(2) C series servo amplifiers - 1

When using the discharge unit, make the following connections:

① Remove the shorting bars between (17) and (18) on terminal block T1 and between (15) and (16) on terminal block T1. (The short bars should not be used.)
② Connect the cables from (1) and (2) on terminal block T3 for the discharge unit to (17) and (19) on terminal block T1 for the amplifier.
③ Connect the thermostat signal cables from (3) and (4) on terminal block T3 for the discharge unit to (15) and (16) on terminal block T1 for the amplifier.

A06B-6066-H500 A06B-6066-H□□□

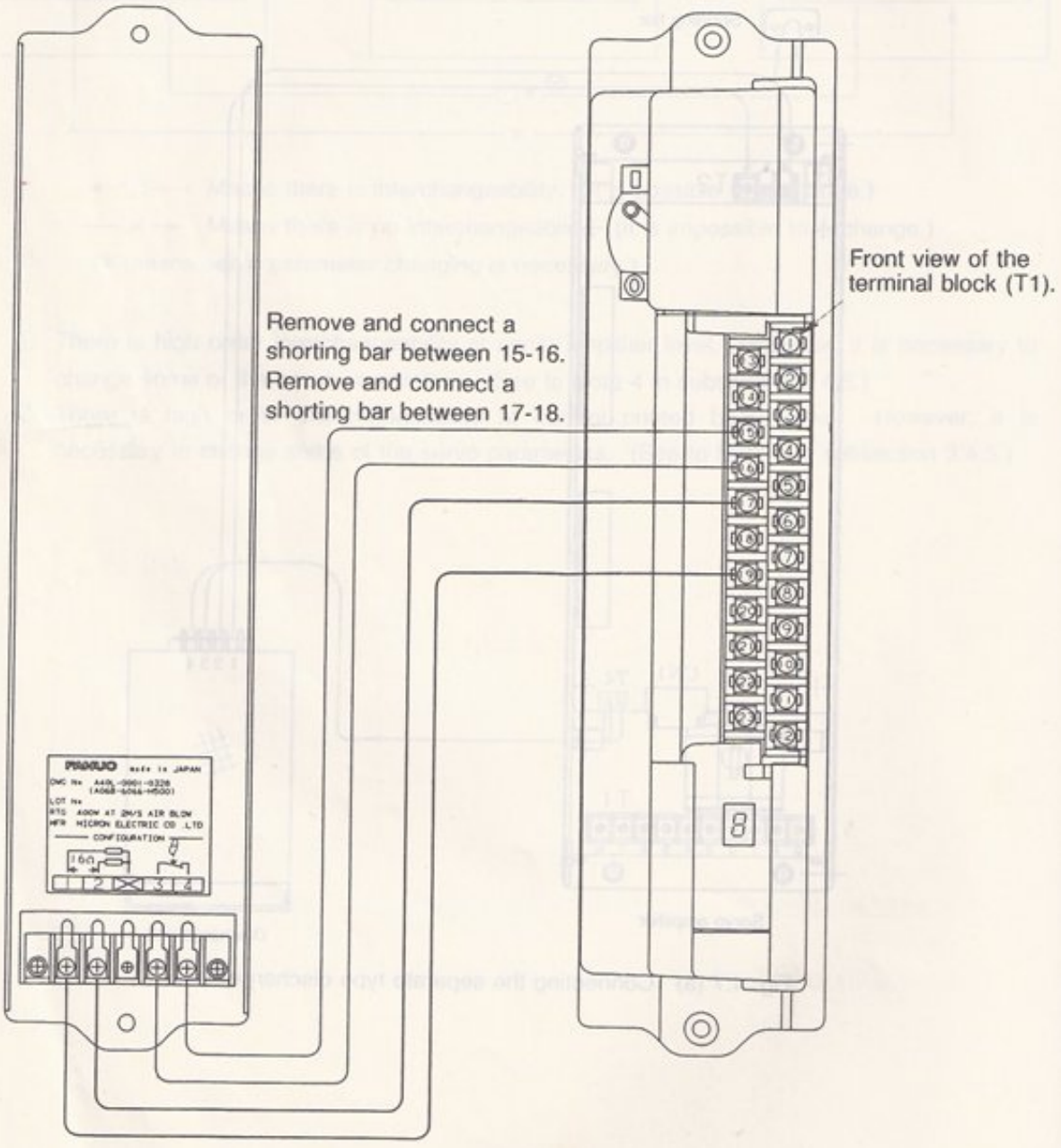


Fig. 4.7 (b) Connecting the separate type discharge unit

4.7 Connection of the Discharge Unit

(1) S series servo amplifiers

When using the discharge unit, connect as follows.

① Take the short bar which is between T2 (4) and T2 (5) out of T2. (Don't use the shorting bar.)
② Connect a cable from the discharge unit between T2 (4) and T2 (6).
③ Connect a cable from the thermostat that is mounted on the discharge unit to T4 or CN2.
④ Set S1 at "L" side. Set S2 at "H" side.

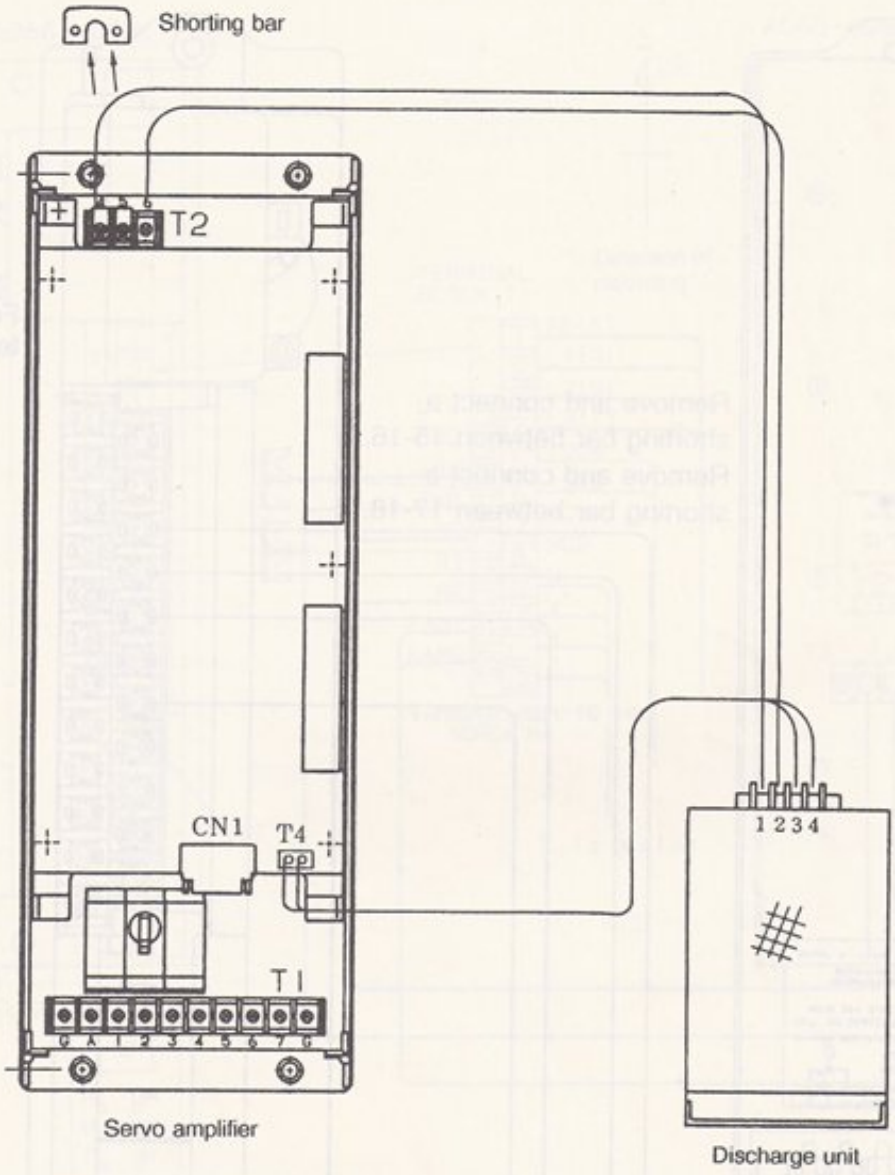
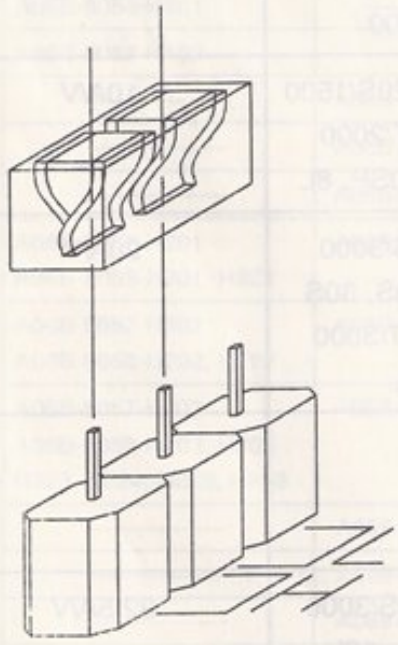


Fig. 4.7 (a) Connecting the separate type discharge unit

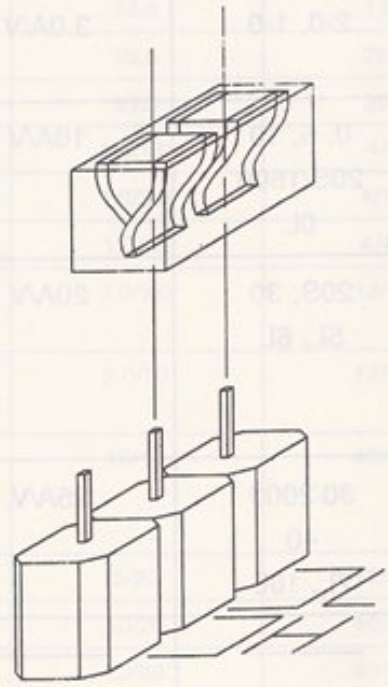
4.5 Setting Terminals for Printed Circuit Boards

4.5.1 Setting terminals for S series servo amplifiers

Terminal	Setting	Content
S1	L	The external thermostat signal is connected to T4 or CN2.
	H	The external thermostat signal is not connected to T4 or CN2.
S2	H	If use a separate discharge unit
	L	If no separate discharge unit
Setting Terminals S3R, S3S (Set at "H" side without fail.) (Only A16B-1100-0300)		
S3R S3S	H	If S series amplifier
	L	Not used



Set at "H" side



Set at "L" side

4.5.2 Setting terminals for C series servo amplifiers

The C series servo amplifiers have no setting terminals.

4.3 Servo Amplifier State Indication

The LED indicators on the printed circuit boards of a servo amplifier indicate states of the servo amplifier. With these LED indicators, servo amplifier trouble can be easily detected.

4.3.1 S series servo amplifiers

(1) PCB of controller

Symbol	Color	Contents
5V	Green	SIGN FOR CONTROL POWER ON "5V" indicates the state of power source applied on the board.
DRDY	Green	SIGN FOR PWM SIGNAL AVAILABLE "DRDY" indicates the ready state of servo amplifier. The condition of DRDY is no alarm and *MCON from NC being low.
HV	Red	HIGH VOLTAGE ALARM "HV" occurs when the DC link voltage has exceeded the limited level.
HC	Red	HIGH CURRENT ALARM "HC" occurs when excessive current has crossed the DC link.
LV	Red	LOW VOLTAGE ALARM "LV" occurs when the DC link voltage is excessively low or regulator circuit has a malfunction.
DC	Red	DISCHARGE ALARM "DC" occurs when the capacity of discharge circuit has been exceeded.
OH	Red	OVERHEAT ALARM "OH" occurs when a normally closed thermostat contact which is mounted either in servo amplifier, on separate discharge unit, or in power transformer has opened.
FAL	Red	In case of fuse alarm NFB1-3 and trip of F4/F5 (or blow-out)

(Note 1) Dynamic brake acts to stop the motor immediately when any alarm occurs.

(Note 2) LED "5V" is on S Series 200 to 230V type amplifier except for early version of A16B-1200-0800.

(Note 3) LED "DC" and DC ALARM are not on the following PCBs. (A20B-1001-0430, A20B-1002-0500 and A20B-1002-0730)

Table 4.3.2 (a) Alarm state indications and meanings (1/2)

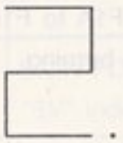
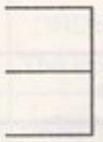
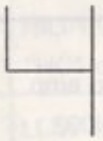
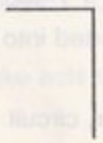
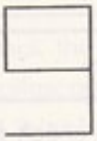
Type	LED indication	Description
Overvoltage alarm (HV)		If DC voltage of main circuit power supply is abnormally high, overvoltage alarm occurs (HV level: 430V DC). Alarm occurs when regenerative discharge resistor is disconnected. For 200V AC input, main circuit voltage is 283V DC (200 × 1.414). Discharge operation is started at voltage of main circuit voltage plus 60V.
Control power supply undervoltage alarm (LV5V)		Alarm occurs if control circuit power supply voltage (+ 5 V) is abnormally low (LV5V level: 4.6 VDC).
DC link undervoltage alarm (LVDC)		Alarm occurs if DC voltage of main circuit power supply is abnormally low (LVDV level: 120V). Causes may include power supply voltage (+ 15V) being 10V or lower and driver module PCB not inserted normally.
Regenerative control circuit abnormality alarm (DCSW)		Alarm occurs when short-time regenerative discharge energy is too high. Cause may be disconnection of regenerative discharge resistor. If IGBT for discharge is continuously on for 1 second or longer, cause may be short circuit between C and E for IGBT for discharge.
Excessive regenerative discharge alarm (DCOH)		Alarm occurs when average regenerative discharge energy is too high. Causes may include operation of thermostat for regenerative discharge resistor or thermostat between (15) and (16) on terminal block T1; this operation results from too frequent acceleration/deceleration operations.
Servo amplifier overheat (OH)		Alarm occurs when thermostat in amplifier operates (when thermostat contact on PCB opens). Check if motor load exceeds rated current.
Magnetic contactor welding alarm (MCC)		Alarm occurs when magnetic contactor contact welds. Check for contact welding immediately after use of magnetic contactor is specified. Causes may include short circuit of 3-phase diode bridge. Usually, replace amplifier.
Overcurrent alarm (HCL)		Alarm occurs when abnormally high current flows in main circuit of 1-axis amplifier or in main circuit of L axis of 2-axis amplifier. Causes may include faulty IC, abnormal PWM signal, faulty motor, and grounded wiring.

Table 4.3.2 (a) Alarm state indications and meanings (2/2)

Type	LED indication	Description
Overcurrent alarm (HCM)		Alarm occurs when abnormally high current flows in main circuit of M axis of 2-axis amplifier. Causes may include faulty IC, abnormal PWM signal, faulty motor, and grounded wiring.
Overcurrent alarm (HCLM)		Alarm occurs when abnormally high current flows in main circuits of L and M axes of 2-axis amplifier. Causes may include faulty IC, abnormal PWM signal, faulty motor, and grounded wiring.

(Note) If an alarm is raised, the motor is stopped by the dynamic brake.

Table 4.3.2 (b) Normal state indications and meanings

Type	LED indication	Description
Amplifier not ready		Magnetic contactor in amplifier is dropped out; preparation for driving motor is not completed. (Ready signal from controller (NC) is not available.)
Amplifier ready		Magnetic contactor in amplifier is picked up; preparation for driving motor is completed. (This state represents normal operating state.)

Table 4.3.2 (c) Tripping of circuit breaker

Type	State indication	Description
Circuit breaker	Circuit breaker trips.	Circuit breaker trips if abnormal current exceeding rated current of circuit breaker flows. DC link undervoltage alarm (LVDC) may be turned on as well.

Table 4.3.2 (d) Blown fuses

Type	State indication	Description
Blown fuse on PCB	7-segment LED indicator provides no indication.	Fuse on PCB blows if abnormal current flows. If fuse blows, power is not supplied to servo amplifier control PCB, so all operations of servo amplifier are disabled. (Fuse check location: Near 7-segment LED indicator. Open terminal block cover to check.)

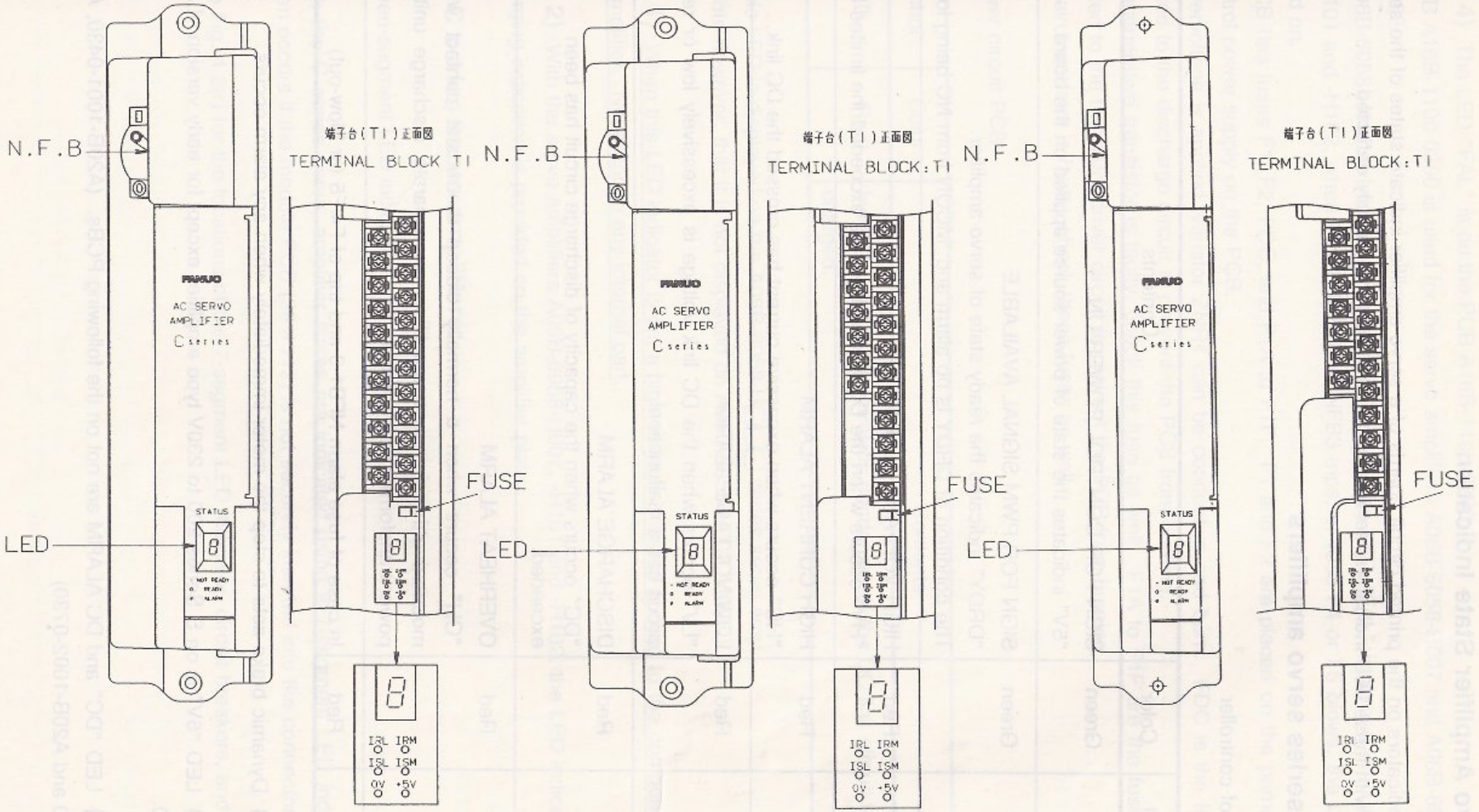


Fig. 4.2 (r) C series servo amplifier parts locations
(1-axis: A06B-6066-H002, H003, H004, H006)
(2-axis: A06B-6066-H222, H223, H224, H233, H234, H235, H236, H244, H246, H266)