



LG

MASTER-K

K200S

K300S

K1000S

LG Industrial Systems



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‘ ’ ‘ ’ 2가 ,

.



가 ,



가 ,



가 .



가 .

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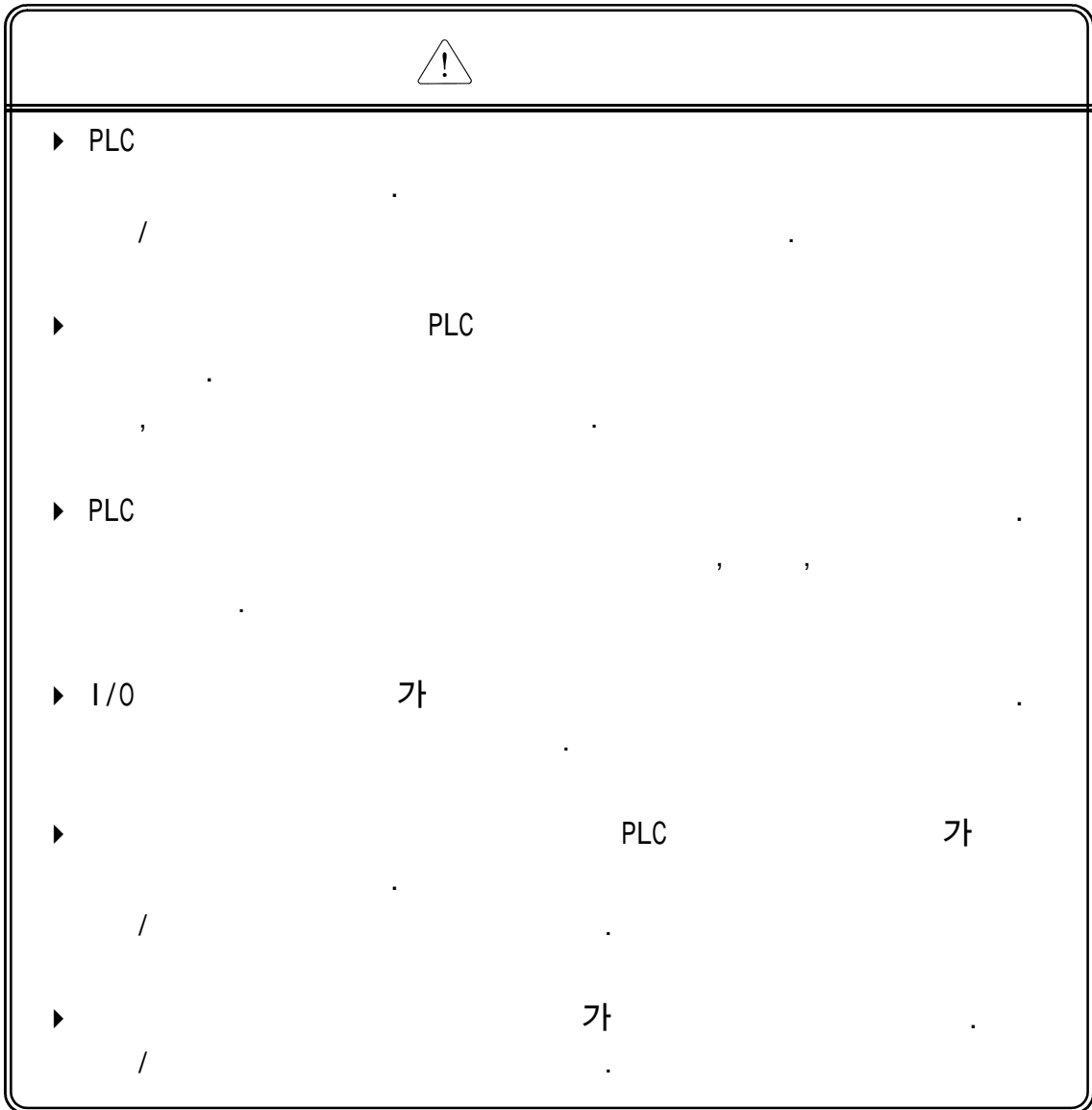
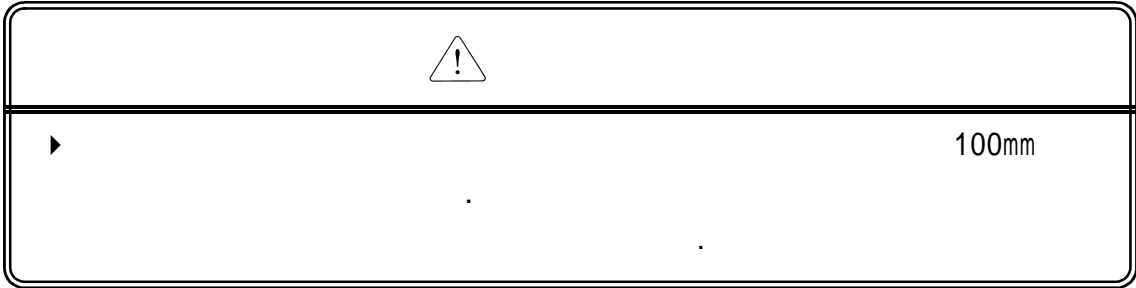


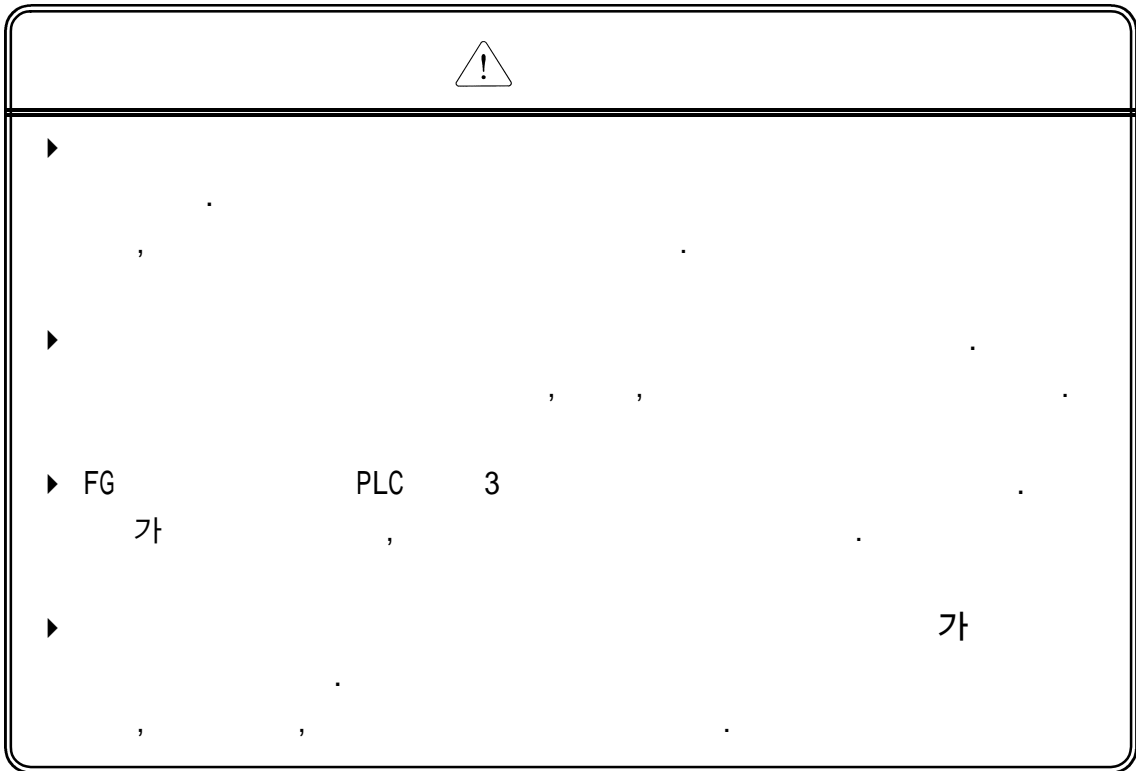
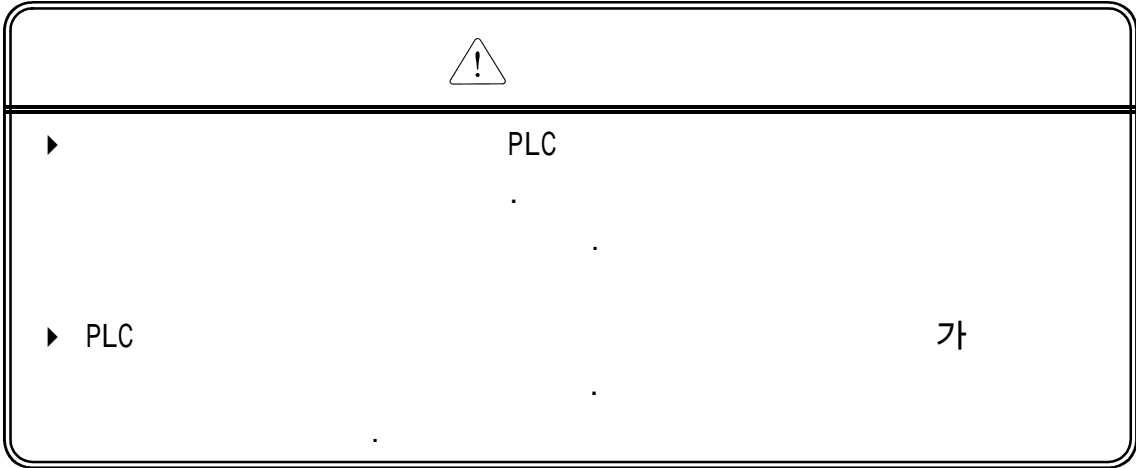
- ▶ , PLC
PLC /
- PLC , /
- PLC CPU가 , Off ,
CPU가 , TR On

▶ 가

▶ PLC On


▶ PLC (PLC)









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- ▶ 가 .
- ▶ , PLC Off
- ▶ , 가 , Short ,

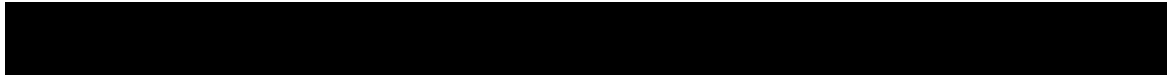


- ▶ PCB .
- ▶ PLC Off
- ▶ PLC 30cm



- ▶ , .

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1.1

K200S/300S/1000S

PLC

1		
2		K200S/300S/1000S
3		K200/300/1000S
4	CPU	CPU
5		CPU
6		
7		
8		
9		
10		PLC
11		PLC 가
12		
13	K200S 232C	K200S A/C RS232C
14	K200S 422	K200S B RS422/485
15	K200S PID	K200S B/C PID
16	K200S	K200S C
1		
2		CPU,

1) /

1.2

1) K200/300/1000S CPU

- (1) (KGL-WIN, KLD-150S)
- (2)
- (3)
- (4) PLC
- (5) RUN 가

2) K200/300/1000S CPU 가 CPU

- (1) 0.2 μ s/Step
(K200S 0.5 μ s/Step)

(2)

(3) PLC

-
-
-
-

(4)

가

1.3

(Module)	가	) CPU ,
(Unit)	PLC 가 PLC) ,
PLC (PLC System)	PLC 가 가	
KGL-WIN	,	
KLD-150S	,	
	CPU	
FAM	Factory Automation Monitoring S/W S/W	
Fnet	Fieldbus Network ()	
Cnet	Computer Network ()	
Enet	Ethernet Network ()	
Pnet	Profibus Network ()	
RTC	Real Time Clock IC	
(Watchdog Timer)	가	

제 2 장 시스템 구성

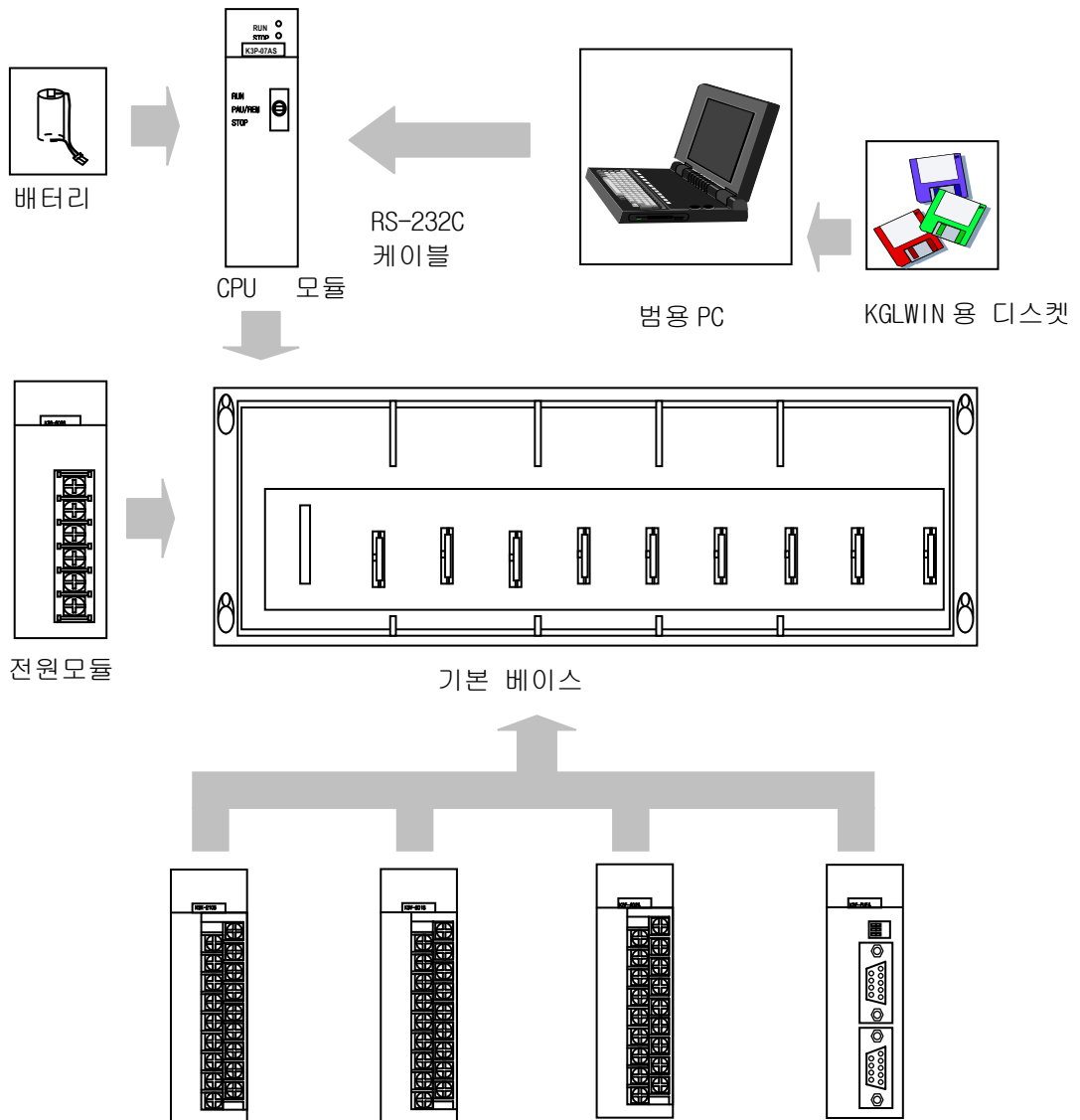
제 2 장 시스템 구성

K200S/K300S/K1000S 시리즈는 기본, 컴퓨터 링크 및 네트워크 시스템 구성에 적합한 각종 제품을 구비하고 있습니다. 본 장은 각 시스템의 구성방법 및 특징에 대해 설명합니다.

2.1 전체구성

1) K200S 시리즈 시스템 구성

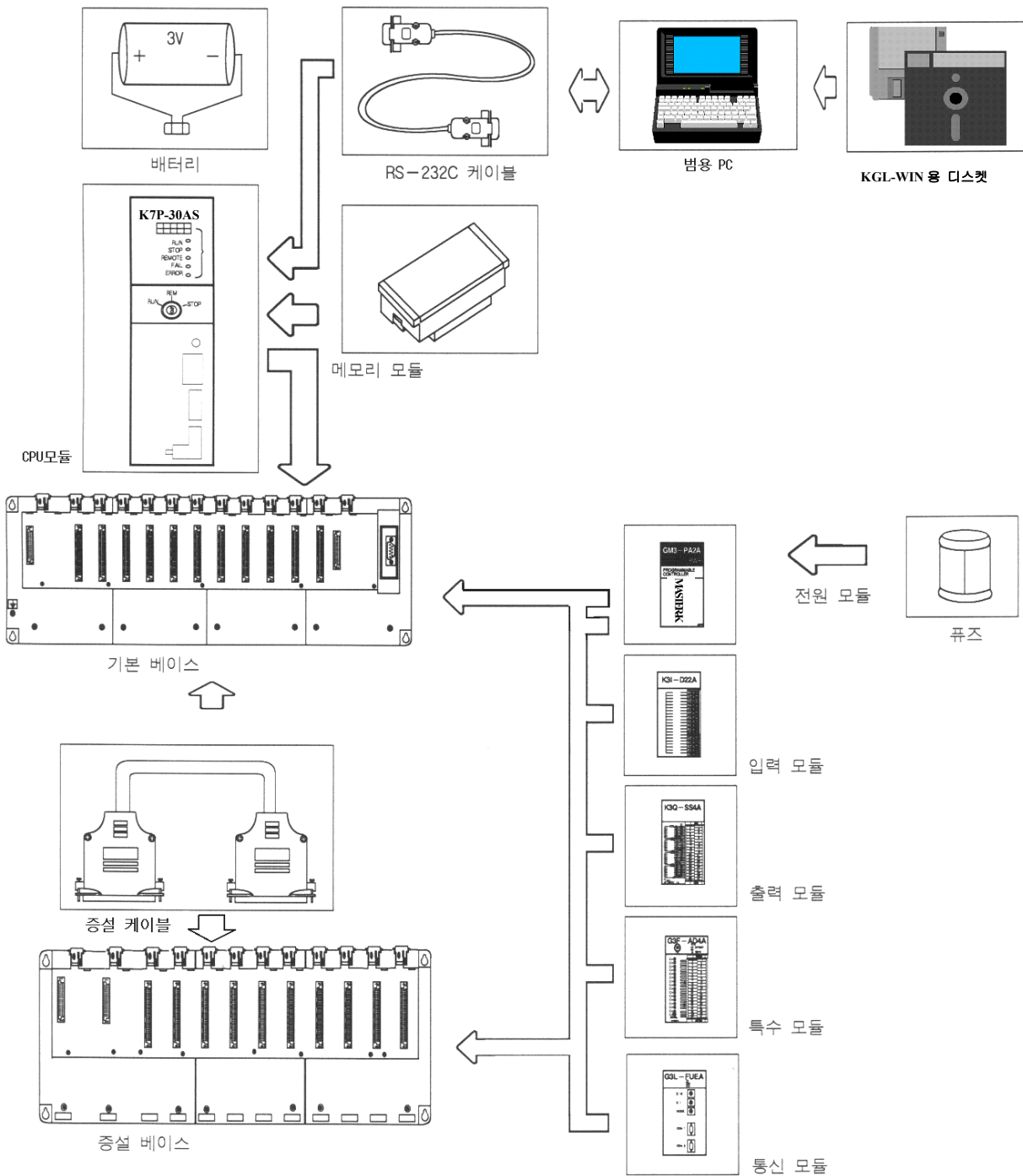
K200S 시리즈의 시스템 구성은 아래 그림과 같습니다.



제 2 장 시스템 구성

2) K300S/K1000S 시리즈 시스템 구성

K300S/K1000S 시리즈의 시스템 구성은 아래 그림과 같습니다.



제 2 장 시스템 구성

2.2 구성 제품 일람

K200S/K300S/K1000S 시리즈의 제품 구성은 아래와 같습니다.

2.2.1 K200S 시리즈 제품구성

품 명	형 명	내 용	비 고
CPU 모듈	K3P-07AS	<ul style="list-style-type: none"> 최대 입출력 점수 : 512 점 내장기능 : RS-232C 	
	K3P-07BS	<ul style="list-style-type: none"> 최대 입출력 점수 : 512 점 내장기능 : RS-422/485, 시계기능(RTC), PID 제어 	
	K3P-07CS	<ul style="list-style-type: none"> 최대 입출력 점수 : 512 점 내장기능 : RS-232C, 시계기능(RTC), PID 제어, 고속카운터 	
디지털 입력 모듈	G6I-D21A	• DC12/24V 입력 8 점 (소스 / 싱크 입력)	
	G6I-D22A	• DC12/24V 입력 16 점 (소스 / 싱크 입력)	
	G6I-D22B	• DC24V 입력 16 점 (소스 입력)	
	G6I-D24A	• DC12/24V 입력 32 점 (소스 / 싱크 입력)	
	G6I-D24B	• DC24V 입력 32 점 (소스 입력)	
	G6I-A11A	• AC110V 입력 8 점	
	G6I-A21A	• AC220V 입력 8 점	
디지털 출력 모듈	G6Q-RY1A	• 릴레이 출력 8 점 (2A 용)	단독접점용
	G6Q-RY2A	• 릴레이 출력 16 점 (2A 용)	
	G6Q-TR2A	• 트랜지스터 출력 16 점 (0.5A 용, 싱크출력)	
	G6Q-TR2B	• 트랜지스터 출력 16 점 (0.5A 용, 소스출력)	
	G6Q-TR4A	• 트랜지스터 출력 32 점 (0.1A 용, 싱크출력)	
	G6Q-TR4B	• 트랜지스터 출력 32 점 (0.1A 용, 소스출력)	
	G6Q-SS1A	• 트라이액 출력 16 점 (1A 용)	
디지털 입/출력 혼합 모듈	G6H-DR2A	• DC12/24V 입력 8 점 (소스 / 싱크 입력) + 릴레이 출력 8 점 (2A 용)	
기본 베이스	GM6-B04M	• 4 모듈 장착용	
	GM6-B06M	• 6 모듈 장착용	
	GM6-B08M	• 8 모듈 장착용	
	GM6-B12M	• 12 모듈 장착용	
전원 모듈	GM6-PAFA	Free Voltage 입력	• DC5V : 2A, DC24V : 0.3A
	GM6-PAFB		• DC5V : 2A, DC±15V : 0.5 / 0.2A
	GM6-PAFC		• DC5V : 3.5A, DC24V : 0.3A
	GM6-PA2A	AC220V 입력	• DC5V : 6A
	GM6-PDFA	DC12~24V 입력	• DC5V : 2A
	GM6-PDFB		• DC5V : 3A, DC±15V : 0.5 / 0.2A

제 2 장 시스템 구성

품 명		형 명	내 용	비 고
특수 모듈	A/D 변환 모듈	G6F-AD2A	<ul style="list-style-type: none"> 전압 / 전류입력: 4 채널 DC 1 ~ 5 / 0 ~ 10 / -10 ~ +10V DC 4 ~ + 20mA 	
	D/A 변환 모듈	G6F-DA2V	<ul style="list-style-type: none"> 전압 출력 : 4 채널 DC -10 ~ +10 V 	
		G6F-DA2I	<ul style="list-style-type: none"> 전류 출력 : 4 채널 DC 4 ~ 20 mA 	
	고속카운터 모듈	G6F-HSCA	<ul style="list-style-type: none"> 계수범위 : 0 ~ 16,777,215 (바이너리 24 비트) 50KHz, 1 채널 	
		G6F-HD1A	<ul style="list-style-type: none"> 계수범위 : -2,147,483,648 ~ 2,147,483,647 (바이너리 32 비트) 500KHz, 2 채널 	라인드라이브
		G6F-HO1A	<ul style="list-style-type: none"> 계수범위 : -2,147,483,648 ~ 2,147,483,647 (바이너리 32 비트) 200KHz, 2 채널 	오픈컬렉터
	위치결정 모듈	G6F-POPA	<ul style="list-style-type: none"> 펄스출력, 2 축 제어 	
		G6F-PPxD	<ul style="list-style-type: none"> x=1,2,3:제어축수, 펄스출력 200kpps, 2/3 축 직선보간, 2 축원호보간, Open Collector Type 	
		G6F-PPx0	<ul style="list-style-type: none"> x=1,2,3:제어축수, 펄스출력 1Mbps, 2/3 축 직선보간, 2 축원호보간, Line Drive Type 	
	열전대 모듈	G6F-TC2A	<ul style="list-style-type: none"> 온도센서 : 7 종류(K, J, E, T, B, R, S) 입력접수: 4 채널 	
통신 모듈	Fast Enet I/F 모듈 (Open 형)	G6L-EUTB	<ul style="list-style-type: none"> 10/100BASE-Tx, UTP 	CPU 0/S 버전 V2.4 부터 사용가능
		G6L-EUFB	<ul style="list-style-type: none"> 100BASE-Fx, Fiber Optic 	
	Fast Enet I/F 모듈 전용(Master)	G6L-EUTC	<ul style="list-style-type: none"> 10/100BASE-Tx, TUP 	
		G6L-EUFC	<ul style="list-style-type: none"> 100BASE-Fx, Fiber Optic 	
	Fast Enet I/F 모듈 전용(Slave)	G6L-ERTC	<ul style="list-style-type: none"> 10/100BASE-Tx, UTP 	
		G6L-ERFC	<ul style="list-style-type: none"> 100BASE-Fx, Fiber Optic 	
	Fnet I/F 모듈	G6L-FUEA	<ul style="list-style-type: none"> Fnet I/F 용 1 Mbps 베이스 밴드 트위스트 케이블용 	
	Fnet 리모트 I/F 모듈	G6L-RBEA	<ul style="list-style-type: none"> Fnet 리모트 I/F 용 1 Mbps 베이스 밴드 트위스트 케이블용 	
	Rnet I/F 모듈	G6L-RUEA	<ul style="list-style-type: none"> Rnet 마스터 모듈, 1Mbps 	CPU V2.2 KGL-WIN V3.3
	Cnet I/F 모듈	G6L-CUEB	<ul style="list-style-type: none"> RS-232C 용 	
		G6L-CUEC	<ul style="list-style-type: none"> RS-422 용 	
	DeviceNet I/F 모듈	G6L-DUEA	<ul style="list-style-type: none"> DeviceNet I/F 용 	
	Profibus I/F 모듈	G6L-PUEA	<ul style="list-style-type: none"> Profibus-DP I/F 모듈, I/O : 1K 	
G6L-PUEB		<ul style="list-style-type: none"> Profibus-DP I/F 모듈, I/O : 7K 		
기타	방진용 모듈	GM6-DMMA	<ul style="list-style-type: none"> 미사용 슬롯의 방진용 모듈 	

제 2 장 시스템 구성

2.2.2 K300S 시리즈 제품구성

품 명	형 명	내 용	비 고
CPU 모듈	K4P-15AS	<ul style="list-style-type: none"> 최대 입출력 점수 : 512 점 	
디지털 입력 모듈	G4I-D22A	<ul style="list-style-type: none"> DC12/24V 입력 16 점 (전류 소스 / 싱크 입력) 	
	G4I-D22B	<ul style="list-style-type: none"> DC12/24V 입력 16 점 (전류 소스 입력) 	
	G4I-D22C	<ul style="list-style-type: none"> DC24V 입력 16 점 (전류 소스 / 싱크 입력) 	
	G4I-D24A	<ul style="list-style-type: none"> DC12/24V 입력 32 점 (전류 소스 / 싱크 입력) 	
	G4I-D24B	<ul style="list-style-type: none"> DC12/24V 입력 32 점 (전류 소스 입력) 	
	G4I-D24C	<ul style="list-style-type: none"> DC24V 입력 32 점 (전류 소스 / 싱크 입력) 	
	G4I-D28A	<ul style="list-style-type: none"> DC12/24V 입력 64 점 (전류 소스 / 싱크 입력) 	
	G4I-A12A	<ul style="list-style-type: none"> AC110V 입력 16 점 	
G4I-A22A	<ul style="list-style-type: none"> AC220V 입력 16 점 		
디지털 출력 모듈	G4Q-RY2A	<ul style="list-style-type: none"> 릴레이 출력 16 점 (2A 용) 	
	G4Q-TR2A	<ul style="list-style-type: none"> 트랜지스터 출력 16 점 (0.5A 용, 싱크출력) 	
	G4A-TR2B	<ul style="list-style-type: none"> 트랜지스터 출력 16 점 (0.5A 용, 소스출력) 	
	G4Q-TR4A	<ul style="list-style-type: none"> 트랜지스터 출력 32 점 (0.1A 용, 싱크출력) 	
	G4Q-TR4B	<ul style="list-style-type: none"> 트랜지스터 출력 32 점 (0.1A 용, 소스출력) 	
	G4Q-TR8A	<ul style="list-style-type: none"> 트랜지스터 출력 64 점 (0.1A 용, 싱크출력) 	
	G4Q-SS2A	<ul style="list-style-type: none"> 트라이액 출력 16 점 (1A 용) 	
	G4Q-SS2B	<ul style="list-style-type: none"> 트라이액 출력 16 점 (0.6A 용) 	
기본 베이스	GM4-B04M	<ul style="list-style-type: none"> 4 모듈 장착용 	
	GM4-B06M	<ul style="list-style-type: none"> 6 모듈 장착용 	
	GM4-B08M	<ul style="list-style-type: none"> 8 모듈 장착용 	
	GM4-B12M	<ul style="list-style-type: none"> 12 모듈 장착용 	증설불가
증설 베이스	GM4-B04E	<ul style="list-style-type: none"> 4 모듈 장착용 	
	GM4-B06E	<ul style="list-style-type: none"> 6 모듈 장착용 	
	GM4-B08E	<ul style="list-style-type: none"> 8 모듈 장착용 	
메모리 모듈	G4M-M032	<ul style="list-style-type: none"> 플래시 메모리 내장 (32Kstep) 	
전원 모듈	GM4-PA1A	AC110V 입력	<ul style="list-style-type: none"> DC5V : 4A DC24V : 0.7A
	GM4-PA2A	AC220V 입력	
	GM4-PA1B	AC110V 입력	<ul style="list-style-type: none"> DC5V : 3A, DC24V : 0.5A
	GM4-PA2B	AC220V 입력	
	GM4-PA2C	AC220V 입력	<ul style="list-style-type: none"> DC5V : 8A
	GM4-PD3A	DC24V 입력	<ul style="list-style-type: none"> DC5V : 3A
증설 케이블	G4C-E041	<ul style="list-style-type: none"> 길이 : 0.4 m 	
	G4C-E121	<ul style="list-style-type: none"> 길이 : 1.2 m 	
	G4C-E301	<ul style="list-style-type: none"> 길이 : 3 m 	

제 2 장 시스템 구성

품 명		형 명	내 용	비 고
특수 모듈	A/D 변환 모듈	G4F-AD2A	<ul style="list-style-type: none"> 전압 / 전류입력: 4 채널 DC -5 ~ +5V / -10 ~ +10V / DC -20 ~ + 20mA 	
		G4F-AD3A	<ul style="list-style-type: none"> 전압 / 전류입력: 8 채널 DC 1~ 5V / 0 ~ 10V / DC 4 ~ 20mA 	
	D/A 변환 모듈	G4F-DA1A	<ul style="list-style-type: none"> 전압 / 전류 출력 : 2 채널 DC -10 ~ +10V / DC 4 ~ 20mA 	
		G4F-DA2V	<ul style="list-style-type: none"> 전압 출력 : 4 채널 DC -10 ~ +10V 	
		G4F-DA2I	<ul style="list-style-type: none"> 전류 출력 : 4 채널 DC 4 ~ 20mA 	
		G4F-DA3V	<ul style="list-style-type: none"> 전압 출력 : 8 채널 DC -10 ~ +10V 	
		G4F-DA3I	<ul style="list-style-type: none"> 전류 출력 : 8 채널 DC 4 ~ 20mA 	
	고속카운터 모듈	G4F-HSCA	<ul style="list-style-type: none"> 계수범위 : 0 ~ 16,777,215(바이너리 24 비트) 50KHz, 1 채널 	
		G4F-HD1A	<ul style="list-style-type: none"> 계수범위 : -2,147,483,648 ~ 2,147,483,647 (바이너리 32 비트) 500KHz, 2 채널 	라인드라이브
		G4F-HO1A	<ul style="list-style-type: none"> 계수범위 : -2,147,483,648 ~ 2,147,483,647 (바이너리 32 비트) 200KHz, 2 채널 	오픈컬렉터
	위치결정 모듈	K4F-POPA	<ul style="list-style-type: none"> 펄스출력, 1 축제어 	
		G4F-POPB	<ul style="list-style-type: none"> 펄스출력, 2 축제어 	
		G4F-PPx0	<ul style="list-style-type: none"> x=1,2,3: 제어축수, 펄스출력 200kpps, 2/3 축 직선보간, 2 축 원호보간, Open Collector Type 	
		G4F-PPxD	<ul style="list-style-type: none"> x=1,2,3: 제어축수, 펄스출력 1Mbps, 2/3 축 직선보간, 2 축 원호보간, Line Drive Type 	
	열전대 입력 모듈	G4F-TC2A	<ul style="list-style-type: none"> 온도센서 : 7 종류(K, J, E, T, B, R, S) 입력점수: 4 채널 	
	온도 제어 모듈	G4F-TMCA	<ul style="list-style-type: none"> 온도 입력 모듈(AI/AO=2/2ch), PID 2 loop, 디지털 출력 2 점 	
	측온저항체 입력 모듈	G4F-RD2A	<ul style="list-style-type: none"> 온도센서 : Pt 100, Jpt 100 입력점수: 4 채널 	
	PID 제어 모듈	G4F-PIDB	<ul style="list-style-type: none"> 최대 16 루프 제어, 10ms 고속 PID 제어 	
아날로그 타이머 모듈	G4F-AT3A	<ul style="list-style-type: none"> 타이머 점수 : 8 점 설정값 범위 : 0.1 ~ 1.0 초, 1 ~ 10 초 10 ~ 60 초, 60 ~ 600 초 	1 점씩 설정가능	
인터럽트 입력모듈	G4F-INTA	<ul style="list-style-type: none"> 입력점수 : 8 점 		

제 2 장 시스템 구성

품 명		형 명	내 용	비 고
통신 모듈	Fast Enet I/F 모듈 (Open 형)	G4L-EUTB	• 10/100BASE-TX, UTP	CPU 0/S 버전 V3.4 부터 사용가능
		G4L-EUFB	• 100BASE-Fx, Fiber Optic	
		G4L-EU5B	• 10BASE-5, AUI	
	Fast Enet I/F 모듈 전용(Master)	G4L-EUTC	• 10/100BASE-TX, UTP	
		G4L-EUFC	• 100BASE-Fx, Fiber Optic	
		G4L-EU5C	• 10BASE-5, AUI	
	Fast Enet I/F 모듈 전용(Slave)	G4L-ERTC	• 10/100BASE-TX, UTP	
		G4L-ERFC	• 100BASE-Fx, Fiber Optic	
		G4L-ER5C	• 10BASE-5, AUI	
	Fnet I/F 모듈	G4L-FUEA	• Fnet I/F 용	컴퓨터 내부 장착용
		G0L-FUEA	• 1 Mbps 베이스 밴드 • 트위스트 케이블용	
	Fnet 리모트 I/F 모듈	G4L-RBEA	• Fnet 리모트 I/F 용 • 트위스트 케이블용	
	Rnet I/F 모듈	G4L-RUEA	• Rnet 마스터 모듈, 1Mbps	CPU V3.2 KGL-WIN V3.3
	Profibus-DP 모듈	G4L-PUEA	• Profibus-DP 마스터 모듈 (I/O 1K)	CPU 0/S 버전 3.0 이상, KGL-WIN 버전 3.2 이상에 서 사용가 능
		G4L-PUEB	• Profibus-DP 마스터 모듈 (I/O 7K)	
	Dnet I/F 모듈	G4L-DUEA	• Dnet I/F 마스터 모듈 • ODVA (Open DeviceNet Vendor Association) 2.0 준거	
	광 컨버터	G0L-FREA	• Fnet 용 리피터	
		G0L-FOEA	• 광 ↔ 전기 컨버터	
	액티브 커플러	G0L-FAPA	• 액티브 커플러용 전원보드	
G0L-FABA		• 액티브 커플러용 베이스		
G0L-FACA		• 액티브 커플러용 카드		
G0L-FADA		• 액티브 커플러용 더미카드		
컴퓨터 링크 모듈	G4L-CUEA	• RS-232C / RS-422 : 각 1 채널		
모의입력 스위치	G4S-SW16	• K300S 입력 16 점용 모의 스위치		
기타	방진용 모듈	GM4-DMMA	• 미사용 슬롯의 방진용 모듈	

제 2 장 시스템 구성

2.2.3 K1000S 시리즈 제품구성

품 명		형 명	내 용	비 고
CPU 모듈		K7P-30AS	• 최대 입출력 점수 : 2,048 점	
디지털 입력 모듈		G3I-D22A	• DC12/24V 입력 16 점 (전류소스 / 싱크 입력)	
		G3I-D24A	• DC12/24V 입력 32 점 (전류소스 / 싱크 입력)	
		G3I-D24C	• DC24V 입력 32 점 (전류소스 / 싱크 입력)	
		G3I-D28A	• DC12/24V 입력 64 점 (전류소스 / 싱크 입력)	
		G3I-A12A	• AC110V 입력 16 점	
		G3I-A22A	• AC220V 입력 16 점	
		G3I-A14A	• AC110V 입력 32 점	
		G3I-A24A	• AC220V 입력 32 점	
디지털 출력 모듈		G3Q-RY2A	• 릴레이 출력 16 점 (2A 용)	
		G3Q-RY4A	• 릴레이 출력 32 점 (1A 용)	
		G3Q-TR2A	• 트랜지스터 출력 16 점 (2A 용, 싱크출력)	
		G3Q-TR4A	• 트랜지스터 출력 32 점 (0.5A 용, 싱크출력)	
		G3Q-TR4B	• 트랜지스터 출력 32 점 (0.5A 용, 소스출력)	
		G3Q-TR8A	• 트랜지스터 출력 64 점 (0.1A 용, 싱크출력)	
		G3Q-TR8B	• 트랜지스터 출력 64 점 (0.1A 용, 소스출력)	
		G3Q-SS2A	• 트라이액 출력 16 점 (2A 용)	
G3Q-SS4A	• 트라이액 출력 32 점 (1A 용)			
기본 베이스		GM3-B04M	• 4 모듈 장착용	
		GM3-B06M	• 6 모듈 장착용	
		GM3-B08M	• 8 모듈 장착용	
증설 베이스		GM3-B04E	• 4 모듈 장착용	
		GM3-B06E	• 6 모듈 장착용	
		GM3-B08E	• 8 모듈 장착용	
메모리 모듈		G3M-M064	• 플래시 메모리 내장 (64Kstep)	
전원 모듈		GM3-PA1A	AC110V 입력	• DC5V : 6A, • DC24V : 1.5A
		GM3-PA2A	AC220V 입력	
		GM1-PA1A	AC110V 입력	• DC5V : 12A
		GM1-PA2A	AC220V 입력	
		GM3-PD3A	DC24V 입력	• DC5V : 6A
증설 케이블		G3C-E061	• 길이 : 0.4 m	
		G3C-E121	• 길이 : 1.2 m	
		G3C-E301	• 길이 : 3 m	
특수 모듈	A/D 변환 모듈	G3F-AD4A	• 전압 / 전류입력 : 16 채널 • DC -5 ~ +5V / -10 ~ +10V / DC -20 ~ +20mA	
		G3F-AD4B	• 전압 / 전류입력 : 16 채널 • DC 1 ~ 5V / DC 4 ~ 20mA	
		G3F-AD3A	• 전압 / 전류입력 : 8 채널 • DC 1 ~ 5V / 0 ~ 10V / DC 4 ~ 20mA	
	D/A 변환 모듈	G3F-DA4V	• 전압 출력 : 16 채널 • DC -5 ~ +5V/DC -10 ~ +10V	
		G3F-DA4I	• 전류 출력 : 16 채널 • DC 4 ~ 20mA	
		G3F-DA3V	• 전압 입력 : 8 채널 • DC 0 ~ 10V	

제 2 장 시스템 구성

품 명		형 명	내 용		비 고
특수 모듈	전원 모듈	G3F-PA1A	AC110V 입력	<ul style="list-style-type: none"> • DC +15V : 0.5A • DC -15V : 0.1A 	
		G3F-PA2A	AC220V 입력		
	고속카운터 모듈	G3F-HSCA	<ul style="list-style-type: none"> • 계수범위 : 0 ~ 16,777,215(바이너리 24 비트) • 50KHz, 2 채널 		
	위치결정 모듈	G3F-POPA	<ul style="list-style-type: none"> • 펄스출력, 2 축 제어 		
	열전대 입력 모듈	G3F-TC4A	<ul style="list-style-type: none"> • 온도센서 : 7 종류(K, J, E, T, B, R, S) • 입력점수 : 16 채널 		
	촉온저항체 입력 모듈	G3F-RD3A	<ul style="list-style-type: none"> • 온도센서 : Pt 100, Jpt 100 • 입력점수 : 8 채널 		
	PID 제어 모듈	G3F-PI0B	<ul style="list-style-type: none"> • 최대 32 루프, 10ms 고속 PID 제어 		
	프로세스 제어모듈	G3F-LPCA	<ul style="list-style-type: none"> • 전압/전류입력, 전류 출력, PID 제어 		
	아날로그 타이머 모듈	G3F-AT4A	<ul style="list-style-type: none"> • 타이머 점수 : 16점 • 설정값 범위 : 0.1 ~ 1.0 초, 1 ~ 10 초 10 ~ 60 초, 60 ~ 600 초			1 점씩 설정가능
인터럽트 입력 모듈	G3F-INTA	<ul style="list-style-type: none"> • 입력점수 : 16점 			
통신 모듈	Fast Enet I/F 모듈 (Open 형)	G3L-EUTB	<ul style="list-style-type: none"> • 10/100 BASE-Tx, UTP 		CPU O/S 버전 V3.2 부터 사용가능
		G3L-EUFB	<ul style="list-style-type: none"> • 100BASE-Fx, Fiber Optic 		
		G3L-EU5B	<ul style="list-style-type: none"> • 10BASE-5, AUI 		
	Fast Enet I/F 모듈 전용(Master)	G3L-EUTC	<ul style="list-style-type: none"> • 10/100 BASE-Tx, UTP 		
		G3L-EUFC	<ul style="list-style-type: none"> • 100BASE-Fx, Fiber Optic 		
		G3L-EU5C	<ul style="list-style-type: none"> • 10BASE-5, AUI 		
	Fast Enet I/F 모듈 전용(Slave)	G3L-ERTC	<ul style="list-style-type: none"> • 10/100 BASE-Tx, UTP 		
		G3L-ERFC	<ul style="list-style-type: none"> • 100BASE-Fx, Fiber Optic 		
		G3L-ER5C	<ul style="list-style-type: none"> • 10BASE-5, AUI 		
	Fnet I/F 모듈	G3L-FUEA	<ul style="list-style-type: none"> • Fnet I/F 용 • 1 Mbps 베이스 밴드 • 트위스트 케이블용 		컴퓨터 내부 장착용
		G0L-FUEA	<ul style="list-style-type: none"> • Fnet I/F 용 • 1 Mbps 베이스 밴드 • 광 케이블용 		
	Fnet 리모트 I/F 모듈	G3L-RBEA	<ul style="list-style-type: none"> • Fnet 리모트 I/F 용 • 1 Mbps 베이스 밴드 • 트위스트 케이블용 		
		G3L-RB0A	<ul style="list-style-type: none"> • Fnet 리모트 I/F 용 • 광 케이블용 		
	Rnet I/F 모듈	G4L-RUEA	<ul style="list-style-type: none"> • Rnet 마스터 모듈, 1Mbps 		CPU V3.1 KGL-WIN V3.3
	컴퓨터 링크 모듈	G3L-CUEA	<ul style="list-style-type: none"> • RS-232C / RS-422 : 각 1 채널 		
Profibus-DP 모듈	G3L-PUEA	<ul style="list-style-type: none"> • Profibus-DP 마스터 모듈 (I/O 1K) 		CPU O/S 버전 3.0 이상, KGL-WIN 버전 3.2 이상에 서 사용가 능	
	G3L-PUEB	<ul style="list-style-type: none"> • Profibus-DP 마스터 모듈 (I/O 7K) 			
기타	모의입력 스위치	G3S-SW32	<ul style="list-style-type: none"> • K1000S 입력 16 점용 모의 스위치 		
	방진용 모듈	GM3-DMMA	<ul style="list-style-type: none"> • 미사용 슬롯의 방진용 모듈 		

제 2 장 시스템 구성

2.3 시스템 구성의 종류

시스템 구성에는 기본/증설 베이스 만으로 구성되는 기본 시스템, 컴퓨터 링크 모듈(G3/4L-CUEA)을 사용하여 CPU 모듈과 컴퓨터 간의 데이터 전송을 수행하는 컴퓨터 링크 시스템 및 PLC 와 원거리 입출력 모듈의 제어를 위한 네트워크 시스템으로 분류합니다.

2.3.1 기본 시스템

기본 베이스와 증설 베이스를 케이블로 연결하여 구성되는 기본 시스템에 대해 설명합니다.



		K200S	K300S	K1000S
최대 증설 단수		-	3 단	
최대 증설 거리		-	3m	
최대입출력모듈장착수		12 모듈	32 모듈	
최대 입출력 점수		512 점	512 점 / 1,024 점 ¹	1024 점
구성제품	CPU 모듈	K3P-07A/B/CS	K4P-15AS	K7P-30AS
	전원 모듈	GM6-PAFA/PAFB/PAFC/ GM6-PDFA/PDFB	GM4-PA1A/PA2A GM4-PA1B/PA2B GM4-PA2C	GM3-PA1A/PA2A GM1-PA1A/PA2A G3F-PA1A/PA2A
	기본베이스	GM6-B04/6/8/12M	GM4-B04/6/8/12M	GM3-B04/6/8/12M
	증설베이스	-	GM4-B04/6/8E	GM3-B04/6/8E
	증설케이블	-	G4C-E041/121/301	G3C-E061/121/301
	입출력모듈 특수모듈	G6I- □□□□ G6Q- □□□□ G6F- □□□□	G4I- □□□□ G4Q- □□□□ G4F- □□□□	G3I- □□□□ G3Q- □□□□ G3F- □□□□
입출력 번호의 할당		<ul style="list-style-type: none"> 빈 슬롯의 경우 16 점(1워드)로 할당되고 32 점,64 점 모듈의 경우 자동으로 할당됩니다. 특수모듈의 장착위치 및 사용갯수에는 제한이 없습니다. 		

¹ 0/S Version 3.0 이상인 CPU 에만 해당

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2.3.2 컴퓨터 링크 시스템

컴퓨터 링크 시스템이란 컴퓨터 링크 모듈의 RS-232C, RS-422 (또는 RS-485) 인터페이스를 사용하여 컴퓨터나 프린터 등의 외부기와 CPU 모듈 사이의 데이터 교환을 하기위한 시스템입니다. 컴퓨터 링크 모듈은 K1000S 시리즈에는 G3L-CUEA, K300S 시리즈에는 G4L-CUEA, K200S 시리즈에는 G6L-CUEB/CUEC 가 있습니다.

컴퓨터 링크 모듈에 대한 자세한 내용은 컴퓨터 링크 관련 사용설명서를 참고하여 주십시오.

2.3.3 네트워크 시스템

MASTER-K 시리즈에서 채택하고 있는 네트워크 시스템은 IEC / ISA 필드버스 규격에 준거한 Fnet 시스템 입니다. Fnet 시스템이란 제어의 분산 및 감시의 집중화가 용이하도록 CPU 모듈간의 데이터 통신 및 원거리에 설치된 입출력 모듈의 제어를 위한 네트워크 시스템입니다.

또한 CPU O/S 버전 3.0 이상, KGL-WIN 3.2 이상의 버전에서는 사용자의 용도에 따라 300S 의 경우 Dnet I/F 시스템 또는 Pnet I/F 시스템을, K1000S 의 경우, Pnet I/F 시스템을 구축 할 수 있습니다. 자세한 내용은 관련 사용설명서를 참고하여 주십시오.

알아두기

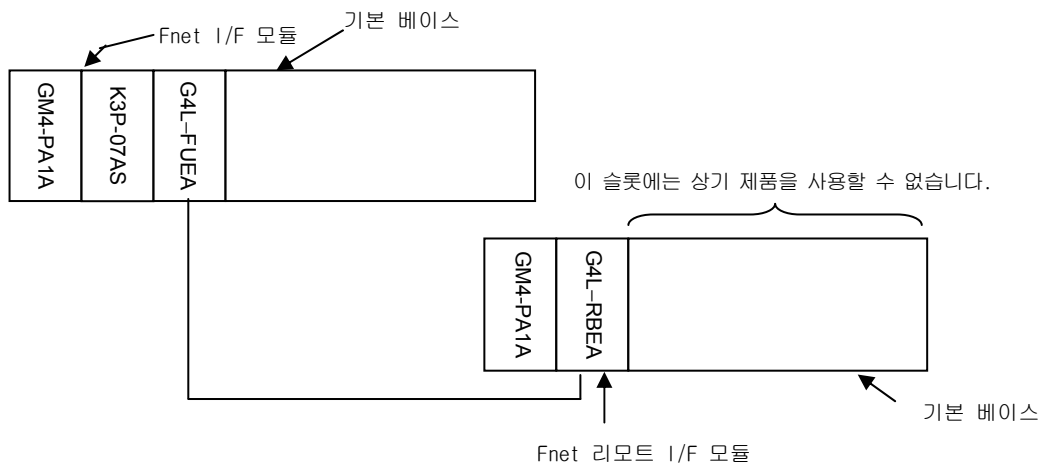
1) 기종별, 모듈별 장착 가능 대수는 다음과 같습니다

기종	장착 가능 대수			
	Cnet	Fnet/Enet (고속링크)	총 통신모듈	장착가능 베이스
K200S/K300S	4	2	4	기본베이스
K300S (V3.0 이상)	4	4	4	기본, 증설베이스
K1000S	8	4	8	기본베이스
K1000S (V3.0 이상)	8	4	8	기본, 증설베이스

1) Fnet 리모트 I / F 모듈에 의해 리모트 시스템을 구성하는 경우는 기본 시스템과 구성방법이 동일하지만 다음과 같은 모듈은 사용할 수 없습니다.

* 사용 불가능한 모듈 : 위치결정, 통신, PID, 아날로그타이머, 인터럽트 모듈은 사용할 수 없습니다

* 구성 예) K300S 의 경우



3.1

MASTER-K

No.				
1	0 ~ 55°C			
2	-25 ~ +70 °C			
3	5 ~ 95%RH,			
4	5 ~ 95%RH,			
5				-
		가		X, Y, Z 10
	10 ≤ f < 57Hz	-	0.075mm	
	57 ≤ f ≤ 150Hz	9.8m/s ² {1G}	-	
		가		
10 ≤ f < 57Hz	-	0.035mm		
	57 ≤ f ≤ 150Hz	4.9m/s ² {0.5G}	-	
6	<ul style="list-style-type: none"> 가 : 147 m/s²{15G} 가 : 11ms : (X, Y, Z 3 3) 			IEC 61131-2
7	± 1,500 V			LG
	: 4kV ()			IEC 61131-2, IEC 1000-4-2
	27 ~ 500 MHz, 10 V/m			IEC 61131-2, IEC 1000-4-3
	/		(24V) (24V)	IEC 61131-2 IEC 801-4
		2kV 1kV 0.25kV		
8	가 , 가			
9	2,000m			
10	2			
11				

1) IEC(International Electrotechnical Commission :)
 : ,
 2)
 :
 2 , .

4 CPU

4.1

K200S/300S/1000SCPU

		K300S					
		K200S	CPU O/S 2.X	CPU O/S 3.X	K1000S		
		, ,					
		() ,					
		(Ladder Diagram) (Instruction List)					
		30					
		218					
		: 0.2 μs/Step(200S : 0.5 μs)					
		7K Step	15K Step		30K Steps		
		384	512	1024			
	P	P000 ~ P31F		P000 ~ P63F			
	M	M000 ~ M191F					
	K	K000 ~ K31F					
	L	L000 ~ L63F					
	F	F000 ~ F63F					
	T	100ms : T000 ~ T191(192)					
		10ms : T192 ~ T255(64) 가 가					
	C	C000 ~ C255					
	S	S00.00 ~ S99.99					
D	D0000 ~ D4999	D0000 ~ D9999					
		RUN, STOP, PAUSE, DEBUG					
		, , , ,					
		3 (K200S :)					
		170(A,C), 210mA(B)	130mA		130mA		
		0.11 kg	0.25 kg		0.42 kg		

4.2.3 (Scan Time)

0 0 .

1) 가 PLC

(1) = + + PLC

• =

• = 1

• PLC = + +

(2) , 가 .

2)

(1) (F)

- F50 : (1ms)
- F51 : (1ms)
- F52 : (1ms)

4.2.4 (Scan Watchdog Timer)

1) . (KGL-WIN .)

2) 가, PLC Off .

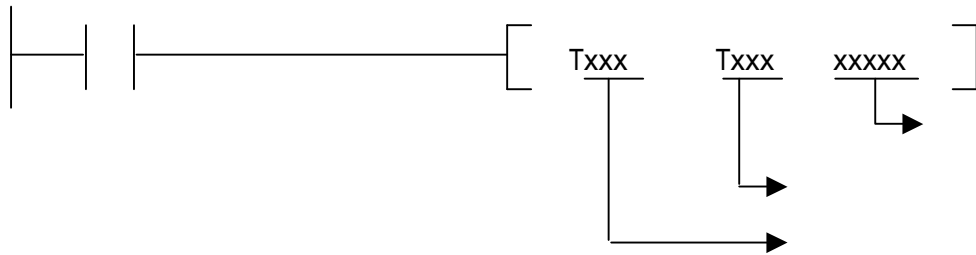
3) (Scan Watchdog Time) 가 'WDT' 0 .

4) STOP , (K1000S 가)

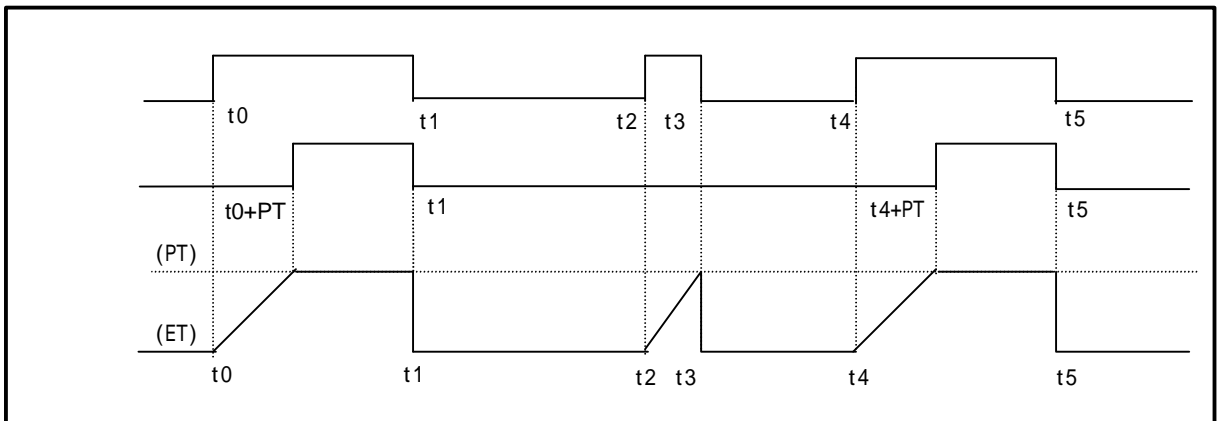
1) 10 ~ 6000ms (10ms) .

4.2.5

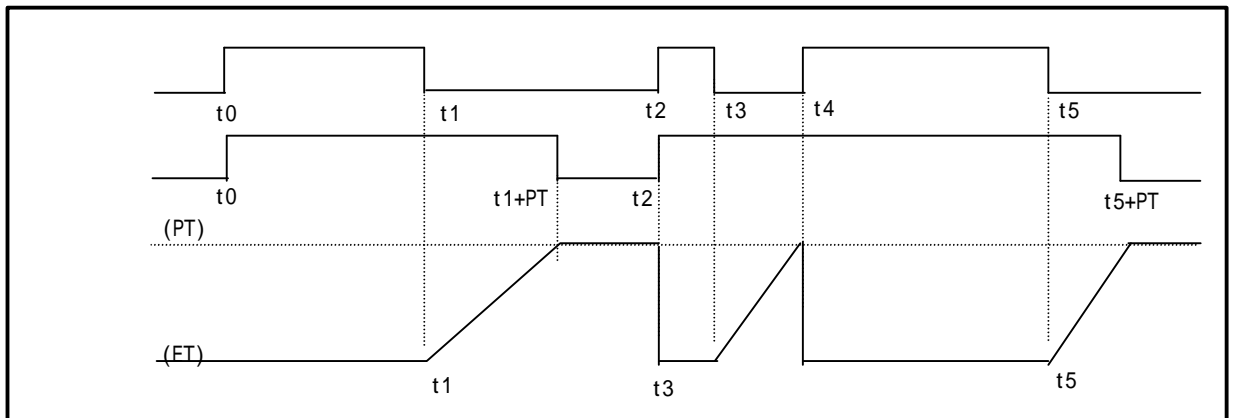
CPU (TON), Off 가 (TOFF), 가 (TMR), Monostable(TMON), Retriggerable(TRTG) . On
 5 가 100ms 0.1 ~ 6553.5 , 10ms 0.01 ~ 655.35
 'MASTER-K



1) On On/Off (=)
 TON (Txxx) On

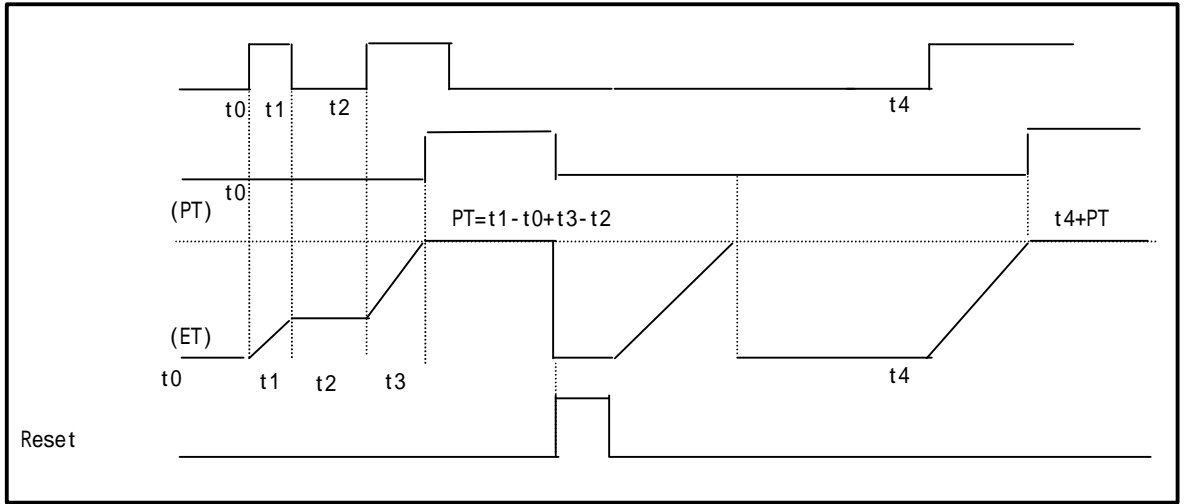


2) Off On/Off (=)
 TOF (Txxx) On Off



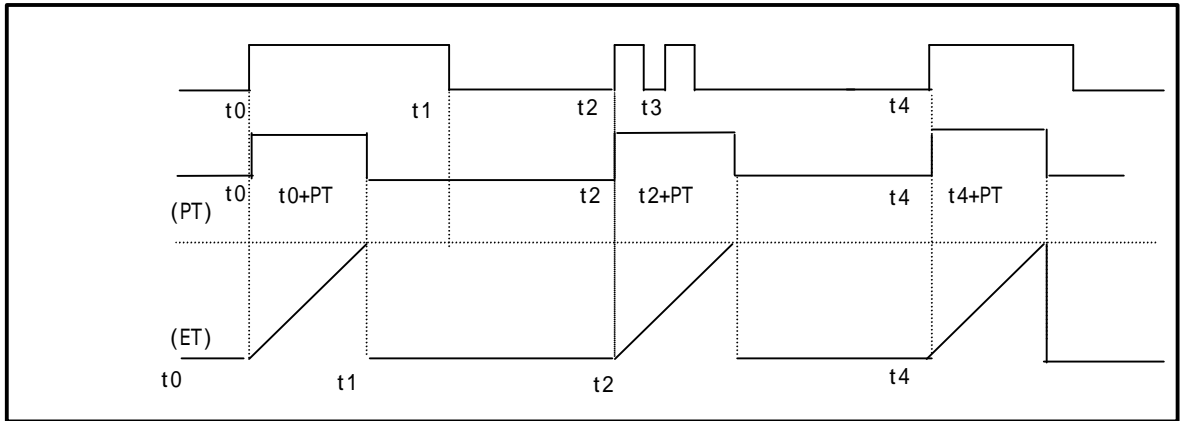
3) (TMR)

On/Off 가 Reset On On



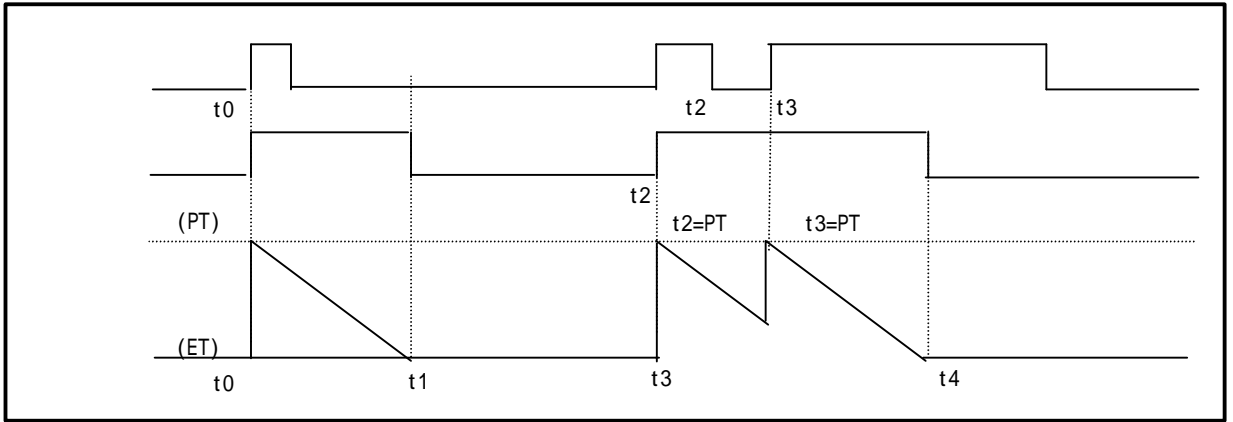
4)

On/Off (Txxx) On On/Off On
On, Off Off TMON "0"



5)

On/Off
 (Txxx) On
 "0" Off "0"
 Off→On



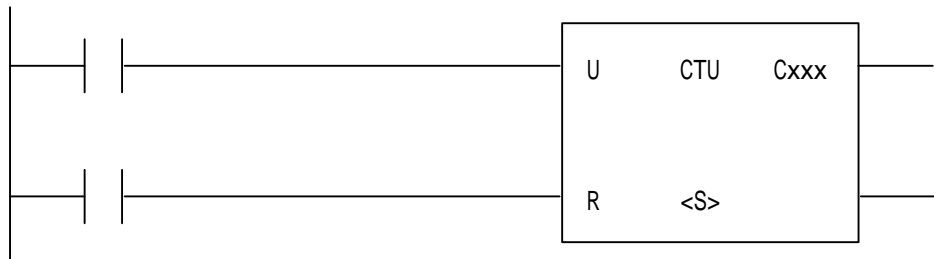
4.2.6

CPU 가 (CTU), (Off|On) (CTD), 가 (CTUD), (CTR)
 4 가 'MASTER-K'

- 가 가 가
- 가 2 가 "0"

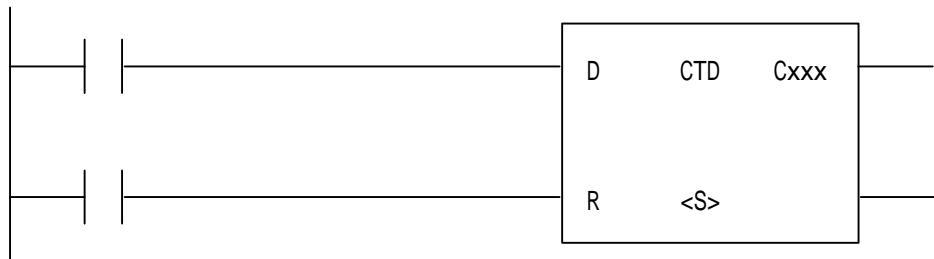
1) On/Off

- (1) 가
- (U), (R)



- 가 0 (Cxxx) On (Cxxx) Off

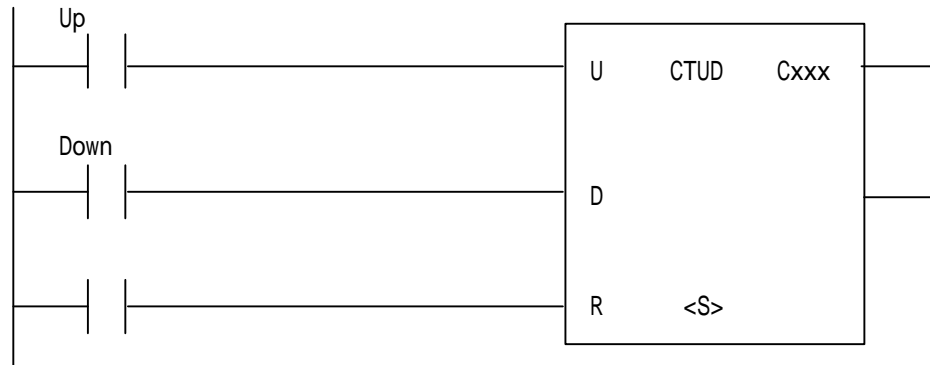
- (2)
- (D),



- 0 (Cxxx) On (Cxxx) Off

(3) 가

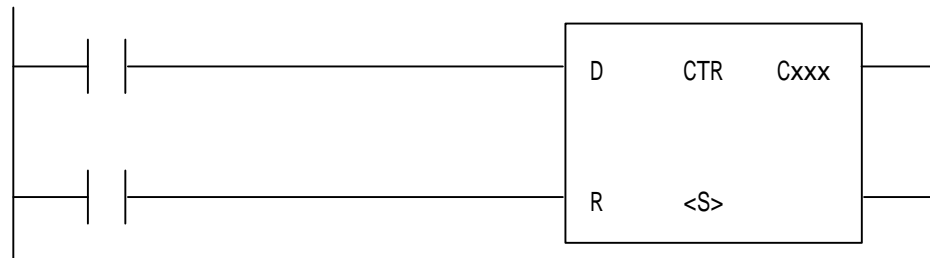
- 2 , .



- 0 .
- Up 1 가, Down Cxxx 가 On , (PV) Cxxx 가 Off .

(4)

- (D), .



- 1 가,
- 0 Cxxx 가 On
- 0 .

2)

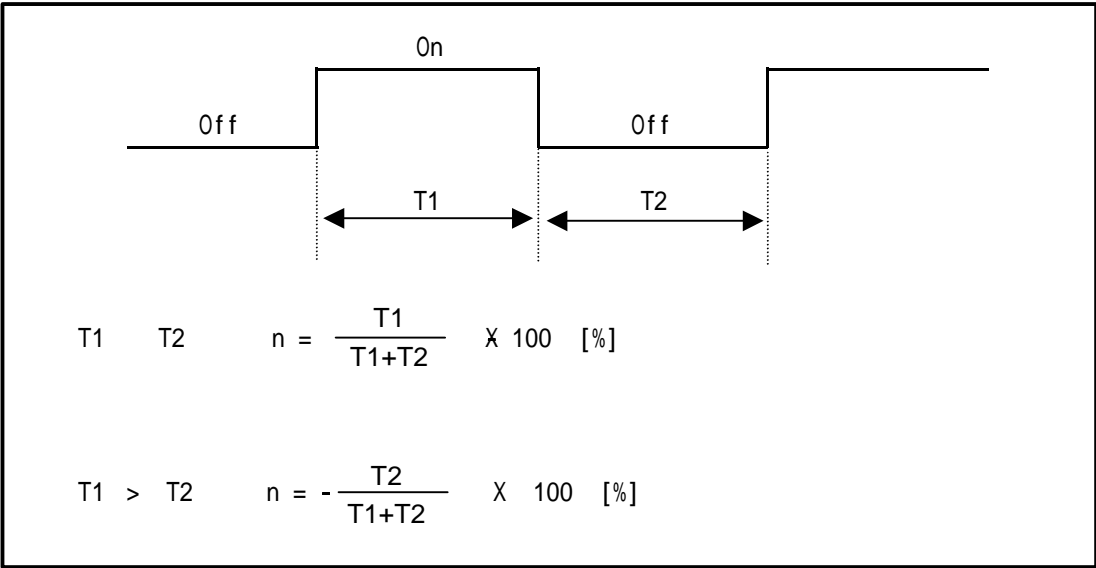
- 가 가 , On Off

$$C_{max} = \frac{n}{100} \times \frac{1}{t_s} \quad [/s]$$

n : (%)

t_s : [s]

- (n) On, Off (%) .



4.3

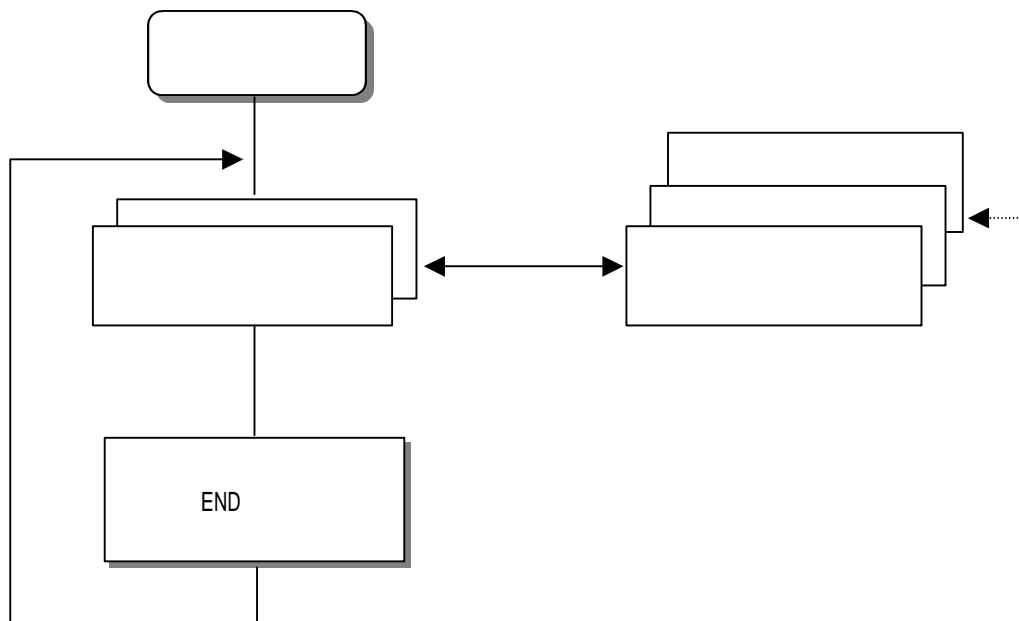
4.3.1

CPU RAM MASTER-K PLC

	• 1
	• 가
	▶ 1 가
	▶ 1
	▶
	•
	• .(CALL On)

4.3.2

CPU 가 RUN



1)

(1)

•

0

•

2)

(1)

•

(2)

•

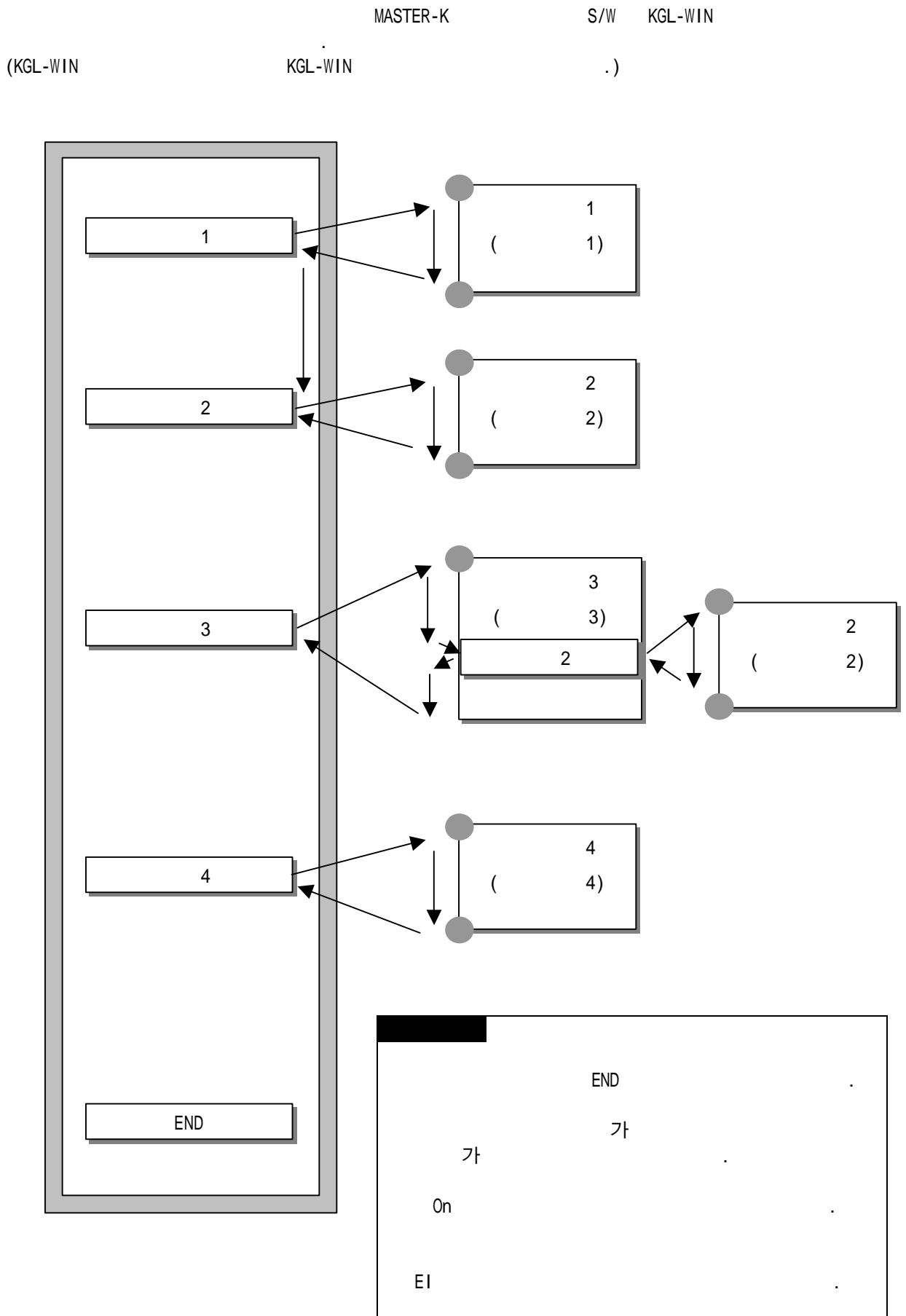
2

:

:

1)	4.3.3

4.3.3



1)

MK200S			MK300S			MK1000S		
INT	INT		INT	INT		INT	INT	
0	TDI 0	10	0	TDI 0	10	0	TDI 0	10
1	TDI 1	20	1	TDI 1	20	1	TDI 1	20
2	INT 0		2	INT 0		2	INT 0	
3	INT 1		3	INT 1		3	INT 1	
•			•			•		
•			•			•		
•			•			•		
•			•			•		
7	INT 4		13	INT 7		29	INT 15	

2)

(Time Drive Interrupt)

(TDINT)

가

가

	가
MK200S	TDINT 0 ~ 2 (3)
MK300S	TDINT 0 ~ 7 (8)
MK1000S	TDINT 0 ~ 15 (16)

3)

(Process Drive Interrupt)

가 Off ⇒ On

On ⇒ Off

.

)

<ul style="list-style-type: none"> • MK200S <ul style="list-style-type: none"> 5 (Pxx0 ~ Pxx4) Off ⇒ On • 20ms

4.3.4

1)

PLC ,

PLC

- PLC
-
-
-

2)

PLC ,

(1) PLC
CPU

, PLC 가
가

(2)

PLC

가

(3)

가

가

가

(4)

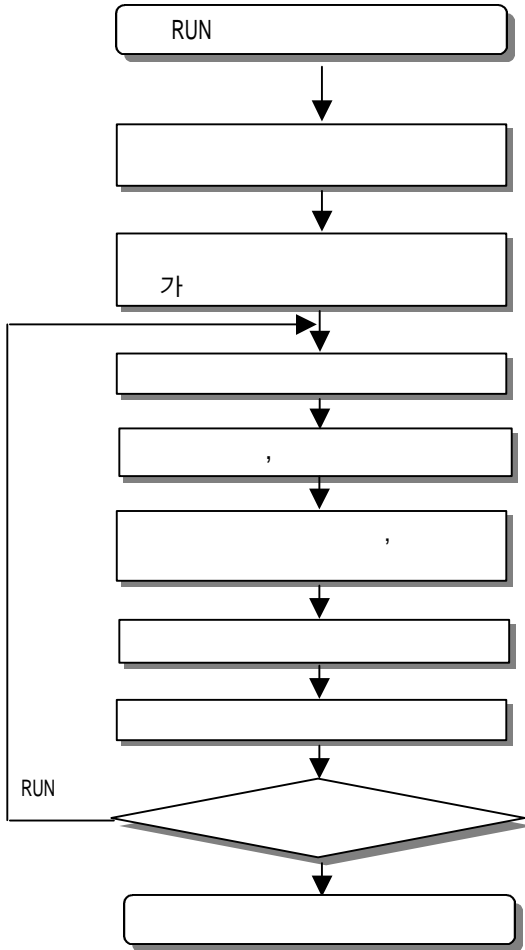
가 PLC
가 ,

1)	가	2	F006	.
2)				.

4.4

CPU RUN , STOP , PAUSE , DEBUG 4 가 .

4.4.1 RUN



- 1) 가 , 가
- 2) 가
- (1)
- (2)
- (3)

4.4.2 STOP

가 STOP KGL-WIN

1)

2)

- (1)
- (2)
- (3)

4.4.3 PAUSE

RUN

1)

2)

- (1)
- (2)
- (3)

4.4.4 DEBUG

가 STOP

1)

- (1)
- (2)

2)

- (1)
- (2)
- (3)
- (4)
- (5)

3)

가 4가 가
가 .

()	
(Break Point)	•
	(Read, Write, Value)

4)

(1) KGL-WIN

(2) (Enable / Disable)
(KGL-WIN 9 .)

4.4.5

1)

- (1) CPU
- (2) CPU KGL-WIN
- (3) KGL-WIN Fnet CPU
- (4) FAM,
- (5) 'STOP'

2)

RUN	RUN
STOP	STOP
STOP → PAU / REM	STOP
PAU / REM → RUN * 1	RUN
RUN → PAU / REM	PAUSE
PAU / REM → STOP	STOP

1)	RUN	RUN	PLC
----	-----	-----	-----

3)

가 . 가 STOP (가 STOP → PAU / REM)

		KGL-WIN	FAM,
PAU / REM	STOP RUN		
	STOP PAUSE	X	X
	STOP DEBUG		
	RUN PAUSE		
	RUN STOP		
	RUN DEBUG	X	X
	PAUSE RUN		
	PAUSE STOP		
	PAUSE DEBUG	X	X
	DEBUG STOP		
	DEBUG RUN	X	X
	DEBUG PAUSE	X	X

4.5

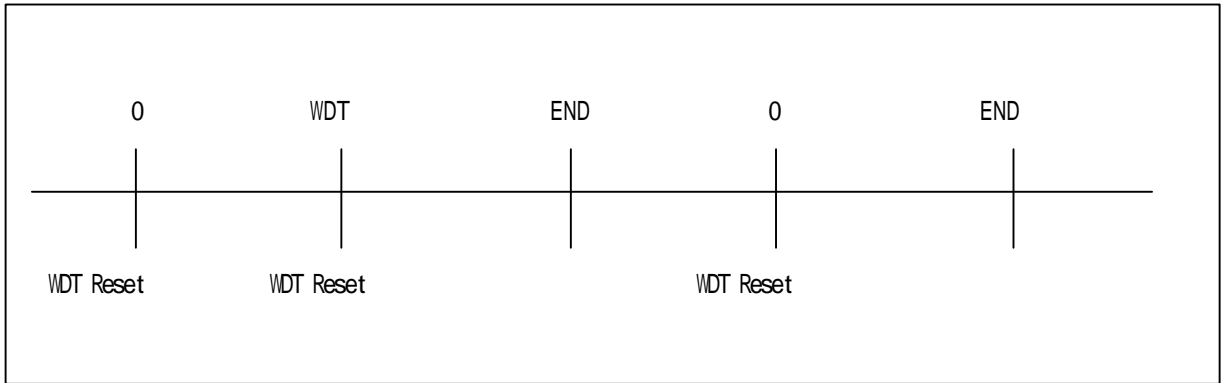
4.5.1

1)

(1) CPU PLC
 (2) PLC

2)

WDT(Watch Dog Timer) PLC CPU WDT CPU WDT PLC
 Off CPU RUN LED 가 WDT LED 가 FOR ~
 NEXT ,CALL WDT MASTER-K .)



3) I/O

I/O

4)

CPU

5)

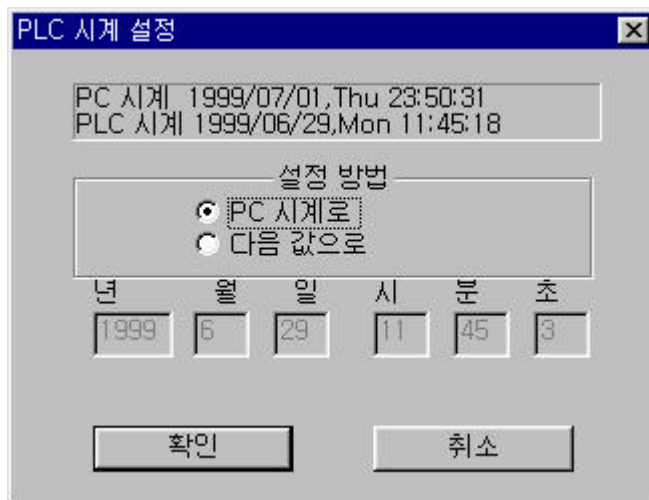
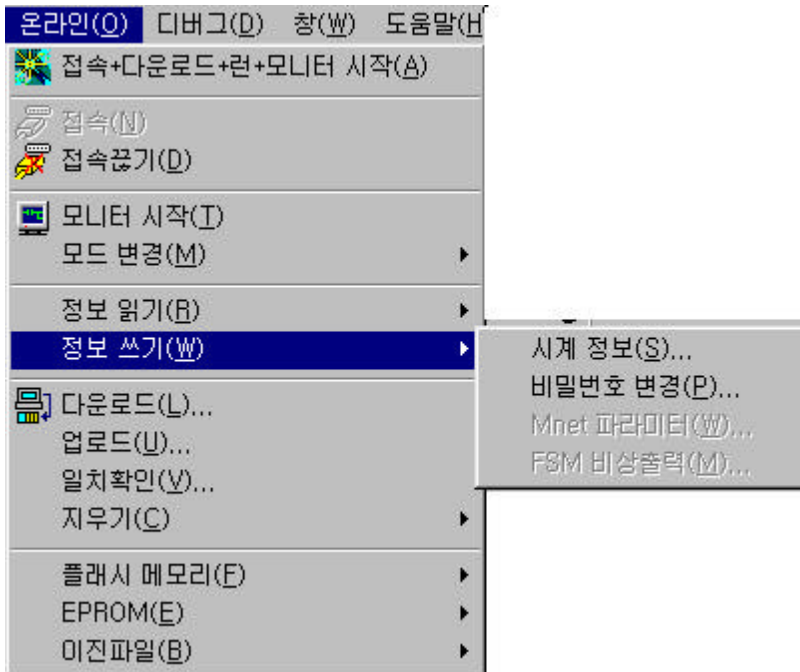
CPU

F006

4.5.2

CPU (K200SA) (RTC)가 . RTC Off
 20ms
 RTC
 . RTC

- 1) /
- (1) KGLWIN



(2)

가 가

F053	h9905	/
F054	h1215	/
F055	h4241	/
F056	h1901	/

(3)

MK1000S	MK300S	MK200S B/C
D9990	D4990	
D9991	D4991	
D9992	D4992	
D9993	D4993	

M1904 On Off .

(Write .)

(4)

	0	1	2	3	4	5	6

2)

±5 / 1

1) RTC 가 CPU .

2) RTC .

3)) 14 32 25 RTC 가 가 가 .

4.5.3

On/Off

I/O

On /Off

1)

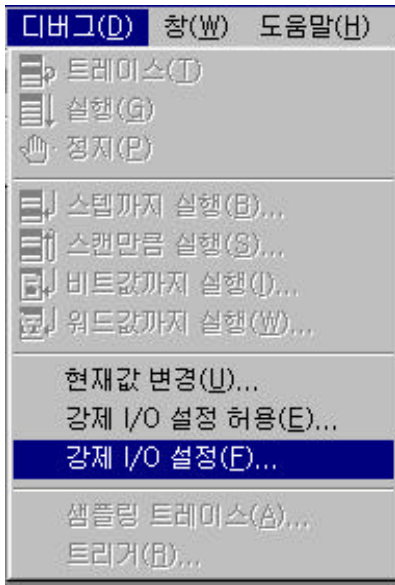
I/O
I/O

I/O

가

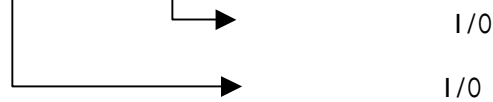
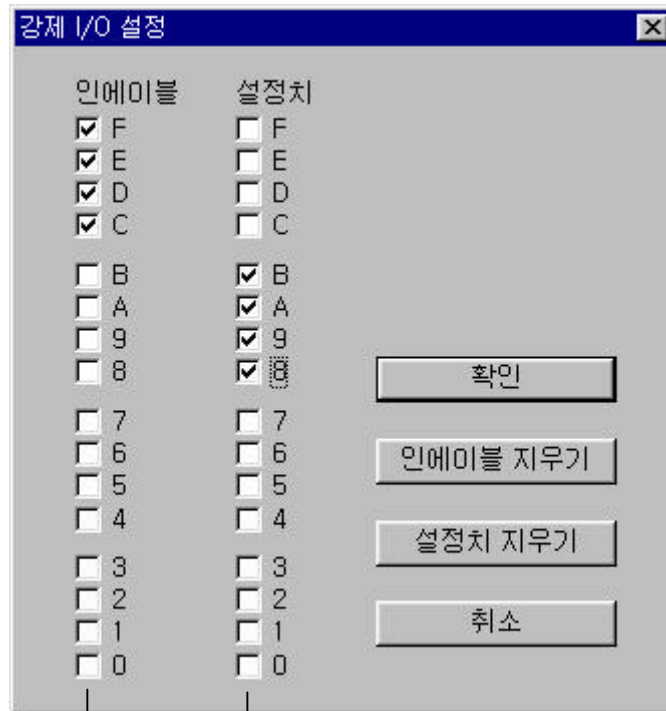
KGL-WIN

I/O

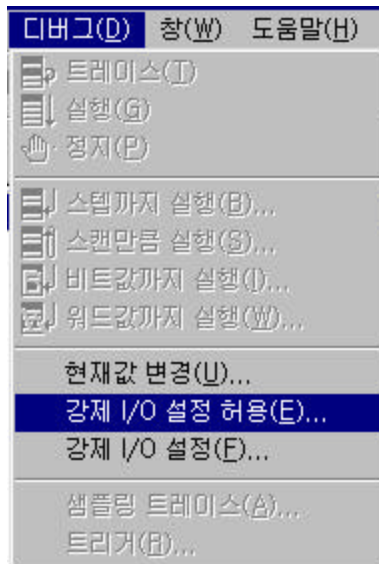


I/O





I/O On I/O



4.5.4 (Direct)

‘IORF

	IORF	MASTER-K
--	------	----------

4.5.5

1)

가 16 17 가

	MK1000S	MK300S	MK200S	
	D9901 ~ D9904	D4901 ~ D4904		1
	D9905 ~ D9908	D9905 ~ D9908		2
	⋮	⋮		
	D9961 ~ D9964	D4961 ~ D4964		16

2)

MK1000S	MK300S	MK200S		
D9900	D4900		h0001	
D9901	D4901		h9905	99 5
D9902	D4902		h2812	28 12
D9903	D4903		h3030	30 30
D9904	D4904		h0001	

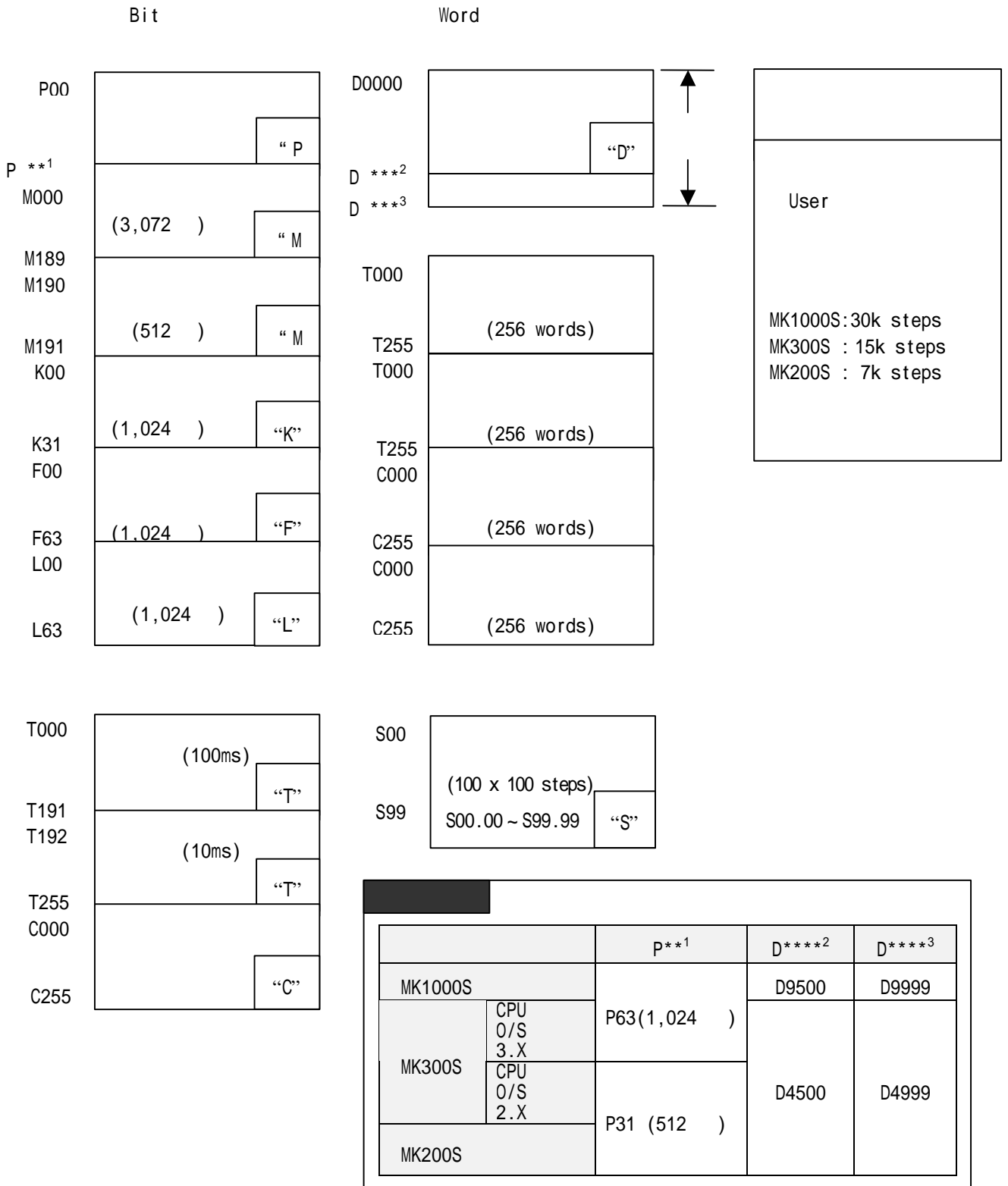
3)

KGL-WIN KLD-150S

	KGLWIN	7	‘PLC
--	--------	---	------

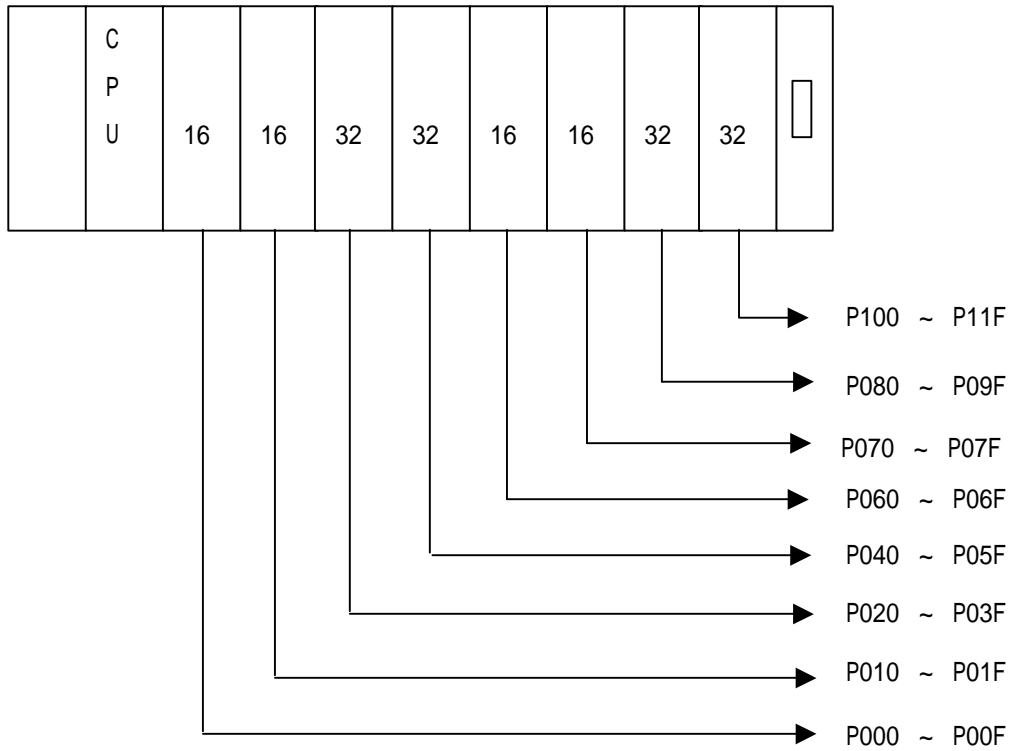
4.6

CPU 가 가 가 가



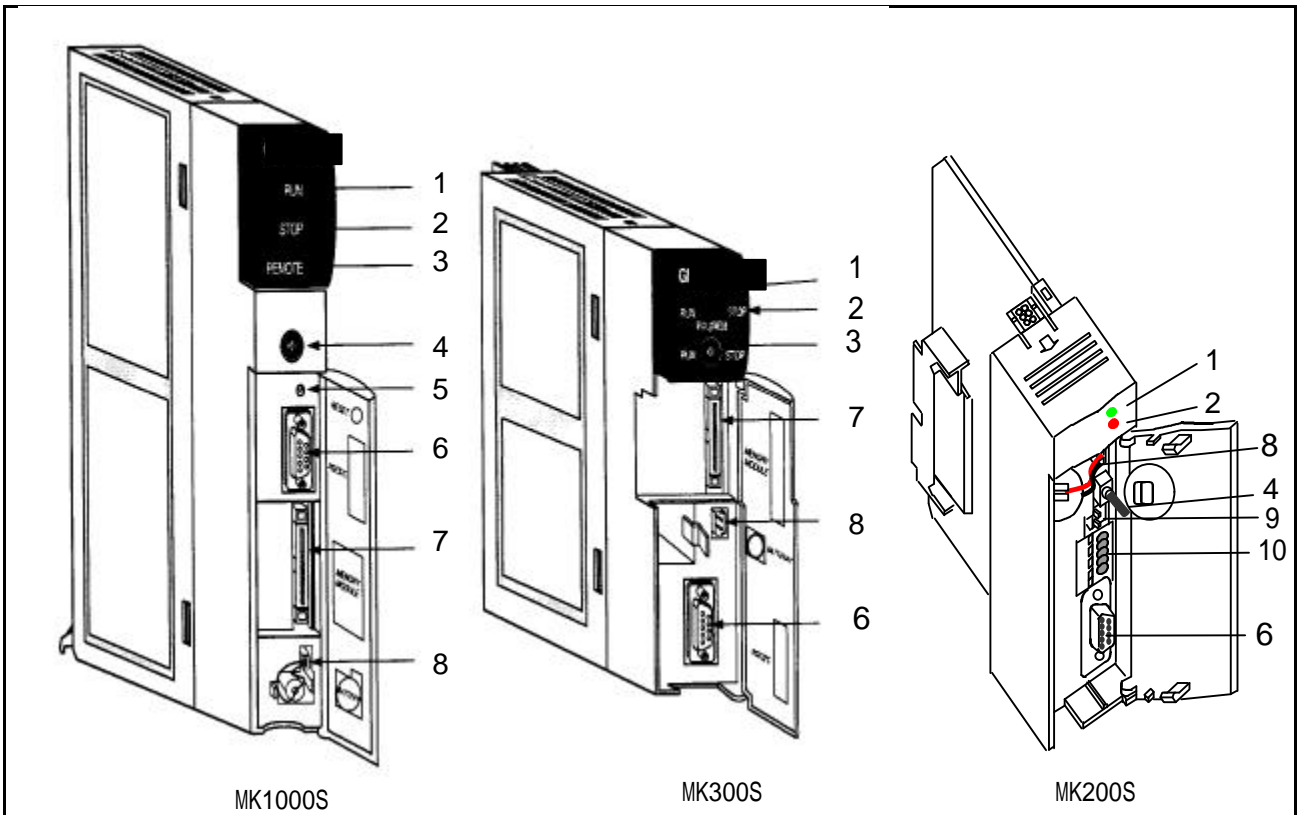
4.7

가 . 가



- 1) 4,6
- 2)
- 3) (.) 가 .
- 4) K300S/1000S CPU O/S V2.0 가 .

4.8



No.		
1	RUN LED	CPU • On : 가 RUN • Off : LED 가 Off . CPU 가 STOP PAU / REM
2	STOP LED	• On : 가 STOP • Off : LED 가 Off . 가 RUN PAUSE 가 RUN / PAUSE / DEBUG • :
3	LED	• On : LED 가 Off . 가 STOP 가 RUN / PAUSE / DEBUG • Off : 가 RUN / STOP / PAUSE (LED K1000S .)

No.																				
4		CPU • RUN : • STOP : • PAU / REM : PAUSE : REMOTE :																		
5		PLC (K1000S .)																		
6	RS-232C	(KGL-WIN)																		
7		CPU																		
8																				
9		6																		
10		<ul style="list-style-type: none"> • K3P-07AS : • K3P-07BS : (RS-422/485) • K3P-07CS : <table border="1" style="margin-left: 40px;"> <tr> <td style="width: 100px;"></td> <td style="text-align: center;">K3P-07BS</td> <td style="text-align: center;">K3P-07CS</td> </tr> <tr> <td style="text-align: center;">RDA</td> <td style="text-align: center;">RDA</td> <td style="text-align: center;">φA 24V</td> </tr> <tr> <td style="text-align: center;">RDB</td> <td style="text-align: center;">RDB</td> <td style="text-align: center;">φB 24V</td> </tr> <tr> <td style="text-align: center;">SDA</td> <td style="text-align: center;">SDA</td> <td style="text-align: center;">COM</td> </tr> <tr> <td style="text-align: center;">SDB</td> <td style="text-align: center;">SDB</td> <td style="text-align: center;">PRE 24V</td> </tr> <tr> <td style="text-align: center;">SG</td> <td style="text-align: center;">SG</td> <td style="text-align: center;">PRE 0V</td> </tr> </table> <p style="margin-left: 40px;">(.)</p> <p style="text-align: right; margin-right: 20px;">13 16</p>		K3P-07BS	K3P-07CS	RDA	RDA	φA 24V	RDB	RDB	φB 24V	SDA	SDA	COM	SDB	SDB	PRE 24V	SG	SG	PRE 0V
	K3P-07BS	K3P-07CS																		
RDA	RDA	φA 24V																		
RDB	RDB	φB 24V																		
SDA	SDA	COM																		
SDB	SDB	PRE 24V																		
SG	SG	PRE 0V																		

LED

1) LED

	LED		
	Run	Stop	Remote
Run	On	Off	Off
Stop	Off	On	Off
Pause	Off	Off	Off
Run	On	Off	On
Stop	Off	On	On
Pause, Debug	Off	Off	On

* Remote LED K1000S

2)

STOP → PAU / REM	Stop
PAU / REM → RUN	Run
RUN → PAU / REM	Pause
PAU / REM → STOP	Stop

* 가 Stop 가 .

5

5.1

	DC 3.0 V
	5
	, RTC
	, 3V
(mm)	φ 14.5 X 26

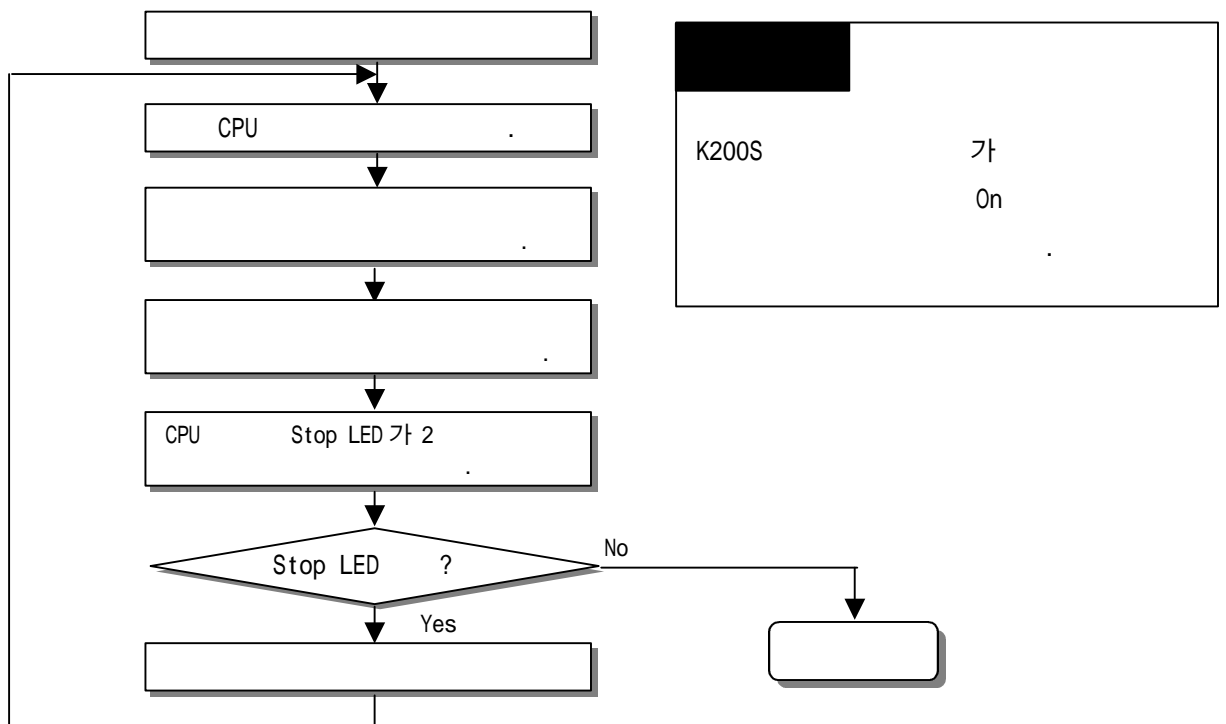
5.2

- 1) 가
- 2)
- 3)

5.3

30

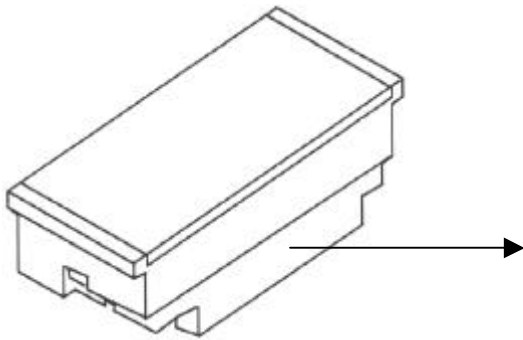
(K200S)가



PLC

PLC (Flash Memory)
 K200S CPU / 가 가

6.1



6.2

1) MK300S/1000S

	K300S	K1000S
	G4M-M032	G3M-M064
	128 Kbyte (32Kstep)	256 Kbyte (64 Kstep)
(Kg)	0.01	0.014

2) MK200S

MK200S CPU RAM / CPU

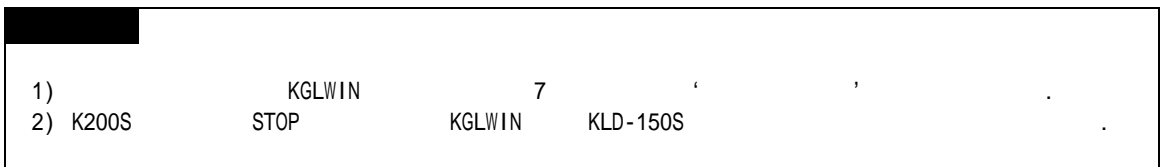
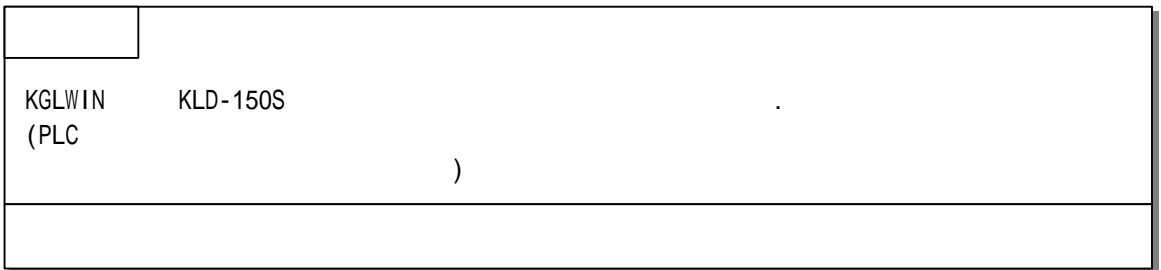
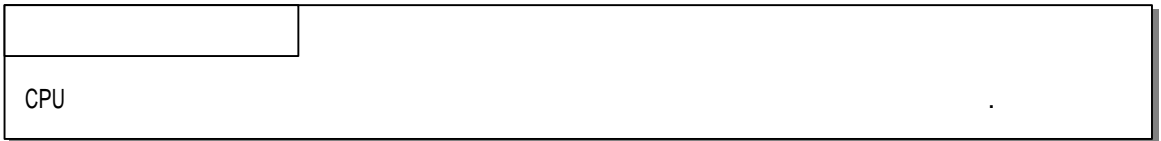
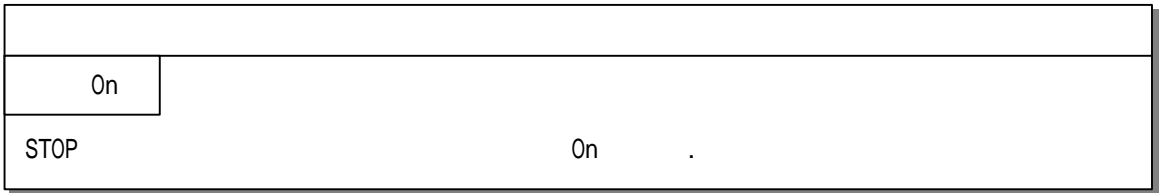
	On
	CPU

CPU (Stop) . (/ .)

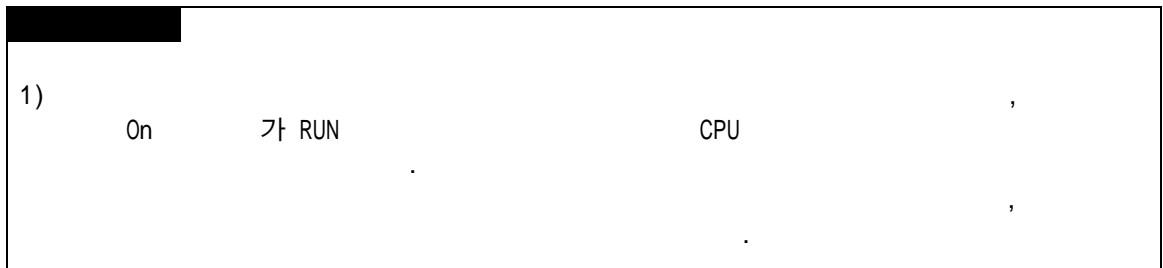
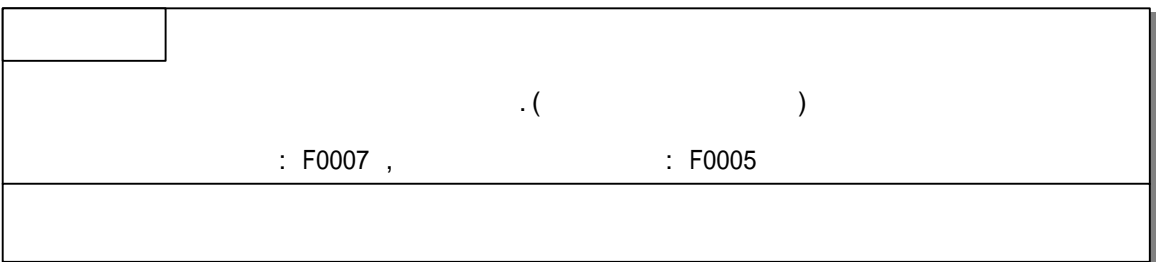
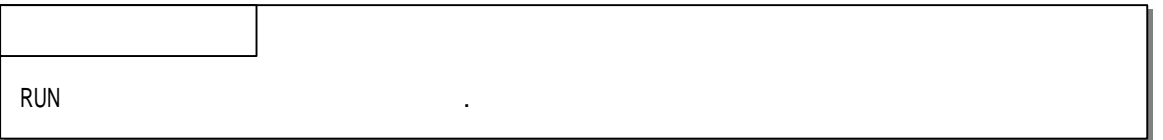
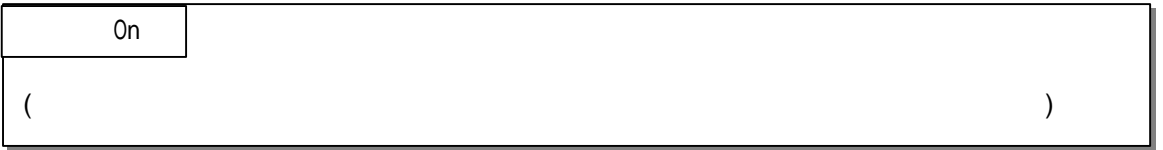
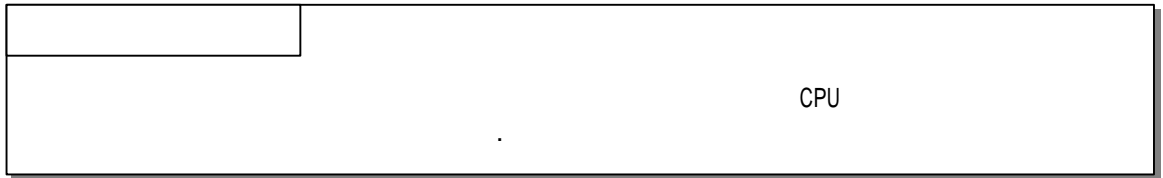
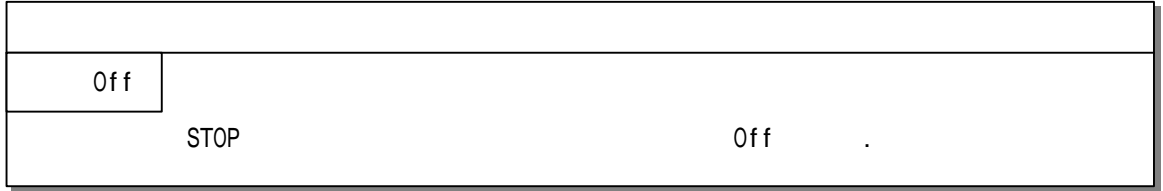
6.3

1)

CPU Off CPU 가 STOP
 가 .



- 2)
- CPU Off
 - On 가 RUN CPU 가 RUN ,



7.1

MK200/300/1000S

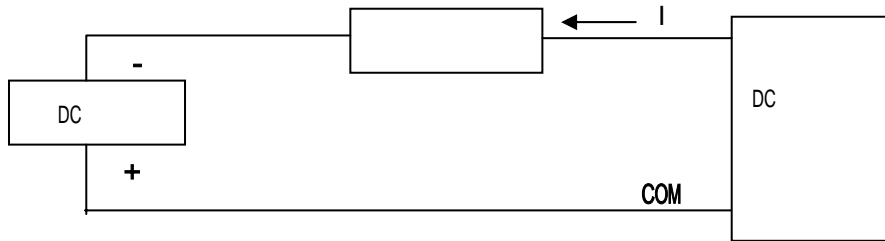
1)

DC

K300S/K1000S

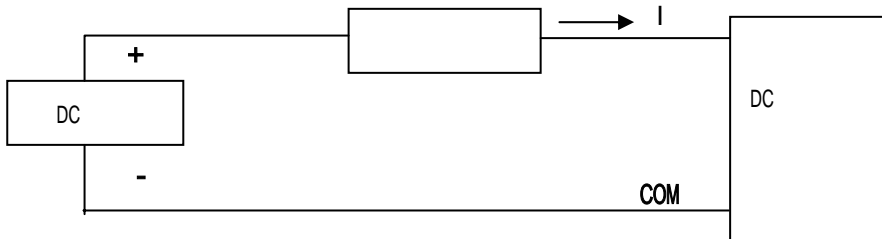
/ DC

(1) DC



- 가 DC DC (-)
- On DC 가

(2) DC



- 가 DC DC (+)
- On DC 가 DC

2)

3)

CPU 1

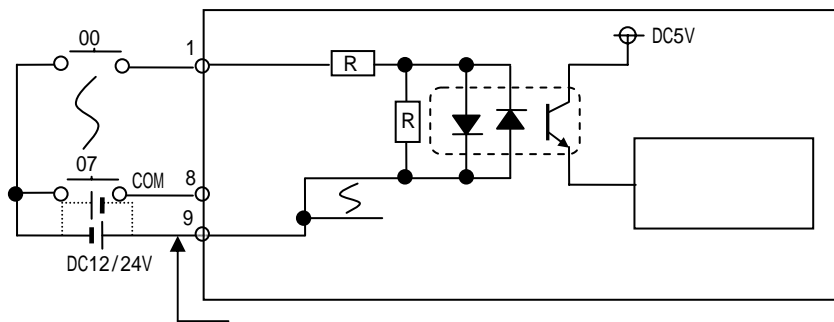
4)

가

7.2

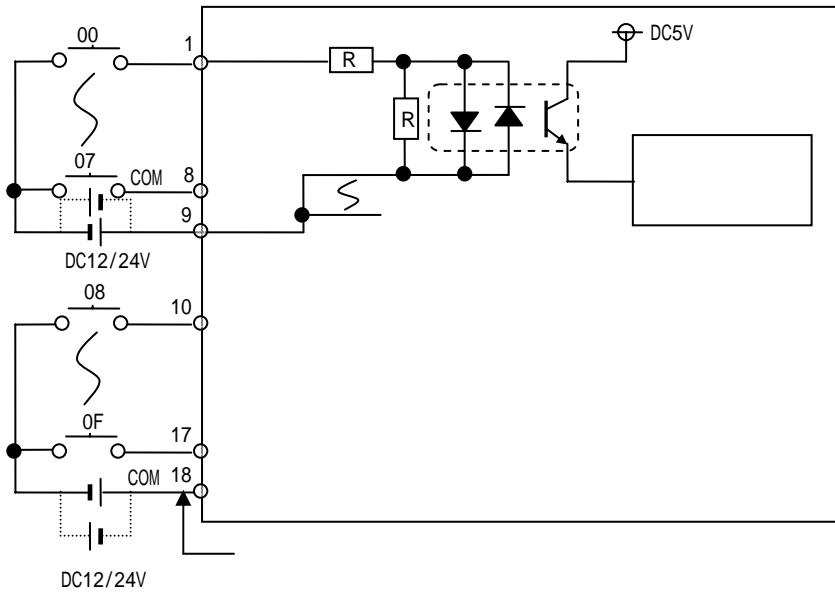
7.2.1 8 DC12/24V (/)

		DC	
		G6I-D21A	
		8	
		DC12V	DC24V
		3 mA	7 mA
		DC10.2 ~ 28.8V (5%)	
		100% On	
On / On		DC9.5V	/ 3.5 mA
Off / Off		DC5V	/ 1.5 mA
		3.3 kΩ	
	Off → On	5 ms	
	On → Off	5 ms	
		8 / COM	
		40 mA	
		On LED	
		9 (M3 X 6)	
		0.12 kg	



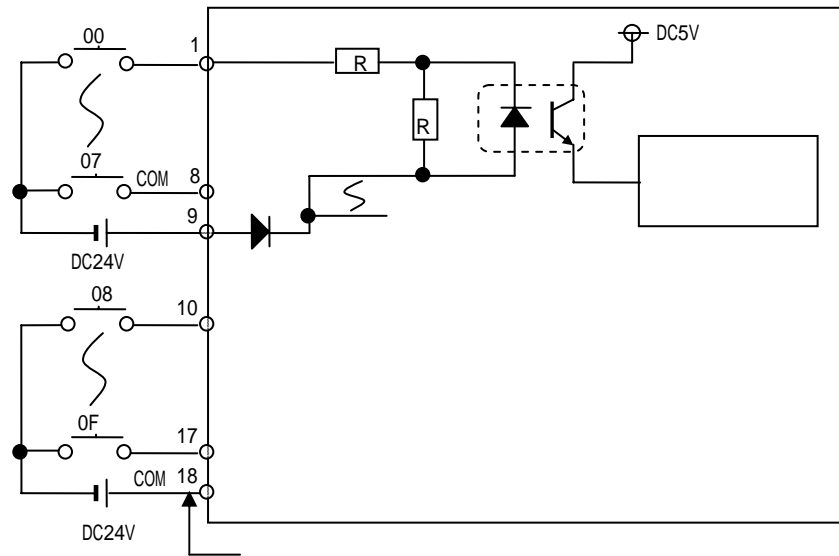
7.2.2 16 DC12/24V (/)

		MK1000S	MK300S	MK200S
		G3I -D22A	G4I -D22A	G6I -D22A
		16		
		DC12 / 24V		
		5 / 11mA		3 / 7mA
		DC10.2 ~ 26.4V (5%)		
		100% On		
On / On		DC9.5V /4.0mA		DC9.5V /3.5mA
Off / Off		DC5V /1.0mA		DC5V /1.5mA
		2.2 kΩ		3.3 kΩ
	Off → On	10 ms		5ms
	On → Off	10 ms		5 ms
		8 / COM		
		70 mA		
		On LED		
		20 (M3 X 6)		18
		0.37 kg	0.25 kg	0.15 kg



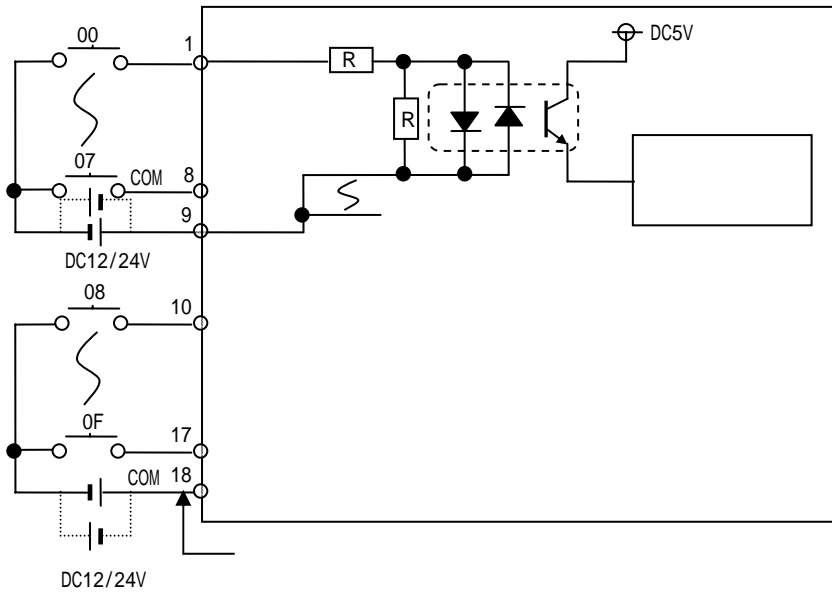
7.2.3 16 DC12/24V ()

		MK300S	MK200S
		G4I-D22B	G6I-D22B
		16	
		DC12/24V	DC24V
		5/11 mA	7 mA
		DC10.2 ~ 26.4V (5%)	DC20.4 ~ 28.8V (5%)
		100% (8 / COM) On	
On / On		DC9.5V / 4.0 mA	DC15V / 4.3 mA
Off / Off		DC5V / 1.0 mA	DC5V / 1.7 mA
		2.2 kΩ	3.3 kΩ
	Off → On	10 ms	5 ms
	On → Off	10 ms	5 ms
		8 / COM	
		70mA	
		On LED	
		18 (M3 X 6)	20 (M3 X 6)
		0.25 kg	0.15 kg



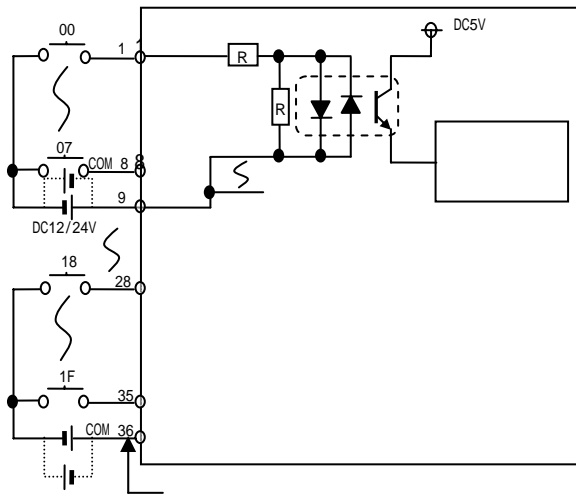
7.2.4 16 DC24V (/)

		MK1000S	MK300S
		G3I-D22A	G4I-D22A
		16	
		DC 24V	
		11mA	
		DC20.4 ~ 26.4V (5%)	
		100% On	
On / On		DC15V /6.0mA	
Off / Off		DC5V /1.0mA	
		3.3 kΩ	
	Off → On	10 ms	
	On → Off	10 ms	
		8 / COM	
		70 mA	
		On LED	
		20 (M3 X 6)	
		0.37 kg	0.25 kg

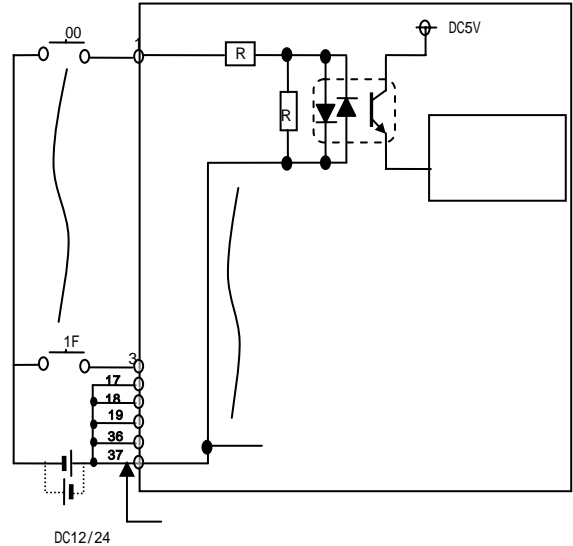


7.2.5 32 DC12/24V (/)

		MK1000S	MK300S	MK200S
		G3I -D24A	G4I -D24A	G6I -D24A
		32		
		DC12 / 24V		
		5 / 11mA		3/7mA
		DC10.2 ~ 26.4V (5%)		
		60% On		
On / On		DC9.5V /4.0mA		DC9.5V /3.5mA
Off / Off		DC5V /1.0mA		DC5V /1.5mA
		2.2 kΩ		3.3 kΩ
	Off → On	10 ms		5ms
	On → Off	10 ms		5 ms
		8 / COM	32 / COM	
		125 mA		75 mA
		On LED		
		38	37Pin D-Sub	
		0.46 kg	0.19 kg	0.11 kg



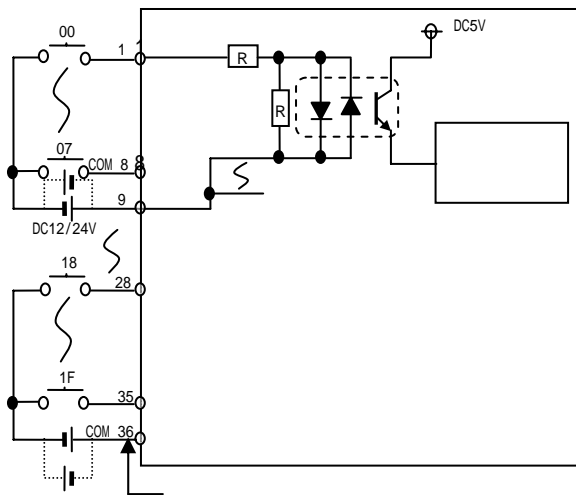
[G3I -D24A]



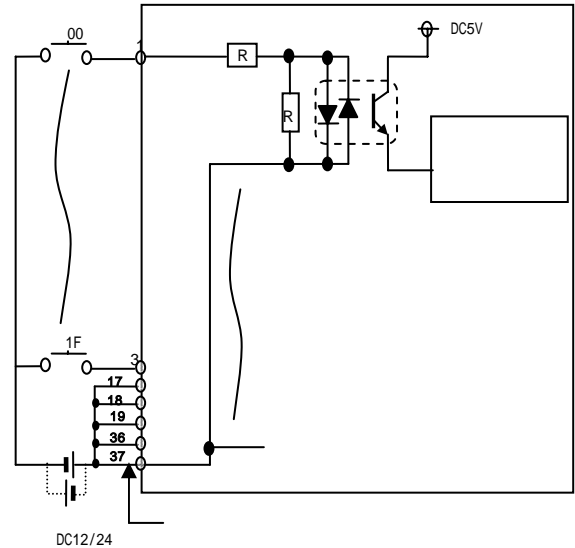
[G4I -D24A /G6I -D24A]

7.2.6 32 DC24V (/)

		MK1000S	MK300S
		G3I-D24C	G4I-D24C
		32	
		DC 24V	
		11mA	
		DC19.2 ~ 26.4V (5%)	
		60% On	
On / On		DC19.5V /4.0mA	
Off / Off		DC15V /1.0mA	
		3.3 kΩ	
	Off → On	10 ms	
	On → Off	10 ms	
		8 / COM	32 / COM
		125 mA	75 mA
		On LED	
		38	37Pin D-Sub
		0.46 kg	0.19 kg



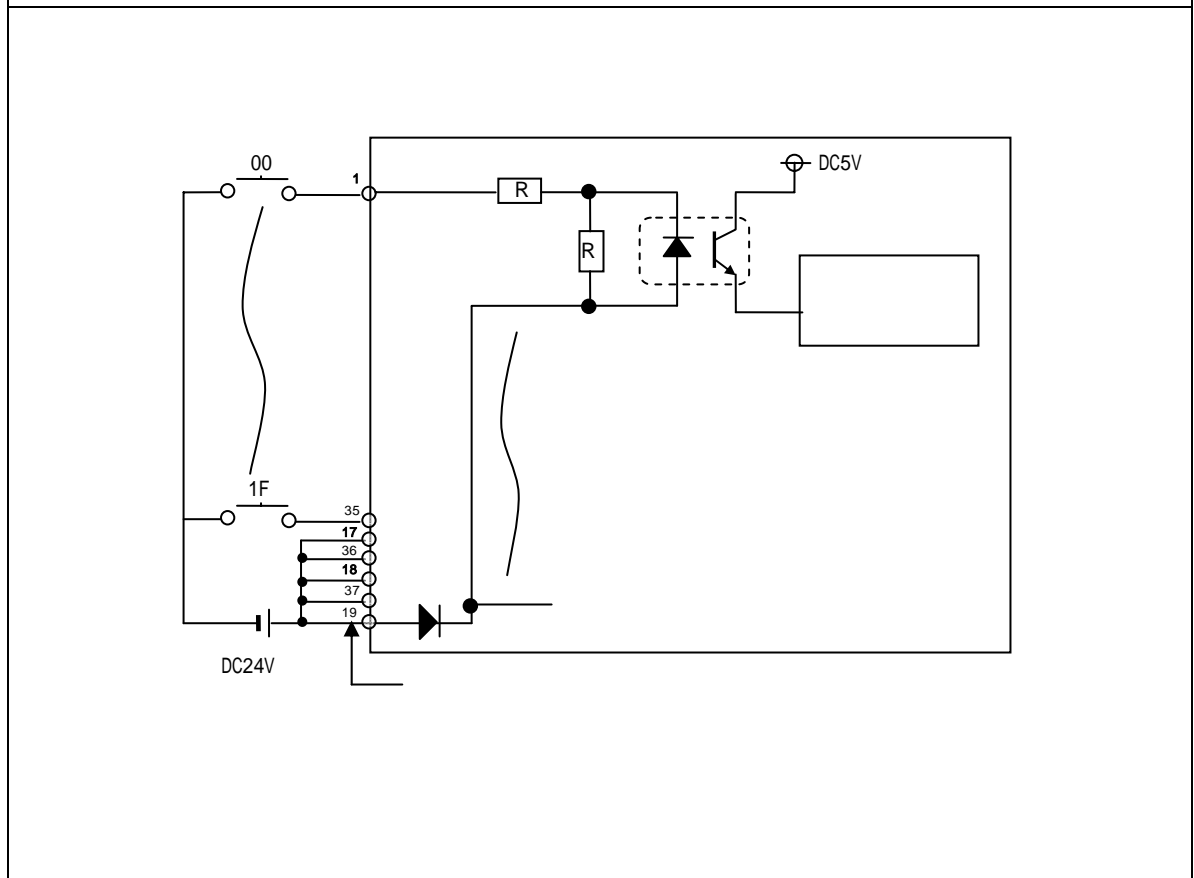
[G3I-D24C]



[G4I-D24C]

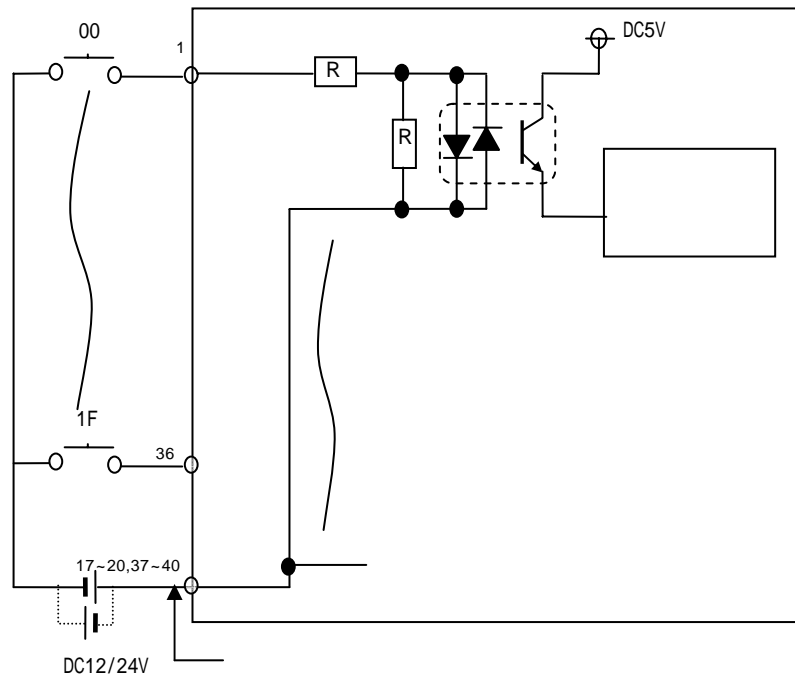
7.2.7 32 DC12/24V ()

		MK300S	MK200S
		G4I-D24B	G6I-D24B
		32	
		DC12/24V	DC24V
		3/7 mA	7 mA
		DC10.24 ~ 26.4V (5%)	DC20.4 ~ 28.8V (5%)
		60% (19 / 1COM) On	
On / On		DC9.5V / 3 mA	DC15V / 4.3 mA
Off / Off		DC5V / 1.5 mA	DC5V / 1.7 mA
		3.3 kΩ	
	Off → On	10 ms	5 ms
	On → Off	10 ms	5 ms
		32 / 1COM	
		75 mA	
		On LED (16)	
		37 D-Sub	
		0.19 kg	0.11 kg

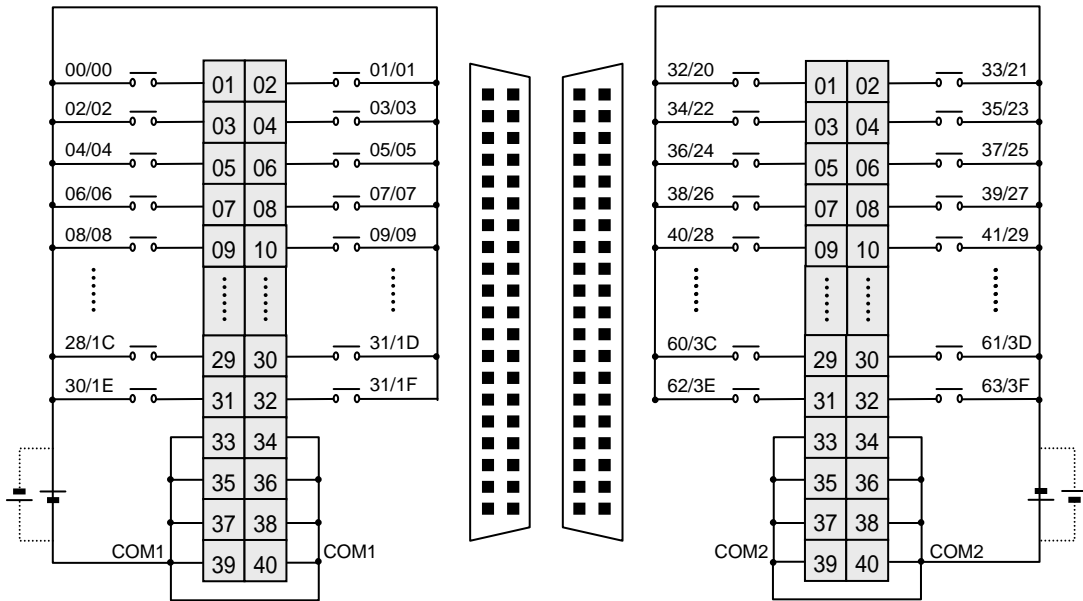


7.2.8 64 DC12/24V (/)

		MK1000S	
		G3I-D28A	
		64	
		DC12/24V	
		3 / 7 mA	
		DC10.2 ~ 26.4V (5%)	
		60% (20 / 1COM) On	
On / On		DC9.5V	/ 4.0 mA
Off / Off		DC5V	/ 1 mA
		3.3 kΩ	
	Off → On	10ms	
	On → Off	10ms	
		32 / 1COM (: 17, 18, 19, 20, 37, 38, 39, 40)	
		120mA	
		ON LED	
		40 2	
		0.46 kg	



		K300S	
		G4I-D28A	
		64	
		DC12/24V	
		3/6 mA	
		DC10.2 ~ 26.4V (5%)	
		60% (20 / 1COM) On	
On / On		DC9.5V / 4.0 mA	
Off / Off		DC5V / 1 mA	
		5.6 kΩ	
	Off → On	10ms	
	On → Off	10ms	
		32 / 1COM (: 33, 34, 35, 36, 37, 38, 39, 40)	
		250mA	
		On LED	
		40 2	
		0.46 kg	

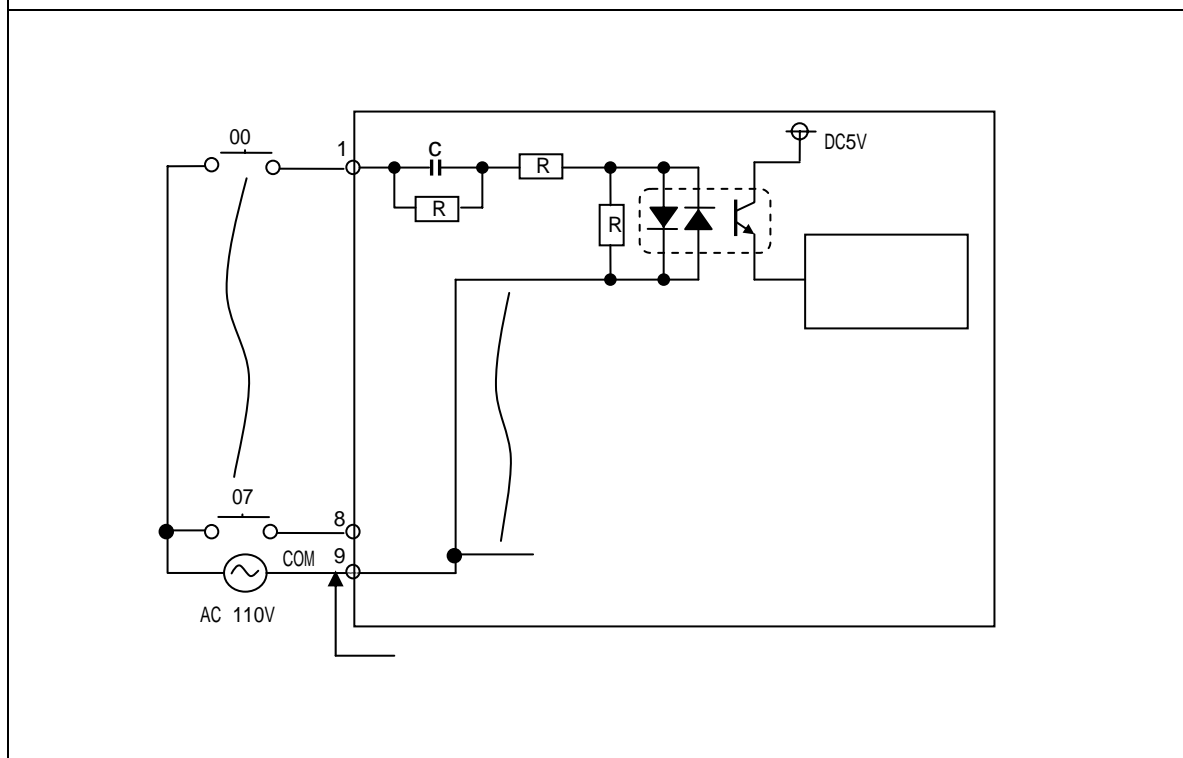


Connector 1 ()

Connector 2 ()

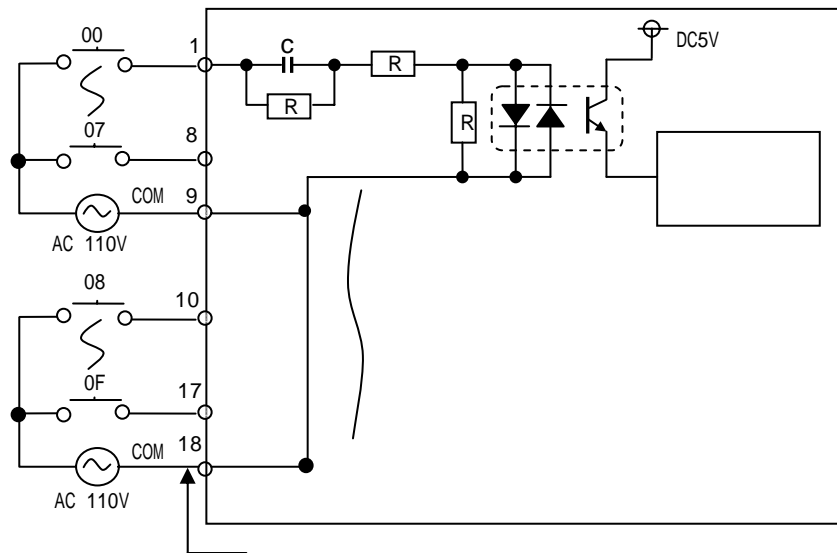
7.2.9 8 AC110V

		MK200S	
		G6I-A11A	
		8	
		AC100V ~ 120V (50 / 60 Hz)	
		7mA (AC110V / 60Hz)	
		AC85 ~ 132V (50 / 60 ± 3 Hz)	
		100% On (8 / 1COM)	
		300mA 0.3 ms (AC132V)	
On	/ On	AC80V	/ 5 mA
Off	/ Off	AC30V	/ 2 mA
		15 kΩ	
	Off → On	15 ms	
	On → Off	25 ms	
		8 / 1COM	
		41 mA	
		On LED	
		9 (M3 X 6)	
		0.14 kg	



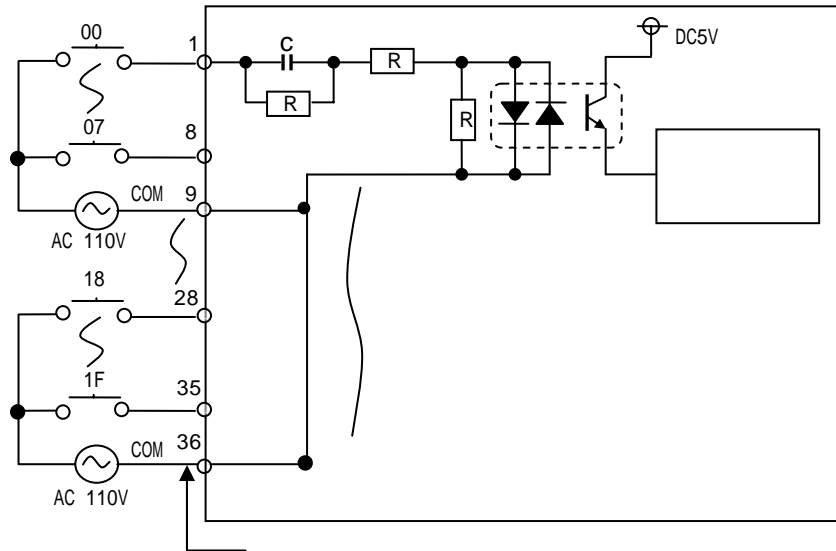
7.2.10 16 AC110V

		MK1000S	MK300S
		G3I-A12A	G4I-A12A
		16	
		AC100V ~ 120V (50 / 60 Hz)	
		11 mA (AC110V / 60Hz)	
		AC85 ~ 132V (50 / 60 ± 3 Hz)	
		100% On (8 / 1COM)	
		600mA 0.3 ms (AC132V)	
On / On		AC80V / 6 mA	
Off / Off		AC30V / 3 mA	
		10 kΩ	
	Off → On	15 ms	
	On → Off	25 ms	
		8 / 1COM	
		70 mA	
		On LED	
		20 (M3 X 6)	
		0.42 kg	0.29 kg



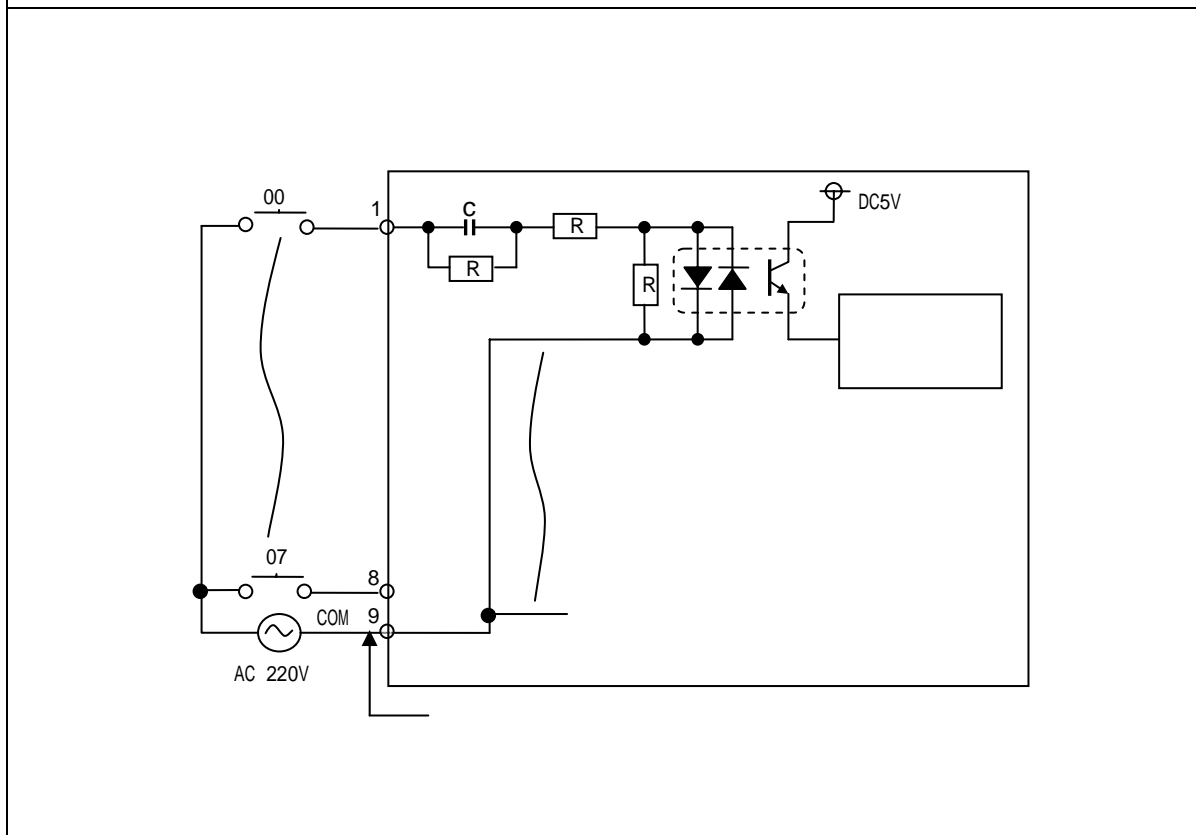
7.2.11 32 AC110V

		MK1000S	
		G3I-A14A	
		32	
		AC100V ~ 120V (50 / 60 Hz)	
		11mA (AC110V / 60Hz)	
		AC85 ~ 132V (50 / 60 ± 3Hz)	
		60% (5 / 1COM)	On
		300 mA	0.3 ms (AC132V)
On	/ On	AC80V	/ 6 mA
Off	/ Off	DC30V	/ 3 mA
		10 kΩ	
	Off → On	15ms	
	On → Off	25ms	
		8 / 1COM	
		120mA	
		On LED	
		38 (M3 X 6)	
		0.56 kg	



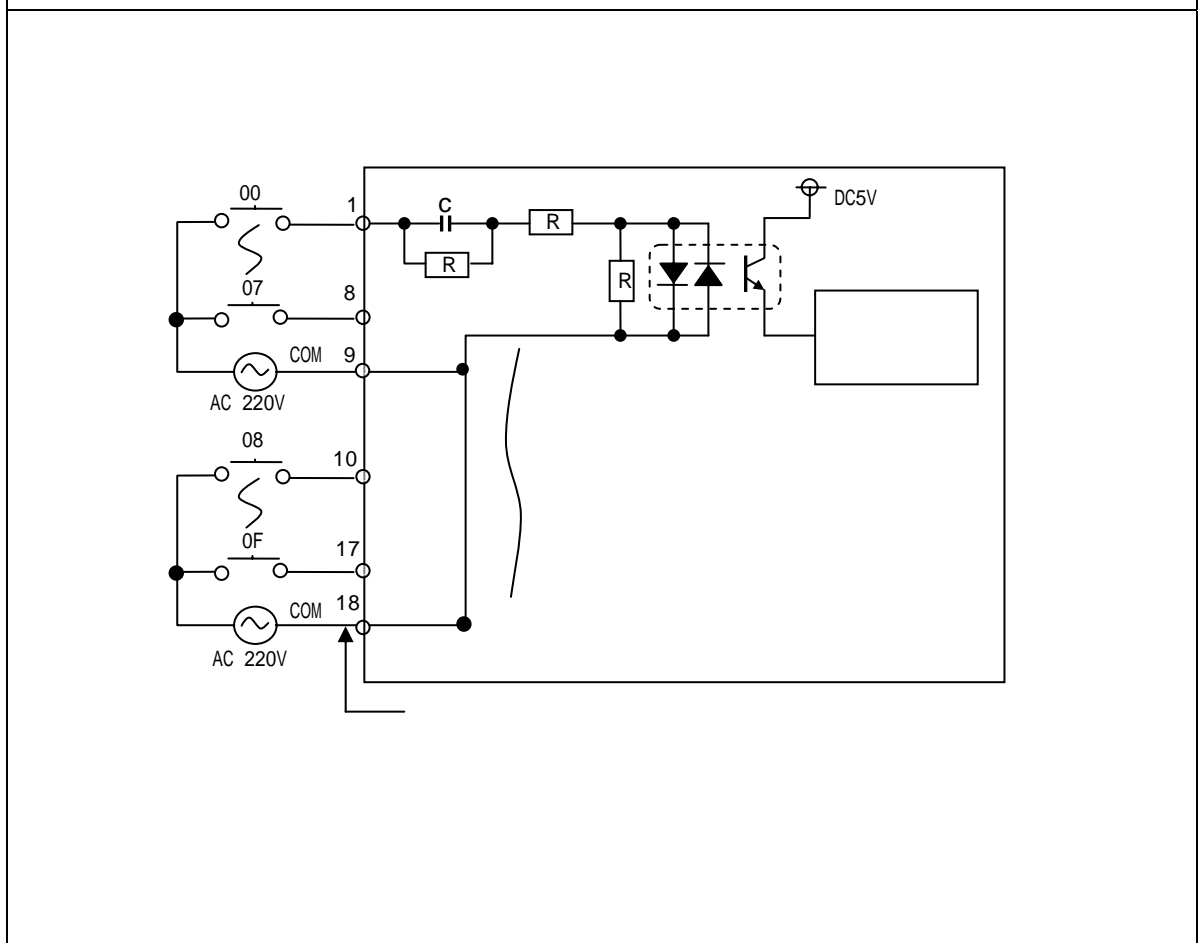
7.2.12 8 AC220V

		MK200S	
		G6I-A21A	
		8	
		AC200V ~ 240V (50 / 60 Hz)	
		11 mA (AC220V / 60Hz)	
		AC170 ~ 264V (50 / 60 ± 3 Hz)	
		100% On (8 / 1COM)	
		600mA 0.12 ms (AC264V)	
On	/ On	AC80V	/ 5 mA
Off	/ Off	AC30V	/ 2 mA
		20 kΩ	
	Off → On	15 ms	
	On → Off	25 ms	
		8 / 1COM	
		40 mA	
		On LED	
		9 (M3 X 6)	
		0.14 kg	



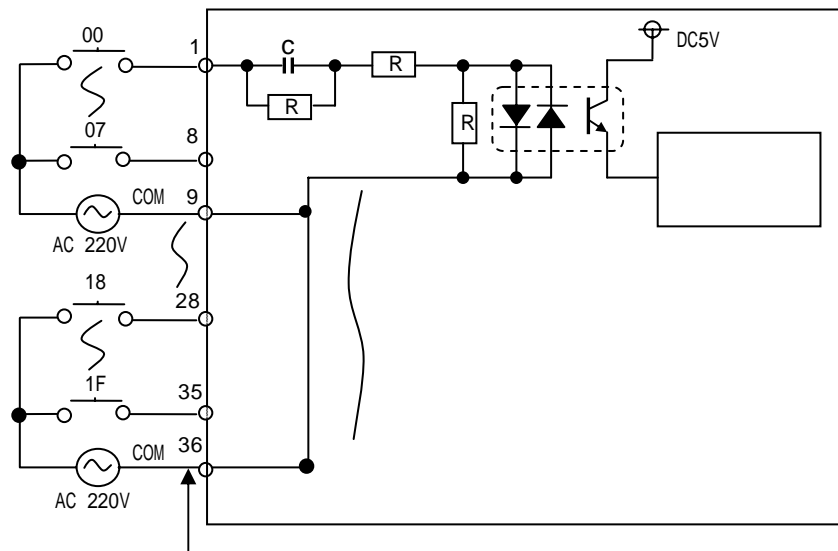
7.2.13 16 AC220V

		MK1000S	MK300S
		G3I-A22A	G4I-A22A
		16	
		AC200V ~ 240V (50 / 60 Hz)	
		11 mA (AC220V / 60Hz)	
		AC170 ~ 264V (50 / 60 ± 3 Hz)	
		100% On (8 / 1COM)	
		600mA 0.12 ms (AC264V)	
On	/ On	AC80V	/ 6 mA
Off	/ Off	AC30V	/ 3 mA
		10 kΩ	
	Off → On	15 ms	
	On → Off	25 ms	
		8 / 1COM	
		70 mA	
		On LED	
		20 (M3 X 6)	
		0.42 kg	0.3 kg



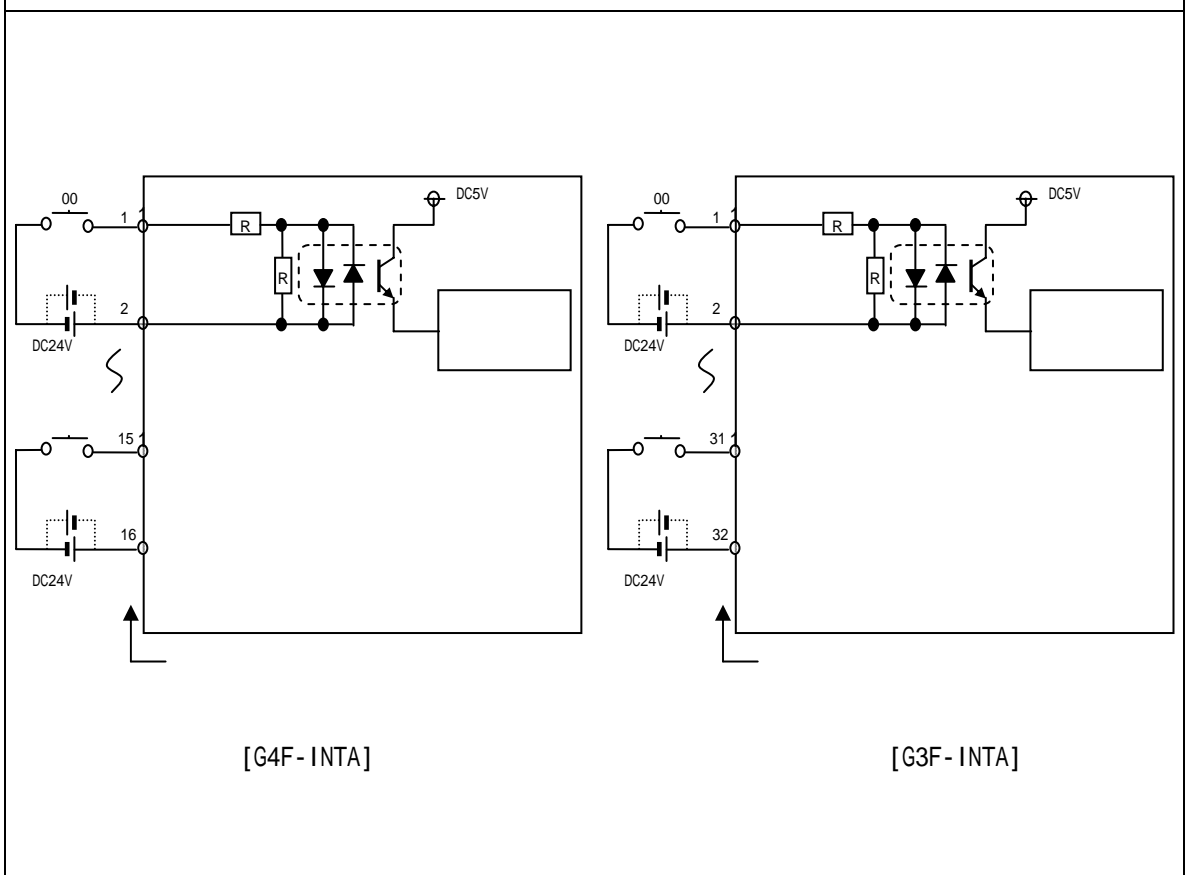
7.2.14 32 AC220V

		MK1000S
		G3I-A24A
		32
		AC200V ~ 240V (50 / 60 Hz)
		10mA (AC220V / 60Hz)
		AC170 ~ 264V (50 / 60 ± 3Hz)
		60% (5 / 1COM) On
		600 mA 0.12 ms (AC264V)
On	/ On	AC150V / 4.5 mA
Off	/ Off	DC50V / 3 mA
		10 kΩ
	Off → On	15ms
	On → Off	25ms
		8 / 1COM
		120mA
		On LED
		38 (M3 X 6)
		0.56 kg



7.2.15

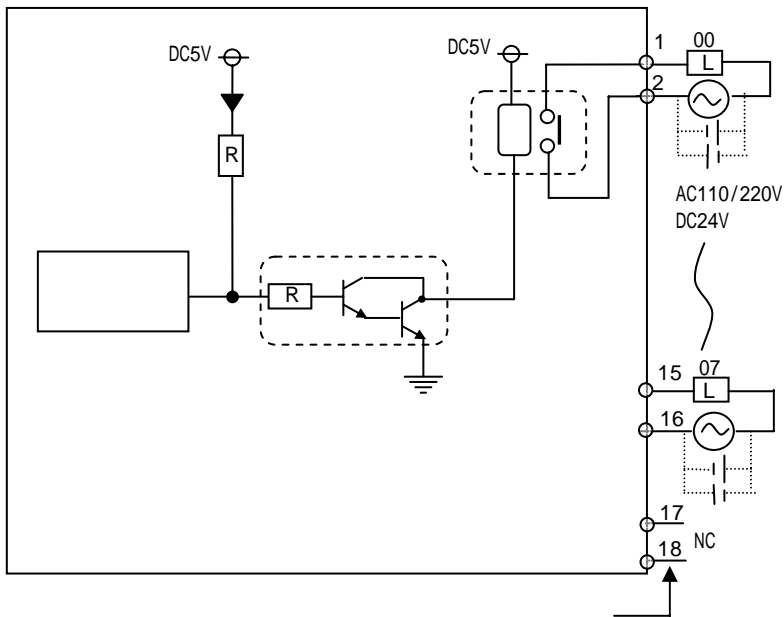
		MK1000S	MK300S
		G3F-INTA	G4F-INTA
		16	8
		DC24V	
		10 mA	
		2.4 kΩ	
		DC21.6 ~ 26.4V	
		100% On	
On / On		DC15V / 6.5 mA	
Off / Off		DC5V / 2 mA	
	Off → On	0.5 ms	
	On → Off	0.5 ms	
		1 / 1COM	
		()	
		200 mA	65 mA
		On LED	
		38 (M3 X 6)	20 (M3 X 6)
		0.4 kg	0.16 kg



7.3

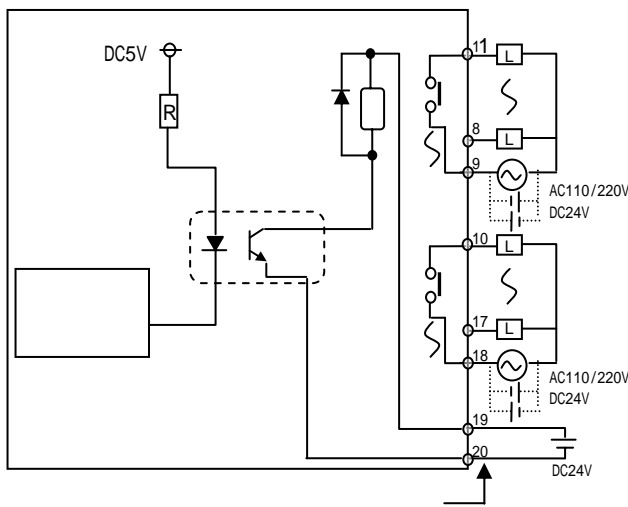
7.3.1 8

		MK200S
		G6Q-RY1A
		8
/		DC24V 2A() / AC220V 2A(COSΨ = 1)
/		DC5V / 1mA
/		AC250V, DC125V
Off		0.1mA (AC220V, 60Hz)
		1,200 /
		2,000
		/ 10
		AC200V / 1.5A, AC240V / 1A (COSΨ = 0.7) 10
		AC200V / 1A, AC240V / 0.5A (COSΨ = 0.35) 10
		DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 10
	Off → On	10 ms
	On → Off	12 ms
		1 / 1COM ()
		210 mA (On)
		On LED
		18 (M3 X 6)
		0.16 kg

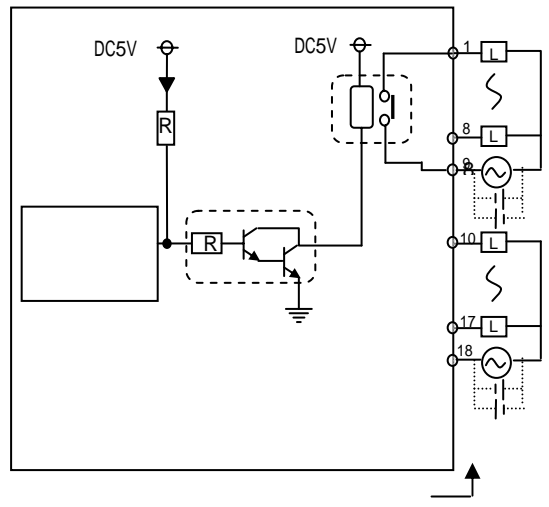


7.3.2 16

	MK1000S	MK300S	MK200S
	G3Q-RY2A	G4Q-RY2A	G6Q-RY2A
	16		
/	DC24V 2A() / 1 , 8A / 1COM AC220V 2A(COSΨ = 1)	DC24V 2A() / 1 , 4A / 1COM AC220V 2A(COSΨ = 1)	DC24V 2A() / 1 , 5A / 1COM AC220V 2A(COSΨ = 1)
/	DC5V / 1mA		
/	AC250V, DC125V		AC250V, DC110V
Off	0.1mA (AC220V, 60Hz)		
	1,200 /		
	2,000		
	/ 10		
	AC200V / 1.5A, AC240V / 1A (COSΨ = 0.7) 10		
	AC200V / 1A, AC240V / 0.5A (COSΨ = 0.35) 10		
	DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 10		
Off → On	10 ms		
On → Off	12 ms		
	8 / 1COM		
	100 mA (On)		400 Ma(On)
	DC24V ± 10% (4 Vp-p)		-
	150mA (DC24V On)	100mA (DC24V On)	-
	On LED		
	20 (M3 X 6)		18
	0.46 kg	0.31 kg	0.19 kg



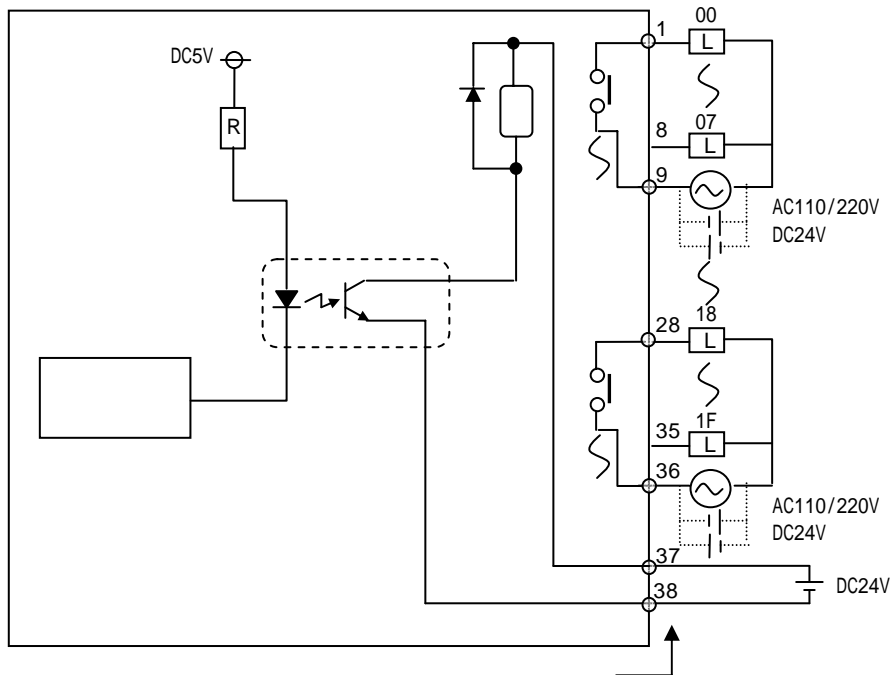
[G3Q-RY2A / G4Q-RY2A]



[G6Q-RY2A]

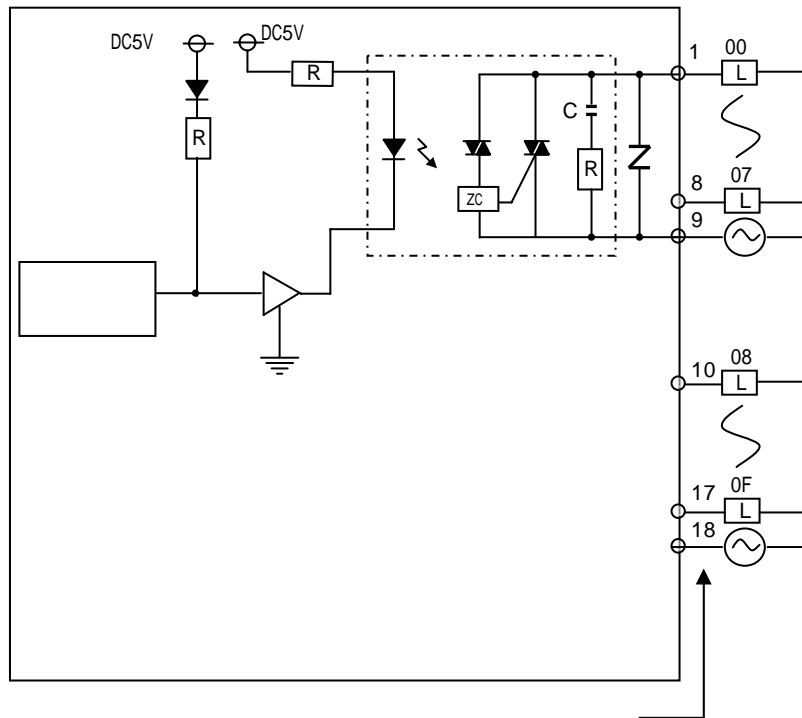
7.3.3 32

		MK1000S
		G3Q-RY4A
		32
/		DC24V / 2A (), AC220V / 2A (COS Ψ = 1) / 1 5A / 1COM
/		DC5V / 1mA
/		AC250V, DC125V
Off		0.1mA (AC220V, 60Hz)
		1,200 /
		2,000
		/ 10
		AC200V / 1.5A, AC240V / 1A (COSΨ = 0.7) 10
		AC200V / 1A, AC240V / 0.5A (COSΨ = 0.35) 10
		DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 10
	Off → On	10 ms
	On → Off	12 ms
		8 / 1COM
		200 mA (On)
		DC24V ± 10% (4 Vp-p)
		170mA(DC24V On)
		On LED
		38 (M3 X 6)
		0.55 kg



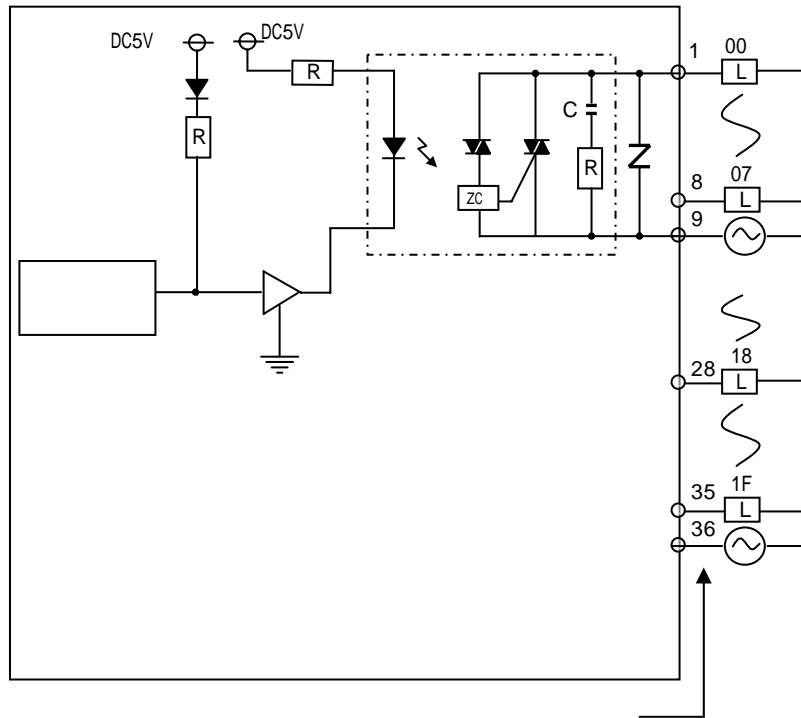
7.3.5 16

	MK1000S		MK300S	
	G3Q-SS2A		G4Q-SS2A	G4Q-SS2B
	16			
	AC 100 ~ 240V (50 / 60 Hz)			
	AC 264V			
	2A/1 , 5A/1COM	1A/1 , 5A/1COM	0.6A/1 , 2.4A/1COM	
	20 mA		10 mA	
Off	2.5 mA (AC 220V 60 Hz)			
	40A, 10 ms	25A, 10 ms	20A, 10 ms	
On	AC 1.5V (2A)	AC 1.5V (1A)	AC 1.5V (0.6A)	
	(387 ~ 473V), C.R			
Off → On	0.5 Cycle + 1 ms			
On → Off	0.5 Cycle + 1 ms			
	8 / 1 COM			
	330 mA (On)			
	On LED			
	20 (M3 X 6)			
	0.5 kg		0.35 kg	



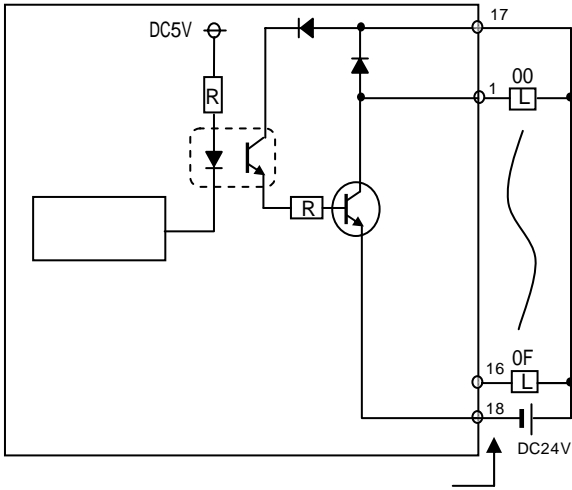
7.3.6 32

		MK1000S
		G3Q-SS4A
		32
		AC100V ~ 240V (50 / 60 Hz)
		AC264V
		1A / 1 , 5A / 1 COM
		20mA
Off		2 mA (AC220V 60Hz)
		25 A, 10ms
On		AC 1.5V (1A)
		(387 ~ 473V), C.R
	Off → On	0.5 Cycle + 1 ms
	On → Off	0.5 Cycle + 1 ms
		8 / 1COM
		600mA (On)
		On LED
		38 (M3 X 6)
		0.6 kg

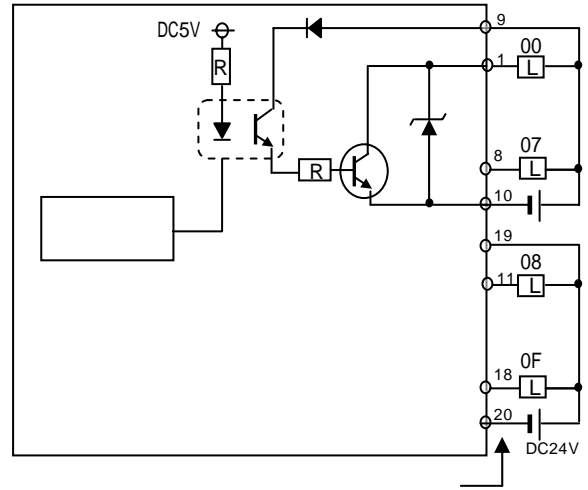


7.3.7 16 ()

	MK1000S	MK300S	MK200S
	G3Q-TR2A	G4Q-TR2A	G6Q-TR2A
	16		
	DC 12 / 24V		
	DC 10.2 ~ 26.4V		
	2A / 1 , 5A / 1COM	0.5A/1 , 3A / 1COM	0.5A/1 , 4A / 1COM
Off	0.1mA		
	8A / 10 ms	4A / 10 ms	
On	DC 1.5V		
	Off → On 2 ms		
	On → Off 2 ms		
	8 / 1COM		16 / 1COM
	120 mA (On)	110 mA (On)	180 mA (On)
	DC24V ± 10% (4 Vp-p)		
	100mA (DC24V 1COM)		48mA (DC24V 1COM)
	On LED		
	20 (M3 X 6)		18
	0.54 kg	0.27 kg	0.18 kg



[G6Q-TR2A]

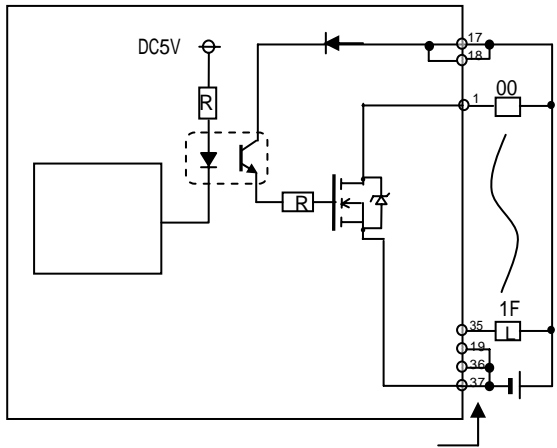


[G3Q-TR2A / G4Q-TR2A]

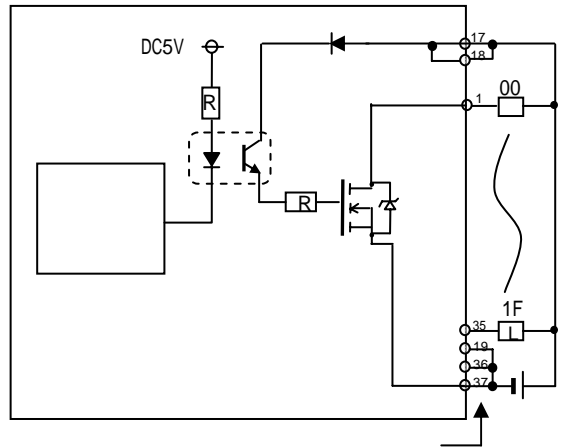
7.3.8 32

()

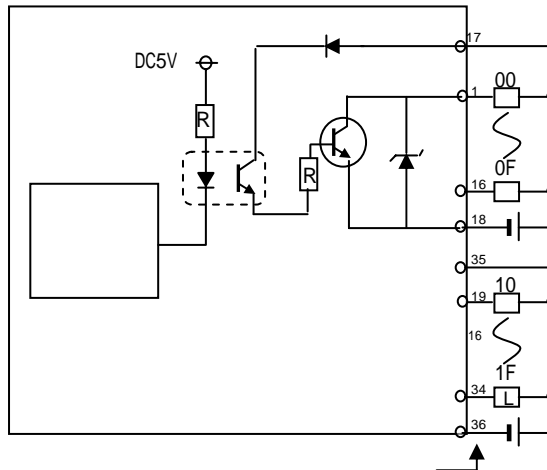
	MK1000S	MK300S	MK200S
	G3Q-TR4A	G4Q-TR4A	G6Q-TR4A
	32		
	DC 12 / 24V		
	DC 10.2 ~ 26.4V		
	0.5A/1 , 3A / 1COM	0.1A/1 , 2A / 1COM	0.1A/1 , 2A / 1COM
Off	0.1mA		
	4A / 10 ms	7A / 10 ms	
On	DC 1.5V		
		DC 0.1V (TYP.), DC 0.2V (MAX.)	
	Off → On		
	2 ms		
	On → Off		
	2 ms		
	16 / 1COM	32 / 1COM	
	120 mA (On)	110 mA (On)	180 mA (On)
	DC24V ± 10% (4 Vp-p)		
	150mA (DC24V 1COM)	20mA (DC24V 1COM)	
	On LED		
	38 (M3 X 6)	37 Pin D-Sub	
	0.5 kg	0.18 kg	0.11 kg



[G4Q-TR4A]



[G6Q-TR4A]

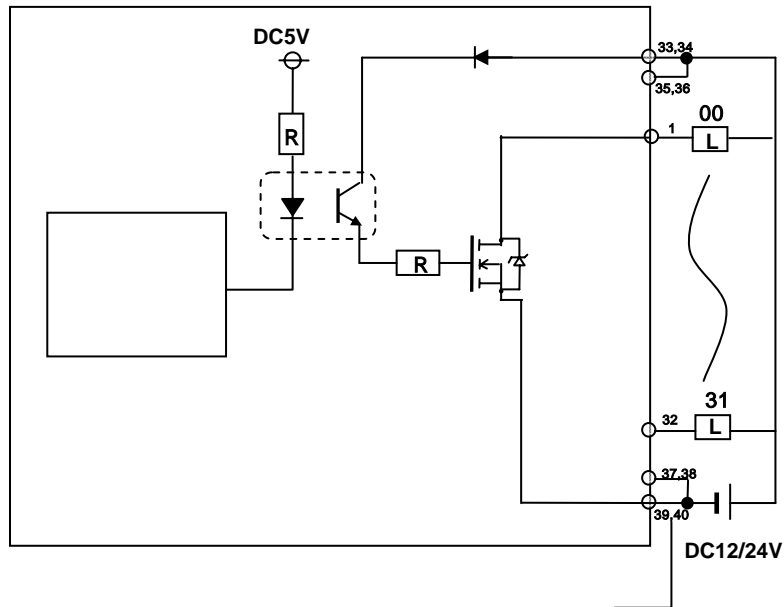


[G3Q-TR4A]

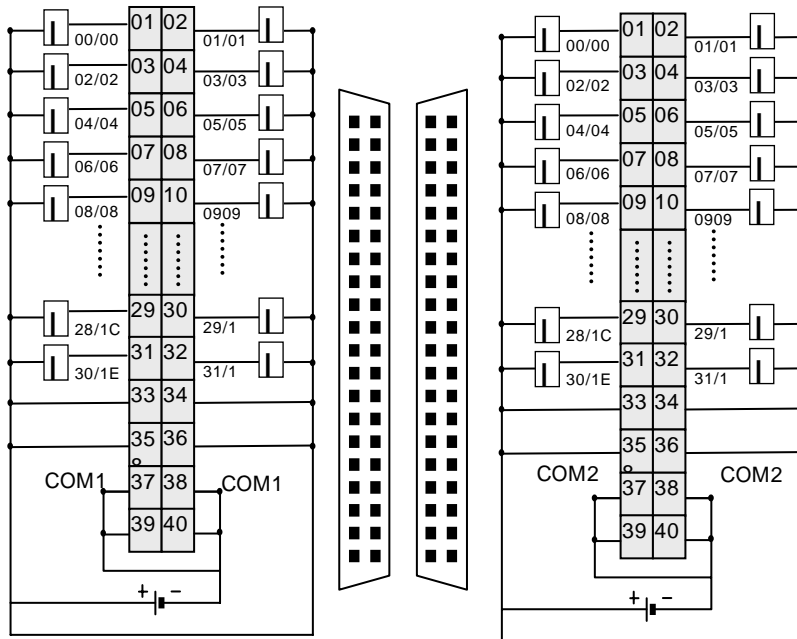
7.3.9 64

()

		MK1000S
		G3Q-TR8A
		64
		DC 12 / 24V
		DC 10.2 ~ 26.4V
		0.1A / 1 , 2A / 1COM
Off		0.1mA
		7 A / 10 ms
On		DC 0.1V (TYP.), DC 0.2V (MAX.)
	Off → On	2 ms
	On → Off	2 ms
		32 / 1COM
		270 mA (On)
		DC24V ± 10% (4 Vp-p)
		20mA (DC24V 1COM)
		On LED
		40 2
		0.42 kg



		K300S	
		G4Q-TR8A	
		64	
		DC 12 / 24V	
		DC 10.2 ~ 26.4V	
		0.1A / 1 , 2A / 1COM	
Off		0.1mA	
		0.4 A / 10 ms	
On		DC 1.0V	
	Off → On	2 ms	
	On → Off	2 ms	
		32 / 1COM	
		250 mA (On)	
		DC10.2 ~ 26.4V	
		170mA (DC24V 1COM)	
		On LED (2 16)	
		40 2	
		0.4 kg	



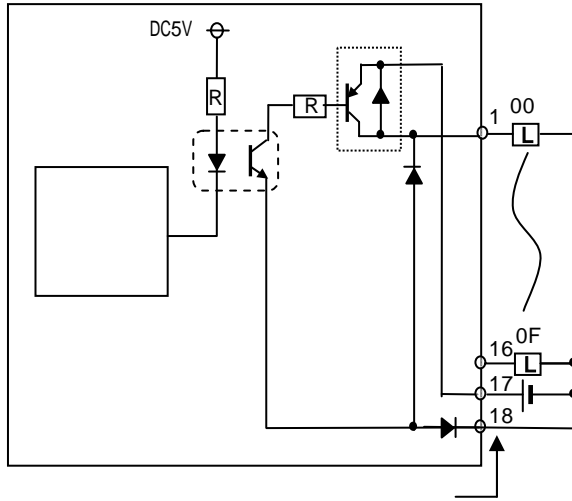
Connector 1 ()

Connector 2 ()

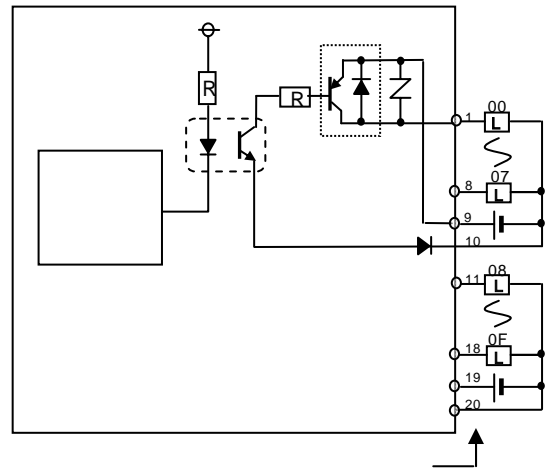
7.3.10 16

()

	MK300S		MK200S	
	G4Q-TR2B		G6Q-TR2B	
	16			
	DC 12 / 24V			
	DC 10.2 ~ 26.4V			
	0.5A/1 , 3A / 1COM		0.5A/1 , 4A / 1COM	
Off	0.1mA			
			4A / 10 ms	
On	DC 1.5V			
	Off → On	2 ms		
	On → Off	2 ms		
	8 / 1COM		16 / 1COM	
	110 mA (On)		180 mA (On)	
	DC24V ± 10% (4 Vp-p)			
	100mA (DC24V 1COM)		(DC24V 1COM) 48mA	
	On LED			
	20 (M3 X 6)		18	
	0.27 kg		0.18 kg	



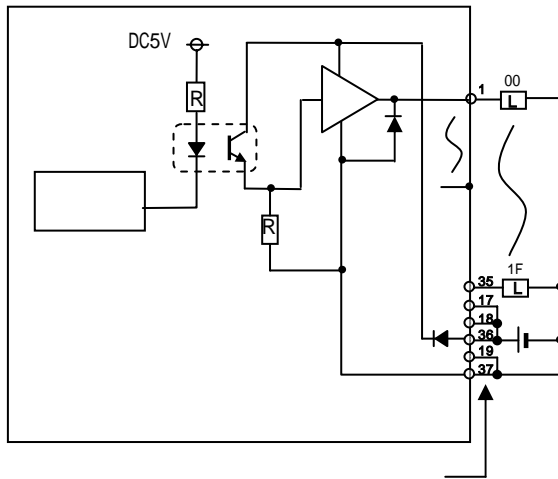
[G4Q-TR2B]



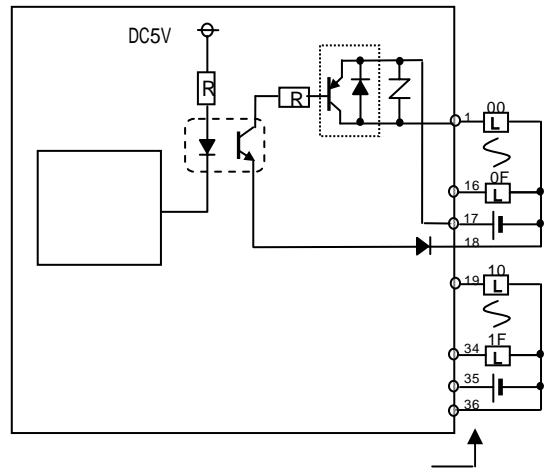
[G6Q-TR2B]

7.3.11 32 ()

		MK1000S	MK300S	MK200S
		G3Q-TR4B	G4Q-TR4B	G6Q-TR4B
		32		
		DC 12 / 24V		
		DC 10.2 ~ 26.4V		
		0.5A/1 , 3A / 1COM	0.1A/1 , 2A / 1COM	0.1A/1 , 2A / 1COM
Off		0.1mA		
		4A / 10 ms	4A / 10 ms	0.4A / 10 ms
On		DC 1.5V		
		DC 3.0V		
		DC 3.0V		
Off → On		2 ms		
On → Off		2 ms		
		16 / 1COM	32 / 1COM	
		120 mA (On)	110 mA (On)	180 mA (On)
		DC24V ± 10% (4 Vp-p)		DC10.2 ~ 26.4V
		150mA (DC24V 1COM)		36mA (DC24V 1COM)
		On LED		
		38 (M3 X 6)	37 Pin D-Sub	
		0.5 kg	0.18 kg	0.11 kg



[G4Q-TR4B / G6Q-TR4B]

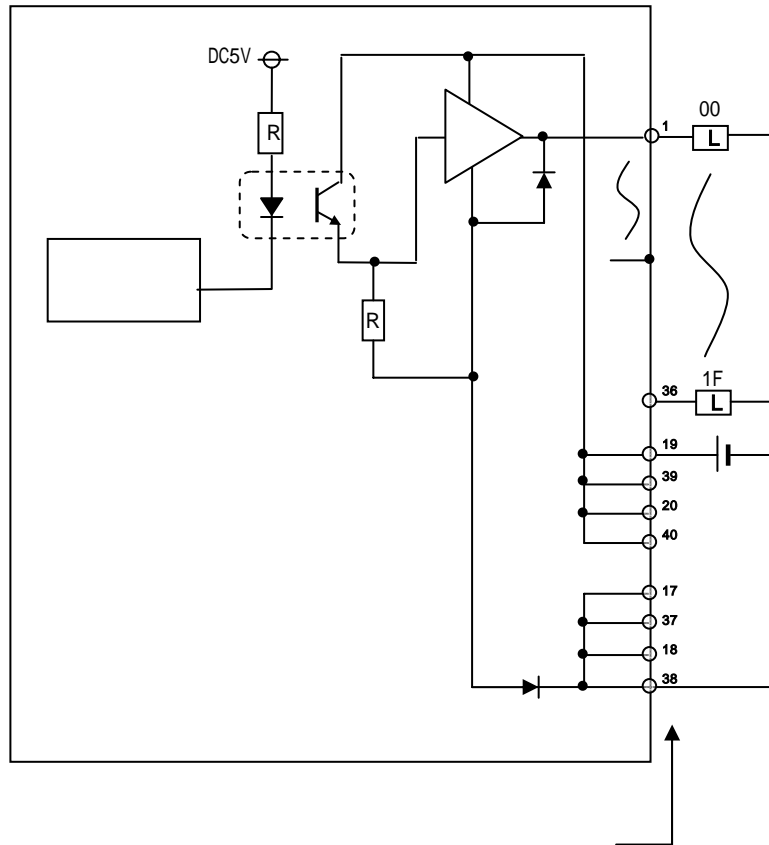


[G6Q-TR4B]

7.3.12 64

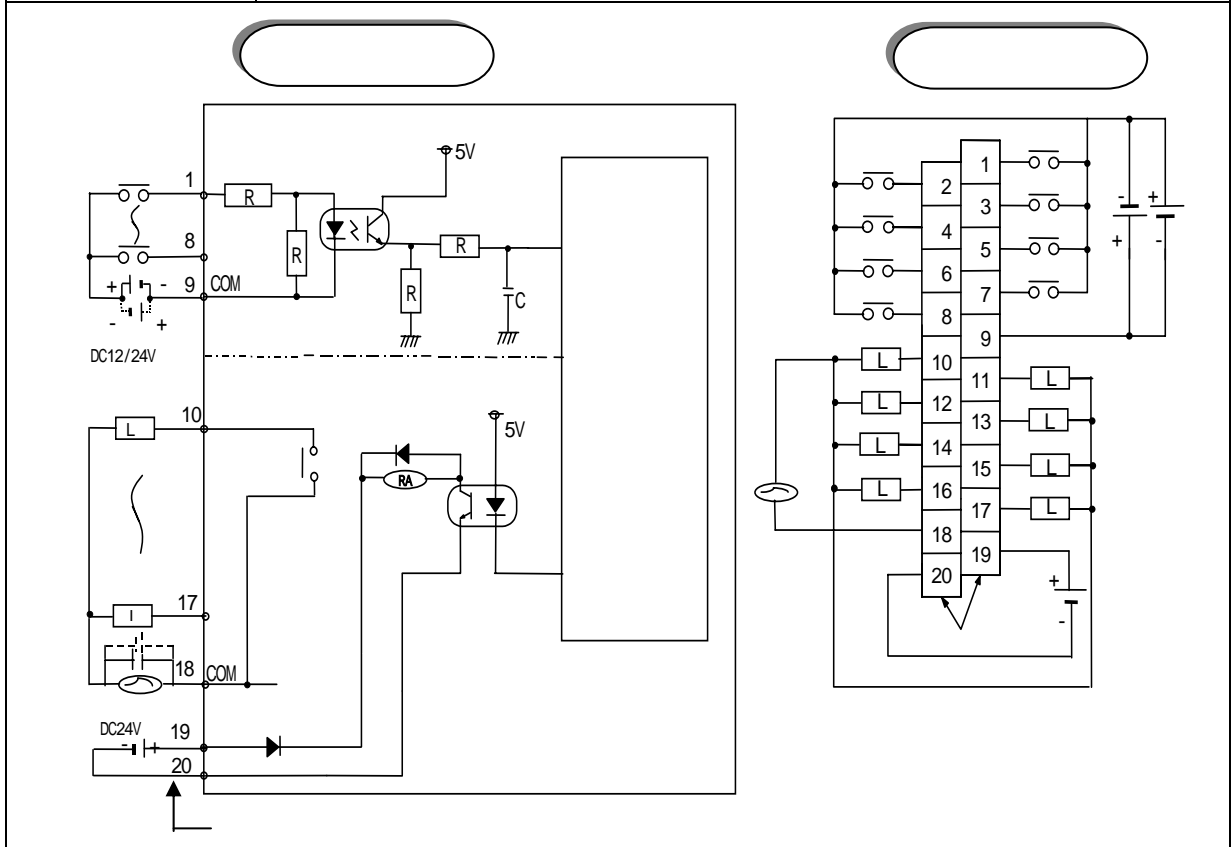
()

		MK1000S
		G3Q-TR8B
		64
		DC 12 / 24V
		DC 10.2 ~ 26.4V
		0.1A / 1 , 2A / 1COM
Off		0.1mA
		0.4 A / 10 ms
On		DC 3.0V
	Off → On	2 ms
	On → Off	2 ms
		32 / 1COM
		300 mA (On)
		DC10.2 ~ 26.4V
		100mA (DC24V 1COM)
		On LED
		40 2
		0.42 kg

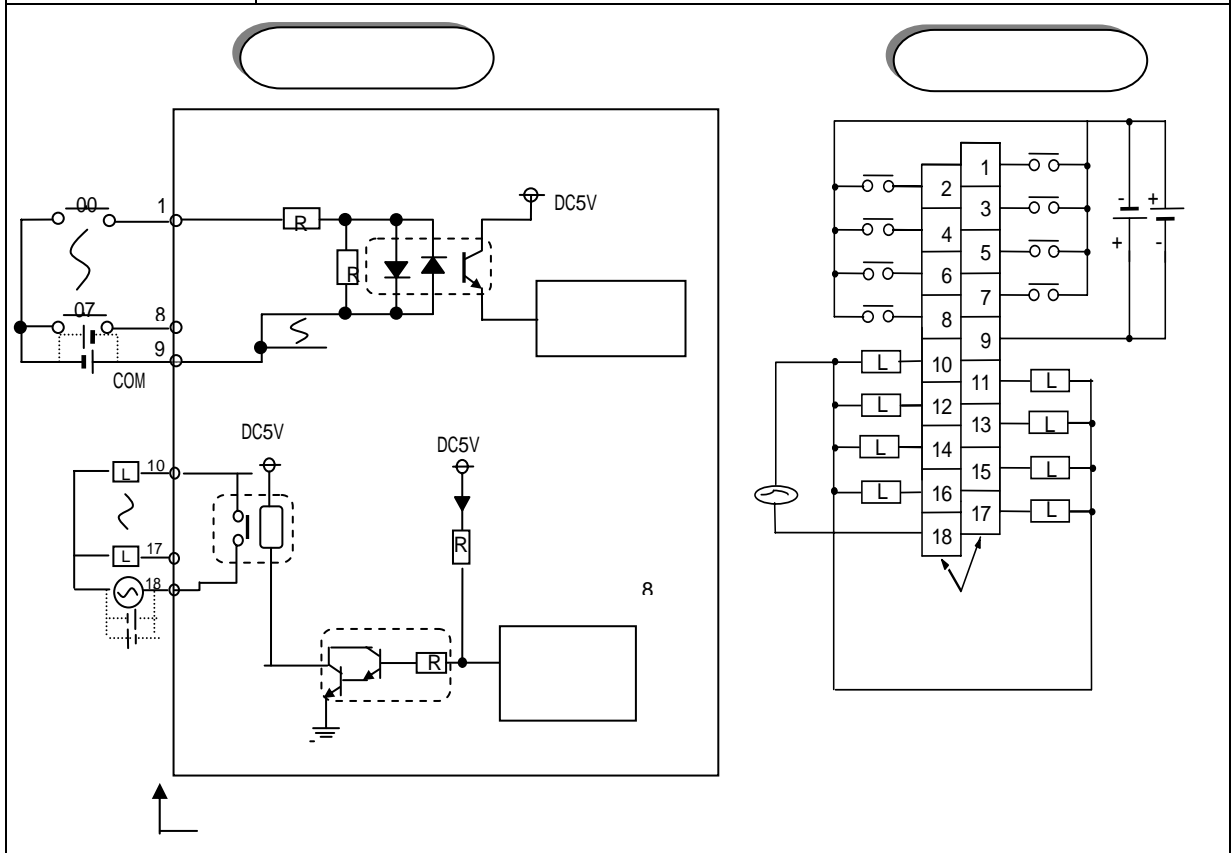


7.3.13 8 DC / 8 Relay

K300S			
G4H-DR2A			
	8		8
	DC12 / 24V	/	DC24V 2A()/1 , 4A / 1COM AC220V 2A(COSΨ = 1)
	5 / 11 mA	/	DC5V / 1 mA
	DC10.2~26.4V (5%)	/	AC250V, DC125V
	100% On	Off	0.1 mA (AC220V, 60Hz)
On /On	DC9.5V / 4.0 mA		1,200 /
Off /Off	DC6V / 1.0 mA		
	2.2 kΩ		
	Off → On		G4Q-RY2A
	On → Off		Off → On
			On → Off
	8 / 1COM		8 / 1COM
	On LED		DC24V ± 10% (4 Vp-p)
-	-		45 mA
-	-		On LED
	20 (M3 × 6)		
	100 mA		
	0.26 kg		

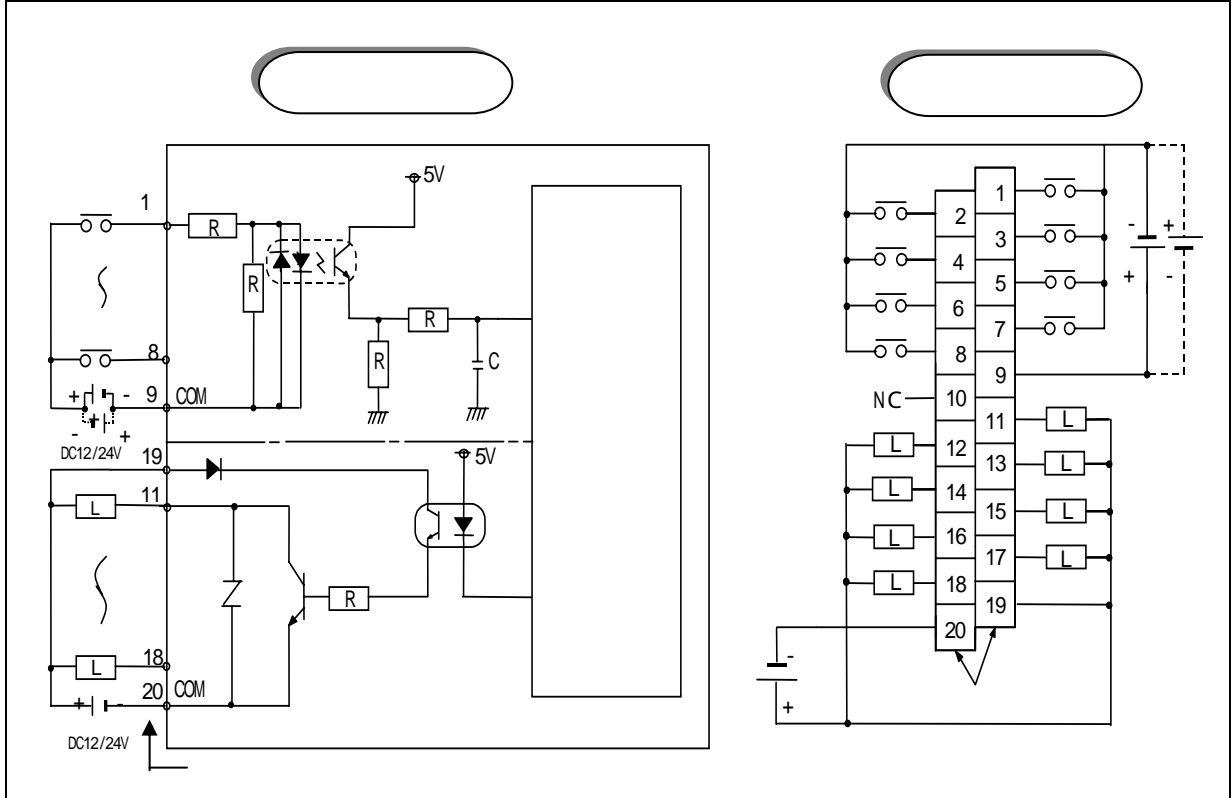


K200S			
G6H-DR2A			
	8		8
			Relay
	DC12 / 24V	/	DC24V 2A()/1 , 4A / 1COM AC220V 2A(COSΨ = 1)
	3 / 7 mA	/	DC5V / 1 mA
	DC10.2~26.4V (5%)	/	AC250V, DC125V
	100% On	Off	0.1 mA (AC220V, 60Hz)
On /On	DC9.5V / 3.0 mA		1,200 /
Off /Off	DC5V / 1.5 mA		
	3.3 kΩ		
	Off → On		G6Q-RY2A
	5 ms		
	On → Off		Off → On
	7 ms		10 ms
	8 / 1COM		On → Off
			12 ms
	On LED		8 / 1COM
-	-		On LED
	18 (M3×6)		
	250 mA		
	0.2 kg		



7.3.14 8 DC / 8 TR

K300S			
G4H-DT2A			
	8		8
	DC12 / 24V		DC12 / 24V
	5 / 11 mA		DC10.2 ~ 26.4V
	DC10.2~26.4V (5%)		0.5 A / 1 3 A / 1COM
	100% On	Off	0.1 mA
On / On	DC9.5V / 4.0 mA		4 A / 10 ms
Off / Off	DC6V / 1.0 mA	On	DC1.5V
	2.2 kΩ		
	Off → On	10 ms	Off → On
	On → Off	10 ms	On → Off
	8 / COM		8 / 1COM
	On LED		DC24V ± 10% (4 Vp-p)
-	-		50 mA
-	-		On LED
	20 (M3 × 6)		
	100 mA		
	0.26 kg		



8.1

1) K300S

(: mA)

CPU	K4P-15AS	130		G4F-HSCA	300
DC12/24V	G4I-D22A/B/C	70		G4F-H01A	400
	G4I-D24A/B/C	125		G4F-HDA	450
	G4I-D28A	250		K4F-POPA	400
AC110V	G4I-A12A	70		G4F-POPB	400
AC220V	G4I-A14A	70		G4F-PP1D	730
	G4Q-RY2A	100		G4F-PP2	700
	G4Q-TR2A	110		G4F-PP3	760
	G4Q-TR2B	110		G4F-PP10	720
	G4Q-TR4A	160		G4F-PP20	770
	G4Q-TR4B	160		G4F-PP30	740
	G4Q-TR8A	320		G4F-TC2A	450
	G4Q-SS2A	330		G4F-RD2A	600
	G4Q-SS2B	330	PID	G4F-PIDA	200
	G4F-INTA	65		G4F-AT3A	200
A/D	G4F-AD2A	400		G4L-CUEA	100
	G4F-AD3A	500	Fnet I/F	G4L-FUEA	160
D/A	G4F-DA1A	450	Fnet I/F	G4L-RBEA	150
	G4F-DA2V	400	DeviceNet I/F	G4L-DUEA	270
	G4F-DA2I	680	Profibus I/F	G4L-PUEA	560
	G4F-DA3V	700		G4L-PUEB	680
	G4F-DA3I	60	Ethernet I/F	G4L-EUEA	270
			Rnet I/F	G4L-RUEA	160
			Fast Enet I/F	G4L-EUxB	600
				G4L-EUxC	
			G4L-ERxx		

2) K1000S

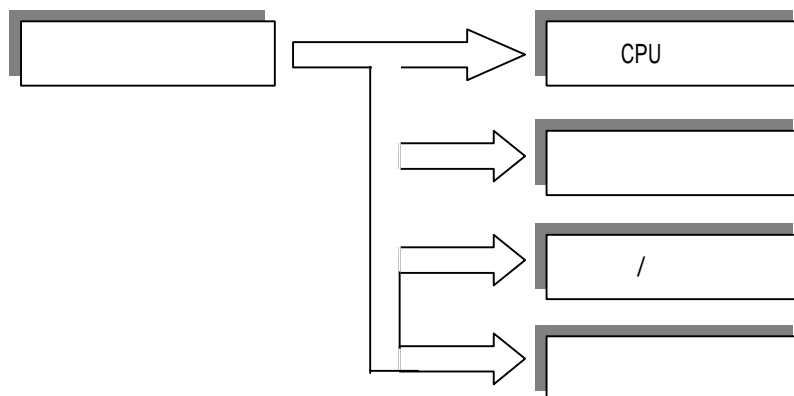
(: mA)

CPU	K7P-30AS	130		G3F-AD4A	700
DC12/24V	G3I-D22A	70	A/D	G3F-AD4B	540
	G3I-D22C			G3F-AD3A	500
	G3I-D22B	70		D/A	G3F-DV4A	350
	G3I-D24A	125	G3F-D14A		250
	G3I-D24C		G3F-DV3A		700
AC110V	G3I-A12A	70	G3F-D13A		60
	G3I-A14A	120			
AC220V	G3I-A22A	70		G3F-HSCA	300
	G3I-A24A	120		K7F-POPA	400
	G3Q-RY2A	100		G3F-POAA	700
	G3Q-RY4A	200		G3F-TC4A	450
	G3Q-TR2A	120		G3F-RD3A	800
	G3Q-TR4A	200	PID	G3F-PIDA	300
	G3Q-TR4B	200		G3F-AT3A	300
	G3Q-TR8A	300	Fnet I/F	G3L-FUEA	170
	G3Q-TR8B	300		G3L-FUOA	130
	G3Q-SS2A	330		G3L-FURA	200
	G3Q-SS4A	600	Fnet I/F	G3L-RBEA	160
	G3F-INTA	200		G3L-RBOA	160
Cnet I/F	G3L-CUEA	100		G3L-RBRA	230
Ethernet I/F	G3L-EUEA	530	Profibus I/F	G3L-PUEA	560
Mini-Map I/F	G3L-MUEA	600		G3L-PUEB	640
			Rnet I/F	G3L-RUEA	170
			Fast Enet I/F	G3L-EUxB	600
				G3L-EUxC	
G3L-ERxx					

3) K200S

(: mA)

CPU	K3P-07AS	170	D/A	G6F-DA2V	50
	K3P-07BS	210		G6F-DA2I	50
	K3P-07CS	170		G6F-HSCA	220
DC12/24V	G6I-D22A	70		G6F-HO1A	400
	G6I-D22B	70		G6F-HD1A	450
	G6I-D24A	75		G6F-POPA	345
	G6I-D24B	75		G6F-PP1D	570
AC110V	G6I-A11A	41		G6F-PP2D	680
AC220V	G6I-A21A	41		G6F-PP3D	780
	G6Q-RY1A	100		G6F-TC2A	70
	G6Q-RY2A	400		G6L-CU2A	108
	G6Q-TR2A	185		G6L-CU4A	138
	G6Q-TR2B	185		Fnet I/F	G6L-FUEA	215
	G6Q-TR4A	139	Fnet I/F	G6L-RBEA	150
	G6Q-TR4B	139	Profibus I/F	G6L-PUEA	510
G6Q-SS1A	330	G6L-PUEB		710	
	G6H-DR2A	250	DeviceNet I/F	G6L-DUEA	215
A/D	G6F-AD2A	50	Rnet I/F	G6L-RUEA	215
			Fast Enet I/F	G6L-EUxB	600
				G6L-EUxC	
				G6L-ERxx	



8.2

1) K1000S

		GM1-PA1A	GM3-PA1A	GM1-PA2A	GM3-PA2A	GM3-PD3A
		AC110V (-15% +10%)		AC220V (-15% +10%)		DC24V
		50/60Hz(47 63 Hz)				-
		2.5A		1.5A		2.6A
		40A				100A
		65% ()				60%
		250VAC 5A				250VAC 8A
		20 ms				1 ms
		DC5V	DC5V/24V	DC5V	DC5V/24V	DC5V
		12A	5A/1.5A	12A	5A/1.5A	6A
		13 20A	5.75 13A 1.6 3A	13 20A	7.5 13A 1.6 3A	6.5 9.5A
		LED On				
		0.75 2mm ²				
(Kg)		0.7				

2) MK300S

		GM4-PA1A	GM4-PA1B	GM4-PA2A	GM4-PA2B	GM4-PA2C	GM4-PD3A
		AC110V (-15% +10%)		AC220V (-15% +10%)			DC24V
		50/60Hz(47 63 Hz)					-
		1.3A		0.8A		0.6A	1.2A
		40A				150A	100A
		65% ()					
		250VAC 3A					250VAC 5A
		20 ms					1 ms
		DC5V/ DC24V	DC5V/ DC24V	DC5V/ DC24V	DC5V/ DC24V	DC5V	DC5V
		4A/0.7 A	3A/0.5 A	4A/0.7 A	3A/0.5 A	8A	4A
		4.4 15A /0.9 3A	3.4 12A /0.7 3A	4.4 15A /0.9 3A	3.4 12A /0.7 3A	8.8 ~ 14.5A	4.4 10A
		LED On					
		0.75 2mm ²					
(Kg)		0.4					

3) K200S

	GM6-PAFA	GM6-PAFB	GM6-PAFC	GM6-PA2A
	AC100 240V		AC220V	
	50/60Hz(47 63 Hz)			
	0.7/0.35A		0.8/0.4A	0.4A
	30A		50A	60A
	65% ()			
	250VAC 3A			
	20 ms			
	DC5V DC24V	DC5V DC+15V, DC-15V	DC5V DC24V	DC5V
	DC5V:2A DC24V:0.3A	DC5V:2A DC+15V:0.5A DC-15V:0.2A	DC5V:3.5A DC24V:0.3A	DC5V:6A
	DC5V:2.2~7.0A DC24V:0.33~1.7A	DC5V:2.2~7.0A DC+15V:0.55~1.5A DC-15V:0.22~1.5A	DC5V:4.0~23.3A DC24V:0.4~4.4A	DC5V:6.6~11A
	LED On			
	0.75 2mm ²			
(Kg)	0.4			

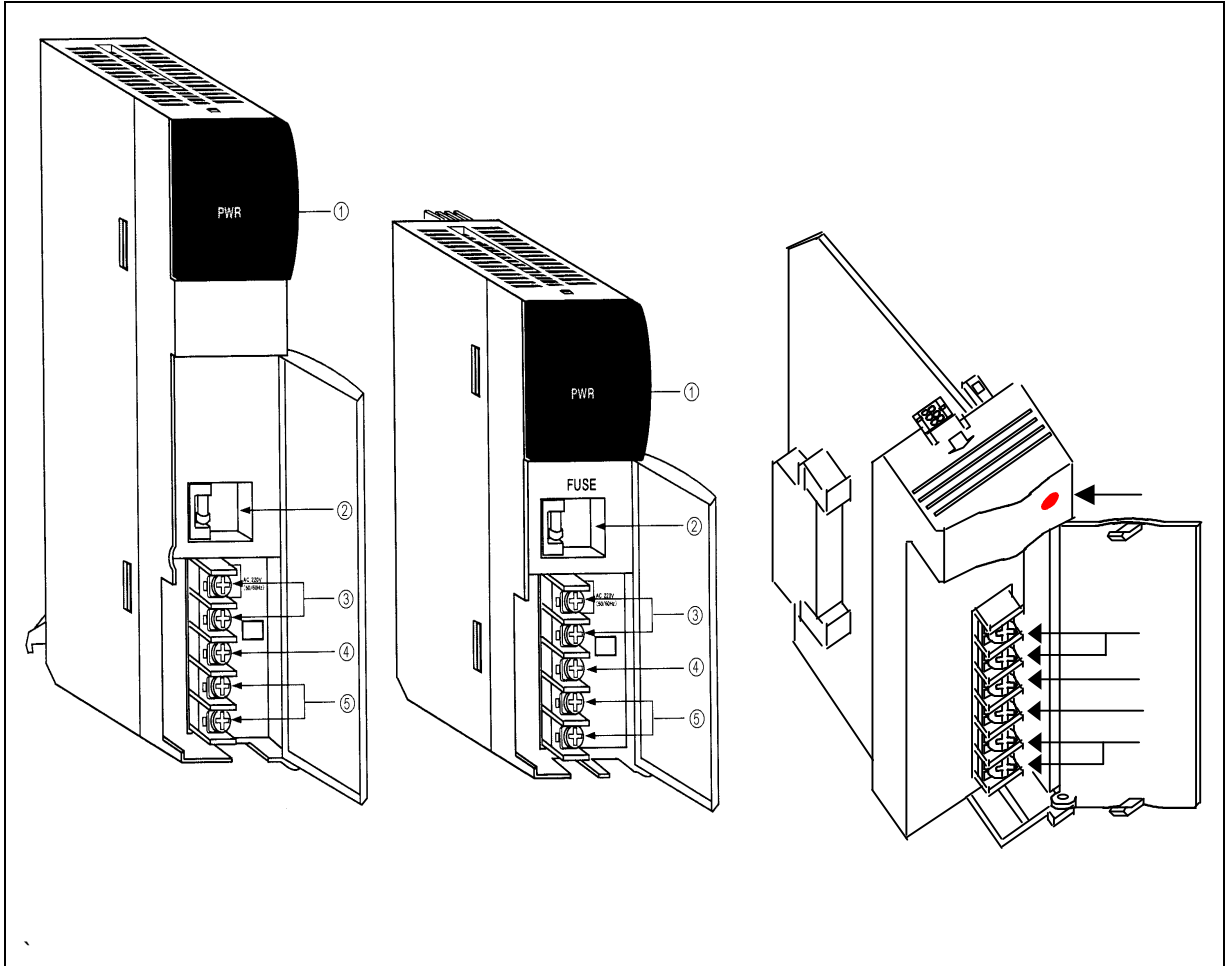
	GM6-PDFA	GM6-PDFB
	DC12/24V	DC12/24V
	0.7/1.8A	0.7/1.2A
	40A	
	60% ()	
	-	50VAC 5A
	1 ms	
	DC5V	DC5V/DC+15V/DC-15V
	DC5V:2A	DC5V:3A, DC+15V:0.5A, DC-15V:0.2A
	DC5V:2.1~3.4A	DC5V:3.3~13.2, DC+15V:0.55~3.9A, 5V:0.22~3.6.A
	LED On	
	0.75 2mm ²	
(Kg)	0.4	

1) : Off 가 AC110 / 220V (AC85 / 170V)

2) (1) DC5V, DC24V 가 가

(2) 가 , 가

8.3



No.		
1	LED	DC5V LED
2		AC 3A (K200S PCB)
3		AC110V AC220V (DC DC24V)
4	LG	
5	DC24V, 24G	DC24V 가 (K3S-304S N.C)
6	FG	

9.1

9.1.1

1) MK1000S

	GM3-B04M	GM3-B06M	GM3-B08M
	4	6	8
(mm)	297 X 250 X 17	367 X 250 X 17	437 X 250 X 17
	ϕ 4.5 (M4)		
FG	BHM 3 X 6		
(kg)	1.7	2.1	2.5

2) MK300S

	GM4-B04M	GM4-B06M	GM4-B08M	GM4-B12M
	4	6	8	12
(mm)	297 X 135 X 17	367 X 135 X 17	437 X 135 X 17	540 X 135 X 17
	ϕ 4.5 (M4)			
FG	BHM X 6			
(kg)	0.85	1.1	1.4	1.85

3) MK200S

	GM6-B04M	GM6-B06M	GM6-B08M	GM6-B12M
	4	6	8	12
(mm)	244 X 110 X 62	314 X 110 X 17	384 X 110 X 17	524 X 110 X 17
	ϕ 4.5 (M4)			
FG	BHM 3 X 6			
(kg)	0.24	0.35	0.75	1.00

1) GM4-B12M

9.1.2

1) MK1000S

	GM3-B04E	GM3-B06E	GM3-B08E
	4	6	8
(mm)	297 X 250 X 17	367 X 250 X 17	437 X 250 X 17
	ϕ 4.5 (M4)		
FG	BHM 3 X 6		
(kg)	1.7	2.1	2.6

2) MK300S

	GM4-B04E	GM4-B06E	GM4-B08E
	4	6	8
(mm)	297 X 135 X 17	367 X 135 X 17	437 X 135 X 17
	ϕ 4.5 (M4)		
FG	BHM 3 X 6		
(kg)	0.9	1.15	1.4

9.1.3

1) MK1000S

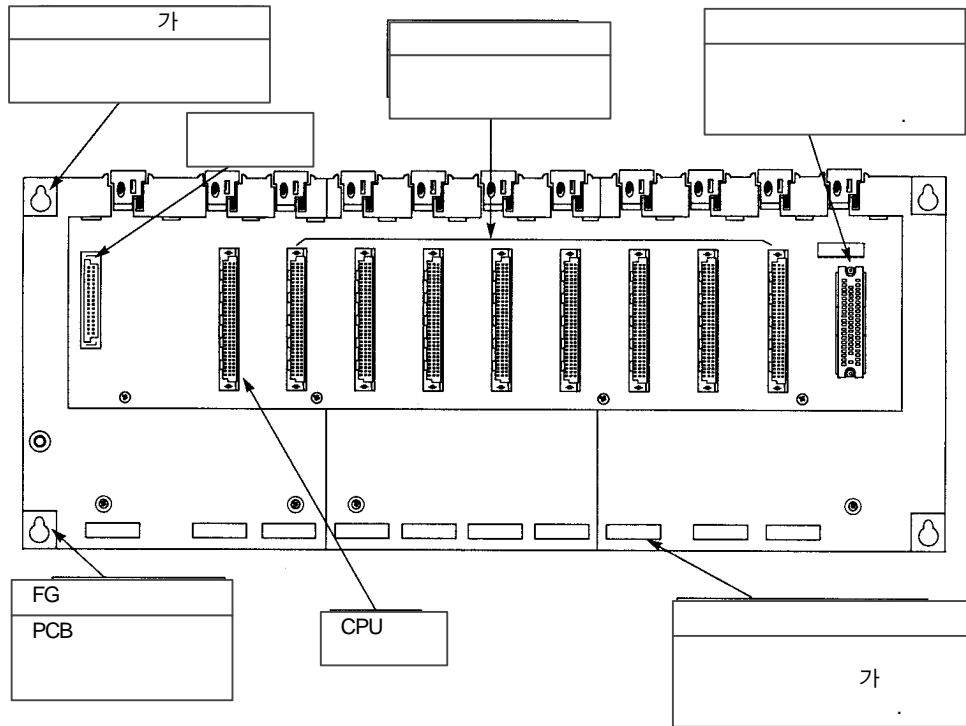
	G3C-E061	G3C-E121	G2C-E301
(m)	0.6	1.2	3.0
(kg)	0.37	0.52	1.27

2) MK300S

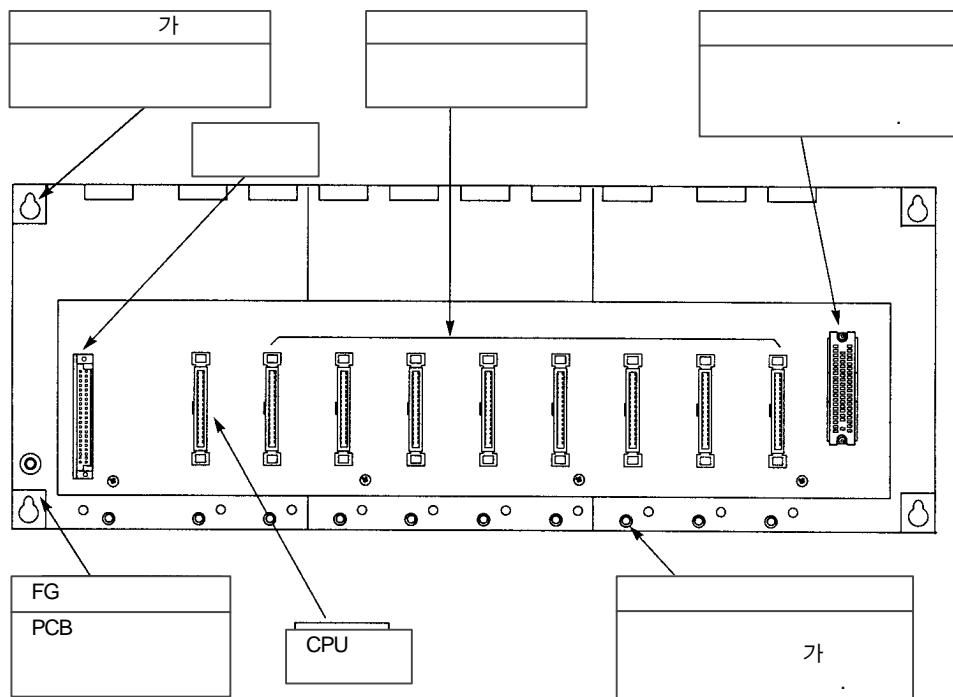
	G4C-E041	G4C-E121	G2C-E301
(m)	0.4	1.2	3.0
(kg)	0.21	0.52	1.09

9.2.1

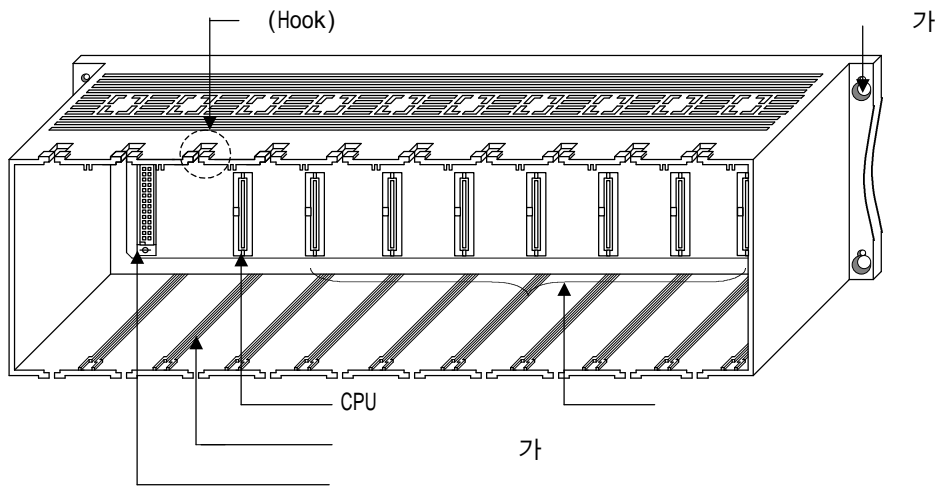
1) MK1000S



2) MK300S

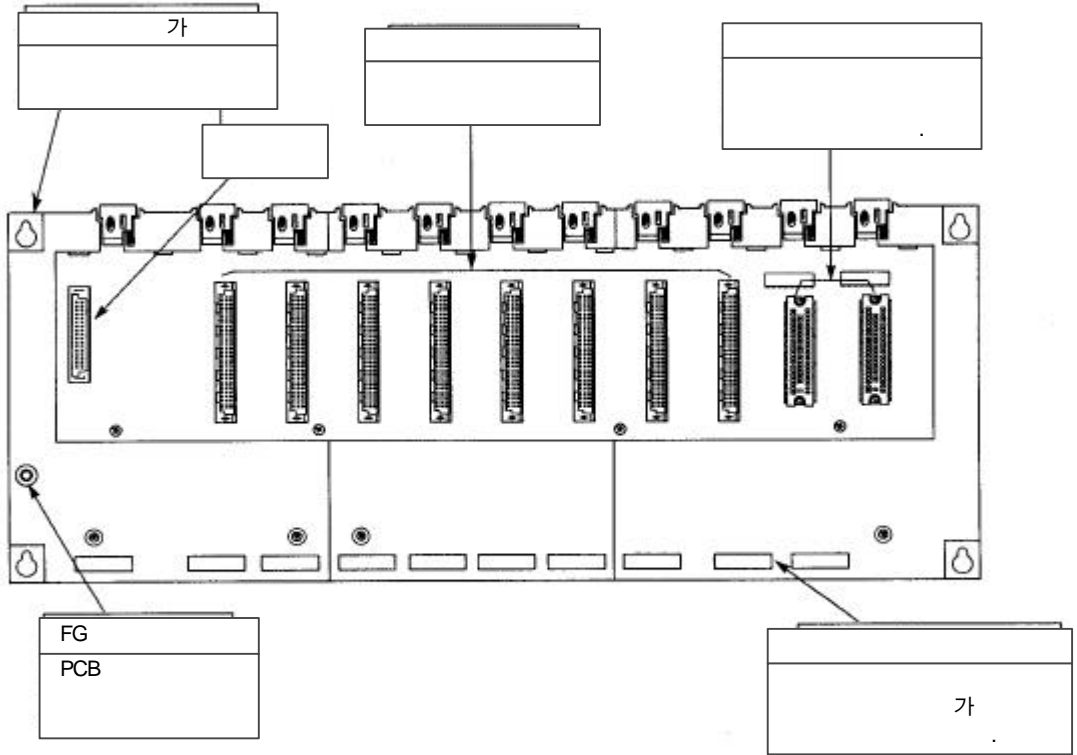


3) MK200S

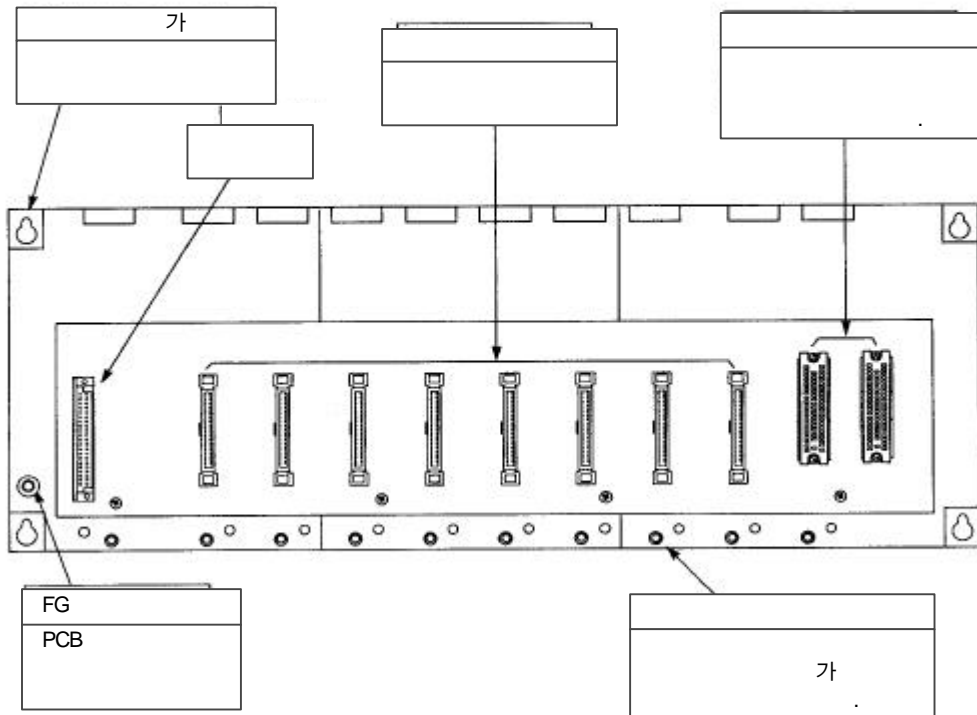


9.2.2

1) K1000S



2) MK300S



10.1

10.1.1

가

1)

- (1) 가
- (2) 가
- (3)
- (4)
- (5) 가 0 ~ 55C
- (6) 가 5 ~ 95%
- (7) 가 가 가 가

2)

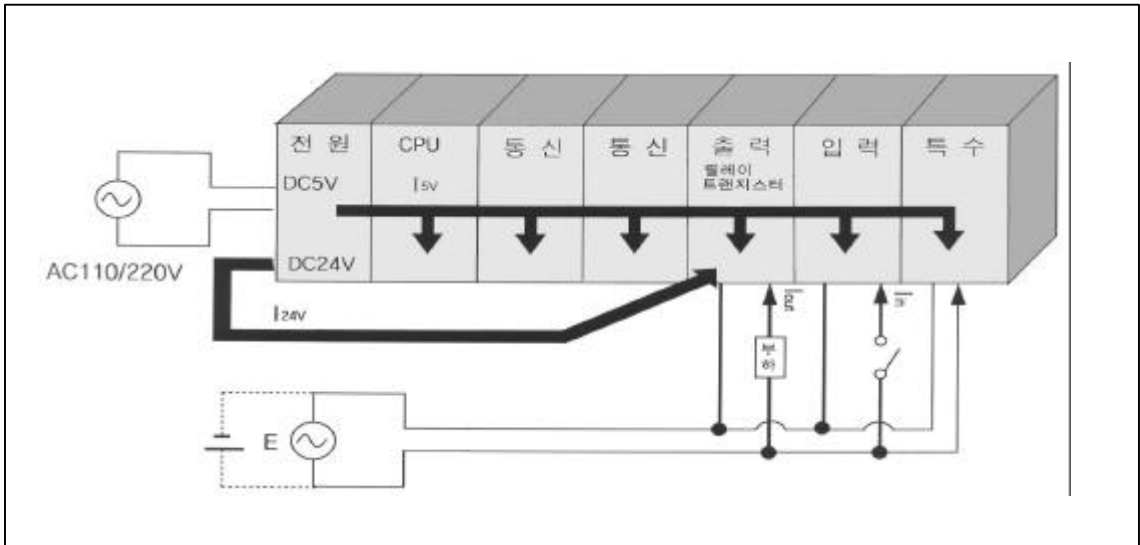
- (1) 가 PLC 가 가
- (2)
- (3) (Panel)
- (4) 50mm
- (5)

3)

- (1) PLC PLC
- (2) , 가 PLC

PLC

1) PLC



2)

(1)

70% , 30%

3/7

• $W_{pw} = 3/7 \{ (I_{5v} \times 5) + (I_{24v} \times 24) \}$ (W)

I_{5v} : DC5V ()

I_{24v} : DC24V (On)

(2) DC5V

DC5V

• $W_{5v} = I_{5v} \times 5$ (W)

(3) DC24V (On)

DC24V

• $W_{24v} = I_{24v} \times 24$ (W)

(4) (On)

• $W_{out} = I_{out} \times V_{drop} \times \dots \times On$ (W)

I_{out} : () (A)

V_{drop} : (V)

10.1.2

- PCB
- 가
- 가

1)

(1)

가

(2)

(0.3mm²)

AWG22

(3)

가

(4)

가

(5)

-

- (LED)

(LED)

가

- (

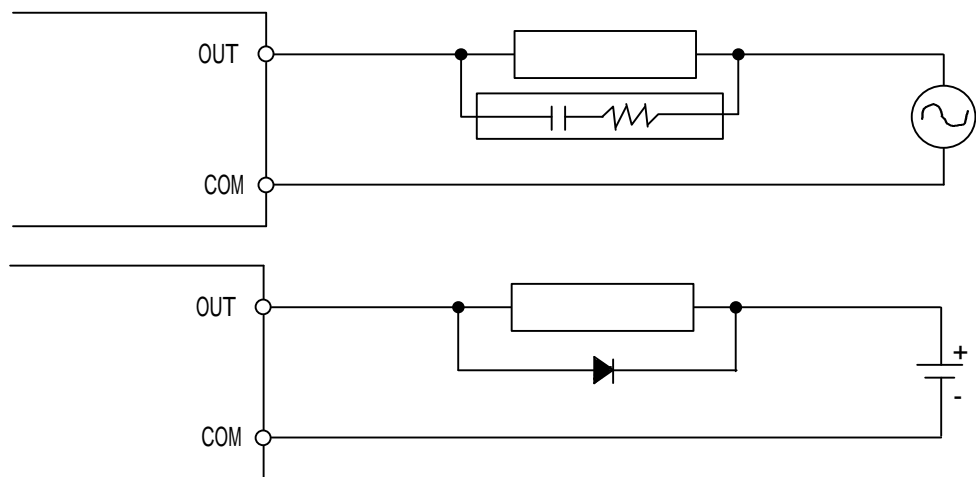
.)

- 가

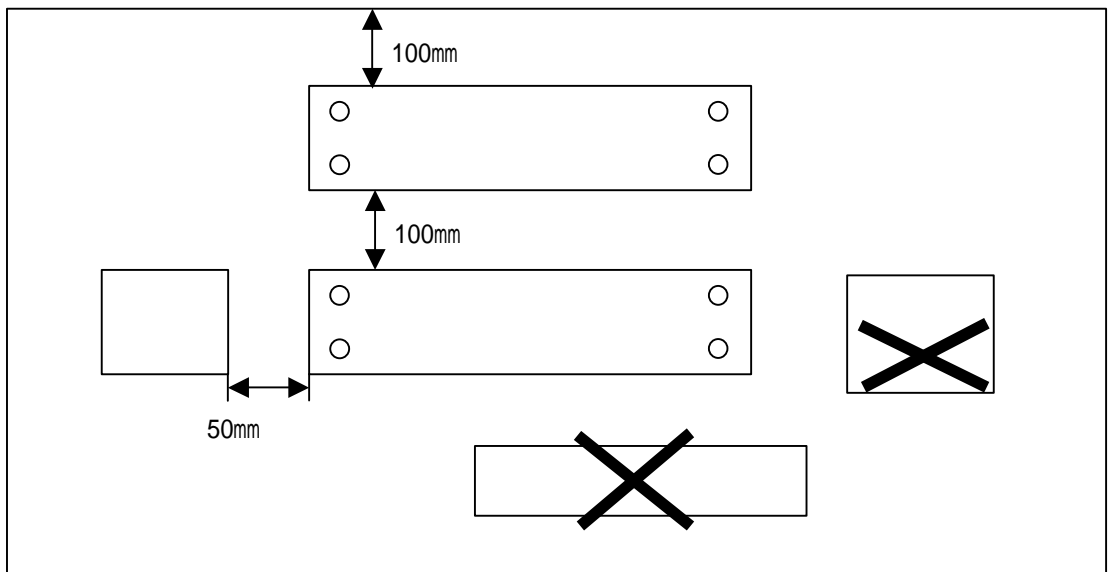
가

(Surge Killer)

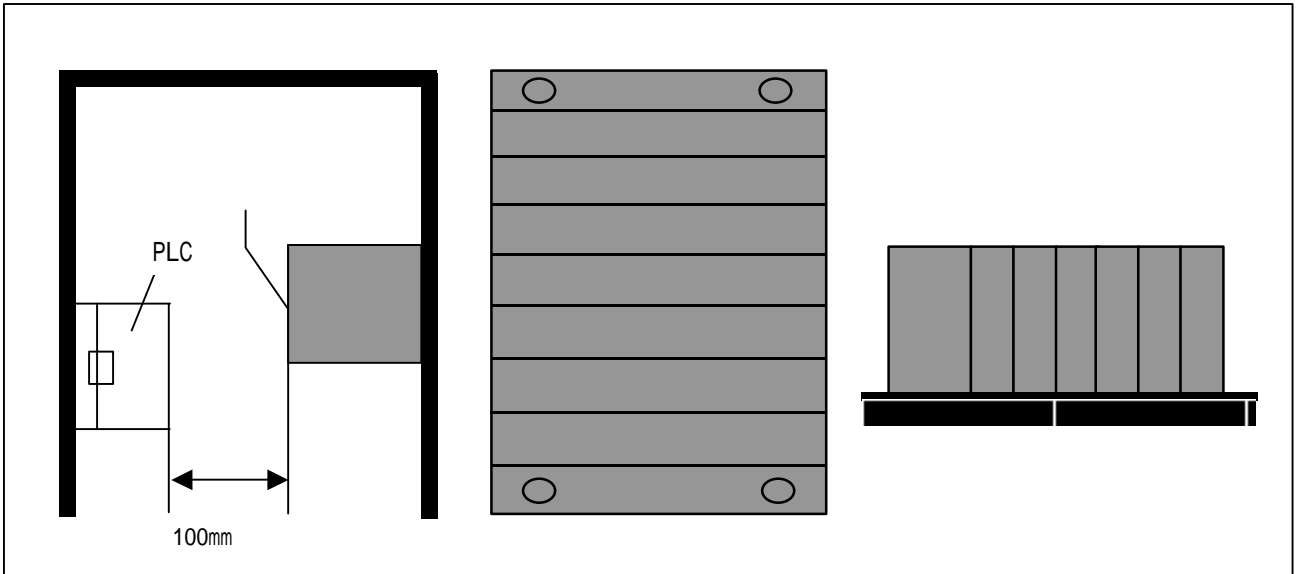
+



- (6) , 가 가 PLC
- (7) 가 , PCB
- 2) PLC
- (1)
- (2)
- (3) (Panel)
- (4) , PLC 가 10.1
- PLC 50mm (Hook)
 - PLC
- (5)) 100mm 50mm PLC 가 (



[14.1] PLC



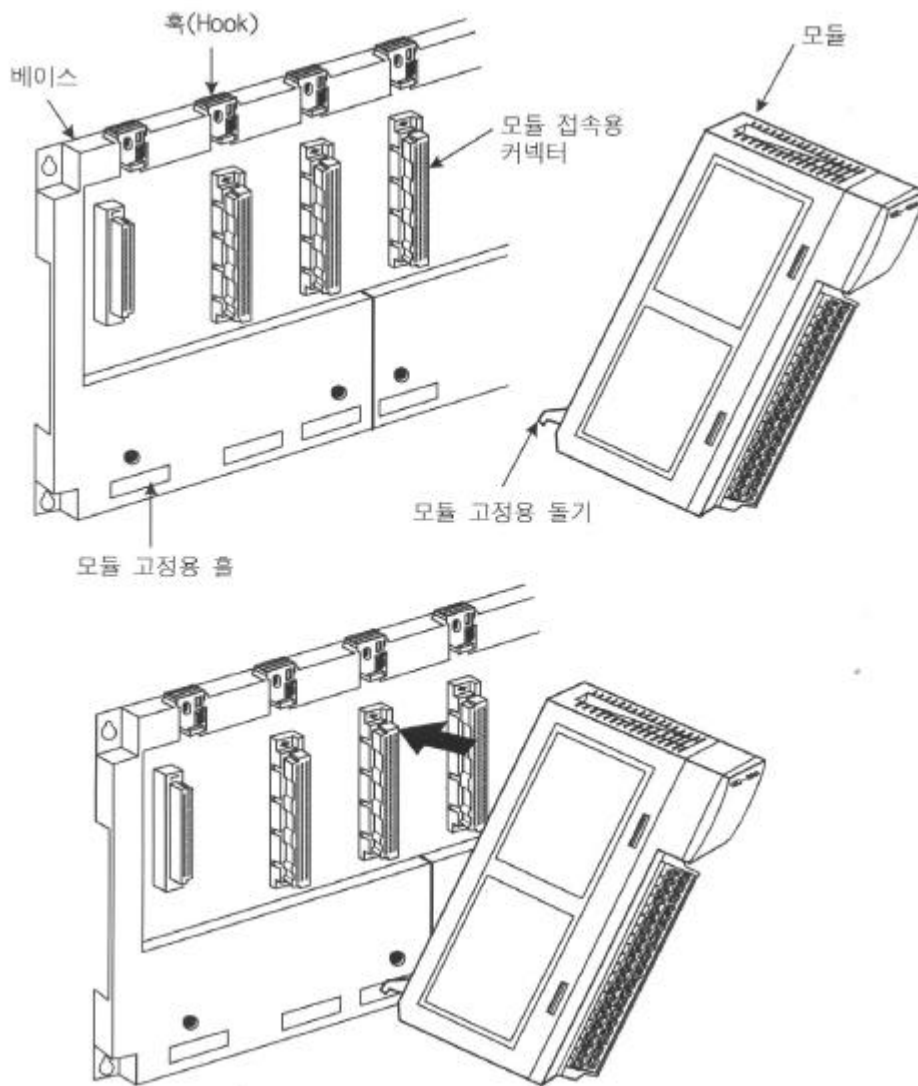
[10.2]

[10.3] (가)

[10.4] (가)

10.1.3

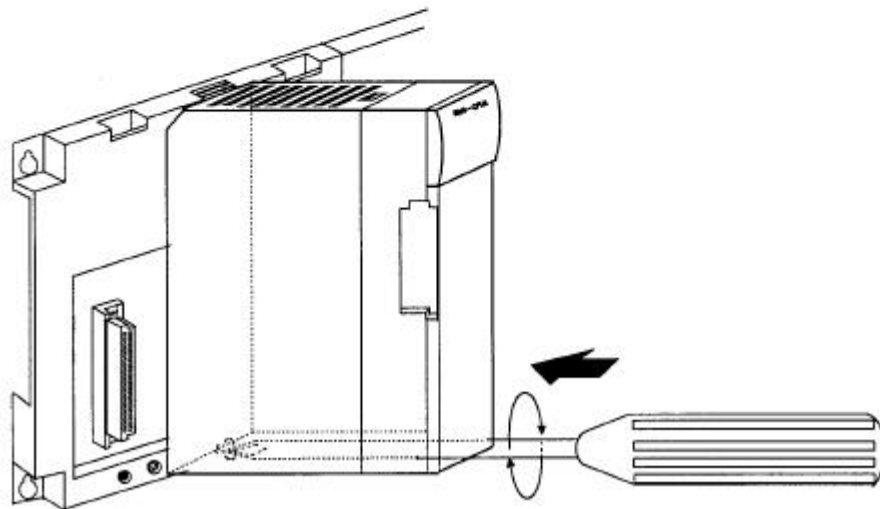
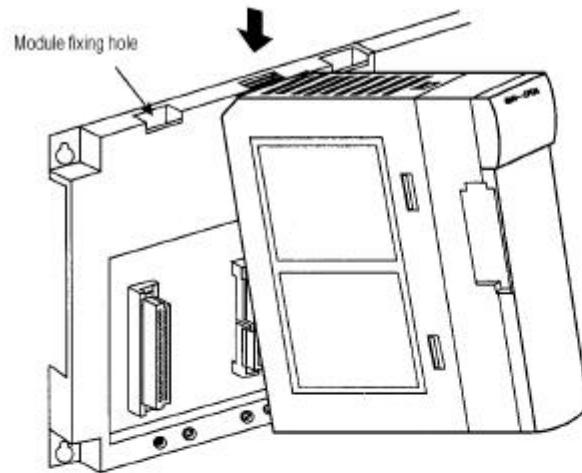
- 1)
- (1) K1000S
-
-
-



1)

(2) K300S

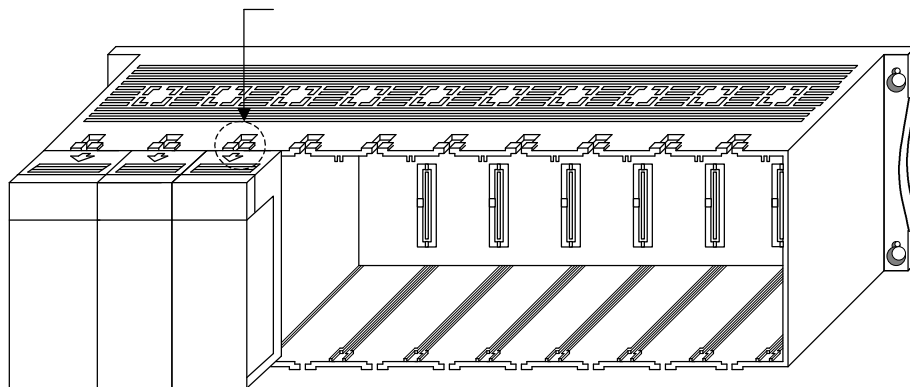
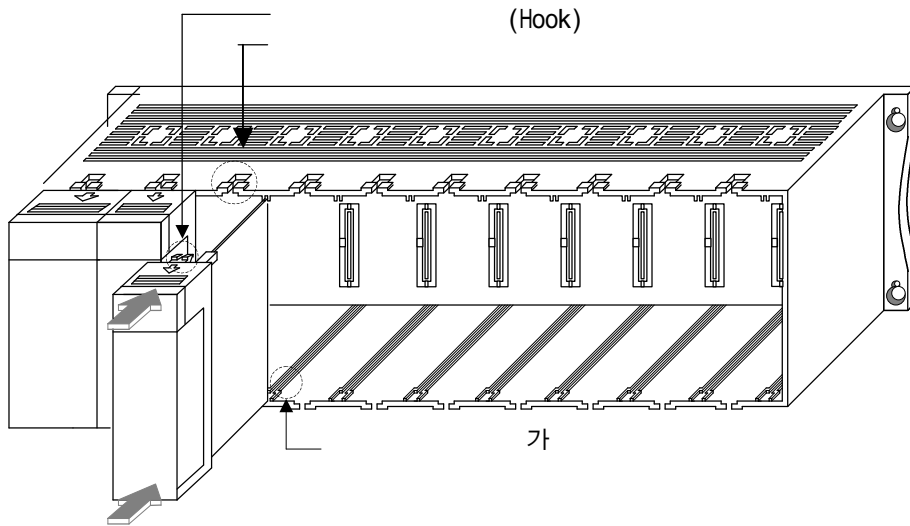
-
-
-



1)

(3) K200S

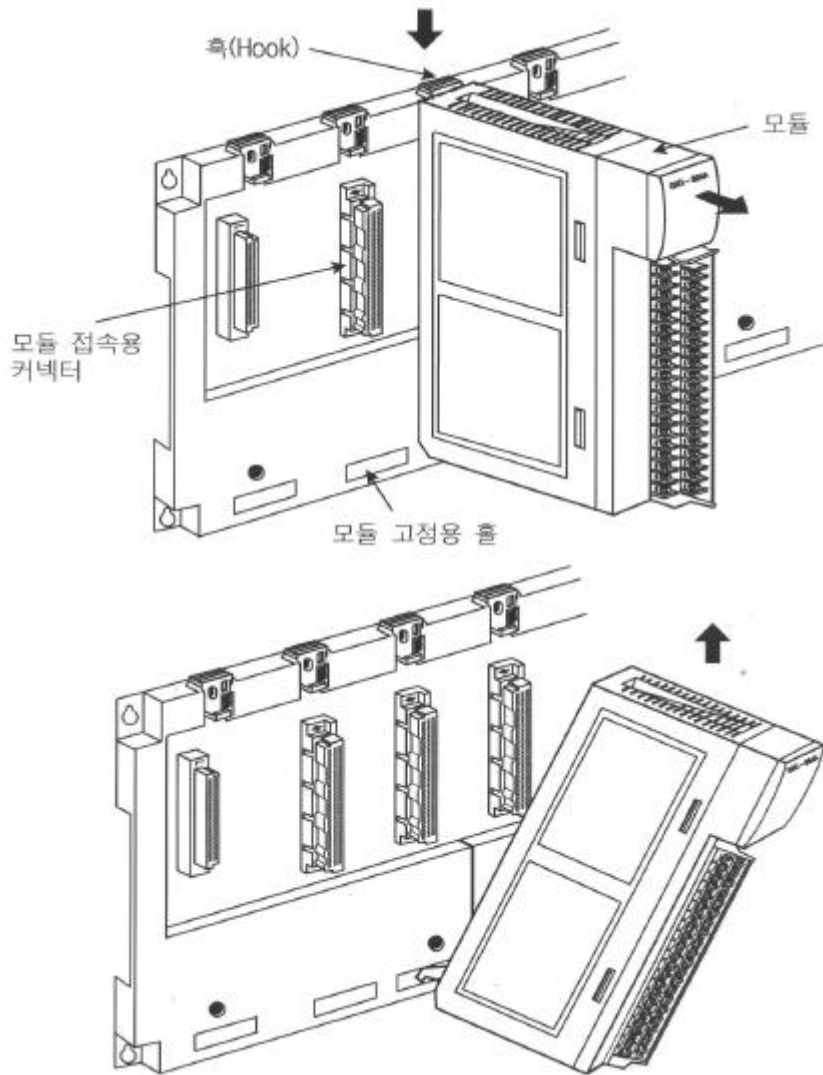
- 가 ()



2)

(1) K1000S

-
-
-

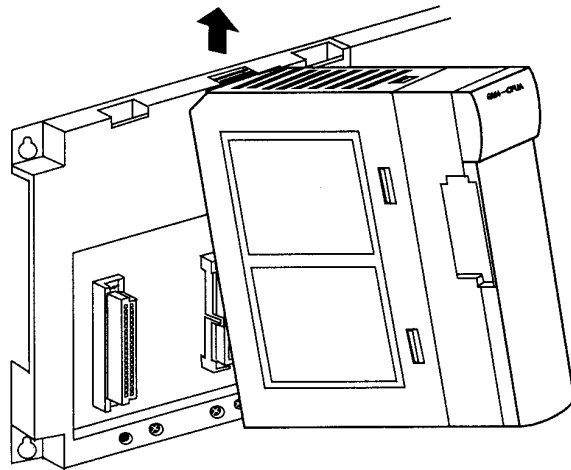
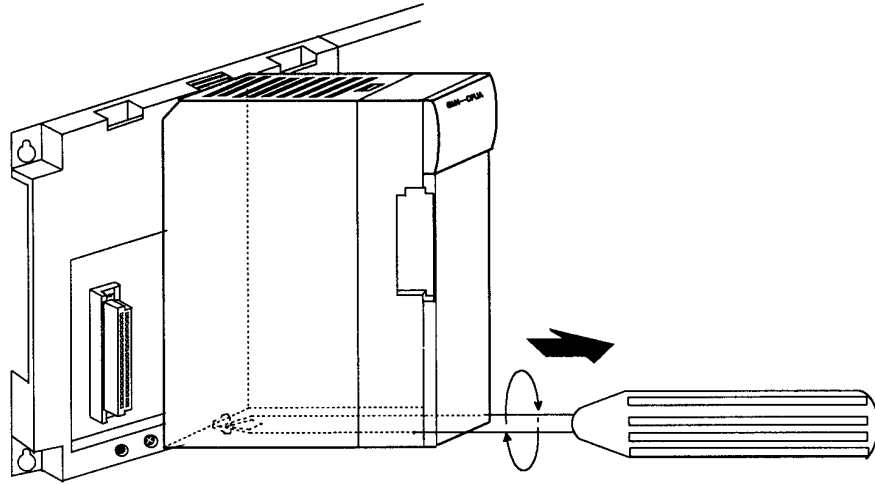


1)

가

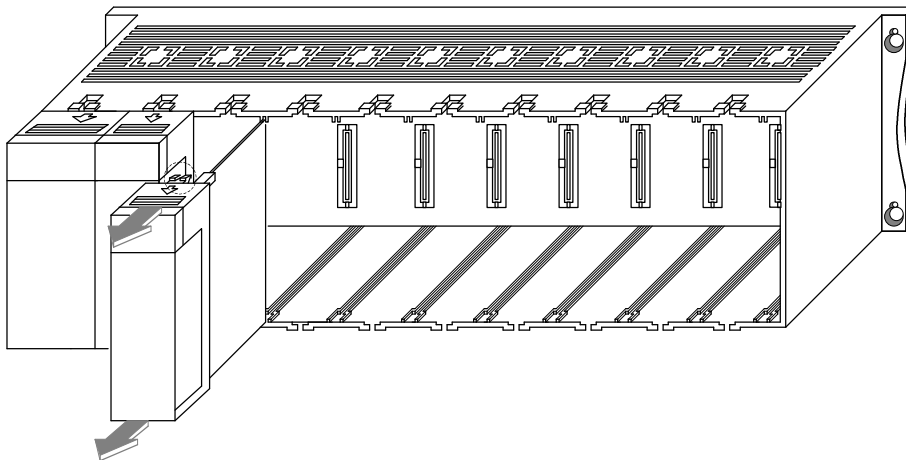
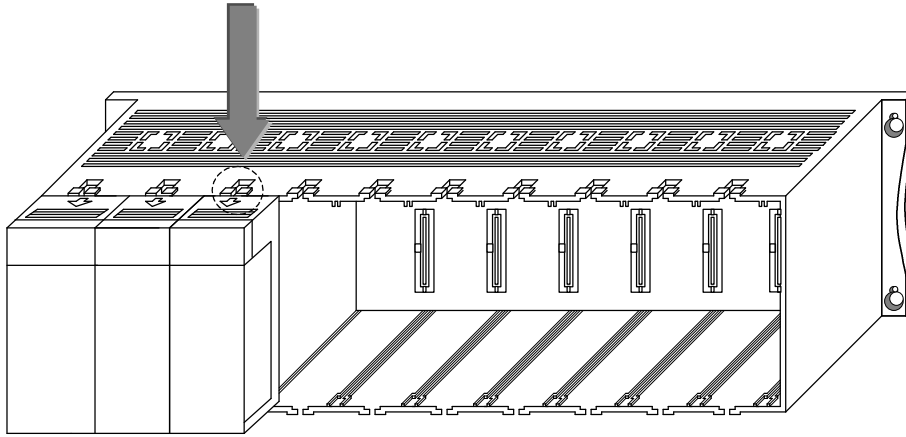
(2) K300S

-
-



(3) K200S

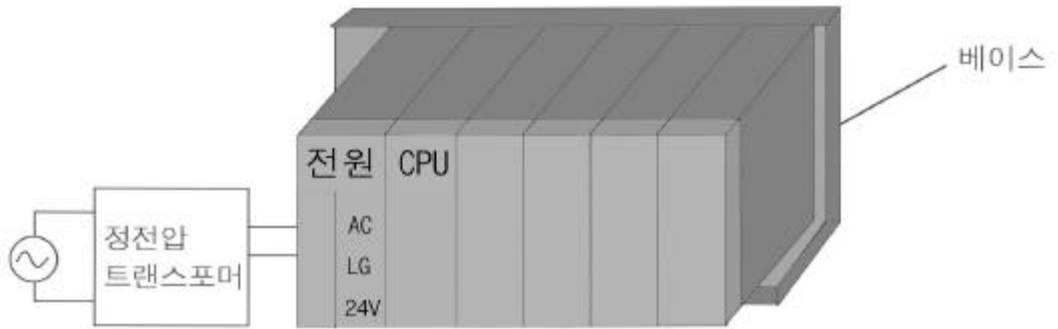
•



10.2

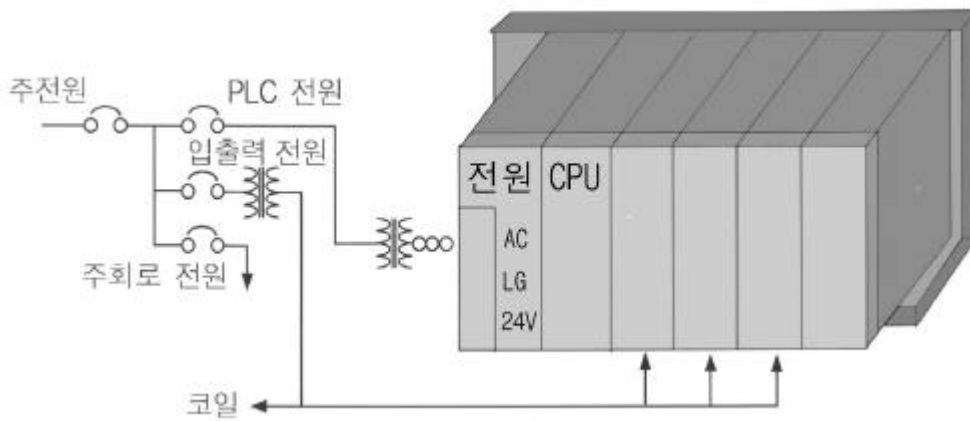
10.2.1

1)



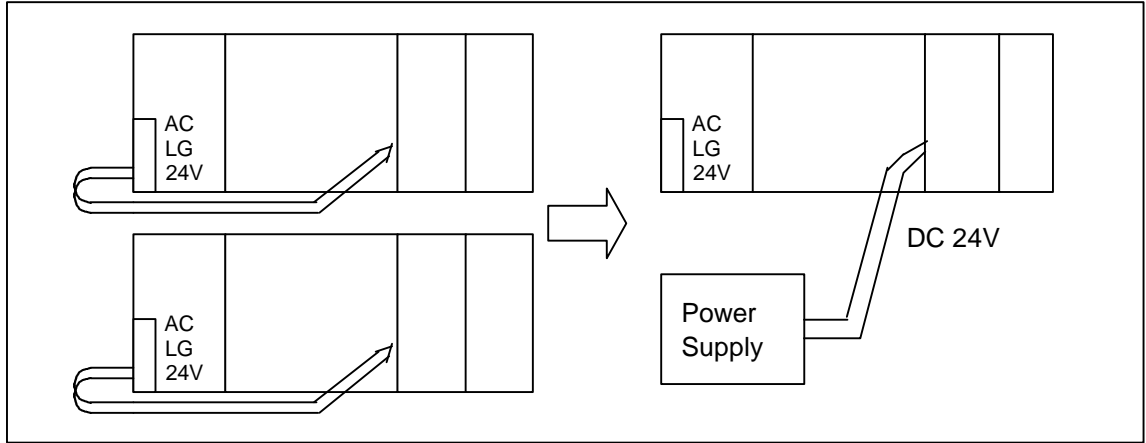
2) 가 가 (가 .)

3) PLC



4) DC24V

- DC24V
- 1 DC24V DC24V

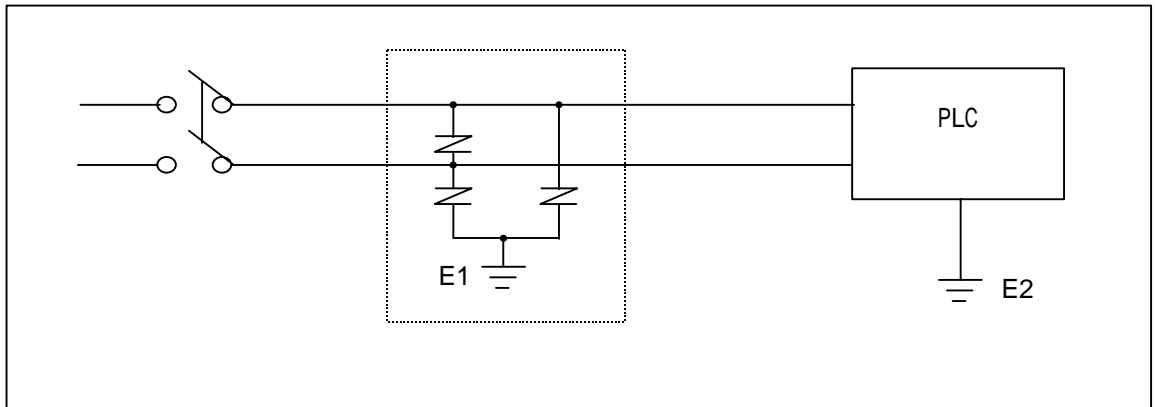


5) AC110V , AC220V , DC24V 가

6) AC110V , AC220V 가 (2mm²)

7) AC110V , DC24V (,) ,
가 100mm

8)



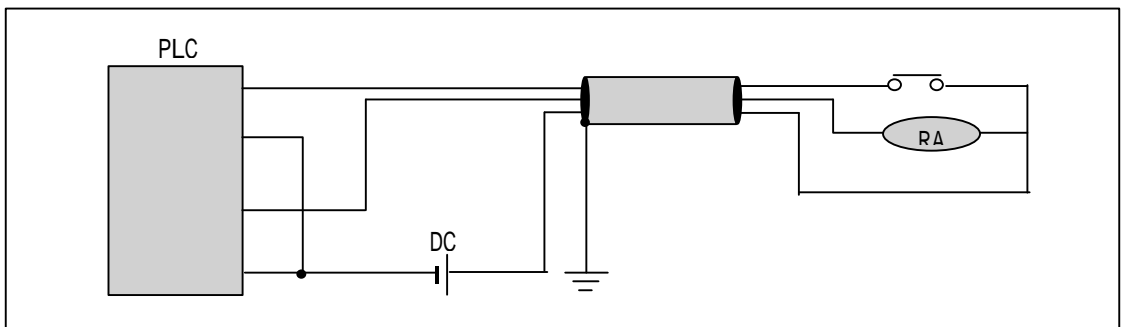
- 1) (E1) PLC (E2)
- 2)

9) 가

10) 가

10.2.2

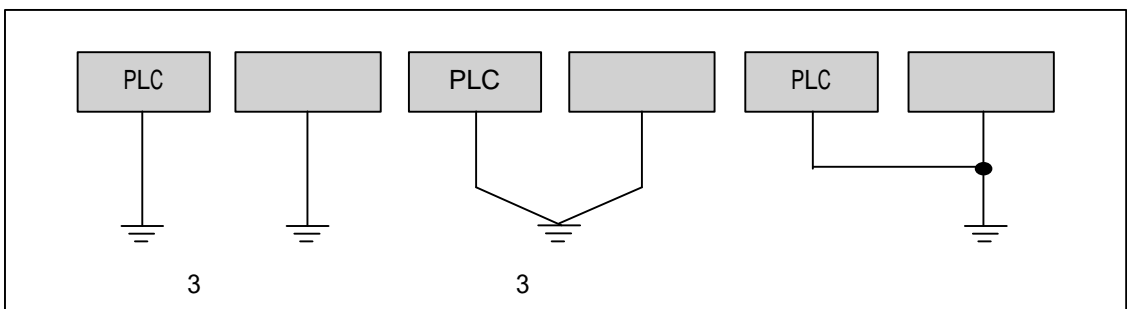
- 1) $0.3 \sim 2 \text{ mm}^2$, (0.3 mm^2)
- 2) .
- 3) 100mm .
- 4) , PLC



- 5) .
- 6) DC24V AC110V AC220V .
- 7) 200m
12 12.4 .

10.2.3

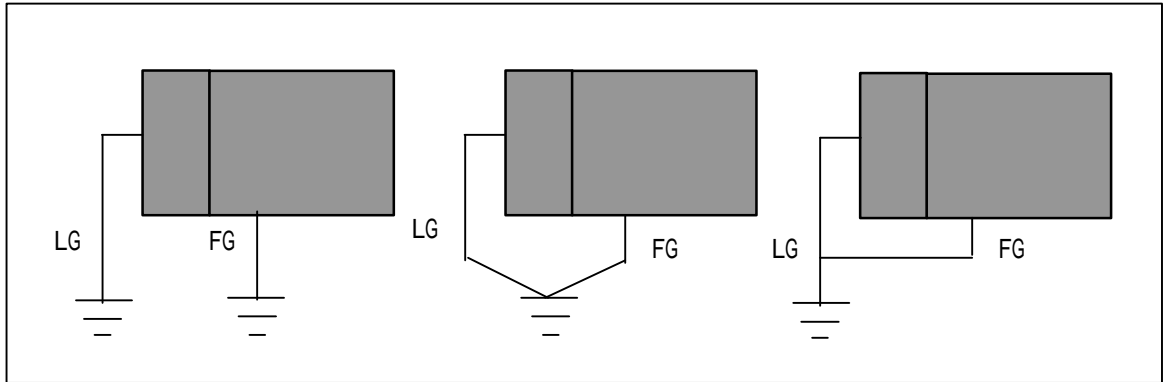
- 1) PLC , 가
- 2) 가 3 (100 Ω) .
- 3)) .



- 가) : 가) :

4) 2 mm² 가 PLC

5) LG FG



가) : 가) :

6) FG

10.2.4

	(mm ²)	
	0.18 (AWG24)	1.5 (AWG16)
	0.18 (AWG24)	2.0 (AWG14)
	0.18 (AWG24)	1.5 (AWG16)
	0.18 (AWG24)	1.5 (AWG16)
	1.5 (AWG16)	2.5 (AWG12)
	1.5 (AWG16)	2.5 (AWG12)

11

PLC

11.1

6 1~2

		0 ~ + 55C	가
		5 ~ 95%RH	
		- 15% / 10%	

11.2

		<ul style="list-style-type: none"> 가 가 		
			가	
LED	LED		()	12
	RUN LED	Run	()	12
	STOP LED	Run		12
	LED	,	On Off	12
	LED	,	On Off	12

11.3

6 1~2

		/ 가	0 ~ 55°C	()
			5 ~ 95%RH	
			가 가	
PLC	,	.		
	,			
		AC110 / 220V	AC85 ~ 132V AC170 ~ 264V	
		,	• 가 • 가	가
			•	가

12.1

가

1)

- (,)
-
-
- (,)
- (Power LED, Run LED, Stop LED, LED) , PLC

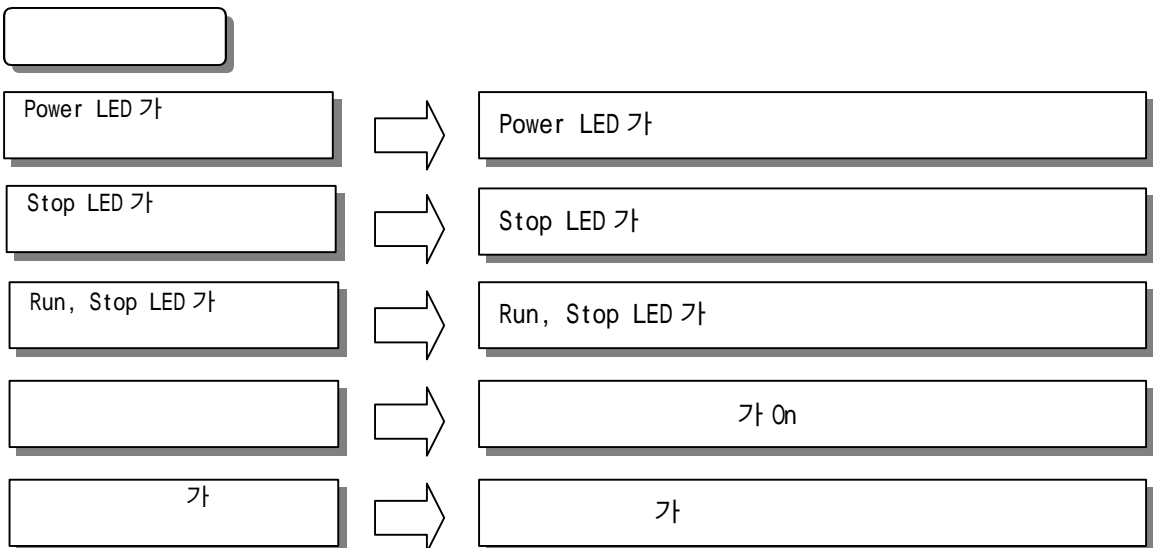
2)

- Stop 가 On / Off

3)

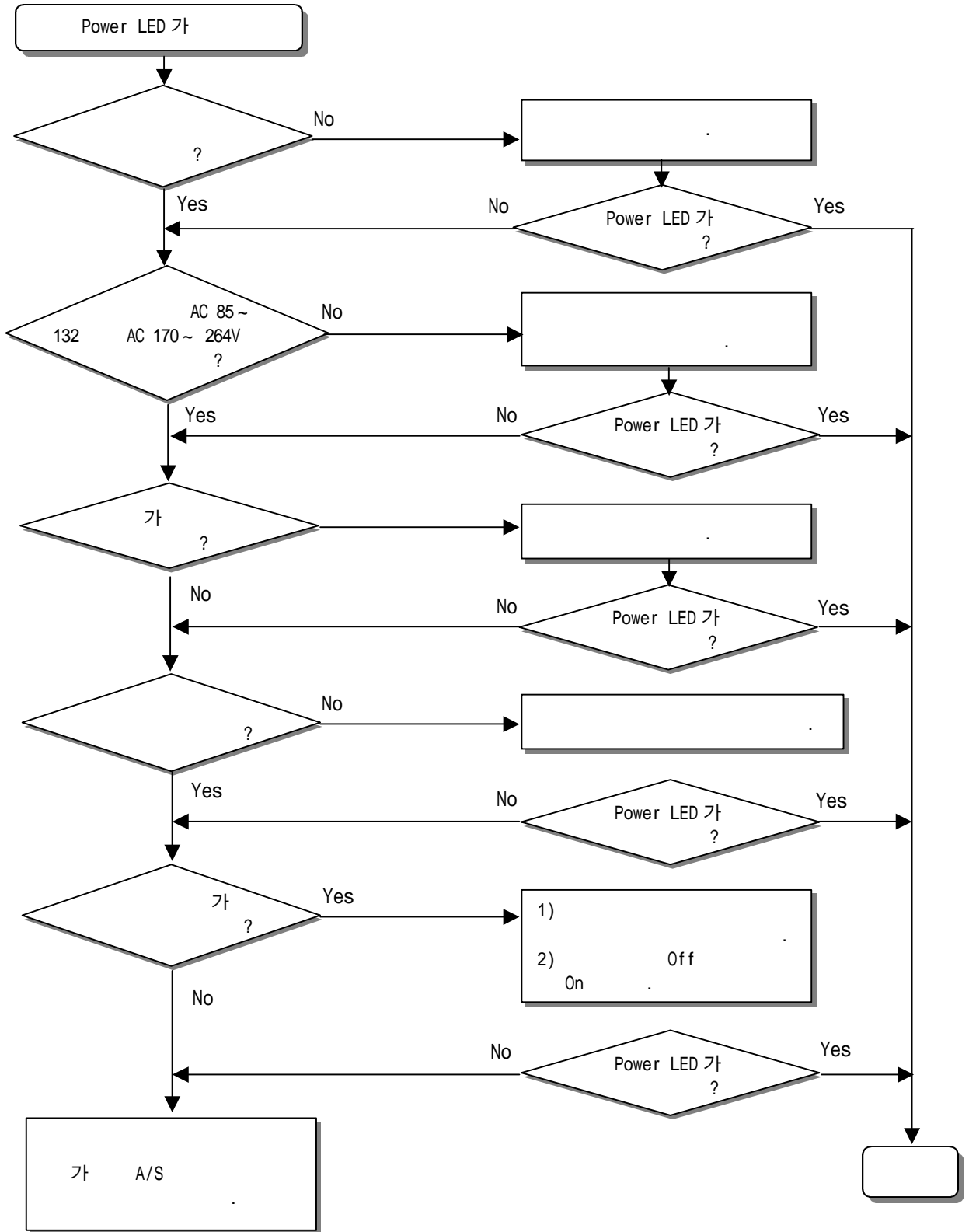
- PLC 가? 가?
- 가? 가?
- PLC 가?

12.2



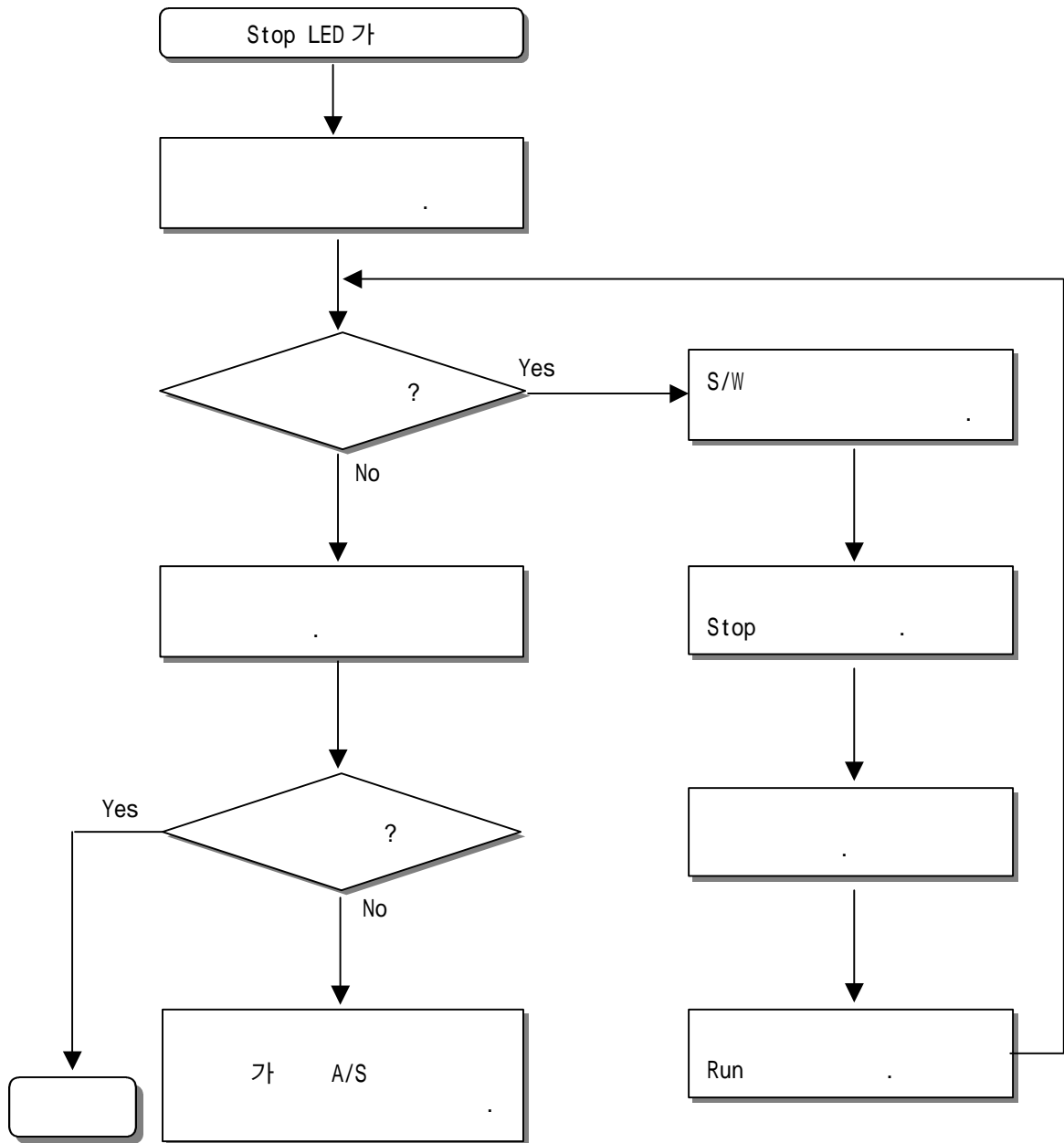
12.2.1 Power LED 가

Power LED 가



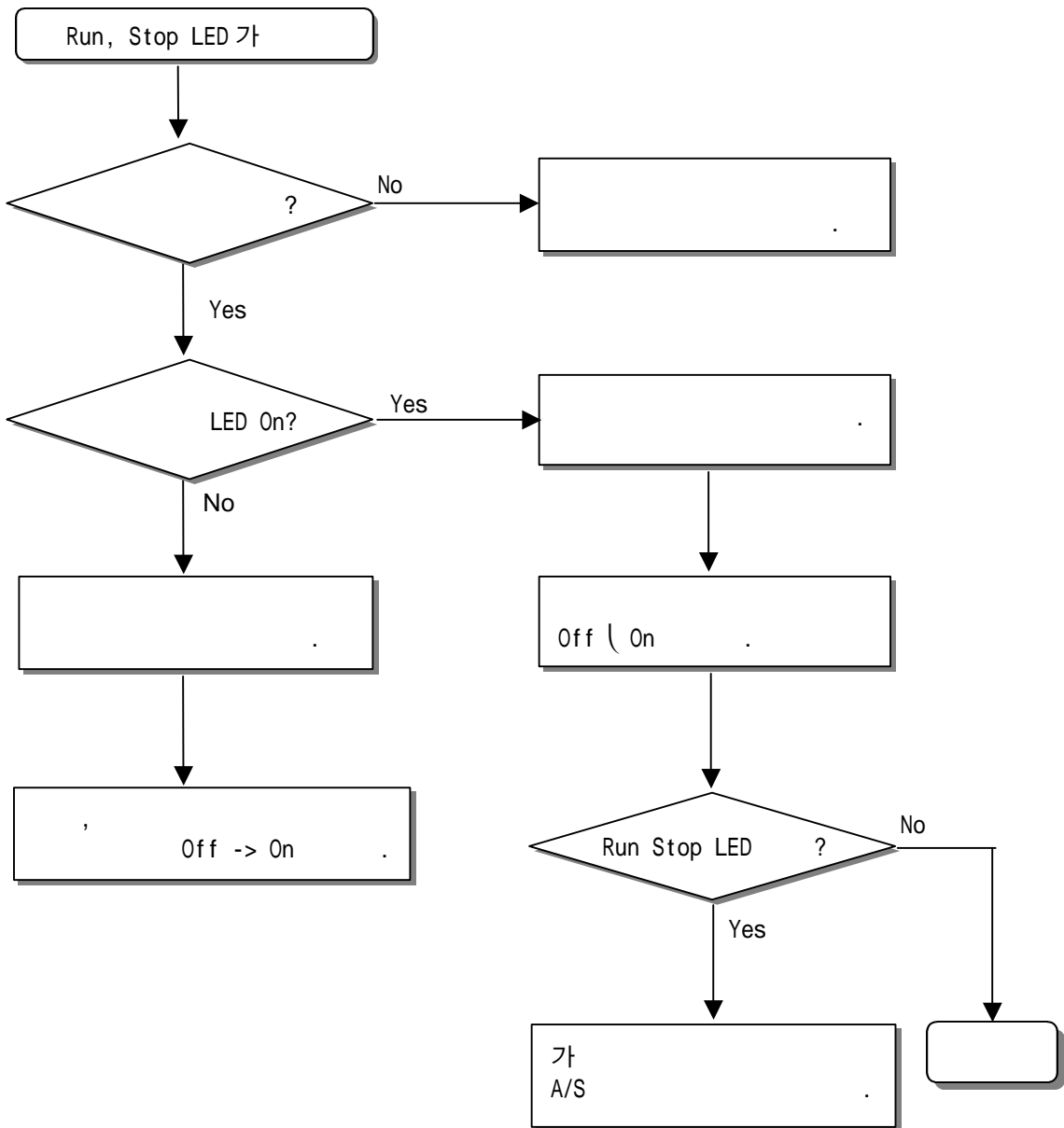
12.2.2 Stop LED 가

Stop LED 가



12.2.3 Run, Stop LED 가

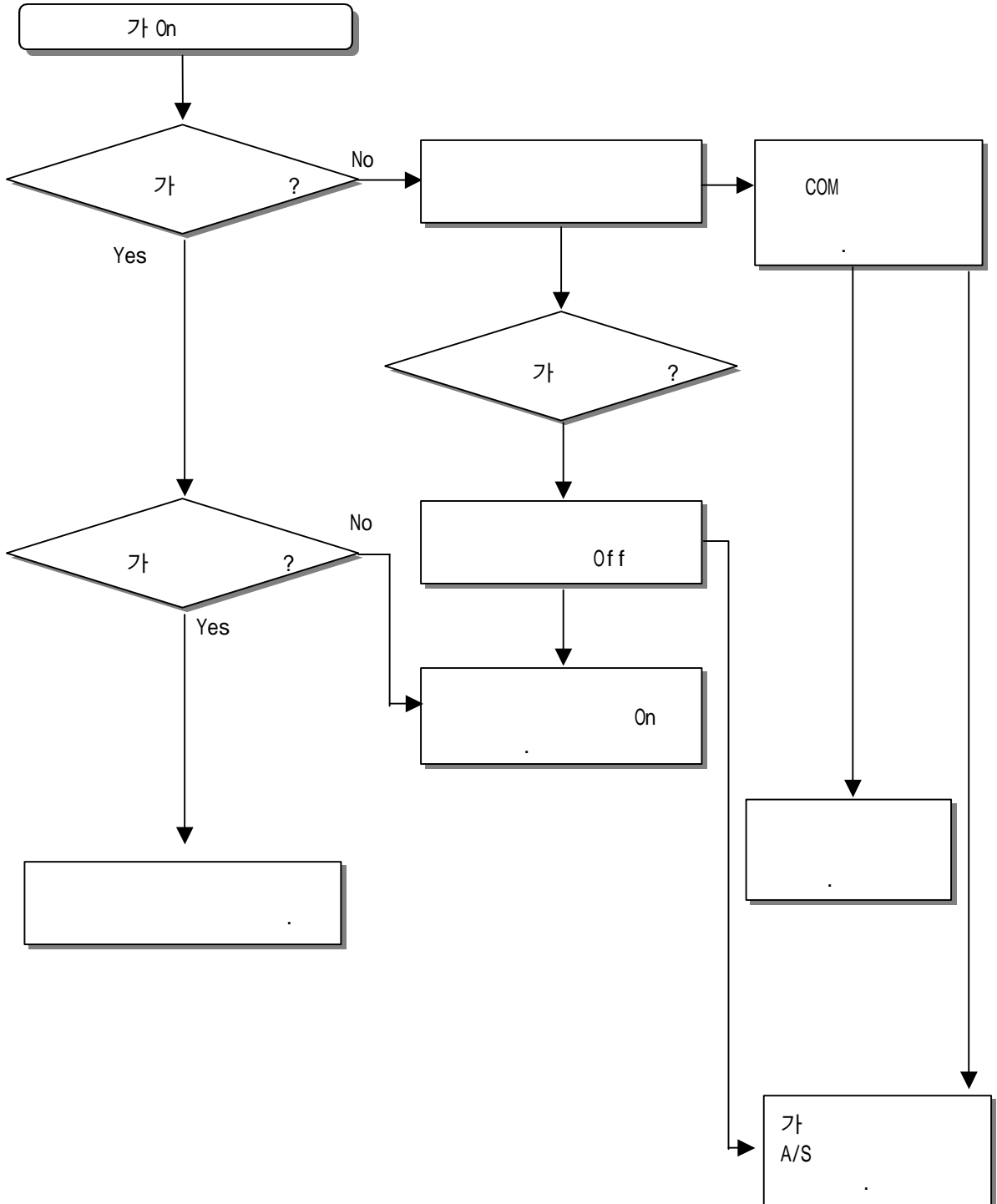
Run, Stop LED 가



12.2.4

가 On

가 On



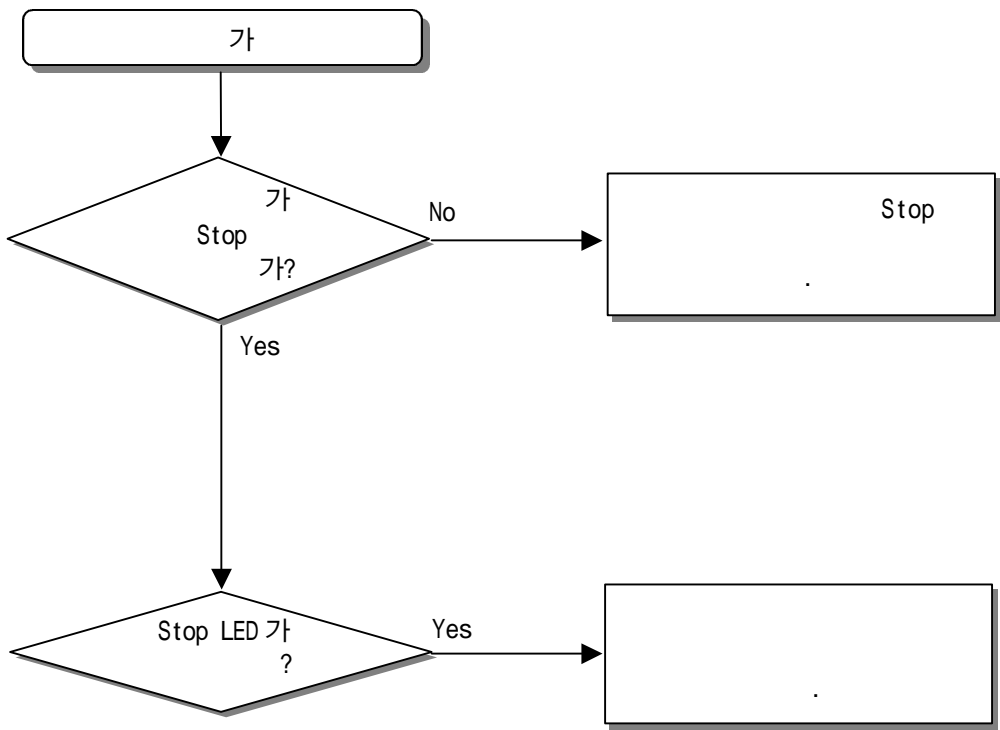
1) 12.4.1 가 Off 가 Off

12.2.5

가

CPU

가



12.3

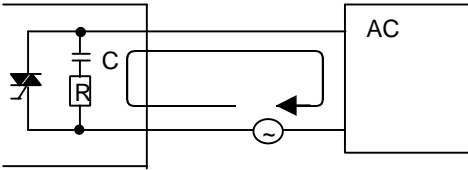
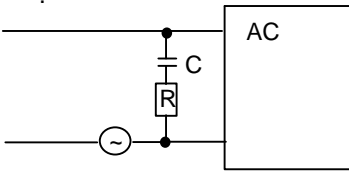
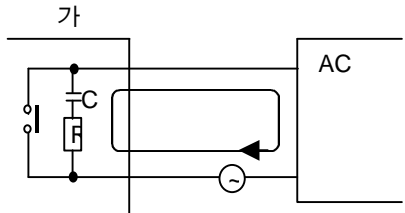
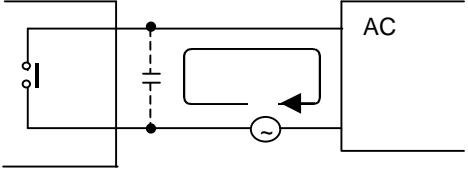
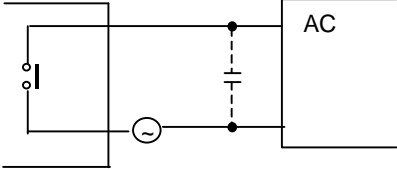
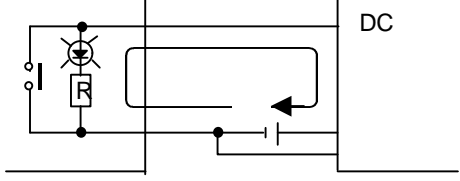
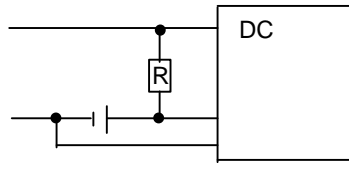
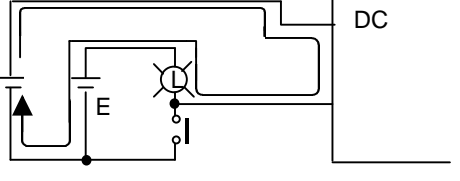
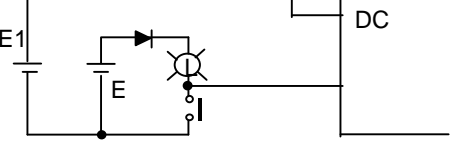
- New MK PLC , A/S
 FAX .
- , .
1. :) _____
 FAX) _____
 2. : ()
 3.
 - CPU : - OS (), - ()
 - KGLWIN : ()
 4. :

 5. CPU :
 - (), - KGLWIN ()
 - ()
 6. CPU Stop LED ? Yes(), No()
 7. KGLWIN :
 8. : ()
 9. 7 :
 10. :
 11.
 - () : (), ()
 - () : :
 12. :

 13. :

12.4

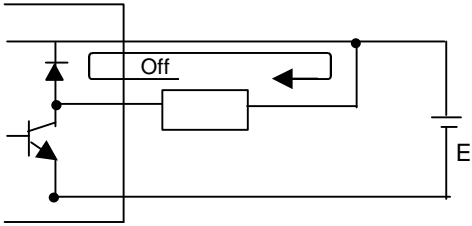
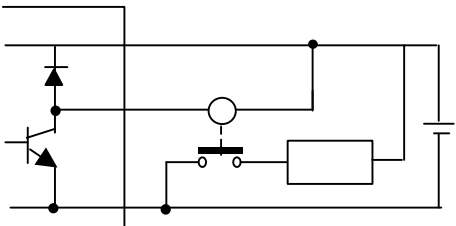
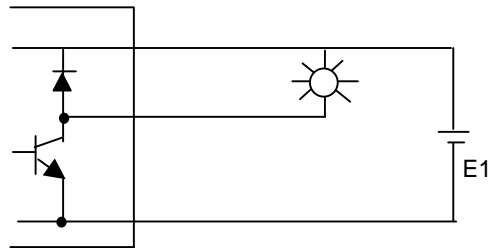
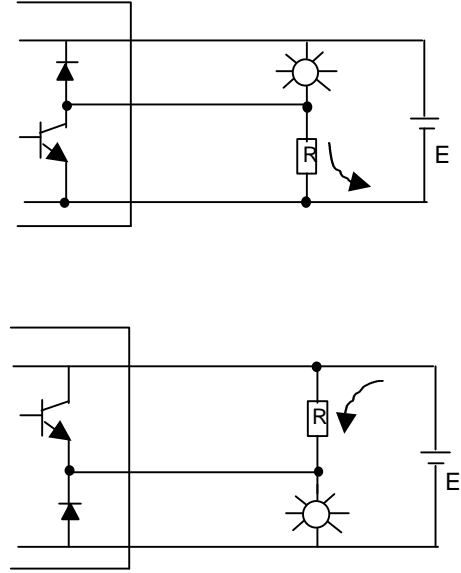
12.4.1

<p>Off 가</p>	<p>()</p> 	
<p>Off 가 (가)</p>	<p>(가)</p> 	<ul style="list-style-type: none"> • CR - C : 0.1 ~ 0.47Uf R : 47 ~ 120Ω (1/2W)
<p>Off 가</p>		
<p>Off 가 (LED)</p>	<p>(LED)</p> 	<p>Off</p> 
<p>Off 가</p>	 <ul style="list-style-type: none"> • E1 > E2 	

12.4.2

<p>Off 가</p>	<ul style="list-style-type: none"> 가 () ↑ C ← C 가 (D) 카 2√2 → <p>)</p> <p>(D) 가</p>	<ul style="list-style-type: none"> kΩ ~ kΩ
<p>Off 가</p>		<ul style="list-style-type: none"> kΩ CR 가
<p>가 C-R</p>		<ul style="list-style-type: none"> C-R C-R 가 가
<p>Off 가 ()</p>	<ul style="list-style-type: none"> 2 <ul style="list-style-type: none"> E1 < E2 E1 Off(E2 On) 	<p>) 가</p> <p>가</p>

()

<p>Off</p>	<ul style="list-style-type: none"> • Off [(L/R)]  <ul style="list-style-type: none"> • Off 가 <p>1</p>	<ul style="list-style-type: none"> • 가 
<p>가</p>	 <ul style="list-style-type: none"> 가 10 가 	<ul style="list-style-type: none"> • 1/3 ~ 1/5 

12.5

	Message	(F006)	CPU		
		h0001		ROM H/W	A/S
OS RAM	OS ROM	h0002		ROM	A/S
OS RAM	OS RAM	h0003		RAM	A/S
RAM	RAM	h0004		RAM	A/S
RAM		h0005		RAM	A/S
Gate Array	G/A	h0006		G/A 가	A/S
Sub Rack Power Down	Sub Power	h0007		Rack Power 가 Down	Rack Power
OS WDT	OS WDT	h0008		CPU OS Watch Dog Timer	Power Off A/S
RAM	Common RAM	h0009		RAM I/F	A/S
Fuse Break	I/O Fuse	h000A	()	가	LED
Instruction	OP	h000B		CPU 가 가 ()	A/S
Flash	User Memory	h000C		Flash 가 Read, Write	Flash
I/O	I/O	h0010		- I/O 가 I/O	- I/O
Maximum I/O	Max I/O	h0011		I/O 가 I/O (FUEA ...	I/O Unit
Special Card Interface	Special I/F	h0012		Card Interface	A/S
Fmm 0 I/F	Fmm 0 I/F	h0013		Fmm 0 I/F	A/S
Fmm 1 I/F	Fmm 1 I/F	h0014		Fmm 1 I/F	A/S
Fmm 2 I/F	Fmm 2 I/F	h0015		Fmm 2 I/F	A/S
Fmm 3 I/F	Fmm 3 I/F	h0016		Fmm 3 I/F	A/S

	Message	(F006)	CPU		
		h0020		-Sum	
I/O	I/O	h0021		RUN I/O 가 I/O	I/O
Maximum I/O	I/O	h0022		I/O I/O 가 I/O	
Fmm 0	Fmm 0 Para	h0023		Fmm 0	
Fmm 1	Fmm 1 Para	h0024		Fmm 1	
Fmm 2	Fmm 2 Para	h0025		Fmm 2	
Fmm 3	Fmm 3 Para	h0026		Fmm 3	
Operation	Operation	h0030	()	· BCD 0~ Digit 가 · Operand	Step
WDT	WDT	h0031		watch dog	
RUN Change	PGM Change	h0032		RUN Change	RUN 가
Change	PGM Change	h0033			
		h0040		CPU 가 가	Step
Missing END	Miss END	h0041		END	END

	Message	(F006)	CPU		
Missing RET	Miss RET	h0042		RET	RET
Missing SBRT	Miss SBRT	h0043		CALL RET	Subroutine
JMP ~ JME	JMP(E)	h0044		JMP ~ JME	JMP ~ JME
FOR ~ NEXT	FOR ~ NEXT	h0045		FOR ~ NEXT	FOR ~ NEXT
MCS ~ MCSCLR	MCS ~ MCSCLR	h0046		MCS ~ MCSCLR	MCS ~ MCSCLR
MPUSH ~ MPOP	MPUSH ~ MPOP	h0047		MPUSH ~ MPOP	MPUSH ~ MPOP
Dual Coil	Dual Coil	h0048		Device	Device
Syntax	Syntax	h0049		Load, And(Or) Load	
		h0050		(Back-up)	

13 . K200S CNET

13.1

K200S A/C CNET CNET , CPU 가 CNET
 , CPU 가 CNET
 , 가, PLC / ,
 , CNET , / ,
 , 가 ,
 CPU 가 CNET .
 K3P-07AS / K3P-07CS .

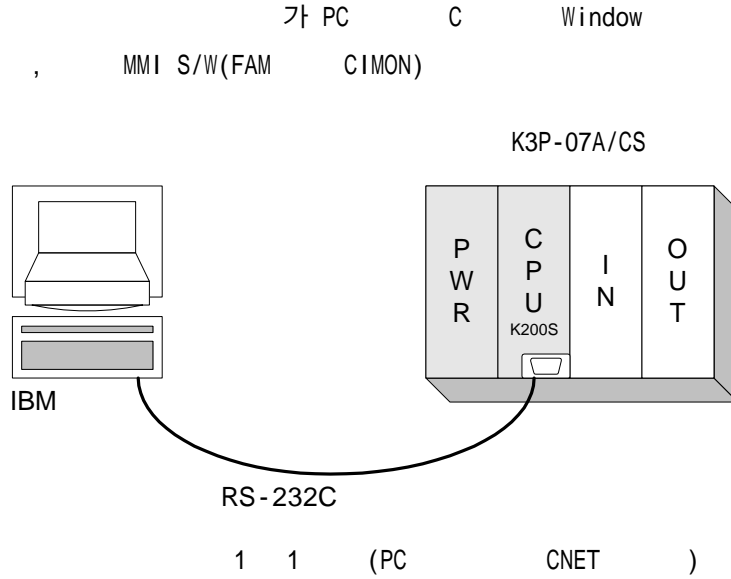
-
- ()
-
- ()
- CPU
-
-
- 1:1 () (K3P-07AS, K3P-07CS : RS-232C, K3P-07BS : RS-422)
- 1:N () (K3P-07BS : RS-422)

K200S CNET CNET 가 CPU CNET ,
 가
 1. K200S CNET RS-232C (A,C), RS-422 B (K3P-07BS)
 .)
 2. RS-232C 1:N . K200S A/C CPU
 RS-232C 가 1 , CNET RS-
 232C CNET
 . CNET 13.3 RS-232C
 .
 3. CNET (Baud Rate) KGLWIN .
 4. CNET (: G6L-CU2A/G6L-CU4A) CNET
 가 , .

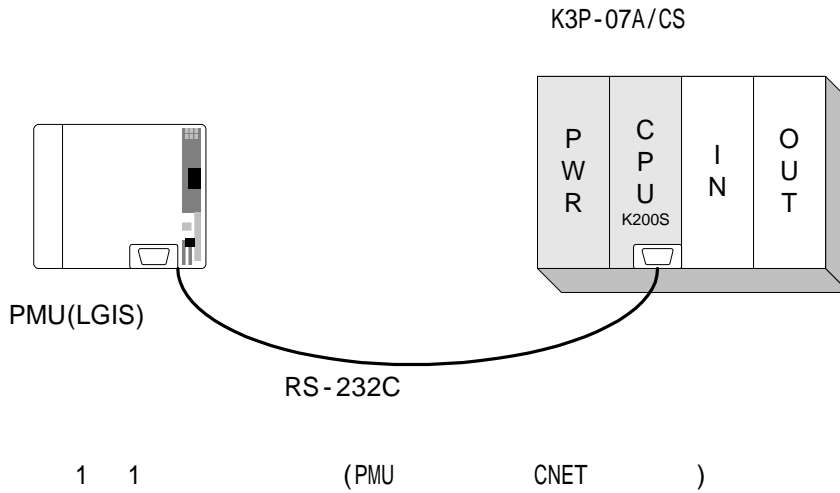
13.2 K200S Cnet

K200S CNET 1. PC 1:1 2. PMU
2가 .

1) PC 1:1



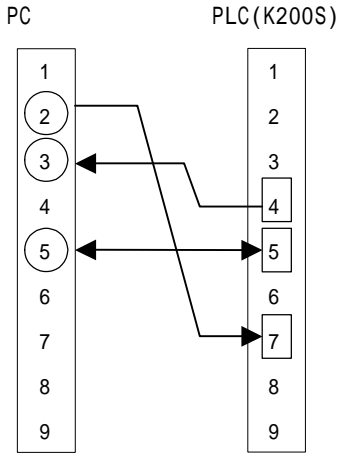
2) PMU



13.3 K200S Cnet RS-232C

1) PC 1:1

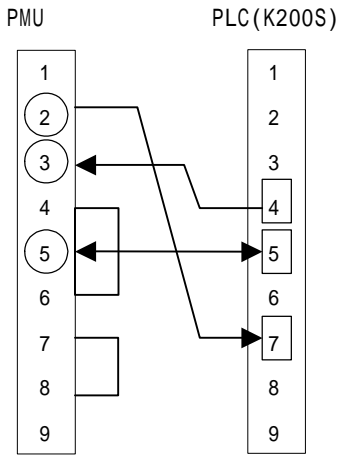
<PC K200S CPU RS-232C >



7

2) PMU

<PMU K200S CPU RS-232C >

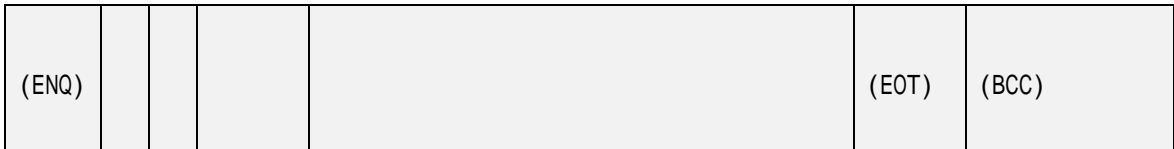


	Cable	Pin Assignment	CNET	, Loader
	Pin			

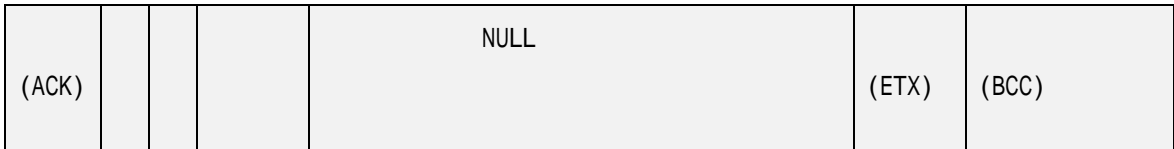
13.4

1)

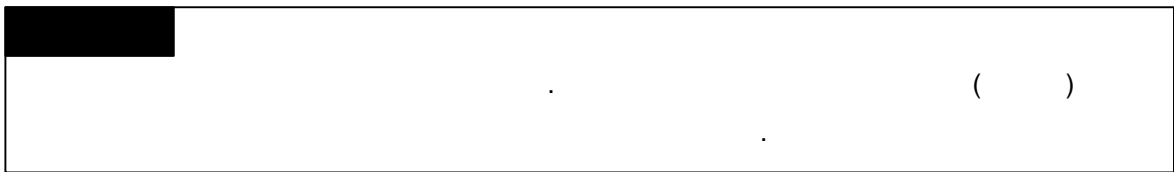
(1) Request (CPU Cnet)
(256 Byte)



(2) ACK Response (Cnet ,)
(256 Byte)

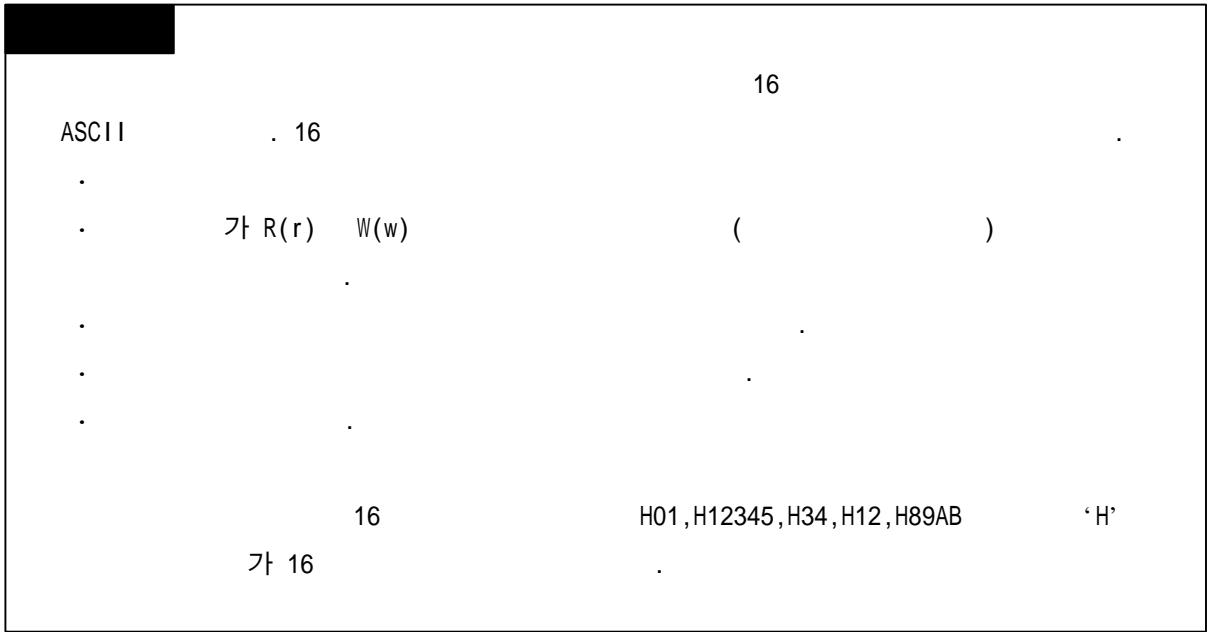


(3) NAK Response (Cnet ,)
(256 Byte)

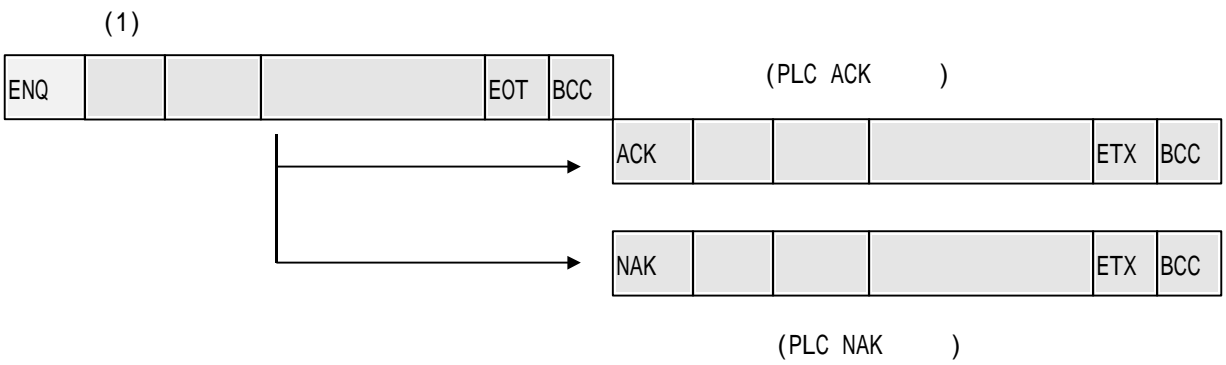


[13.1]

	Hex		
ENQ()	H05	Enquiry	Request
ACK()	H06	Acknowledge	ACK
NAK()	H15	Not Acknowledge	NAK
EOT()	H04	End of Transmission	ASCII
ETX()	H03	End of Text	ASCII



2)



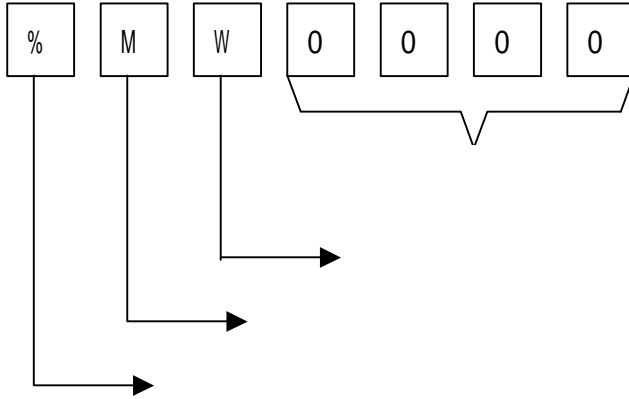
13.5

[13.2]

		ASCII		ASCII		
	r(R)	H72 (H52)	SS	5353	Bit, Word (K200S Bit, Word .)	
	r(R)	H72 (H52)	SB	5342	Word (Bit)	
	w(W)	H77 (H57)	SS	5353	Bit, Word (K200S Bit, Word .)	
	w(W)	H77 (H57)	SB	5342	Word (Bit)	
	x(X)	H78 H58	(h00 ~ H09)	3030 ~ 3039		
	y(Y)	H79 (H59)	(H00 ~ 09)	3030 ~ 3039		
CPU	r(R)	H73 (H53)	ST	5354	CPU (CPU) PLC	

1. , (BCC , .)
 2. , %MW100 %mw100
- , %mx001f(X) → %mx001E(O)

13.6



1)

2)

P()	%PW0000 ~ %PW0031 (32 Words) %PX0000 ~ %PX031F (32*16 Bits)	Bit, Word / 가
M()	%MW0000 ~ %PW0191 (192 Words) %MX0000 ~ %MX0191F (192*16 Bits)	Bit, Word / 가
K()	%KW0000 ~ %KW0031 (32 Words) %KX0000 ~ %KX031F (32*16 Bits)	Bit, Word / 가
L()	%LW0000 ~ %LW0063 (64 Words) %LX0000 ~ %LX063F (64*16 Bits)	Bit, Word / 가
F()	%FW0000 ~ %FW0063 (64 Words) %FX0000 ~ %FX063F (64*16 Bits)	Bit, Word 가
T()	%TX0000 ~ %TX0255 (256 Bits)	Bit 가 / 가
C()	%CX0000 ~ %CX0255 (256 Bits)	Bit 가 / 가
S()	%SW0000 ~ %SW0099 (100 Words)	Word 가 / 가
D()	%DW0000 ~ %DW4999 (5000 Words)	Word 가 / 가
¹⁾ T()	%TW0000 ~ %TW0255 (256 Words)	Word 가 / 가
¹⁾ C()	%CW0000 ~ %CW0255 (256 Words)	Word 가 / 가

3)

2)	.	.
Bit	X(58H)	%MX0000,%PX0000.%TX000
WORD	W(57H)	%MWO00,%PWO00.%TWO00,%DWO000

2) K200S Bit,Word
 Byte, DWord

4)

K200S	Word	Decimal
Bit	Word	Decimal
Hex	(	, Decimal .)
) %MWO100 → M	100	
%DWO200 → D	200	
%MX010F → M	10	15
%PX031A → P	31	10
%FX0000 → F	0	0

1) Bit Hex

2) 4 , K200S

2 8 가

) %MW10, %MW010, %MWO010, %MWO0010, %MWO00010

%MX01, %MX001, %MX0001, %MX00001, %MX000001

3) K200S

, %MWO010 %mw0010

13.7 ()

13.7.1 (RSS)

1)

PLC

16

. Access 가

13.6

2) (PC -> PLC)

()	ENQ	H20 ¹ 11	R(r)	SS	H01	H06	%MW100	.....	EOT	BCC
ASCII	H05	H3230	H52(72)	H5353	H3031	H3036	H254D57313030		H04	

1 (16 가)

*BCC : 가 (r) ENQ EOT ASCII Byte
 Byte ASCII BCC 가 .

* : '[]' 가 16
 [] H01(ASCII :3031) ~ H10(ASCII :3130)

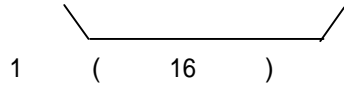
* :
 8 Hex ASCII H01
 (ASCII :3031) H10(ASCII :3130)
) %MW000 = H06 , %MX0000 = H07

* : . 16 ASCII
 , (), , '%' .

1) () Hex , 'H'
2) WORD , Bit 가

3) (PLC 가 ACK)

()	ACK	H20	R(r)	SS	H01	H02	HA9F3	.....	ETX	BCC
ASCII	H06	H3230	H52(72)	H5353	H3031	H3032	H41394633		H04	



*

* BCC 가 (r) ACK ETX ASCII Byte
 Byte ASCII BCC 가

* Hex Byte ASCII
 (X,W)

[]
Bit(X)	1
WORD(W)	2

* Hex ASCII

1	가 H02(ASCII :H3032)	2Byte	16	(Hex)	가
(WORD)					
	2 Byte Hex 가 ASCII				

2	가 H04	가 H12345678	ASCII	“31 32 33 34 35 36 37 38”
---	-------	-------------	-------	------------------------------

	Bit	Hex	Byte	Bit	0
H00	, 1	H01			

4) (NAK)

					(Hex 2 Byte)		
()	NAK	H20	R(r)	SS	H2232	ETX	BCC
ASCII	H15	H3230	H52(72)	H5353	H32323332	H03	

*

* BCC 가 (r) NAK ETX ASCII Byte

Byte ASCII BCC 가

* Hex 2 Byte(ASCII 4Byte)

5)

1 M 20 P 1 Word
 (M 20 H1234 , P H3456 가 가)

()

											BCC
()	ENQ	H01	R(r)	SS	H02	H06	%MW020	H06	%PW001	EOT	BCC
ASCII	H05	H3031	H52(72)	H5353	H3032	H3035	H254D5730 3230	H3038	H25515730 3031	H04	

(PLC ACK)

											BCC
()	ACK	H01	R(r)	SS	H02	H02	H1234	H02	H5678	ETX	BCC
ASCII	H06	H3031	H52(72)	H5353	H3032	H3032	H31323334	H3032	H35363738	H03	

(PLC NAK)

											BCC
()	NAK	H01	R(r)	SS	(2 Byte)					ETX	BCC
ASCII	H15	H3031	H52(72)	H5353	(4 Byte)					H03	

3) (ACK)

()	ACK	H10	R(r)	SB	H04	H12345678	ETX	BCC
ASCII	H06	H3130	H52(72)	H5342	H3034	H31323334 35363738	H03	

*

* BCC 가 (r) ACK ETX ASCII Byte
Byte ASCII BCC 가

* Hex Byte ASCII
(W)
()

	(Byte)
WORD(W)	2

1	가 02	PLC ACK	W(WORD)
	ASCII	3034	H04(2*2 = 4 Byte)Byte

* Hex ASCII

2	2 WORD	1234,5678,	ASCII
	31323334 35363738		

4) (PLC NAK)

					(Hex 2 Byte)		
()	NAK	H10	R(r)	SB	H2232	ETX	BCC
ASCII	H15	H3130	H52(72)	H5342	H32323332	H03	

*

* BCC 가 (r) NAK ETX ASCII Byte
 Byte ASCII BCC 가

* Hex 2 Byte(ASCII 4Byte)

5)

10 M 0 2 Word
 (M 0 H1234 가, H5678 가)

									BCC
()	ENQ	H0A	R(r)	SB	H07	%MW0000	H02	EOT	BCC
ASCII	H05	H3041	H52(72)	H5342	H3037	H2554303030	H3032	H04	

(PLC ACK)

									BCC
()	ACK	H0A	R(r)	SB	H04	12345678		ETX	BCC
ASCII	H06	H3041	H52(72)	H5342	H3034	H3132333435363738		03	

(PLC NAK)

									BCC
()	NAK	H0A	R(r)	SB		(2 Byte)		ETX	BCC
ASCII	H15	H3041	H52(72)	H5342		(4 Byte)		H03	

10 M 0 2 Bit
 (M 0 HFFF 가, 가)
 PLC NAK 6001
 (RSB Bit .)

13.7.3 (WSS)

1)
PLC

16

2)

										
()	ENQ	H20	W(w)	SS	H01	H06	%MW100	H00E2	.	EOT	BCC
ASCII	H05	H3230	H57(77)	H5353	H3031	H3036	H254D573 13030	H303045 32		H04	

1 (16 가)

*BCC : 가 (w) ENQ EOT ASCII Byte
Byte ASCII BCC 가 .

* : '[] [] []'
가 16
[] H01(ASCII :3031)-H10(ASCII :3130)

* : []
16 Hex ASCII
H01(ASCII :3031) H10(ASCII :3130)

* :
16 ASCII , (), , '%'

* : M100 HA H000A
M100 Word H A H000A
Hex ASCII

)	Word	가 H1234	ASCII
31323334			

1)			
2)	Bit	Hex 1Byte	Bit '0'
H00(3030)	, '1'	H01(3031)	

3) (ACK)

()	ACK	H20	W(w)	SS	ETX	BCC
ASCII	H06	H3230	H57(77)	H5353	H03	

*

* BCC 가 (w) ACK ETX ASCII Byte
 Byte ASCII BCC 가

4) (NAK)

					(Hex 2 Byte)		
()	NAK	H20	W(w)	SS	H4252	ETX	BCC
ASCII	H15	H3230	H57(77)	H5353	H34323532	H03	

*

* BCC 가 (w) NAK ETX ASCII Byte
 Byte ASCII BCC 가

* Hex 2 Byte(ASCII 4Byte)

5)

1 M 130 "H00FF" Write .

()

										BCC
()	ENQ	H01	W(w)	SS	H01	H06	%MW130	H00FF	EOT	BCC
ASCII	H05	H3031	H57(77)	H5353	H3031	H3036	H254D57313330	H30304646	H04	

(PLC ACK)

										BCC
()	ACK	H01	W(w)	SS					ETX	BCC
ASCII	H06	H3031	H57(77)	H5353					H03	

(PLC NAK)

										BCC
()	NAK	H01	W(w)	SS		(2)			ETX	BCC
ASCII	H15	H3031	H57(77)	H5353		(4)			H03	

13.7.4 (WSB)

1)
PLC

2)

							2 (120Byte)			
()	ENQ	H10	W(w)	SB	H06	%MD100	H01	H11112222	EOT	BCC
ASCII	H05	H3130	H57(77)	H5342	H3036	H254D443 13030	H3031	H31313131 32323232	H04	

1)
Word 가 5 , 5 Word

2) WSB ,”M 0
0 7 ‘0’ ”

* BCC : 가 (w) ENQ EOT ASCII Byte
Byte ASCII BCC 가

* []가

* : 16
Hex ASCII
H01(ASCII :3031) H10(ASCII :3130)

* :
16 ASCII (), , ‘%’

3) (ACK)

()	ACK	H10	W(w)	SB	ETX	BCC
ASCII	H06	H3130	H57(77)	H5342	H03	

*

* BCC 가 (w) ACK ETX ASCII Byte
 Byte ASCII BCC 가

4) (PLC NAK)

					(Hex 2Byte)		
()	NAK	H10	W(w)	SB	H1132	EOT	BCC
ASCII	H15	H3130	H57(77)	H5342	H31313332	H03	

*

* BCC 가 (w) NAK ETX ASCII Byte
 Byte ASCII BCC 가
 * Hex 2 Byte(ASCII 4Byte)

5)

1 P 0 1 HAA15 H056F Write

()

							(Byte)			
()	ENQ	H01	W(w)	SB	H06	%PW000	H04	HAA15056F	EOT	BCC
ASCII	H05	H3031	H57(77)	H5342	H3036	H254F443030 30	H3034	H4141313530 353646	H04	

(PLC ACK)

()	ACK	H01	W(w)	SB					ETX	BCC
ASCII	H06	H3031	H57(77)	H5342					H03	

(PLC NAK)

()	NAK	01	W(w)	SB			(2)		ETX	BCC
ASCII	H15	H3031	H57(77)	H5342			(4)		H03	

13.7.5 (X##)

1)

10

2)

()	ENQ	H10	X(x)	H09		EOT	BCC
ASCII	H05	H3130	H58(78)	H3039	[]	H04	

*BCC : 가 (x) ENQ EOT ASCII Byte
 Byte ASCII BCC 가 .

* 10 (0-9 , H00 ~ H9)

..

* , EOT .

: 2 가

RSS	(2 Byte)	(2 Byte)	(8 Byte)	...
-----	----------	----------	----------	-----



1 (16)

RSB	(2 Byte)	(8 Byte)	
-----	----------	----------	--

3) (PLC ACK)

()	ACK	H10	X(x)	H1F	ETX	BCC
ASCII	H06	H3130	H58(78)	H3146	H03	

*

* BCC 가 (x) NAK ETX ASCII Byte
 Byte ASCII BCC 가

4) (PLC NAK)

					(Hex 2Byte)	
()	ACK	H10	X(x)	H1F	H1132	BCC
ASCII	H06	H3130	H58(78)	H3146	H31313332	H03

*

* BCC 가 (x) NAK ETX ASCII Byte
 Byte ASCII BCC 가

* Hex 2 Byte(ASCII 4Byte)

5)

1 D0000 01 Monitor .

()

					R##					
()	ENQ	H01	X(x)	H01	RSS	H01	H04	%DW0000	EOT	BCC
ASCII	H05	H3031	H58(78)	H3031	H523041	H3031	H3034	H44573030 3030	H04	

(PLC ACK)

()	ACK	H01	X(x)	H01				ETX		BCC
ASCII	H06	H3031	H58(78)	H3031				H03		

(PLC NAK)

()	NAK	H01	X(x)	H01			(2)	ETX		BCC
ASCII	H15	H3031	H58(78)	H3031			(4)	H03		

3) (PLC NAK)

					(Hex 2Byte)		
()	NAK	H10	Y(y)	H1F	H1132	ETX	BCC
ASCII	H15	H3130	H59(79)	H3146	H31313332	H03	

*

* BCC 가 (y) NAK ETX ASCII Byte
 Byte ASCII BCC 가
 * Hex 2 Byte(ASCII 4Byte)

4)

1 1
 D0000 1 Word 가

()

()	ENQ	H01	Y(y)	H01	E0T	BCC	
ASCII	H05	H3031	H59(79)	H3031	H04		

(PLC ACK)

()	ACK	H01	Y(y)	H01	H01	H02	H2342	ETX	BCC
ASCII	H06	H3031	H59(79)	H3031	H3031	H3032	H32333432	H03	

(PLC NAK)

()	NAK	H01	Y(y)	H01	(2)	ETX	BCC	
ASCII	H15	H3031	H59(79)	H3031	(4)	H03		

13.7.7 PLC STATUS (RST)

1)

PLC

2)

()	ENQ	H0A	R(r)	ST	EOT	BCC
ASCII	H05	H3041	H52(72)	H5354	H04	

*BCC : 가 (r) ENQ EOT ASCII Byte
 Byte ASCII BCC 가 .

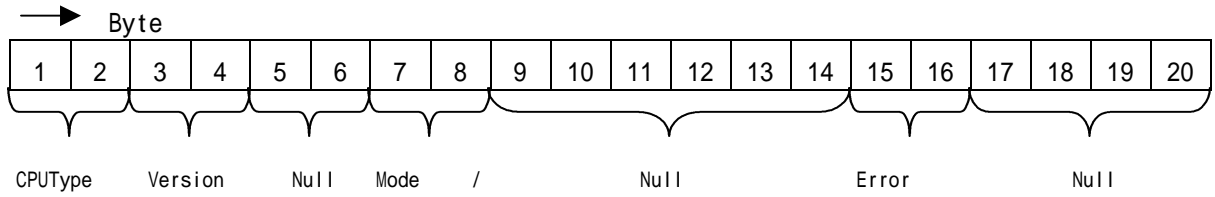
3) (PLC ACK)

					STATUS (Hex 20 Byte)	
()	ACK	H0A	R(r)	ST	STATUS	ETX BCC
ASCII	H06	H3041	H52(72)	H5354	[]	H03

*

* BCC 가 (r) ACK ETX ASCII Byte
 Byte ASCII BCC 가 .

STATUS Hex 20 Byte 가 ASCII
 ASCII Hex

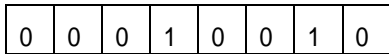


- . CPU Type

CPU Type	Code
200S A(K3P-07AS)	3A
200S B(K3P-07BS)	3B
200S C(K3P-07CS)	3C
300S A(K4P-15AS)	33
1000S (K7P-30AS)	32

- . Version No.

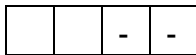
) Bit



= Version 1.2

- . Mode / Flash

Bit



- 0 : Mode Key 가 Remote
- 1 : Mode Key 가 Remote 가

- 0 : Flash Memory 가
- 1 : Flash Memory 가

- . CPU Mode

Bit



- RUN Mode
- PROGRAM Mode
- PAUSE Mode
- DEBUG Mode

- . ERROR : CPU 가

4) (PLC NAK)

					(Hex 2 Byte)		
()	NAK	H0A	R(r)	ST	H1132	ETX	BCC
ASCII	15	3041	5272	5354	31313332	03	

*

* BCC 가 (r) NAK ETX ASCII Byte
 Byte ASCII BCC 가
 * Hex 2 Byte(ASCII 4Byte)

5)

1 가 PLC STATUS

()

							BCC
()	ENQ	H01	R(r)	ST		EOT	BCC
ASCII	H05	H3031	H52(72)	H5354		H04	

(PLC ACK)

					STATUS		BCC
()	ACK	H01	R(r)	ST	STATUS FORMAT	ETX	BCC
ASCII	H06	H3031	H52(72)	H5354		H03	

(PLC NAK)

							BCC
()	NAK	H01	R(r)	ST	(2)	ETX	BCC
ASCII	H15	H3031	H52(72)	H5354	(4)	H03	

13.8 NAK ()

H0001	PLC	PLC 가 가	On/Off
H0011		*ASCII	(‘%’, ’_’, ’.’), 가
H0021		* w(W), r(R), x(X), y(Y), s(S)	
H0031		* , wSS, wSB “SS”, ”SB”	
H1132		* p(P), m(M), l(L), k(K), t(T), c(C), f(F), s(S), d(D)	
H1232		가 0 120 Byte	(1 ~ (60)120)
H2432		b(B), d(D) 1)%db %dd	,
H7132		* %가	,
H2232		(P,M,L,K,T,C,F, S,D)	
H0190			가 9
H0290			가 9
H6001	_6001	1) %DX, %SX (S,D Word Access 가) 2) %px0 가 1 3) F Write (F Read Only)	
H6010	_6010	OVER-RUN,	

H6020	_6020	TIME_OUT	RS-232C
H6030	_6030		ENQ,EOT 가
H6040	_6040	가 256	256 가
H6050	_6050	BCC	BCC 가

14 K200S RS-422/485 ()

14.1

- (1) RS-422/485 () 1() : N()
 MASTER-K PLC PC RS422/485 .
- (2) KGLWIN 1
- (3) MASTER-K Cnet
 (K3P-07BS 가 .)

14.2

- (1) 64
- (2) 32
- (3) PLC
- (4)
- (5) KGL-WIN

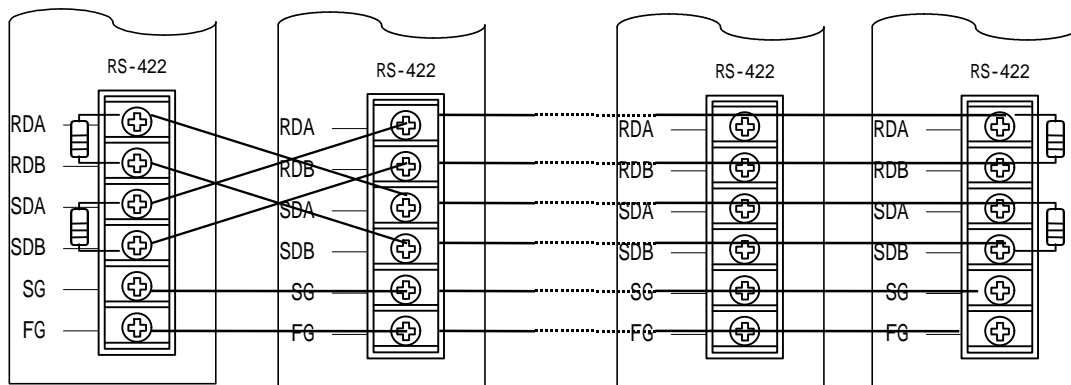
14.3

		RS422/485
		MASTER-K
		500m()
		32 (0 ~ 31)
		8
		1
		9600, 19200, 38400, 56000, 57600, 76800, 115200, 128000 bps

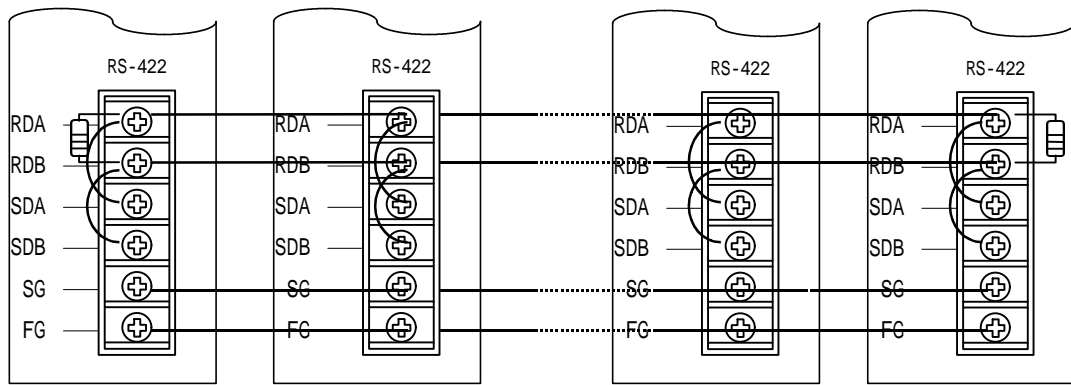
14.4

(1/2W 120Ω)

1) RS-422



2) RS-485



14.5 RS-422/485

RS-422

5

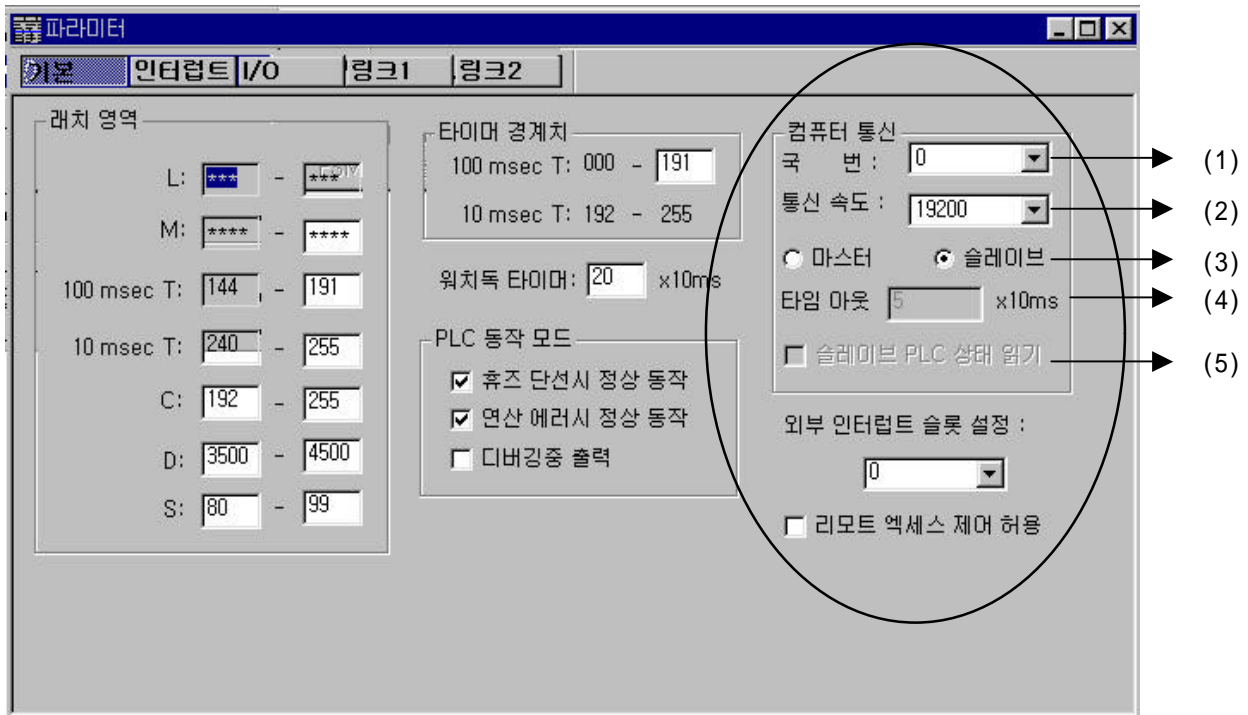
		(↔)	
1	RDA (+)	←	SDA
2	RDB (-)	←	SDB
3	SDA (+)	→	RDA
4	SDB (-)	→	RDB
5	S.G		S.G

- RS-485 RS-422 RDA
SDA , RDB SDB

- MASTER-K ,
PLC

14.6

- 1) CPU K3P-07BS
- 2)
- 3) 1
- 4)



- (1) : . (0 31 가) .
- (2) : . (9600, 19200, 38400, 56000, 76800, 115200, 128000 bps 가)
- (3) / : 1 RS422/485
- (4) : PLC (Default : 500ms, 10ms)
- (5) PLC : PLC 가 .

5)

(1) 1 MASTER-K 422/485

(2)

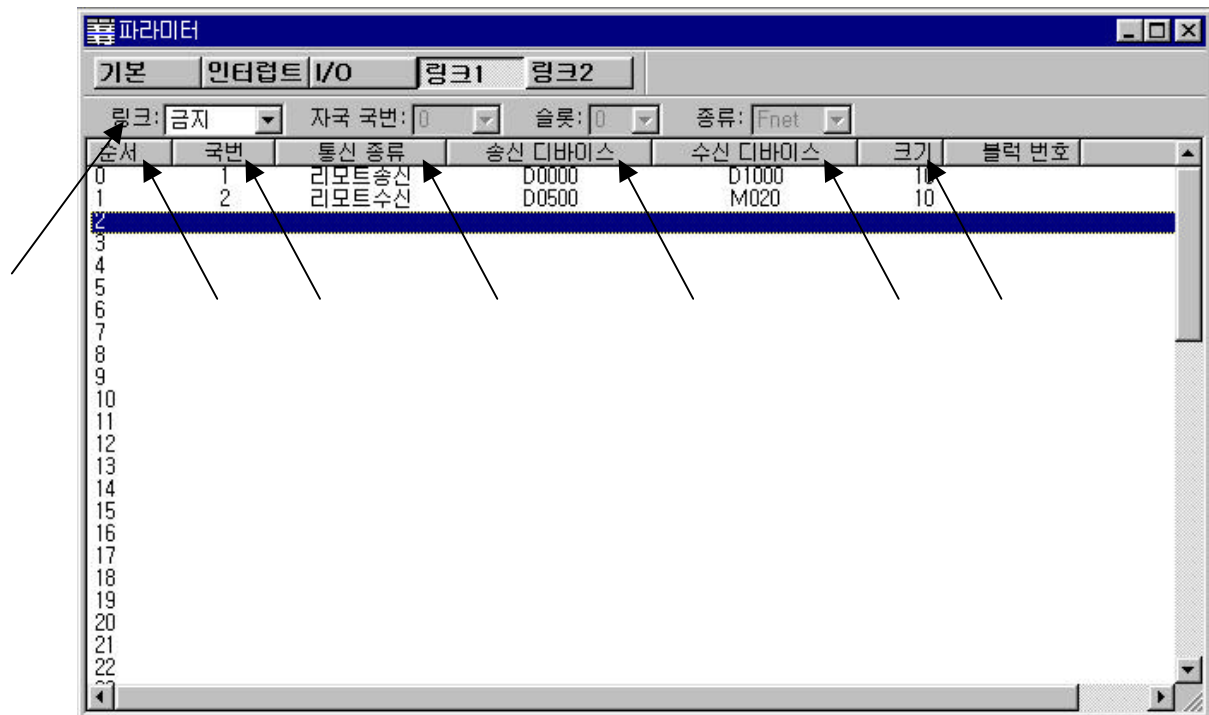
(3) 64

(4) 60

(5)

- :

- : (F)



: 64

: 0 ~ 31

/ 가

14.7

- 1) (32)
- (32)

14.5

(32)

0,1	D4400	16,17	D4408	/ (1)
2,3	D4401	18,19	D4409	
4,5	D4401	20,21	D4410	
6,7	D4403	22,23	D4411	
8,9	D4404	24,25	D4412	
10,11	D4405	26,27	D4413	
12,13	D4406	28,29	D4414	
14,15	D4407	30,31	D4415	

1 :

2 : NAK

- 2)

(32)

0,1	D4416	16,17	D4424	/ (1)
2,3	D4417	18,19	D4425	
4,5	D4418	20,21	D4426	
6,7	D4419	22,23	D4427	
8,9	D4420	24,25	D4428	
10,11	D4421	26,27	D4429	
12,13	D4422	28,29	D4430	
14,15	D4423	30,31	D4431	

(, 0

D4416 Byte

31

D4431 Byte

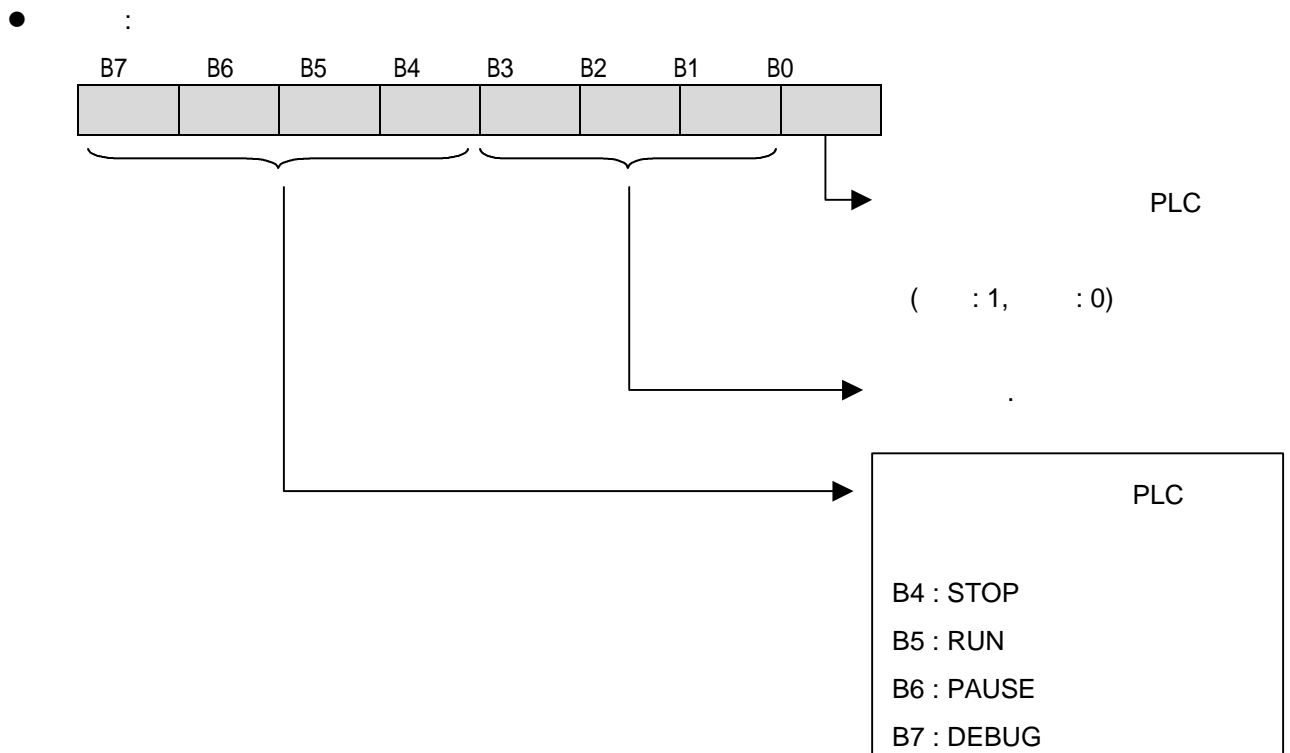
,

.)

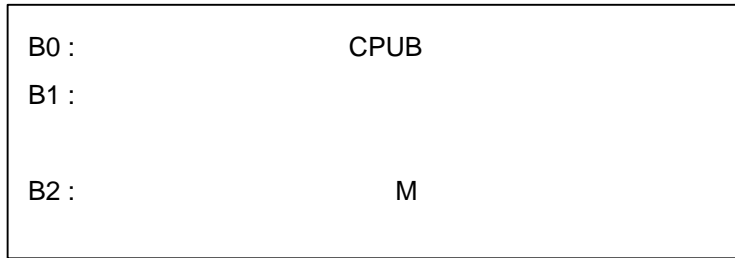
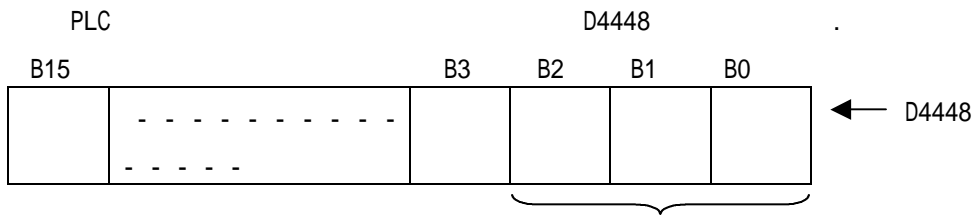
3) PLC
PLC

(32) PLC

0,1	D4432	16,17	D4440	/ (1)
2,3	D4433	18,19	D4441	
4,5	D4434	20,21	D4442	
6,7	D4435	22,23	D4443	
8,9	D4436	24,25	D4444	
10,11	D4437	26,27	D4445	
12,13	D4438	28,29	D4446	
14,15	D4439	30,31	D4447	



4) PLC
PLC



5)

	D4449 – D4450
	D4451 – D4452
	D4453 – D4454

14.8

KGLWIN

1

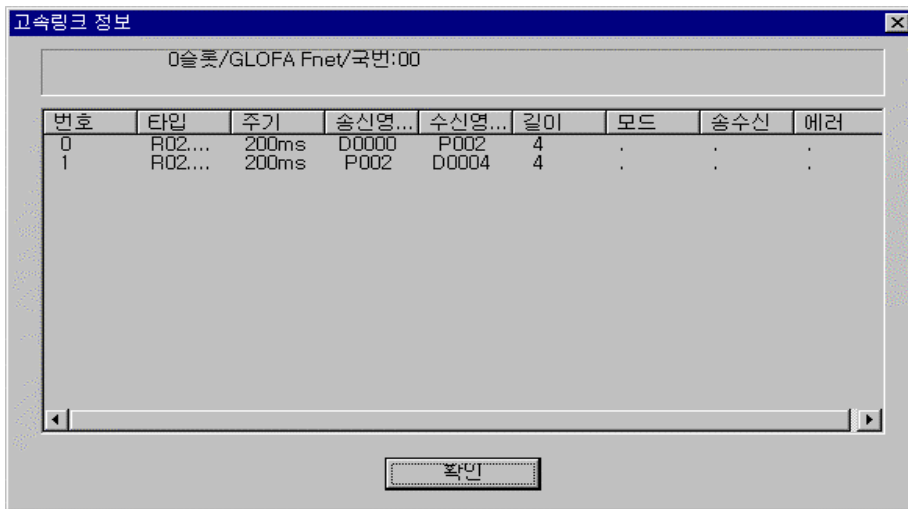
422/485

● PLC CPU B

가

422/485

PLC 422



15.2 PID

15.2.1

1) (P)

(1) (E: (SV) (PV:))

(2) (E) (SV) (PV)

(Referece value)

가

$$MV = Kp * [b * SV - PV]$$

Kp , b . b가 '1'

(3) 가 (MV) 2-1

(4) (Kp)가 (E) (MV)가 ,

(Kp)가

(5) (Kp)가 (PV) (SV) 2-1

가

(6) (Kp)가 2-2

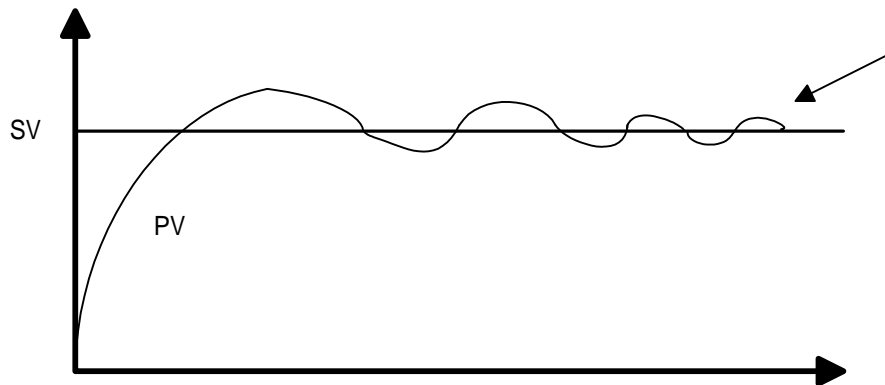
(PV) (SV) 가 (:)가

(7) (MV) 0 ~ 4000 (MV_MAX)

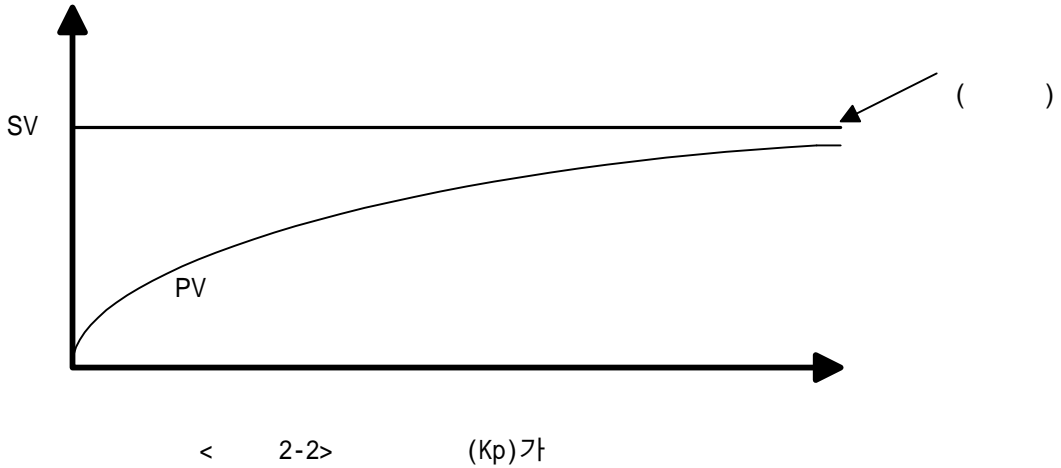
(MV_MIN) 가 0 ~ 4000

(8) 가 , 가 (Bias)

(SV) (PV)



< 2-1> (Kp)가



2) (I)

(1) (SV) (PV) (E)가 ,
가 .

= (MV) (PV) } { , (SV)
가 ()

(2) 가 , Ti .

(3) 가 2-3 .

(4) .

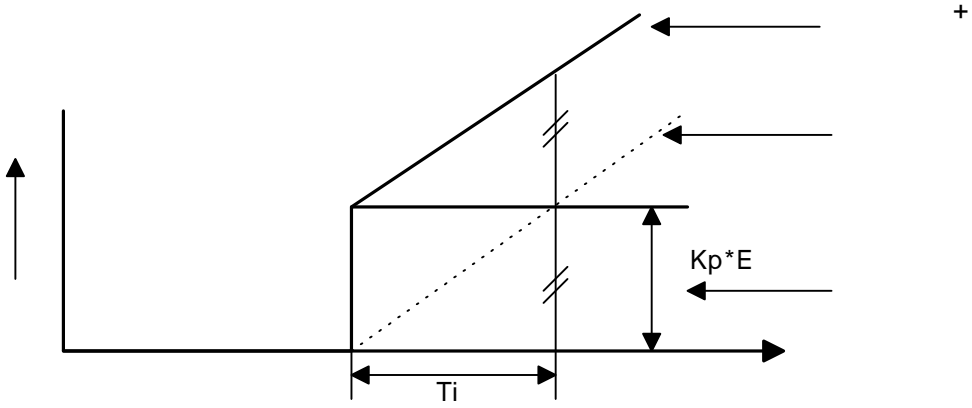
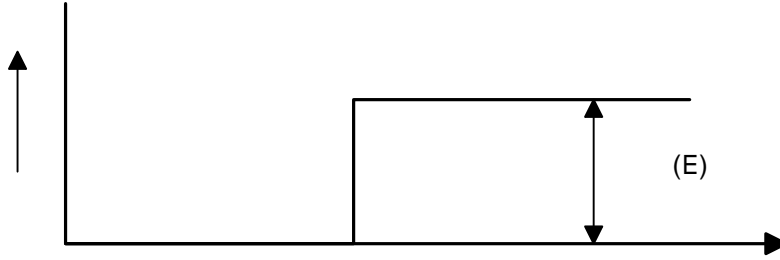
$$MV = \frac{Kp}{Ti} \int E dt$$

(Ti) , 2-4 , 가

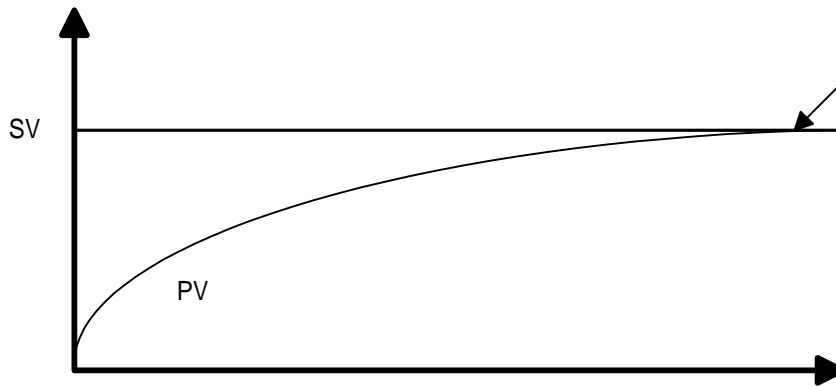
가 , 2-5

(5) , I PI , PID

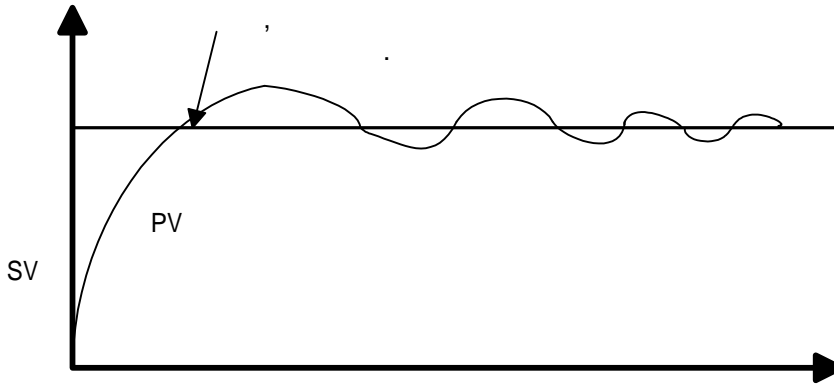
, I .



< 2-3> 가



< 2-4>

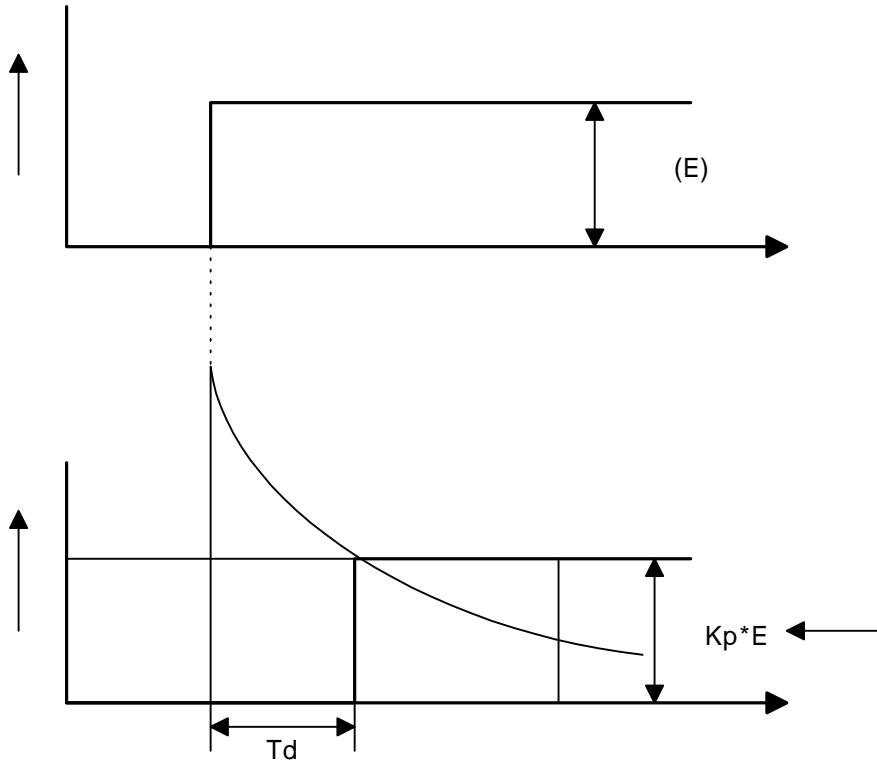


< 2-5 >

- 3) (D)
- (1) (SV) 가 () (MV)
- (2) 가 () 가
- (3)
- (4) 가 Td
- (5) 가 2-6
- (6)

$$MV = K_p * T_d \frac{dE}{dt}$$

- (SV) - (PV) (E ,
- (7) PID , D PD



< 2-6> 가

15. PID

4) PID

(1) PID

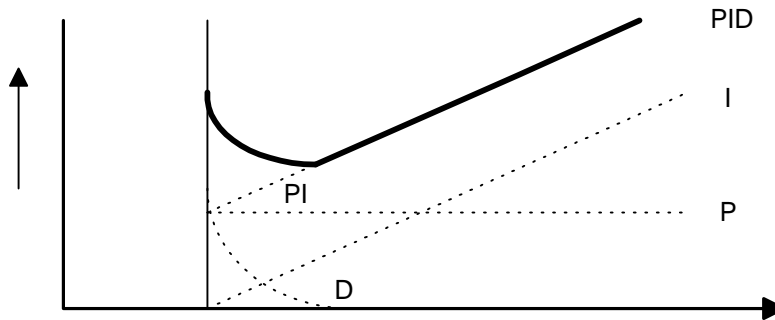
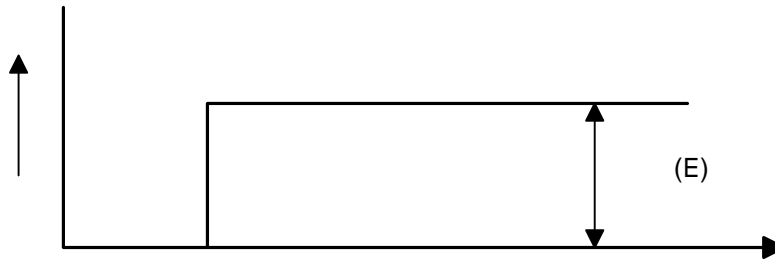
P + I + D

(2)

가

, PID

2-7



< 2-7 >

가

PID

5)

(1) PID

2

(PV)

(SV)

(MV)

(PV)

(SV)

(MV)

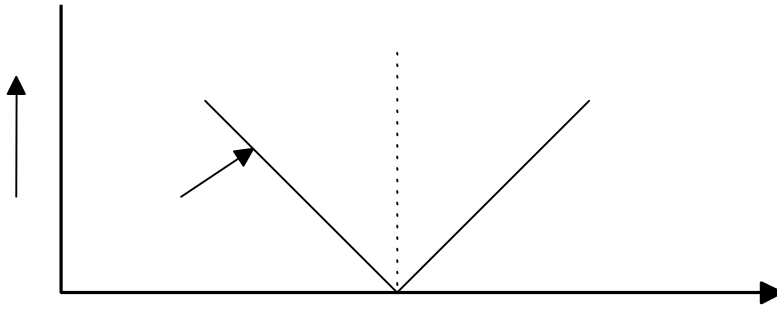
(2)

(MV),

(PV),

(SV)

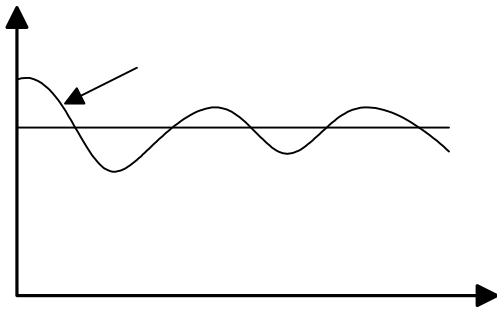
2.8



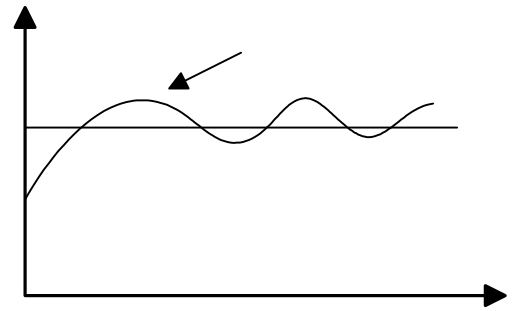
< 2-8> (MV), (PV), (SV),

(3),

2-9 .



()



()

< 2-9>

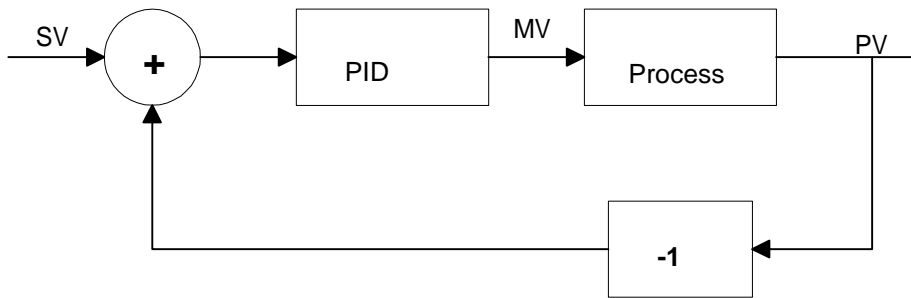
15. PID

6) (Reference Value)

PID (SV) (PV) PID 2-1 PID

$$MV = K \left[E_p + \frac{1}{T_i} \int_0^t E_i(s) ds + T_d \frac{dE_d}{dt} \right]$$

MV, K, T_i, T_d, E_p, b*SV - PV, E_d -PV, T_i SV-PV, b (Reference Value), (Reference Value), (Load Disturbance), (Measurement Noise)



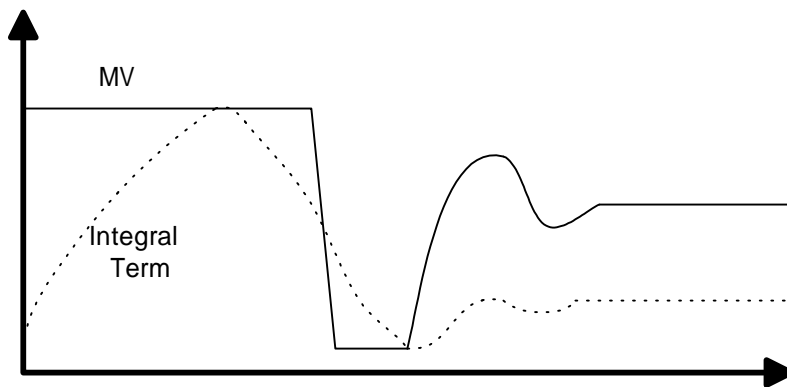
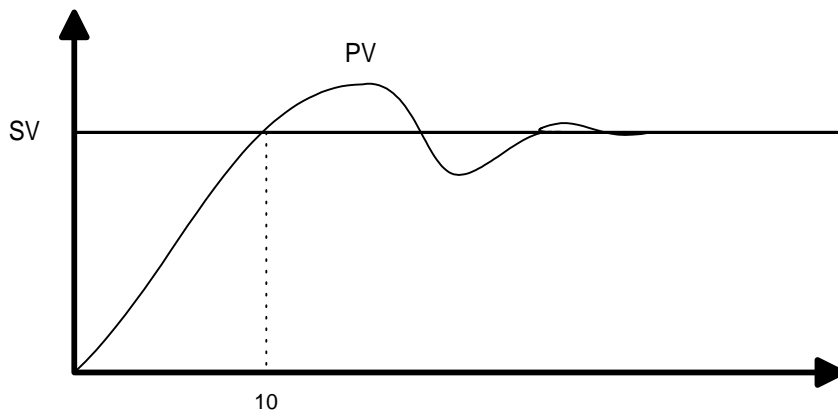
< 2-1 >

2-2 PI b (PV) . ()

(SV) 가 (Transient Response) 가 ,

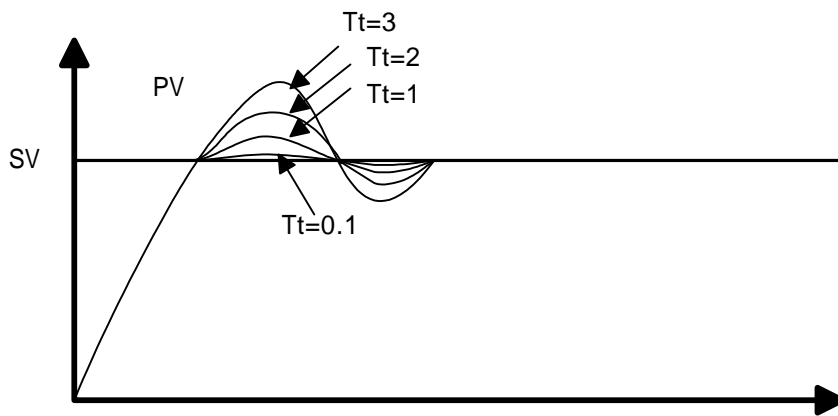
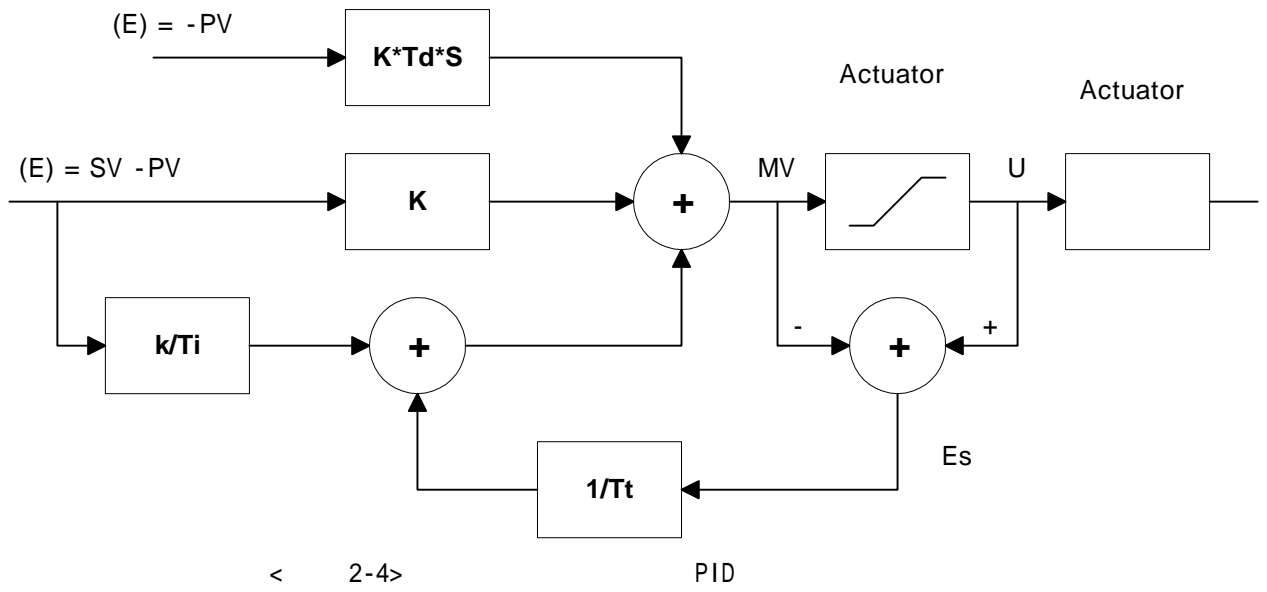
15.PID

2-4 (Gain) $1/T_t$, (U) PID (MV) Es 가
 , Es '0' PID 가
 가 (, MV = U) , 가 가 Es '0'
 . 가 가 Tt 가 $1/T_t$
 Tt
 (Anti Windup)
 2-5 PI Tt (PV)



< 2-3 >

15.PID



< 2-5> Tt(Tracking Time Constant)

15.2.2 PID

PID P, I, D

1) P

P

$$P(n) = K[b * SV(n) - PV(n)] \quad (2.2.1)$$

n, K, b, SV, PV

2) I

$$I(t) = \frac{K}{Ti} \int_0^t e(s) ds$$

t

$$\frac{dI}{dt} = \frac{K}{Ti} e \quad (SV - PV)$$

$$\frac{I(n+1) - I(n)}{h} = \frac{K}{Ti} e(n)$$

h

$$I(n+1) = I(n) + \frac{Kh}{Ti} e(n) \quad (2.2.2)$$

3) D

$$\frac{Td}{N} \frac{dD}{dt} + D = -KTd \frac{dy}{dt}$$

N (High Frequency Noise Depression Ratio), y, PV, PV, 가, Tustin, Tustin

$$D(n) = \frac{2Td - hN}{2Td + hN} D(n-1) - \frac{2KTdN}{2Td + hN} [y(n) - y(n-1)] \quad (2.2.3)$$

4) PID

P, I, D PID (Pseudo Code)

Step1: PID

$$\begin{aligned} Bi &= K \cdot h / Ti; \\ Ad &= (2 \cdot Td - N \cdot h) / (2 \cdot Td + N \cdot h); \\ Bd &= 2 \cdot K \cdot N \cdot Td / (2 \cdot Td + N \cdot h); \\ A0 &= h / Tt; \end{aligned}$$

Step2: (SV) (PV)

$$PV = \text{adin}(ch1);$$

Step3:

$$P = K \cdot (b \cdot SV - PV);$$

Step4:

$$D = Ad \cdot D - Bd \cdot (PV - PV_old);$$

Step 5:

$$MV = P + I + D;$$

Step 6:

$$U = \text{sat}(MV, U_{\text{low}}, U_{\text{high}});$$

Step 7: MV D/A

Step 8:

$$I = I + bi * (SV - PV) + A0 * (U - MV)$$

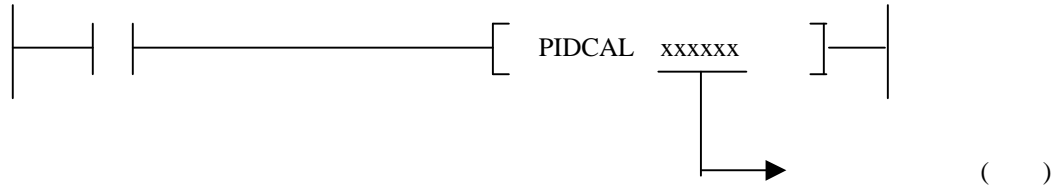
Step 9: PV_old

$$PV_{\text{old}} = PV$$

15.PID

15.3.1 PID

1) PIDCAL



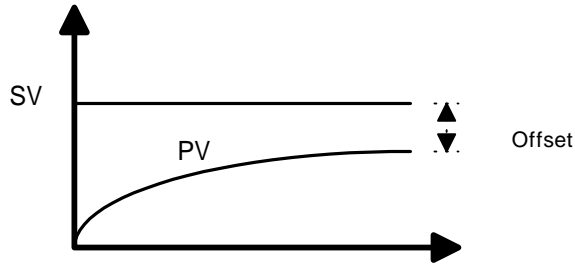
+0	S_TIME	(: 0.1 ~ 10 1 ~ 100 .)	
+1	MVMAN	(: 0 ~ 4000)	
+2	MV_MIN	(: 0 ~ 4000)	
+3	MV_MAX	(: 0 ~ 4000)	
+4	N	High Frequency Noise Depression Ratio(: 1 ~ 10)	
+5	TT	Tracking Time Constant (: 0.01 ~ 10.00 1 ~ 1000 .)	
+6	REF	(: 0.1 ~ 1 1 ~ 10 .)	
+7	D_TIME	(: 0.0 ~ 2000.0 0 ~ 20000)	
+8	I_TIME	(: 0.0 ~ 2000.0 0 ~ 20000)	
+9	P_GAIN	(: 0.01 ~ 100.00 1 ~ 10000)	
+10	EN_D	(1: , 0:)	
+11	EN_I	(1: , 0:)	
+12	EN_P	(1: , 0:)	
+13	BIAS	(disturbance) Feed forward Offset (: 0 ~ 4000)	
+14	PV		
+15	SV	(Set Point) (: 0 ~ 4000)	

15.PID

+16	D/R	/	(0: , 1:)
+17	MAN		(1: , 0:)
+18	STAT		
+19	MV	MV	
+20	ERR.	PV-SV	
+21	P_VAL(LOW)	PID	
+22	P_VAL(HIGH)	“	
+23	I_VAL(LOW)	“	
+24	I_VAL(HIGH)	“	
+25	D_VAL(LOW)	“	
+26	D_VAL(HIGH)	“	
+27	Bi	가	
+28	Ad	“	
+29	Bd	“	
+30	AO	“	
+31	PV_OLD	“	
+32	ACTUATOR_OUT	“	
+33	REAL_MV(LOW)	“	
+34	REAL_MV(HIGH)	“	
+35	CORRUPT/STAGE	“	
+36	TEMP_PV	“	

- (1) SV(Setting Value,) PV(Process Value,) K200S
 0 ~ 4000 . K200S A/D D/A
 가 12 , Offset .
- (2) BIAS Offset . , P
 Offset (Compensation) . SV - PV Offset 100
 가 , BIAS 100 .

15.PID



(3)

No.	EN_P	EN_I	EN_D	
1	1(Enable)	0(Disable)	0(Disable)	P
2	1(Enable)	1(Enable)	0(Disable)	PI
3	1(Enable)	1(Enable)	1(Enable)	PID
4	0(Disable)	0(Disable)	0(Disable)	On/Off

* , PD

(4) K200S

가

Floating

, PID

, K200S

PID

P_GAIN

100

Scale

Up

Fixed

98 P_GAIN

, 9800

, 10.99

1099

P_GAIN

100.00(

10000)

(5) I_TIME, D_TIME

P_GAIN

가

P_GAIN

100

Scale Up

, I_TIME

D_TIME

10

Scale Up

가 I_TIME

1889.4

18894

I_TIME

2000.0(

20000)

(6) S_TIME(

)

(PID

)

가

. S_TIME

10

Scale Up

가 2

20

. 0.1 (

: 1)

10 (

: 100)

가

10.0(

100)

15.PID

(7) REF() . PID 가
 () ,
 (, ,) . 10 Scale
 Up , 가 . 가 1
 10 REF . 0.1(1)
 1.0(10) . → 2

(8) TT(Tracking Time COnstant) Anti_Reset Windup , 100
 Scale Up . 가 . 가 0.5
 TT 50 . 0.01(
 1) 10.00(1000) . →
 2 .

(9) N(High Frequency Noise DepressiOn Ratio) ,
 . 1 . Scale
 1 10 . 1 10
 . → 15.2 .

15.PID

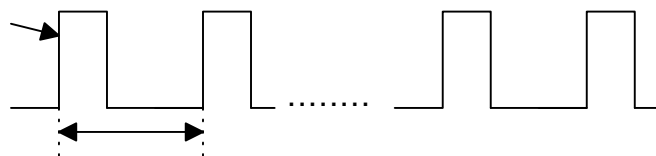
2) PIDAUT(Auto Tuning)

+0	S_TIME	(: 0.1 ~ 10 1 ~ 100 .)	
+1	PV		
+2	SV	(Set Point) (: 0 ~ 4000)	
+3	Ripple	A/T 가 1	
+4	STAT		
+5	MV	(: 0 ~ 4000)	
+6	P	(: 0.01 ~ 100.0) 1 ~ 10000)	
+7	I	(: 0.0 ~ 2000.0) 0 ~ 20000)	
+8	D	(: 0.0 ~ 2000.0) 0 ~ 20000)	
+9	PV_OLD		
+10	Limit		
+11	Ultimate_Time		
+12	MAX_amplitude		
+13	MIN_amplitude		
+14	Stage		
+15	Region/Corrupt		
+16	Temp_PV		
+17	Amplitude		
+18	Kc		

15.PID

(1) SV(Setting Value,) PV(Process Value,)
 K200S 0 ~ 4000 K200S
 A/D D/A 가 12 , Offset
 (SV) (SV)
 Pt100(: =0 °C ~ 250°C)
 가 (SV) 100°C SV 100
 A/D 1.
 (1V ~ 5V) 2. (4 ~ 200mA) (1V ~ 5V) A/D (12)
 0 ~ 4097(K200S A/D 0 ~ 4000)
 A/D
 , 0 °C 1V (A/D : 0) , 250 °C
 5V (A/D : 4000) 100 °C 2V
 .5V(250 °C) : 4000 = 2V(100 °C):SV
 SV 1600 .PV 가

(2) S_TIME()
 (PID)
 가 S_TIME 10 Scale Up , 가
 2 20 0.1 (:1)
 10 (: 100) 가
 10.0 (100)
 , S_TIME PID6AT



15.PID

(3) K200S (A/T) (Frequency Response) (PV)

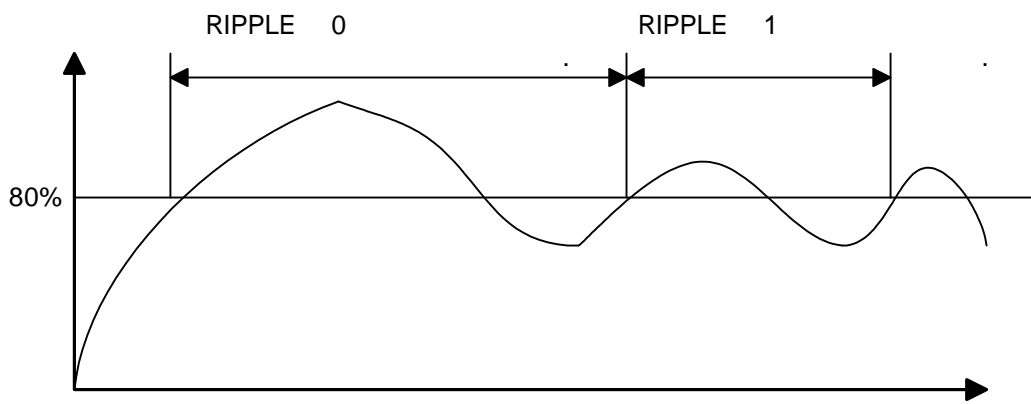
가 On/Off

Ripple A/T 0 , 1

1 2 가 , 0 1

가 1 PID A/T

가 80% Ripple On/Off



15.PID

15.3.2 PID

1) PIDCAL

STAT

STAT			
0			-
1		(SV)	(SV) 0 ~ 4000 가
2		(MVMAN)	(MVMAN) 0 ~ 4000 가
3		(P_GAIN)	(P_GAIN) 가 0.01 ~ 100.00 K200S 10000 , 87.43 8743 1 ~
4		(I_TIME)	(I_TIME) 가 0.0 ~ 2000.0 K200S 20000 , 283.7 2837 0 ~
5		(D_TIME)	(D_TIME) 가 0.0 ~ 2000.0 K200S 0 ~ 20000 , 283.7 2837
6		(S_TIME)	S_TIME 가 0.1 ~ 10 , 가 1 ~ 100 가 , 0 100 가
7		REF	REF 가 0.1 ~ 1 , 가 1 ~ 10 가 , 0 10 가

15.PID

STAT			
8		TT(Tracking Time COnstant)	TT 가 0.01 ~ 10.00 , 가 1 ~1000 가 , 0 1000 가 .
9		N (High Frequency Noise Depression Ratio)	N 가 1 ~ 10 , 가 1 ~10 가 , 0 1000 가 .
10		EN_P = 0 EN_I = 1 AND/OR EN_D= 1	ID I D . P , PI , PID ON/OFF 가 .
40		CPU 가 A	PID CPU 가 B C . CPU B,C .

15.PID

2) PIDTUN

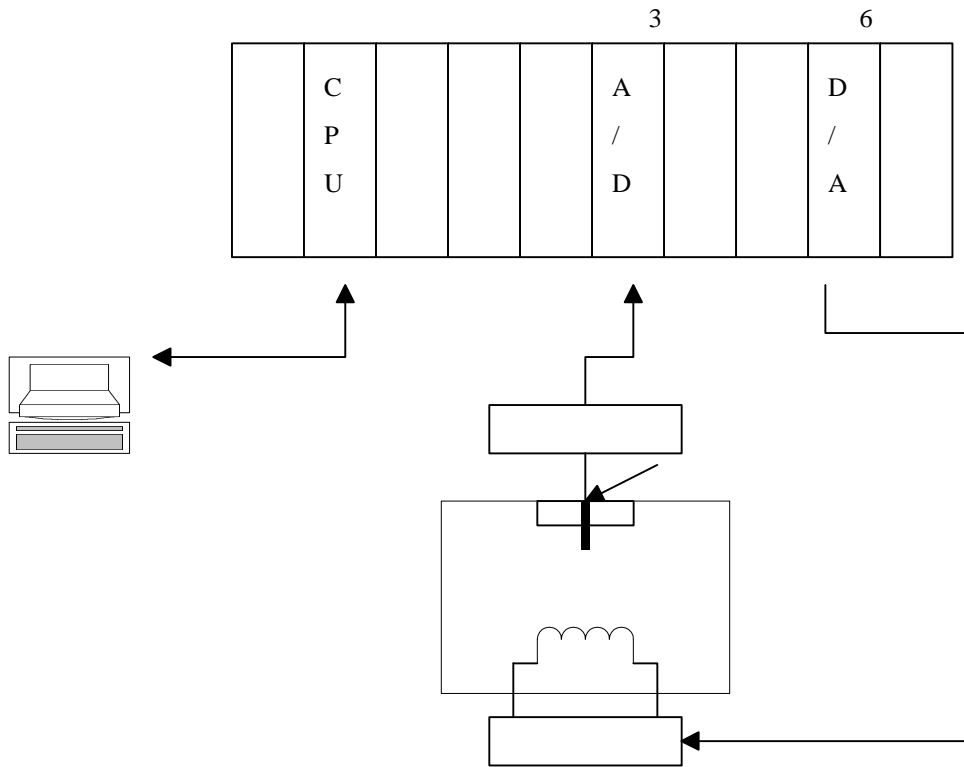
STAT

STAT			
0			-
1		(SV)	(SV) 0 ~ 4000 가
2		(PV)	PV (0 ~ 40000) A/D
3		(S_TIME)	S_TIME 가 0.1 ~ 10 , 가 1 ~ 10 가 , 0 100 가
40		CPU 가 A	PID CPU B,C CPU B,C

15.4

15.4.1

: K3S-304S
 CPU : K3P-07BS, K3P-07CS
 A/D : K3F-AD2A, D/A : K3F-DI2A



15.4.2

- 1) PID (CPUB, CPUC)
 (1) , :
 (2) , :
 (3) (:960(60 °C), 1120(70 °C), 1280(80 °C),
 1600(100 °C)

15. PID

- (4) BIAS : 0 (P 0)
- (5) EN-P, EN_D, EN_I : PID 1, EN_P =1, EN_I =1, EN_D =1
- (6) (REF), Tracking Time(TT), (N) : REF=10, TT=50, N=1
- (7) MV_MAX, MV_MIN, MVMAN : MV_MAX=4000, MV_MIN =0, MVMAN =2000
- (8) : 10 (S_TIME=100)

- 2) A/T (CPUB, CPUC)
- (1) (RTD): 960(60 °C), 1120(70 °C), 1280(80 °C), 1600(100 °C)
- (2) : 10 (S_TIME=100)

- 3) A/D
- (1) : 0
- (2) : -48 ~ 4047
- (3) :

- 4) D/A
- (1) : 0

15.4.3

1) PID

- (1) (0 ~ 250°C) 4 ~ 20mA
A/D 0, 0 ~ 4000 .
- (2) PID 가 (P_GAIN, I_TIME, D_TIME) (SV) A/D (: PV) , (MV) 0 ~ 4000 D/A .
- (3) D/A PID (4 ~ 20mA)
() .

2) (A/T) PID

- (1) (0 ~ 250°C) 4 ~ 20mA
A/D 0, 0 ~ 4000 .
- (2) A/T 가 , (SV)
A/D (: PV) , (MV)
D/A .
- (3) A/T , END 가 1 , P, I, D PID
(P_GAIN, I_TIME, D_TIME) 가 , PID .

15.PID

(4) D/A

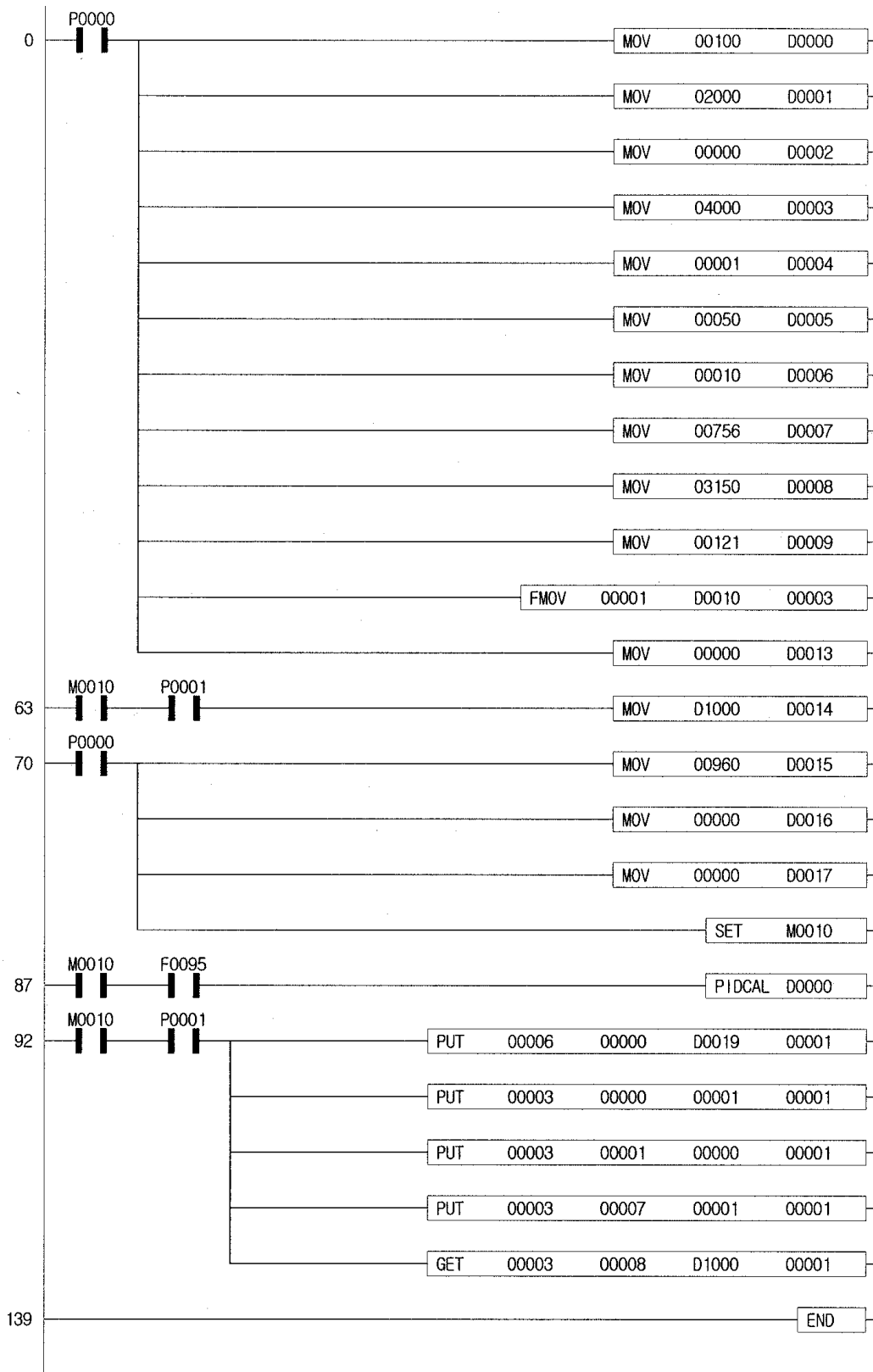
PID

(4 ~ 20mA)

()

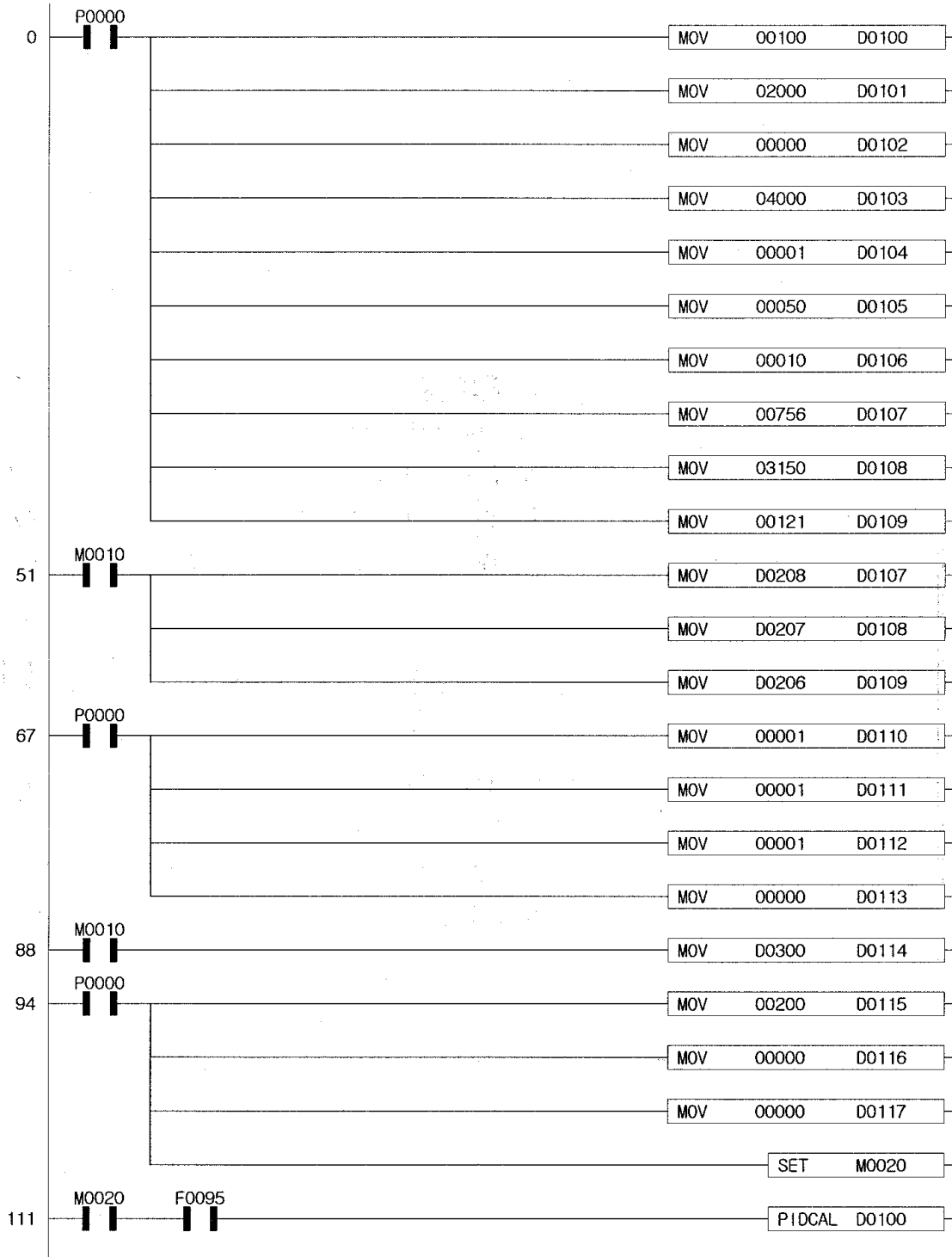
(1) K200S	A/D	D/A	4	.	.	.	.	A/D	
D/A				.					

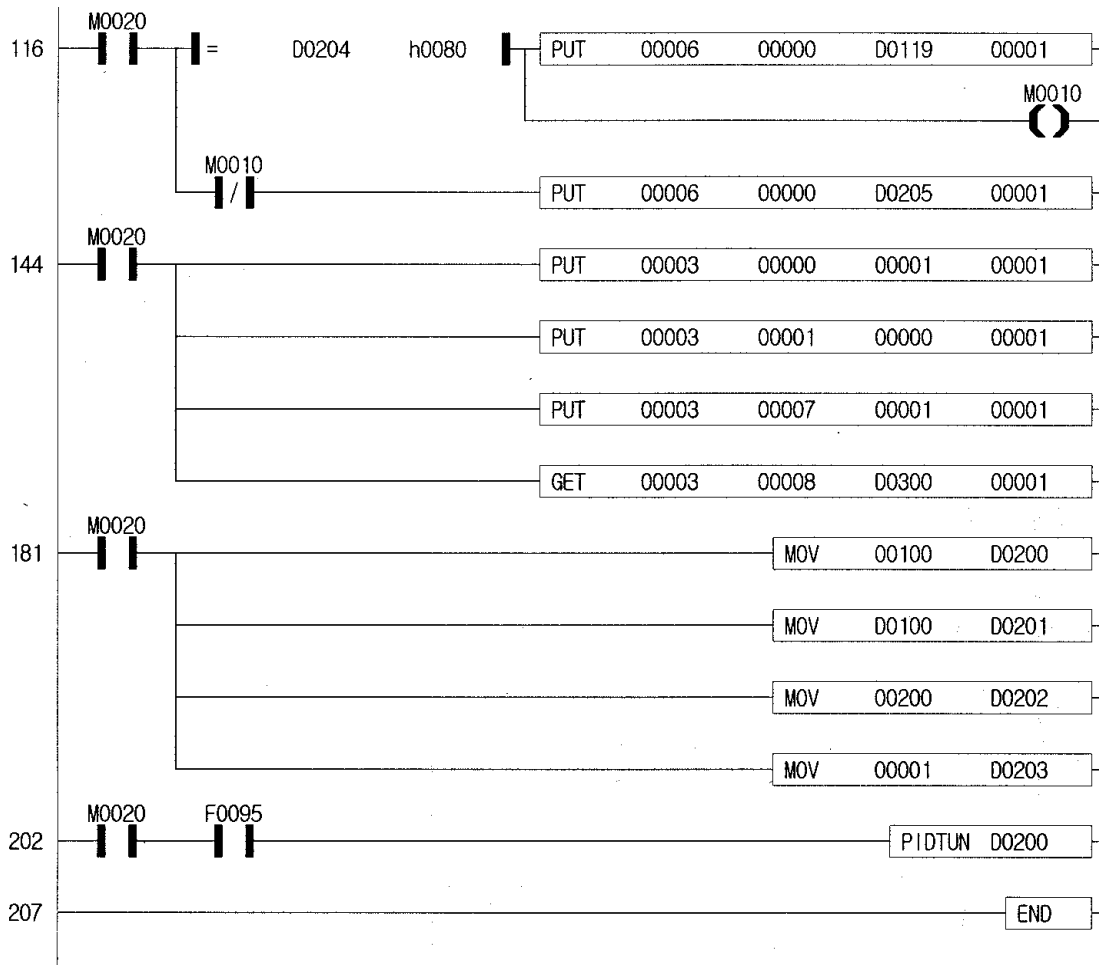
15.4.4 (PID)



15.PID

15.4.5 (PID A/T)
 A/T 80% P,I,D 가 , PID 가 80%





16.3

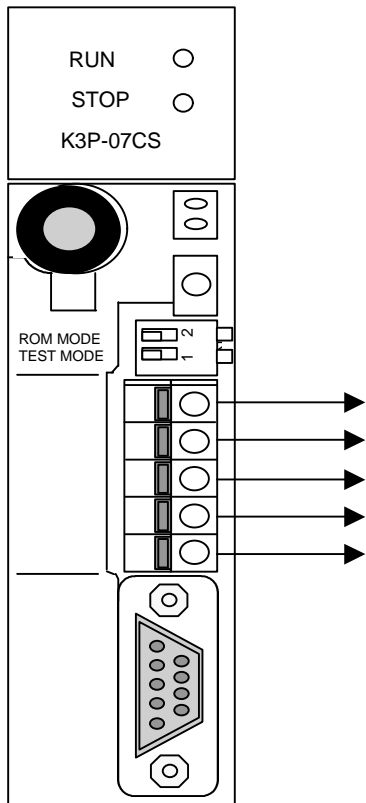
1) A / B

/	DC 24V (13mA)
On	14V
Off	2.5V

2)

/	DC 24V (10mA)
On	19V
Off	6V
On	1.5ms
Off	2ms

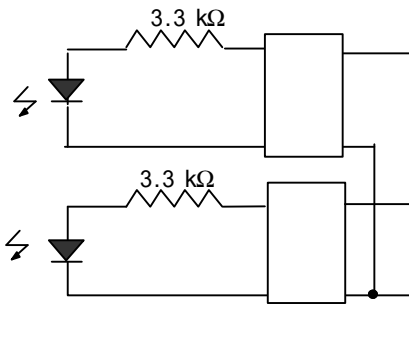
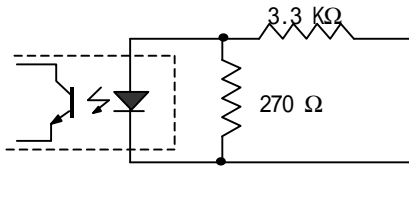
16.4



No.		
	ϕ A 24V	A
	ϕ B 24V	B
	COM	A/B
	24V	
	0V	

16.5

(I/F) .
I/F

/					
	1	A (DC24V)	On	14 ~ 26.4 V	
	2	B (DC24V)	Off	2.5V	
	3	COM (A/B)	—		
	4	(DC24V)	On	19 ~ 26.4 V	
	5	COM ()	Off	6 V	

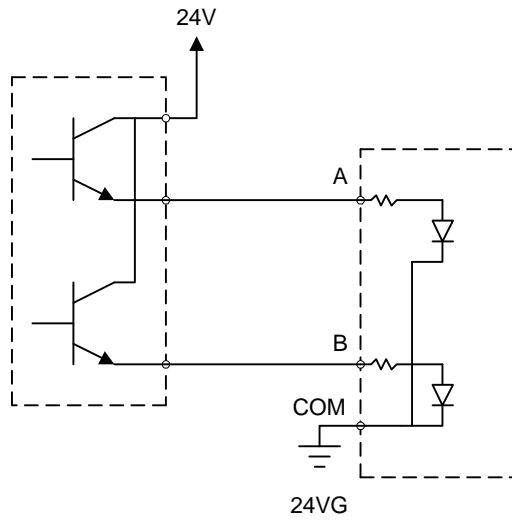
16.6

(Noise)

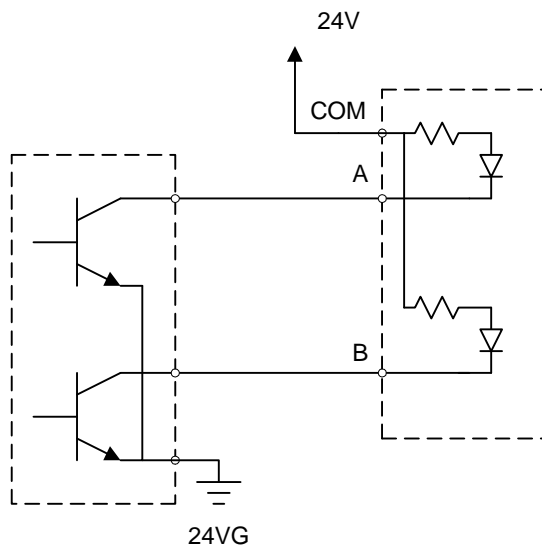
- 1) 3
- 2) 가 , 가
- 3) 가 .
1 A , 2 A , B

16.7

1) ()가

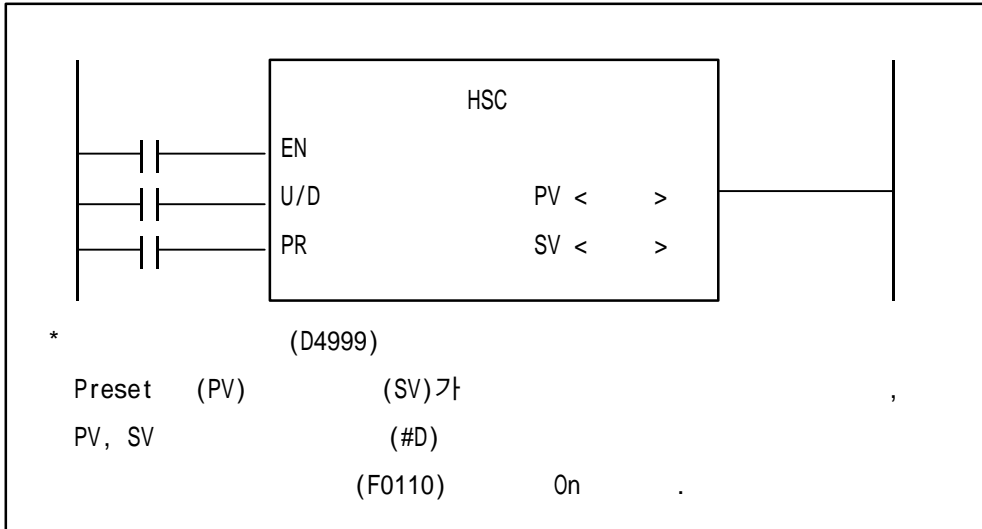


2) 가



16.8

16.8.1 (HSC)



(D4999)		A	B	Preset		
1	1000h	Pulse	-	-	-	U/D : PR :
	1010h	Pulse	-	Preset	-	U/D : PR : Preset
	1100h	Pulse	U/D		-	U/D : B PR :
	1110h	Pulse	U/D	Preset	-	U/D : B PR : Preset
2	2001h	A	B	-	1	PR : 1
	2002h	A	B	-	2	PR : 2
	2004h	A	B	-	4	PR : 4
	2011h	A	B	Preset	1	PR : Preset 1
	2012h	A	B	Preset	2	PR : Preset 2
	2014h	A	B	Preset	4	PR : Preset 4

*) U/D PR HSC U/D, PR

Dummy

1) EN

Enable EN On .

2) U/D

1 Up/Down , U/D Off

Up , On Down .

B Up/Down B High Up , Low Down

3) PR

Preset , PR Edge HSC PV

Preset (PR) Preset , Preset Preset

가 .

4) (F0170)

(F019, F018)가 HSC (SV) On ,

Off .

5) Carry (F0171)

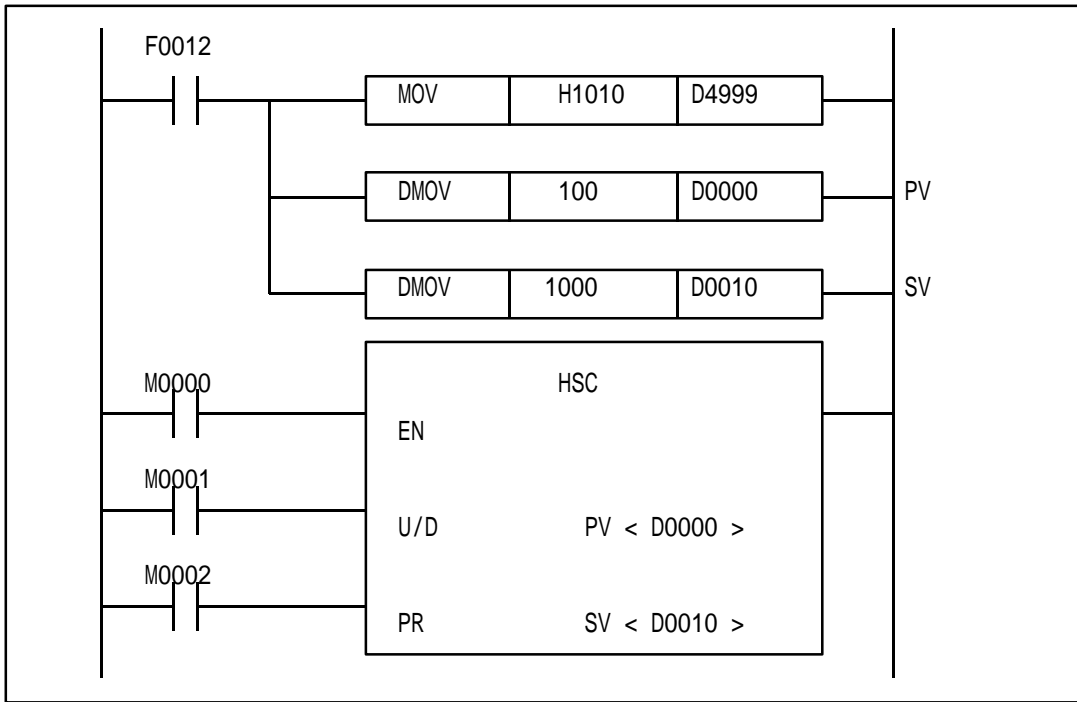
16,777,215(FFFFFFh) 0 0 16,777,215(FFFFFFh)

On , Enable (EN) Off Preset (PR) Edge Off

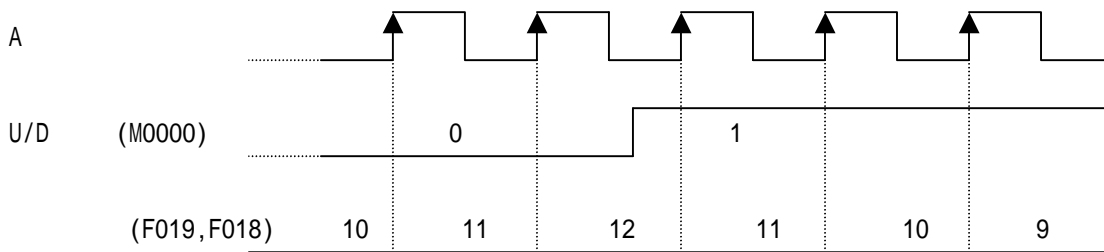
Carry On .

16.9

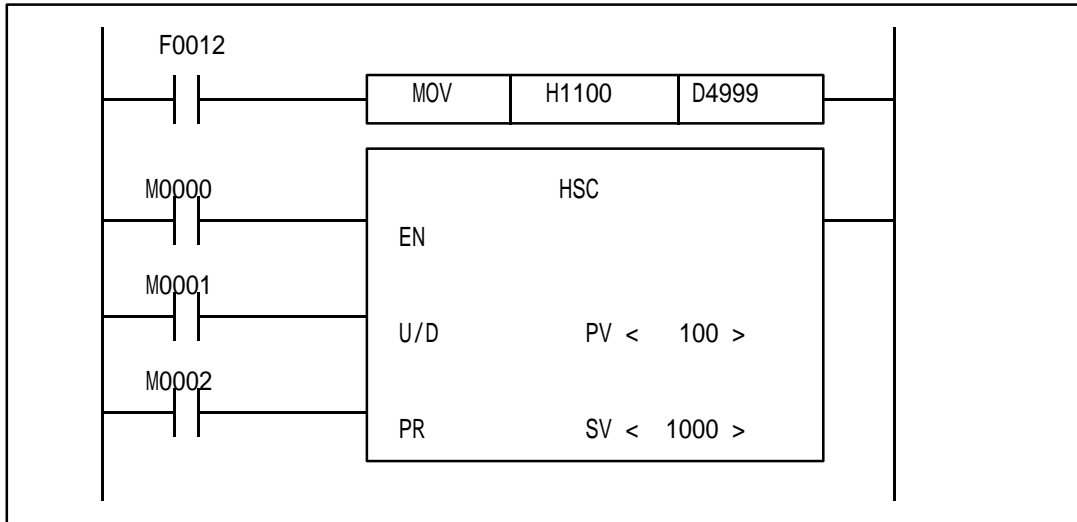
- 1) 1 (가/)
 (1) U/D Preset Preset
 (2) Preset = D0000 = 100, = D0010 = 1000



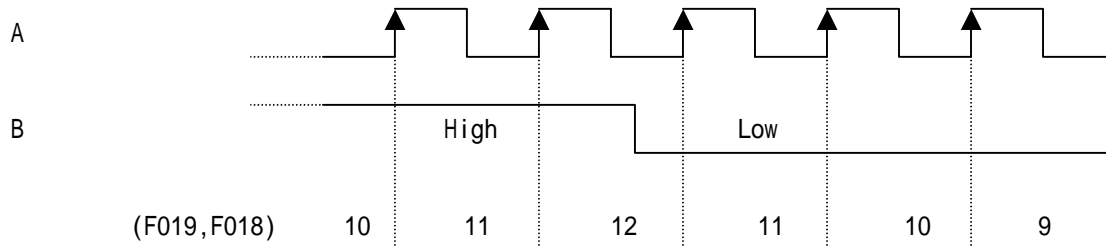
- (3) EN (M0000) 1
 (4) A 가 , HSC U/D (M0001)
 가,
 (5) U/D 0 가 , 1



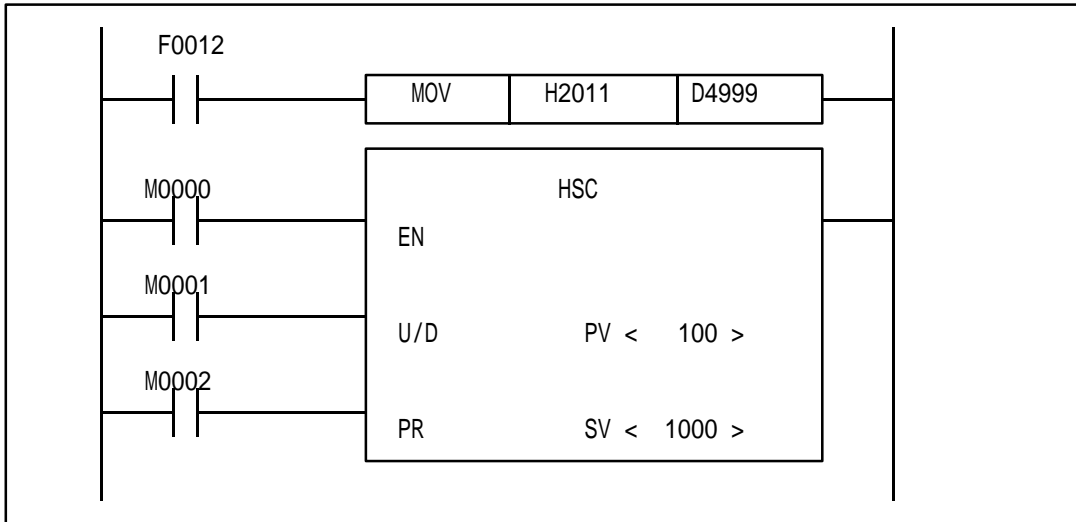
- 2) 1 (B 가/)
 (1) B U/D Preset
 (2) Preset = 100, = 1000



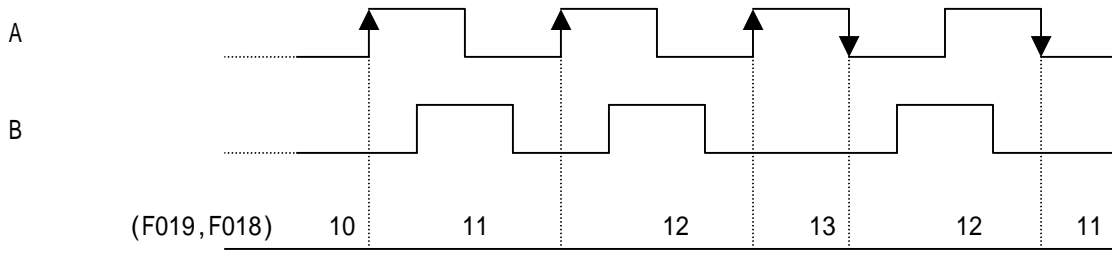
- (3) EN (M0000) 1
 (4) A 가 , B 가,
 (5) B High 가 , Low



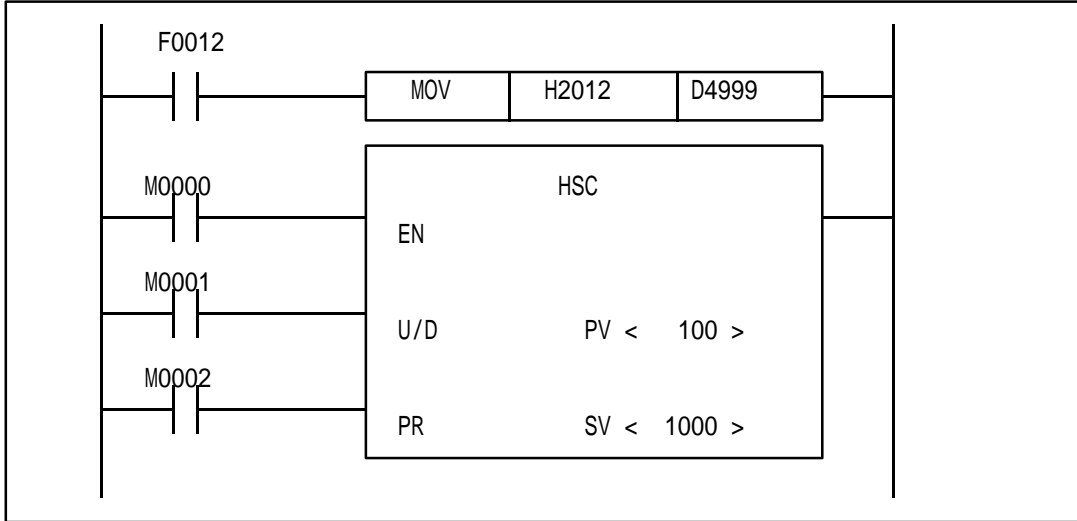
- 3) 2 (1)
 (1) Preset Preset 1
 (2) Preset = 100, = 1000



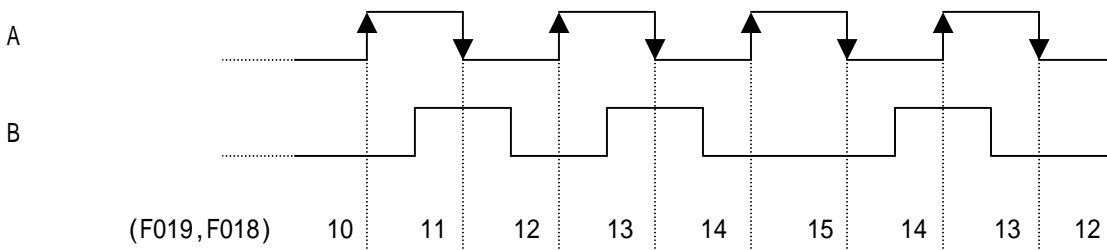
- (3) EN (M0000) 1 .
 (4) A 가 B 가 ,
 (5) B 가 A .
 (6) A 가 B 가 Low 가 ,
 (7) A 가 B 가 Low .



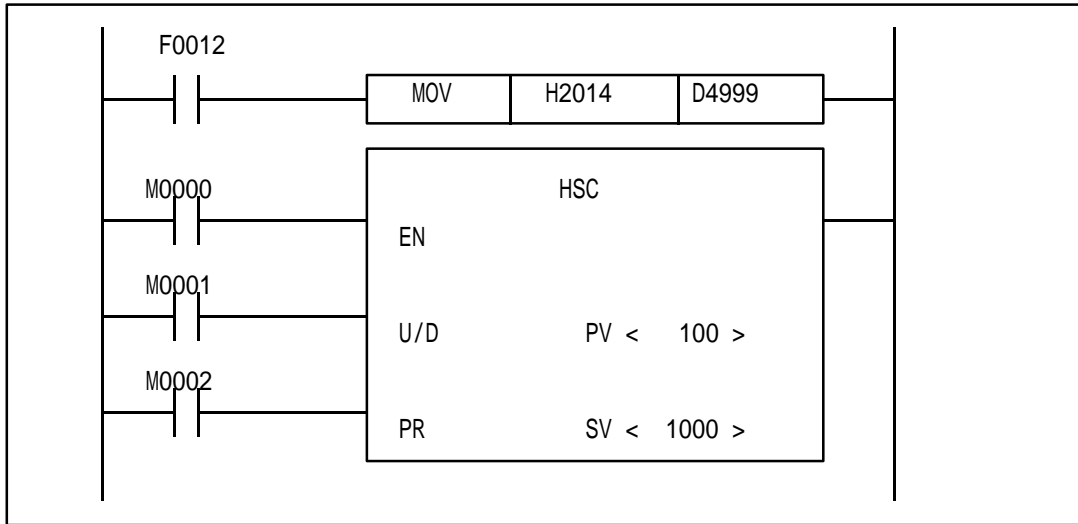
- 4) 2 (2)
 (1) Preset Preset 2
 (2) Preset = 100, = 1000



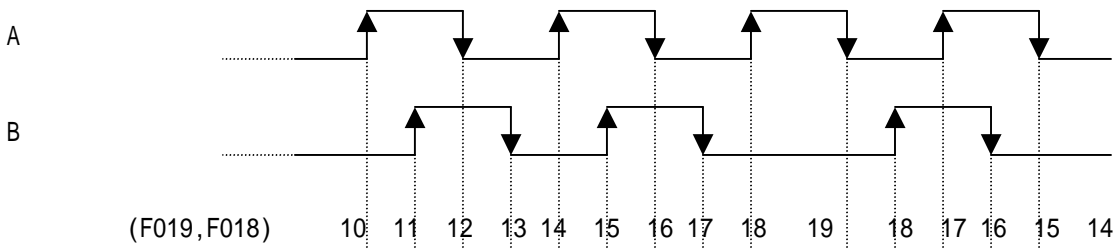
- (3) EN (M0000) 1 .
 (4) A 가 B 가 ,
 (5) B 가 A .
 (6) A 가 B 가 Low , A 가 B
 , A 가 High 가 ,A 가 B 가 High
 , A 가 B 가 Low .



- 5) 2 (4)
 (1) Preset Preset 4
 (2) Preset = 100, = 1000



- (3) EN (M0000) 1 .
 (4) A 가 B 가 ,
 (5) B 가 A .
 (6) A 가 B 가 Low , A 가
 B 가 High , B 가 A 가
 High , B 가 A 가 Low 가 ,
 A 가 B 가 High , A 가 B
 가 Low , B 가 A 가 Low ,
 B 가 A 가 High .



1.1

(F/M)

1) F

F0000	RUN	CPU 가 RUN	On
F0001		CPU 가	On
F0002	Pause	CPU 가 Pause	On
F0003		CPU 가	On
F0006	Remote	CPU 가 Remote	On
F0007	User	User	On
F0008 ~ F0009			
F000A	User	User	On
F000B ~ F000E			
F000F	STOP	STOP	On
F0010	On	On	
F0011	Off	Off	
F0012	1 On	1 On	
F0013	1 Off	1 Off	
F0014			
F0015 ~ F001F			
F0020	1 RUN	1 RUN	On
F0021	Break Point RUN	Break Point RUN	On
F0022	RUN	RUN	On
F0023	RUN	RUN	On
F0024	RUN	RUN	On
F0025 ~ F002F			
F0030			On
F0031			On
F0032	WDT	Watch Dog	On
F0033	I / O	I / O 가 On	On (F0040 ~ F005F)
F0034			On
F0035	Fuse	Fuse	On
F0036 ~ F0038			
F0039			On
F003A		Setting	On
F003B		RUN Edit	On
F003C		RUN Edit	On

F003D ~ F003F		
F0040 ~ F005F	I / O	I / O () I / O On
F0060 ~ F006F		(2.9)
F0070 ~ F008F	Fuse	Fuse On
F0090	20ms Clock	<p>On / Off</p>
F0091	100ms Clock	
F0092	200ms Clock	
F0093	1s Clock	
F0094	2s Clock	
F0095	10s Clock	
F0096	20s Clock	
F0097	60s Clock	
F0098 ~ F009F		
F0100	User Clock 0	Duty On / Off
F0101	User Clock 1	<p>[DUTY F010x N1 N2]</p>
F0102	User Clock 2	
F0103	User Clock 3	
F0104	User Clock 4	
F0105	User Clock 5	
F0106	User Clock 6	
F0107	User Clock 7	
F0108 ~ F010F		
F0110		On
F0111		가"0" On
F0112		가 On
F0113	Off	OUTPUT On
F0114	RAM R/W	Access On
F0115	()	On()
F0116 ~ F011F		
F0120	LT	CMP $S_1 < S_2$ On
F0121	LTE	CMP $S_1 \leq S_2$ On
F0122	EQU	CMP $S_1 = S_2$ On
F0123	GT	CMP $S_1 > S_2$ On
F0124	GTE	CMP $S_1 \geq S_2$ On

F0125	NEQ	CMP	$S_1 \neq S_2$	On
F0126 ~ F012F				
F0130 ~ F013F	AC Down Count	AC Down	Count	
F0140 ~ F014F	FALS	FALS		
F0150 ~ F015F	PUT/GET		RAM Access	On
F0160 ~ F049F				
F0500 ~ F050F				
F0510 ~ F051F				
F0520 ~ F052F				
F0530 ~ F053F	(/)	(/)		
F0540 ~ F054F	(/)	(/)		
F0550 ~ F055F	(/)	(/)		
F0560 ~ F056F	(/)	(/)		
F0570 ~ F058F				
F0590 ~ F059F				
F0600 ~ F060F	FMM	FMM		
F0610 ~ F063F				

2) M

M1904		On	RTC	Write
M1910	I / O	I / O	I/O	

1) F	가
2) M	가 가

1.2 ()

Fnet/Cnet

KGL-WIN

[(가 0)]

x : K1000S=9, K300S/K200S=4

Dx500 Dx502	_CnSTNOL _CnSTNOH		Fnet :
Dx504	_CnTXECNT		가 1 가
Dx505	_CnRXECNT		가 1 가
Dx506	_CnSVCFCNT		가 1 가
Dx507	_CnSCANMX	(1ms)	TOKEN
Dx508	_CnSCANAV	(1ms)	TOKEN
Dx509	_CnSCANMN	(1ms)	TOKEN
Dx510	_CnLINF		
Dx510.B	_CnCRDER	(=1)	H/W O/S
Dx510.C	_CnSVBSY	(=1)	가
Dx510.D	_CnIFERR	(=1)	가
Dx510.E	_CnINRING	(가 =1)	가
Dx510.F	_CnLNKMOD	(=1)	가 TEST
Dx680	_CnVERNO	NO	O/S
Dx690	_FSMn_st_no	I/O	8bit I/O ()
Dx690.0	_FSMn_reset	I/O s/w reset	_FSMn_st_no I/O
Dx690.1	_FSMn_io_reset	I/O reset	_FSMn_st_no I/O
Dx690.2	_FSMn_hs_reset	I/O	_FSMn_st_no bit off 1 bit ON bit가 On 0

- 1) , K200S 가 ,K300/1000S
- 2) ' 1' 가가
- 3) _FSM3_st_no(Dx693) 8bit 가 h10 , 가 3
가 16 _FSMn_reset, _FSMn_io_reset, _FSMn_hs_rese
, hFF 가 3

	D	
1	Dx511 ~ Dx521	$D = [\begin{matrix} 0 & & & & & & N \\ & & & & & & \\ & & & & & & \\ * & : N=1 \sim 7 & D & = [1] & +11 \times N \\ & & & & & & \\) & 6 & & & & & \\ \rightarrow Dx508+11 \times 6 = Dx574 & & & & & & \end{matrix}]$
2	Dx522 ~ Dx532	
3	Dx533 ~ Dx543	
4	Dx544 ~ Dx554	
5	Dx555 ~ Dx565	
6	Dx566 ~ Dx576	
7	Dx577 ~ Dx587	

1) K200S	Dx680 ~ Dx687	0	7	
,	I/O Dx690 ~ Dx697	0	7	
.	(K300/1000S			가가
)				

1.3 ()

x : K1000S=9, K300S/K200S=4 m :

Bit			
Dx600.0	_HSmRLINK	RUN_LINK	1. RUN ON 가 2. 가 3. 가 - On ON
Dx600.1	_HSmLTRBL	(LINK_TROUBLE)	_HSmRLINK가 ON 가 1. RUN ON 가 2. 가 3. 가 가 1,2,3 OFF ON ,
Dx601.0 ~ Dx604.15	_HSmSTATE[k] (k=0 ~ 63)	k	_HSmSTATE[k] = _HSmMOD[k] & _HSmTRX[k] & _HSmERR[k]
Dx605.0 ~ Dx608.15	_HSmMOD[k] (k=0 ~ 63)	(RUN = 1, = 0)	k
Dx609.0 ~ Dx612.15	_HSmTRX[k] (k=0 ~ 63)	(=1, =0)	k 가
Dx613.0 ~ Dx616.15	_HSmERR[k] (k=0 ~ 63)	0000000 (=1, =0)	k 가

1) k	0 ~ 63	64	1Word	16	4Word	.
	(_HSOMOD)	Dx605	0	15	Dx606, Dx607, Dx608	
	16 ~ 31, 32 ~ 47, 48 ~ 63	가	.	55	Dx608.7	

m=1 ~ 3

	D	
High Speed Link2 (m=1)	Dx620 ~ Dx633	m=0 m=1 ~ 3
High Speed Link3 (m=2)	Dx640 ~ Dx653	D * : m=1 ~ 3 D = { 3} + 20 x
High Speed Link4 (m=3)	Dx660 ~ Dx673	m

New MK FNet

0	RS-232C	L0000 (1 Frame)	L0001 (2 Frame)	.....	L000E (15 Frame)	L000F (16 Frame)
		L0010 (17 Frame)	L0011 (18 Frame)	.....	L001E (31 Frame)	L001F (32 Frame)
		L0020 (33 Frame)	L0021 (34 Frame)	.....	L002E (47 Frame)	L002F (48 Frame)
		L0030 (49 Frame)	L0031 (50 Frame)	.....	L003E (63 Frame)	L003F (64 Frame)
	RS-422	L0040 (1 Frame)	L0041 (2 Frame)	.....	L004E (15 Frame)	L004F (16 Frame)
		L0050 (17 Frame)	L0051 (18 Frame)	.....	L005E (31 Frame)	L005F (32 Frame)
		L0060 (33 Frame)	L0061 (34 Frame)	.....	L006E (47 Frame)	L006F (48 Frame)
		L0070 (49 Frame)	L0071 (50 Frame)	.....	L007E (63 Frame)	L007F (64 Frame)
1	RS-232C	L0080 (1 Frame)	L0081 (2 Frame)	.....	L008E (15 Frame)	L008F (16 Frame)
		L0090 (17 Frame)	L0091 (18 Frame)	.....	L009E (31 Frame)	L009F (32 Frame)
		L0100 (33 Frame)	L0101 (34 Frame)	.....	L010E (47 Frame)	L010F (48 Frame)
		L0110 (49 Frame)	L0111 (50 Frame)	.....	L011E (63 Frame)	L011F (64 Frame)
	RS-422	L0120 (1 Frame)	L0121 (2 Frame)	.....	L012E (15 Frame)	L012F (16 Frame)
		L0130 (17 Frame)	L0131 (18 Frame)	.....	L013E (31 Frame)	L013F (32 Frame)
		L0140 (33 Frame)	L0141 (34 Frame)	.....	L014E (47 Frame)	L014F (48 Frame)
		L0150 (49 Frame)	L0151 (50 Frame)	.....	L015E (63 Frame)	L015F (64 Frame)

2 Contact ()

2.1 DC

(EMF : Electromotive Force) ARC

2.1.1

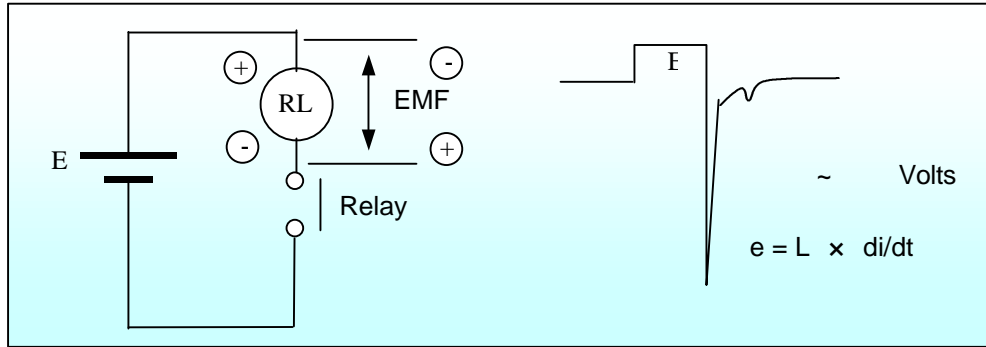
Relay

OFF

~ Volts

$$1/2LI^2$$

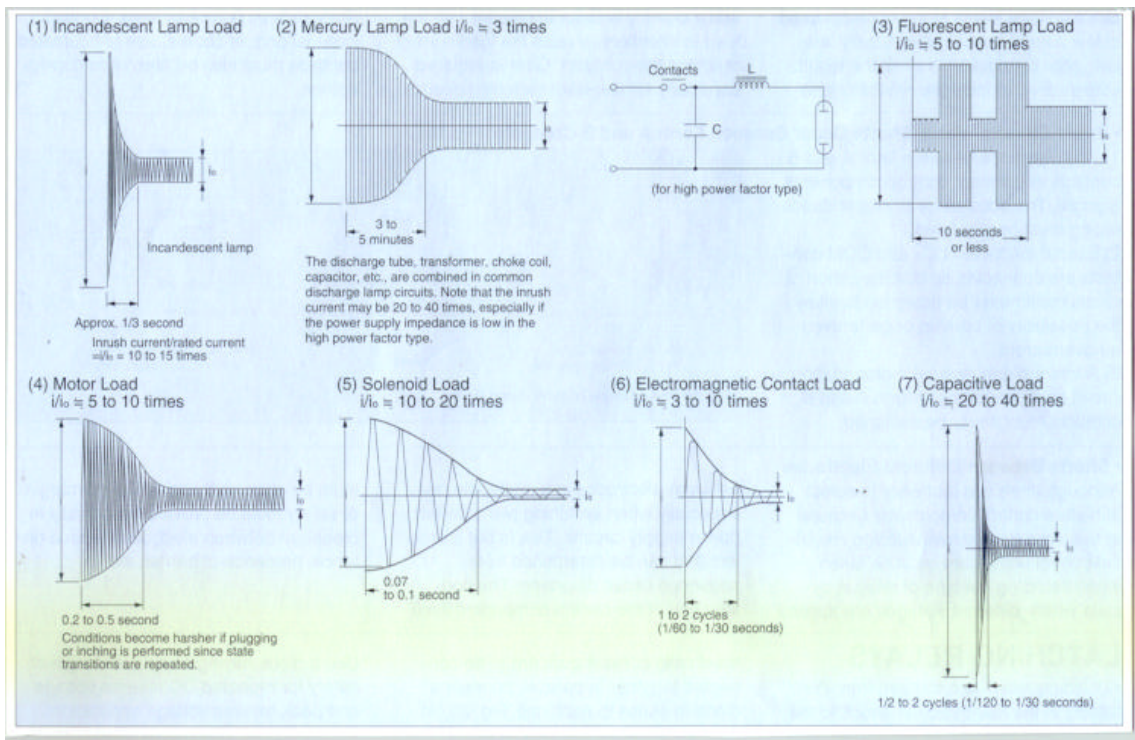
ARC



2.

2.2 AC

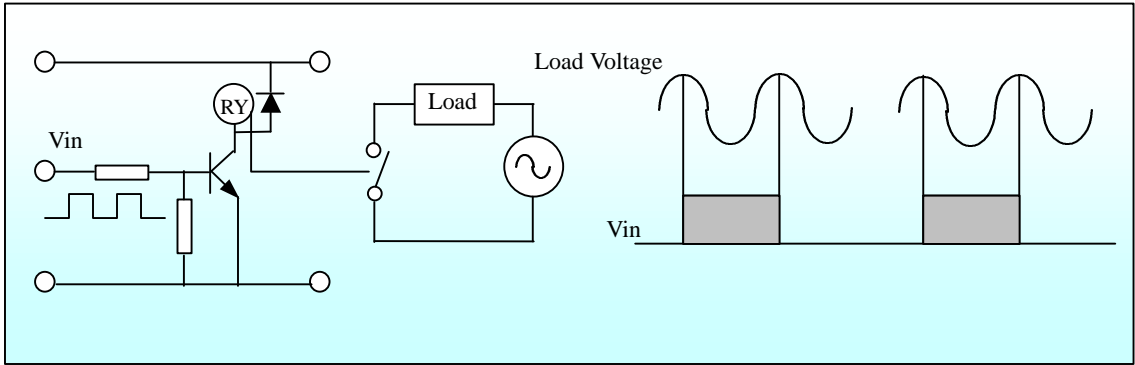
Steady (가)



3. AC

2.3 AC

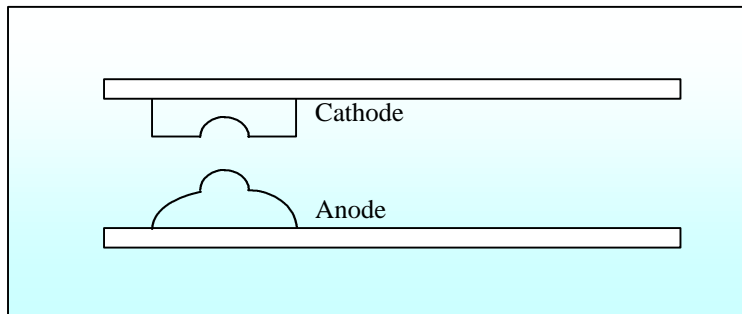
- AC Point Relay 가



4. AC Switching

2.4 ARC

- ARC 가
ARC , 4 가



5.

2.5

Relay

2.5.1

- DC

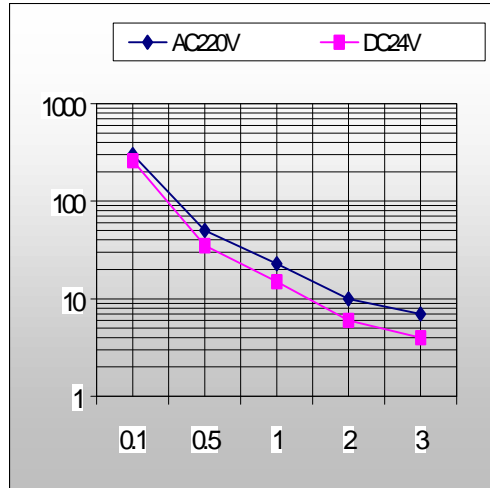
()

가 (轉移) , AC

Zero

(Crossing)

DC



6. AC/DC

2.5.2

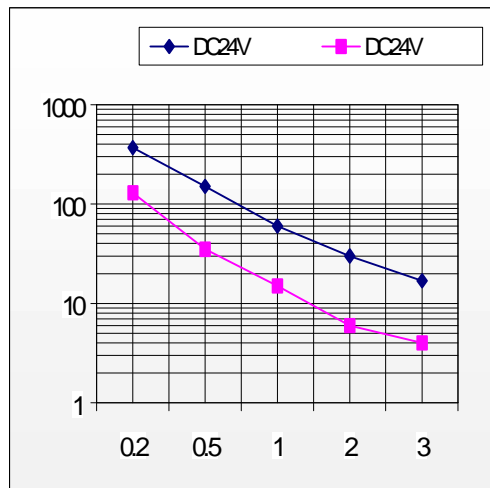
- DC

, AC

(CosÖ)

AC

1



7.

3

AC DC
, Varistor
가 .

CR ,

가 가

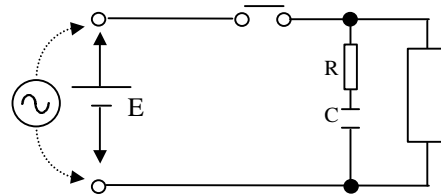
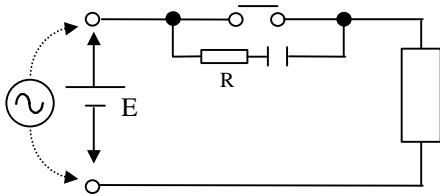
Relay

15~20

3.1 CR

3.1.1 R : 0.5 ~ 1 / Voltage (: DC24V
12 ~ 24V)

3.1.2 C : 0.5 ~ 1 / Current (: 가 0.1A C
0.05 ~ 0.1uF)

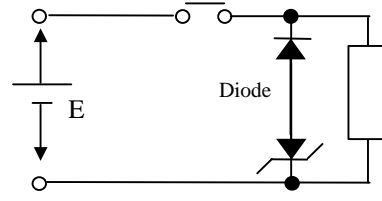
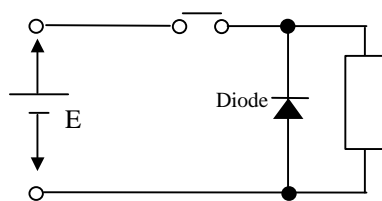


8. CR

3.2 Diode (DC)

3.2.1 Diode : (E) 10 가 ,

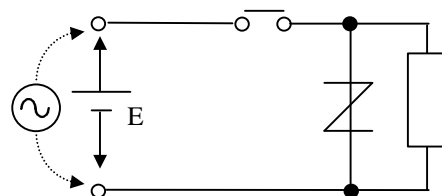
3.2.2 Zener Diode : (E) Zener Diode
(: DC24V Zener Diode 24V)



9. Diode

3.3 Varistor

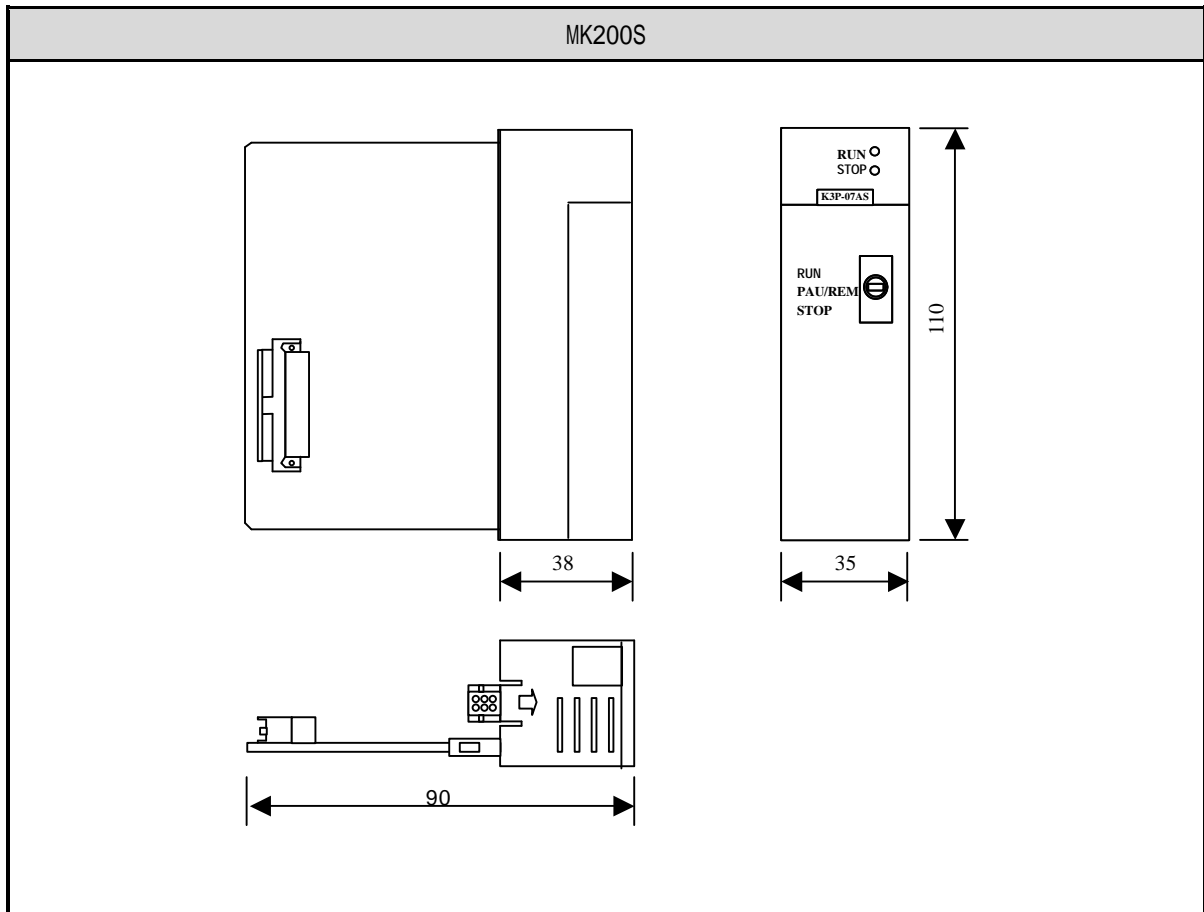
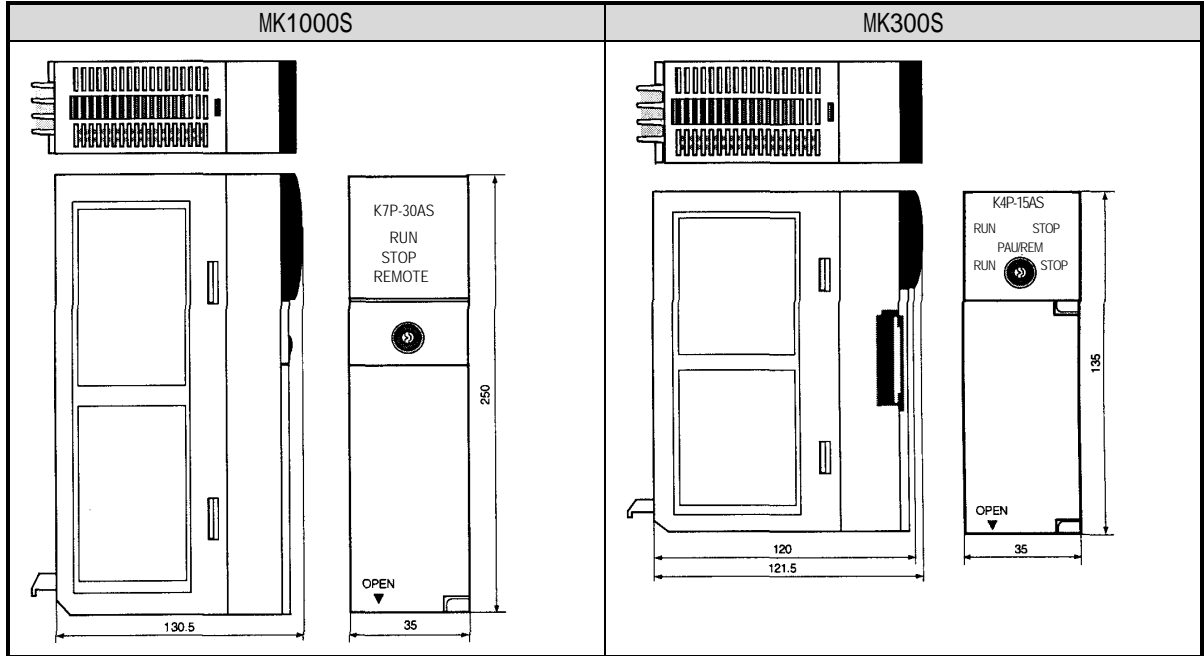
3.3.1 Varistor : (E) , 1.5
가 .



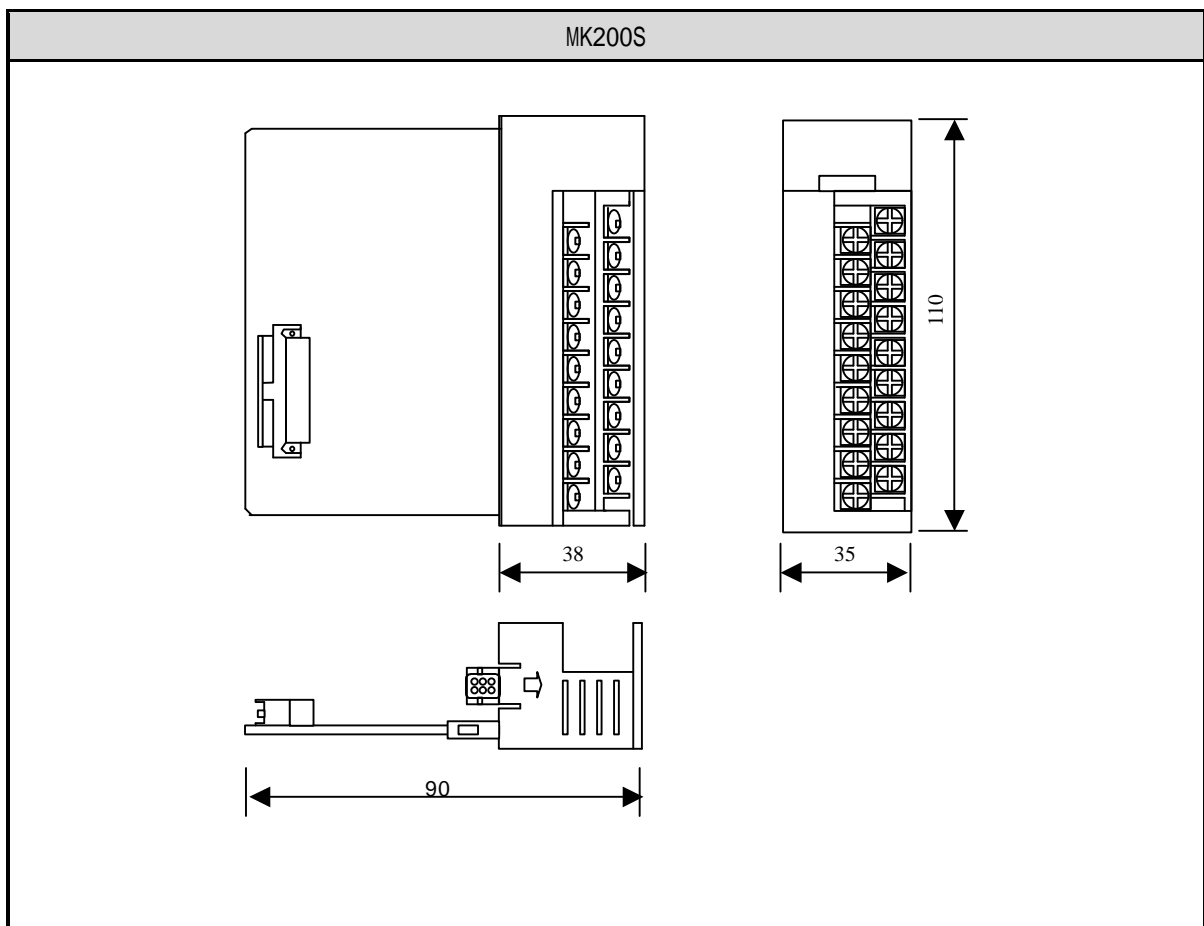
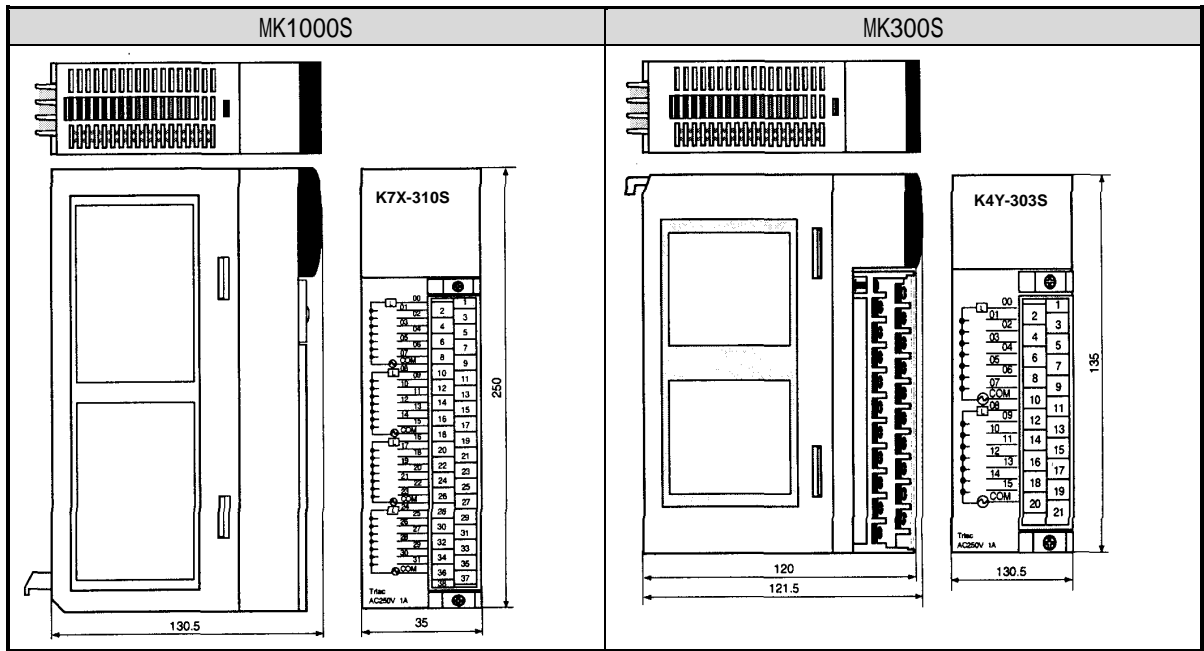
10. Varistor

2. (: mm)

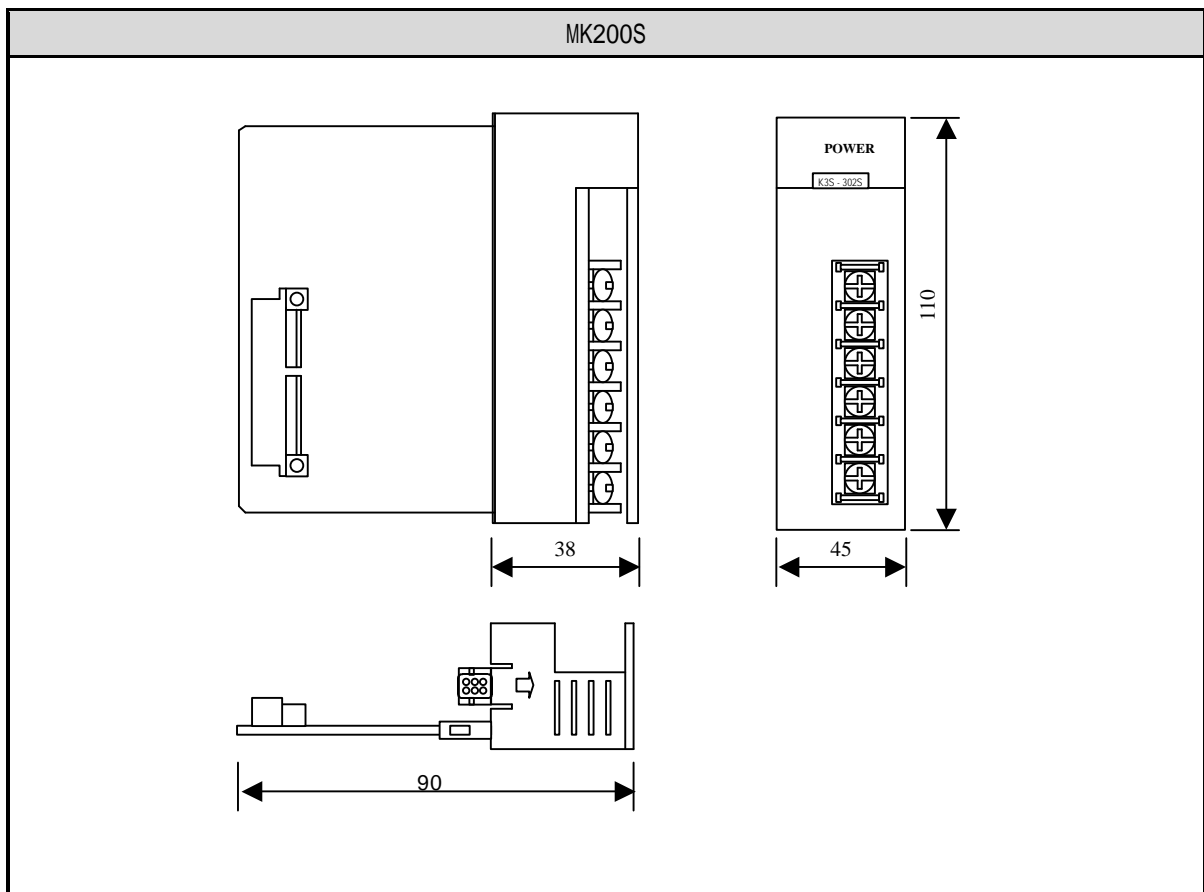
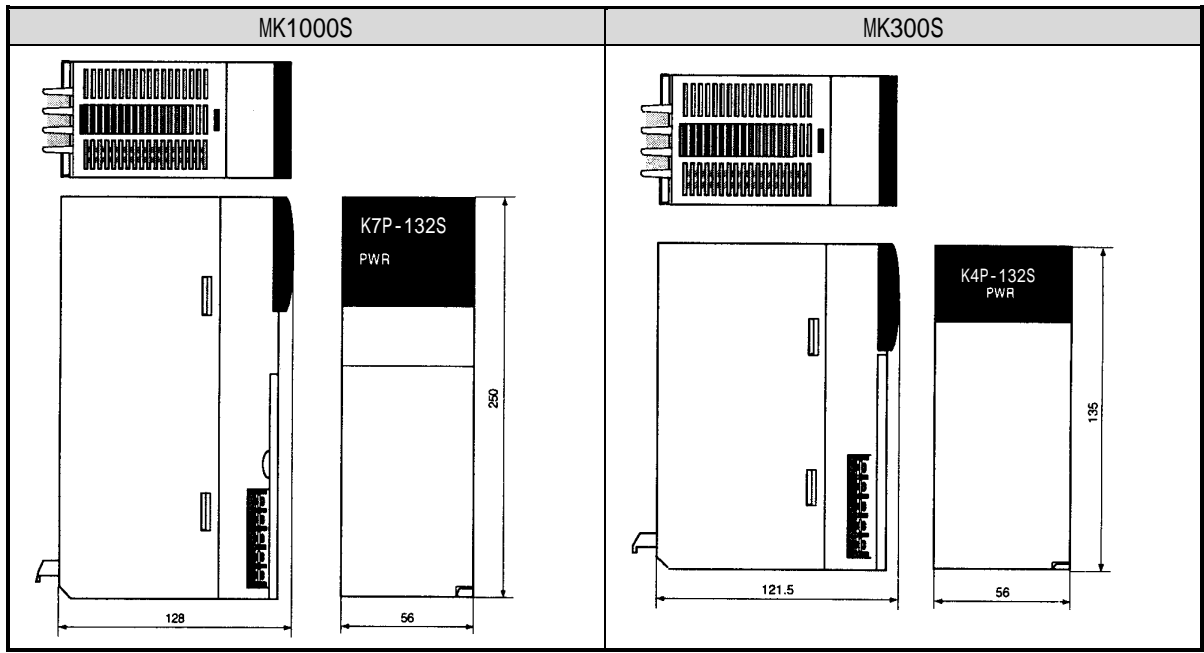
1) CPU



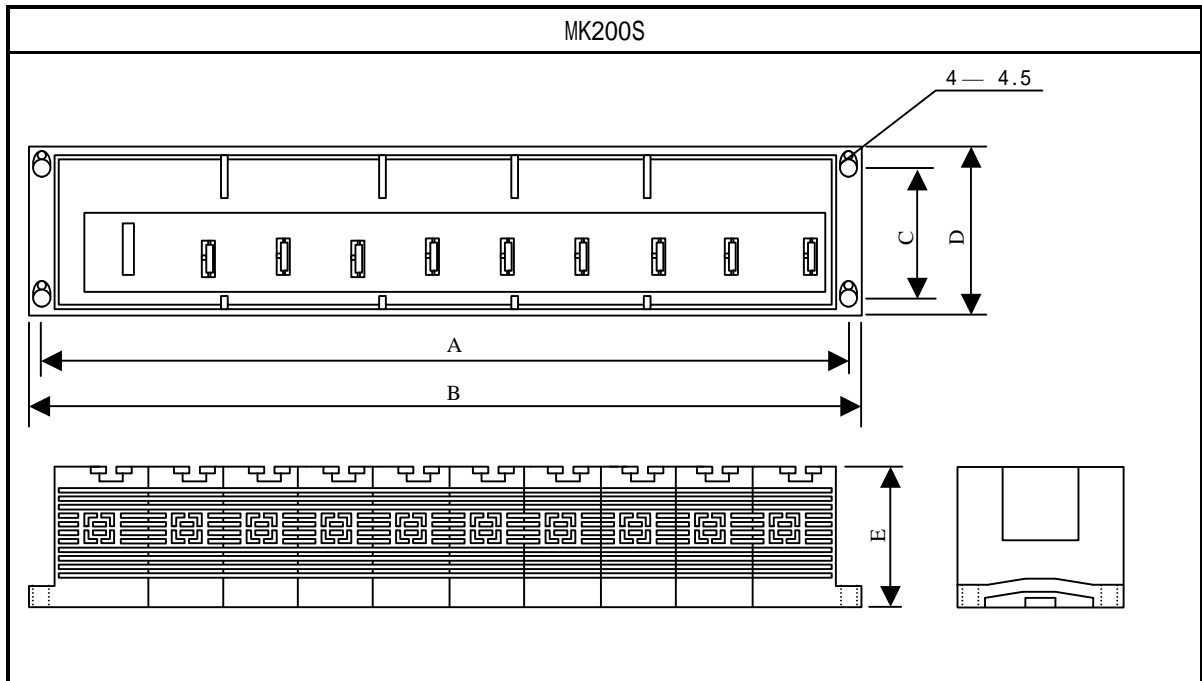
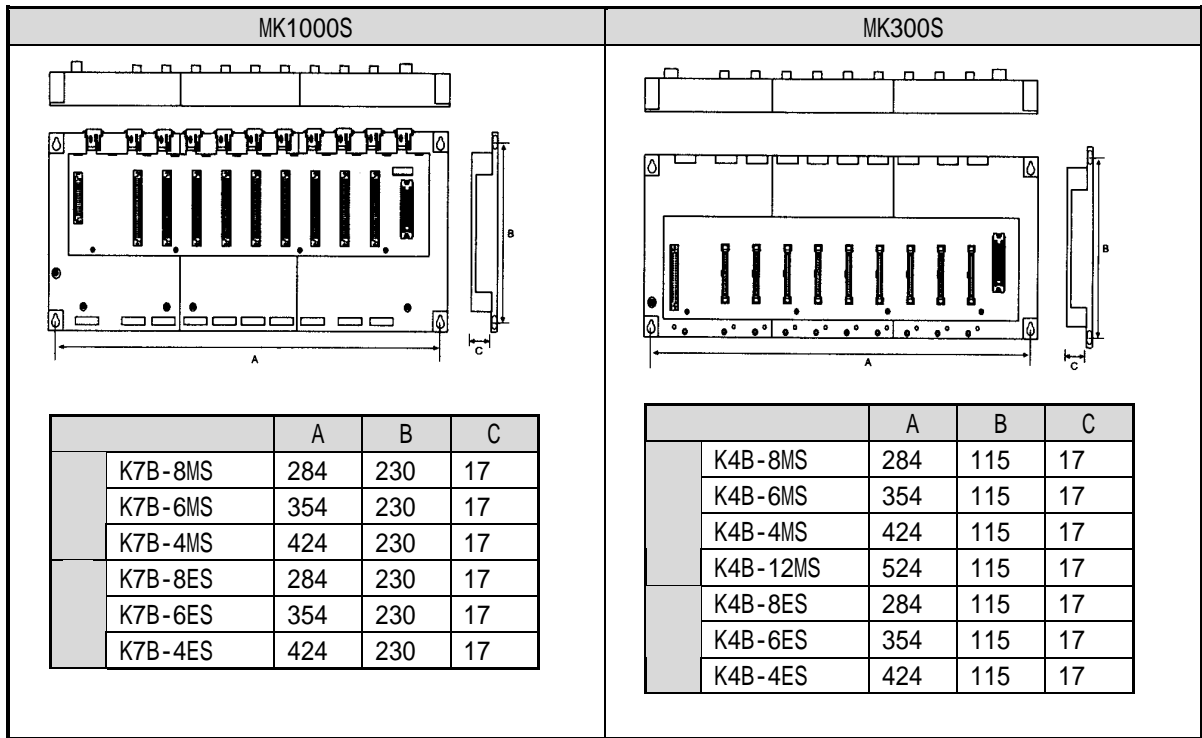
2)



3)



4) /



	A	B	C	D	E
GM6-B04M	230.5	244	92.5	110	62
GM6-B06M	300.5	314	92.5	110	62
GM6-B08M	370.5	384	92.5	110	62
GM6-B12M	510.5	524	92.5	110	62