

1

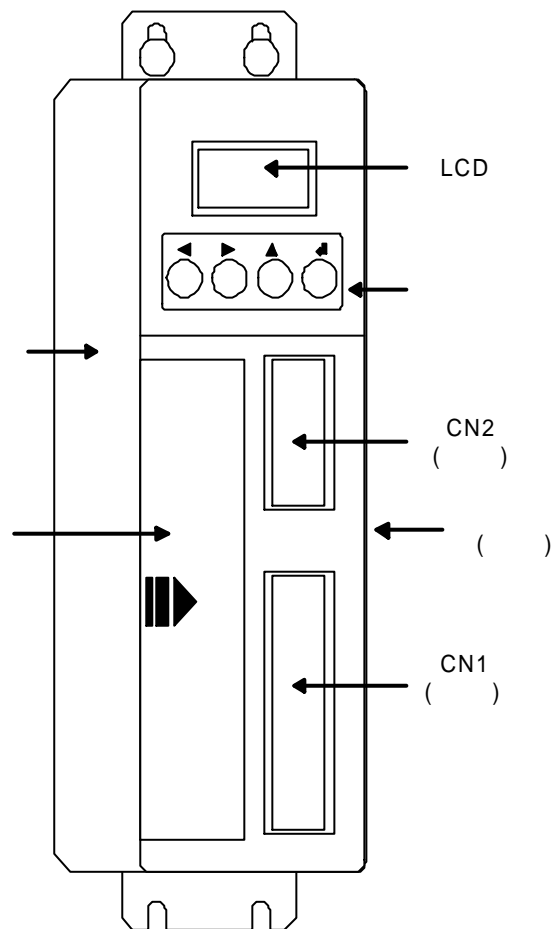
1.1

AC SERVO DRIVE

가 COVER

1.2

FDA-3000



LCD

가

가

가

CN1

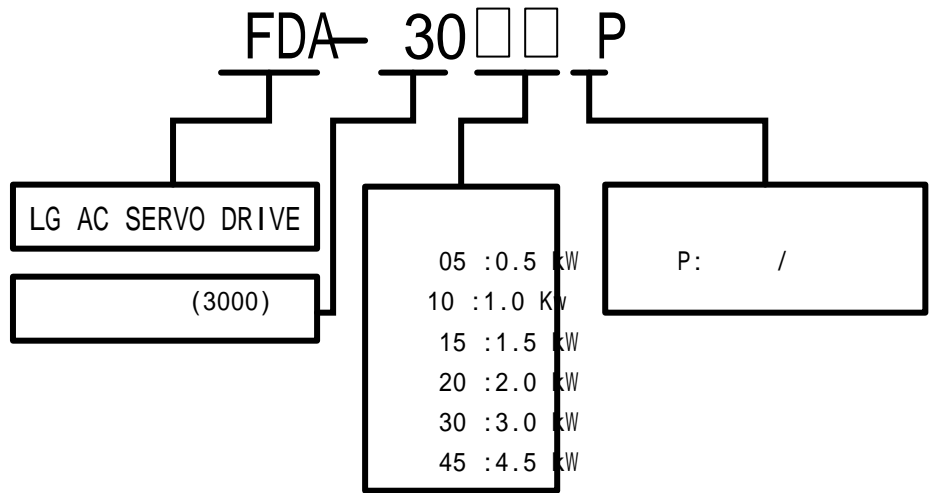
CN2

2.1

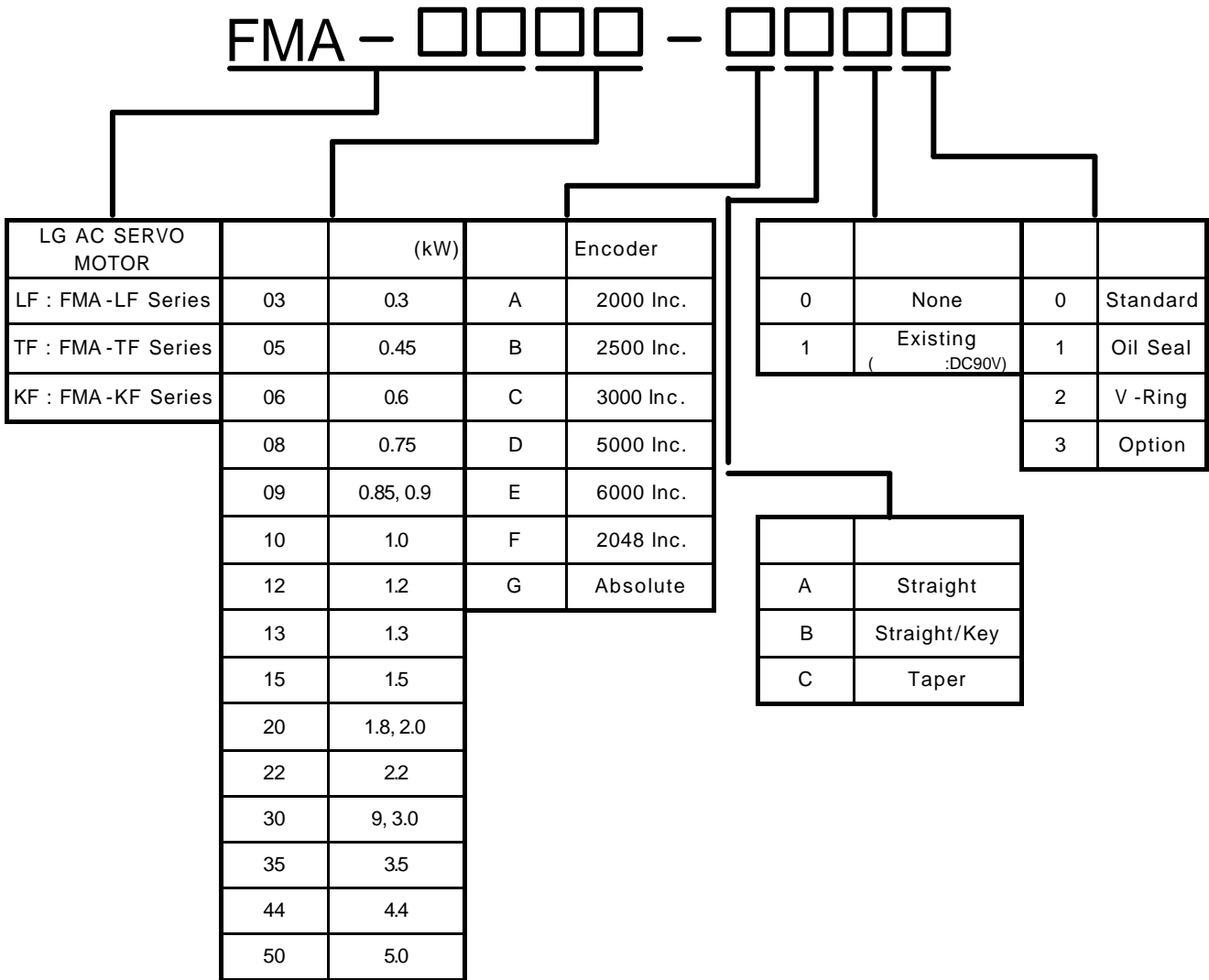
<div>DRIVE</div> <div>MOTOR</div>		FDA-3005P	FDA-3010P	FDA-3015P	FDA-3020P	FDA-3030P	FDA-3045P
AC	TF -	0.45kW	0.85kW	1.3kW	1.8kW	2.9kW	4.4kW
	KF -	---	0.75kW 1.0 kW	1.5kW	2.2kW	3.5kW	5.0kW
	LF -	0.3kW	0.6 kW 0.9 kW	1.2kW	2.0Kw	3.0kW	---

2.2

2.2.1 AC SERVO DRIVE()



2.2.2 AC SERVO MOTOR



3.1 FMA-TF AC SERVO MOTOR

		-TF05	-TF09	-TF13	-TF20	-TF30	-TF44
* kW		0.45	0.85	1.3	1.8	2.9	4.4
*	N · m	2.87	5.41	8.27	11.5	18.6	27.94
	kgf · cm	29	55	85	117.0	190.0	285.0
*	N · m	8.61	14.7	24.5	34.4	55.9	77.45
	kgf · cm	89.5	150.0	250.0	351.0	570.0	790.0
* A [rms]		4.0	7.0	10.7	14.8	21.7	34.5
* A [rms]		13.4	19.0	32.0	44.3	65.2	95.6
r/min		1500					
r/min		3000					
*	N · m/A[rms]	0.77	0.805	0.803	0.80	0.88	0.83
	kgf · cm/A[rms]	7.85	8.21	8.19	8.18	8.96	8.48
ROTOR ($J_m = GD^2 / 4$)	kg · m ²	10.3×10^{-4}	15.2×10^{-4}	24.8×10^{-4}	64.0×10^{-4}	98.5×10^{-4}	156×10^{-4}
	gf · cm · s ²	10.5	15.5	25.3	65.3	100.5	159.1
*POWER RATE kW/S		7.85	19.1	28.0	21.1	35.2	50.0
msec		3.49	2.28	2.15	6.17	4.88	4.24
msec		4.56	5.63	5.59	10.85	11.09	11.02
	F						
	AC 1500V 1						
	DC 500[V] 10MΩ						
	V15						
	IP45 ()						
	FLANGE						
	MUNSELL N1.5						
	20 ~ 80%(가)						
	0 ~ +40						

* : AC SERVO DRIVE , 가 20°C .

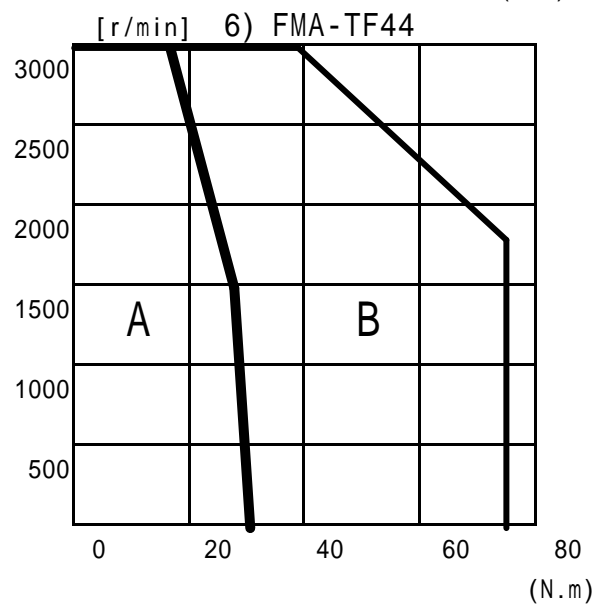
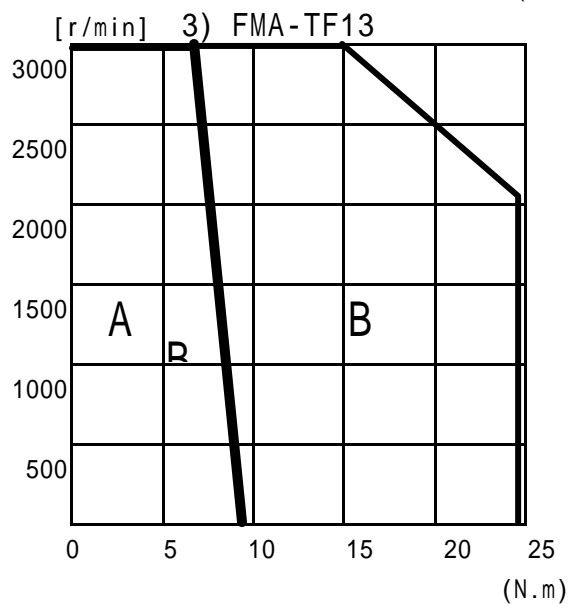
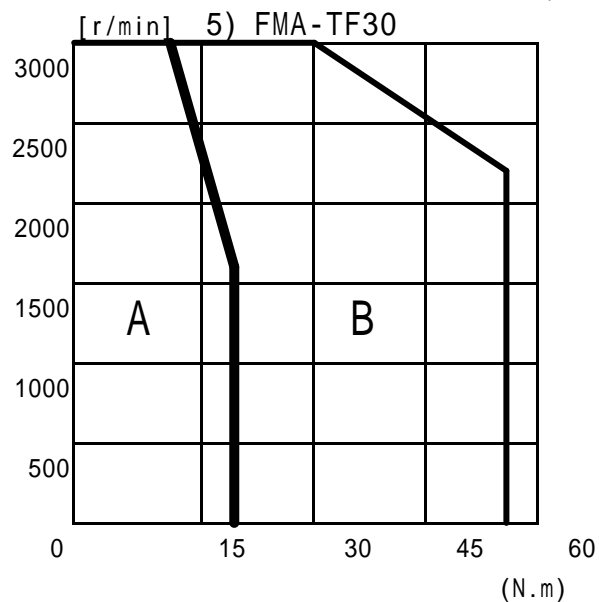
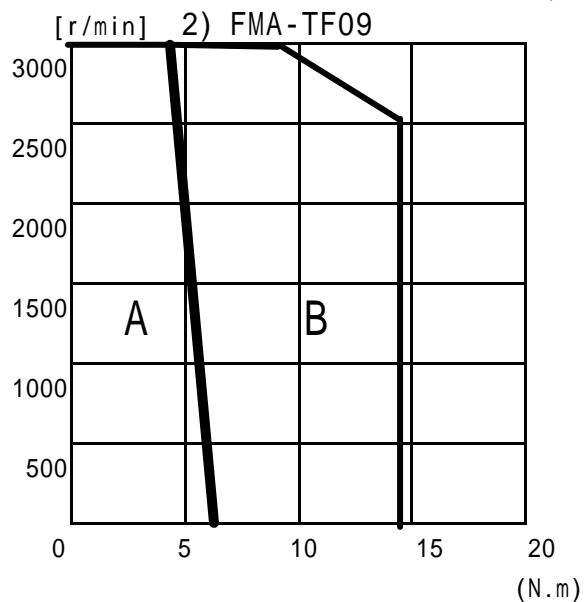
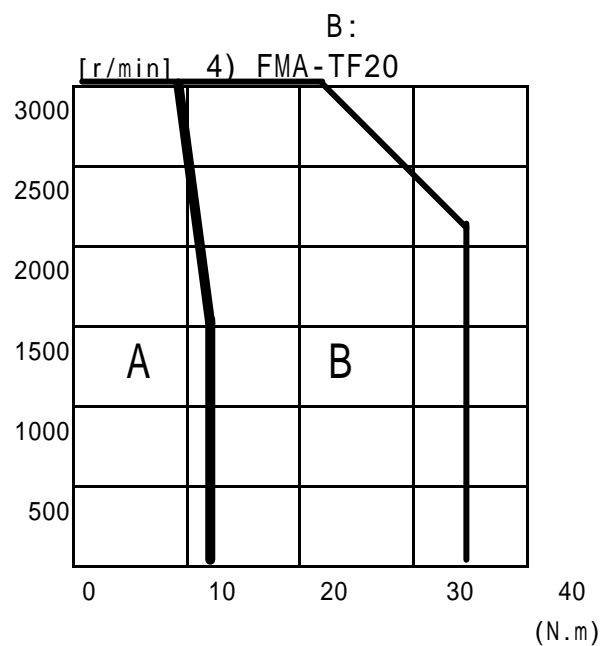
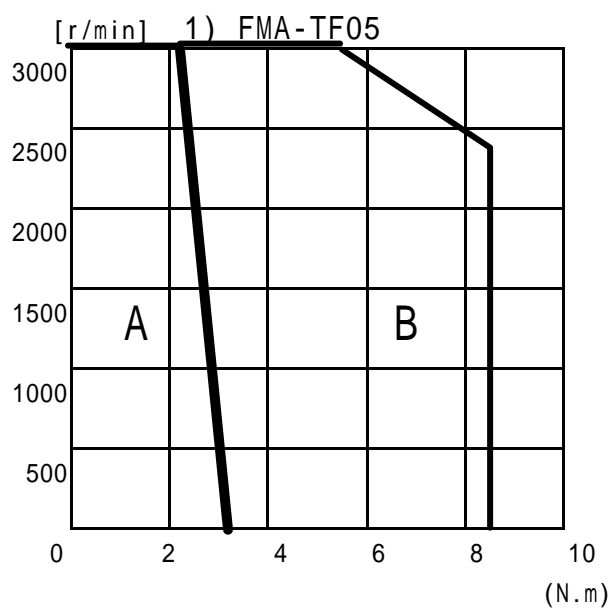
(OPTION) MOTOR

				DC	
OPR-109A		AC 200[V] 60Hz	DC 90[V]	1 [A]	0.1[Kg]

[-]

(*) 3 AC 200V

A:

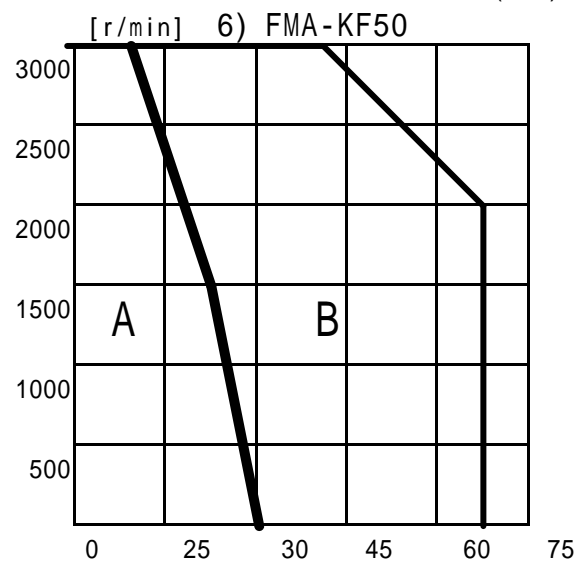
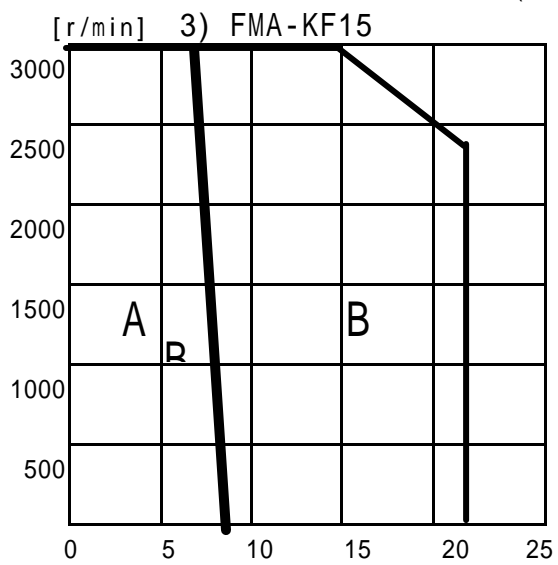
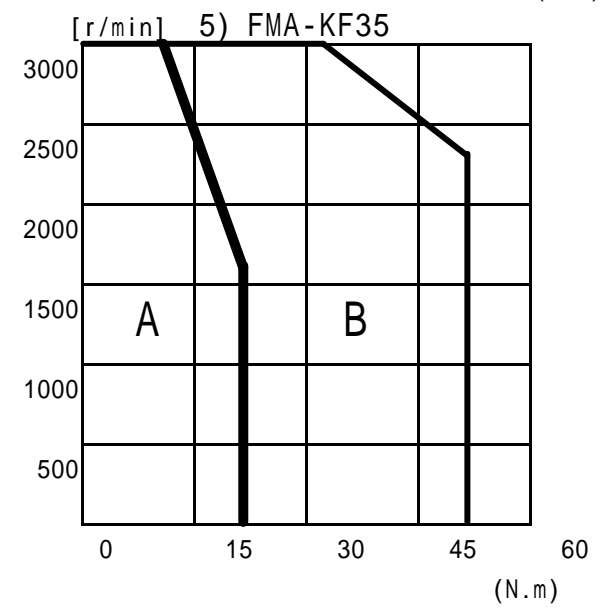
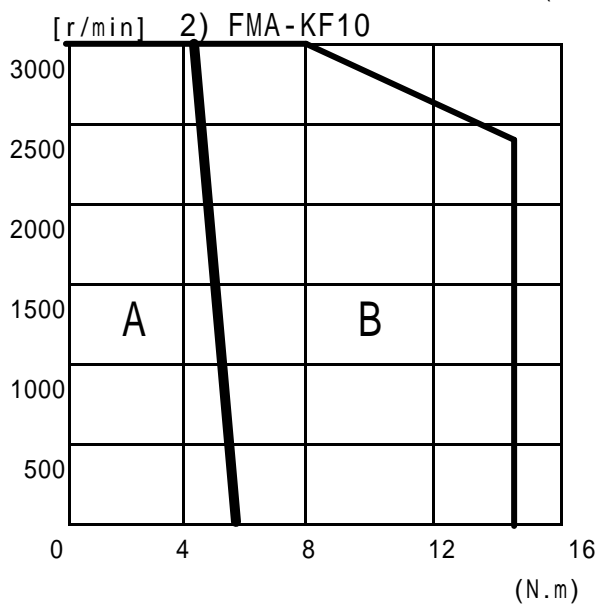
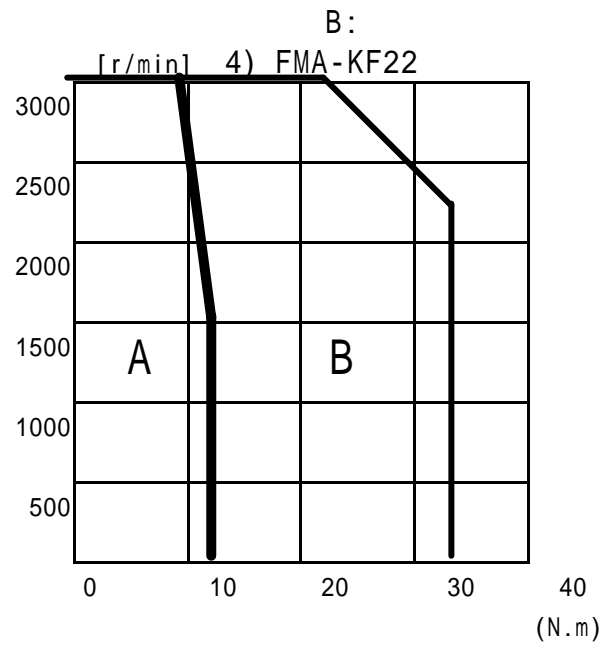
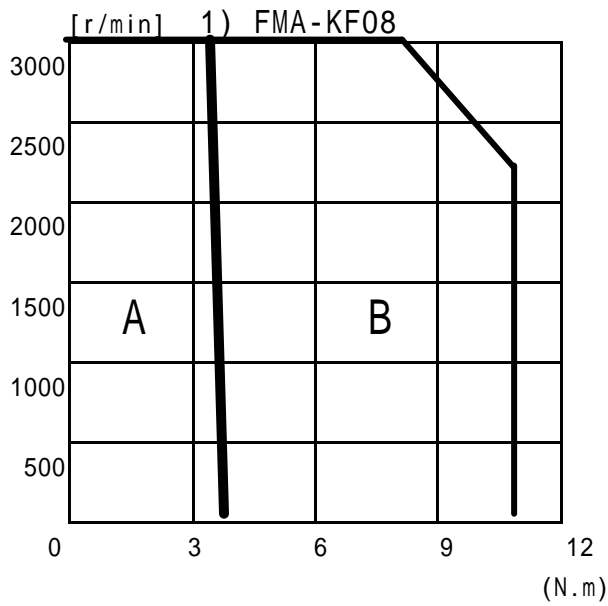


3.2 FMA-KF AC SERVO MOTOR

(FMA)		-KF08	-KF10	-KF15	-KF22	-KF35	-KF50
* kW		0.75	1.0	1.5	2.2	3.5	5.0
*	N · m	3.58	4.77	7.16	10.49	16.67	23.82
	kgf · cm	37	49	73	107	170	243
*	N · m	10.74	14.31	21.56	31.47	50.01	66.7
	kgf · cm	110	146	220	321	510	680.4
* A [rms]		5.3	6.2	9.2	14.1	20.5	33.8
* A [rms]		16.2	18.0	27.0	42.3	61.5	94.64
r/min		2000					
r/min		3000					
*	N · m/A[rms]	0.706	0.806	0.733	0.78	0.84	0.73
	kgf · cm/A[rms]	7.20	8.22	7.48	7.93	8.59	7.41
ROTOR ($J_m = GD^2 / 4$)	kg · m ²	10.4x10 ⁻⁴	15.2x10 ⁻⁴	24.8x10 ⁻⁴	64.0x10 ⁻⁴	98.5x10 ⁻⁴	156x10 ⁻⁴
	gf · cm · s ²	10.6	15.5	25.3	65.3	100.5	159.1
*POWER RATE kW/S		12.7	15.2	20.6	17.18	28.18	36.37
msec		3.21	2.27	2.36	6.37	5.09	4.86
msec		4.88	5.63	5.59	10.85	11.09	11.02
	F						
	AC 1500V 1						
	DC 500[V] 10MΩ						
	V15						
	IP45 ()						
	FLANGE						
	MUNSELL N1.5						
	20 ~ 80% (가)						
	0 ~ +40						

* : AC SERVO DRIVE , 가 20°C .

A:



(N.m)

(N.m)

3.3 FMA-LF AC SERVO MOTOR

		-LF03	-LF06	-LF09	-LF12	-LF20	-LF30
* kW		0.3	0.6	0.9	1.2	2.0	3.0
*	N · m	2.84	5.68	8.62	11.5	19.1	28.4
	kgf · cm	29.4	58.1	88.0	117.0	195.0	290.0
*	N · m	8.7	16.5	23.0	34.4	57.3	78.7
	kgf · cm	89.5	168.5	235.0	351.0	585.0	803.3
* A [rms]		2.45	4.7	7.2	9.8	16.0	24.3
* A [rms]		7.5	13.6	19.2	29.3	48.0	67.3
r/min		1000					
r/min		2000					
*	N · m/A[rms]	1.229	1.251	1.235	1.19	1.21	1.21
	kgf · cm/A[rms]	12.54	12.76	12.60	12.19	12.34	12.37
ROTOR ($J_m = GD^2 / 4$)	kg · m ²	10.3×10^{-4}	15.2×10^{-4}	24.8×10^{-4}	64.0×10^{-4}	98.5×10^{-4}	156×10^{-4}
	gf · cm · s ²	10.5	15.5	25.3	65.3	100.5	159.1
*POWER RATE kW/S		7.85	19.1	28.0	20.5	37.0	51.8
msec		3.49	2.28	2.15	5.29	4.51	3.71
msec		4.56	5.63	5.59	11.03	11.4	12.03
	F						
	AC 1500V 1						
	DC 500[V] 10MΩ						
	V15						
	IP45 ()						
	FLANGE						
	MUNSELL N1.5						
	20 ~ 80% (가)						
	0 ~ +40						

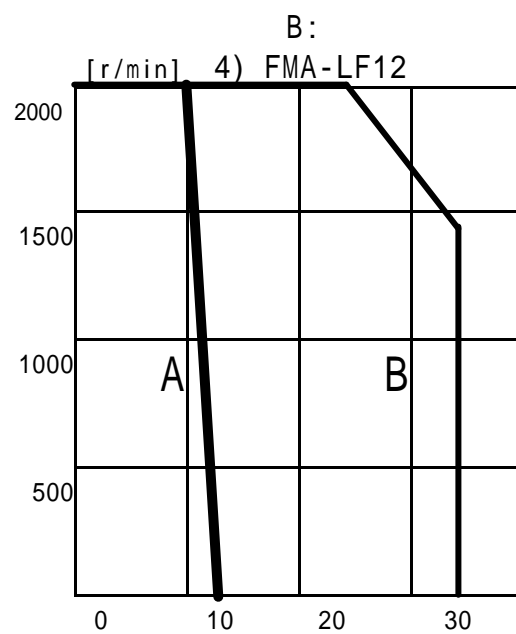
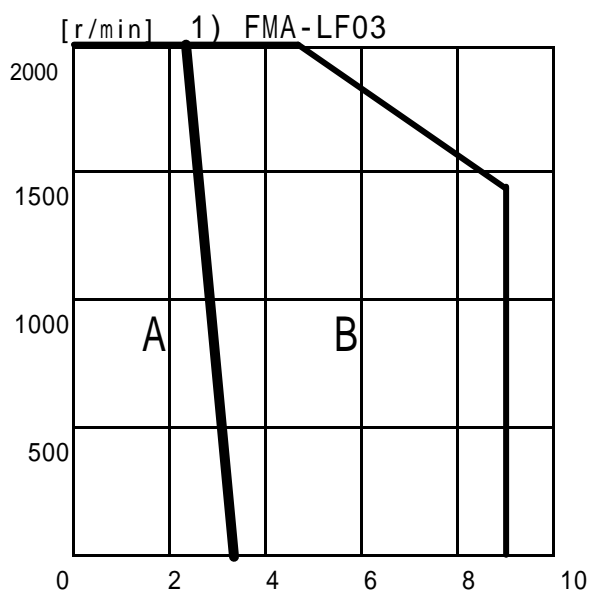
* : AC SERVO DRIVE

가 20°C

[-]

(*) 3 AC 200V

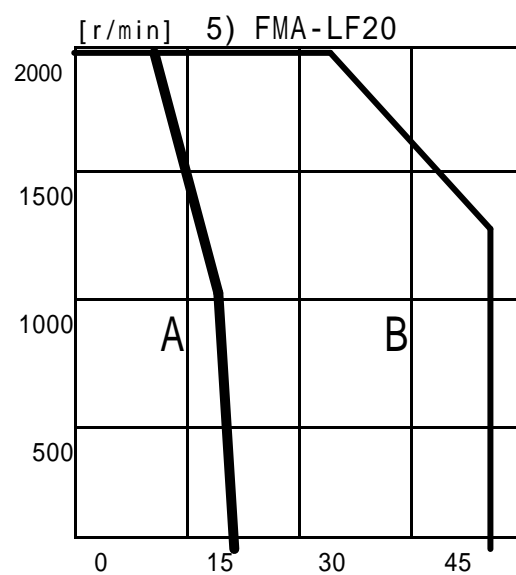
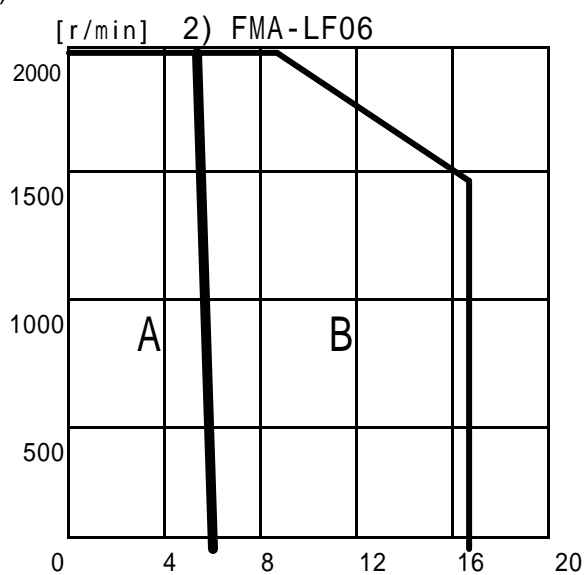
A:



40

(N.m)

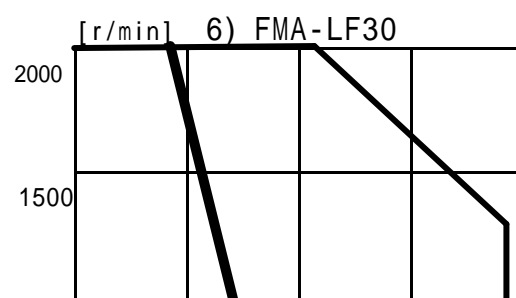
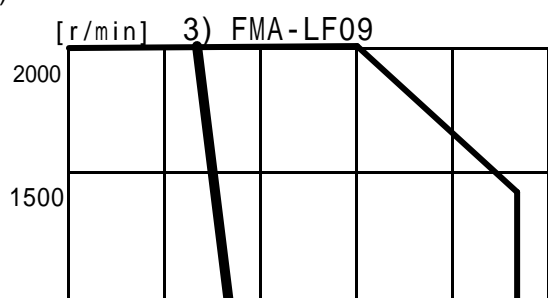
(N.m)

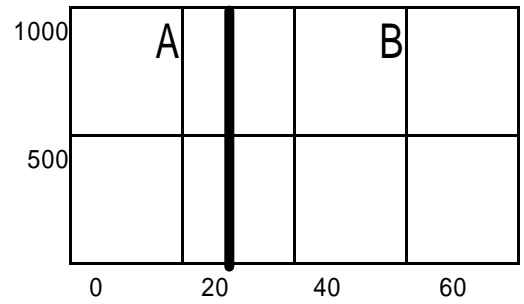
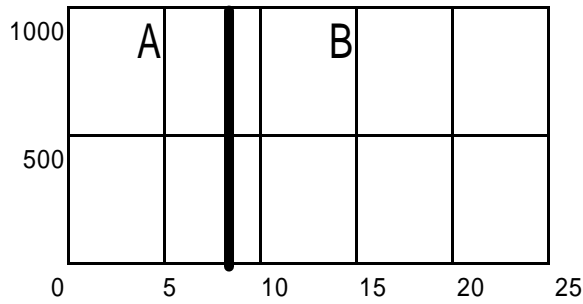


60

(N.m)

(N.m)





80

(N.m)

(N.m)

3.4 FDA-3000

AC SERVO DRIVE

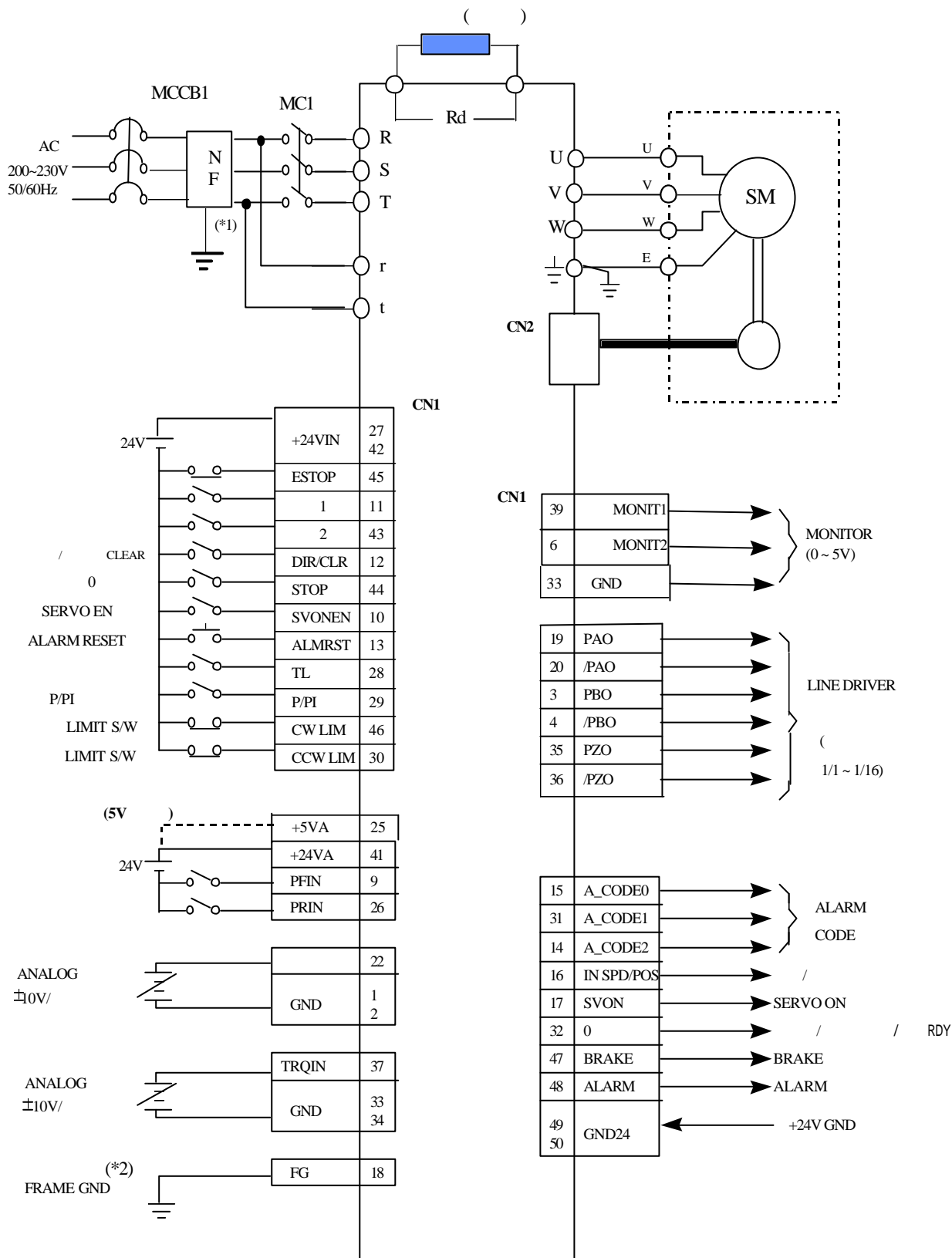
(FDA)		(1) - 3005P	(1) - 3010P	- 3015P	- 3020P	- 3030P	- 3045P
		3 AC200 ~ 230V +10/15%, 50/60Hz					
	(kVA)	1.1	2.1	3.1	4.1	6.0	8.0
		3 AC Servo Motor					
MOTOR	(kW)	0.5	1.0	1.5	2.0	3.0	4.5
	(A)	15	19	32	48	64	95
		(A,B,C,U,V,W)					
		Differential Line Driver					
		1000 ~ 10000 [pulse/rev] (,400[kpulse/sec])					
		DC5[V], 0.3[A]					
		3 PWM (IGBT-IPM)					
		1:3000 (4000P/R)					
		150[Hz](GD ² = GD ²)					
		: DC 0[V] ~ ±10[V] (가) : 3 가					
		0 ~ 100% : ±0.01% ±10% : ±0.01% 25±25[] : ±0.1%					
	가	,S 가 가 (0 ~ 50[sec],0.01[sec])					
	pulse	300[kpps]					
	pulse	+pulse, pulse+ pulse, 2 pulse(A +B)					
	pulse	Open Collect (DC5[V],DC24[V])					
		LCD 2 8					
		, , , , IPM ERROR, ,					
	Dynamic Brake	(Dynamic Brake)					
	GD ²	Motor GD ² 5					

	Monitor	, (0 ~ +5[V] 2.5±2.5[V] 가)					
		0 ~ +50 []					
		90% ()					
		-20 ~ +80 []					
		DC500[V] 10MΩ					
		Book Type					
					FAN		
(kg)		3.0	3.0	5.0	5.5	6.0	6.0

(1) FDA3005P, FDA3010P AC 220V 가 . ,

4

4.1



*1 : NF NOISE FILTER

NOISE

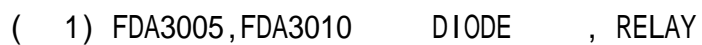
.(4.1)

*2 : F.G(FRAME GROUND)

CN1 CABLE SHIELD

4.2

4.2.1

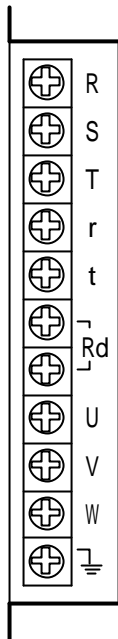


The block diagram illustrates the control system architecture, showing the flow of data and control signals between various components:

- USER I/O**: Connected to **CN 1**, which provides input to the **ANALOG COMMAND** block.
- ANALOG COMMAND**: Receives signals from **CN 1** and sends them to the **FILTER, A/D CONVERTER**.
- FILTER, A/D CONVERTER**: Outputs **Iu, Iw** signals to the **CPU**.
- CPU (TMS320C26)**: The central processing unit, connected to **CN 4**, **EPROM**, **ASIC**, and **EEPROM**.
- EPROM (64k * 16)**: Provides program memory for the **CPU**.
- ASIC**: Receives signals from **CN 6** and outputs **SCR IPM** signals to the **CPU**.
- EEPROM**: Provides non-volatile memory for the **CPU**.
- Encoder Section**: Includes **BIT**, **ENCODER**, and **ENCODER** blocks, each receiving signals from **CN 1** and **CN 2** and outputting to the **ANALOG COMMAND** block.
- Teach Panel**: Connected to **CN 6**, providing input to the **ASIC** and outputting **LCD I/F** and **KEY I/F** signals to the **CPU**.

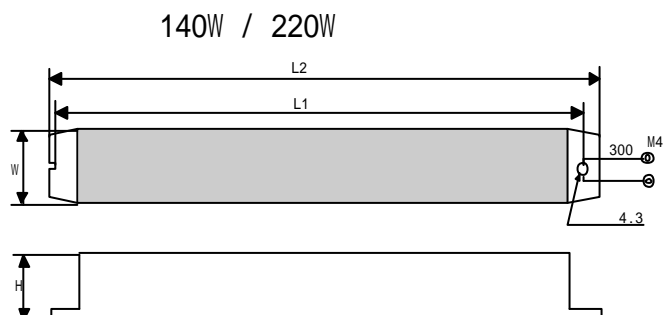
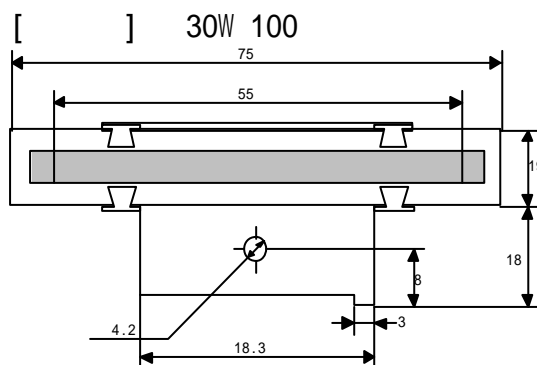
4.3

- 가
()
- 1) R,S,T
3 AC200 ~ 230[V]
LINE
NOISE FILTER
AC200 ~ 230[V]
(4.1)
- 2) r, t
3) Rd
()
- 4) U,V,W
U,V,W
- 5) \perp



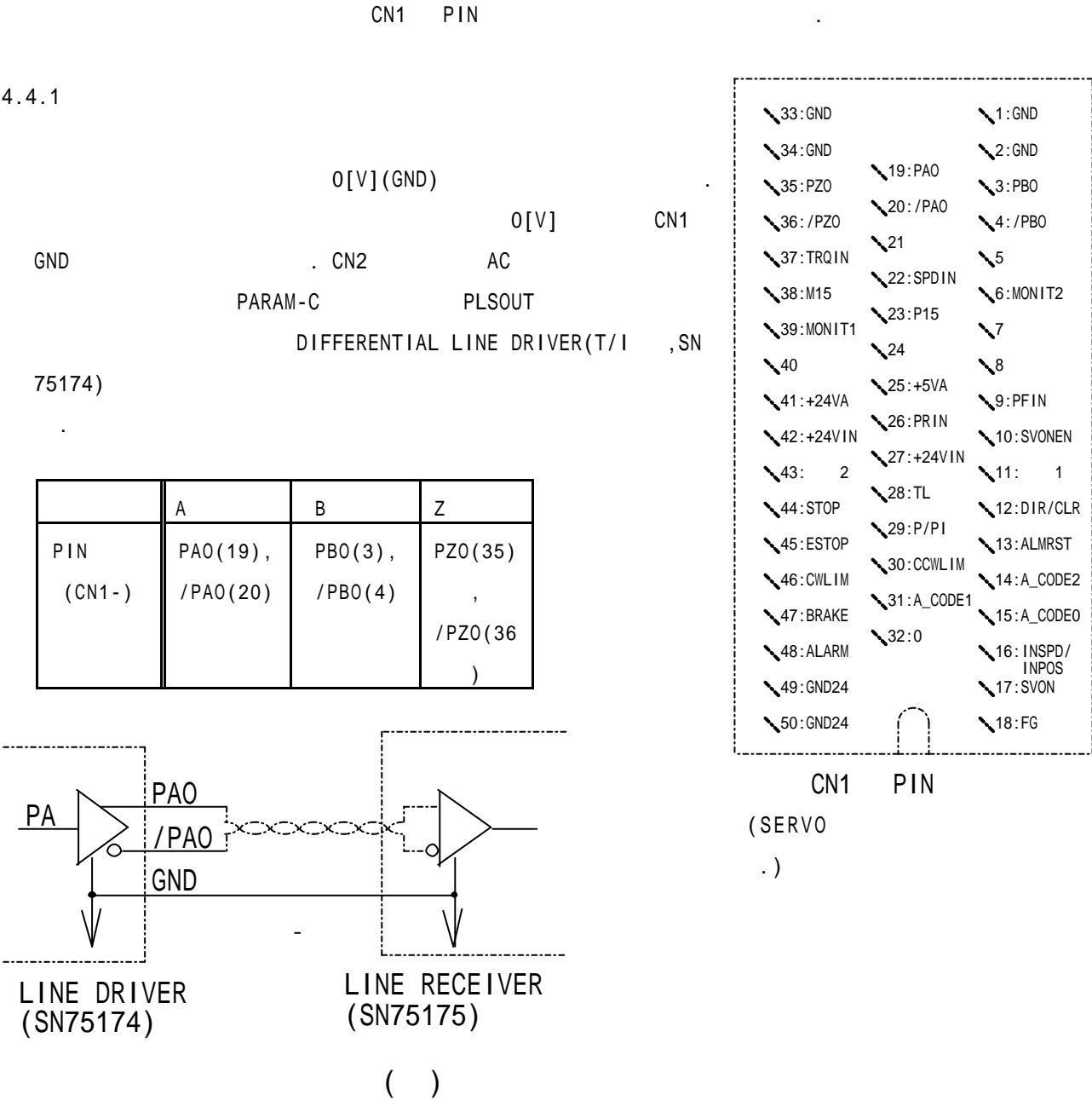
[4.1]

AC SERVO	FDA-3005	FDA-3010	FDA-3015	FDA-3020	FDA-3030	FDA-3045
	AWG #14 (2.0mm ²)	AWG #12 (3.5mm ²)			AWG #10 (5.5mm ²)	
	KET GP110012	KET GP110721			KET GP110028	
	CH-7.5N(35A)				CH-10N(50A)	
MCCB	ABS33M (5A)	ABS33M (8A)	ABS33M (10A)	ABS33M (16A)	ABS33M (24A)	ABS33M (32A)
NOISE FILTER	NFS-310	NFS-315		NFS-320	NFS-330	NFS-340
(Rd) SIZE ()	30W 100Ω ()	140W 50Ω (L1=172,L2=182, W=42,H=20)		220W 25Ω (L1=220, L2=230, W=60,H=20)	220W 25Ω 2 ()	



4.4 CN1

CN1



. +10[V]가 , -10[V] 가

(CN1-37) (CN1-28) 가 ON
0 [V]

() 0 [V] ALARM

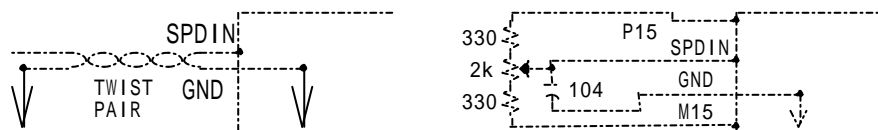
10[V] 가
-10[V] 10[V]
가
TWIST PAIR GND

	*1		1	2
	-10 ~ 10[V]	0 ~ ±10[V]	0 ~ 5 V]	0 ~ 5 [V]
PIN (CN1-)	SPDIN (22)	TRQIN (37)	MONIT1 (39)	MONIT2 (6)

*1 :

GND , 가
가 +/-15[V]
30[mA]

	+15[V]	-15[V]	0[V]
PIN (CN1-)	P15(23)	M15(38)	GND(1,2,33,34)

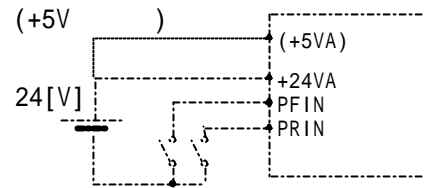


4.4.3

24[V] 5[V] ,MPG(
) PLC CARD
+ , + , LEAD +LAG 가 가
PARAM_P PLS TYPE
PHOTO COUPLER

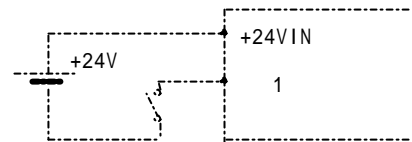
24[V] 5[V]

	F	R	24[V]	5[V]
PIN	PFIN	PRIN	+24VA	+5VA
(CN1-)	(9)	(26)	(41)	(25)



가 ()

4.4.4



DC+24[V] 100[mA]
(CN1-27,42)

+24[V]

()

(CN1-10) ON IGBT-IPM BASE BLOCK, DYNAMIC BRAKE
SERVO ON

1(CN1-11), 2(CN1-43)
SPD0, SPD1, SPD2 PARAM_S

(CN1-12) PARAM_S
SPD0, SPD1, SPD2 , 가
OFF

CLEAR (CN1-12) CLEAR

(CN1-44) 0 ,

(CN1-28)
10[V] 0 [V]
가
-10[V] 10[V]

가 .

ALARM RESET (CN1-13) ALARM RESET .

() ALARM RESET	(SVONEN)	OFF
-----------------	----------	-----

(CN1-45) ALARM . 가
가
. (ON .)

(CN1-30) (CN1-46) ,LIMIT
SWITCH . (ON .)

P/PI (CN1-29) 0 , DRIFT
가 가 . P/PI ON TORQUE
가 . (OFF .)

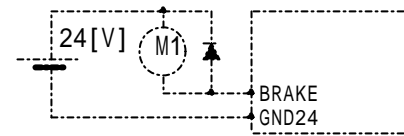
[CN1]

		1	2		P/PI	
				CLEAR	P/PI	
PIN (CN1-)	SVONEN (10)	1 (11)	2 (43)	DIR/CLR (12)	P/PI (29)	STOP (44)
()	ON = 가 OFF= 가	(1, 2) (= OFF, OFF) : (= ON, OFF) : SPD0 (= OFF, ON) : SPD1 (= ON, ON) : SPD2		OFF= : ON = : ON = CLEAR	ON = P OFF=PI	ON = STOP

				ALARM RESET		+24[V]
				ALARM RESET		+24[V]
PIN (CN1-)	CCWLIM (30)	CWLIM (46)	TL (28)	ALMRST (13)	ESTOP (45)	+24VIN (27,42)

()	OFF= ON= 가	OFF= ON= 가	ON = OFF=	ON=ALARM RESET	OFF =	
---------	-------------------	-------------------	--------------	-------------------	-------	--

4.4.5



(: DC 24[V] $\pm 10\%$)

BRAKE
ON BRAKE
BRAKE가
SEQUENCE

[CN1]

	BRAKE	SERVO ON		ALARM	0 /	ALARM	+24[V] GND
	BRAKE	SERVO ON		ALARM	0 /	ALARM	+24[V] GND
PIN	BRAKE (47)	SVON (17)	INSPD/ INPOS (16)	ALARM (48)	0 (32)	A_CODE0, A_CODE1, A_CODE2 (15, 31, 14)	GND24 (49, 50)
	ON =	ON = SERVO ON	ON =	OFF = ALARM	ON = 0 /	*	

ALARM
ALARM
가
ALARM

ALARM	EMG			IPM FAULT				
A_CODE0	ON	OFF	ON	OFF	ON	OFF	ON	OFF
A_CODE1	ON	ON	OFF	OFF	ON	ON	OFF	OFF
A_CODE2	ON	ON	ON	ON	OFF	OFF	OFF	OFF

ALARM

4.4.6 CN1

Table

					I/ O
	PA0, /PA0 PB0, /PB0 PZ0, /PZ0	19, 20 3, 4 35, 36	CN2 PARAM-C PLSOUT Line Drive		O
	SPDIN	22	PARAM-S SPD 10V (0 ~ ± 10 V) +10V : : - 10 V :)		I
	TRQIN	37	± 10 V (0 ~ 10(V) , + 10 V -10V) 가		I
	MONIT1	39	PARAM-C MON-SPD, MON-MODE 0 ~ 5(V) 1) MON - MODE 가 0 : 0 =0(V), MON-SPD =5(V) 2) MON - MODE 가 1 : 0 =2.5(V), MON-SPD = 5(V) MON-SPD = 0(V)		O
	MONIT2	6	PARAM-C MON-TRQ % , 0 ~ 5(V) ()		O
+15(V) -15(V)	P15 M15	23 38	, 가 ± 15 (V)		O
0(V)	GND	1,2,33,34	, , , , Common		

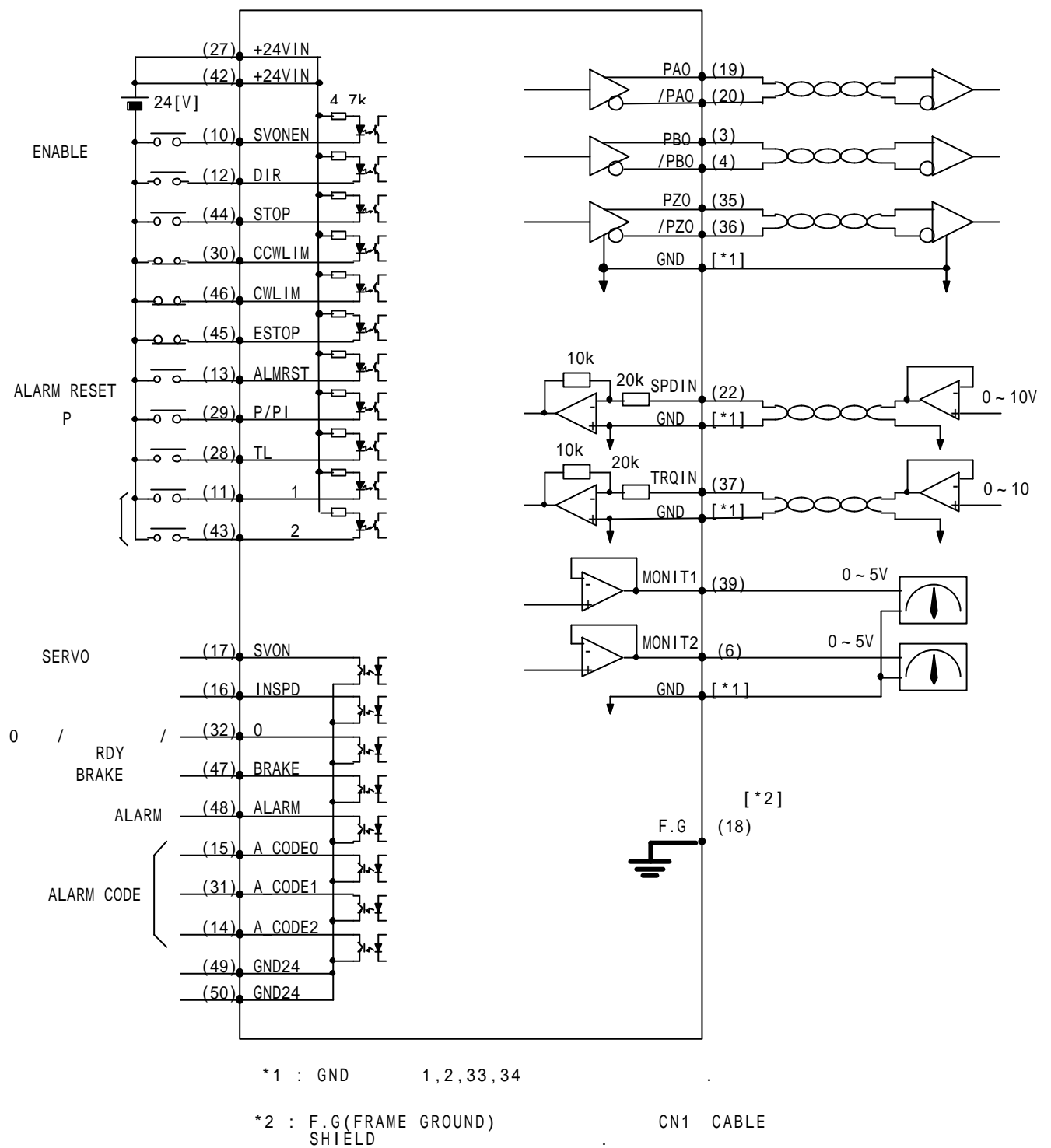
F R	PFIN PRIN	9 26	PARAM-P PLS TYPE (PLS LOG = 0; 1) 0 : PF PR) 2) 1 : PF PR 3) 2 : PF PR 0 1 Edge (PR PF 가 PR PF 가 0 PF 가 PR 1 PF 가		I															
24V 5V	+24VA +5VA	41 25	PF, PR (+24VA : DC+24V , +5VA : DC+5V)		I															
	SVONEN	10	가 , (ON: 가 OFF: 가)		I															
1 2	1 2	11 43	<div> : PARAM-S SPD0, SPD1, SPD2</div> <table><tr><td></td><td>2</td><td>1</td></tr><tr><td>OFF</td><td>OFF</td><td></td></tr><tr><td>OFF</td><td>ON</td><td>SPD0</td></tr><tr><td>ON</td><td>OFF</td><td>SPD1</td></tr><tr><td>ON</td><td>ON</td><td>SPD2</td></tr></table>		2	1	OFF	OFF		OFF	ON	SPD0	ON	OFF	SPD1	ON	ON	SPD2		I
	2	1																		
OFF	OFF																			
OFF	ON	SPD0																		
ON	OFF	SPD1																		
ON	ON	SPD2																		

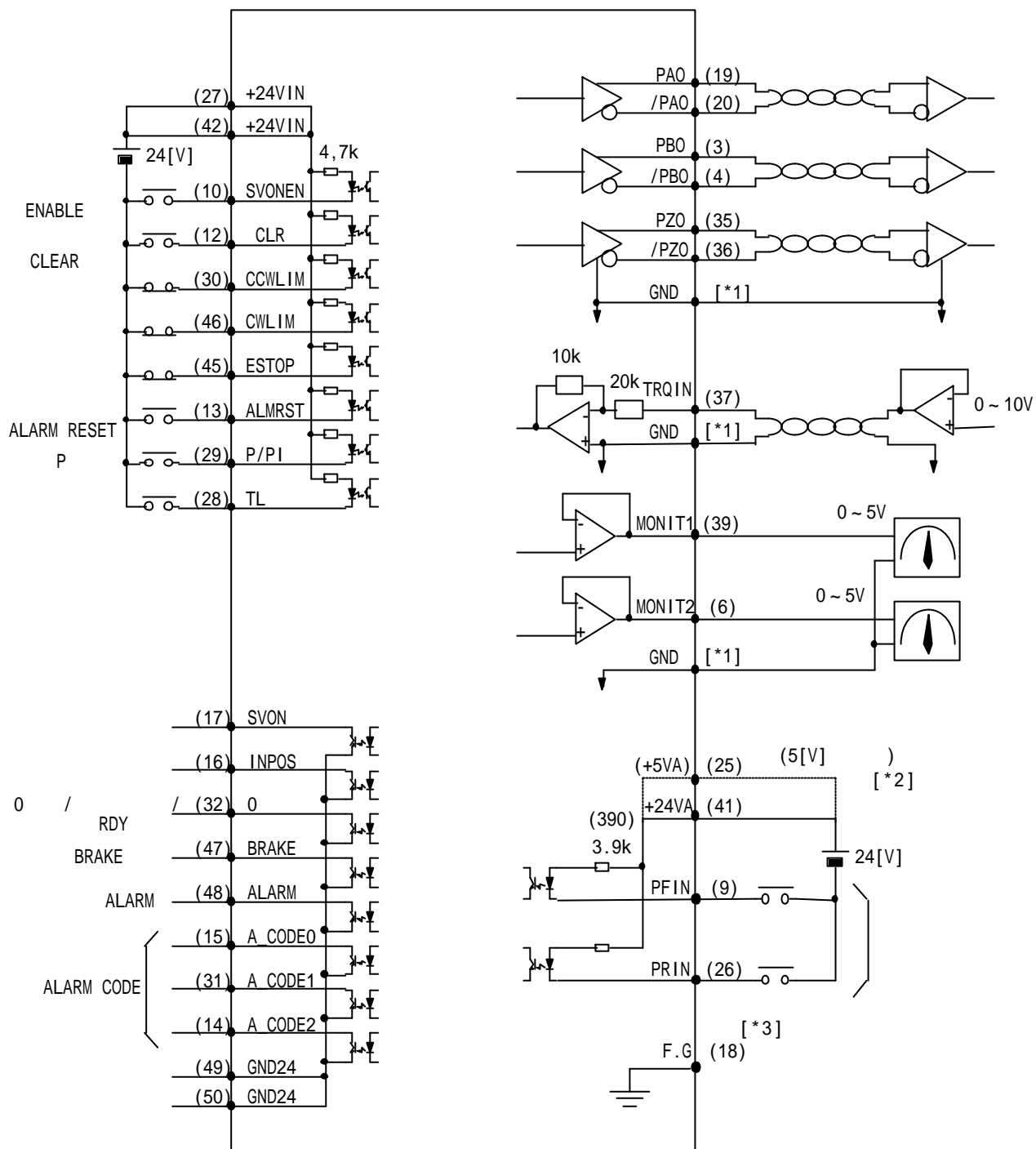
					I/ 0
/	DIR/CLR	12	(OFF: ON:)		I
			Clear		

	TL	28	(TRQIN) (ON: , OFF:)		I
ALARM RESET	ALMRST	13	Alarm		1
	ESTOP	45	(Free-Run) (ON: OFF:)		I
+24(V)	+24VIN	27, 42	DC+24(V)±10%1.0[A] () *		I
+24(V) GND	GND24	49, 50	DC + 24(V) ± 10 % Ground ()		I
BRAKE	BRAKE	47	BRAKE PARAM-C BKSPD (ON: BRAKE 가)		0
SERVO ON	SVON	17	SERVO ON 가		0
/	INSPD/	16	ON (PARAM-S INSPD)		0
	INPOS		ON (PARAM-S INPOS)		
ALARM	ALARM	48	Alarm OFF (ON)		0
ALARM CODE 0	A-CODE0	15	Alarm 가		0
ALARM CODE 1	A-CODE1	31	Alarm 가		
ALARM CODE 2	A-CODE2	14			
0 /	0	32	PARAM-C OUTSEL OUTSEL=0 0 OUTSEL=1 OUTSEL=2 RDY		0
/ RDY					
FRAME GROUND	F,G	18	CN1 Cable Shield		I

4.4.7

CN1





*1 : GND 1,2,33,34

*2 : 5[V]
CN1-25(+5VA)

*3 : F.G(FRAME GROUND)
CABLE SHIELD

CN1

4.5 CN2

CN2

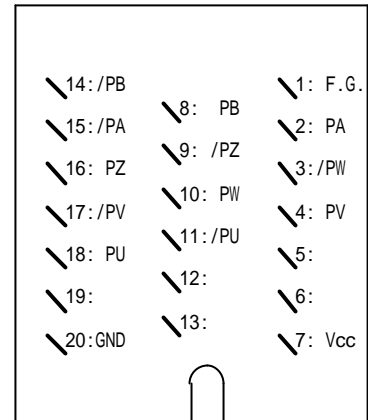
PIN

가

가

가

2가



CN2

PIN

1) TYPE 0 : INCREMENTAL ENCODER (A LEAD)

2) TYPE 1 : INCREMENTAL ENCODER (B LEAD)

(SERVO

)

* TYPE PARAM-M ENC TYPE

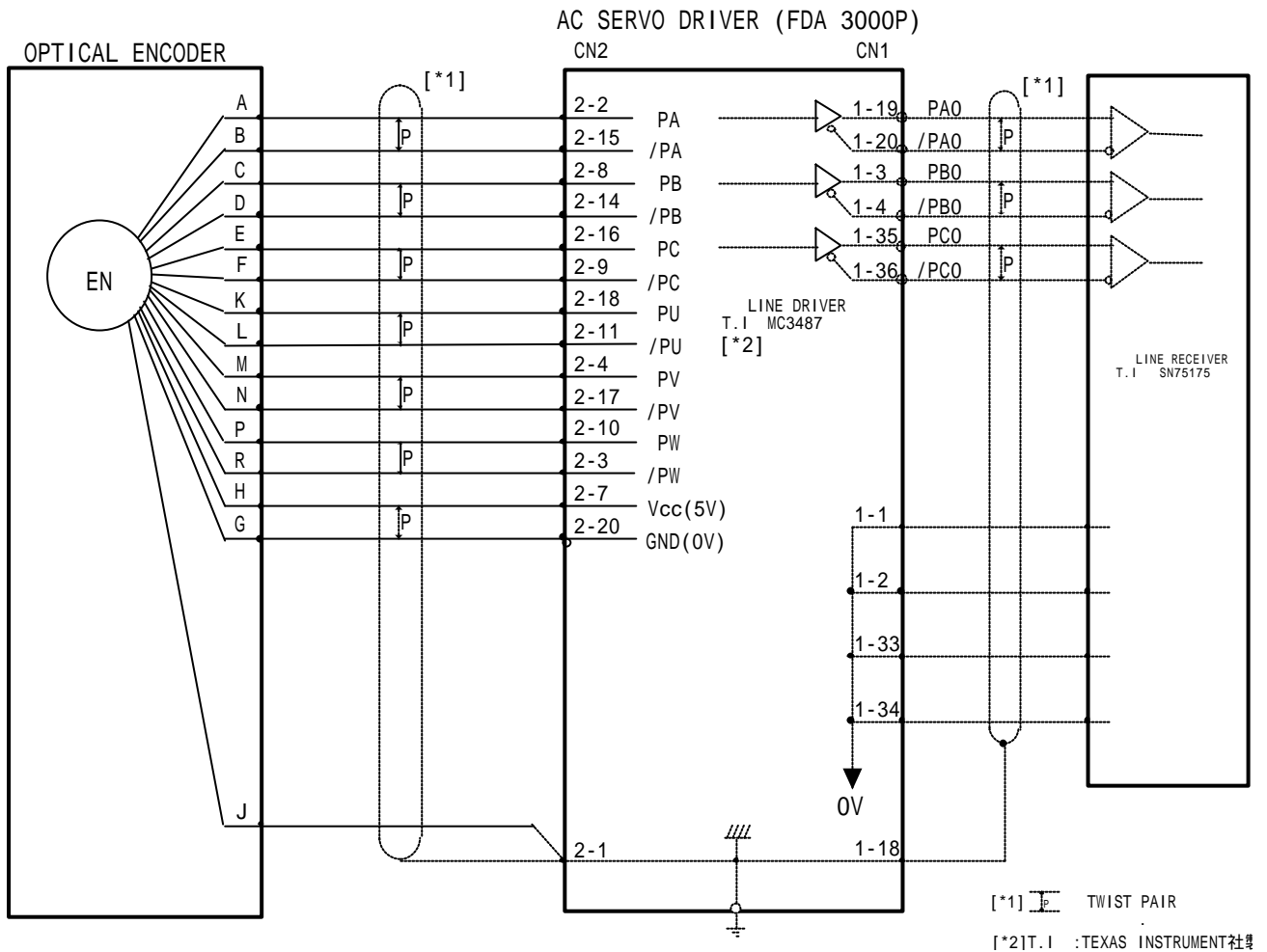
CN2 F AC SERVO MOTOR

CN2 PIN No.		MOTOR PIN No.
1	F.G.	J
2	PA	A
3	/PW	R
4	PV	M
5		
6		
7	Vcc(5V)	H
8	PB	C
9	/PZ(/PC)	F
10	PW	P
11	/PU	L
12		
13		
14	/PB	D
15	/PA	B
16	PZ(PC)	E
17	/PV	N
18	PU	K
19		
20	GND(0V)	G

● F.G.

SHIELD

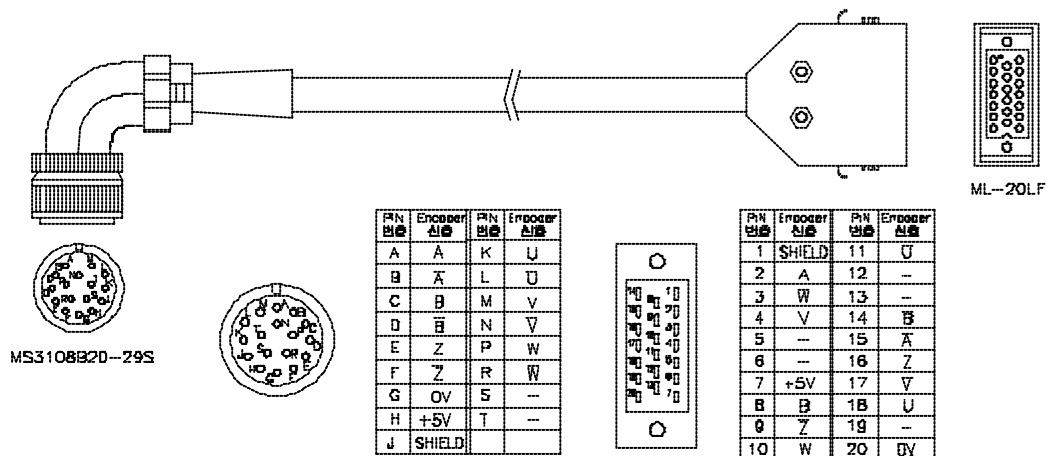
● CABLE : AWG24x9P TWIST, SHIELD CABLE(20m)



MOTOR OPTICAL ENCODER CONNECTOR
CONNECTOR : MS3102 A20-29P(RECEPTACLE)

[CN2]

<Encoder 신호 Cable>



<Motor측 Connector>

<Driver측 Connector>

제품명:FCA-00E-C29S(3m,5m,10m,20m)

) CN2 ENCODER CABLE ASS'Y : OPTION .