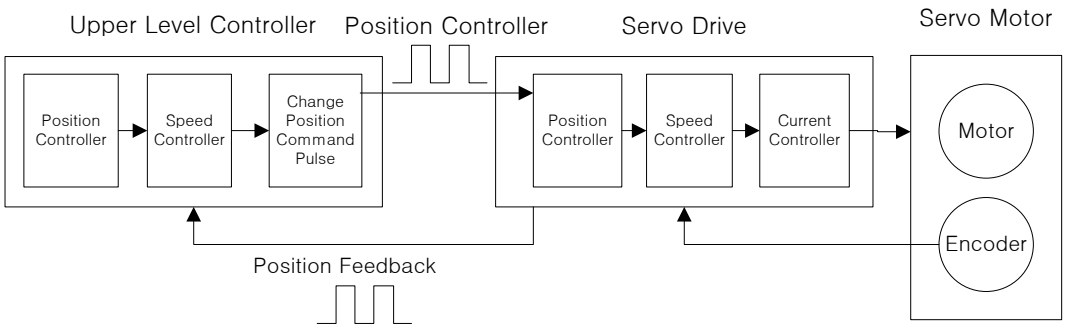
1.2 System Configuration

1.2.1 Overview

The L7 servo system can be configured in various ways depending on its interface with the upper level controller.

(1) Position Operation System

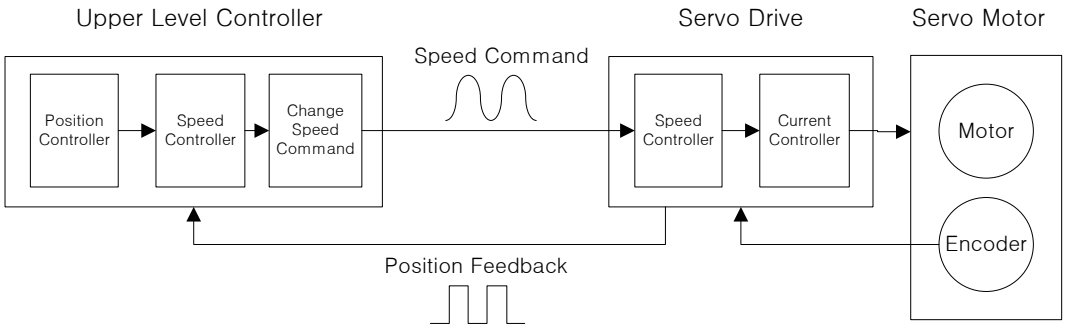
The servo is run by pulse commands. You can change the location of the servo motor by changing command pulses based on a certain transfer unit.



- Advantage: The structure of the upper level controller is simple because pulse input is linked to transfer units.
- Disadvantages:
  - Fast rotation is compromised when a precise transfer unit is used.
  - Response is low because multiple levels of controllers are used.

(2) Speed Operation System

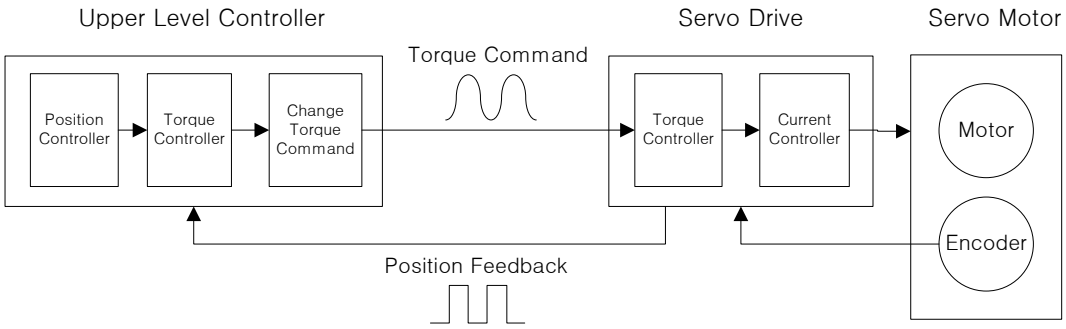
The servo is run by speed commands. There are two types of speed commands: analog voltage command and digital speed command.



- Advantages:
  - The servo responds quickly.
  - Precision control is easy.
- Disadvantage: The upper level controller is complex.

(3) Torque Operation System

The servo is run by torque commands. Analog voltage-based commands are used.



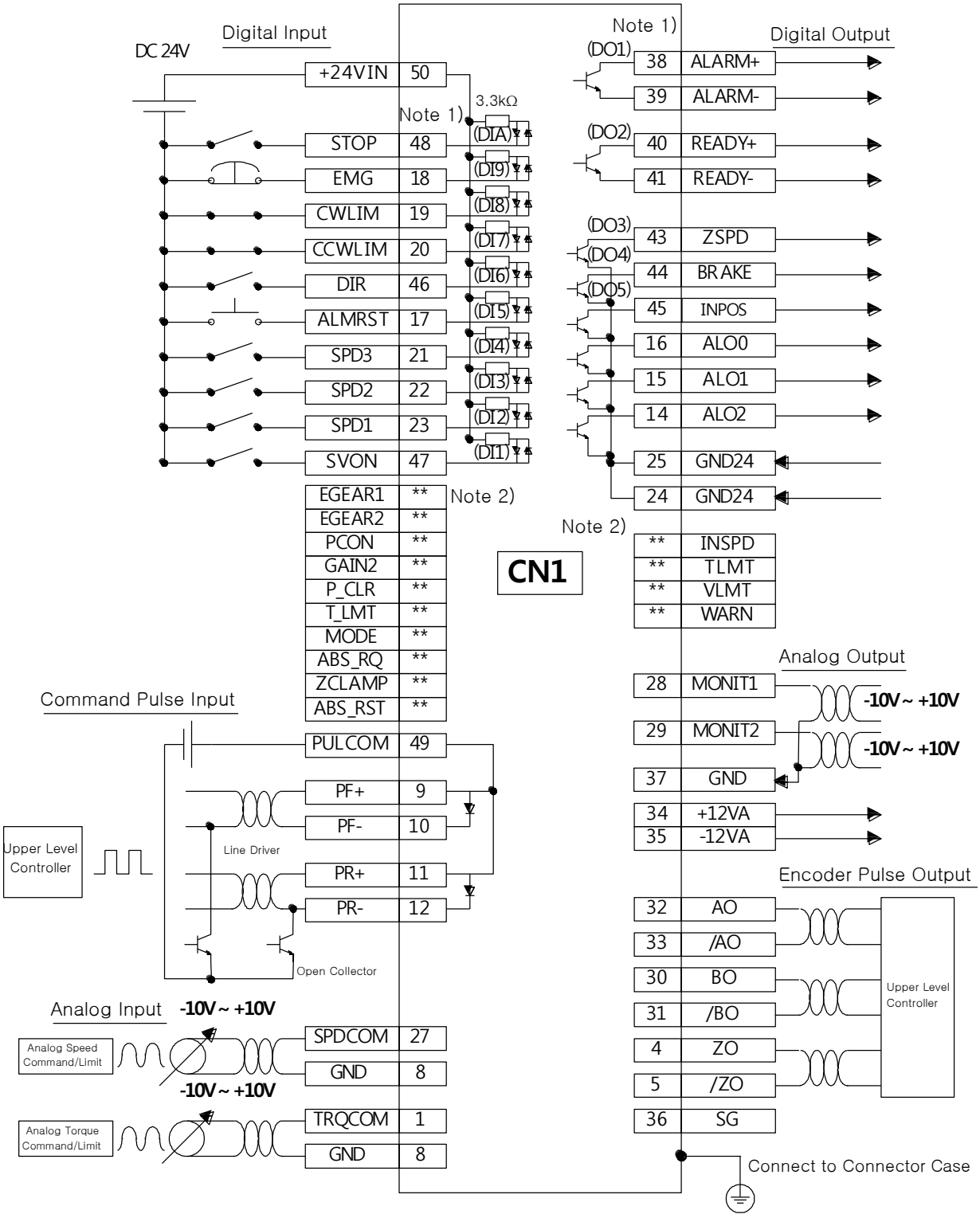
- Advantages:
  - The servo responds quickly.
  - Precise control is easy.
- Disadvantage: The upper level controller is complex.

(4) Operation Mode

The L7 servo drive can be run in torque, speed and position modes, depending on its interface with the upper level controller. The operation modes can be switched by parameters or digital input contact point.

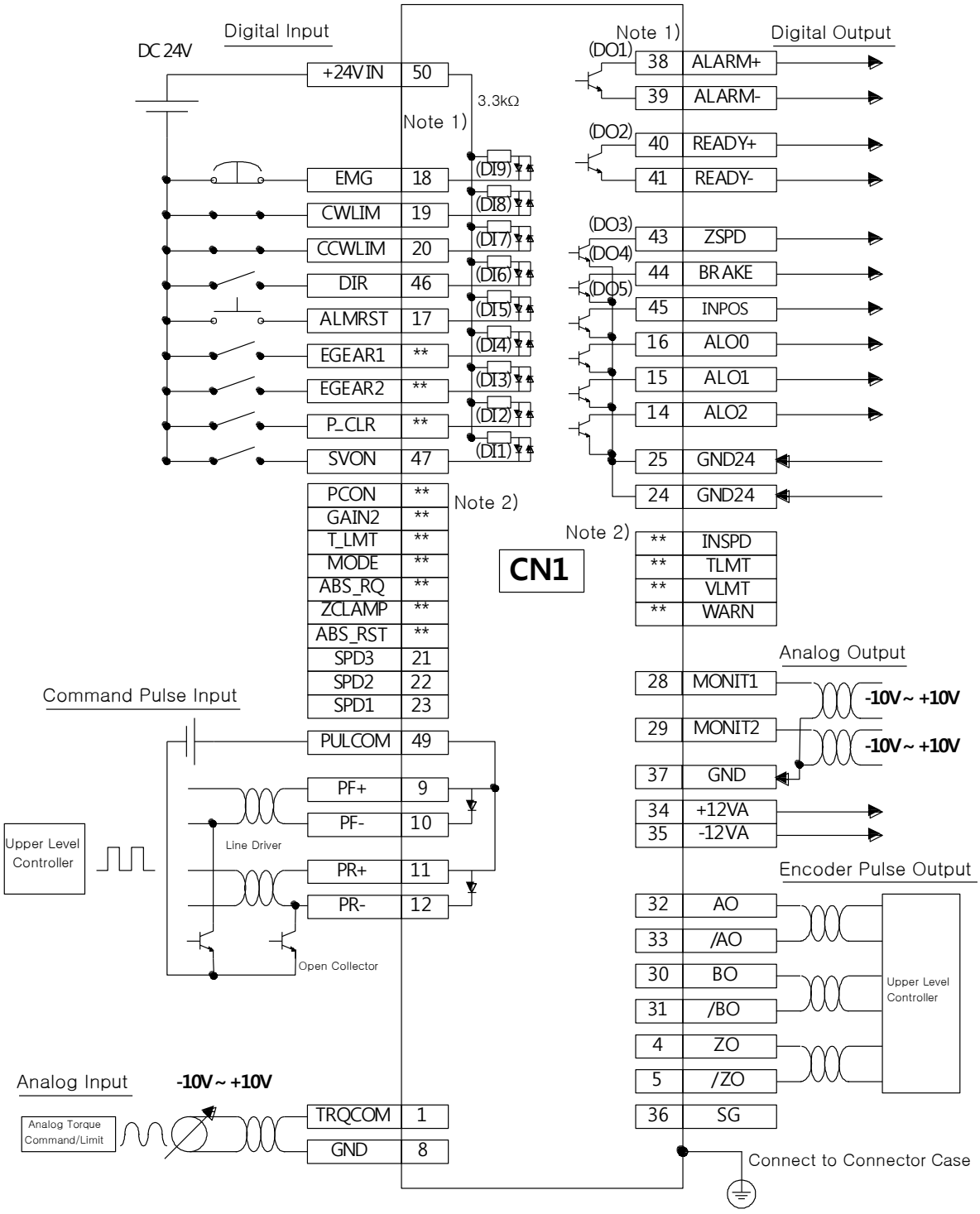
Operation Mode	System Configuration
0	The servo is run on the torque operation system.
1	The servo is run on the speed operation system.
2	The servo is run on the position operation system.
3	The servo is run with the speed and position operation systems as points of contact.
4	The servo is run with the speed and torque operation systems as points of contact.
5	The servo is run with the position and torque operation systems as points of contact.

1.2.2 Wiring Diagram of the Entire CN1 Connector



Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
Note 2) **These are non-allocated signals. You can change their allocation by setting parameters. For information, refer to "4.1.6 External Input Signal and Logic Definition" and "4.1.8 External Output Signal and Logic Definition."

1.2.3 Example of Position Operation Mode Wiring



Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
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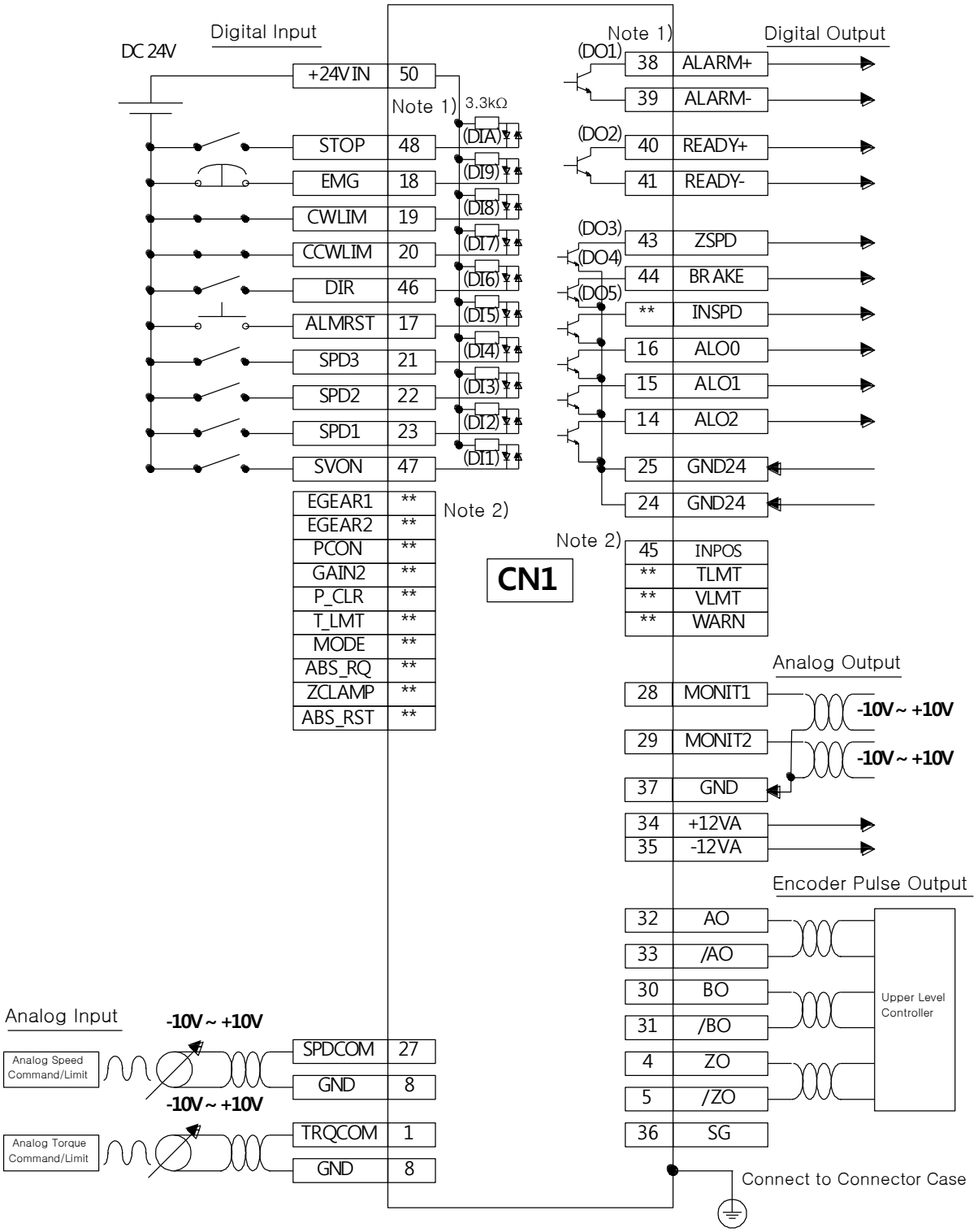
1.2.4 Example of Speed Operation Mode Wiring



Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
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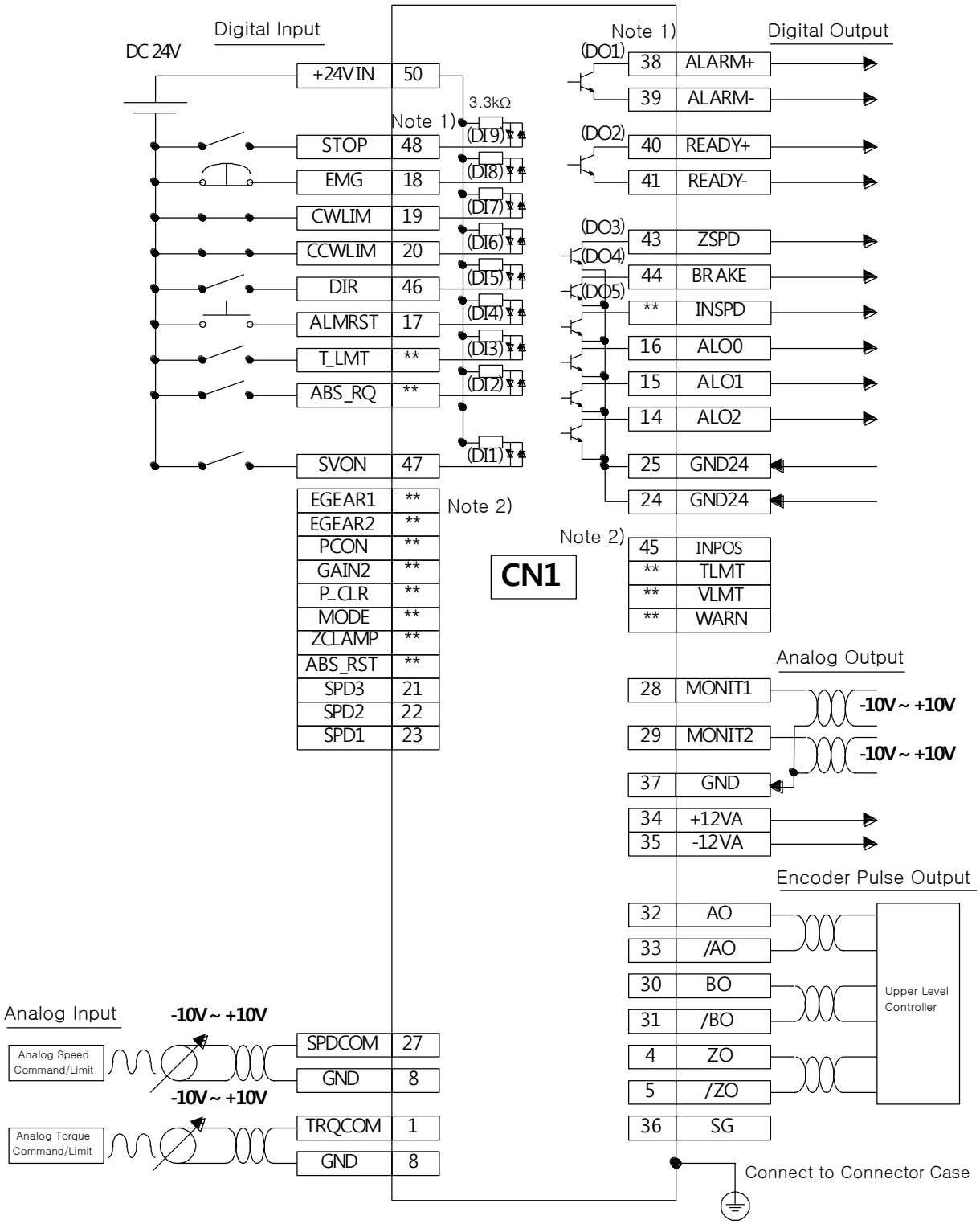
1.2.5 Example of Torque Operation Mode Wiring



Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
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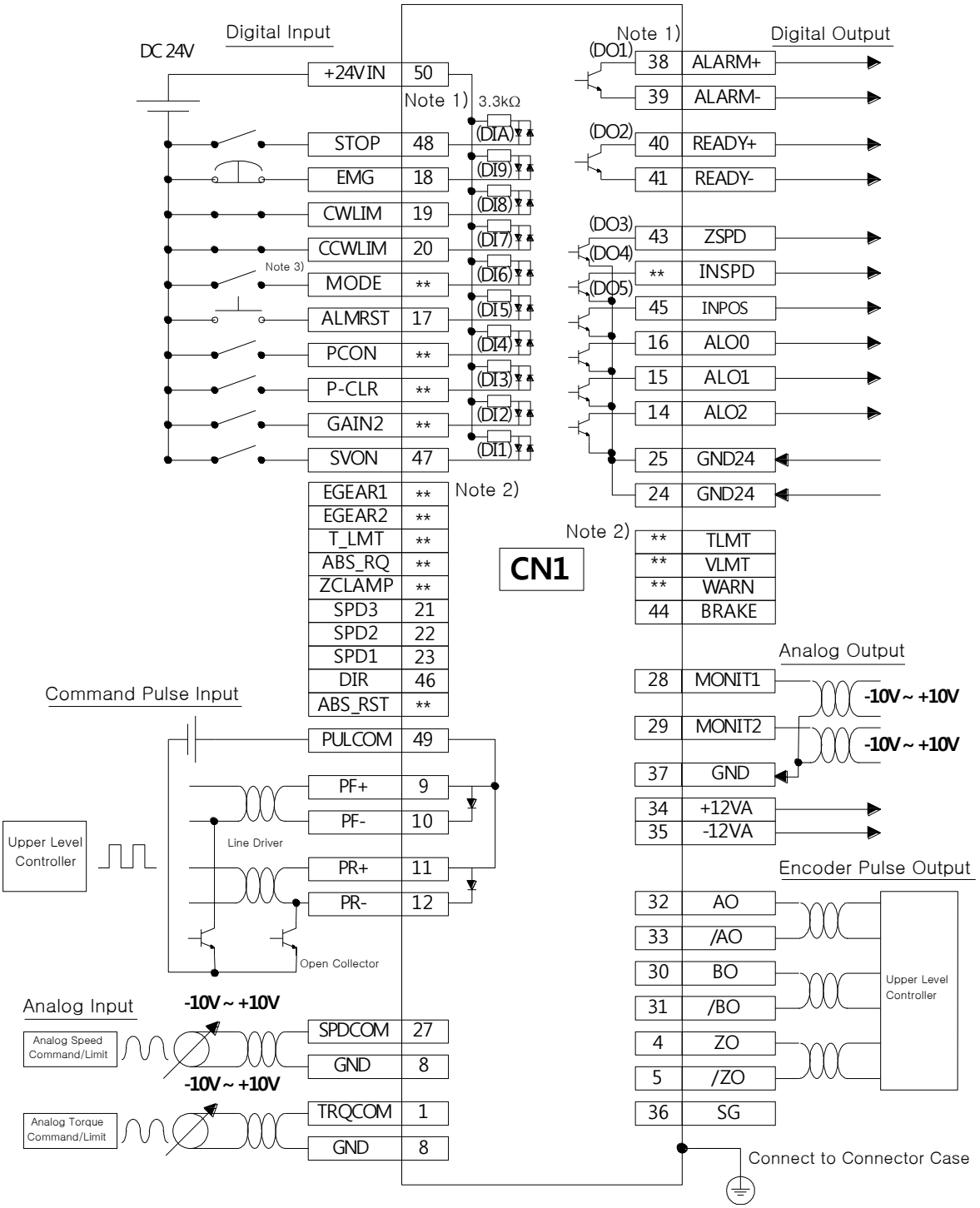
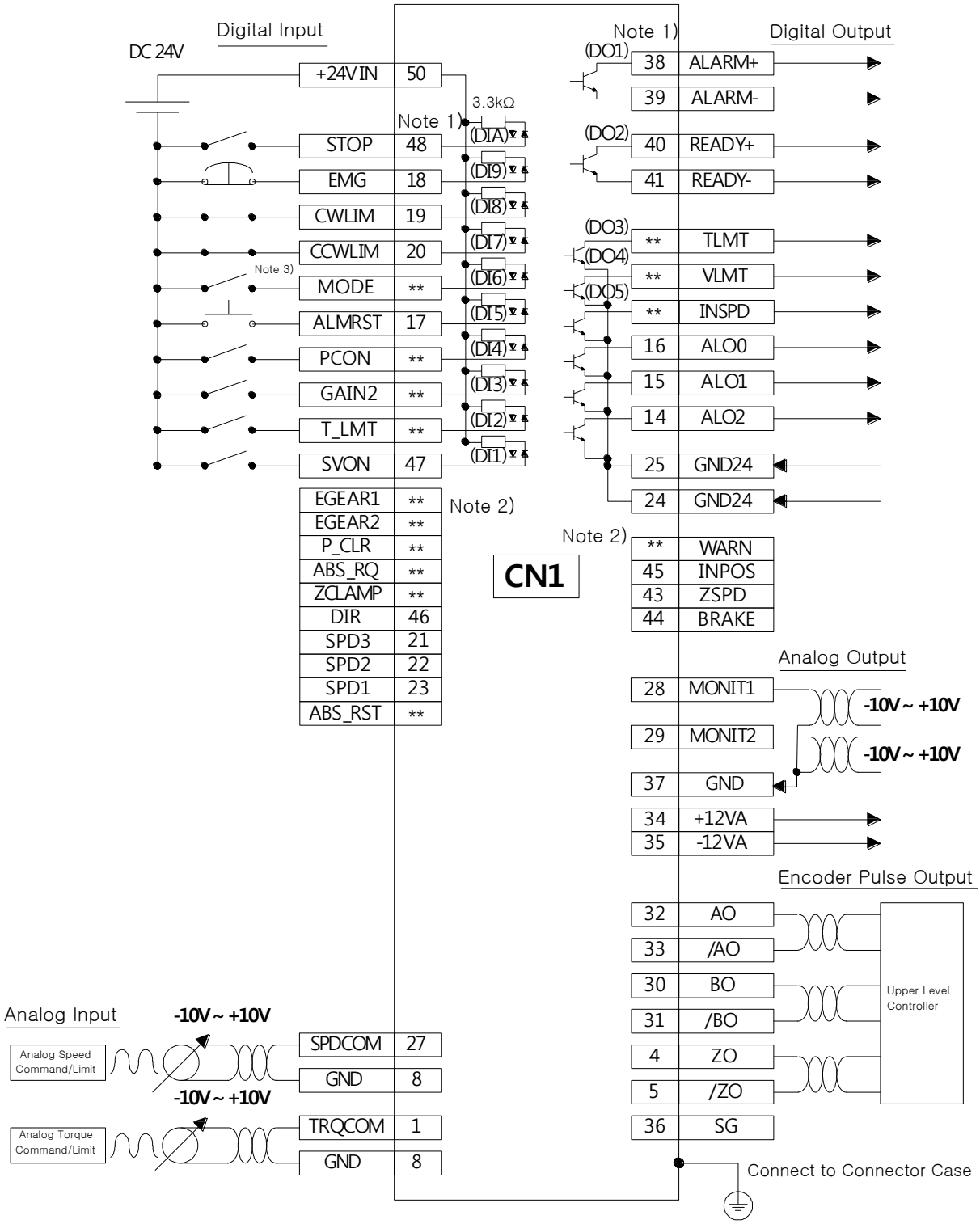
1.2.6 Examples of Speed / Position Operation Mode Wiring



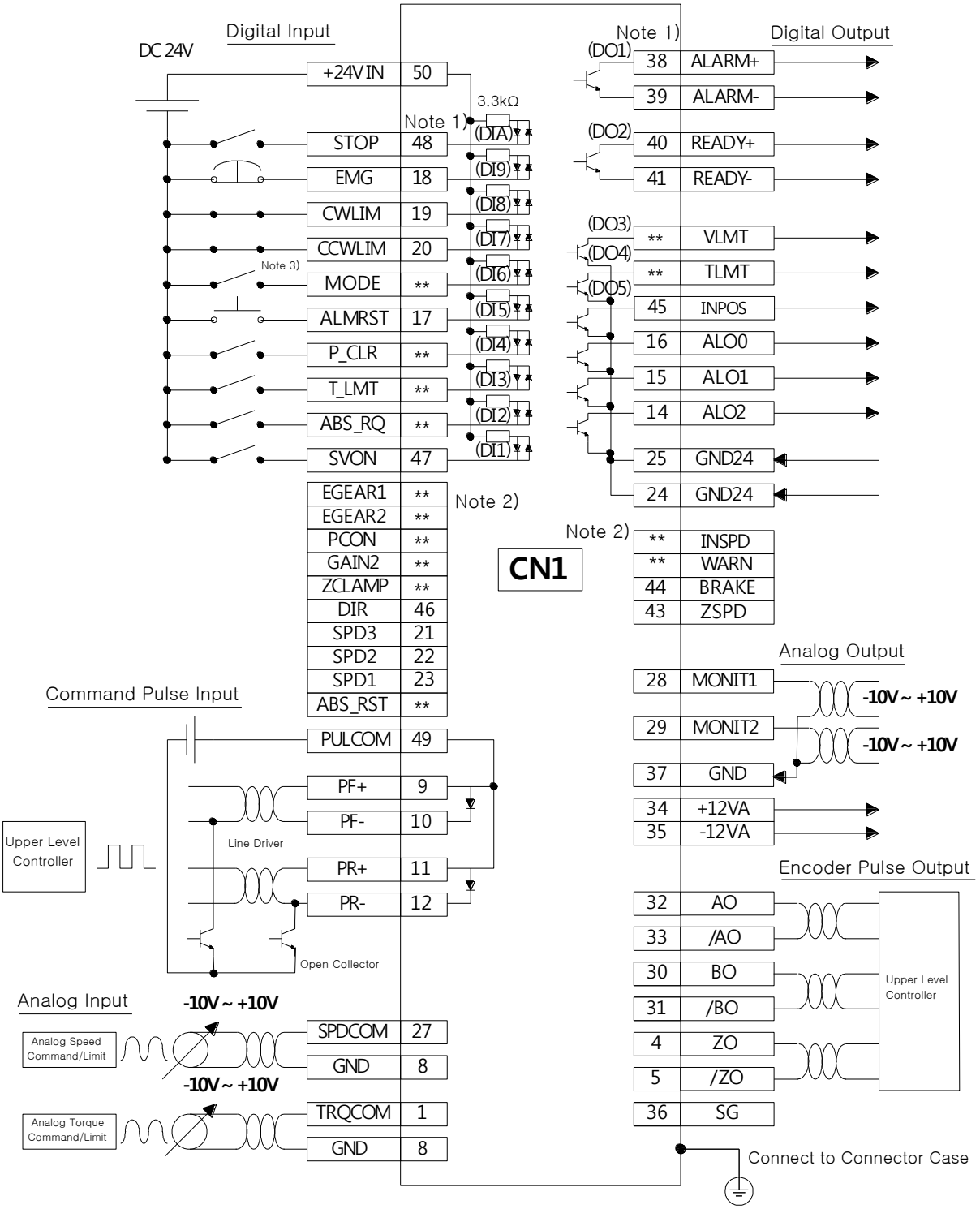
Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
Note 2) **These are non-allocated signals. You can change their allocation by setting parameters. For information, refer to "4.1.6 External Input Signal and Logic Definition" and "4.1.8 External Output Signal and Logic Definition."
Note 3) Input Contact Mode = ON : Speed Control Mode, Mode = OFF : Position Operation Mode

1.2.7 Example of Speed/Torque Operation Mode Wiring



Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
Note 2) **These are non-allocated signals. You can change their allocation by setting parameters. For information, refer to "4.1.6 External Input Signal and Logic Definition" and "4.1.8 External Output Signal and Logic Definition."
Note 3) Input Contact Mode = ON : Speed Control Mode, Mode = OFF : Torque Operation Mode

1.2.8 Example of Position/Torque Operation Mode Wiring



Note 1) Input signals DI1 to DIA and output signals DO1 to DO5 are default signals allocated by the factory.
Note 2) **These are non-allocated signals. You can change their allocation by setting parameters. For information, refer to "4.1.6 External Input Signal and Logic Definition" and "4.1.8 External Output Signal and Logic Definition."
Note 3) Input Contact Mode = ON : Position Control Mode, Mode = OFF : Torque Operation Mode

1.3 Signal

1.3.1 Digital Input Contact Signal

Pin Number of Factory Setting	Name	Details	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
50	+24 V IN	Input contact +24 [V] power	O	O	O	O	O	O
47	SVON	Servo ON	O	O	O	O	O	O
23	SPD1	Multi-speed 1	X	O	X	O/X	O/X	X
22	SPD2	Multi-speed 2	X	O	X	O/X	O/X	X
21	SPD3	Multi-speed 3	X	O	X	O/X	O/X	X
17	ALMRST	Reset upon alarm	O	O	O	O	O	O
46	DIR	Select rotation direction	O	O	O	O	O	O
20	CCWLMT	Counter-clockwise limit	O	O	O	O	O	O
19	CWLMT	Clockwise limit	O	O	O	O	O	O
18	EMG	Emergency stop	O	O	O	O	O	O
48	STOP	Stop	X	O	O	O/X	O	X/O
Allocate	EGEAR1	Electronic gear ratio 1	O	X	X	X/O	X	O/X
Allocate	EGEAR2	Electronic gear ratio 2	O	X	X	X/O	X	O/X
Allocate	PCON	P control action	O	O	X	O	O/X	O/X
Allocate	GAIN2	Select gain 2	O	O	X	O	O/X	O/X
Allocate	P_CLR	Clear error pulse	O	X	X	X/O	X	O/X
Allocate	T_LMT	Control torque with TRQCOM	O	O	O	O	O	O
Allocate	MODE	Change operation modes	X	X	X	O	O	O
Allocate	ABS_RQ	Request absolute position data	O	O	O	O	O	O
Allocate	ZCLAMP	Zero clamp	X	O	X	O/X	O/X	O
Allocate	ABS_RST	Reset absolute encoder data	O	O	O	O	O	O

1.3.2 Analog Input Contact Signal

Pin Number	Name	Description	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
27	SPDCOM	Analog speed command (-10-+10 [V])	X	O	X	O/X	O/X	X
		Analog Speed Limit (-10-+10 [V])	X	X	O	X	X/O	X/O
1	TRQCOM	Analog Torque Command (-10-+10 [V])	X	X	O	X	X/O	X/O
		Analog torque limit (-10-+10 [V])	O	O	X	O	O/X	O/X
8 37	GND	Grounding for analog signals	O	O	O	O	O	O

1.3.3 Digital Output Contact Signal

Pin Number of Factory Setting	Name	Description	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
16	ALO0	Alarm group contact output 1	O	O	O	O	O	O
15	ALO1	Alarm group contact output 2	O	O	O	O	O	O
14	ALO2	Alarm group contact output 3	O	O	O	O	O	O
38 / 39	ALARM +/-	Alarm	O	O	O	O	O	O
40 / 41	READY +/-	Ready for operation	O	O	O	O	O	O
43	ZSPD	Zero speed reached	O	O	O	O	O	O
44	BRAKE	Brake	O	O	O	O	O	O
45	INPOS	Position reached	O	X	X	X/O	X	O/X
Allocate	TLMT	Torque limit	O	O	O	O	O	O
Allocate	VLMT	Speed limit	O	O	O	O	O	O
Allocate	INSPD	Speed reached	X	O	X	O/X	O/X	X
Allocate	WARN	Warning	O	O	O	O	O	O
24 25	GND24	Input/output contact Grounding of drive power (24 [V])	O	O	O	O	O	O

1.3.4 Monitor Output Signal and Output Power

Pin Number	Name	Description	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
28	MONIT1	Analog monitor output 1 (-10-+10 [V])	O	O	O	O	O	O
29	MONIT2	Analog monitor output 2 (-10-+10 [V])	O	O	O	O	O	O
8 37	GND	Grounding for analog signals	O	O	O	O	O	O
34	+12 V	Terminal for +12 [V] power output	O	O	O	O	O	O
35	-12 V	Terminal for -12 [V] power output	O	O	O	O	O	O

1.3.5 Pulse Train Input Signal

■ Line Driver (5 V)

Pin Number	Name	Description	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
9	PF+	F+ pulse input	O	X	X	X/O	X	O/X
10	PF-	F- pulse input	O	X	X	X/O	X	O/X
11	PR+	R+ pulse input	O	X	X	X/O	X	O/X
12	PR-	R- pulse input	O	X	X	X/O	X	O/X
49	PULCOM	Not for use	X	X	X	X	X	X

■ Open Collector (24 V)

Pin Number	Name	Description	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
9	PF+	Not for use	X	X	X	X	X	X
10	PF-	F pulse input	O	X	X	X/O	X	O/X
11	PR+	Not for use	X	X	X	X	X	X
12	PR-	R pulse input	O	X	X	X/O	X	O/X
49	PULCOM	+24 V power input	O	X	X	X/O	X	O/X

1.3.6 Encoder Output Signal

Pin Number	Name	Description	Applicable Modes					
			Position	Speed	Torque	Speed /Position	Speed /Torque	Position /Torque
32 33 30 31	AO /AO BO /BO	Outputs encoder signals received from the motor as signals pre-scaled according to the ratio defined by [P0-14]. (5 [V] line driver method)	O	O	O	O	O	O
4 5	ZO /ZO	Outputs encoder Z signals received from the motor. (5 [V] line driver method)	O	O	O	O	O	O