

mitsubishi

미쓰비시 **범용** AC서보

MELSERVO[®]-J3시리즈

SSCNETⅢ 대응 리니어 서보

형명(서보앰프)

MR-J3-□B-RJ004U□

형명(리니어 서보모터)

LM-H2

LM-U2

기술자료집

● 안전상의 주의 ●

(사용하시기 전에 반드시 읽어 보십시오)

, , ,

· MR - J3 - □B

· ,

「 」 「 」

.

⚠ 위험

가

⚠ 주의

가

, ⚠

가

,

.



(「 」)

「 」



가



(「 」)

(earth)



가

「 」

, 가

1. 감전방지를 위하여

⚠ 위험	
• OFF 10 , (charge) , • • 가 • • 가 , , • • • OFF	

2. 화재방지를 위하여

⚠ 주의	
• 가 • 가 가 • , • 가	

3. 상해방지를 위하여

⚠ 주의	
• 2 • , 가 • 2 • , 가 , , , , , • 가 가 • () ,2 , .2 () , () 2 () (倍)가 , 가 . • 가	

⚠ 주의	
•	가
•	
• (+ · -)	
•	
가	()
•	(, , PC)
	(IC , ,)
	가
•	
•	
•	

4. 제반 주의사항

(1) 운전 · 설치에 대하여

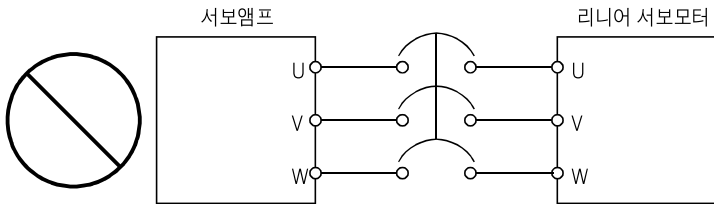
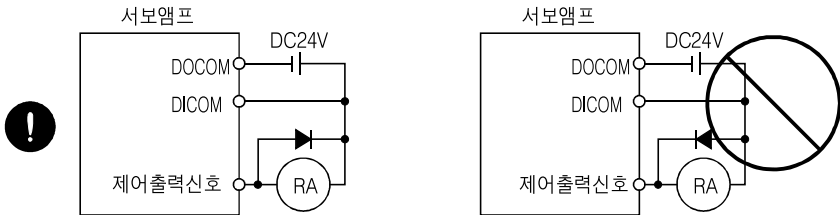
⚠ 주의	
•	
•	
•	
•	가
•	
•	,
가	
•	
•	
•	
•	
•	
•	가
•	
•	
•	IP00
(2.1.2	)
• 2 ()	,
•	
	가

⚠ 주의

- .
- .
- 가 , 가 .
- 가 , 가 .
- 가 (.)
- 1 () 2 () 가
- 가 . ,
- 가 가 , 가 가
- .
- 가
- 가 , 가 , 2 가
- ,
- 가 가 , ,
- ,
- , 가 가 .
- 2 () 2 , ±0.2mm
- 1 () .1 가
- 1 ()
- ,
- .
- ,
- () .
- .

		0 ~ +55 ()	0 ~ +40 ()
		-20 ~ +65 ()	-15 ~ +70 ()
		90%RH (가)	80%RH (가)
			90%RH (가)
		(), 가 . 가 . 가	
		1000m	
		5.9m/s	LM - H2
			LM - U2
			49m/s

(2) 배선에 대하여

⚠ 주의	
• (FR - BIF) • (U · V · W) 가 (U · V · W) • (U · V · W)	
• DC • 가 (EM1) 가	
• 1 () • 가	

(3) 시운전 · 조정에 대하여

⚠ 주의
• •

(4) 사용방법에 대하여

⚠ 주의
• •

⚠ 주의	
•	가
•	
•	
•	가
•	, 가 가 가
•	

(5) 이상시의 처리에 대하여

⚠ 주의	
•	가
•	
•	가 가 가
(	.)

(6) 보수 점검에 대하여

⚠ 주의	
•	가 , ()
•	2
10	()

(7) 폐기에 대하여

⚠ 위험	
•	2 가
•	2 (1 () 2 ()) 가
•	2 (1 (), 2 ()) 2 () (배) 가

⚠ 주의	
• 2 () - 가 • (IC , , PC) ,2 () - 가 • 1 () “ ” • 2 () ,2 () 300 - 가 “ ” • 2 () 300 가 , 가 2	

(8) 일반적인 주의사항

가

● 폐기물 처리에 대해서 ●

- 2
가
()
1.
(:)
(1)
가
(2)
,
가
2.
(:)
(1)
1
(2)
(3)
가
가

2004 1 가 「 가 」 가 가 , 가 가 (FR - BAL FR - BEL)



. , . , , , , .

EEP-ROM

EEP-ROM 10 EEP-ROM 가 가 EEP-ROM EEP-ROM

EC

1. EC

EC , EU 가 . EU 가 EC 가 (1995 1) · EMC (1996) · (1997 1) CE 가 CE 가 (CE) . (1) EMC EMC 가 EMC , EMC 가 EMC (IB()67303)

(2)

3 가 TUV ,

(3)

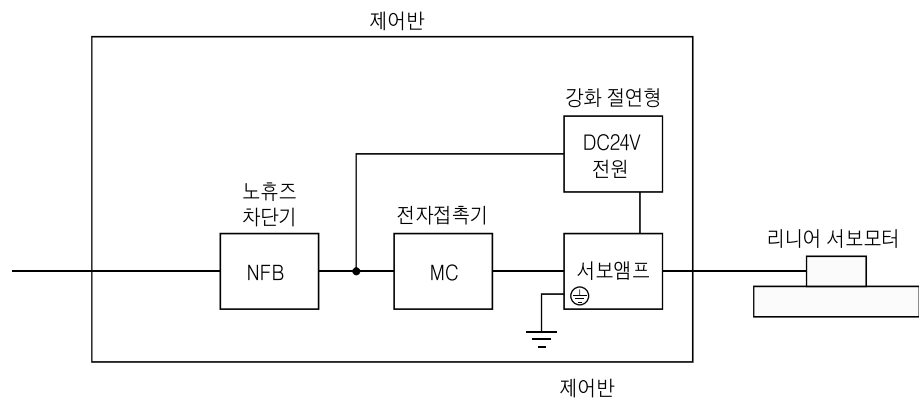
가

2.

(1)

: MR - J3 - 40B - RJ004~MR - J3 - 500B - RJ004

(2)



(3)

IEC60664 - 1

2

가

(IP54)

(4)

(a)

Y

IEC60664 - 1

, 400V

가

(b)

DC24V

(5)

(a)

(PE)

(⊖ 가)

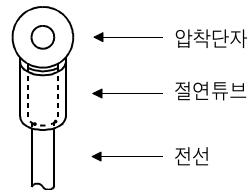
(PE)

(b) (PE)



(c) (PE)

(6) 가



(7) (a) 11.9 EN/IEC B()

() A: 가
B: , 가

(b) 11.8

EN60204 - 1 5 C
: 40
: PVC()

(c) EMC

(8) EMC

EMC () 가
EMC , EMC 가 (IB()67303)

<<

>>

MR - J3 - □B - RJ004

MR - J3 - □B

MR - J3 - □B - RJ004

MELSERVO - J3 (AC)	IB()0300077
MR - J3 - □B	SH()030050
EMC 가	IB()67303

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

한국미쓰비시전기오토메이션(주)

1	1-1 ~ 1-12
---	------------

1.1		1- 1
1.2		1- 2
1.3	.....	1- 3
1.4	.....	1- 4
1.5	.....	1- 5
1.6	.....	1- 6
1.7	.....	1- 9

2	2-1 ~ 2-26
---	------------

2.1		2- 1
2.1.1	.....	2- 1
2.1.2	.....	2- 2
2.1.3	.....	2- 3
2.1.4	.....	2- 4
2.2	.....	2- 5
2.2.1 1 ( )	.....	2- 5
2.2.2 2 ( )	.....	2- 6
2.2.3	.....	2- 6
2.3	.....	2- 7
2.3.1 1 () · 2 ( )	.....	2- 7
2.3.2	.....	2- 7
2.4	.....	2- 8
2.5 LM-H2	.....	2- 9
2.5.1	.....	2- 9
2.5.2 LM-H2	.....	2-10
2.5.3	.....	2-11
2.5.4	.....	2-12
2.5.5	.....	2-15
2.5.6	.....	2-18
2.6 LM-U2	.....	2-19
2.6.1	.....	2-19
2.6.2 LM-U2	.....	2-20
2.6.3	.....	2-21
2.6.4	.....	2-21
2.6.5	.....	2-24
2.6.6	.....	2-25

3	3-1 ~ 3-30
---	------------

3.1		3- 1
3.2	.....	3- 2
3.2.1 ( )	.....	3- 2
3.2.2	.....	3-10

3.2.3	()	3-17
3.2.4	()	3-22
3.3	A · B · Z	3-25
3.4	.	3-28
3.4.1	MR-EKCBL□M-H	3-28
3.4.2	MR-ECNM	3-30
3.4.3	MR-J3CN2	3-30

4	4-1 ~ 4-10
---	------------

4.1		4-2
4.2		4-2
4.3		4-6
4.4		4-8
4.5		4-9

5	5-1 ~ 5-28
---	------------

5.1		5-1
5.1.1		5-1
5.1.2		5-2
5.1.3		5-3
5.2		5-4
5.2.1		5-4
5.2.2		5-4
5.2.3		5-7
5.2.4	MR Configurator	5-8
5.2.5		5-9
5.2.6		5-11
5.3		5-13
5.3.1		5-13
5.3.2		5-16
5.4	MR Configurator	5-17
5.5		5-19
5.5.1		5-19
5.5.2		5-20
5.6		5-25
5.6.1		5-25
5.6.2		5-27
5.6.3		5-27
5.7		5-27

6	6-1 ~ 6-18
---	------------

6.1	(No.PA19)	6-1
6.2	(No.PA□□)	6-2
6.2.1		6-2
6.2.2		6-3
6.3	(No.PB□□)	6-6

6.3.1	.....	6 - 6
6.3.2	.....	6 - 7
6.4	(No.PC□□).....	6 - 8
6.4.1	.....	6 - 8
6.4.2	.....	6 - 9
6.4.3	.....	6 - 11
6.5	(No.PD□□)	6 - 14
6.5.1	.....	6 - 14
6.5.2	.....	6 - 15
6.6	(No.PS□□).....	6 - 16
6.6.1		6 - 16
6.6.2		6 - 17

7	7-1 ~ 7-8
---	-----------

7.1		7 - 1
7.2		7 - 2
7.3		7 - 7
7.4	1(2A)	7 - 8

8	8-1 ~ 8-4
---	-----------

9	9-1 ~ 9-2
---	-----------

9.1		9 - 1
9.2		9 - 2

-1 ~ -9

1.		- 1
2.		- 3
3.		- 3
4.		- 5

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한국미쓰비시전기오토메이션(주)

제1장 기능과 구성

1.1 개요

가 , .

가 .

가 . 가,

		(MR-J3-□B-RJ004)	(MR-J3-□B)	
		()		ON
			()	ON No.PS01 (5.2.2 (2))
		1048576pulse ()	1	
	(MR - J3BAT)			(25) (92) (9F) (E3)
		가		가 1(16) 2(20) (27) 2(28) 1(2A) (42) (46) 1(50) 2(51) (E2)
	(J)			
MR Configurator 221 (B3)	(,)	mm/s	r/min	
	JOG			

1. 기능과 구성

1. 2 서보앰프 표준 사양

MR-J3-□-RJ004			40B	70B	200B	350B	500B
			AC200~230V, 50/60Hz AC230V, 50/60Hz		AC200~230V, 50/60Hz		
			AC200~230V : AC170~253V AC230V : AC207~253V		AC170~253V		
			±5%				
			MR-J3-□B		10.5		
			AC200~230V, 50/60Hz				
			AC170~253V				
			±5%				
			30W				45W
			MR-J3-□B		10.5		
			DC24V±10%				
			(1)150mA				
			PWM ,				
			() .				
			(IP00)	, (IP00)			
			(2) 0 ~ +55 ()				
			- 20 ~ +65 ()				
			90%RH (가)				
			() . 가 가 . 가				
			1000m				
			5.9m ³				
			[kg]	1.0	1.4	2.3	2.3	4.6

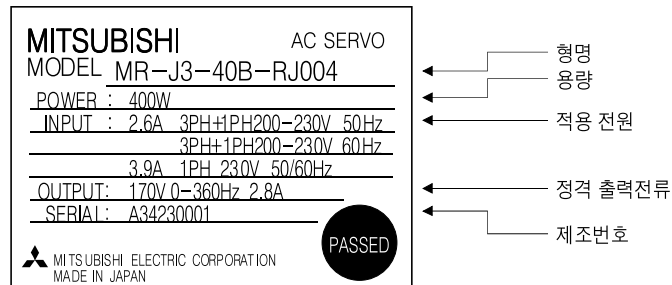
() 1. 150mA
2. 0~45 , 75% . 가 .

1.3 기능 일람

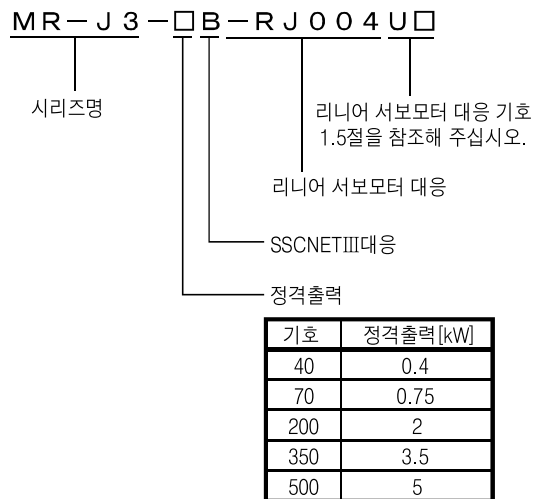
	가 , 가 MR - J3BAT	5.7
	가	MR - J3 - □B
	가	
	가 가	
	- PC MRZJW3 - SETUP221E가 , MR Configurator (-)	
	PC MRZJW3 - SETUP221E가 , MR Configurator (-)	
	PC가 MRZJW3 - SETUP221E가 , MR Configurator (-)	
	±1	MR - J3 - □B
	가 가 MELSERVO - J2 - Super	
	5kW	
	5kW	
	ON/OFF	
	DO MR Configurator (-) MRZJW3 - SETUP221E가	
		No.PC09
MR Configurator (-)	PC 가	5.4

1. 4 형명의 구성

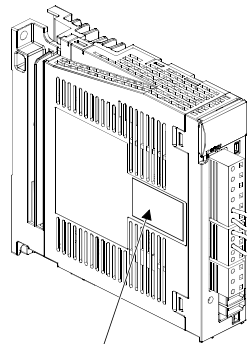
(1)



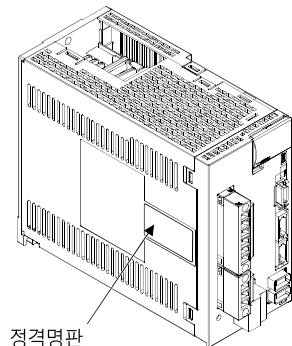
(2)



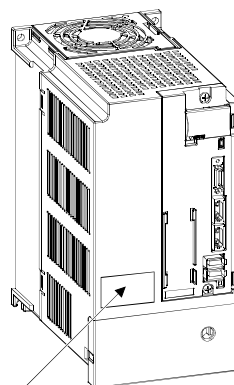
MR-J3-70B-RJ004이하



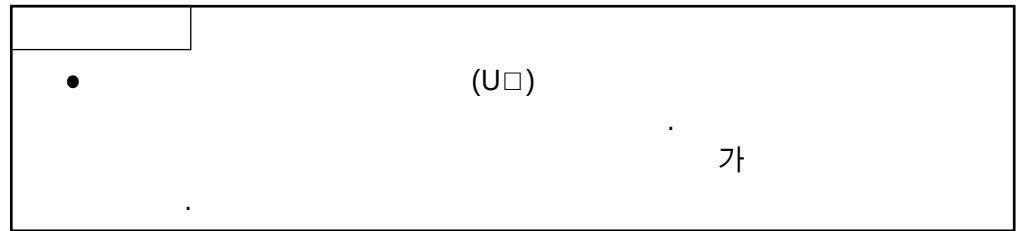
MR-J3-200B・350B-RJ004



MR-J3-500B-RJ004



1. 5 서보앰프와 리니어 서보모터와의 조합



(1) LM-H2

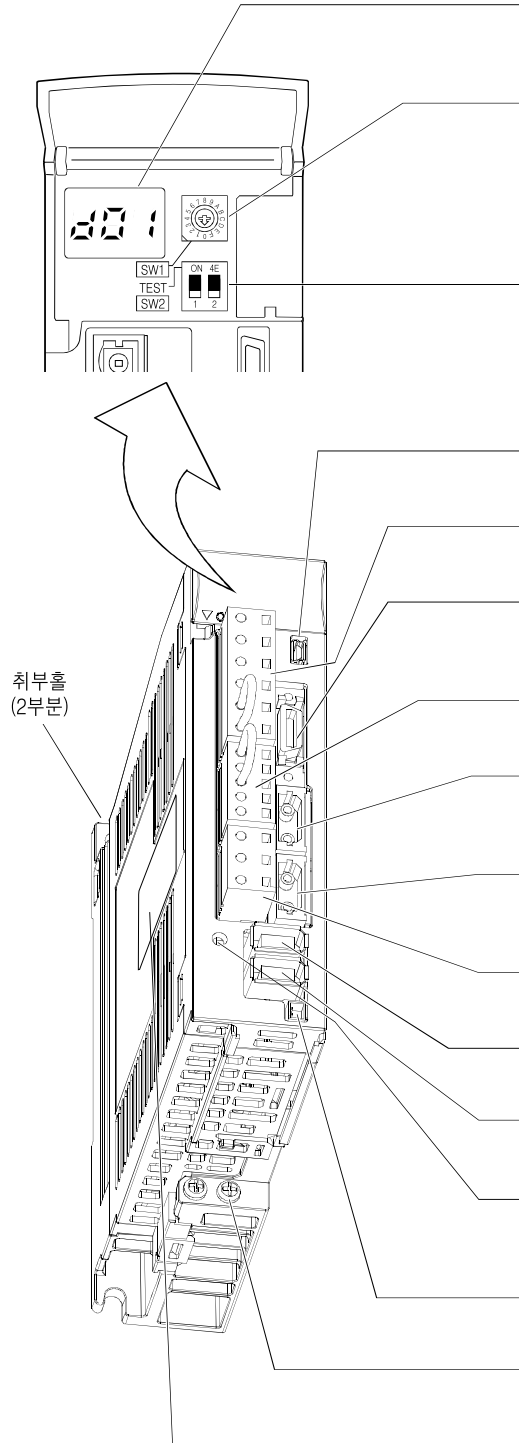
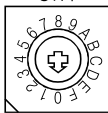
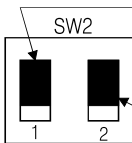
	1 ()	2 ()
MR - J3 - 40B - RJ004U500	LM - H2P1A - 06M	LM - H2S10 - 288 LM - H2S10 - 384 LM - H2S10 - 480 LM - H2S10 - 768
MR - J3 - 40B - RJ004U501	LM - H2P2A - 12M	LM - H2S20 - 288 LM - H2S20 - 384 LM - H2S20 - 480 LM - H2S20 - 768
MR - J3 - 70B - RJ004U502	LM - H2P2B - 24M	
MR - J3 - 200B - RJ004U503	LM - H2P2C - 36M	
MR - J3 - 200B - RJ004U504	LM - H2P2D - 48M	
MR - J3 - 70B - RJ004U505	LM - H2P3A - 24M	LM - H2S30 - 288 LM - H2S30 - 384 LM - H2S30 - 480 LM - H2S30 - 768
MR - J3 - 200B - RJ004U506	LM - H2P3B - 48M	
MR - J3 - 350B - RJ004U507	LM - H2P3C - 72M	
MR - J3 - 500B - RJ004U508	LM - H2P3D - 96M	

(2) LM-U2

	1 ()	2 ()
MR - J3 - 200B - RJ004U509	LM - U2P2B - 40M	LM - U2S20 - 480
MR - J3 - 350B - RJ004U510	LM - U2P2C - 60M	
MR - J3 - 500B - RJ004U511	LM - U2P2D - 80M	

1.6 각부의 명칭

(1) MR-J3-100B-RJ004

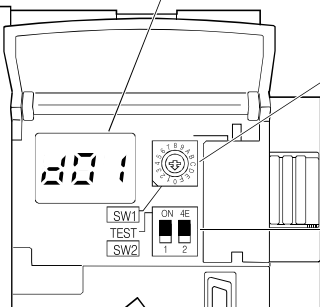
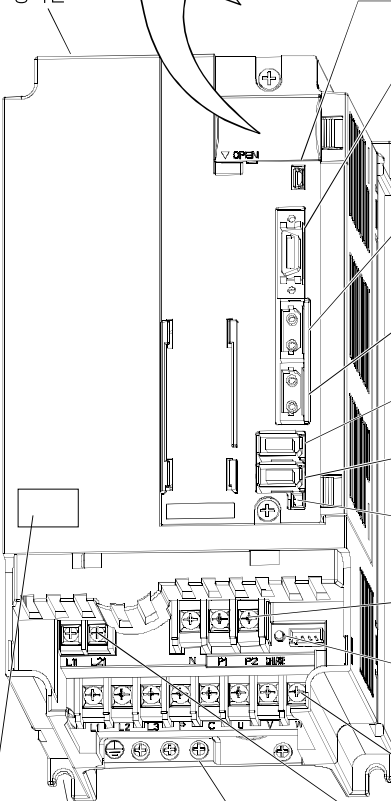
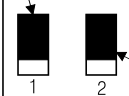
	3	7	LED	No.	MR-J3-□B	
	(SW1)					
						
	 MR Configurator() (“下”)					
	USB PC	(CN5)				
	(CNP1)					4.2
	(CN3)					4.3
	(CNP2)					4.2
	SSCNET	(CN1A) (前)			MR-J3-□B	
	SSCNET (前)	(CN1B)				
	(CNP3)					2 4.2
	(CN2)					2
	(CN2L)					3
	가					
(CN4)						
(PE) (⊖)					4.2	
					1.4	

(2) MR-J3-200B-RJ004 · MR-J3-350B-RJ004

냉각팬 취부홀(3부분)	3	7	LED	No.	MR-J3-□B
	(SW1)				
	MR Configurator() (“下”)				
	USB PC (CN5)				
	(CNP1)				4.2
	(CN3)				4.3
	SSCNET (CN1A) (前)				MR-J3-□B
	SSCNET (前) (CN1B)				
	(CNP3)				2
	(CN2)				
	(CN2L)				3
	(CN4)				
	(CNP2)				4.2
	가				
	(PE) (⊖)				4.2
					1.4

(3) MR-J3-500B-RJ004

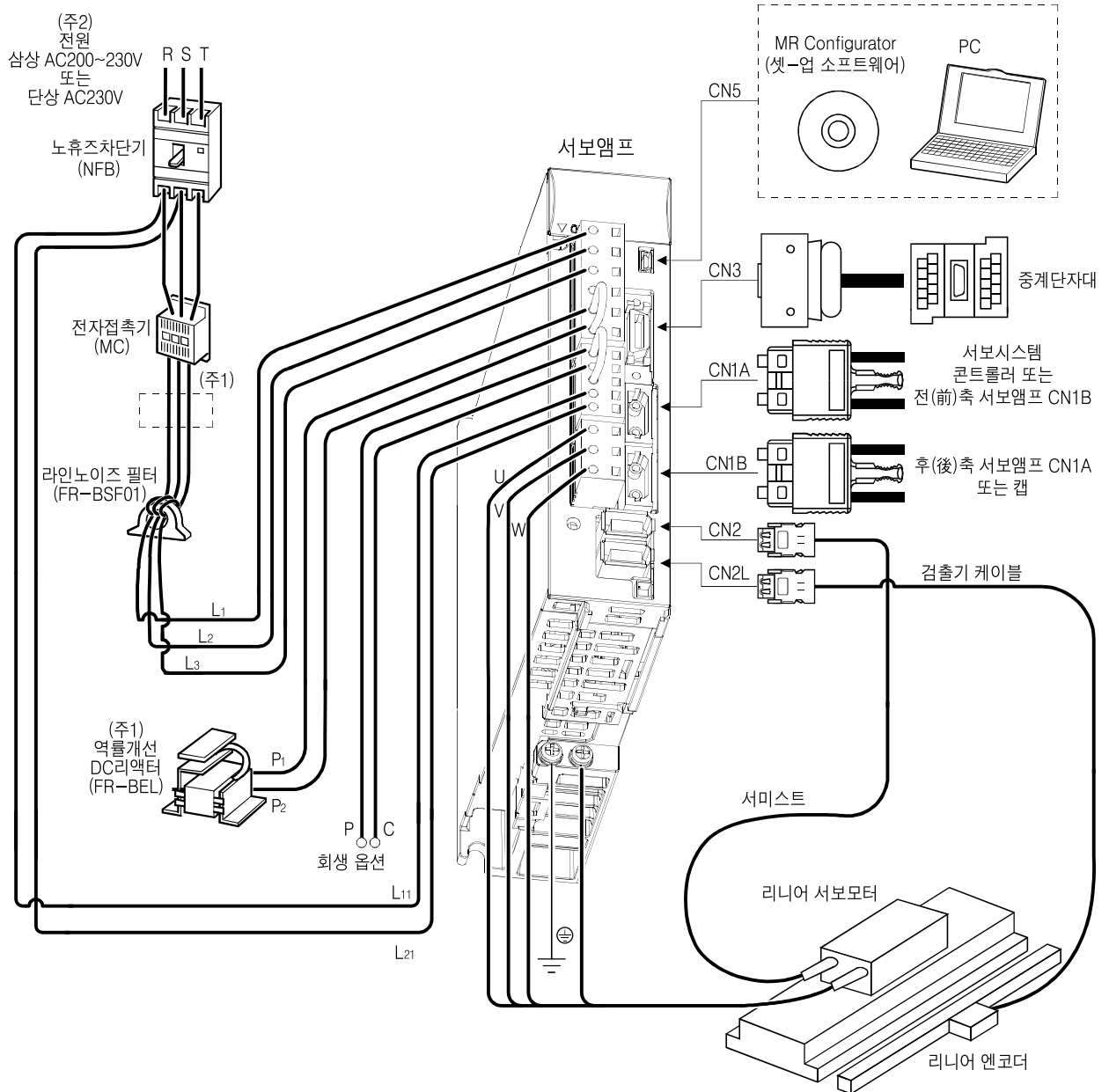
	MR-J3-□B
1.7.2	

  냉각팬 취부홀 (4부분)	3	7	LED	No.	MR-J3-□B		
	(SW1)						
							
						MR Configurator()	(“下”)
	USB PC (CN5)						
	(CN3)					4.3	
	SSCNET (CN1A) (前)					MR-J3-□B	
	SSCNET (前) (CN1B)						
	(CN2)					2	
	(CN2L)					3	
	(CN4)					MR-J3-□B	
	DC DC (TE3)						
	가					2 4.2	
	(TE1)						
	(TE1)					4.2	
	(PE) (⊖)						
						14	

1.7 주변 기기와의 접속

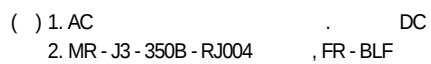


(1) MR-J3-100B-RJ004



- () 1. AC DC
2. AC200 ~ 230V MR-J3-70B-RJ004

(2) MR-J3-200B-RJ004 · MR-J3-350B-RJ004



DC

[illegible]

2
가

2.1.1 전반적인 주의사항

[illegible]

- PC () (IC , ,) .
- IP00 . .
- ,
- 1 (), 2 ()
가 .

 주의

- 가 ,
가 ,
가 .
(.)
● 1 () 2 ()
가 .
가
● 가 가 가
● .
● .
● 가
가 , 가
● 1 () 2 ()
● 1 () ,가
● , 가 2 가
● .
● 가 가 ,
● ,
● 가 가
● 2 () 2 , 2 ()
 $\pm 0.2\text{mm}$ 가
● 1 () .1 가
1 ()

•	가
•	가 , ,
•	가
•	
•	가 ,
•	가

2.1.3 설치 작업상의 주의 사항

•	() , 2 () 2 ()
2 ()	(倍)가
가	가
⚠ 위험	
• 2	가
1 ()	2 () SCM435,
900(N/mm ²)	
()	: 가

•	가
가	가 가 ,
•	
•	

⚠ 주의

● 위험
● OFF 15가

⚠ 주의

- 가 () ,
- .
- .
- .
- 가 ,

2 - 5

(5)

가

2.2.2 2차측(자석)의 점검

(1)

1 () 2 ()
가 , 1 ()
가

(2)

2 ()
2 () , 2 ()

(3)

(a) 2 () 가
2 () 가 , 2 ()
(b) 2 ()
2 () ,
2 ()
1 () 2 ()

(4)

1 ()
1 () 가

2.2.3 리니어 엔코더의 점검

가

2. 3 교환

2.3.1 1차측(코일), 2차측(자석)의 교환

1 () 2 () , 1 () 2 ()
가 $\pm 0.1\text{mm}$ 가
5% 가

2.3.2 리니어 엔코더의 교환

$\pm 0.1\text{mm}$ 가

(1)

MR Configurator

가 $\pm 0.1\text{mm}$ 가

MR Configurator

0.1mm

() $\pm$

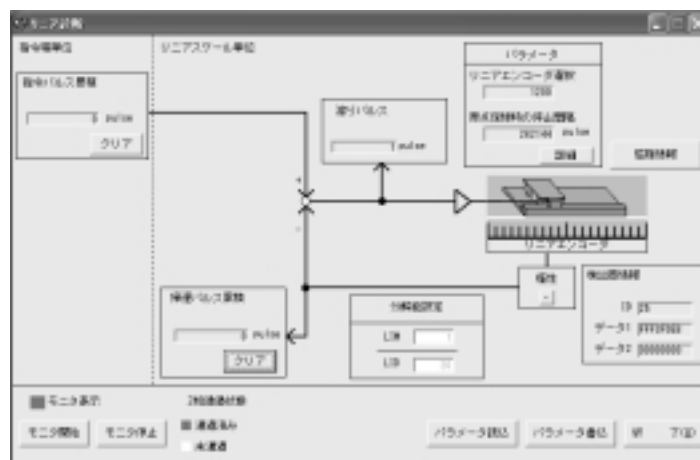
(2) MR Configurator

MR Configurator

“MR-J3-B”

PC 가

“ ” “ ”



1()

2. 4 리니어 서보모터 폐각시의 주의

2 () 300 가

- 2 가
- 2 (1 () 2 ()) 가
- 2 (1 (), 2 ()) 2 () (배)가 가

⚠ 위험

- 2 () ()

가

- , PC) (IC , (,)
- , 2 () 가

⚠ 주의

- 2 () 300 가 , 가

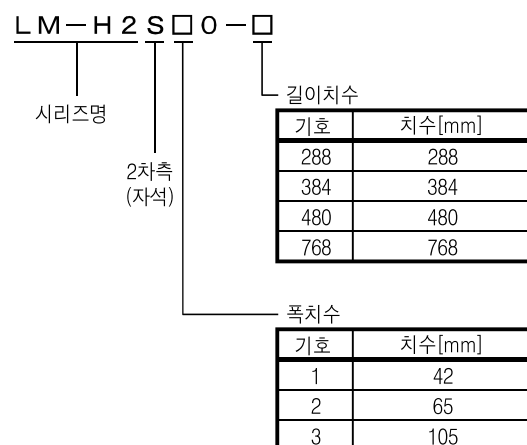
2. 5 LM-H2시리즈

2.5.1 형명의 구성

(1) 1 :



(2) 2 :



2.5.2 LM-H2 시리즈 사양 일람

(1)	LM-H2P1A-06M	LM-H2P2A-12M	LM-H2P2B-24M	LM-H2P2C-36M	LM-H2P2D-48M	LM-H2P3A-24M	LM-H2P3B-48M	LM-H2P3C-72M	LM-H2P3D-96M
(2)	LM-H2S10-288 LM-H2S10-384 LM-H2S10-480 LM-H2S10-768	LM-H2S20-288 LM-H2S20-384 LM-H2S20-480 LM-H2S20-768				LM-H2S30-288 LM-H2S30-384 LM-H2S30-480 LM-H2S30-768			
MR-J3-	40B-RJ004 U500	40B-RJ004 U501	70B-RJ004 U502	200B-RJ004 U503	200B-RJ004 U504	70B-RJ004 U505	200B-RJ004 U506	350B-RJ004 U507	500B-RJ004 U508
[kVA]	0.9	0.9	1.3	3.5	3.5	1.3	3.5	5.5	7.5
(2) [N]	60	120	240	360	480	240	480	720	960
[N]	150	300	600	900	1200	600	1200	1800	2400
(1) [m/s]	2								
[N]	500	1000	1900	2700	3500	2000	3700	5300	7000
	1 30								
	(IP00)								
	0~40 ()								
	- 15~70 ()								
	80%RH (가)								
	90%RH (가)								
	()								
	가 . 가 . 가								
	49m/s ²								
	1000m								
1 ()	0.9	1.4	2.5	3.6	4.7	2.4	4.3	6.2	8.1
2 ()	0.6 (288mm 1) 0.8 (384mm 1) 1.0 (480mm 1) 1.6 (768mm 1)	1.1 (288mm 1) 1.4 (384mm 1) 1.8 (480mm 1) 2.9 (768mm 1)				3.2 (288mm 1) 4.3 (384mm 1) 5.3 (480mm 1) 8.5 (768mm 1)			

) 1.

2.

(L[mm] × W[mm] × H[mm])

1 ()

.()

LM-H2P1A-06M : 192 × 225 × 30

LM-H2P3A-24M : 192 × 495 × 30

LM-H2P2A-12M : 192 × 315 × 30

LM-H2P3B-48M : 336 × 495 × 40

LM-H2P2B-24M : 336 × 315 × 30

LM-H2P3C-72M : 480 × 495 × 40

LM-H2P2C-36M : 480 × 315 × 40

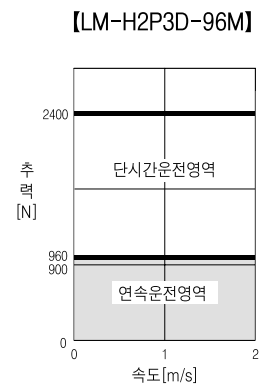
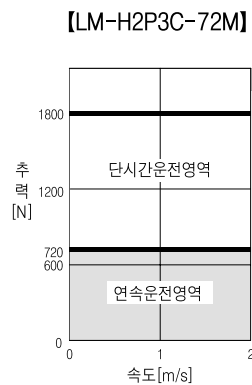
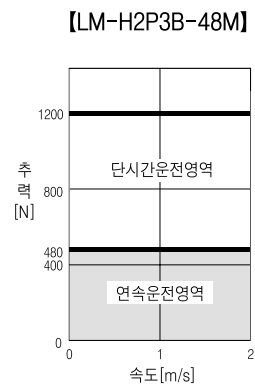
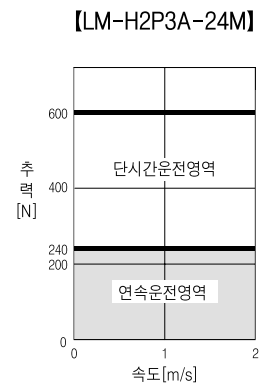
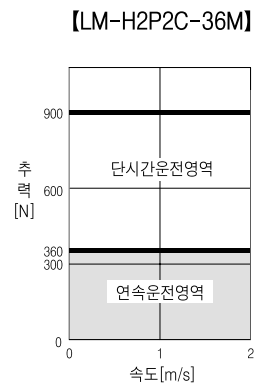
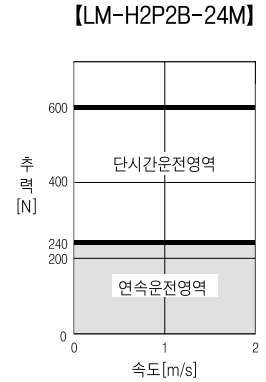
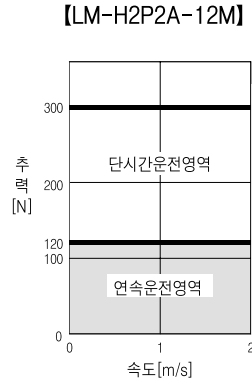
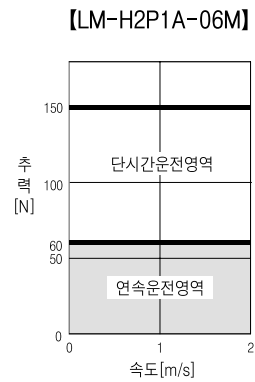
LM-H2P3D-96M : 624 × 495 × 40

LM-H2P2D-48M : 624 × 315 × 40

2.5.3 추력 특성

AC200V

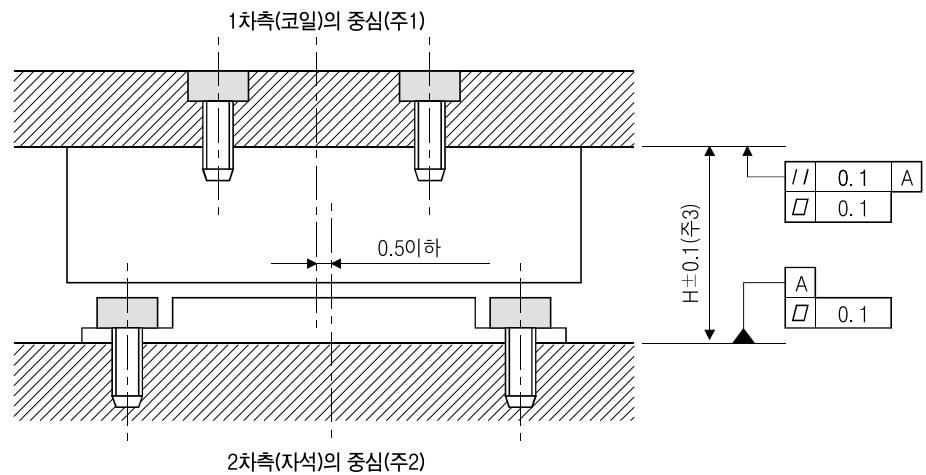
AC230V



2.5.4 설치

(1)

[단위:mm]



1. 1 ()

LM - H2P1□ - □ :

LM - H2P2□ - □ :

LM - H2P3□ - □ :

2. 2 ()

3. H (1 ()) + (2 ()) + (:0.5mm)

LM - H2P1□ - □ : H = 43.0mm

LM - H2P2□ - □ : H = 43.0mm

LM - H2P3□ - □ : H = 48.0mm

(2) 2 ()

⚠ 위험

• 2

가

⚠ 주의

• 2 ()

• 2 ()

2 ()

가 2 ()

• 2 () 2

±2mm

가

2 ()

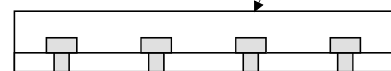
		명판

2 ()

< 1>

2 ()

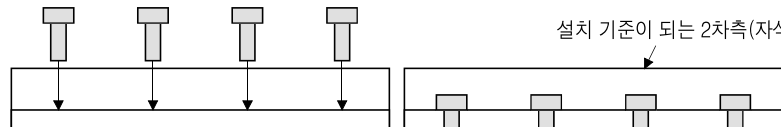
설치 기준이 되는 2차측(자석)



< 2> 2 ()

가(假)

설치 기준이 되는 2차측(자석)



< 3> 가(假)

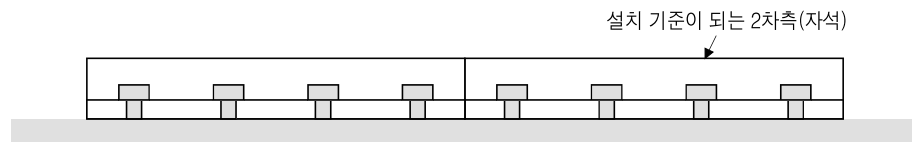
2 ()

2 ()

설치 기준이 되는 2차측(자석)



< 4> 가(假) 2 () .

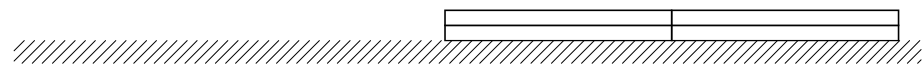


(3) 1 ()

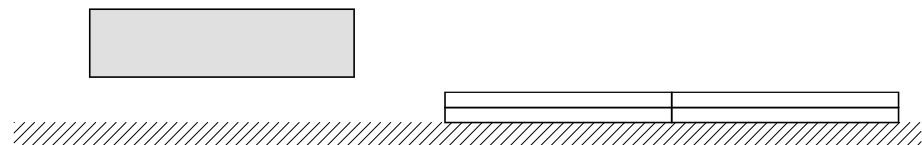
⚠ 주의

- 1 () - 2 ()
2 () 1 ()
- , 2 () , 1 () ,
- 1 () , 2 ()

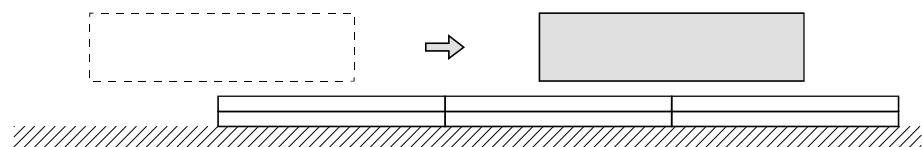
< 1> 2 () .



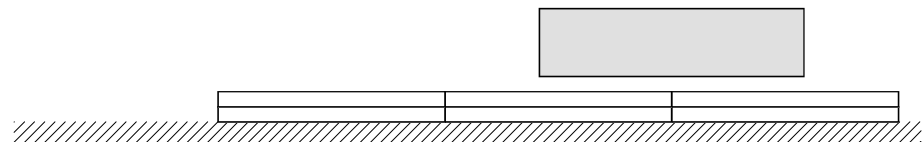
< 2> 2 () 1 () .



< 3> 1 () 2 ()
1 () 2 () .



< 4> 2 () .

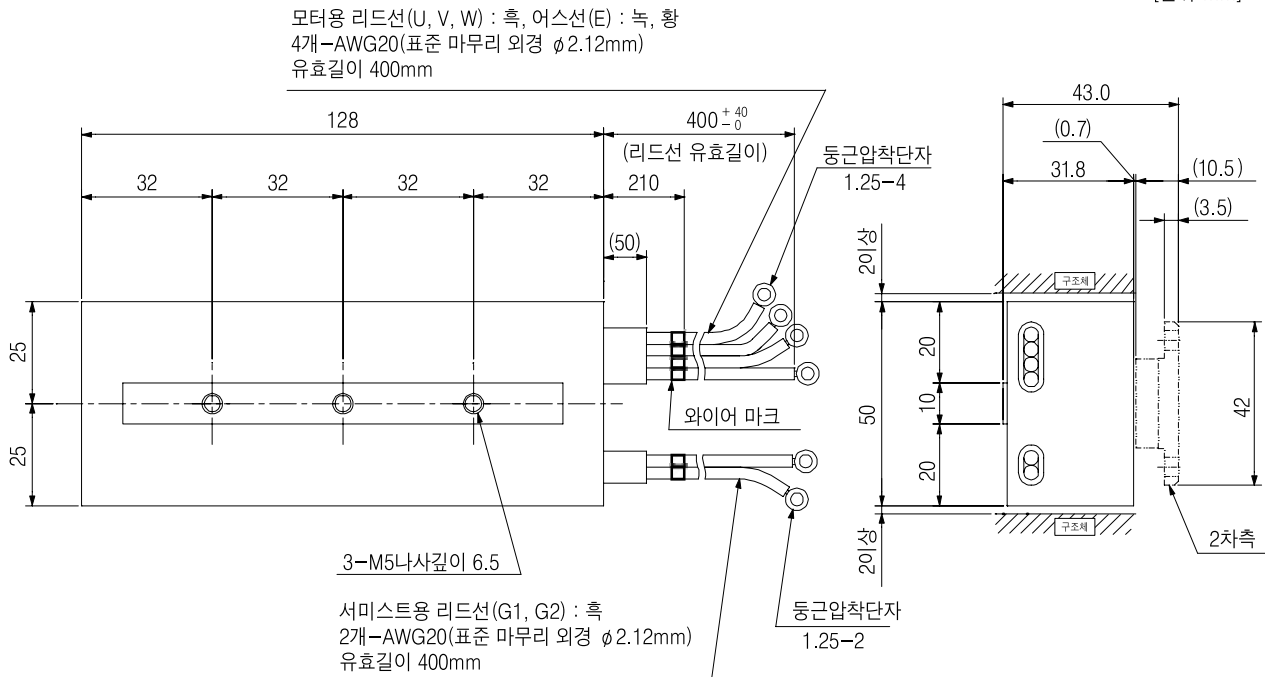


2.5.5 외형치수도

(1) 1 ()

(a) LM - H2P1A - 06M

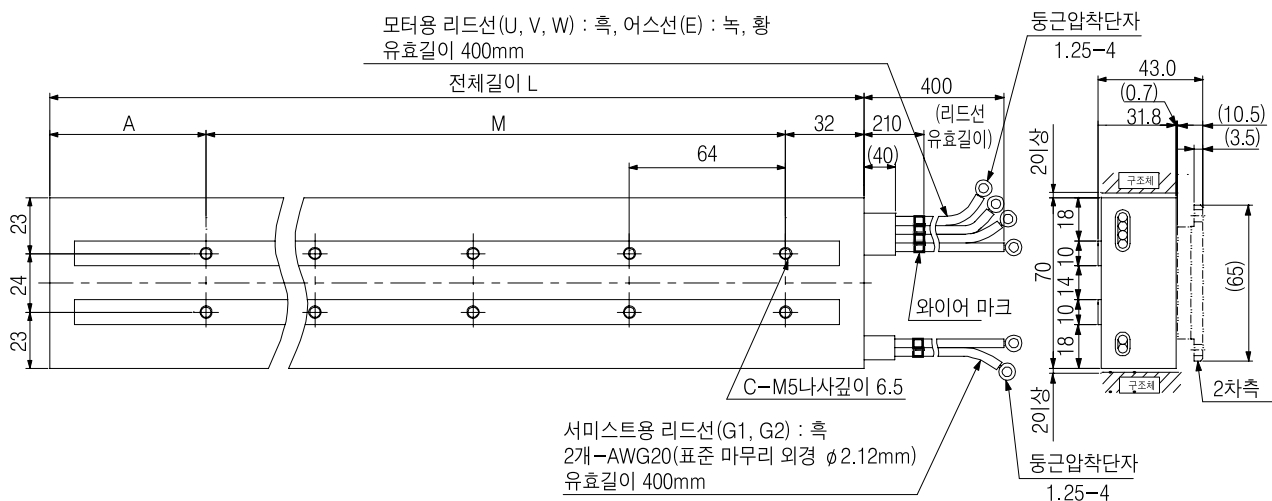
[단위:mm]



(b) LM - H2P2A - 12M · LM - H2P2B - 24M · LM - H2PC - 36M · LM - H2P2D - 48M

[단위:mm]

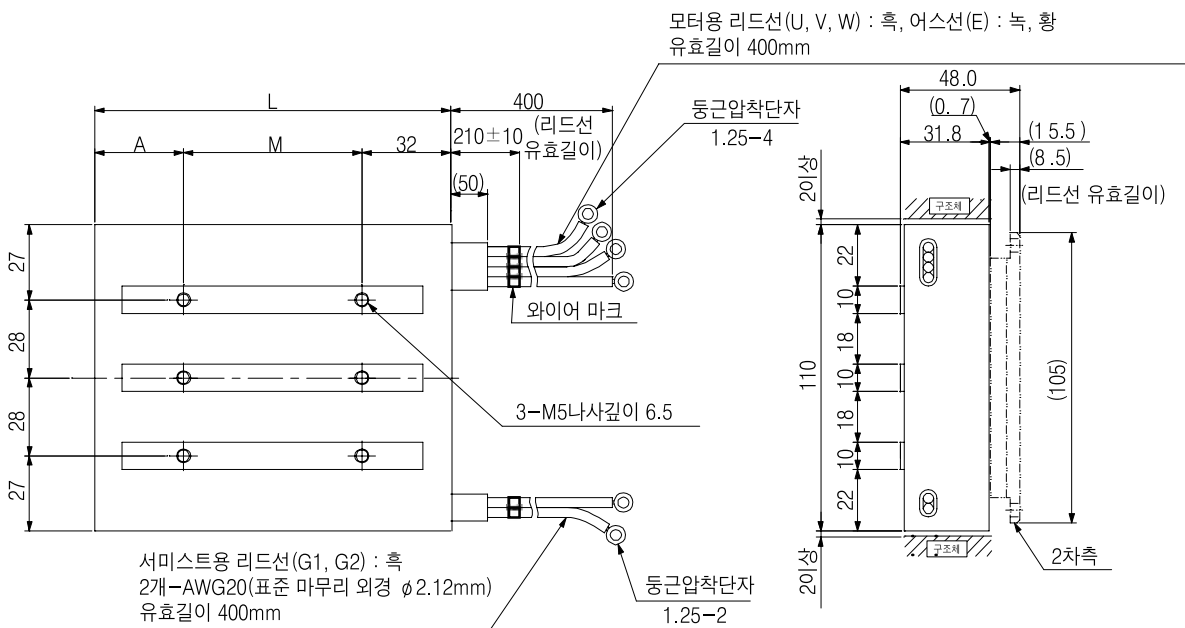
형명	변화치수				모터용 리드선	
	L	M	A	C	사이즈	표준 마무리 외경
LM-H2P2A-12M	128	64	(32)	3×2	AWG20	$\phi 2.12$
LM-H2P2B-24M	224	2×64(9=128)	(64)	6×2	AWG6	$\phi 2.7$
LM-H2P2C-36M	320	4×64(9=256)	(32)	9×2		
LM-H2P2D-48M	416	5×64(9=320)	(64)	12×2		



(c) LM - H2P3A - 24M · LM - H2P3B - 48M · LM - H2P3C - 72M · LM - H2P3D - 96M

[단위:mm]

형명	변화치수				모터용 리드선	
	L	M	A	C	사이즈	표준 마무리 외경
LM-H2P3A-24M	128	64	(32)	3×3	AWG20	φ2.12
LM-H2P3B-48M	224	2×64(9=128)	(64)	6×3	AWG14	φ3.12
LM-H2P3C-72M	320	4×64(9=256)	(32)	9×3		
LM-H2P3D-96M	416	5×64(9=320)	(64)	12×3		

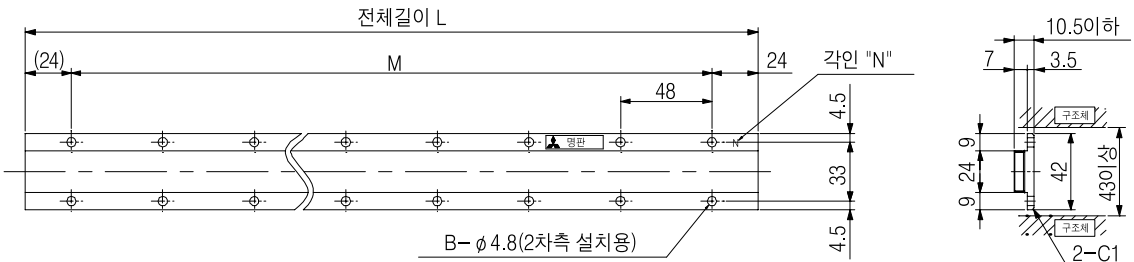


(2) 2 ()

(a) LM - H2S10 - □

[단위:mm]

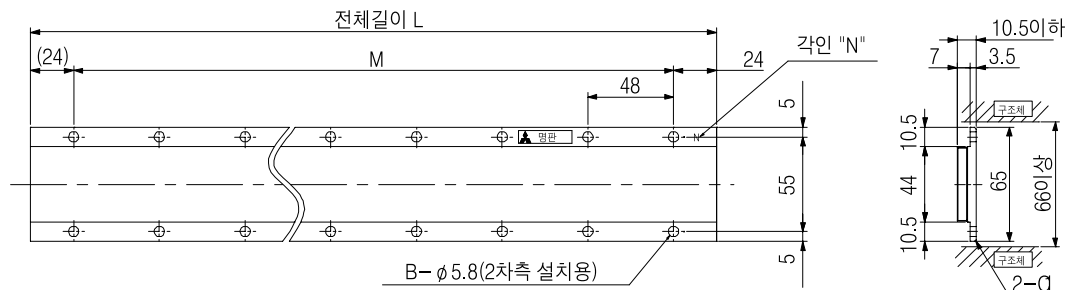
형명	변화치수		
	L	M	B
LM-H2S10-288	288	5×48(9=240)	6×2
LM-H2S10-384	384	7×48(9=336)	8×2
LM-H2S10-480	480	9×48(9=432)	10×2
LM-H2S10-768	768	25×48(9=720)	16×2



(b) LM - H2S20 - □

[단위:mm]

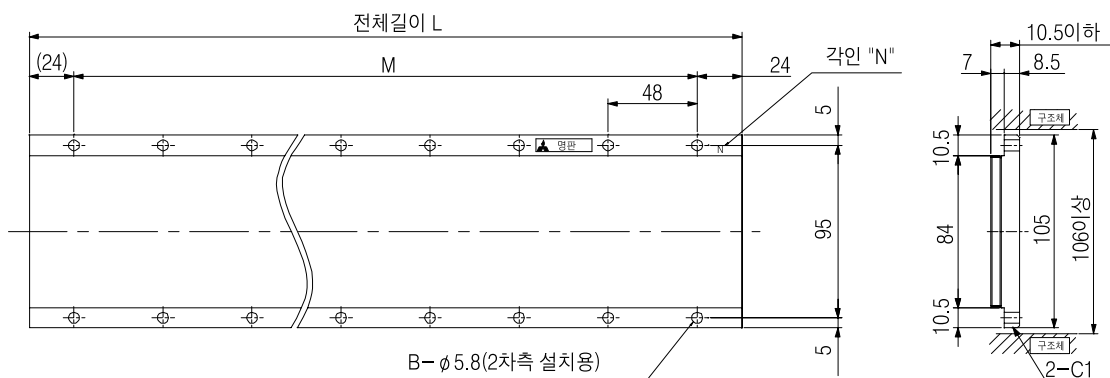
형명	변화치수		
	L	M	B
LM-H2S20-288	288	5×48(9=240)	6×2
LM-H2S20-384	384	7×48(9=336)	8×2
LM-H2S20-480	480	9×48(9=432)	10×2
LM-H2S20-768	768	15×48(9=720)	16×2



(c) LM - H2S30 - □

[단위:mm]

형명	변화치수		
	L	M	B
LM-H2S30-288	288	5×48(9=240)	6×2
LM-H2S30-384	384	7×48(9=336)	8×2
LM-H2S30-480	480	9×48(9=432)	10×2
LM-H2S30-768	768	15×48(9=720)	16×2



2.5.6 서보앰프와 리니어 서보모터의 접속

(1)

⚠ 위험

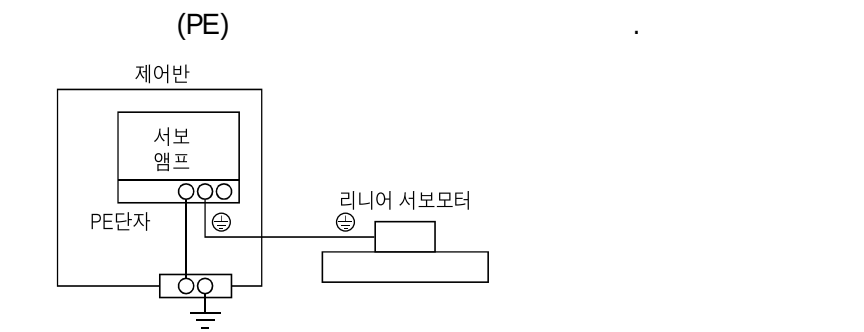
가

⚠ 주의

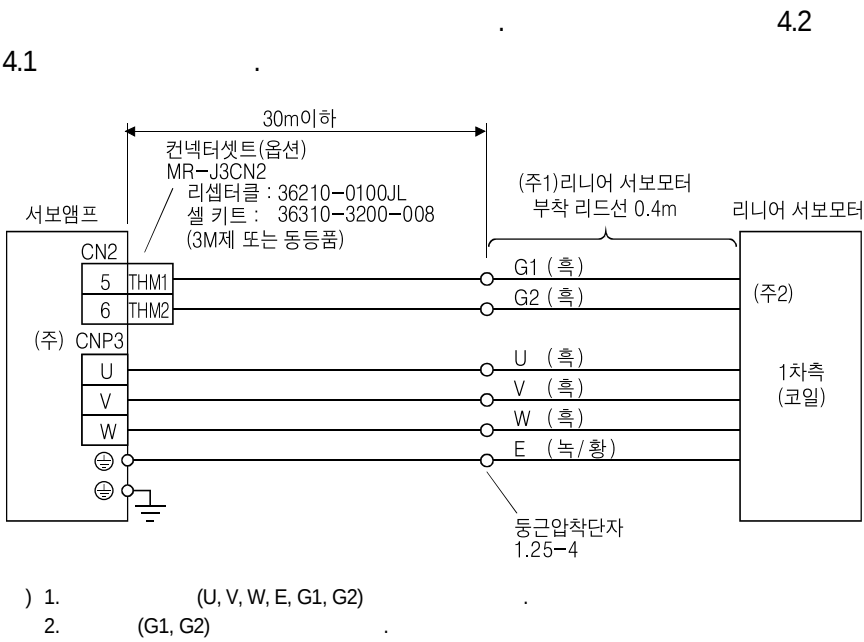
가

$(U \cdot V \cdot W)$

(PE), (PE)



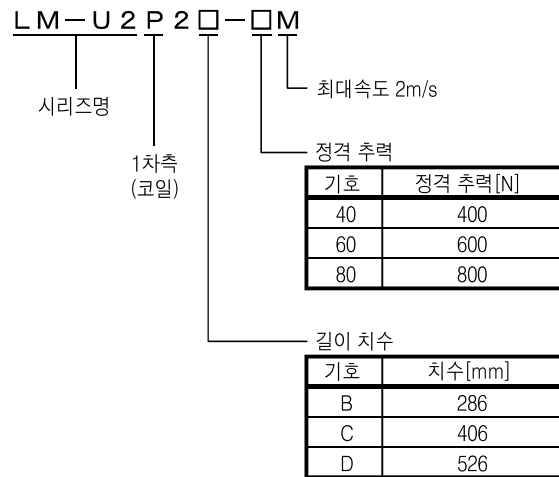
(2)



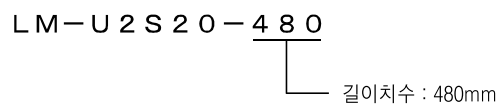
2. 6 LM-U2시리즈

2.6.1 형명의 구성

(1) 1 :



(2) 2 :



2.6.2 LM-U2 시리즈 사양일람

(1)		LM-U2P2B-40M	LM-U2P2C-60M	LM-U2P2D-80M
(2)		LM-U2S20-480		
MR-J3-		200B-RJ004U509	350B-RJ004U510	500B-RJ004U511
[kVA]		3.5	5.5	7.5
	(2) [N]	400	600	800
	[N]	1600	2400	3200
(1) [m/s]		2		
[N]		0		
		1 30		
		(IP00)		
		0~40 ()		
		- 15~70 ()		
		80%RH (가)		
		90%RH (가)		
		()		
		가 . 가 . 가		
		49m/s ²		
		1000m		
	1 ()	2.9	4.2	5.5
	2 ()	15.3		

) 1.

2. (L[mm] × W[mm] × H[mm]) 1 () . ()

LM-U2P2B-40M : 900 × 800 × 12

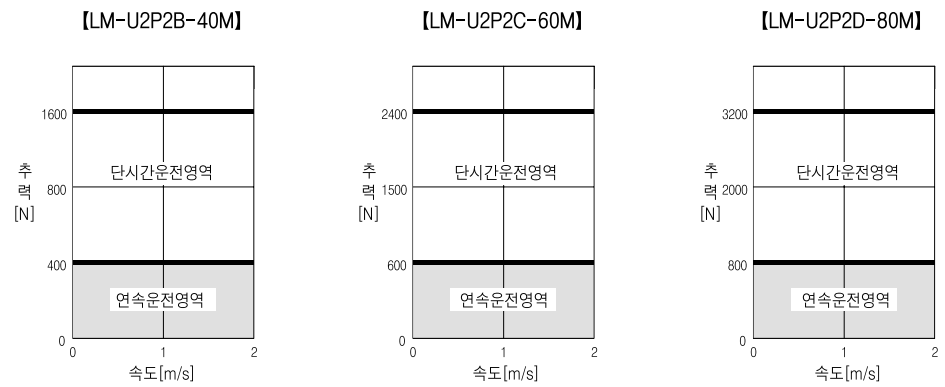
LM-U2P2C-60M : 900 × 800 × 12

LM-U2P2D-80M : 990 × 800 × 12

2.6.3 추력 특성

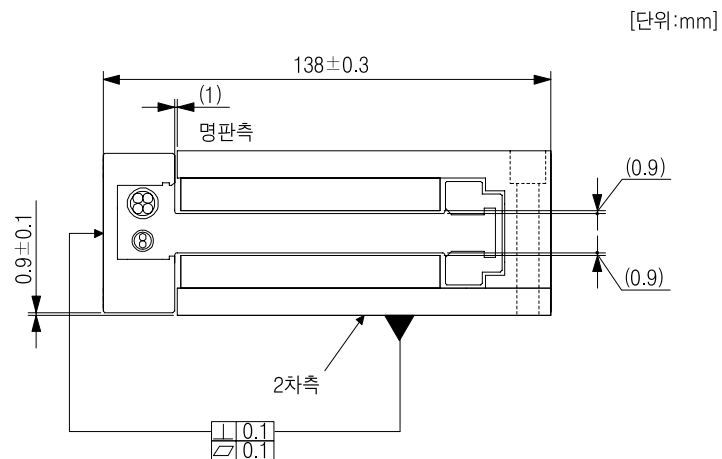
AC200V

AC230V



2.6.4 설치

(1)



(2) 2 ()

⚠ 위험

• 2

가

⚠ 주의

• 2 ()

• 2 ()

2 ()

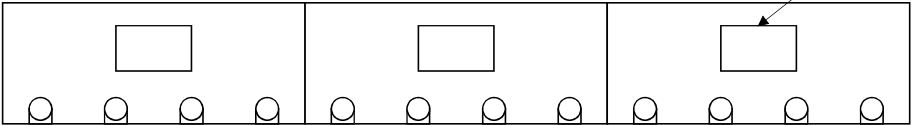
가 2 ()

• 2 () 2

±2mm

가

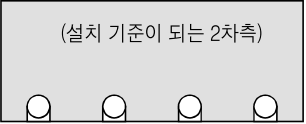
2 ()



2 ()

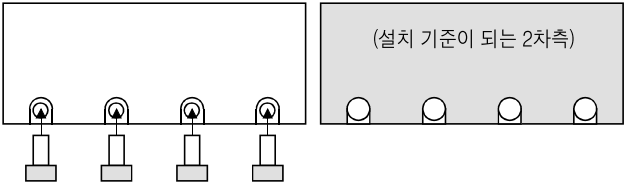
< 1>

2 ()



< 2> 2 ()

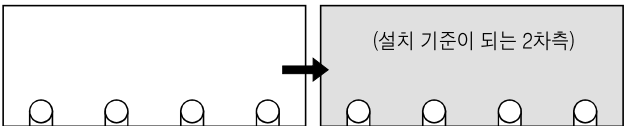
가(假)



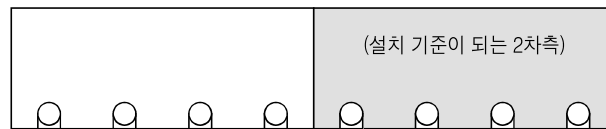
< 3> 가(假)

2 ()

2 ()

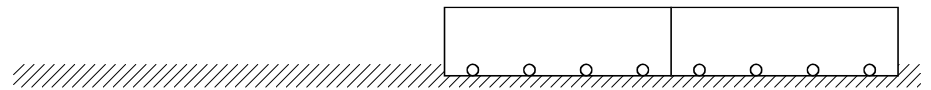


< 4> 가(假) 2 () .

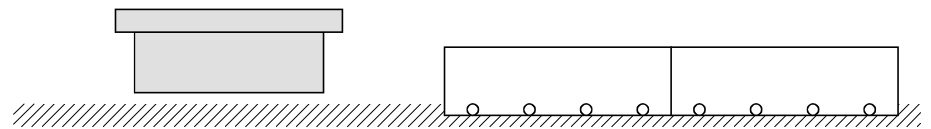


(3) 1 ()

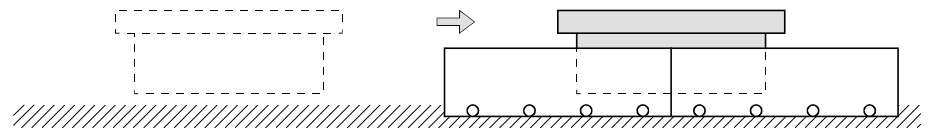
< 1> 2 () .



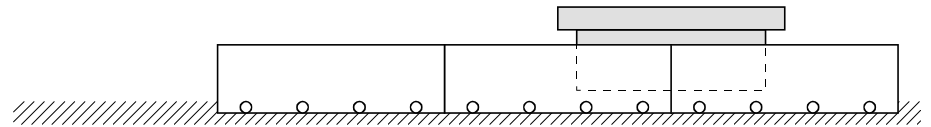
< 2> 2 () 1 () .



< 3> 1 () 2 ()
1 () 2 () .



< 4> 2 () .

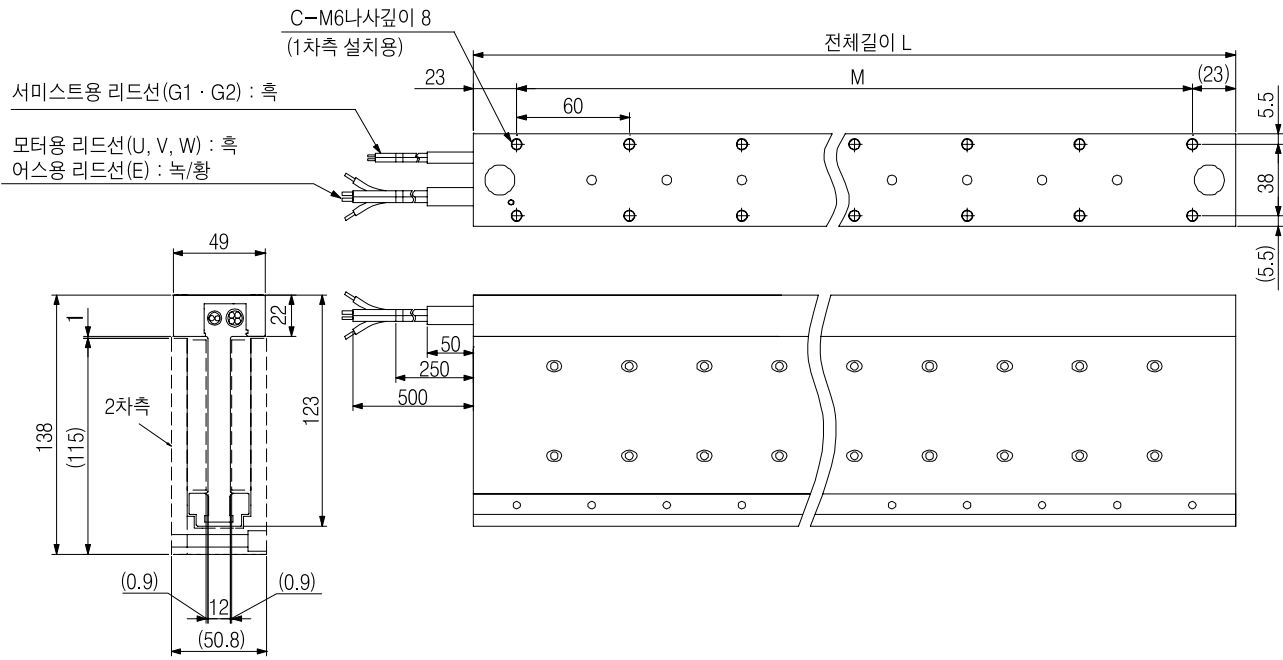


2.6.5 외형 치수도

(1) 1 ()

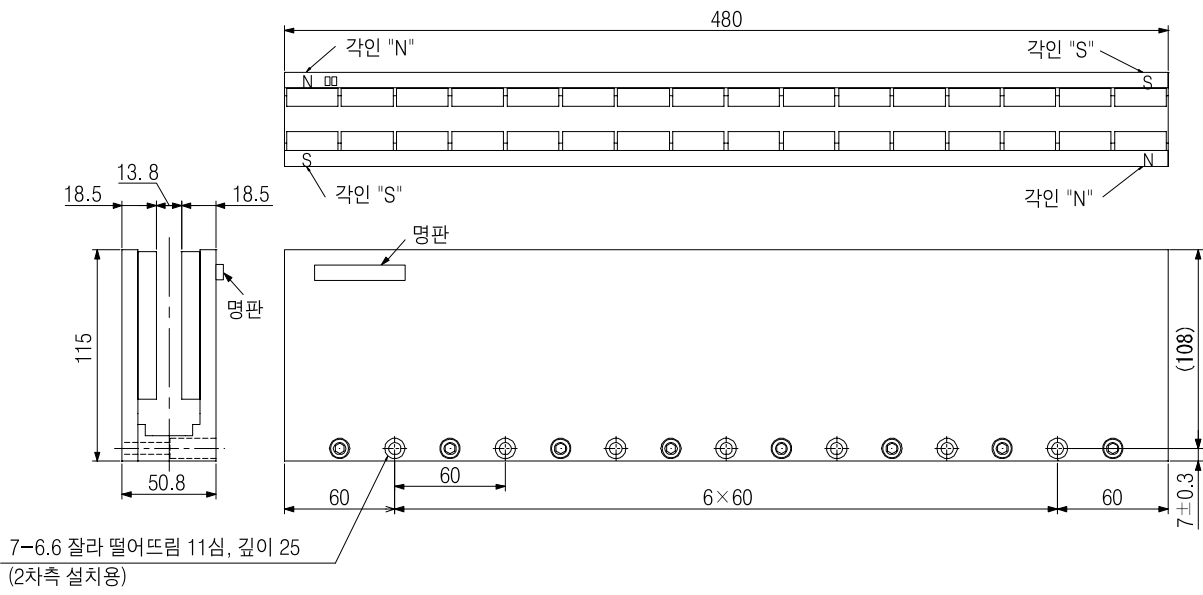
[: mm]

				U · V · W · E	G1 · G2
	L	M	C		
LM - U2P2B - 40M	286	240	5 × 2	1.25mm ² ((AWG 16) (ø 2.7mm)	0.2mm ² ((AWG 24) (ø 2mm)
LM - U2P2C - 60M	406	360	7 × 2	2mm ² (AWG 14)	
LM - U2P2D - 80M	526	480	9 × 2	(ø 3.12mm)	



(2) 2 () LM-U2S20-480

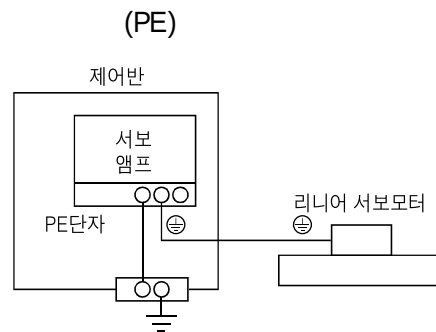
[단위:mm]



2.6.6 서보앰프와 리니어 서보모터의 접속

(1)

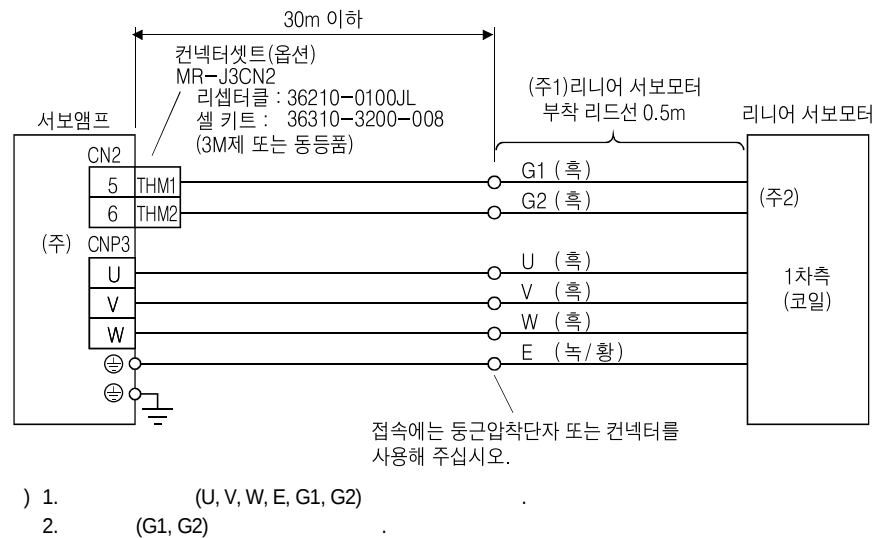
⚠ 위험	•	가	.
⚠ 주의	•	가	(U · V · W)
	•		(PE)
			(PE)



(2)

4.1

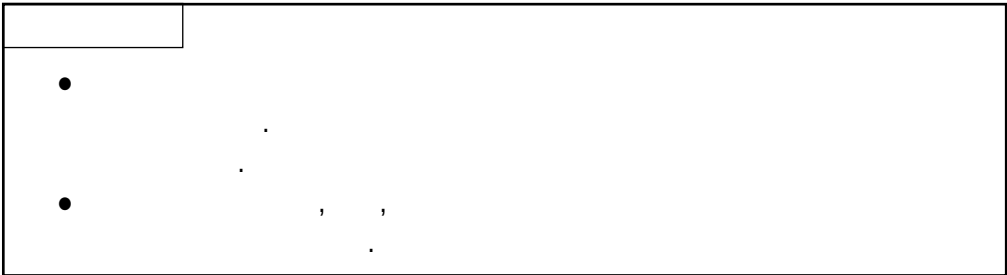
4.2



MEMO

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

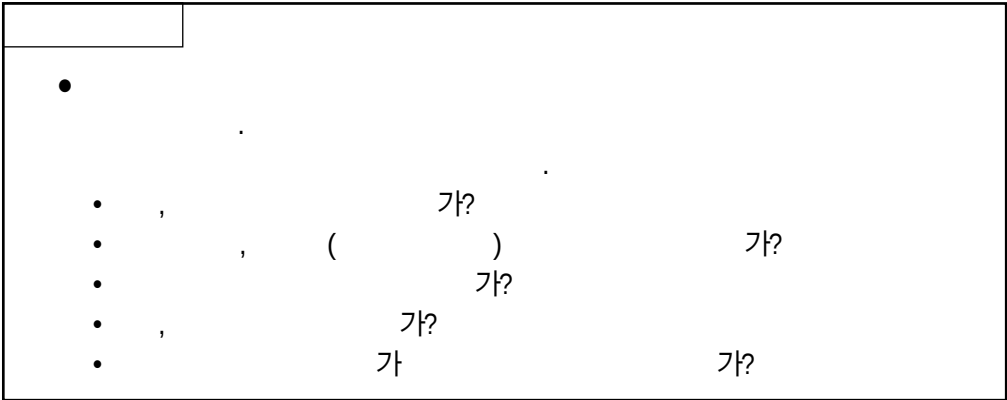
제3장 리니어 엔코더



3. 1 대응 리니어 엔코더 일람

						()		
	ABS		AT343A	0.05 μm	2.0m/s	3000 mm	2	○
			AT543A - SC		2.5m/s	2200 mm		
			ST741A	0.5 μm	4.0m/s	3000mm		
				LC491M	0.05 μm	2.0m/s	2040 mm	4
	INC	()	SL710 + PL101R/RH + MJ830 MJ831	0.2 μm ()	6.4m/s	3000 mm	2	×
			SH13 + MJ830 MJ831	0.005 μm ()	1.4m/s	1240 mm		×
		()	RGH26P	5.0 μm	4.0m/s	70000 mm	2	×
			RGH26Q	1.0 μm	3.2m/s			×
			RGH26R	0.5 μm	1.6m/s			×
			LIDA485 + APE391M	0.005 μm (20/4096 μm)	4.0m/s	30040 mm	4	×
			LIDA487 + APE391M			6040 mm		
INC				(7)			3	×

) (MJ830/MJ831 : ()) .



3.2 미쓰비시 시리얼 인터페이스 대응 리니어 엔코더

3.2.1 주식회사 미쓰토요 제품 리니어 스케일 (앱솔루트 타입)

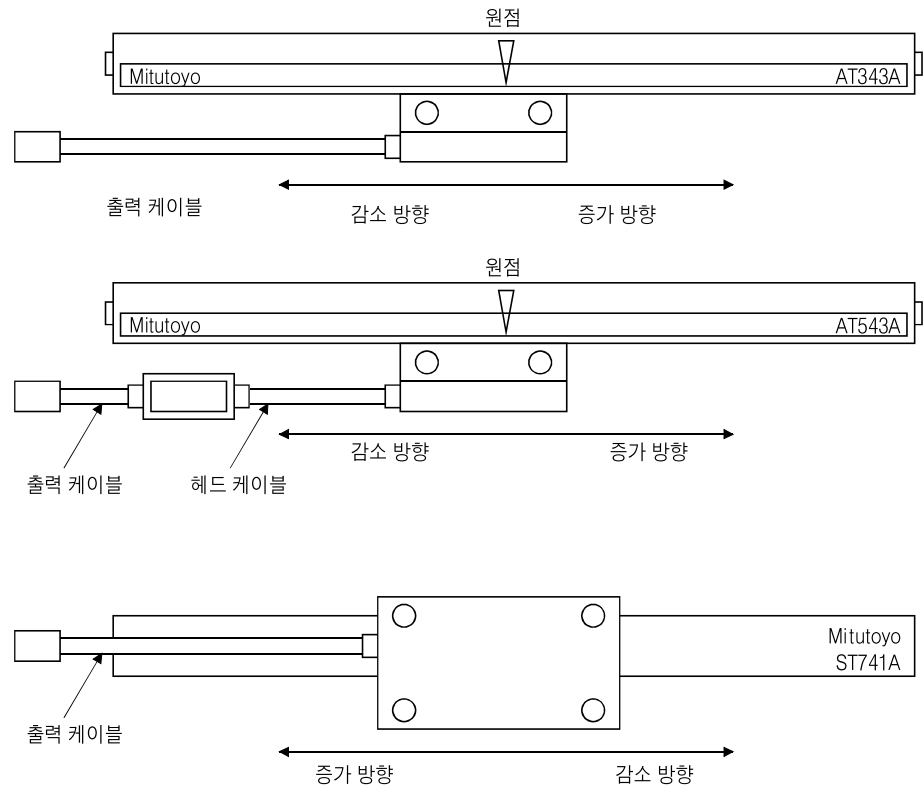
(1)

•	MR - J3BAT

	AT343A - □□□	AT543A - □□□ - SC()	ST741A - □□□
	(靜電容量) , (光電)		(電磁誘導)
	100~3000mm	100~2200mm	100~3000mm
(2 0)	0.05 μm		0.5 μm
	100~1500mm : 3+3L/1000 μm 1600mm~3000mm : 5 + 5L/1000 μm L :	100~1500mm : 3+3L/1000 μm L :	8+ (5L/1000) μm L :
	5V ± 5%		5V ± 10%
	250mA	270mA	
	2.0m/s		4.0m/s
	2.0m/s		4.0m/s
	0~45 ()	0~50 ()	
	20~80 %RH(가)		
	- 20~70 ()		
	20~80%RH(가)		
.	IP53 (())		IP65 ()
	100m/s ² (55~2000Hz)	195m/s ² (55~2000Hz)	300m/s ²
	150m/s ² (1/2sin, 11ms)	340m/s ² (1/2sin, 11ms)	500m/s ²
	5N		
	() Part №09BAA598A~C : 0.2, 2, 3m	2m + 3m	1m
	MR - EKCBL□M - H() , (4)(a), (b)		06ACF117A : 5m 06ACF117B : 10m (()) , (4)(c)

) AT543A - □□□ - HC/ - HL/ - HR , ()

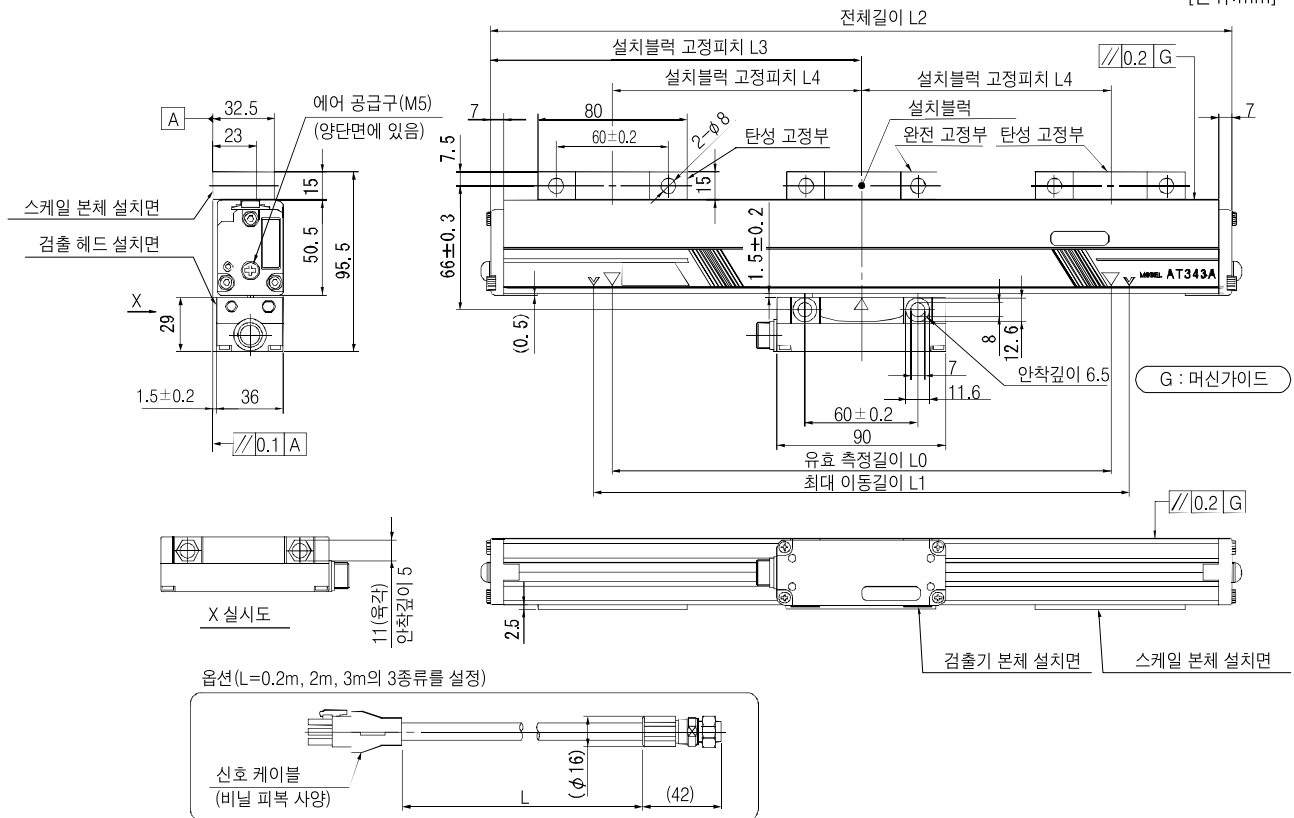
(2)



(3)

(a) AT343A

[단위:mm]

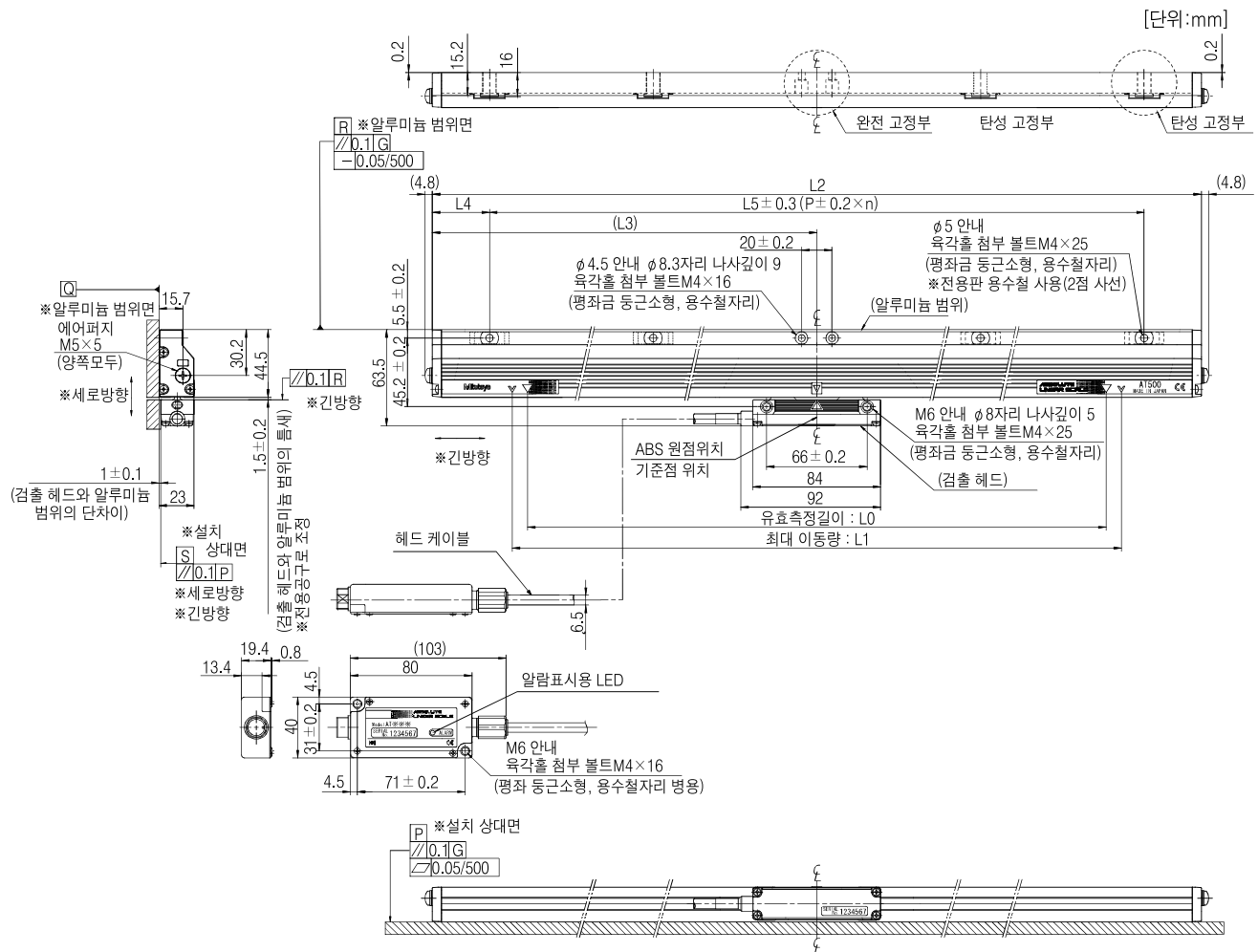


)

(Part.No.09BAA598A~C : 0.2m, 2m, 3m)

	L0	L1	L2	L3	L4	()		L0	L1	L2	L3	L4	()
AT343A - 300	300	330	440	220	150	3	AT343A - 1300	1300	1360	1470	735	325	5
AT343A - 350	350	380	490	245	175		AT343A - 1400	1400	1460	1570	785	350	
AT343A - 400	400	430	540	270	200		AT343A - 1500	1500	1560	1670	835	375	
AT343A - 450	450	480	590	295	225		AT343A - 1600	1600	1690	1800	900	400	
AT343A - 500	500	540	650	325	250		AT343A - 1700	1700	1790	1900	950	425	
AT343A - 600	600	650	760	380	300		AT343A - 1800	1800	1890	2000	1000	450	7
AT343A - 700	700	760	870	435	350		AT343A - 2000	2000	2100	2210	1105	335	
AT343A - 750	750	810	920	460	375		AT343A - 2200	2200	2300	2410	1205	370	
AT343A - 800	800	860	970	485	400		AT343A - 2400	2400	2500	2610	1305	400	
AT343A - 900	900	960	1070	535	450		AT343A - 2500	2500	2600	2710	1355	315	9
AT343A - 1000	1000	1060	1170	585	500		AT343A - 2600	2600	2700	2810	1405	325	
AT343A - 1100	1100	1160	1270	635	275	5	AT343A - 2800	2800	2900	3010	1505	350	
AT343A - 1200	1200	1260	1370	685	300		AT343A - 3000	3000	3050	3210	1605	375	

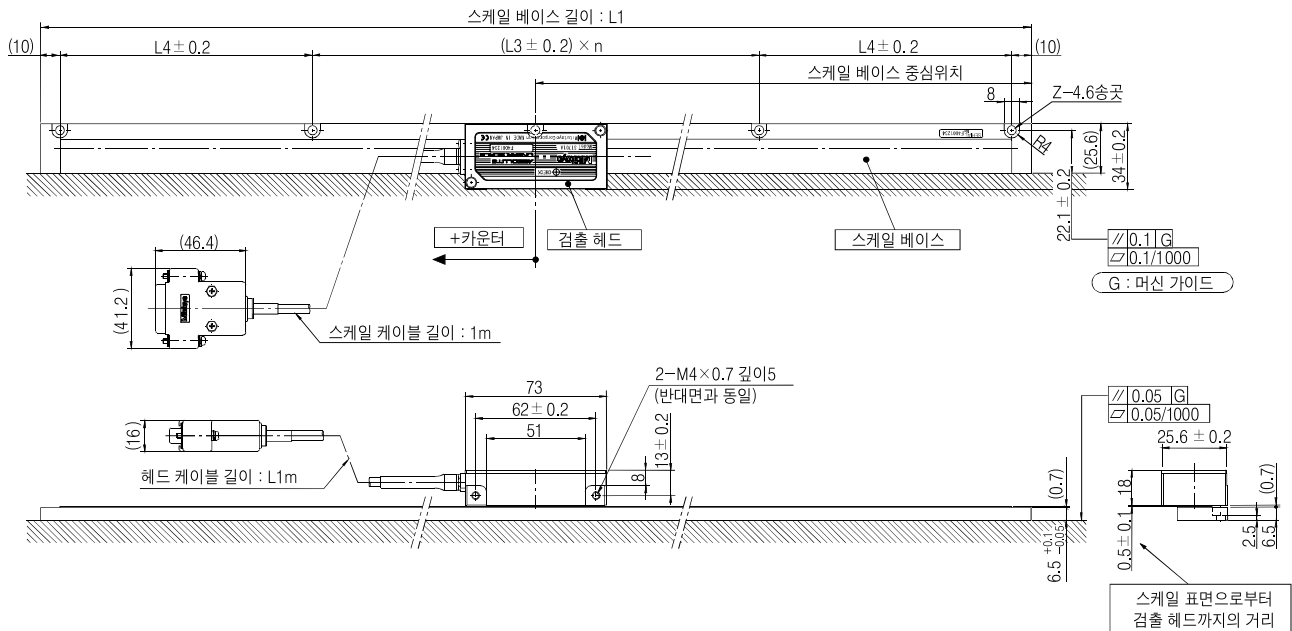
(b) AT543A - SC



	L0	L1	L2	L3	L4	L5	P	$\begin{matrix} n \\ [\quad] \end{matrix}$		L0	L1	L2	L3	L4	L5	P	$\begin{matrix} n \\ [\quad] \end{matrix}$
AT543A - 100 - SC	100	120	225	112.5	37.5	150	75	2	AT543A - 1100 - SC	1100	1120	1225	612.5	87.5	1050	175	6
AT543A - 200 - SC	200	220	325	162.5	37.5	250	125	2	AT543A - 1200 - SC	1200	1220	1325	616.5	62.5	1200	200	6
AT543A - 300 - SC	300	320	425	212.5	37.5	350	175	2	AT543A - 1300 - SC	1320	1425		712.5	112.5	1200	150	8
AT543A - 400 - SC	400	420	525	262.5	62.5	400	200	2	AT543A - 1400 - SC	1400	1420	1525	762.5	62.5	1400	175	8
AT543A - 500 - SC	500	520	625	312.5	62.5	500	125	4	AT543A - 1500 - SC	1500	1520	1625	812.5	112.5	1400	175	8
AT543A - 600 - SC	600	620	725	362.5	62.5	600	150	4	AT543A - 1600 - SC	1600	1620	1725	862.5	62.5	1600	200	8
AT543A - 700 - SC	700	720	825	412.5	62.5	700	175	4	AT543A - 1800 - SC	1800	1820	1925	962.5	87.5	1750	175	10
AT543A - 800 - SC	800	820	925	462.5	62.5	800	200	4	AT543A - 2000 - SC	2000	2020	2125	1062.5	62.5	2000	200	10
AT543A - 900 - SC	900	920	1025	512.5	62.5	900	150	6	AT543A - 2200 - SC	2200	2220	2325	1162.5	112.5	2100	175	12
AT543A - 1000 - SC	1000	1020	1125	562.5	37.5	1050	175	6									

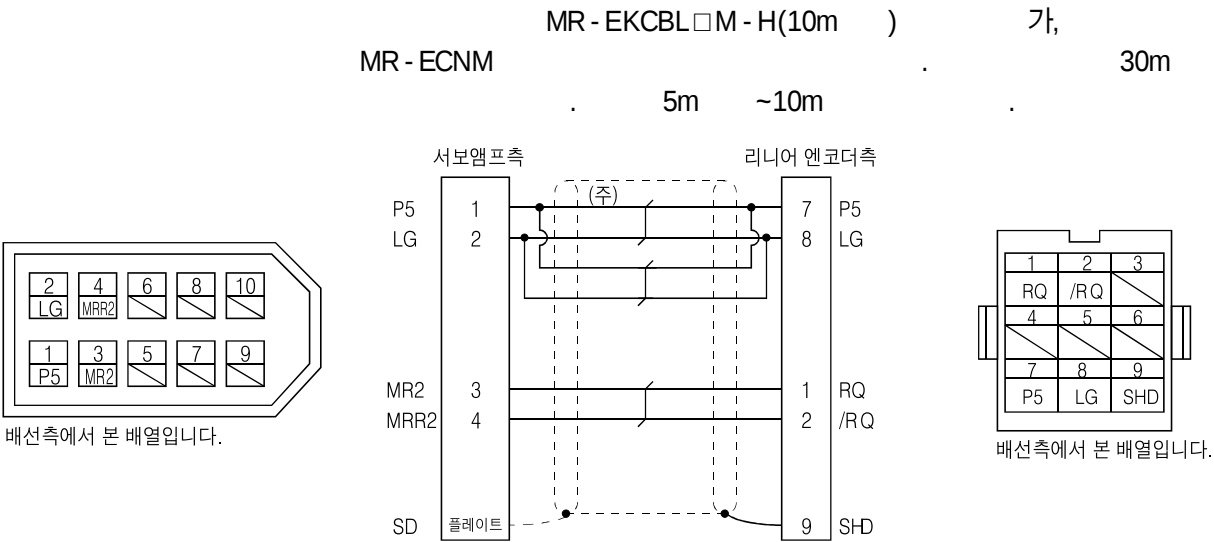
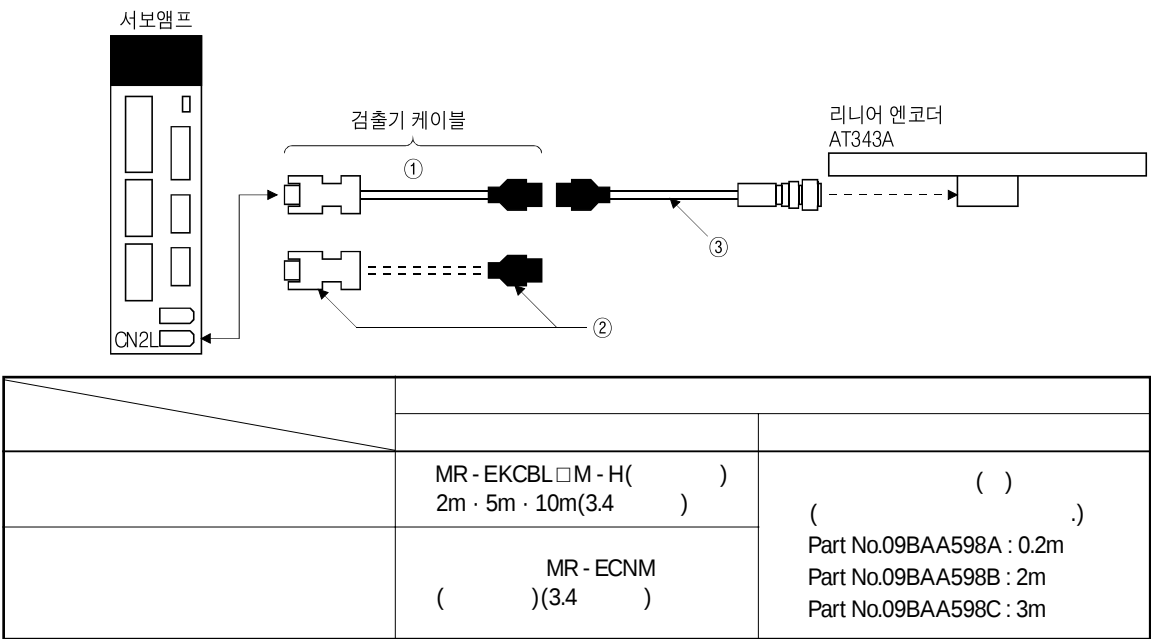
(c) ST741A

[단위:mm]



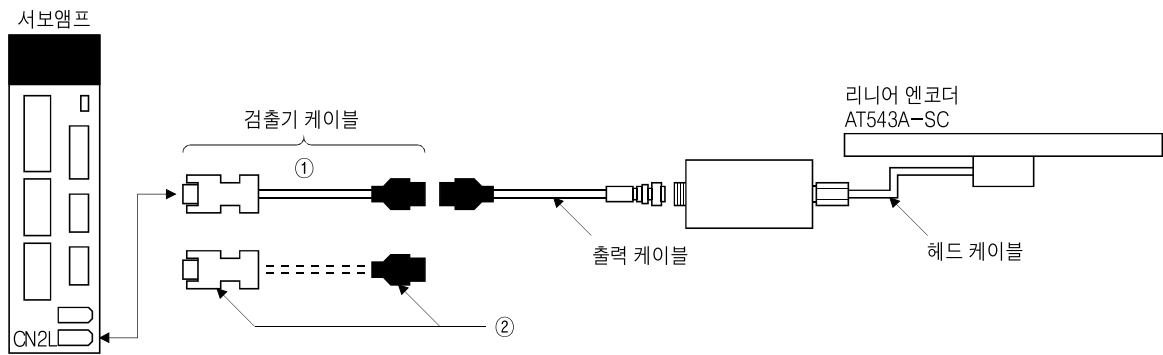
			L1	L2	L3	n	L4	Z				L1	L2	L3	n	L4	Z
ST741A - 100A	100	110	180	90	80	2	—	3	ST741A - 1600A	1600	1610	1680	840	200	6	230	9
ST741A - 200A	200	210	280	140	130		—		ST741A - 1700A	1700	1710	1780	890		8	80	11
ST741A - 300A	300	310	380	190	180		—		ST741A - 1800A	1800	1810	1880	940			130	
ST741A - 400A	400	410	480	240	230		—		ST741A - 1900A	1900	1910	1980	990			180	
ST741A - 500A	500	510	580	290	5		80	ST741A - 2000A	2000	2010	2080	1040	230		13		
ST741A - 600A	600	610	680	340			130	ST741A - 2100A	2100	2110	2180	1090	80			10	
ST741A - 700A	700	710	780	390			180	ST741A - 2200A	2200	2210	2280	1140	130				
ST741A - 800A	800	810	880	440			230	ST741A - 2300A	2300	2310	2380	1190	180				
ST741A - 900A	900	910	980	490	200		4	80	ST741A - 2400A	2400	2410	2480	1240		230	12	15
ST741A - 1000A	1000	1010	1080	540				130	ST741A - 2500A	2500	2510	2580	1290		80			14	17
ST741A - 1100A	1100	1110	1180	590		180		ST741A - 2600A	2600	2610	2680	1340	130				
ST741A - 1200A	1200	1210	1280	640		230		ST741A - 2700A	2700	2710	2780	1390	180				
ST741A - 1300A	1300	1310	1380	690		6	80	ST741A - 2800A	2800	2810	2880	1440	230				
ST741A - 1400A	1400	1410	1480	740			130	ST741A - 2900A	2900	2910	2980	1490	80				
ST741A - 1500A	1500	1510	1580	790			180	ST74 1A - 3000A	3000	3010	3080	1540	130				

(4)
(a) AT343A



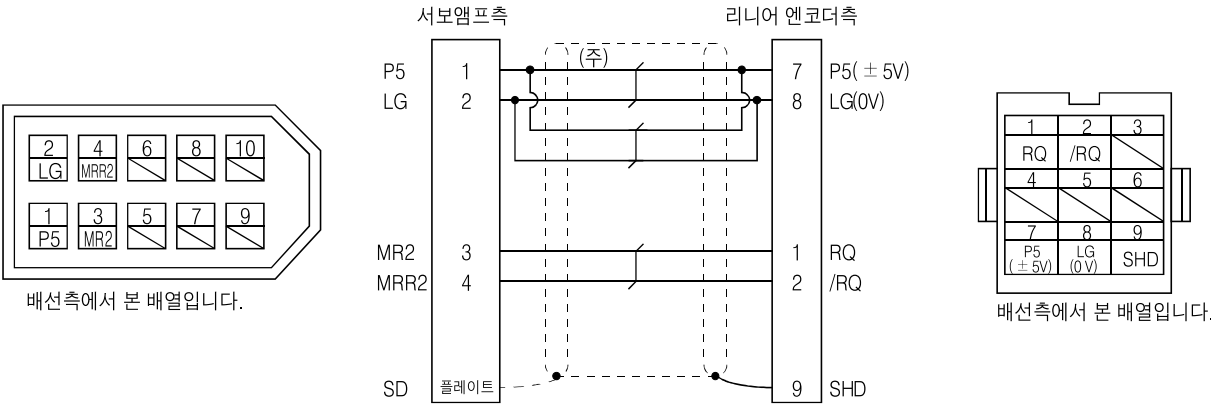
	LG, P5 3m	
~5m	1	AWG22
~10m	2	
~20m	4	
~30m	6	

(b) AT543A - SC



	MR - EKCBL□M - H() 2m · 5m · 10m(3.4)		
	MR - ECNM () (3.4)	3m	2m

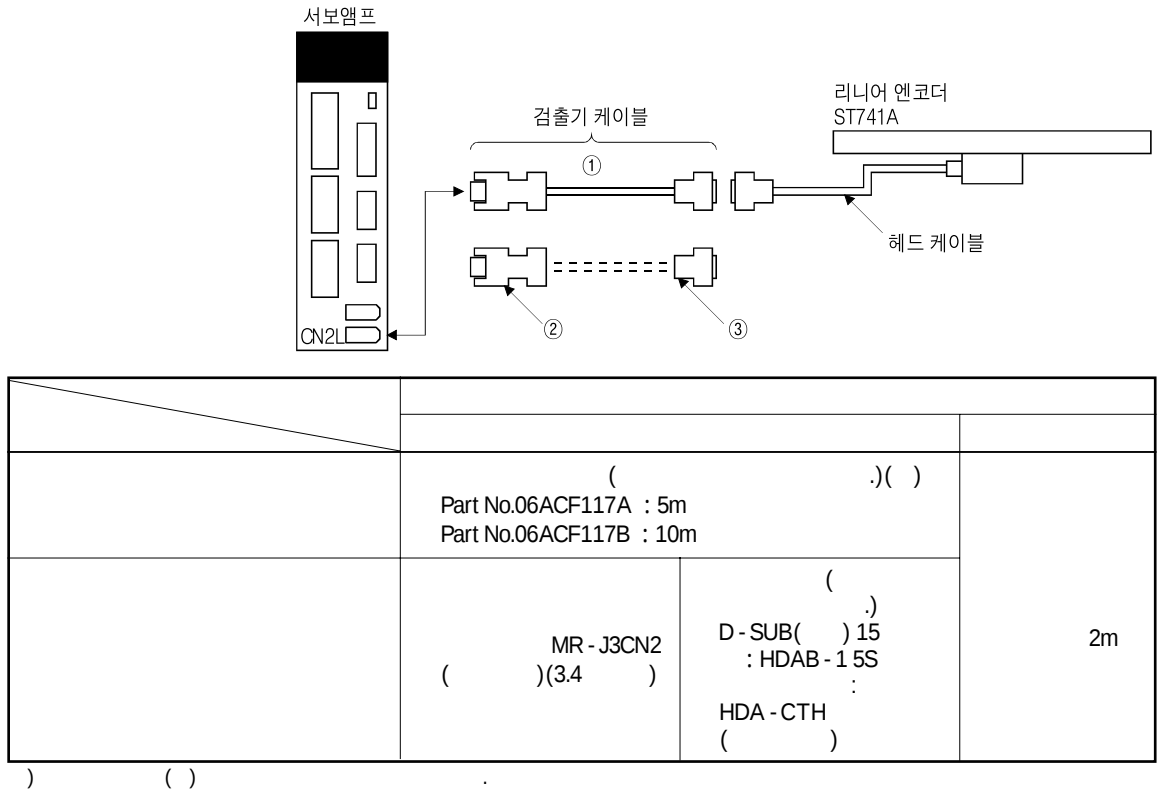
MR - EKCBL□M - H(10m) 가, 30m
MR - ECNM 5m ~10m



) LG, L5

	LG, P5 3m	
~5m	1	AWG22
~10m	2	
~20m	4	
~30m	6	

(c) ST741A



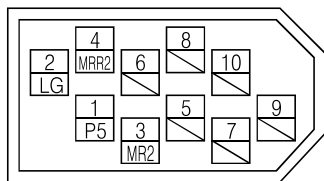
MR-J3CN2,

30m

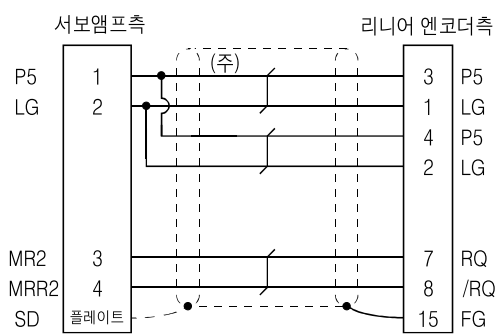
5m

~ 10m

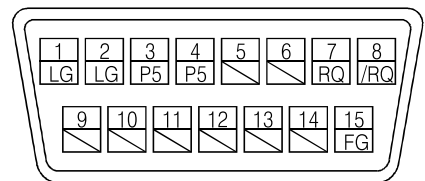
컨넥터 셋트(옵션)
MR-J3CN2
리셉터클 : 36210-0100JL
셸 키드 : 36310-3200-008
(3M제 또는 동등품)



배선측에서 본 배열입니다.



셸 : HDAB-15S
실드 커버 : HDA-CTH
(히로세전기 또는 동등품)



배선측에서 본 배열입니다.

)

LG, L5

	LG, P5 1m	
~5m	1	AWG22
~10m	2	
~20m	3	
~30m	4	

3.2.2 하이덴하인주식회사 제품 리니어 엔코더

(1)

•	MR - J3BAT

(a)

	LC491M
	(光電走査)
	70~2040mm
	0.05 μm
(2 0)	± 3 μm(± 5 μm 1240 μm)
	5V ± 5%
	300mA
	2.0m/s
	2.0m/s
	0~50 ()
	- 20~70 ()
	IP53 (IP64())
	100m/s²(DINIEC 68 - 2 - 6) 150m/s²(DINIEC 68 - 2 - 6)
	150m/s²(DINIEC 68 - 2 - 6) (11ms)
	5N
	337439 - × × (17) , 367425 - 0 × (20)
	, (4)

(b)

	LIDA485	LIDA487	
			APE391M
	(光電走査)		
	140~30040mm	240~6040mm	
	0.005 μm (20/4096 μm) APE391M : 4096		
(2 0)	$\pm 5 \mu\text{m}$		
	5V $\pm 5\%$		
	200mA		160mA
	4.0m/s		
	8.0m/s		
	$\sim 1\text{V}_{\text{PP}}$		
가	400kHz		
	0~50 ()		
	- 20~70 ()		
	IP50		
	100m/s ² (IEC 60 068 - 2 - 6)(55~2000Hz)		100m/s ²
	500m/s ² (IEC 60 068 - 2 - 27)(11ms)		200m/s ²
	(Z) ()		
	() 3m		
	+ (APE391M) 0.5m		
	366 419 - $\times \times$ ()		
	(5)		

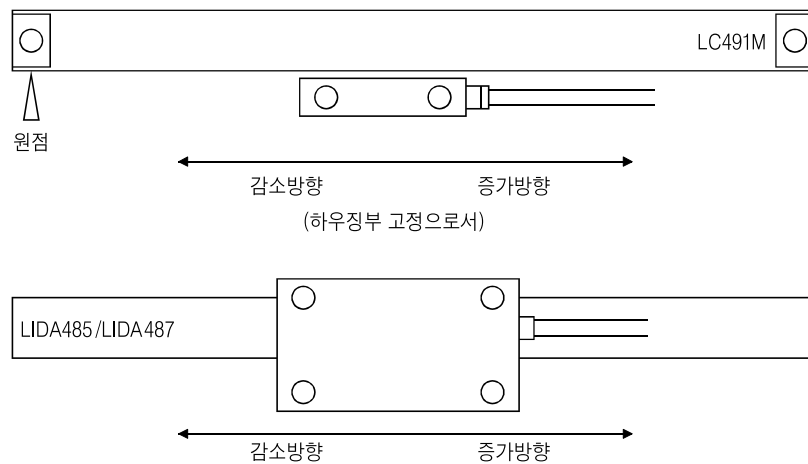
)

()

,

.

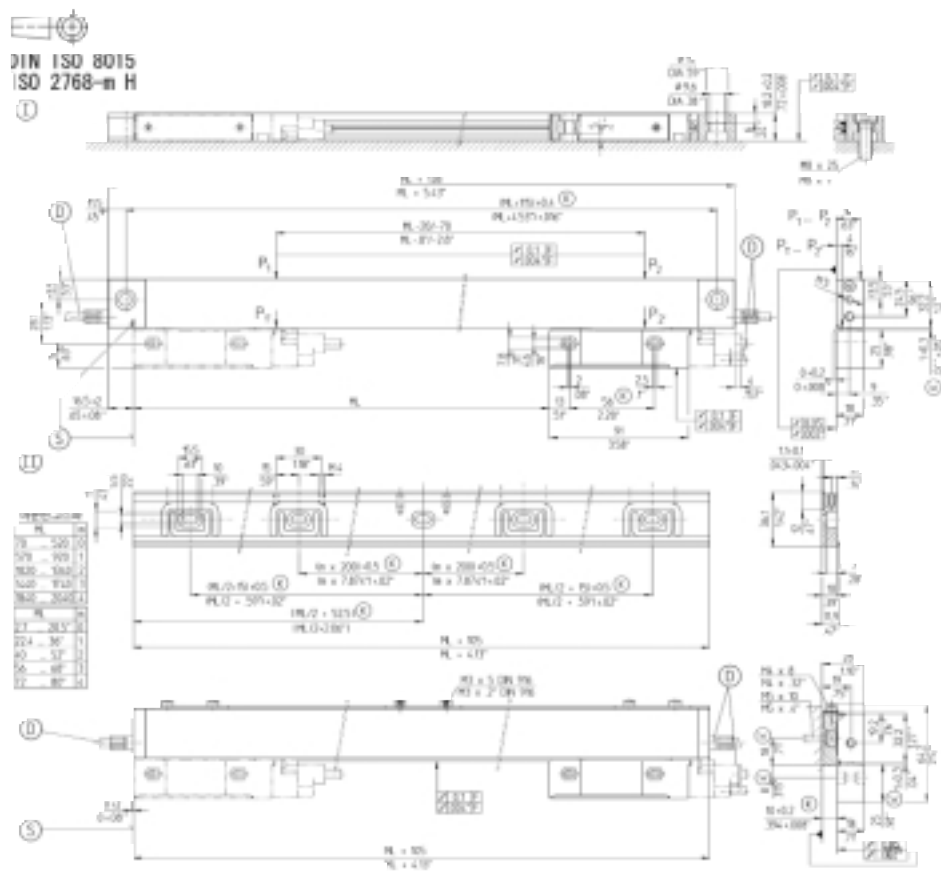
(2)



(3)

● LIDA485	()

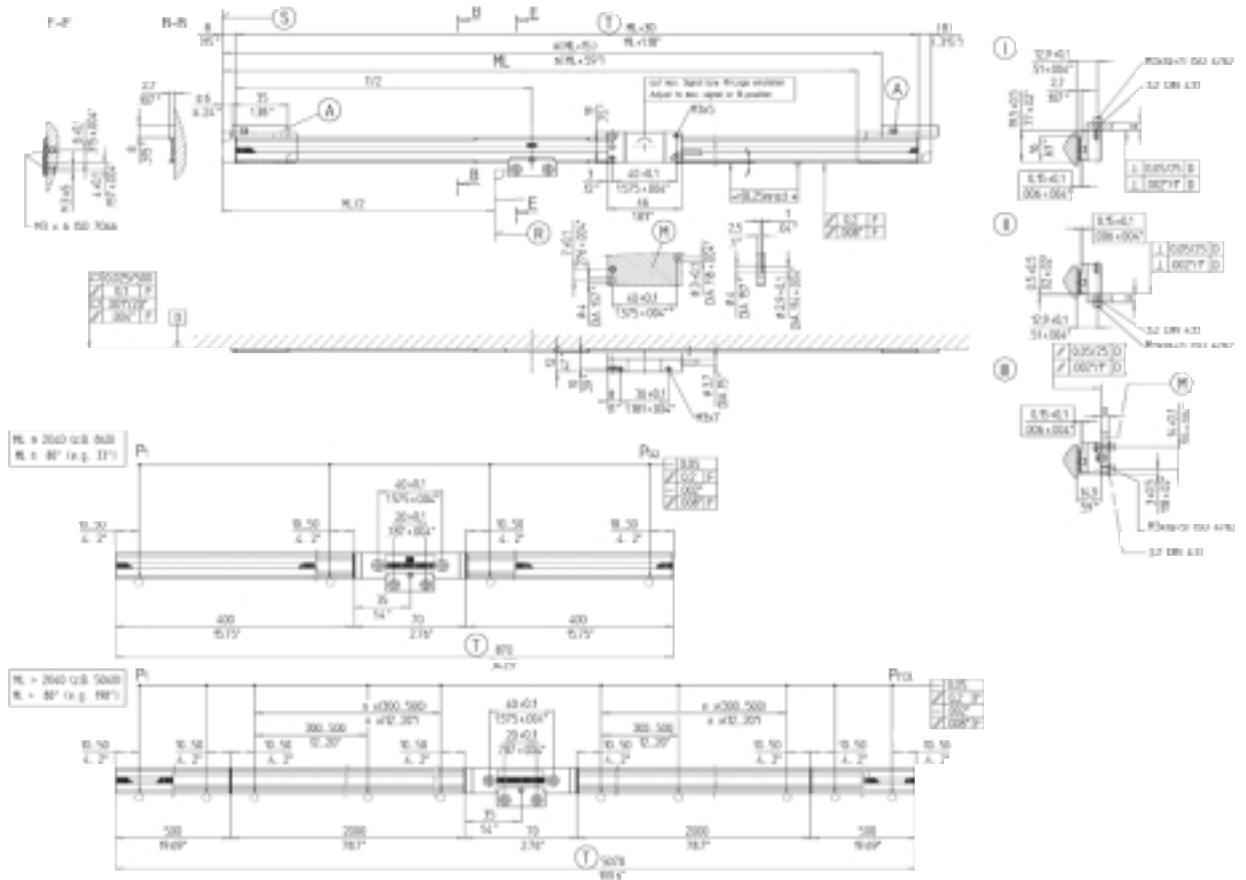
(a) LC491M()



① =
② =
F = 가
P =
K =
U =
S = (pos. 20mm)

) PDF

(b) LIDA487()



①②③= (走査)

Ⓕ= 가

□=

*=

Ⓖ=

Ⓖ=

Ⓖ=

Ⓖ=

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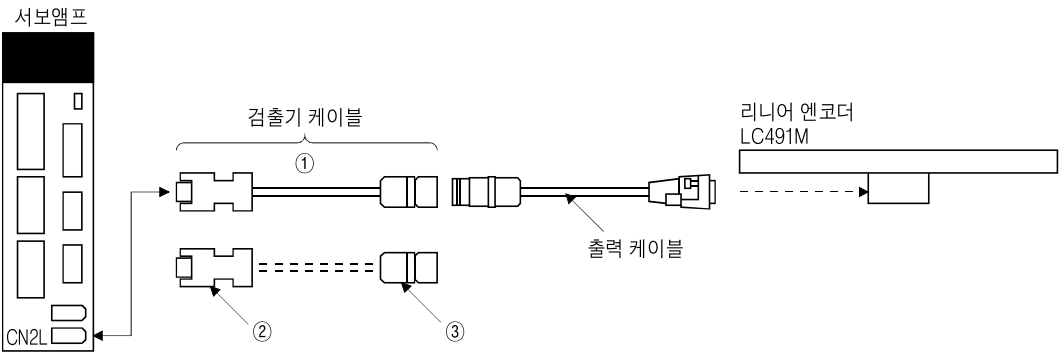
Ⓖ=

Ⓖ=

) PDF

(4)
(a) LC491M()

● 4 No.PC26 “ 1□□□ ” 4



	() ()		337 439 - × × ... □ m
	MR - J3CN2 (3.4)	17 () 291697 - 26 ()	() () ()

) ()

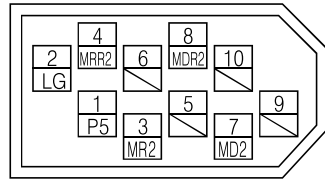
MR - J3CN2,

30m

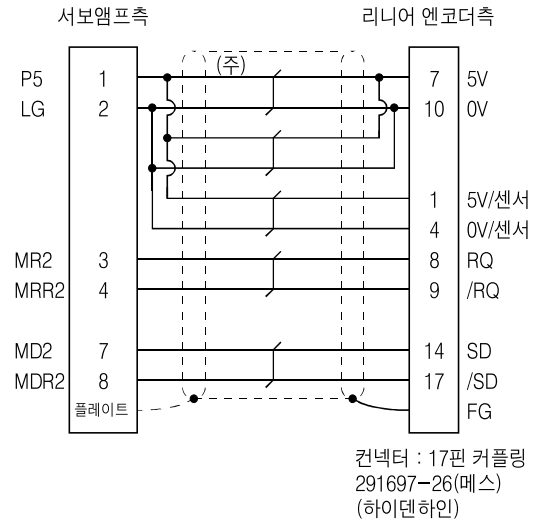
5m

~ 10m

컨넥터 셋트(옵션)
MR-J3CN2
리셋터클 : 36210-0100JL
셀 키트 : 36310-3200-008
(3M제 또는 동등품)



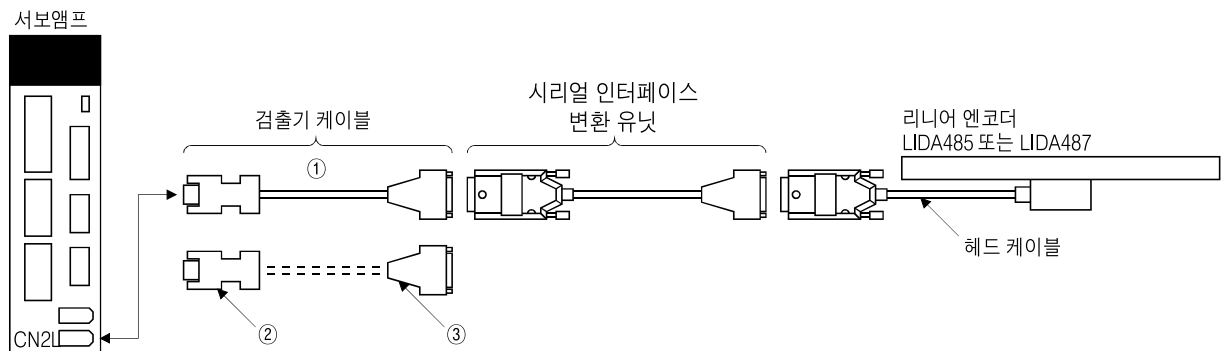
배선측에서 본 배열입니다.



) LG, L5

	LG, P5 1m	
~5m	2	AWG22
~10m	3	
~20m	5	
~30m	7	

(b) LIDA485 LIDA487()



MELSERVO

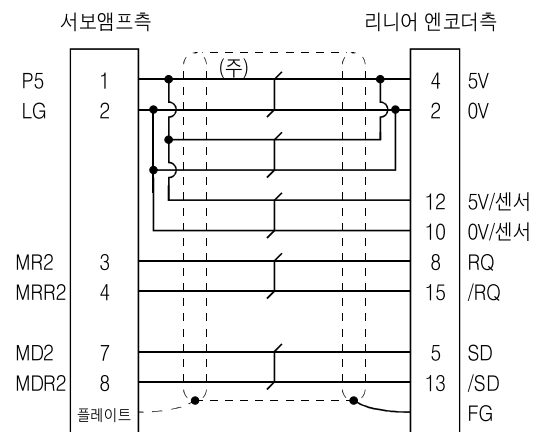
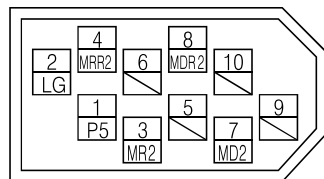
	366 419 - x × ...□m (.)()		APE391M 0.5m
	MR - J3CN2 () (3.4)	(.) D-SUB15 ()	3m

MR - J3CN2,

30m

5m ~ 10m

컨넥터 셋트(옵션)
MR-J3CN2
리셉터클 : 36210-0100JL
셀 키트 : 36310-3200-008
(3M제 또는 동등품)



컨넥터 : D-SUB(메스)15핀

LG, L5

	LG, P5	
~5m	2	AWG22
~10m	3	
~20m	6	
~30m	8	

3.2.3 소니매뉴팩처링시스템즈주식회사 제품 리니어 엔코더 (인크리멘털 타입)

(1)

	MJ830/MJ831	SL710 + PL101 - R/RH	MJ830/MJ831	SH13
	(磁氣檢出)		(光學檢出)	
	50~3000mm		70~1240mm	
	0.2 μm (1)		0.005 μm (1)	
(20)	$\pm 10 \mu\text{m}$		$\pm 3 \mu\text{m}$ A3 $\pm 5 \mu\text{m}$ A5	
	MJ830 : 5V(4.5~5.5V) MJ831 : 12~24V(11~32V)		5V(4.5~5.5V)(1)	
	3W		3W	
	6.4m/s		1.4m/s	
	6.4m/s		2.0m/s	
	0~55 ()	0~45 ()	0~55 ()	0~45 ()
	- 20~65 ()	- 20~50 ()	- 20~65 ()	- 10~60 ()
		IP50(PL101R), IP64(PL101RH)		IP53 ()
	9.6m/s ² 5~800Hz	20m/s ² 50~2000Hz	9.6m/s ² 5~800Hz	98m/s ² (30~1000Hz 30)
	980m/s ² 11ms	980m/s ² 11ms	980m/s ² 11ms	294m/s ² (11ms XYZ 3 3)
	(Z) (2)		(Z) (2)	
		CK - T1□		CR4 - 05NNT0□, CR4 - 10NNT01(10m)
	(4)		(4)	

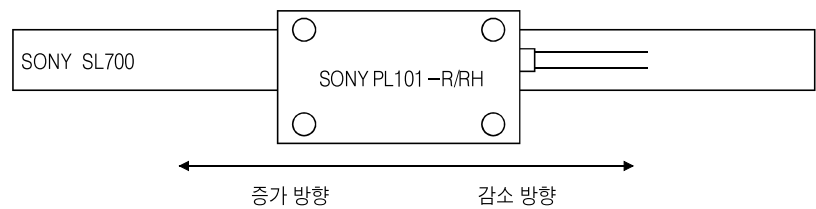
) 1.

2. () , .

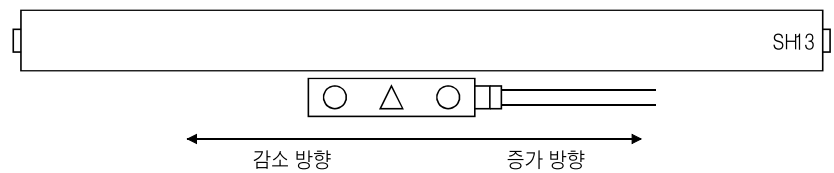
(2)

가 / (MJ830/MJ831)
 (MJ830/MJ831)
 MODE 5
 ()

PL101-R/RH, SL700사용시

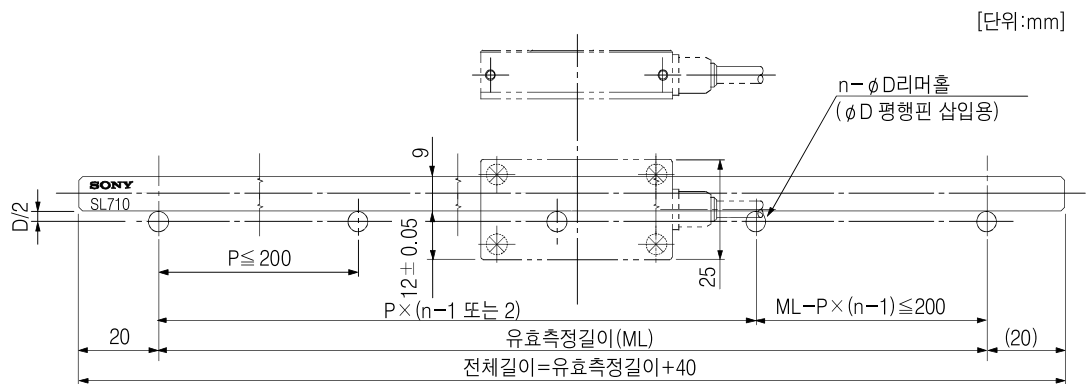


SH13 사용시



(3)

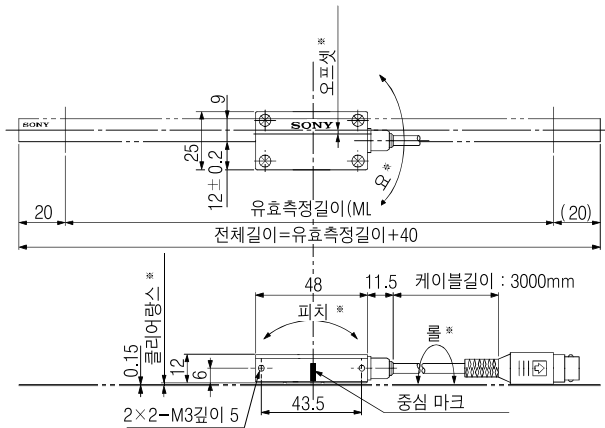
(a) SL710



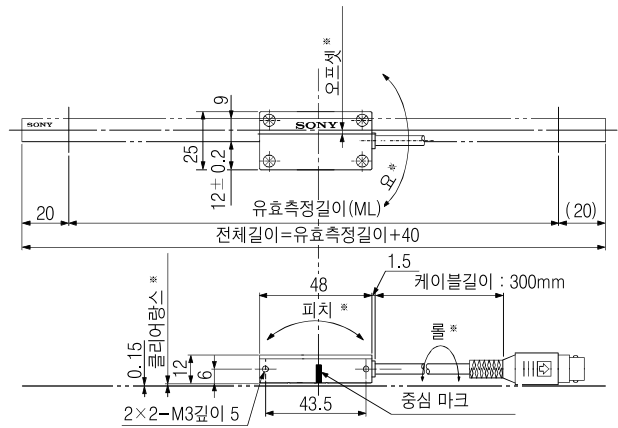
3mm

(b) PL101

<PL101-RH(IP67타입)>

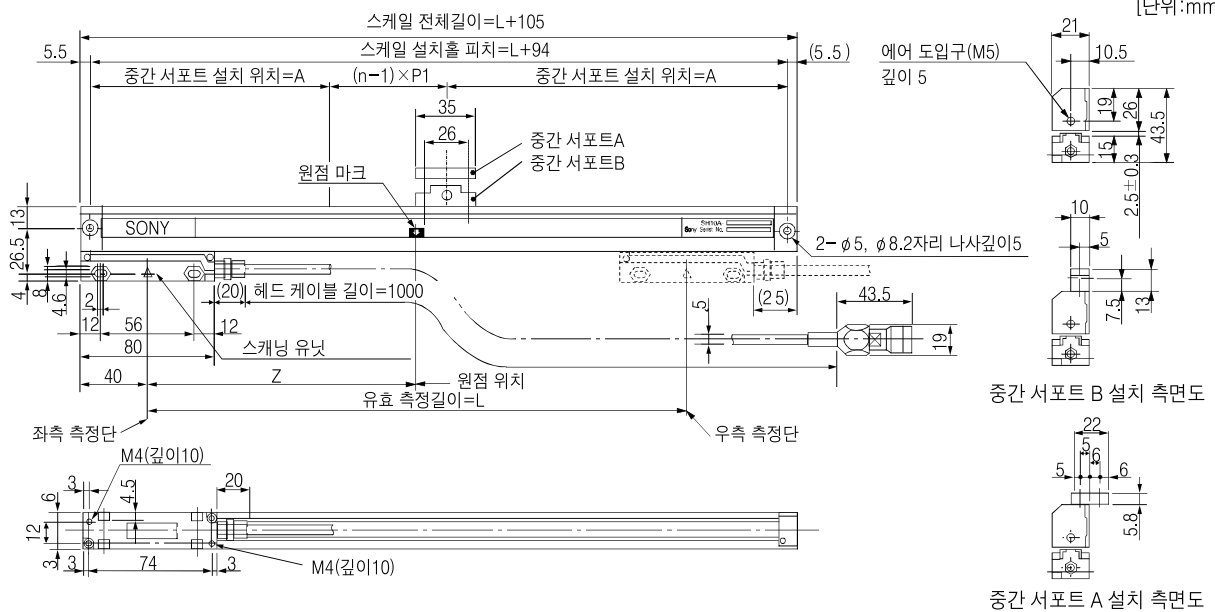


<PL101-N/PL101-R(IP50타입)>



(c) SH13

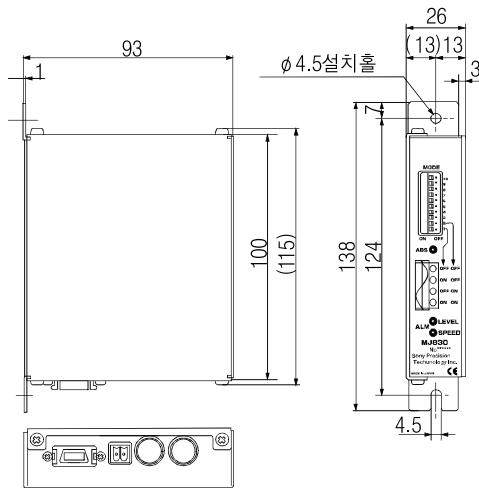
[단위:mm]



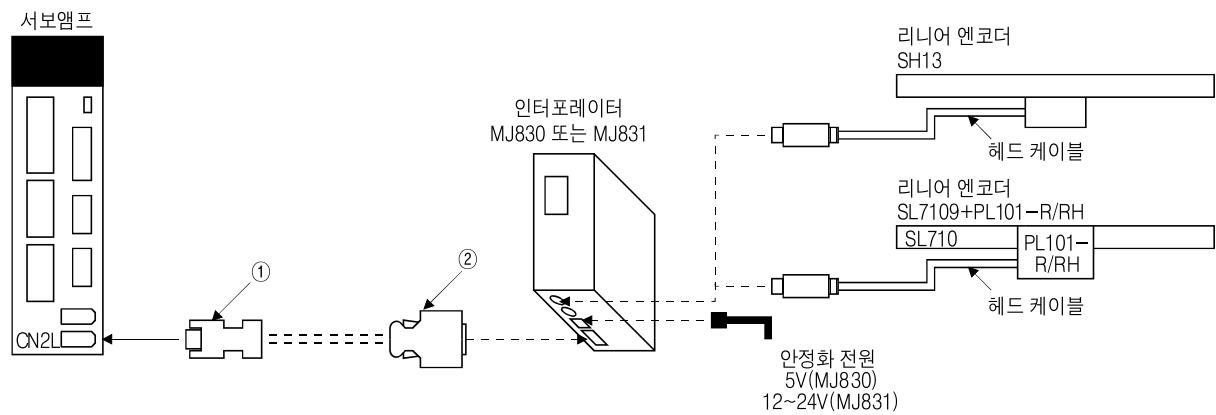
SH13-			007	012	017	022	027	032	037	042	047	052	057	062	067	072	077	082	092	102	114	124
유효 측정길이	L	mm	70	120	170	220	270	320	370	420	470	520	570	620	670	720	770	820	920	1020	1240	1240
중간 서포터	n											1	1	1	1	1	1	1	1	2	2	2
중간 서포터 설치홀 피치	A	mm										307	322	357	382	407	432	457	507	380	420	450
	P1	mm																		354	394	434
원점 위치	Z	mm	35	60	85	110	135	160	185	210	235	260	285	310	335	360	385	410	460	510	570	620

(d) MJ830/MJ831

[단위:mm]



(4)



	()			(.)
	MR - J3CN2 () (3.4)	(: 10114 - 3000VE : 10314 - 52F0 - 008 (3M)	PL101 - R : 0.3m PL101 - RH : 3m 1m	MJ830 MJ831
SL710 + PL101 - R/RH				
SH13				

MR - J3CN2,

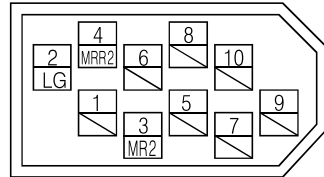
30m

컨넥터 세트(옵션)

MR-J3CN2

리셉터클 : 36210-0100JL

셀 키트 : 36310-3200-008
(3M제 또는 동등품)



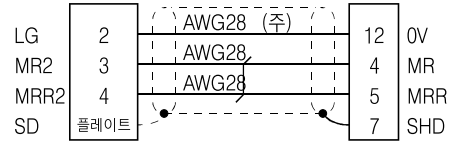
배선측에서 본 배열입니다.

) LG 0V

가

서보앰프측

리니어 엔코더측



컨넥터 : 17핀 커플링
291697-26(메스)
(하이덴하인)

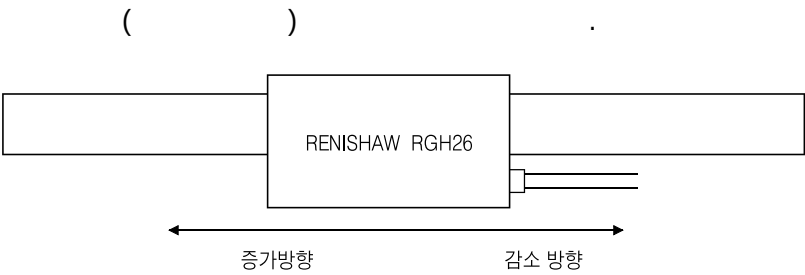
3.2.4 레니쇼주식회사 제품 리니어 엔코더 (인크리멘털 타입)

(1)

	RGH26P	RGH26Q	RGH26R
	(光學)		
	7000mm		
	5 μm	1 μm	0.5 μm
(20)	± 3 μm/m(2)		
	5V ± 5%		
	230mA		
(1)	4.0m/s	3.2m/s	1.6m/s
	5.0m/s	4.0m/s	2.0m/s
	0~55 ()		
	10~90%RH(가)		
	- 20~70 ()		
	IP50		
	100m/s²(55~2000Hz)		
	1000m/s²(1/2sin, 11ms)		
	(Z		)(2)
	() N - 15 PIN Dtype plug(0.5m)		
	(4)		

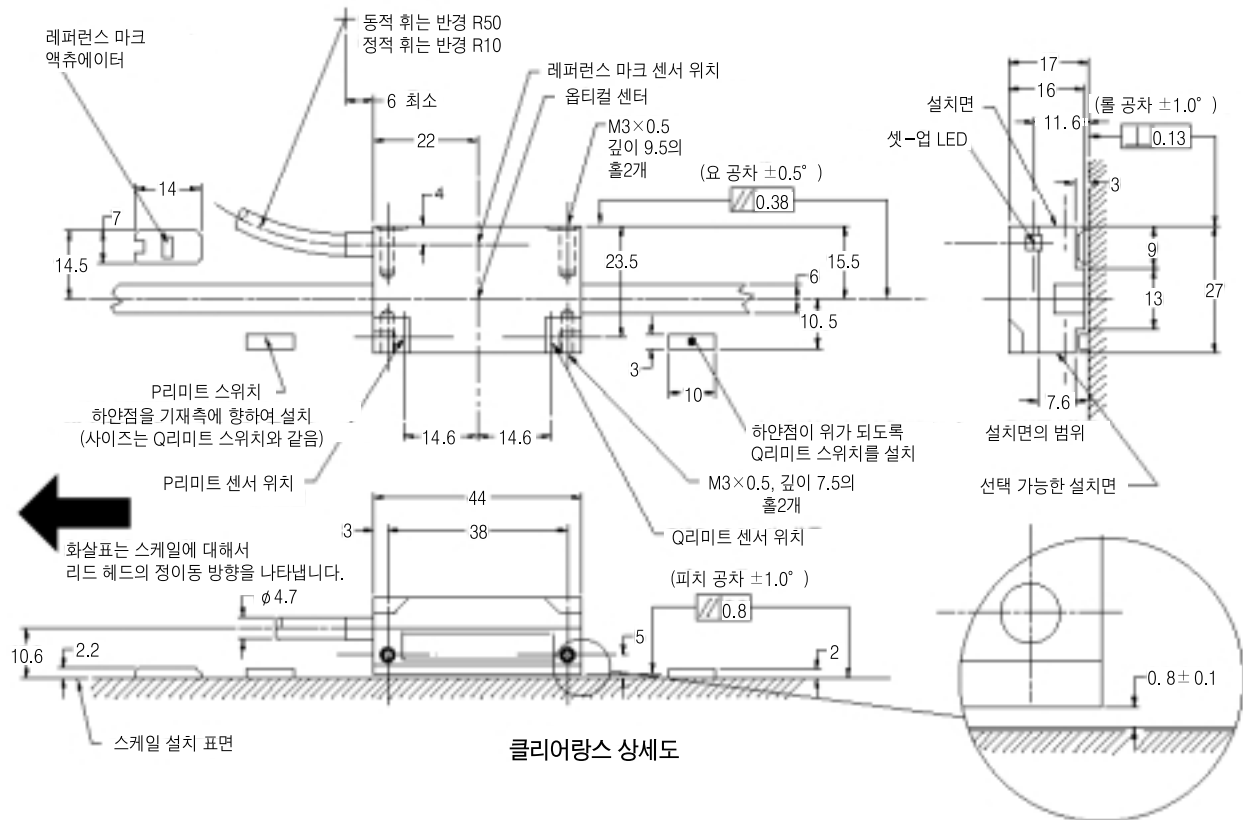
-) 1.
2. ()

(2)



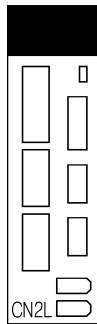
(3) RGH26P, RGH26Q, RGH26R

[단위:mm]



(4)

서보앰프

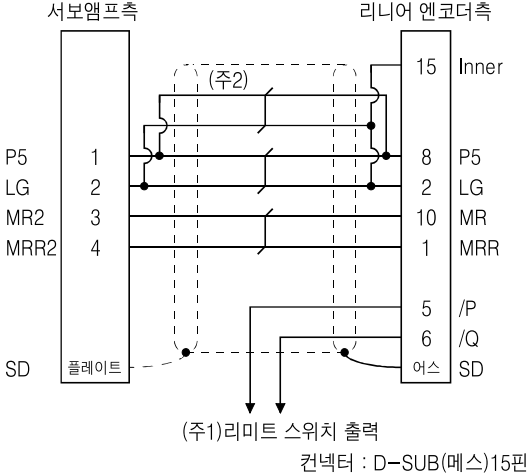


RGH26

출력 케이블

()		
MR - J3CN2	()	
()	()	
(3.4)	D - SUB15 ()	0.5m

MR - J3CN2,
30m



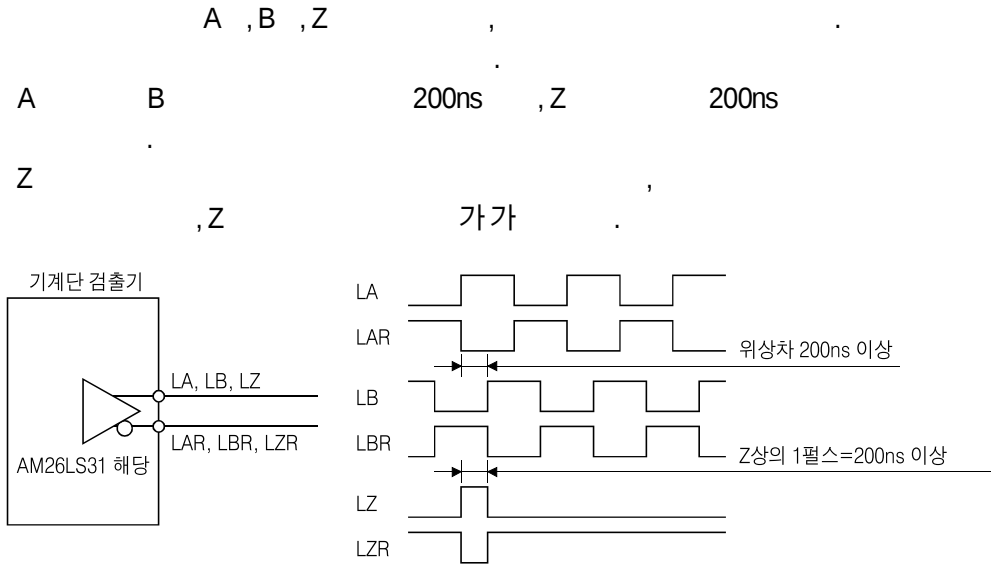
-) 1. ()
2. LG, L5

	LG, P5	
~5m	1	AWG22
~10m	2	
~20m	4	
~30m	6	

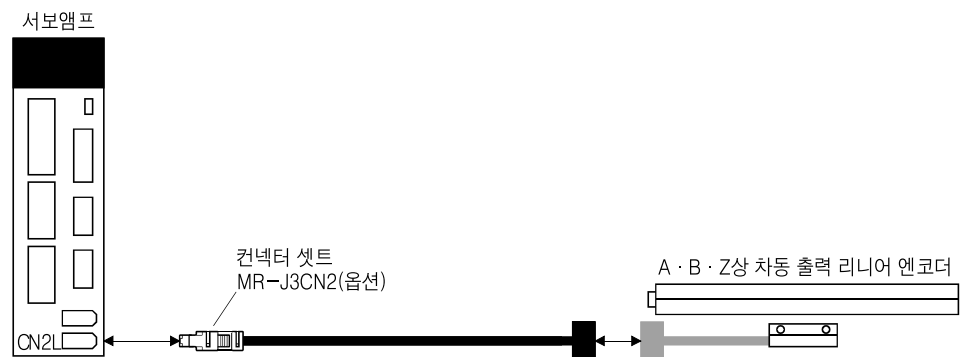
3.3 A·B·Z상 차동 출력 리니어 엔코더

A·B·Z
,MR-J3CN2 (3)

(1) A·B·Z



(2) A·B·Z



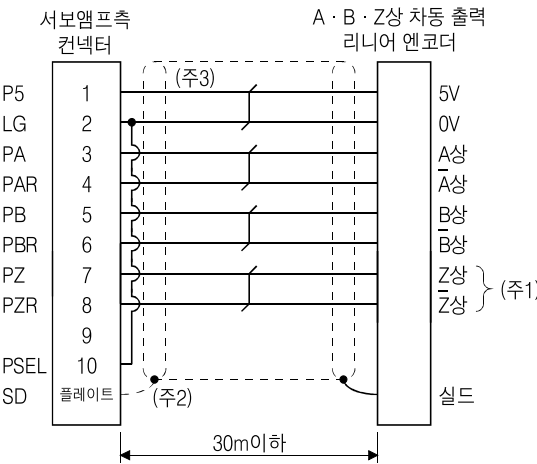
(3)

, RS - 422

30m

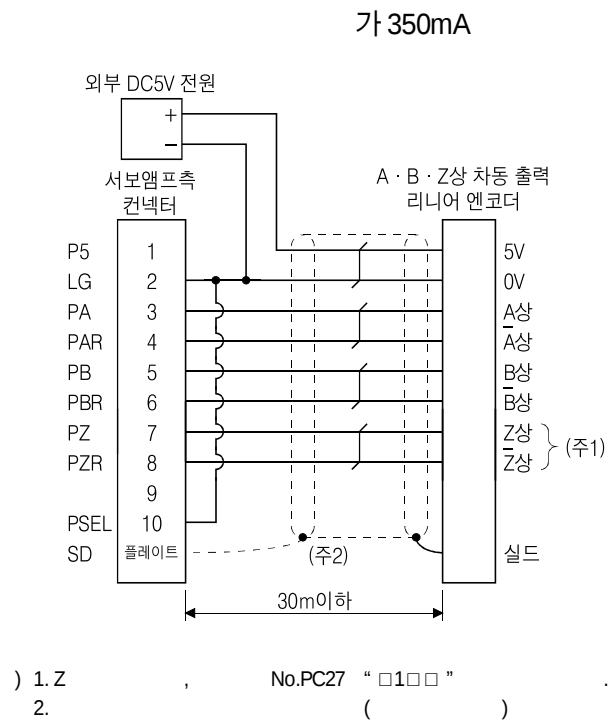
가

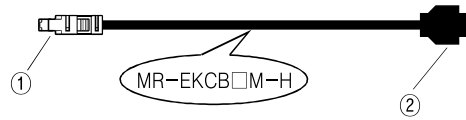
가 350mA



-) 1. Z , No.PC27 “ □1□□ ”
2. ()
3. 가 350mA , LG, L5
가 350mA 가

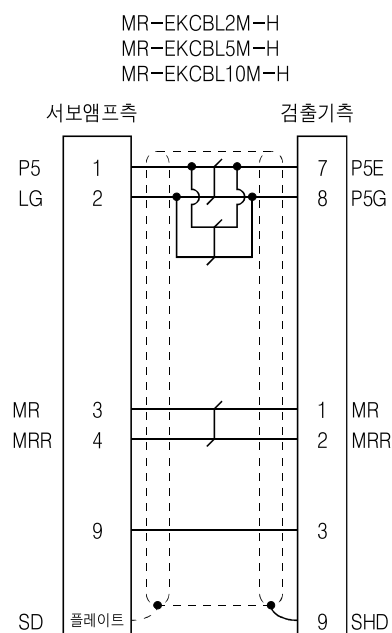
	LG, P5	
~5m	2	AWG22
~10m	3	
~20m	6	
~30m	8	





	CN2L		
MR - EKCB□M - H	(1)	(2)	
	: 54593 - 1011	: 51209 - 1001	: 1 - 172161 - 9
	A : 54594 - 1015	A : 54594 - 1015	: 170359 - 1
	B : 54595 - 1005	B : 54595 - 1005	(
	: 58935 - 1000	: 58935 - 1000	)
	: 58934 - 1000	: 58934 - 1000	: MTI - 0002
	: 58937 - 0000	: 59351 - 8187	(:)
	: 58203 - 0010	: 58937 - 0000	
	(Molex)	: 58203 - 0010	
		(Molex)	
	(주) 신호배열		신호배열
	배선측에서 본 배열입니다.		배선측에서 본 배열입니다.
	) , 10		
	가		

(3)

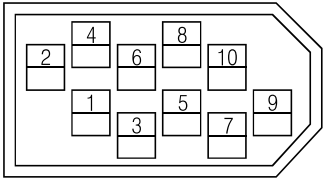


3.4.2 MR-ECNM

	MR - ECNM()	
		
	CN2L	
	: 54593 - 1011	: 1 - 172161 - 9
	A : 54594 - 1015	: 170359 - 1
	B : 54595 - 1005	(
	: 58935 - 1000	)
	: 58934 - 1000	: MTI - 0002
	: 58937 - 0000	(
	: 58203 - 0010	)
	(Molex)	

3.4.3 MR-J3CN2

컨넥터 셋트(옵션)
MR-J3CN2
리셉터클 : 36210-0100JL
셀 키트 : 36310-3200-008
(3M제 또는 동등품)



배선측에서 본 배열입니다.

제4장 신호와 배선

⚠ 위험

- 가 .
- OFF , 15 가
- , .
- .
- , 가 , ,

⚠ 주의

- 가 .
- .
- (+ · -) .
- DC 가 (EMG)

서보앰프

서보앰프

- .
- .
- (FR - BIF) .
- , (異常) 가
- .
- 1 () ,
- 가

4. 1 본 장의 주의사항

MR - J3 - □B

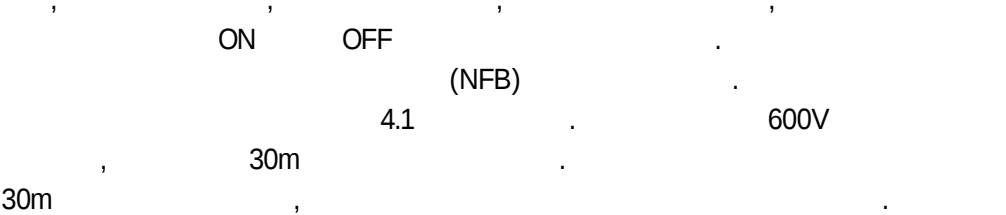
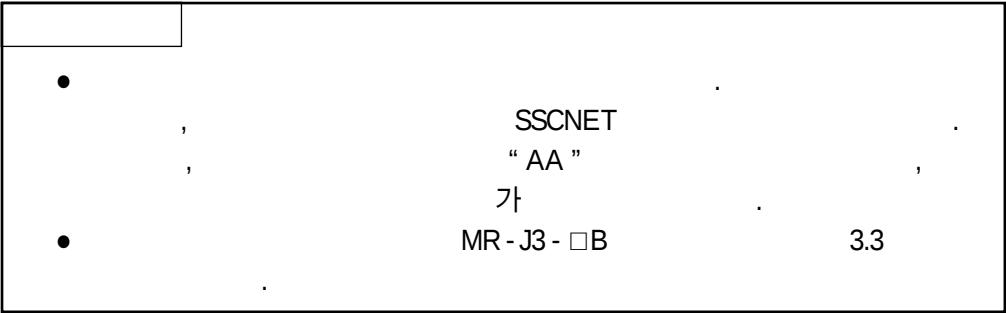
MR - J3 - □B

	MR-J3-□B
	3.3
()	3.5
	3.7 ()
	3.8
SSCNET□	3.9
	3.13

4. 2 전원계 회로의 접속 예

⚠ 주의

- 가
- 가
- (ALM)
- 가

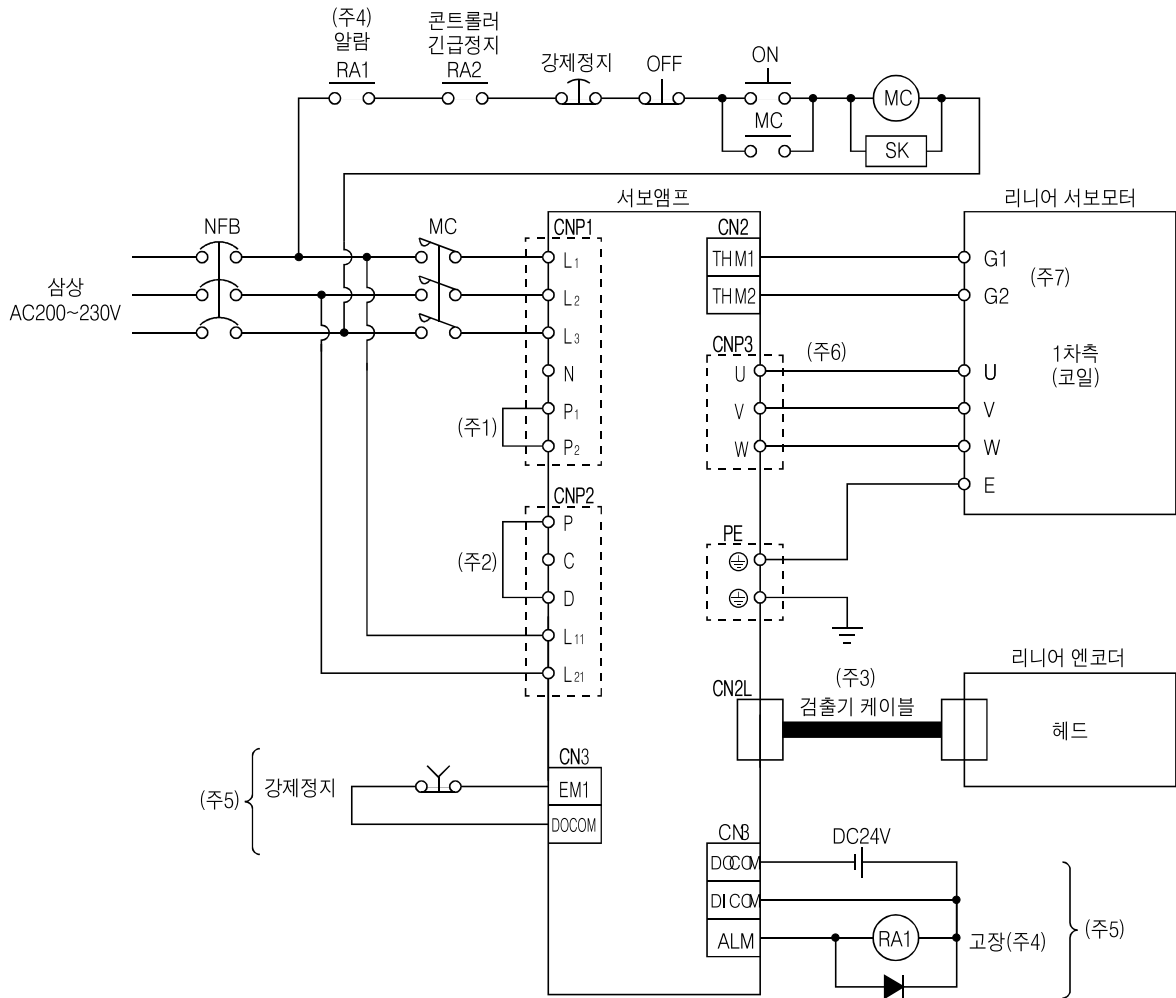


4.1

	[mm ²]				
	L1 · L2 · L3 · ⊕	L11 · L21	U · V · W · ⊕	P · C	THM1 · THM2
MR - J3 - 40B - RJ004	2(AWG14)	1.25(AWG16)	1.25(AWG16)	2(AWG14)	0.2(AWG24)
MR - J3 - 70B - RJ004					
MR - J3 - 200B - RJ004	3.5(AWG12)		3.5(AWG12)		
MR - J3 - 350B - RJ004	5.5(AWG10)		5.5(AWG10)		
MR - J3 - 500B - RJ004	5.5(AWG10)		5.5(AWG10)		

(1) MR-J3-40B-RJ004~MR-J3-350B-RJ004

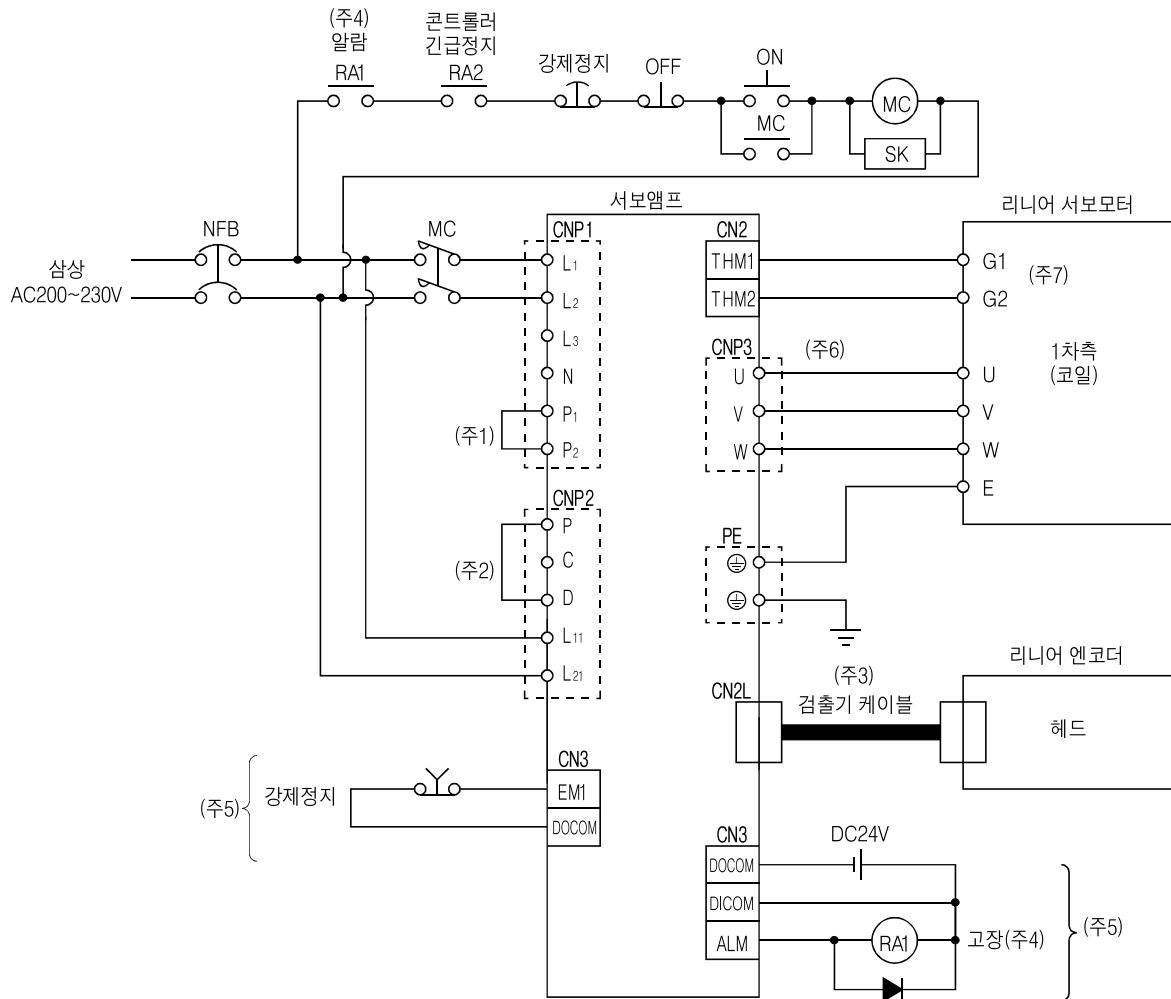
AC200~230V



1. P1 - P2 DC (MR-J3-□B) 11
2. P - D (MR-J3-□B) 11
3. 3
4. (ALM)
5. MR-J3-□B 3.7.3
6. 2
7. 가

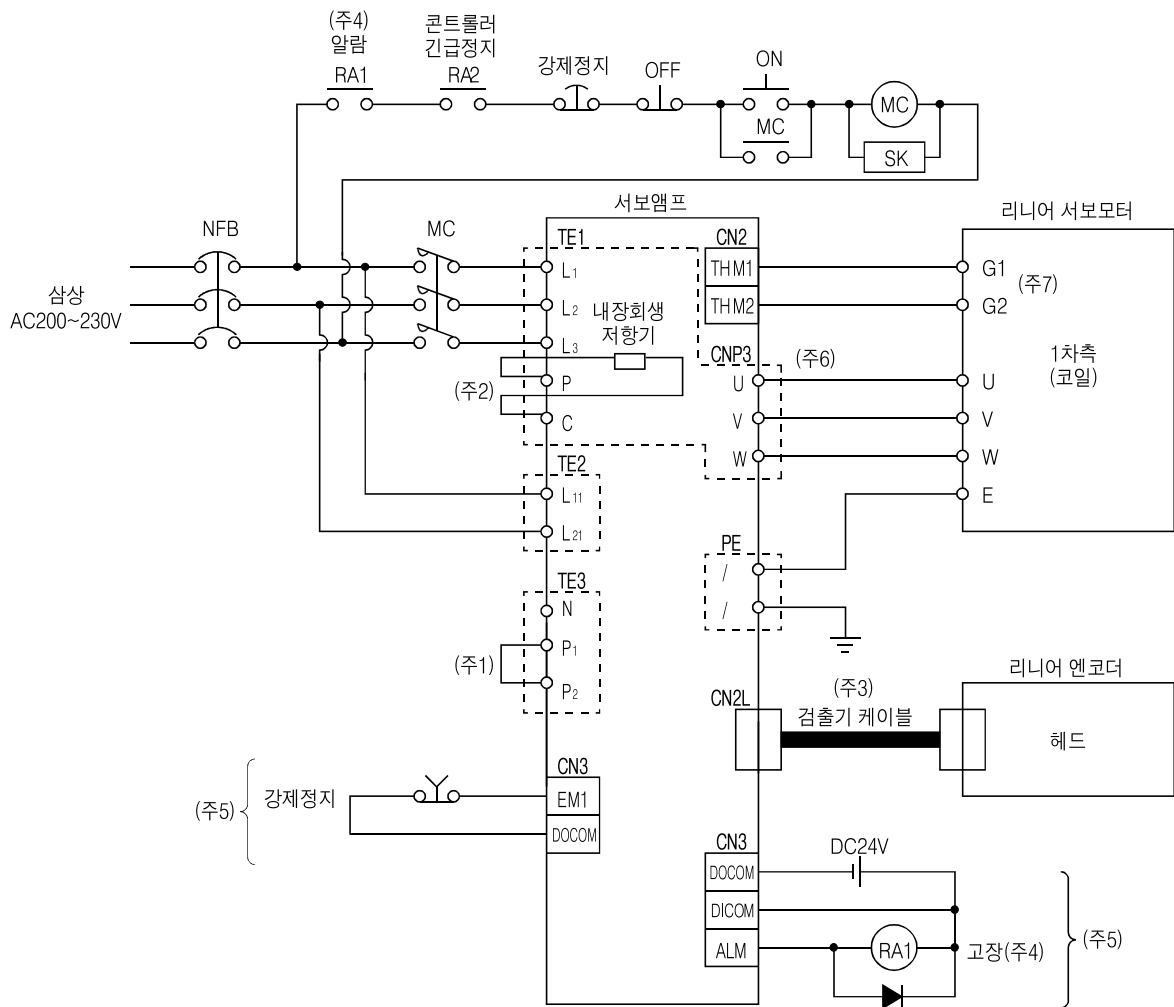
(2) MR-J3-40B-RJ004~MR-J3-70B-RJ004

AC230V



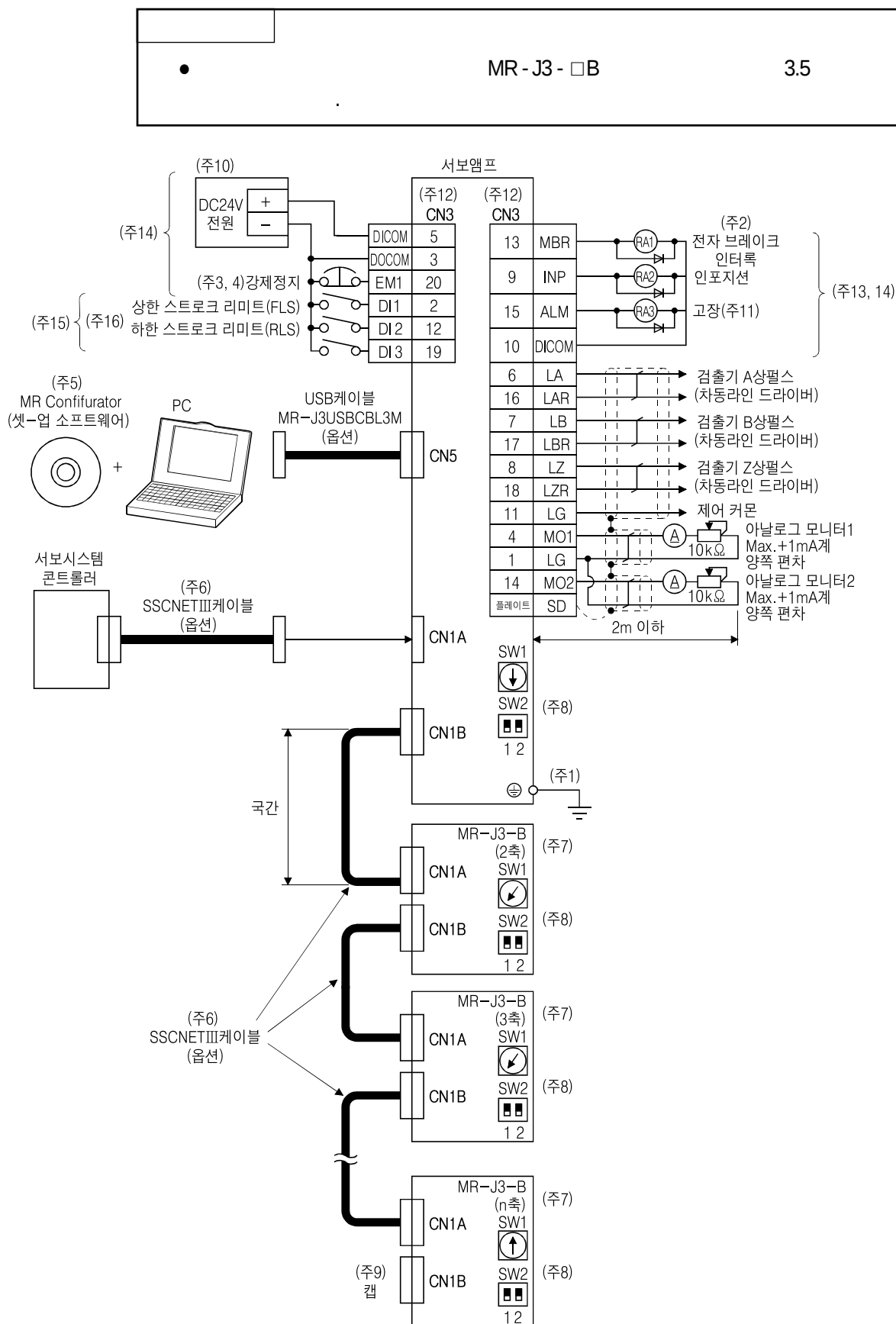
1. P1 - P2 DC (MR-J3-□B) 11
2. P - D (MR-J3-□B) 11
3. 3
4. (ALM)
5. MR-J3-□B 3.7.3
6. 2
7. 가

(3) MR-J3-500B-RJ004



- | | | | | | | |
|----|---------|----|--------------|----|-------|---|
| 1. | P1 - P2 | .(| MR - J3 - □B | .) | 11 | . |
| 2. | DC | | | | | |
| 3. | | | MR - J3 - □B | | 11 | . |
| 4. | 3 | | | | | |
| 5. | | | (ALM) | | | |
| 6. | | | | | | |
| 7. | 2 | | MR - J3 - □B | | 3.7.3 | . |
| | | | 가 | | | |

4.3 입출력 신호의 접속 예

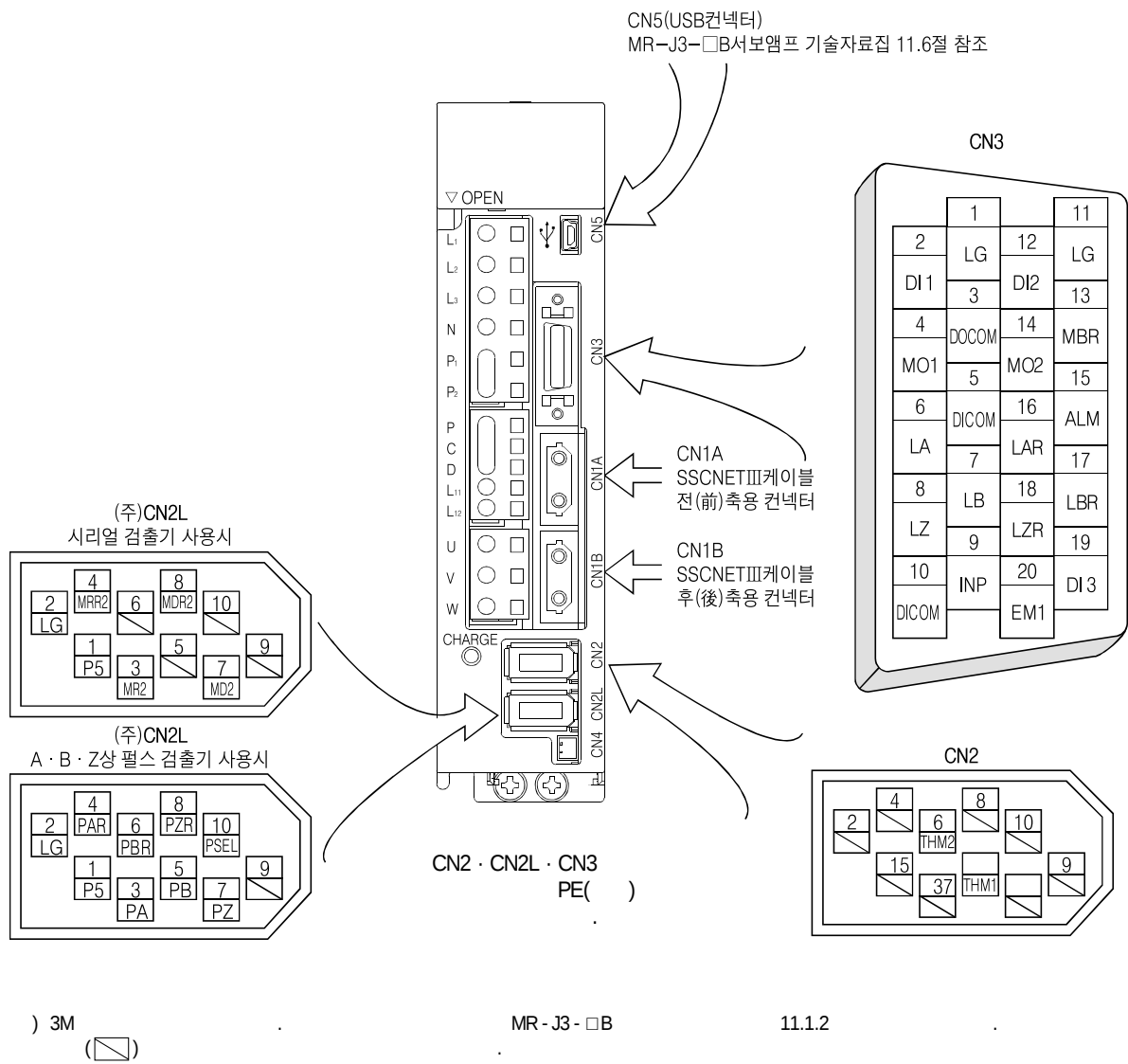


1. (PE) (⊖ 가) (PE)
2. 가 가 , 가 가 (EM1)
3. (B)
4. (EM1) ON (B) No.PA04 " □1□□ " (EM1)
5. MRZJW3 - SETUP221
6. SSCNET

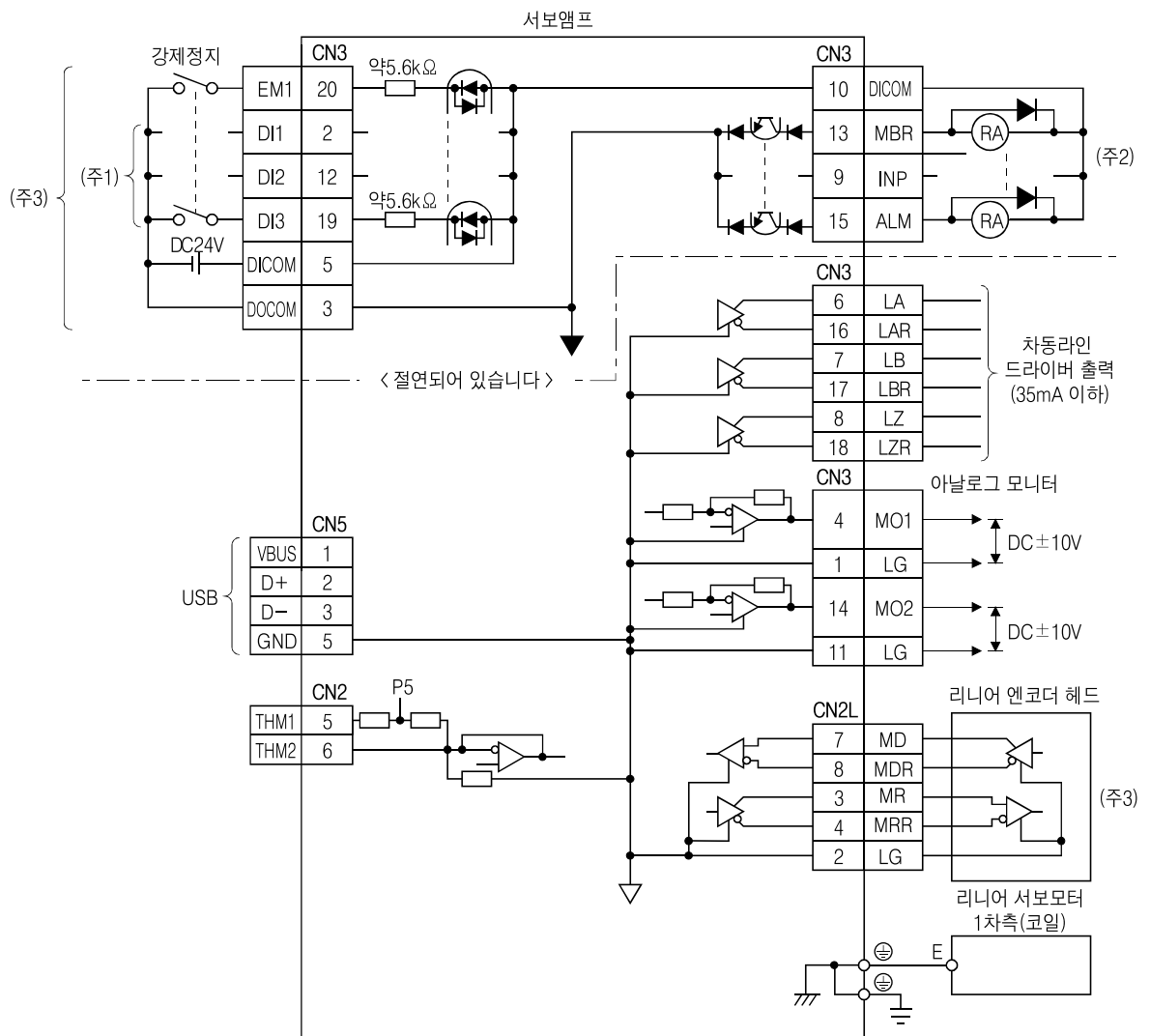
	MR - J3BUS□M	0.15m~3m	20m
	MR - J3BUS□M - A	5m~20m	
	MR - J3BUS□M - B	30m~50m	50m

7. 2
8. 16 3.13
9. CN1A · CN1B
10. DC24V±10% 150mA 가 . 3.7.2 (1) . 150mA
11. (ALM) ON . OFF가 ()
- 12.
13. No.PD07, PD08, PD09
14. 3.7.3
15. DI1 · DI2 · DI3 가
- DI1 : (FLS)
- DI2 : (RLS)
- DI3 : (DOG)
16. .(4.2)

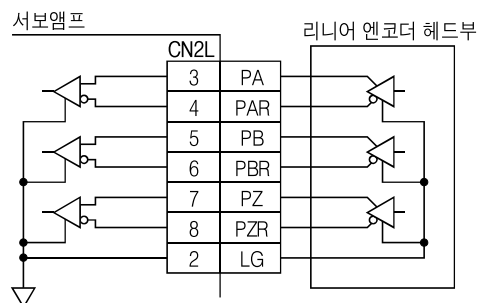
4.4 커넥터와 신호 배열



4.5 내부 접속도



1. 가 .
2. .
- 3.A · B · Z
- MR - J3 - □B 3.7.3



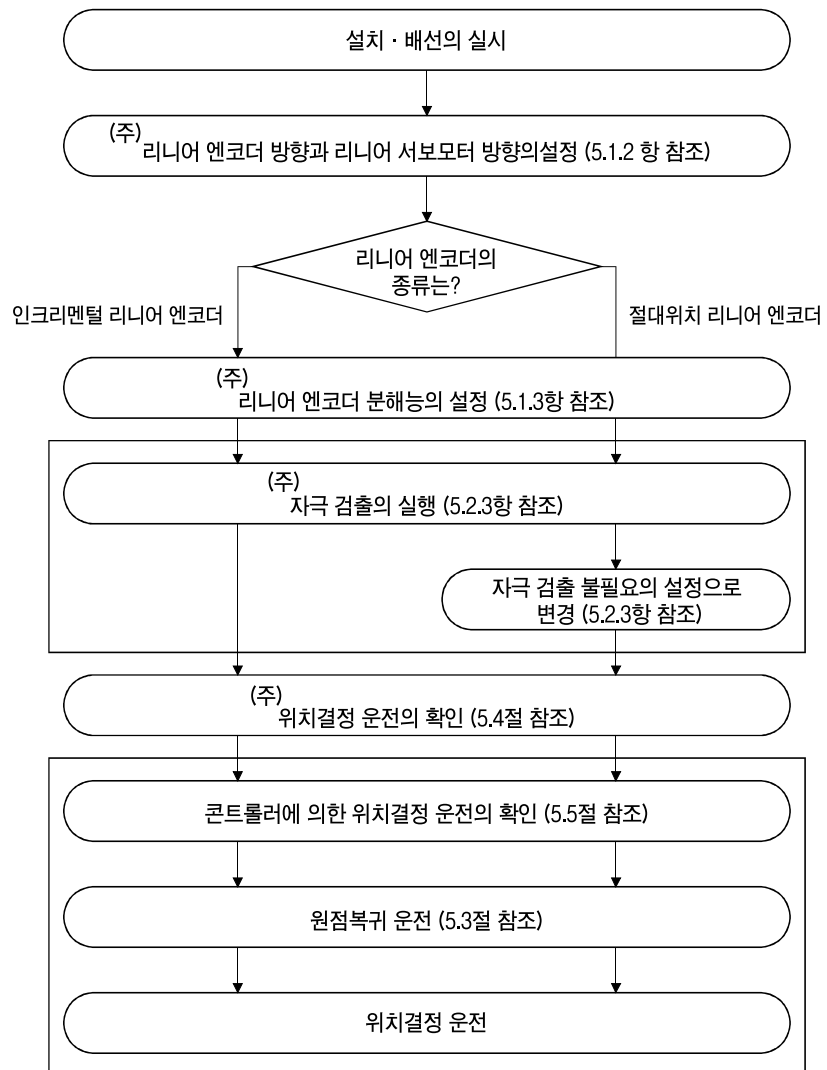
MEMO

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

제5장 운전과 기능

5. 1 기동

5.1.1 기동 순서



) MR Configurator

5.1.2

No.PC27 1 (가)

파라미터 No.PC27

--	--	--	--

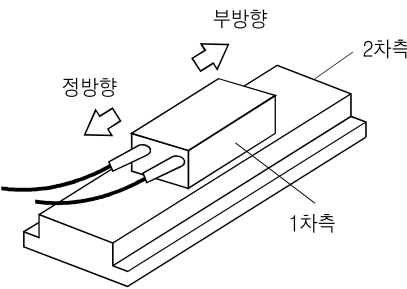
검출기 펄스 카운트 극성 선택
0 : 리니어 서보모터 정방향으로 리니어 엔코더 증가 방향
1 : 리니어 서보모터 정방향으로 리니어 엔코더 감소 방향

(1)

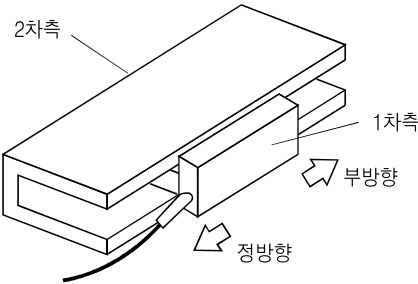
(a)

No.PA14

No.PA14	가	
0		
1		



LM-H2시리즈



LM-U2시리즈

(b) 가
(c)

No.PC27 “ □□□0 ”
가

“ □□□1 ”

가
No.PC27

(2)

가

(a) OFF
(b) MR Configurator (.)

(a) No.PC27 “ □ □ □ 0 ”
가 (正)
가 (負)
No.PC27 “ □ □ □ 1 ”
가 (負)

5.1.3 인크리멘탈 리니어 엔코더의 분해능 설정

No.PS02()
, No.PS03()

- No.PA19 “ □ □ □ D ”
OFF
- OFF

(1)

$$\frac{\text{No.PS02()}}{\text{No.PS03()}} = \text{[}\mu\text{m]}$$

(2)

$$\frac{0.5\mu\text{m}}{\text{No.PS02}} = \text{No.PS03} = 0.5\mu\text{m} = \frac{1}{2}$$

No.PS02 · PS03

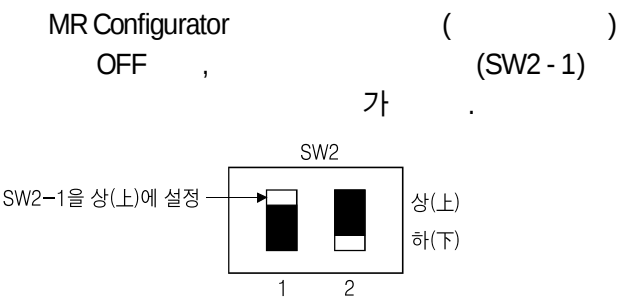
		(μm)							
		0.01	0.02	0.05	0.1	0.2	0.5	1.0	2.0
	No.PS02	1	1	1	1	1	1	1	2
	No.PS03	100	50	20	10	5	2	1	1

- No.PS02, PS03
- (27 · 42)

5. 2 자극 검출과 자극 검출 전압 레벨의 설정

MR Configurator

5.2.1 자극 검출의 준비



5.2.2 자극 검출

⚠ 위험

가

- (FLS, RLS)
(FLS, RLS)가 가 가
- (正) , (負)
- No.PS09() , ,
- ON
(RD)가 ON ,
- MR Configurator ()
- ,
- , 가
- 가 (
- No.PS02 · PS03) No.PS09()
- 30% , ,
- 20% ,

- (a) (1))
- (b) (2))
- ()
 - (1 () 2 ())
 - ()

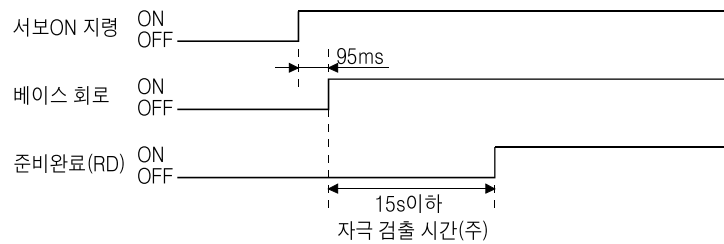
(1)

⚠ 위험

- ON ON ,

ON ON , , ,

(a)

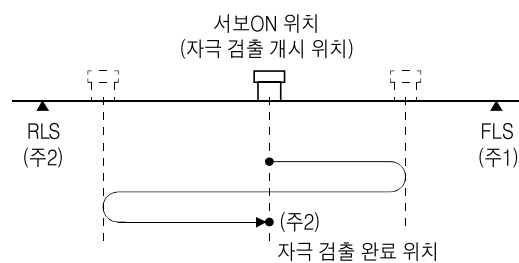


)

(FLS · RLS)가 ON

(b)

(FLS · RLS가 ON)



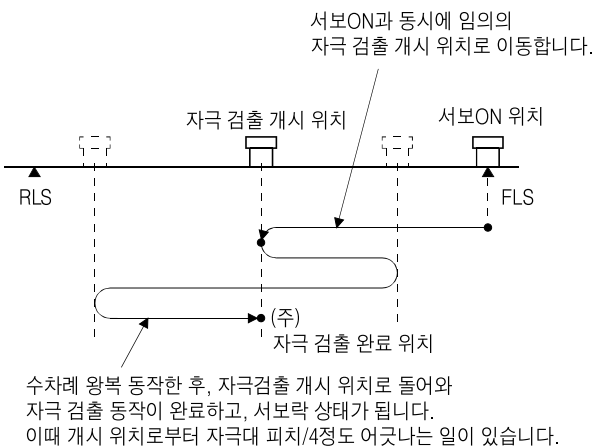
) 1.

FLS RLS가 OFF (FLS RLS)가 OFF가 (27)

2.

	LM-H2	LM-U2
[mm]	48	60

(b) (FLS RLS가 OFF)
ON FLS RLS가 OFF가 ,

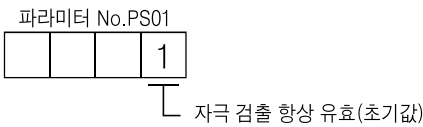


) (1)(b) 2 .

(2)

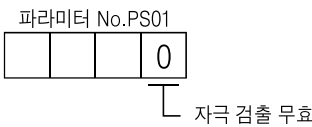
가 , .

(a) No.PS01() “ □□□1() ”



(b) . ((1)(a), (b))

(c) No.PS01 “ □□□0() ”



No.PS01
가 .

5.2.3 자극 검출 전압 레벨의 설정

No.PS09() .

(1)

No.PS09()	← () → (~10 () 50~)	

(2)

(a) 1(50) · 2(51) · (33) · 1(E1) ·
2(EC)가 No.PS09()
“ 5 ” 가 MR Configurator
가 MR Configurator

(b) 1(50) · 2(51) · (33) · 1(E1) · 2(EC)
가 70%
(27) 1(50) · 2(51) · (33) ·
1(E1) · 2 (EC)가

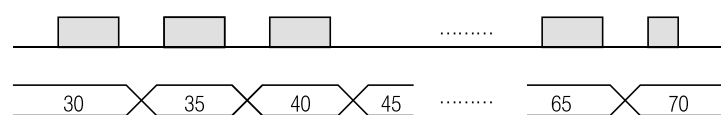
(c)

(3)

리니어 엔코더
자극 검출

파라미터 No.PS09의
설정값

과부하 · 과전류
알람



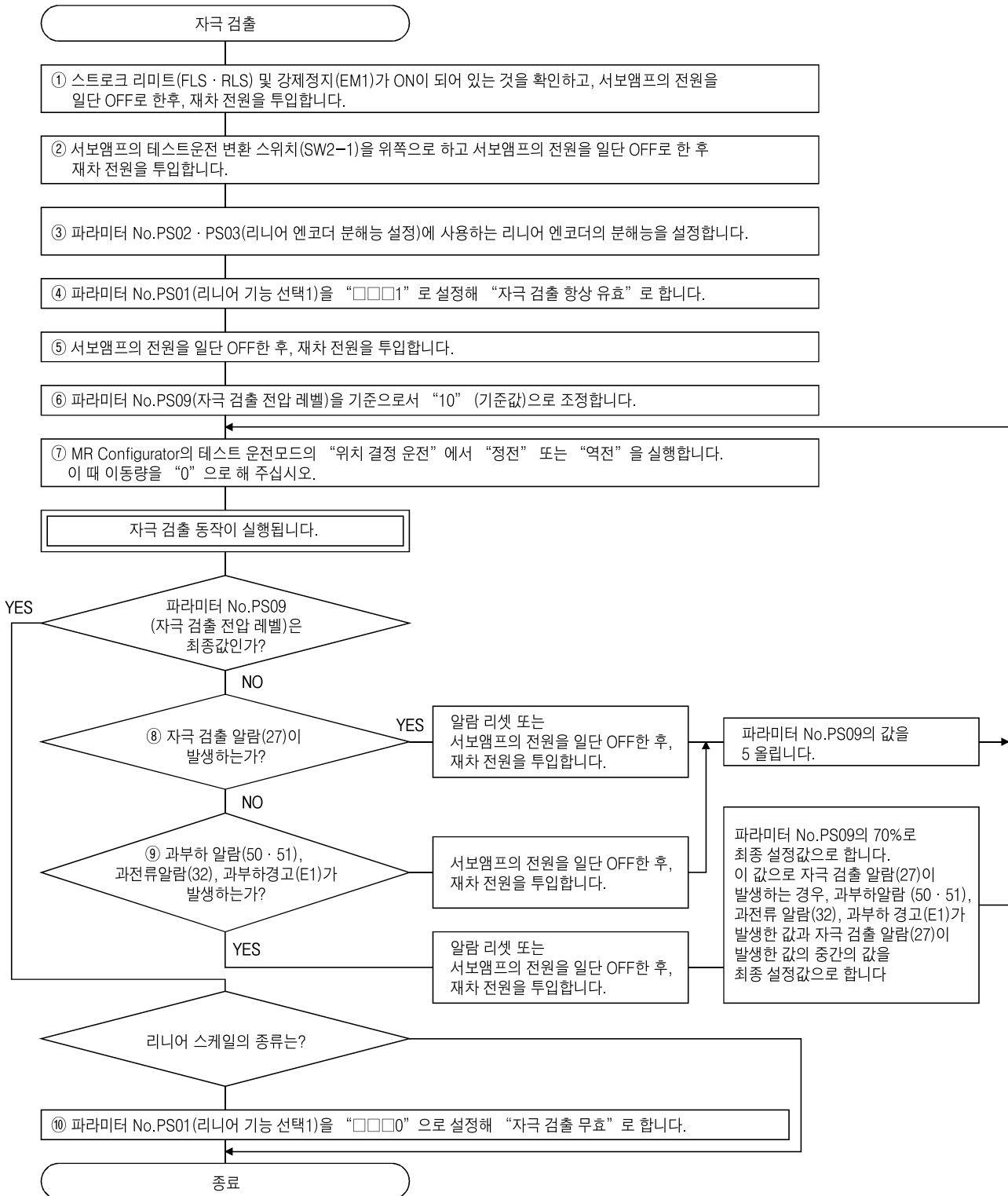
파라미터 No.PS09의 설정값을 크게 하면서
자극 검출을 반복해 실행합니다.

파라미터 No.PS09의 설정값을 70으로
했을때에 알람이 발생합니다.

No.PS09 49(.
= 70 × 0.7) .

5.2.4 MR Configurator에 의한 자극 검출 방법

MR Configurator



5.2.5 서보앰프 교환시의 자극 검출

MR Configurator

(1)

(a)

(b)

(c)

가

(2)

(a)

MR Configurator

PC 가

“ MR-J3-B ”

“ ”_“ ”

“ ” ()

“ ”

. ()

1,

2()

,

(b)

MR Configurator

PC 가

“ MR-J3-B ”

“ ”_“ ”

“ ” ()

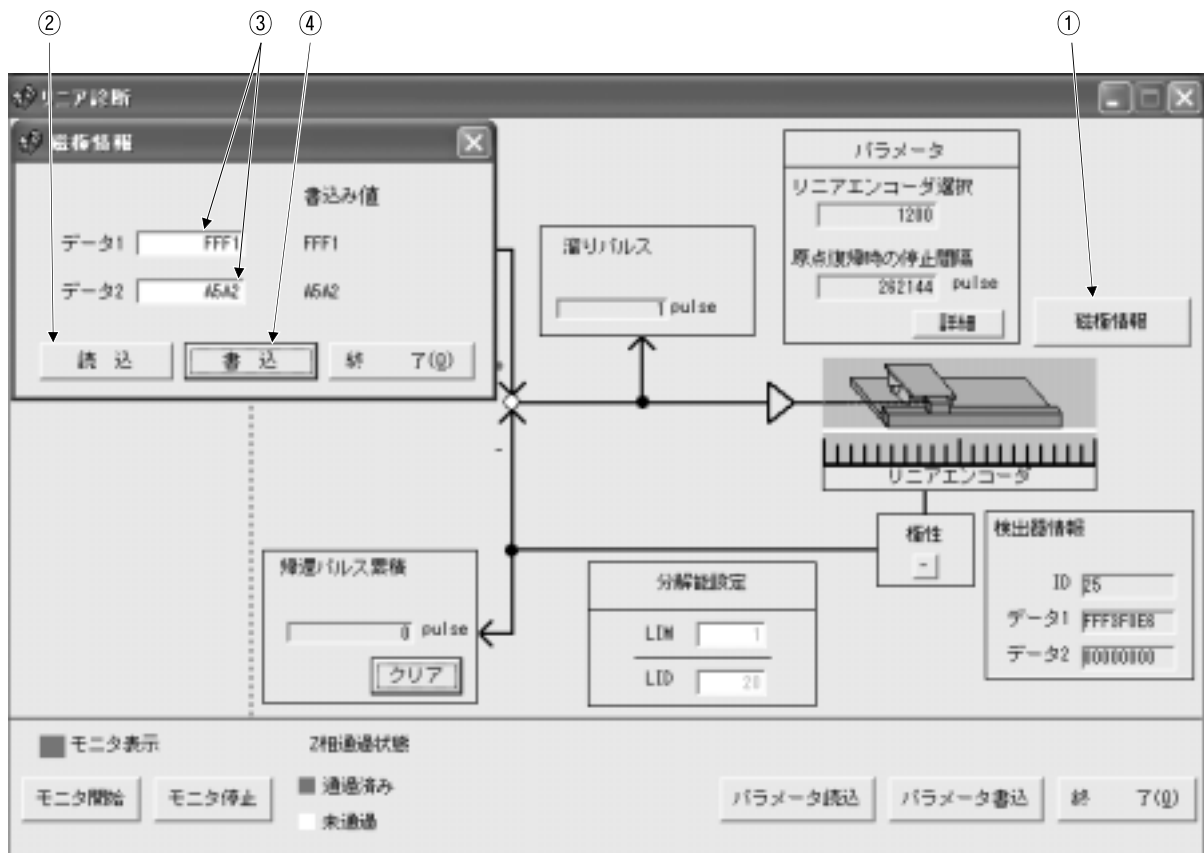
1,

2()

“ ”()

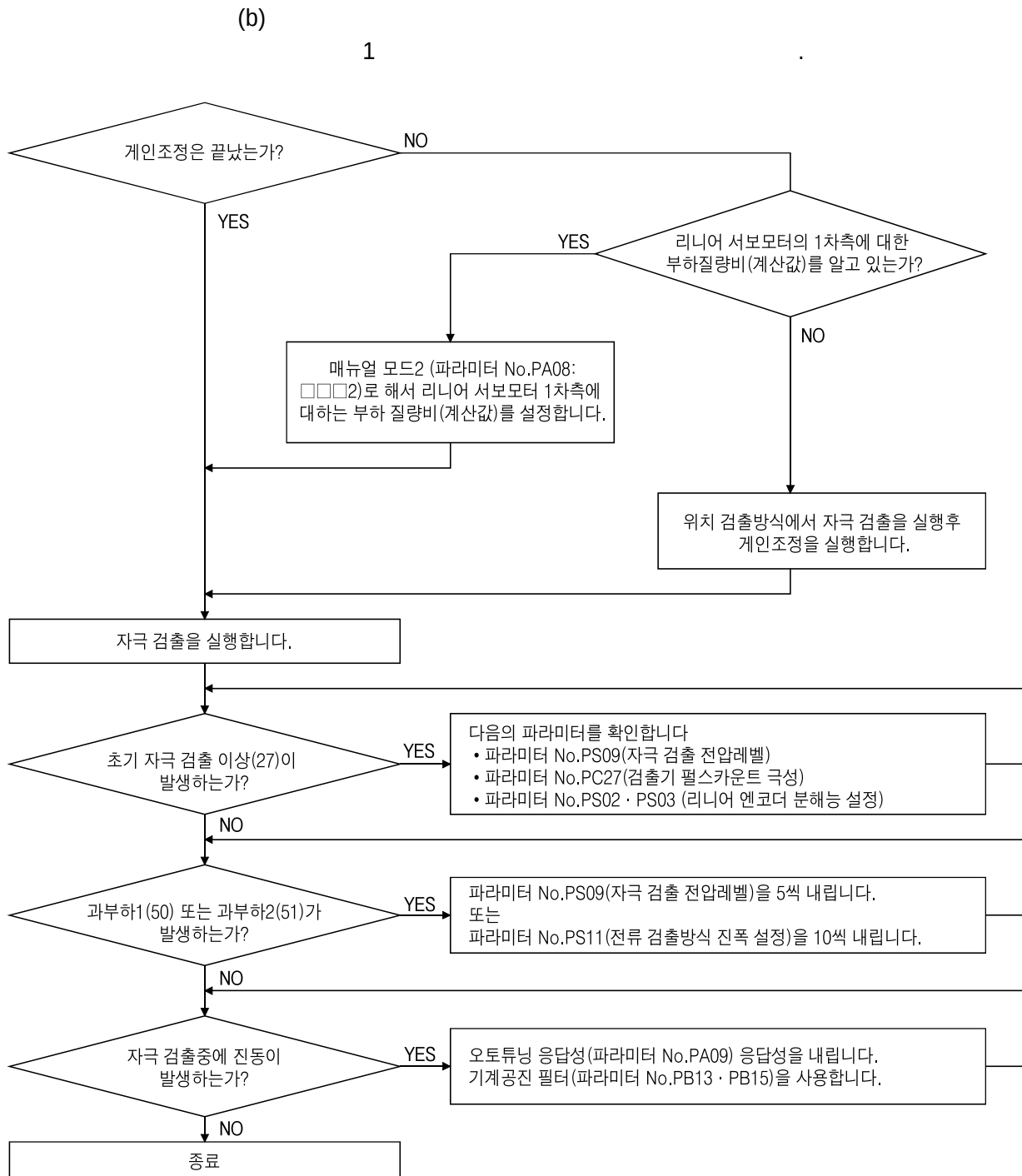
OFF

,



5.2.6 특정조건하에서의 자극 검출

- (1) 1 () () .
- (a) 1 (No.PB06 · PB07 · PB08 · PB09 · PB10) .
- a b .
- a , () .
- b. 2(No.PA08 : □□□2), 12(No.PA09 :) 1 (No.PB06) .
- (27) , 가
- No.PS09() .
 - No.PC27() .
 - No.PS02 · PS03() .
- No.PS09) 5 , 1(50) · 2(51)가 , (No.PS11) 10 .
- 가 , (No.PA09) , (No.PB13 · PB15) .

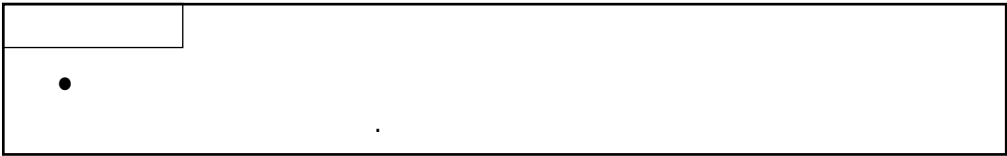


(2) 2
가
1
가

, 1,

1 ,

5. 3 원점복귀



5.3.1 인크리멘탈 리니어 엔코더

⚠ 위험

가 (No.PS01 3)

가 (QD75MH)

(3)

(1) ()

1048576pulse((No.PS01 3 가) 가 No.PS01

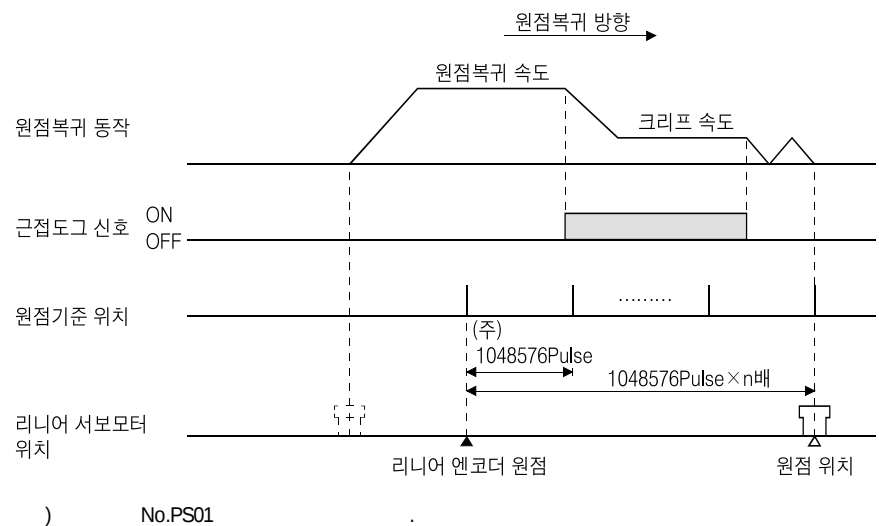
파라미터 No.PS01

--	--	--	--

원점 복귀시의 정지 간격 설정

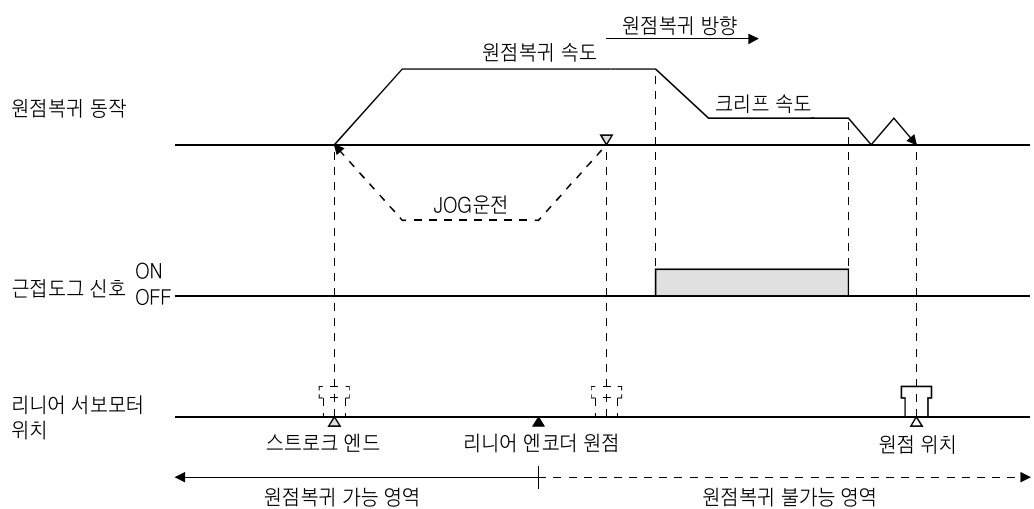
설정값	이동 간격[Pulse]
0	8192
1	131072
2	262144
3	1048576
4	4194304
5	16777216
6	67108864

가 , OFF 가 1 , Z (LZ)



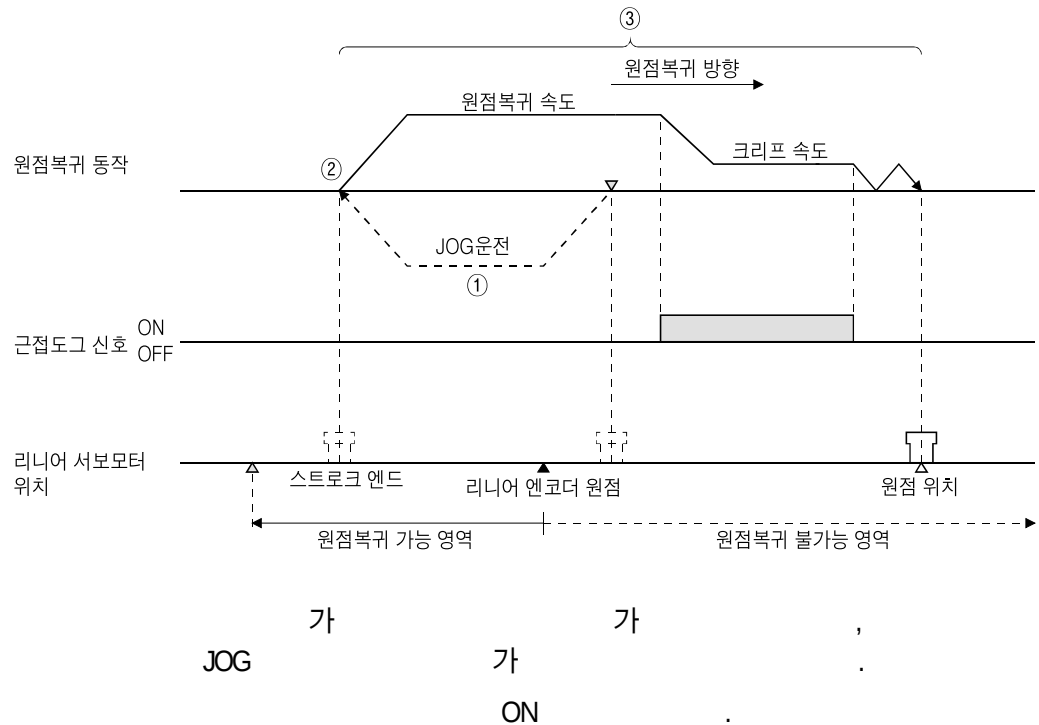
(2)

가 가 JOG



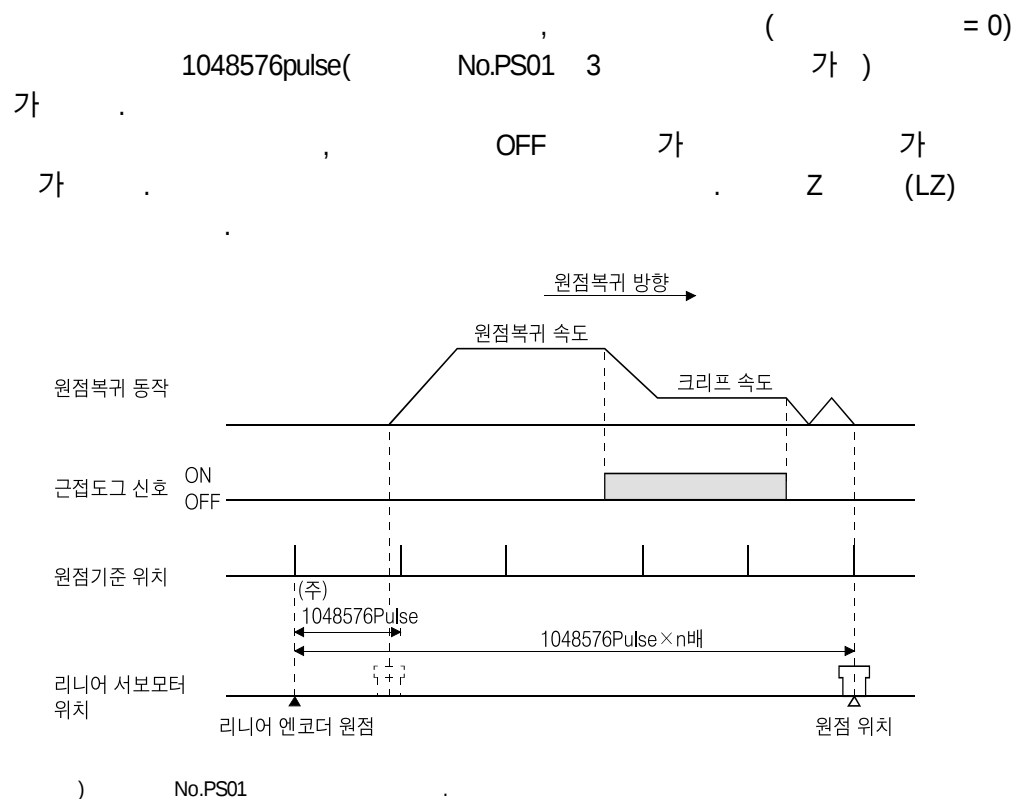
•	JOG
•	No.PS01 3

(3) QD75MH
QD75MH1/QD75MH2/QD75MH4



설정 항목	설정 내용	설정값	초기값	버퍼 메모리 어드레스			
				제1축	제2축	제3축	제4축
영점 재설정 요구	인크리멘털 리니어 엔코더를 이용한 시스템에 대해 원점복귀를 하고 동시에 본 요구를 ON으로 해 주십시오.	10진수로 설정합니다. 설정값 K1 영점 설정 요구 1: 설정 요구 ON	0	1557	1657	1757	1857

5.3.2 절대위치 리니어 엔코더



●	

5. 4 MR Configurator에서의 테스트 운전모드

⚠ 주의

-
-

(EM1)

-

PC

(1)
(a)

ON/OFF

MR Configurator

[pulse]	4000	0~99999999
[mm/s]	10	0~
가 [ms]	1000	0~50000

	“ ”
	“ ”
	“ ”

(b) (D0)

ON/OFF 가

MR Configurator D0

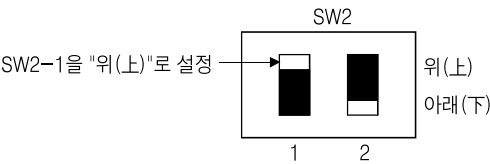
(c)

ON/OFF
MR Configurator
MR Configurator

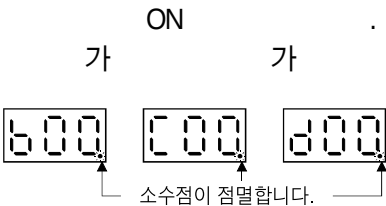
	"
	" "

(2)

OFF
SW2 - 1 " (上) "



SW1 SW2 - 1
PC



PC

5. 5 컨트롤러로부터의 운전

, 가 .
(MR - J3BAT) .
가 .

	Q17□HCPU	() (VVF, VVR) .
	QD75MH□	

5.5.1 운전 방법

, MR - J3 - □B .
, ON
. ON
.

5.5.2 서보시스템 컨트롤러의 설정

(1)

MR - J3 - □B

OFF

CPU

				Q17□H		(3) QD75MH□
				MR - J3 - B		MR - J3 - B
No.	(1)			A		(3) 가
PA01		(2)	0040h			
PA19	*BLK		000Dh			
PC01	*ERZ		100			
PC03	*ENRS		0010h			
PC26	**COP8	C - 8	0100h			
PC27	**COP9	C - 9	0000h			
PS01	**LIT1	1	0301h			
PS02	**LIM		1000			
PS03	**LID		1000			
PS04	*LIT2	2	0003h			
PS05	LB1		50			
PS06	LB2		1000			
PS07	LB3		100			
PS08	*LIT3	3	0010h			
PS09	LPWM		30			
PS10	LFH		5			
PS11	LIDH		100			
PS12		(2)	500			
				mm		mm
1 (AL, AM)				(2)		

) 1. * 가

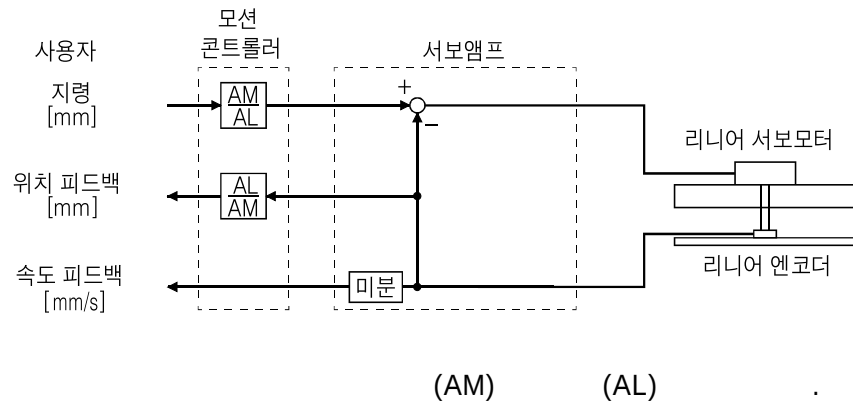
* : OFF
** : OFF

2. QD75MH□

3.

- ROM ()가 QD75MH□
- ROM QD75MH□ OFF, OFF, QD75MH□
- 가

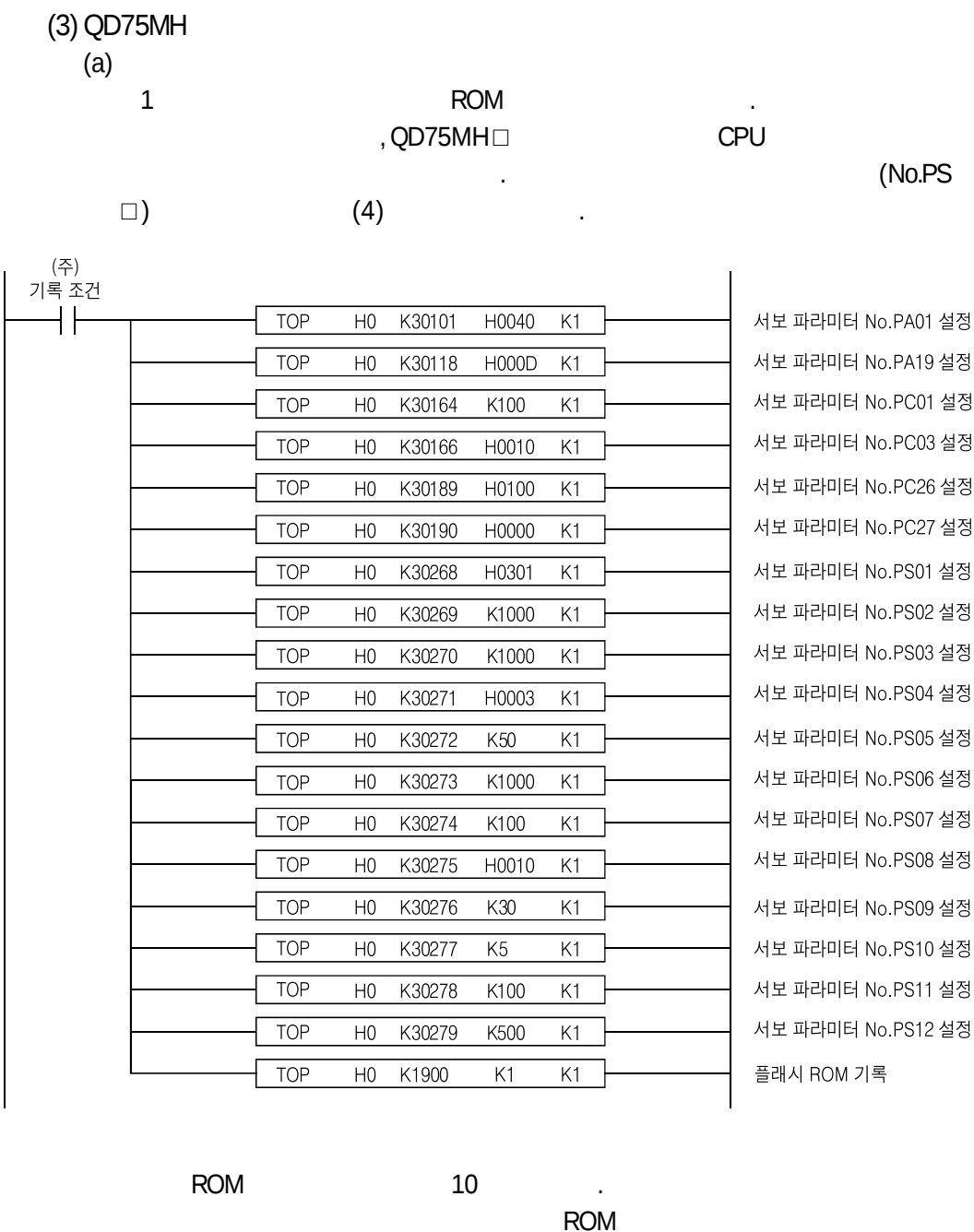
(2) (AM) · (AL)



$$= \frac{(AM)}{(AL)}$$

$$= 0.05 \mu m$$

$$\frac{(AM)[Pulse]}{(AL)[\mu m]} = \frac{1}{0.05} = \frac{20}{1}$$



(b) QD75MH□ (3)(a) ROM ROM

- QD75MH□ (37) ROM 1 ROM GX Configurator - QP

(c) NoPD22 (3)(a) 가 (FLS) (RLS) ON

TOP HO K30197 H0003 K1

서보 파라미터 No.PD02 설정 (FLS · RLS를 자동 ON으로 하는 경우)

FLS - RLS ON

(4)

(No.PS□□) QD75MH□

No.					1	2	3	4
PS01	**LIT1	1	0301h		30268	30468	30668	30868
PS02	**LIM		1000		30269	30469	30669	30869
PS03	**LID		1000		30270	30470	30670	30870
PS04	*LIT2	2	0003h		30271	30471	30671	30871
PS05	LB1		50	mm	30272	30472	30672	30872
PS06	LB2		1000	mm/s	30273	30473	30673	30873
PS07	LB3		100	%	30274	30474	30674	30874
PS08	*LIT3	3	0010h		30275	30475	30675	30875
PS09	LPWM		30	%	30276	30476	30676	30876
PS10	LFH		5	Hz	30277	30477	30677	30877
PS11	LIDH		100	%	30278	30478	30678	30878
PS12			500		30279	30479	30679	30879
PS13			0000 h		30280	30480	30680	30880
PS14			0000 h		30281	30481	30681	30881
PS15			0000 h		30282	30482	30682	30882
PS16			0000 h		30283	30483	30683	30883
PS17			0000 h		30284	30484	30684	30884
PS18			0000 h		30285	30485	30685	30885
PS19			0000 h		30286	30486	30686	30886
PS20			0000 h		30287	30487	30687	30887
PS21			0000 h		30288	30488	30688	30888
PS22			0000 h		30289	30489	30689	30889
PS23			0000 h		30290	30490	30690	30890
PS24			0000 h		30291	30491	30691	30891
PS25			0000 h		30292	30492	30692	30892
PS26			0000 h		30293	30493	30693	30893
PS27			0000 h		30294	30494	30694	30894
PS28			0000 h		30295	30495	30695	30895
PS29			0000 h		30296	30496	30696	30896
PS30			0000 h		30297	30497	30697	30897
PS31			0000 h		30298	30498	30698	30898
PS32			0000 h		30299	30499	30699	30899

(2)

No.PS04 “ □ □ □ 2 ” ,

파라미터 No.PS04

			2
--	--	--	---

└ 속도편차 이상검지

5.1 (3) (4) No.PS06(가 No.PS06
) (0~ m/s)
(42) .
1000mm/s .

(3)

No.PS04 “ □ □ □ 4 ” ,

파라미터 No.PS04

			4
--	--	--	---

└ 추력편차 이상검지

5.1 (5) (6) , No.PS07(가 NoPS05
) (1~1000%)
(42) .
100% .

(4)

No.PS04 가
(1) ~ (3) .

파라미터 No.PS04

--	--	--	--

└

설정값	위치편차 이상검지	속도편차 이상검지	추력편차 이상검지
3	○	○	
5	○		○
6		○	○
7	○	○	○

5.6.2 오토튜닝 기능

오토튜닝 기능은 모터의 기계적 특성에 따라 자동적으로 모터의 파라미터를 조정하여, 모터의 성능을 최적화하는 기능입니다. (J)

1 () 가 .

(J)

1 () = 2kg

(1 ()) = 4kg

(J) = 4/2 = 2

MR - J3 - □B

MR - J3 - □B

6

•	1	
가		
•	2000mm/s	, 5s 가
•	가 150mm/s	
•	1 ()	가 100
•	가 10%	

5.6.3 머신 아날라이저 기능

MR Configurator

MR - J3 - □B

•	,	가
•	,	가

5. 7 절대위치 검출시스템

가

(MR - J3BAT)

(25) (92, 9F, E3)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5 - 28

제6장 파라미터

⚠ 주의

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

6. 1 파라미터 기록 금지(파라미터 No.PA19)

●	OFF

가

No.PA19

No.PA19

○

No.PA19		No.PA□□	No.PB□□	No.PC□□	No.PD□□	No.PS□□
0000h		○				
		○				
000Bh		○	○	○		
		○	○	○		
000Ch		○	○	○	○	
		○	○	○	○	
000Dh ()		○	○	○	○	○
		○	○	○	○	○
100Bh		No.PA19				
		No.PA19				
100Dh		○	○	○	○	○
		No.PA19				

6. 2 기본 설정 파라미터(No.PA□□)

6.2.1 파라미터 일람

●	MR - J3 - □B	
●	MR - J3 - □B	
●	* 가	
●	** :	OFF
●	** :	OFF

No.					
PA01			0040h		
PA02	**REG		0000h		MR - J3 - □B
PA03	*ABS		0000h		6.2.2
PA04	*AOP1	A - 1	0000h		MR - J3 - □B
PA05			0		
PA06			1		
PA07			1		
PA08	ATU		0001h		MR - J3 - □B
PA09	RSP		12		
PA10	INP		100	pulse	6.2.2
PA11			1000.0		
PA12			1000.0		MR - J3 - □B
PA13			0000h		
PA14	*POL		0		
PA15	*ENR		4000		6.2.2
PA16	*ENR2	2	0		
PA17			0000h		
PA18			0000h		
PA19	*BLK		000Dh		6.2.2

6.2.2 상세 일람

No.					
PA01				0040h	
PA03	*ABS	0 0 0 절대위치 검출시스템의 선택 (MR-J3-□B 서보앰프 기술자료집 제12장 참조) 0 : 인크리멘털 시스템으로 사용합니다. 1 : 절대위치 검출시스템으로 사용합니다. 인크리멘털 타입의 리니어 엔코더 사용시에 절대위치 검출시스템을 유효로 하게되면 파라미터 이상(37)이 발생합니다.	0000h		
PA10	INP	(INP) 지령 펄스 귀환 펄스 서보모터 귀환 펄스 인포지션 범위[Pulse] ON OFF 위치결정 완료(INP)	100 pulse	0 ~ 65535	

	No.																																																																																														
PA03	*POL	<table><tr><td></td><td colspan="2">가</td></tr><tr><td>0</td><td></td><td></td></tr><tr><td>1</td><td></td><td></td></tr></table>		가		0			1			부방향 정방향 2차측 1차측 LM-H2시리즈 2차측 1차측 부방향 정방향 LM-U2시리즈 <table><tr><td></td></tr><tr><td>●</td></tr></table>		●	0	0 · 1																																																																															
			가																																																																																												
0																																																																																															
1																																																																																															
●																																																																																															
PA19	*BLK	<table><tr><td></td><td></td><td>No.PA□□</td><td>No.PB□□</td><td>No.PC□□</td><td>No.PD□□</td><td>No.PS□□</td></tr><tr><td>0000h</td><td></td><td>○</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>○</td><td></td><td></td><td></td><td></td></tr><tr><td>000Bh</td><td></td><td>○</td><td>○</td><td>○</td><td></td><td></td></tr><tr><td></td><td></td><td>○</td><td>○</td><td>○</td><td></td><td></td></tr><tr><td>000Ch</td><td></td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr><tr><td></td><td></td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr><tr><td>000Dh</td><td></td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr><tr><td></td><td></td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr><tr><td>100Bh</td><td></td><td>○</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>No.PA19</td><td></td><td></td><td></td><td></td></tr><tr><td>100Dh</td><td></td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr><tr><td></td><td></td><td>No.PA19</td><td></td><td></td><td></td><td></td></tr></table>			No.PA□□	No.PB□□	No.PC□□	No.PD□□	No.PS□□	0000h		○							○					000Bh		○	○	○					○	○	○			000Ch		○	○	○	○				○	○	○	○		000Dh		○	○	○	○	○			○	○	○	○	○	100Bh		○							No.PA19					100Dh		○	○	○	○	○			No.PA19					000Dh	
				No.PA□□	No.PB□□	No.PC□□	No.PD□□	No.PS□□																																																																																							
0000h		○																																																																																													
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000Ch		○	○	○	○																																																																																										
		○	○	○	○																																																																																										
000Dh		○	○	○	○	○																																																																																									
		○	○	○	○	○																																																																																									
100Bh		○																																																																																													
		No.PA19																																																																																													
100Dh		○	○	○	○	○																																																																																									
		No.PA19																																																																																													

No.					
PA15	*ENR	No.PC03 “ □□1□() ” 가 (A · B) 가 (pulse) = ————— [pulse] A · B 4.6Mpps(4)가 가 1/4 가	4000		0 ~ 65535
PA16	*ENR2	No.PC03 “ □□3□ ” 가 (A · B) 가 No.PA15 No.PA16 (pulse) = × ————— [pulse] No.PA15 No.PA16 “ 0() ” , “ 1 ”	0		0 ~ 65535

6. 3 게인 · 필터 파라미터(No.PB□□)

6.3.1 파라미터 일람

●	MR - J3 - □B	
●	MR - J3 - □B	
●	* 가	
●	* :	OFF
●	** :	OFF
●		

No.					
PB01	FILT	()	0000h		MR - J3 - □B
PB02	VRFT	()	0000h		
PB03			0		
PB04	FFC		0	%	MR - J3 - □B
PB05			500		
PB06	GD2		7.0		6.3.2
PB07	PG1		24	rad/s	MR - J3 - □B
PB08	PG2		37	rad/s	
PB09	VG2		823	rad/s	
PB10	VIC		33.7	ms	
PB11	VDC		980		
PB12			0		
PB13	NH1	1	4500	Hz	MR - J3 - □B
PB14	NHQ1	1	0000h		
PB15	NH2	2	4500	Hz	
PB16	NHQ2	2	0000h		
PB17			0000		
PB18	LPF		3141	rad/s	MR - J3 - □B
PB19	VRF1		100.0	Hz	
PB20	VRF2		100.0	Hz	
PB21			0.00		
PB22			0.00		
PB23	VFBF		0000h		MR - J3 - □B
PB24	*MVS		0000h		
PB25			0000h		
PB26	*CDP		0000h		MR - J3 - □B
PB27	CDL		10		
PB28	CDT		1	ms	
PB29	GD2B		7.0		6.3.2
PB30	PG2B		37	rad/s	MR - J3 - □B
PB31	VG2B		823	rad/s	
PB32	VICB		33.7	ms	
PB33	VRF1B		100.0	Hz	
PB34	VRF2B		100.0	Hz	

6.3.2 상세 일람

No.					
PB06	GD2	1 () 1 () 1 0~100.0 No.PA08 “ □□□2 ” “ □□□3 ”	가 .	7.0	0 ~ 300.0
PB29	GD2B	1 () 1 () (No.PA08 : □□□3)	.	7.0	0 ~ 300.0

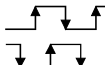
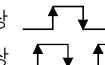
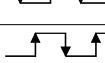
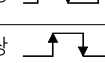
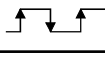
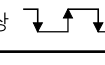
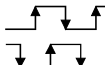
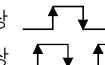
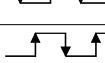
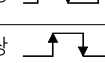
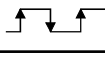
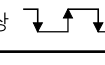
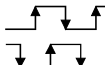
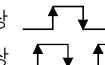
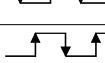
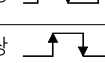
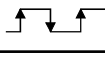
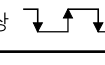
6. 4 확장 설정 파라미터(No.PC□□)

6.4.1 파라미터 일람

●	MR - J3 - □B
●	MR - J3 - □B
●	* 가
●	* : OFF
●	** : OFF
●	

No.					
PC01	*ERZ		100	mm	6.4.2
PC02	MBR		0	ms	MR - J3 - □B
PC03	*ENRS		0000h		6.4.2
PC04			0000h		
PC05			0000h		
PC06			0000h		
PC07	ZSP		50	mm/s	6.4.2
PC08			0		
PC09	MOD1	1	0000h		6.4.2
PC10	MOD2	2	0001h		6.4.3
PC11	MO1	1	0	mV	
PC12	MO2	2	0	mV	
PC13			0		
PC14			0		
PC15			0		
PC16			0000h		
PC17	**COP4	C - 4	0000h		MR - J3 - □B
PC18			0000h		
PC19			0000h		
PC20			0000h		
PC21	*BPS		0000h		MR - J3 - □B
PC22			0000h		
PC23			0000h		
PC24			0000h		
PC25			0000h		
PC26	**COP8	C - 8	0100h		6.4.2
PC27	**COP9	C - 9	0000h		
PC28			0000h		
PC29			0000h		
PC30			0000h		
PC31			0000h		
PC32			0000h		

6.4.2 상세 일람

No.																											
PC01	*EZR			100	mm	1 ~ 1000																					
PC03	*ENRS	0 0 A, B <table><tr><td></td><td></td><td></td></tr><tr><td>0</td><td>A상 </td><td>A상 </td></tr><tr><td></td><td>B상 </td><td>B상 </td></tr><tr><td>1</td><td>A상 </td><td>A상 </td></tr><tr><td></td><td>B상 </td><td>B상 </td></tr></table> 1: 3: A · B (No.PA15, PA16)				0	A상 	A상 		B상 	B상 	1	A상 	A상 		B상 	B상 	0010h									
0	A상 	A상 																									
	B상 	B상 																									
1	A상 	A상 																									
	B상 	B상 																									
PC04				0000h																							
PC05				0000h																							
PC07	ZSP	(ZSP) 20r/min 가		50	mm/s	0 ~ 10000																					
PC09	MOD1	0 0 0 1(MO1) (.5.3.3) 1(MO1) <table><tr><td>0</td><td>(±8V/)</td></tr><tr><td>1</td><td>(±8V/)(2)</td></tr><tr><td>2</td><td>(+8V/)</td></tr><tr><td>3</td><td>(+8V/)(2)</td></tr><tr><td>4</td><td>(±8V/)</td></tr><tr><td>5</td><td>(±10V/1Mpps)</td></tr><tr><td>6</td><td>(±10V/100pulse)(1)</td></tr><tr><td>7</td><td>(±10V/1000pulse)(1)</td></tr><tr><td>8</td><td>(±10V/10000pulse)(1)</td></tr><tr><td>9</td><td>(±10V/100000pulse)(1)</td></tr><tr><td>D</td><td>(+8V/400V)</td></tr></table> () 1. 2. 8V	0	(±8V/)	1	(±8V/)(2)	2	(+8V/)	3	(+8V/)(2)	4	(±8V/)	5	(±10V/1Mpps)	6	(±10V/100pulse)(1)	7	(±10V/1000pulse)(1)	8	(±10V/10000pulse)(1)	9	(±10V/100000pulse)(1)	D	(+8V/400V)	0000h		
0	(±8V/)																										
1	(±8V/)(2)																										
2	(+8V/)																										
3	(+8V/)(2)																										
4	(±8V/)																										
5	(±10V/1Mpps)																										
6	(±10V/100pulse)(1)																										
7	(±10V/1000pulse)(1)																										
8	(±10V/10000pulse)(1)																										
9	(±10V/100000pulse)(1)																										
D	(+8V/400V)																										

6. 파라미터

No.						
PC10	MOD2	2 2(MO2) 000	2(MO2)	1 No.PC09	0001h	
PC13					0	
PC14					0	
PC26	**COP8	C - 8 CN2L 100	0 : 2 1 : 4	1(16)2(20)가	0100h	
PC27	**COP9	C - 9 CN2L Z 0 0	0 : 1 : A · B · Z A · B · Z 0 : 1 :	A · B · Z 1(16)2(20)가 Z ,Z 2(20)가 2(20)	0000h	

6.4.3 아날로그 모니터

2

(1)

No.PC09 · PC10

파라미터 No.PC09

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

아날로그 모니터1(MO1) 출력 선택
(MO1-LG간에 출력하는 신호)

파라미터 No.PC10

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

아날로그 모니터2(MO2) 출력 선택
(MO2-LG간에 출력하는 신호)

No.PC11 · PC12

- 999~999mV

No.		[mV]
PC11	1(MO1)	- 999 ~ 999
PC12	2(MO2)	

(2)

1(MO1)

2(MO2)

No.PC09 · PC10

(3)

0		1	(2)	
2		3	(2)	

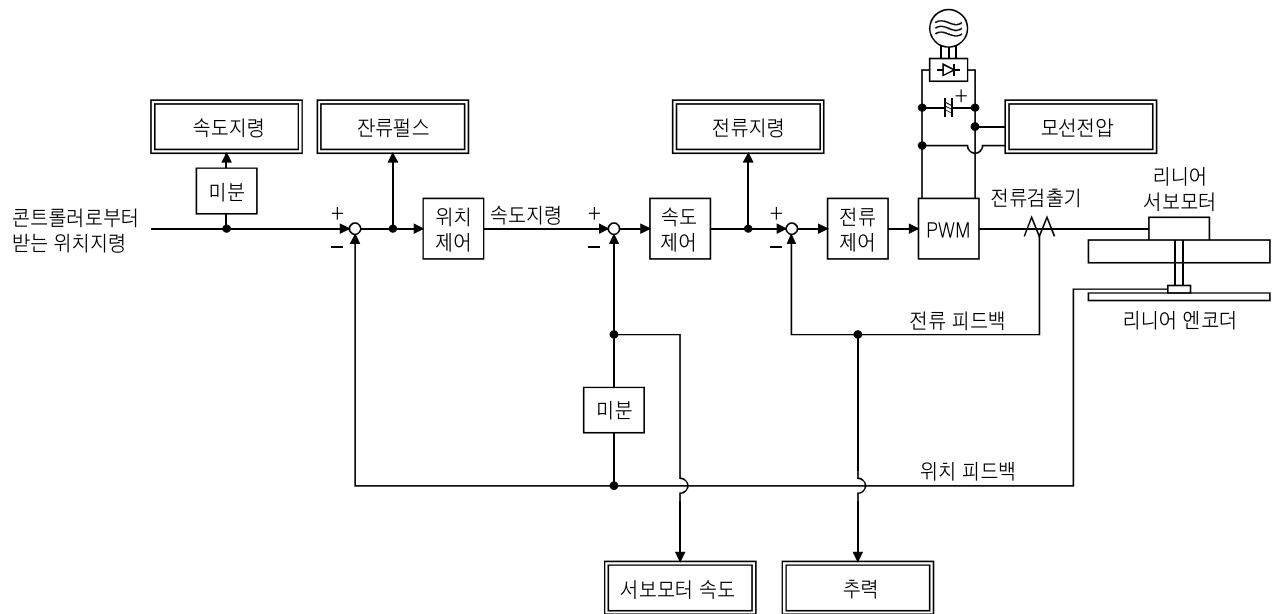
6. 파라미터

MELSERVO

4			5		
6	(1) ($\pm 10V/100pulse$)		7	(1) ($\pm 10V/1000pulse$)	
8	(1) ($\pm 10V/10000pulse$)		9	(1) ($\pm 10V/100000pulse$)	
D					

- () 1. .
2. 8V .

(3)



6. 5 입출력 설정 파라미터(No.PD□□)

6.5.1 파라미터 일람

●	MR - J3 - □B
●	MR - J3 - □B
●	* 가
●	* : OFF
●	** : OFF
●	

No.					
PD01			0000h		
PD02	*DIA2	ON	0000h		6.5.2
PD03			0020h		
PD04			0021h		
PD05			0000h		
PD06			0000h		
PD07	*DO1	(CN3 - 13)	0005h		
PD08	*DO2	(CN3 - 9)	0004h		MR - J3 - □B
PD09	*DO3	(CN3 - 15)	0003h		
PD10			0000h		
PD11			0004h		
PD12			0000h		
PD13			0000h		
PD14	*DOP3	D - 3	0000h		MR - J3 - □B
PD15			0000h		
PD16			0000h		
PD17			0000h		
PD18			0000h		
PD19			0000h		
PD20			0000h		
PD21			0000h		
PD22			0000h		
PD23			0000h		
PD24			0000h		
PD25			0000h		
PD26			0000h		
PD27			0000h		
PD28			0000h		
PD29			0000h		
PD30			0000h		
PD31			0000h		
PD32			0000h		

6.5.2 상세 일람

	No.																		
PD02	*DIA2	ON ON 000 <table><tr><th rowspan="2">신호명</th><th colspan="2">초기값</th></tr><tr><th>BIN</th><th>HEX</th></tr><tr><td>상한 스트로크 리미트 (FLS)</td><td>0</td><td rowspan="4">0</td></tr><tr><td>하한 스트로크 리미트 (RLS)</td><td>0</td></tr><tr><td></td><td>0</td></tr><tr><td></td><td>0</td></tr></table> BIN 0 : 외부 입력신호로 사용합니다. BIN 1 : 자동 ON , RLS ON , (FLS) “ 0002 가 , (RLS) ON <td>0000h</td> <td></td> <td></td>	신호명	초기값		BIN	HEX	상한 스트로크 리미트 (FLS)	0	0	하한 스트로크 리미트 (RLS)	0		0		0	0000h		
신호명	초기값																		
	BIN	HEX																	
상한 스트로크 리미트 (FLS)	0	0																	
하한 스트로크 리미트 (RLS)	0																		
	0																		
	0																		

6. 6 특수 설정 파라미터(No.PS□□)

6.6.1 파라미터 일람

●	MR - J3 - □B	
●	MR - J3 - □B	
●	* 가	
●	* :	OFF
●	** :	OFF
●		

No.					
PS01	**LIT1	1	0301h		
PS02	**LIM		1000		
PS03	**LID		1000		
PS04	*LIT2	2	0003h		
PS05	LB1		50	mm	
PS06	LB2		1000	mm/s	
PS07	LB3		100	%	
PS08	*LIT3	3	0010h		
PS09	LPWM		30	%	
PS10	LFH		5	Hz	
PS11	LIDH		100	%	
PS12			500		
PS13			0000h		
PS14			0000h		
PS15			0000h		
PS16			0000h		
PS17			0000h		
PS18			0000h		
PS19			0000h		
PS20			0000h		
PS21			0000h		
PS22			0000h		
PS23			0000h		
PS24			0000h		
PS25			0000h		
PS26			0000h		
PS27			0000h		
PS28			0000h		
PS29			0000h		
PS30			0000h		
PS31			0000h		
PS32			0000h		

6.6.2

6.6.2 상세 일람

No.																					
PS01	**LIT1	1 0 0: () 1: () <table><tr><th>설정값</th><th>이동간격[Pulse]</th></tr><tr><td>0</td><td>8192</td></tr><tr><td>1</td><td>131072</td></tr><tr><td>2</td><td>262144</td></tr><tr><td>3</td><td>1048576</td></tr><tr><td>4</td><td>4194304</td></tr><tr><td>5</td><td>16777216</td></tr><tr><td>6</td><td>67108864</td></tr></table> 0: () 1: () 가 가	설정값	이동간격[Pulse]	0	8192	1	131072	2	262144	3	1048576	4	4194304	5	16777216	6	67108864	0301h		
설정값	이동간격[Pulse]																				
0	8192																				
1	131072																				
2	262144																				
3	1048576																				
4	4194304																				
5	16777216																				
6	67108864																				
PS02	**LIM	1μm (5.1.3) No.PS02 (μm) = LIM/LID	1000		1 ~ 65535																
PS03	**LID	No.PS03	1000		1 ~ 65535																
PS04	*LIT2	2 0 0 0: (5.6.1) 1: () 2: () 3: () 4: () 5: () 6: () 7: () 0: 가(OFF (42) 가) 1: 가	0003h																		
PS05	*LIB1	(42)가 (5.6.1)	50	mm	1 ~ 1000																

6. 파라미터

MELSERVO

No.					
PS06	LB2	(42)가 .(5.6.1)	1000	mm/s	1 ~ 5000
PS07	LB3	(42)가 .(5.6.1)	100	%	1 ~ 1000
PS08	*LIT3	3 .(5.2.6) 001 └ 0: 1: 2: 1 2	0010h		
PS09	LPWM	51), (32) (50, .(5.2.3)	30	%	0 ~ 100
PS10	LFH	No.PS08 “ □□□1 ” “ □□□2 ” 가 (5.2.6)	5	Hz	0 ~ 500
PS11	LIDH	No.PS08 “ □□□1 ” “ □□□2 ” (50, 51) (5.2.6)	100	%	50 ~ 100
PS12			500		
PS13			0000h		
PS14			0000h		
PS15			0000h		
PS16			0000h		
PS17			0000h		
PS18			0000h		
PS19			0000h		
PS20			0000h		
PS21			0000h		
PS22			0000h		
PS23			0000h		
PS24			0000h		
PS25			0000h		
PS26			0000h		
PS27			0000h		
PS28			0000h		
PS29			0000h		
PS30			0000h		
PS31			0000h		
PS32			0000h		

제7장 트러블 슈팅

●	MR-J3-□B
	MR-J3-□B 가
●	OFF ,

가

,

.

7. 1 알람·경고 일람표

,

가

7.2 MR-J3-□B

8.2 , 가

7.3

MR-J3-□B

8.3

ALM OFF가

○

			OFF-ON		CPU
10			○	○	○
12	1(RAM)		○		
13			○		
15	2(EEP-ROM)		○		
16	1()		○		
17			○		
19	3(Flash-ROM)		○		
20	2		○		
24			○	○	○
27			○	○	○
28	2		○		
2A	1		○		
30			(1) ○	(1) ○	(1) ○
31			○	○	○
32			○		
33			○	(2) ○	○
34	1		○	○	○
35			○	○	○
37			○		
42			○	(3) ○	(3) ○
45			(1) ○	(1) ○	(1) ○
46			(1) ○	(1) ○	(1) ○
47			○		
50	1		(1) ○	(1) ○	(1) ○
51	2		(1) ○	(1) ○	(1) ○
52			○	○	○
8A	USB		○	○	○
8E	USB		○	○	○
888			○		

96	
E0	
E1	1
E2	
E4	
E6	
E7	
E8	
E9	OFF
EC	2
ED	

() 1. , 30

2.

가

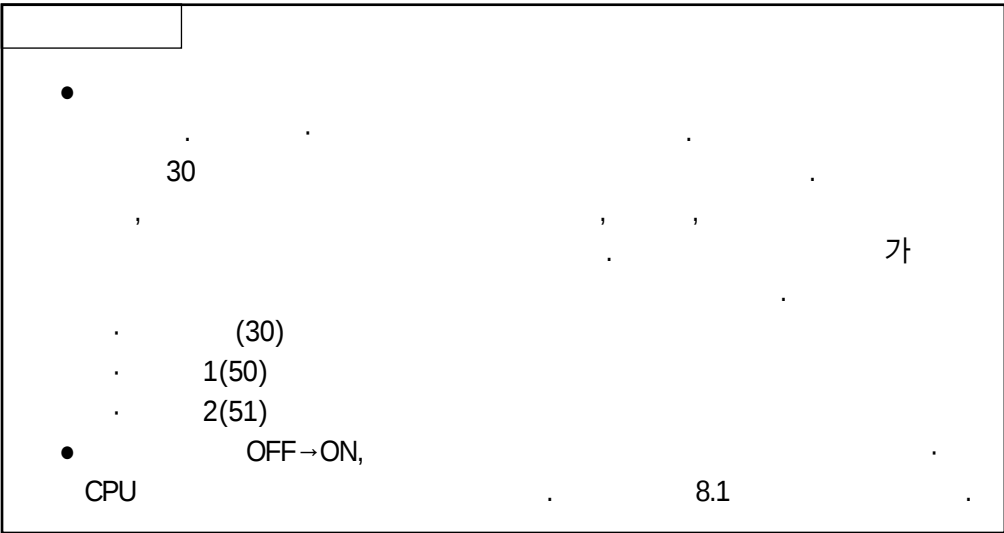
3.

No.PS04 "1□□□"

7. 2 알람 대처 방법

 주의

-
- OFF



(ALM) OFF가
NO.
가
MR Configurator(-)

10		MR - J3 - □B 8		
12	(RAM)			
13				
15	(EEP - ROM)			
16	(1)		1. (CN2L)가	
			2.	
			3. ()	
			4. (2 , 4)	No.PC26 4
		A · B · Z	5. (CN2L)가	
			6.	
			7. (2 , 4) PSEL - LG	

17				
19	(Flash - ROM)	MR - J3 - □B	8	
20	2	A · B · Z	1. (CN2L)가	
			2.	
			1. 3. ()	
			5. (CN2L)가	
			6.	
			7. (2 , 4) (PSEL - LG)	1. 2. Z No.27 “ □ □ 1 □ ”
24		MR - J3 - □B	8	
27			1. 가	
			2. 가	No.PS09()
			3. U · V · W	
			4.	No.PS02, PS03()
			5.	No.PC27
			6. 가 가 (ON) , ON)	No.PD02
28			1. 가	,
			2.	

7. 트러블 슈팅

MELSERVO

2A	1	가	1. 가	
			2.	
			3.	
			4.	
30		MR - J3 - □B	8	
31				
32				
33				
34	1			
35				
36	2			
37				
42			1.	No.PS02, PS03 ()
			2.	
			3.	No.PC27
			4. 가	No.PS05()
			5. 가	No.PS06()
			6. 가	No.PS07()
			7. U · V · W U · V · W가	
45		MR - J3 - □B	8	

46		가	1. 가40	가 0~40 가
			2. 가	1. 2. 3.
			3. 가	
			4.	
			5. (CN2)가	
47		MR-J3-□B	8	
50	1		1. 가	1. 2. 3.
			2. 가	1. 가 2. 3. OFF
			3.	1. 2.
			4. U·V·W U·V·W가	
			5. OFF 가 가	
			6.	No.PS02, PS03 ()
			7.	
			8.	No.PC27

51	2	: 1s : 2.5s	1.	1.
			2.	2.
			2.	U · V · W U · V · W가
			3. 가	1. 가 2. 3. OFF
			4.	
			5.	No.PS02, PS03 ()
			6.	
52	8A	MR - J3 - □B	7.	No.PC27
8E	USB			
888				

7. 3 경고 대처 방법

가 , OFF/ON	OFF/ON , 30

E6 · E7 · E9가 OFF 가 가 , 가 .

MR Configurator(-) .

96		MR - J3 - □B 8 .		
E0		MR - J3 - □B 8 .		
E1	1			
E2		가 85% .	1. 가 40 .	가0~40 가 .
			2. 가 .	1. . 2. . 3. .
			3. 가 .	1 () .
E4		MR - J3 - □B 8 .		
E6				
E7				
E8				
E9	OFF			
EC	2			
ED				

7. 4 리니어 엔코더 이상(2A)의 상세 설명

1(2A) , MR Configurator

7.1 1(2A)

Bit	(2A)			
Bit7				
Bit6	ROM · RAM			
Bit5	EEPROM		EEPROM	
Bit4	CPU		CPU	
Bit3			ABS	
Bit2			INC	
Bit1			INC · ABS	
Bit0				

AT343A 1(2A)가



알람 상세정보 : 44h

1(2A) 가 “ 44 ”가
16 “ 44 ” 2

bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0
44h = 0 1 0 0 0 1 0 0

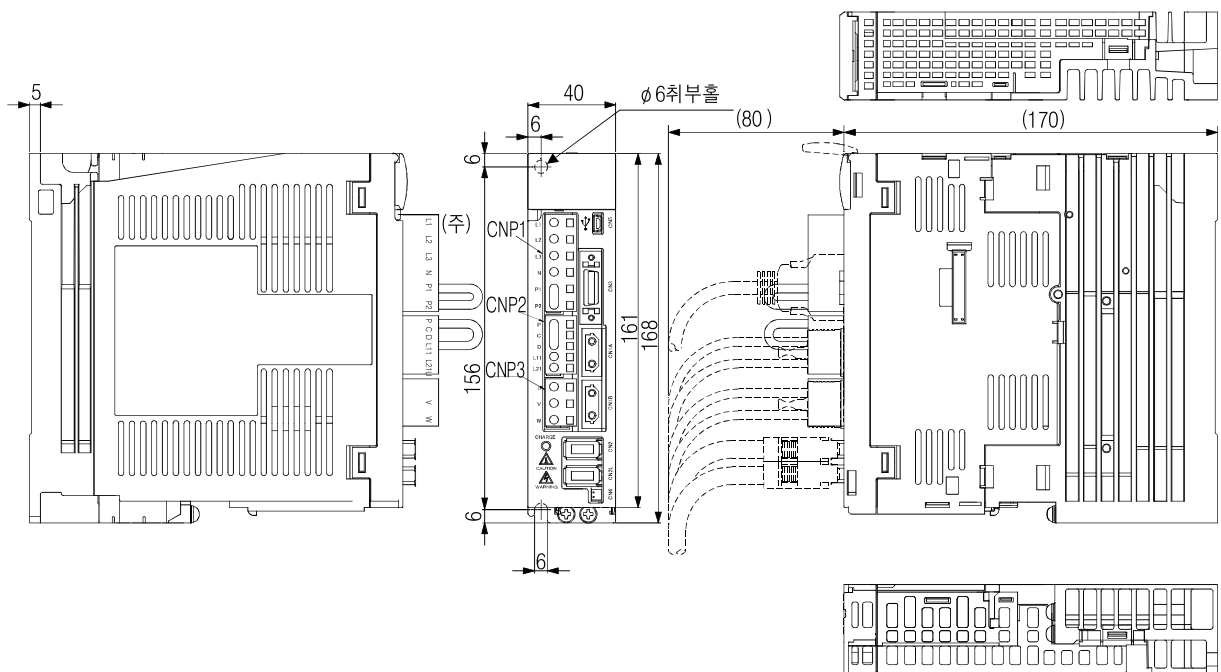
Bit6 Bit2 1 “ 1 ” bit 7.1
ROM · RAM (bit6) (bit2)가

제8장 외형치수도

●	MR - J3 - □B	9.2
CN2	. CN2L	CN2

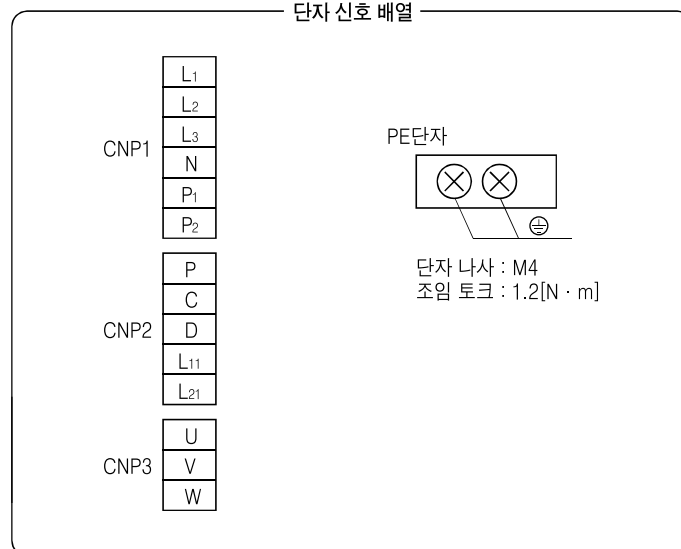
(1) MR-J3-40B-RJ004

[단위: mm]



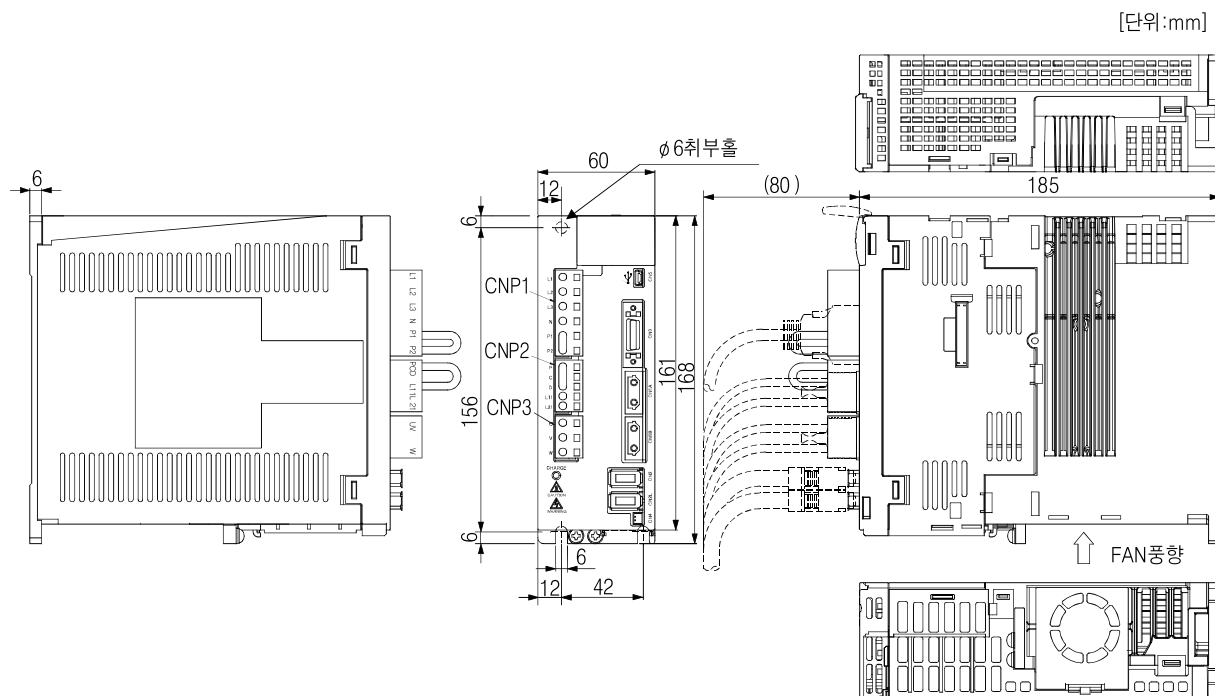
질량 : 1.0[kg]

단자 신호 배열

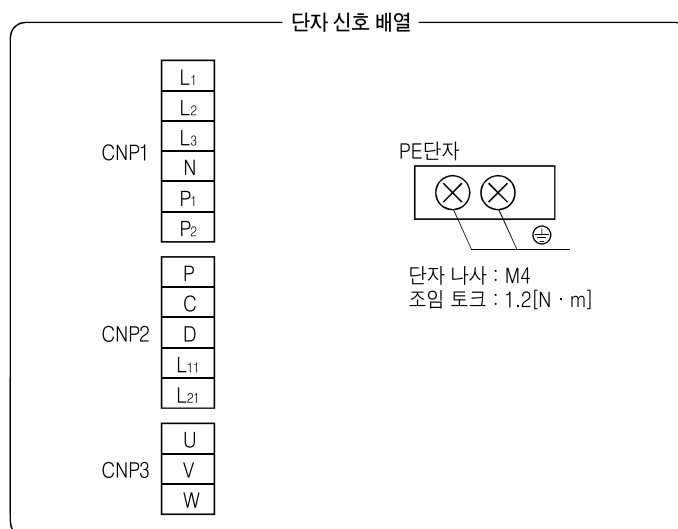


취부 나사
나사 사이즈 : M5
조임 토크 : 3.24[N · m]

(2) MR-J3-70B-RJ004

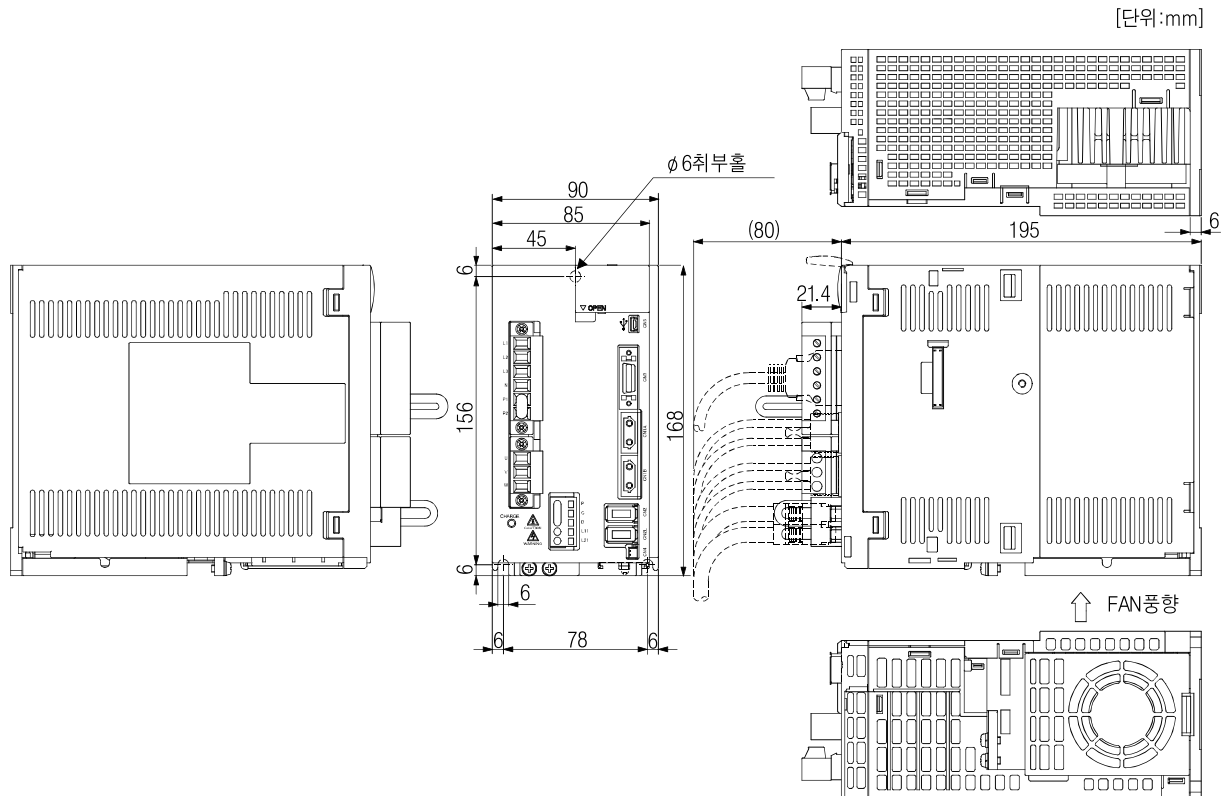


질량 : 1.4[kg]

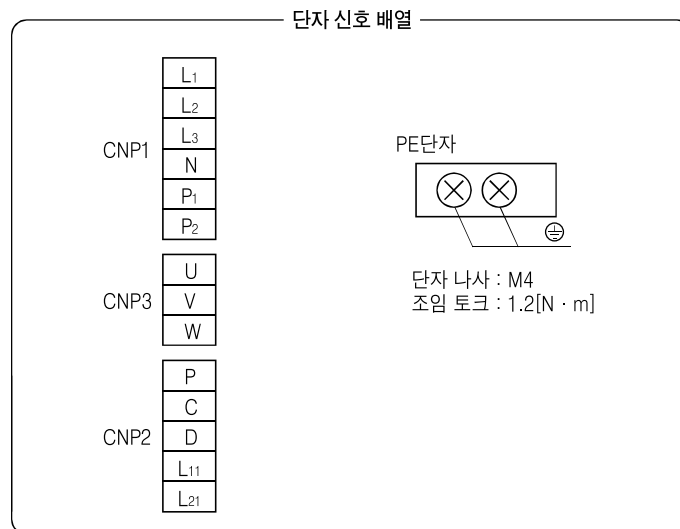


취부 나사
나사 사이즈 : M5
조임 토크 : 3.24[N · m]

(3) MR-J3-200B-RJ004 · MR-J3-350B-RJ004



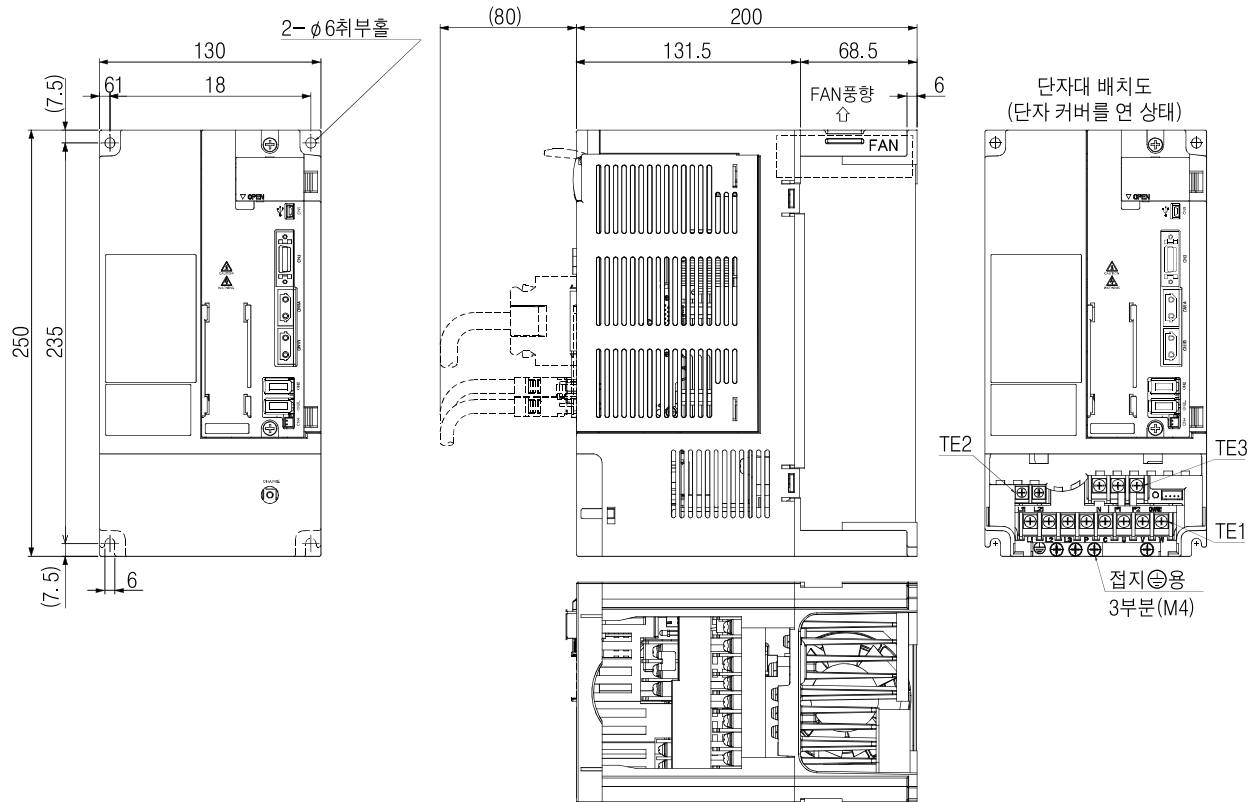
질량 : 1.4[kg]



취부 나사
나사 사이즈 : M5
조임 토크 : 3.24[N · m]

(4) MR-J3-500B-RJ004

[단위:mm]



질량 : 4.6[kg]

단자 신호 배열

TE1

L1	L2	L3	P	C	U	V	W
----	----	----	---	---	---	---	---

단자 나사 : M4
조임 토크 : 1.2[N · m]

TE2

L11	L21
-----	-----

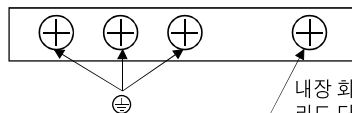
단자 나사 : M3.5
조임 토크 : 0.8[N · m]

TE3

N	P1	P2
---	----	----

단자 나사 : M4
조임 토크 : 1.2[N · m]

PE단자



단자 나사 : M4
조임 토크 : 1.2[N · m]

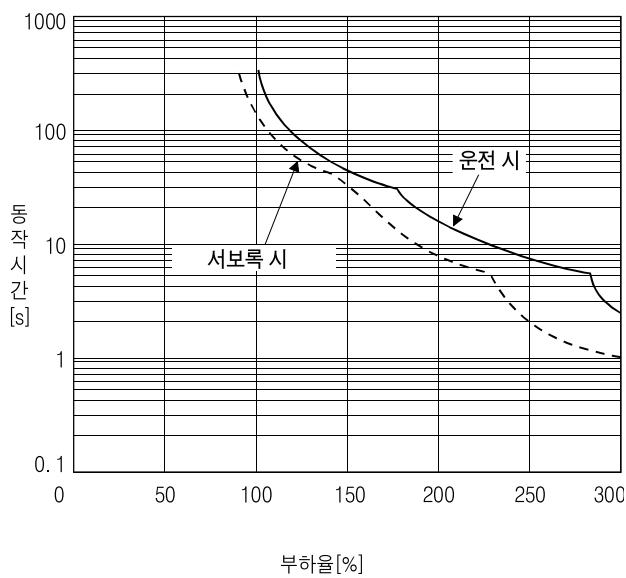
취부 나사
나사 사이즈 : M5
조임 토크 : 3.24[N · m]

제9장 특성

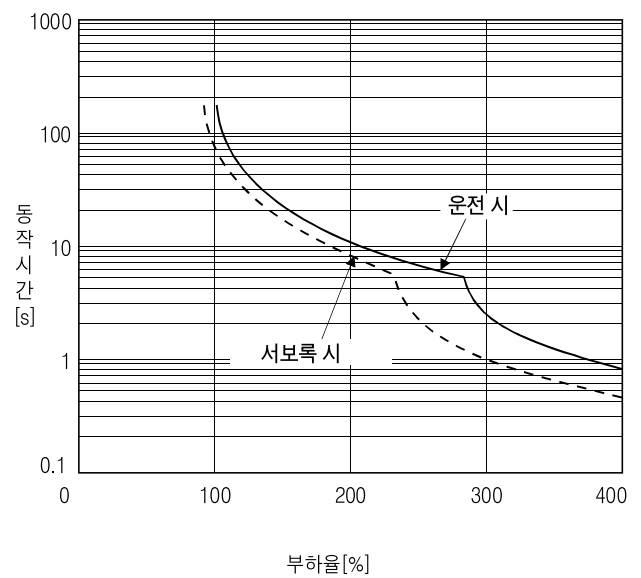
9. 1 과부하 보호특성

가

1 (50),
2 (51)



a. LM-H2시리즈



b. LM-U2시리즈

9.1

9. 2 다이내믹 브레이크 특성

$$L_{\max} : V_0 \cdot (0.03 + M \cdot (A + B \cdot V_0^2))$$
$$L_{\max} : \quad \quad \quad [m]$$
$$V_0 : \quad \quad \quad [m/s]$$
$$M : \text{가} \quad \quad \quad [kg]$$
$$A : \quad (\quad \quad \quad)$$
$$B : \quad (\quad \quad \quad)$$

	A	B
LM - H2P1A - 06M	2.91×10^{-2}	8.44×10^{-3}
LM - H2P2A - 12M	1.01×10^{-2}	5.71×10^{-3}
LM - H2P2B - 24M	3.14×10^{-2}	7.26×10^{-4}
LM - H2P2C - 36M	1.57×10^{-3}	4.16×10^{-4}
LM - H2P2D - 48M	1.28×10^{-3}	3.16×10^{-4}
LM - H2P3A - 24M	3.28×10^{-2}	7.59×10^{-4}
LM - H2P3B - 48M	1.12×10^{-3}	2.72×10^{-4}
LM - H2P3C - 72M	9.05×10^{-4}	1.50×10^{-4}
LM - H2P3D - 96M	8.01×10^{-4}	1.20×10^{-4}

	A	B
LM - U2P2B - 40M	1.38×10^{-3}	1.37×10^{-5}
LM - U2P2C - 60M	1.04×10^{-3}	8.19×10^{-6}
LM - U2P2D - 80M	8.60×10^{-4}	5.63×10^{-6}

 주의

가 , 가

부록 1. 파라미터 일람

●	* 가
* :	OFF
** :	OFF

(PA□□)		
No.		
PA01		
PA02	*REG	
PA03	*ABS	
PA04	*AOP1	1
PA05 ~ PA07		
PA08	ATU	
PA09	RSP	
PA10	INP	
PA11 ~ PA13		
PA14	*POL	
PA15	*ENR	
PA16 ~ PA18		
PA19	*BLK	

(PB□□)		
No.		
PB01	FILT	()
PB02	VRFT	()
PB03		
PB04	FFC	
PB05		
PB06	GD2	
PB07	PG 1	
PB08	PG2	
PB09	VG2	
PB10	VIC	
PB11	VDC	
PB12		
PB13	NH1	1
PB14	NHQ1	1
PB15	NH2	2
PB16	NHQ2	2
PB17		
PB18	LPF	
PB19	VRF1	
PB20	VRF2	
PB21		
PB22		
PB23	VFBF	
PB24	*MVS	
PB25		
PB26	*CDP	
PB27	CDL	
PB28	CDT	
PB29	GD2B	
PB30	PG2B	
PB31	VG2B	
PB32	VICB	
PB33	VRF1B	
PB34	VRF2B	
PB35 ~ PB45		

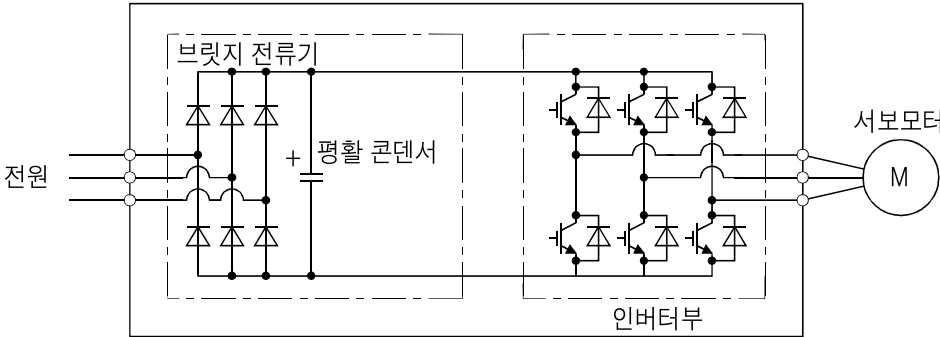
(PC□□)		
No.		
PC01	*ERZ	
PC02	MBR	
PC03	*ENRS	
PC04	**COP1	1
PC05	**COP2	2
PC06		
PC07	ZSP	
PC08		
PC09	MOD 1	1
PC10	MOD2	2
PC11	MO 1	1
PC12	MO2	2
PC13		
~		
PC16		
PC17	**COP4	C - 4
PC18		
~		
PC20		
PC21	*BPS	
PC22		
PC23		
PC24	*ABN	
PC25	*ABD	
PC26	**COP8	C - 8
PC27	**COP9	C - 9
PC28		
~		
PC32		

(PD□□)		
No.		
PD01		
PD02	*DIA2	ON
PD03		
~		
PD06		
PD07	*D01	1(CN3 - 13)
PD08	*D02	2(CN3 - 9)
PD09	*D03	3(CN3 - 15)
PD10		
~		
PD13		
PD14	*DOP3	D - 3
PD15		
~		
PD32		

(PD□□)		
No.		
PS01	**LIT1	1
PS02	**LIM	
PS03	**LID	
PS04	*LIT2	2
PS05	LB1	
PS06	LB2	
PS07	LB3	
PS08	*LIT3	3
PS09	LPWM	
PS10	LFH	
PS11	LIDH	
PS12		
~		
PS32		

3.1.2 서보앰프의 고조파 발생 원리

가



3.1.3 고조파의 영향

가

(1)

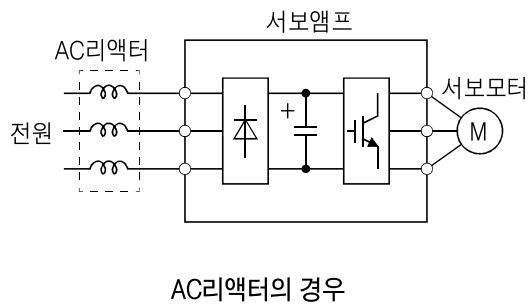
(2)

가

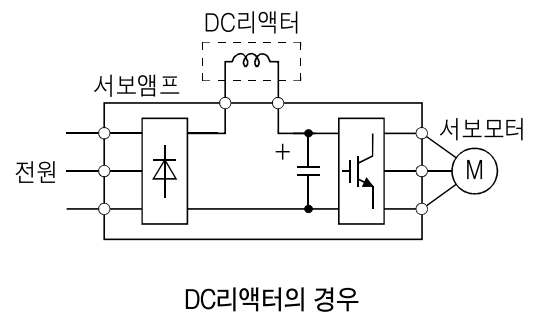
3. 2 서보앰프의 대상 기종

100V		1994 9 () 가 가 」
200V		,
200V		(())
400V		가 」 JEM - TR225 - 2003

3. 3 고조파 전류 억제 대책



가



가

부록 4. 리니어 서보모터의 용량 선정

4. 1

가 , 가

(1)

2m/s

가

2m/s

(2) 1 () ()

가

() ,

3

가

.

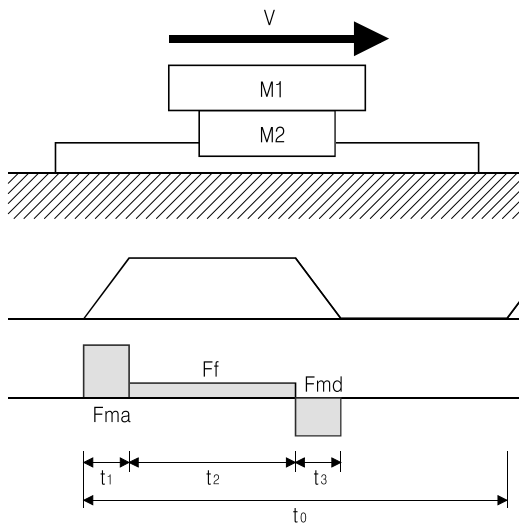
,

,

가

.

.



V : [m/s]

$M1$: [kg]

$M2$: 1 [kg]

F_{ma} : 가 [N]

F_f : [N]
(, ,)

F_{md} : [N]

t_1 : 가 [s]

t_2 : [s]

t_3 : [s]

t_0 : 1 [s]

a : 가 가 [m/s²]

η :

μ :

1

()

가

(

)

가

가

.

$M1 > M2$

$M = M1 + M2$ [kg]

$F_f = \mu \cdot (M \cdot 9.8 +)$ [N] ()

가

,

$F_{ma} = M \cdot a + F_f$ [N]

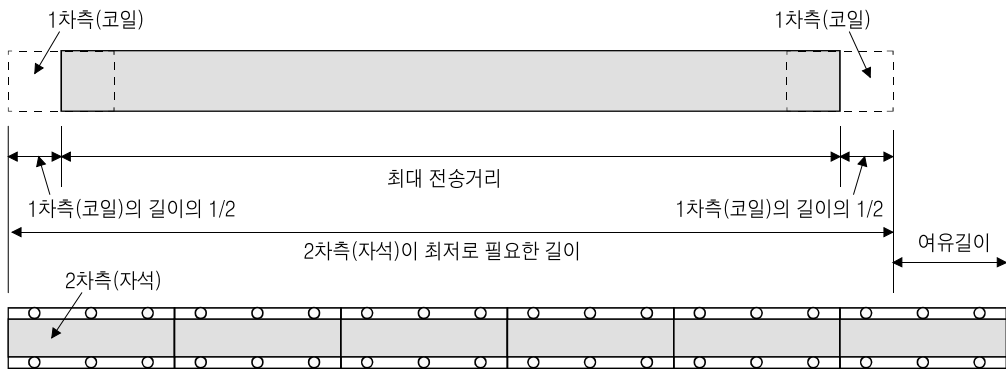
$F_{md} = -M \cdot a + F_f$ [N]

$F_{rms} = \sqrt{(F_{ma}^2 \cdot t_1 + F_f^2 \cdot t_2 + F_{md}^2 \cdot t_3) / t_0}$ [N]

$$F_{rms}/\eta \text{ 가}$$
$$F_{ma}/\eta \text{ 가}$$

$$[N]$$
$$[N]$$

$$(3) \frac{2}{2} \left(\frac{\quad}{\quad} \right)$$
$$\frac{2}{2} \left(\frac{\quad}{\quad} \right)$$
$$\left(\frac{2}{2} \left(\frac{\quad}{\quad} \right) \right) \left(\frac{\quad}{\quad} \right) + \left(\frac{1}{2} \right) \left(\frac{\quad}{\quad} \right)$$



(4)

MR-J3-□-RJ004	C [J]	[%]								
				MR-RB032 [40Ω]	MR-RB12 [40Ω]	MR-RB30 [13Ω]	MR-RB31 [6.7Ω]	MR-RB32 [6.7Ω]	() MR-MB50 [6.7Ω]	() MR-MB51 [6.7Ω]
40B	11	85	10	30	100					
70B	18	80	20	30	100			300		
200B	40	85	100			300			500	
350B	40	85	100			300			500	
500B	45	90	130				300			500

)

가 .

$$P(W) = (- F_{md} \cdot t_3 \cdot (\quad / 2) \cdot (\quad / 100) - C \quad) / t_0$$

가 가 .

4.2

			: 20kg	
			: 2m/s	η: 0.9
			: 1600mm	: 0.01
			: 1s	1 : 2s

- (1) 가
가 $t_1=0.2s$, $t_2=0.6s$ 가 .
가 $a = 2[m/s]/0.2[s] = 10[m/s^2]$
20kg 가 9.6 가 LM - H2P2B - 24M
가 .

	: 2.5kg
	: 1900N
	: 240N
	: 600N

- (2) 가 , (Ff)
 $E_f = \mu \cdot (M \cdot 9.8 + 1900) = 0.01 \times \{(20 + 2.5) \times 9.8 + 1900\} = 21.2[N]$
 $F_{ma} = M \cdot a + F_f = (20 + 2.5) \times 10m/s^2 + 21.2 = 246.2[N]$
 $F_{md} = -M \cdot a + F_f = -(20 + 2.5) \times 10m/s^2 + 21.2 = -203.8[N]$

- (3)

$$F_{rms} = \sqrt{(F_{ma}^2 \cdot t_1 + F_f^2 \cdot t_2 + F_{md}^2 \cdot t_3) / t_0}$$

$$= \sqrt{(246.2^2 \times 0.2 + 21.2^2 \times 0.6 + (-203.8)^2 \times 0.2) / 2} = 101.7[N]$$

$$F_{rms} / \eta = 101.7 / 0.9 = 113[N]$$

, 240N 가

$$F_{rms} / \eta = 246.2 / 0.9 = 273.6[N]$$

, 600N 가

(4) 2 ()

$$() + (1 ()) = 1600 + 224 = 1824[\text{mm}]$$

, 2 () 가 1824mm

- (a) LM - H2S20 - 480 4 (1920mm)
- (b) LM - H2S20 - 384 5 (1920mm)
- (c) LM - H2S20 - 288 7 (2016mm)
- (d) LM - H2S20 - 768 2 LM - H2S20 - 288 1 (1824mm)

(5)

$$P(W) = \{ -F_{md} \cdot t_3 \cdot (/2) \cdot (/100) - C \} / t_0$$

$$= \{ 203.8 \times 0.2 \times (2/2) \times (80/100) - 11 \} / 2 = 10.8[\text{N}]$$

(MR - J3 - 70B - RJ004U502)
가 (20W)

: MR - J3 - 70B - RJ004U502	
1 ()	: LM - H2P2B - 24M
2 ()	: LM - H2P20 - 480(4)
:	

개정 이력

2005 9	SH() - 030053 - A	

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**MITSUBISHI
ELECTRIC**

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