB ON



ON



2.4

	* 가	OFF
--	-----	-----

(a)

No.								
PA01	*STY					0000h		0000 0002
PA02	*REG					0000h		0000 0000
PA03	*ABS					0000h		0000 0000
PA04	*AOP1	A - 1				0000h		0000 0000
PA05	*FBP	1				0		0 0
PA06	CMX	()				1		262144 262144
PA07	CDV	()				1		10000 10000
PA08	ATU					0001h		0001 0001
PA09	RSP					12		18 18
PA10	INP					100	pulse	100 100
PA11	TLP					100.0	%	100.0 100.0
PA12	TLN					100.0	%	100.0 100.0
PA13	*PLSS					0000h		0000 0000
PA14	*POL					0		0 0
PA15	*ENR					4000	pulse/rev	4000 4000
PA16						0		0 0
PA17						0000h		0000 0000
PA18						0000h		0000 0000
PA19	*BLK					000Bh		000C 000C

(b)

No.								
PB01	FILT	()				0000h		0000 0000
PB02	VRFT	()				0000h		0000 0000
PB03	PST	가 ()				0	ms	0 0
PB04	FFC					0	%	0 0
PB05						500		500 500
PB06	GD2					7.0		7.0 7.0
PB07	PG1					24	rad/s	24 24
PB08	PG2					37	rad/s	37 37
PB09	VG2					823	rad/s	823 823
PB10	VIC					33.7	ms	33.7 33.7
PB11	VDC					980		980 980
PB12						0		0 0
PB13	NH1	1				4500	Hz	4500 4500
PB14	NHQ1	1				0000h		0000 0000
PB15	NH2	2				4500	Hz	4500 4500
PB16	NHQ2	2				0000h		0000 0000
PB17						0000		() ()
PB18	LPF					3141	rad/s	3141 3141
PB19	VRF1					100.0	Hz	100.0 100.0
PB20	VRF2					100.0	Hz	100.0 100.0
PB21						0.0		0.00 0.00
PB22						0.0		0.00 0.00
PB23	VFBF					0000h		0000 0000
PB24	*MVS					0000h		0000 0000
PB25	*BOP1	B - 1				0000h		0000 0000
PB26	*CDP					0000h		0000 0000
PB27	CDL					10		10 10
PB28	CDT					1	ms	1 1
PB29	GD2B					7.0		7.0 7.0
PB30	PG2B					37	rad/s	37 37
PB31	VG2B					823	rad/s	823 823
PB32	VICB					33.7	ms	33.7 33.7
PB33	VRF1B					100.0	Hz	100.0 100.0
PB34	VRF2B					100.0	Hz	100.0 100.0
PB35						0.0		0.00 0.00
PB36						0.0		0.00 0.00
PB37						100		100 100
PB38						0		0.0 0.0
PB39						0		0.0 0.0
PB40						0		0.0 0.0
PB41						1125		1125 1125
PB42						1125		1125 1125
PB43						0004h		0004 0004
PB44						0.0		0000 0000
PB45						0000h		0000 0000

()

(c)

No.									
PC01	STA	가				0	ms	0	0
PC02	STB					0	ms	0	0
PC03	STC	스 가				0	ms	0	0
PC04	TQC					0	ms	0	0
PC05	SC1	1				100	r/min	100	100
		1							
PC06	SC2	2				500	r/min	500	500
		2							
PC07	SC3	3				1000	r/min	1000	1000
		3							
PC08	SC4	4				200	r/min	200	200
		4							
PC09	SC5	5				300	r/min	300	300
		5							
PC10	SC6	6				500	r/min	500	500
		6							
PC11	SC7	7				800	r/min	800	800
		7							
PC12	VCM					0	r/min	0	0
PC13	TLC					100.0	%	100.0	100.0
PC14	MOD1	1				0000h		0002	0002
PC15	MOD2	2				0001h		0003	0003
PC16	MBR					100	ms	100	100
PC17	ZSP					50	r/min	50	50
PC18	*BPS					0000h		0000	0000
PC19	*ENRS					0000h		0000	0000
PC20	*SNO					0		0	0
PC21	*SOP					0000h		0000	0000
PC22	*COP1	C - 1				0000h		0000	0000
PC23	*COP2	C - 2				0000h		0000	0000
PC24	*COP3	C - 3				0000h		0000	0000
PC25						0000h		0000	0000
PC26	*COP5	C - 5				0000h		0000	0000
PC27						0000h		0000	0000
PC28						0000h		0000	0000
PC29						0000h		0000	0000
PC30	STA2	가 2				0	ms	0	0
PC31	STB2	2				0	ms	0	0
PC32	CMX2	2				1		1	1
PC33	CMX3	3				1		1	1

No.								
PC34	CMX4	4				1		1 1
PC35	TL2	2				100.0	%	100.0 100.0
PC36	*DMD					0000h		0000 0000
PC37	VC0					0	mV	0 0
PC38	TP0					0	mV	0 0
PC39	MO1	1				0	mV	0 0
PC40	MO2	2				0	mV	0 0
PC41						0		0 0
PC42						0		0 0
PC43						0		0000 0000
PC44						0		0000 0000
PC45						0		0000 0000
PC46						0		0000 0000
PC47						0		0000 0000
PC48						0		0000 0000
PC49						0		0000 0000
PC50						0		0000 0000

(d)

No.								
PD01	*DIA1	ON	1				0000h	0C00 0C00
PD02							0000h	0000 0000
PD03	*DI 1		1(CN1 - 15)				00020202h	00020202 00020202
PD04	*DI2		2(CN1 - 16)				00212100h	00212100 00212100
PD05	*DI3		3(CN1 - 17)				00070704h	00070700 00070700
PD06	*DI4		4(CN1 - 18)				00080805h	00000505 00000505
PD07	*DI5		5(CN1 - 19)				00030303h	00030303 00030303
PD08	*DI6		6(CN1 - 41)				00202006h	00060606 00060606
PD09							00000000h	00000000 00000000
PD10	*DI8		8(CN1 - 43)				00000A0Ah	00080800 00080800
PD11	*DI9		9(CN1 - 44)				00000B0Bh	00202000 00202000
PD12	*DI10		10(CN1 - 45)				00232323h	00232323 00232323
PD13	*DO1		1(CN1 - 22)				0004h	0002 0002
PD14	*DO2		2(CN1 - 23)				000Ch	000C 000C
PD15	*DO3		3(CN1 - 24)				0004h	0004 0004
PD16	*DO4		4(CN1 - 25)				0007h	0007 0007
PD17							0003h	0003 0003
PD18	*DO6		6(CN1 - 49)				0002h	0002 0002
PD19	*DIF						0002h	0002 0002
PD20	*DOP1	D - 1					0000h	0000 0000
PD21							000h	0000 0000
PD22	*DOP3	D - 3					0000h	0000 0000
PD23							0000h	0000 0000
PD24	*DOP5	D - 5					0000h	0000 0000
PD25							0	0000 0000
PD26							0	0000 0000
PD27							0	0000 0000
PD28							0	0000 0000
PD29							0	0000 0000
PD30							0	0000 0000



· AC



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