

AD-4328

Weighing Indicator

MAINTENANCE MANUAL



Contents

| | |
|---|-----------|
| 1. Introduction..... | 3 |
| 1-1 About the AD-4328..... | 3 |
| 1-2 Block diagram | 3 |
| 2. Operations | 4 |
| 2-1 A/D converter | 4 |
| 2-2 Power supply | 6 |
| 2-3 External input..... | 6 |
| 2-4 Current loop output | 7 |
| 2-5 EEPROM | 8 |
| 2-6 Options..... | 9 |
| 3. Calibration by Digital Input..... | 11 |
| 3-1 Outline..... | 11 |
| 3-2 Adjustment | 11 |
| 4. Check Mode | 12 |
| 4-1 Entering the check mode | 12 |
| 4-2 Description of items displayed | 12 |
| 5. Function mode..... | 16 |
| 5-1 Entering the C functions mode | 16 |
| 5-2 Description of C functions | 16 |
| 6. Parts List | 18 |
| 6-1 AD-4328 (PZ:3071) | 18 |
| 6-2 AD-4328-01 (PZ:3078A) | 19 |
| 6-3 AD-4328-02 (PZ:3122)..... | 19 |
| 6-4 AD-4328-03 (PZ:3079A) | 20 |
| 6-5 AD-4328-04 (PZ:3080)..... | 21 |
| 7. Circuit Diagram..... | 22 |
| 7-1 AD-4328 (PZ:3071) | 22 |
| 7-2 AD-4328-01 (PZ:3078A) | 23 |
| 7-3 AD-4328-02 (PZ:3122)..... | 24 |
| 7-4 AD-4328-03 (PZ:3079A) | 25 |
| 7-5 AD-4328-04 (PZ:3080)..... | 26 |

| | |
|---|---------------|
| 8. Board Component Location..... | 27 |
| 8-1 AD-4328 (PZ:3071) | 27 |
| 8-2 AD-4328-01 (PZ:3078A) | 28 |
| 8-3 AD-4328-02 (PZ:3122) | 29 |
| 8-4 AD-4328-03 (PZ:3079A) | 30 |
| 8-5 AD-4328-04 (PZ:3080) | 31 |
| 9. Exploded View | 32 |
| 9-1 View-1 AD-4328 | 32 |
| 9-2 View-2 AD-4328 | 34 |
| 9-3 View-3 AD-4328 | 36 |
| 9-4 View-4 AD-4328 | 37 |
| 9-5 View AD-4328-01 | 38 |
| 9-6 View AD-4328-02 | 39 |
| 9-7 View AD-4328-03 | 40 |
| 9-8 View AD-4328-04 | 41 |

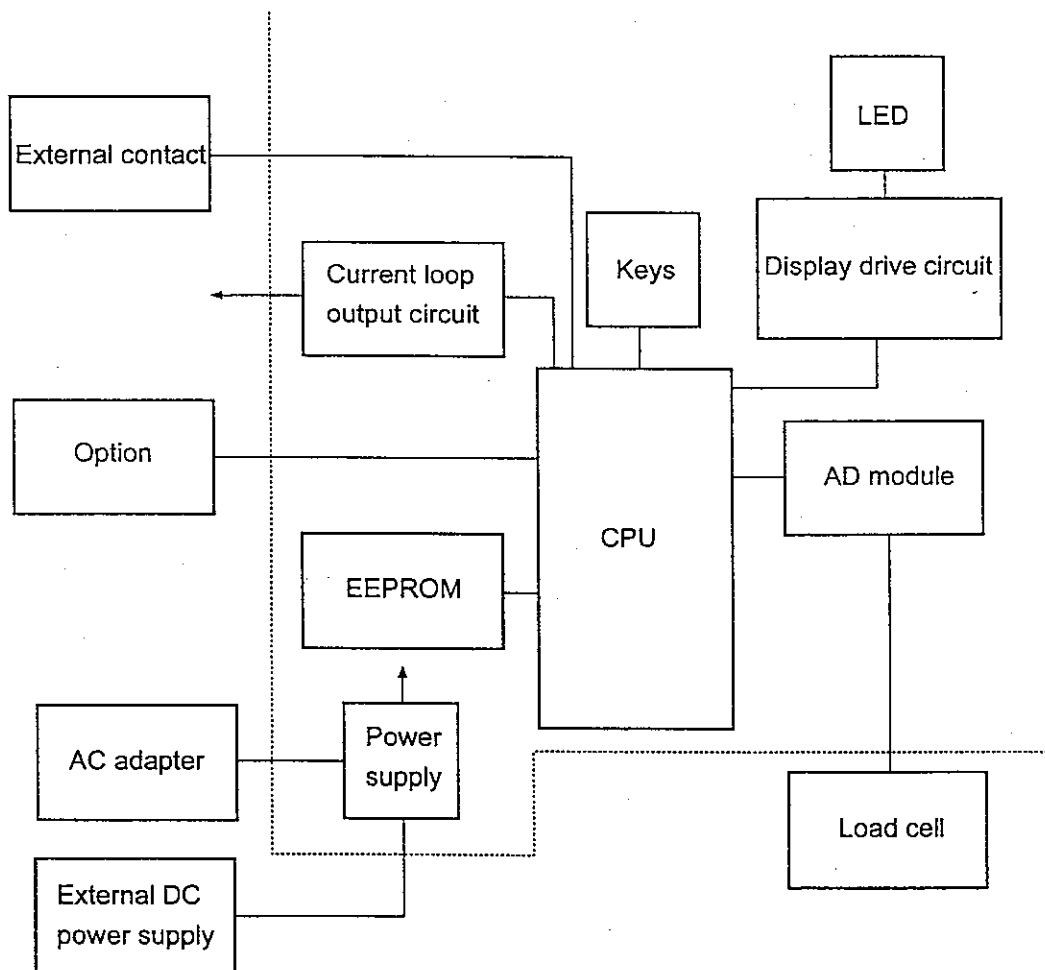
1. Introduction

1-1 About the AD-4328

The AD-4328 is a weighing indicator with the following features.

- Maximum display resolution 1/10000
- Maximum input sensitivity 0.2 μ V (Load cell excitation voltage 5V)
- Input signal range -1mv to 15 mV (-0.2 mV/V to 3 mV/V)
- 6-digit LED display
- Calibration by digital input

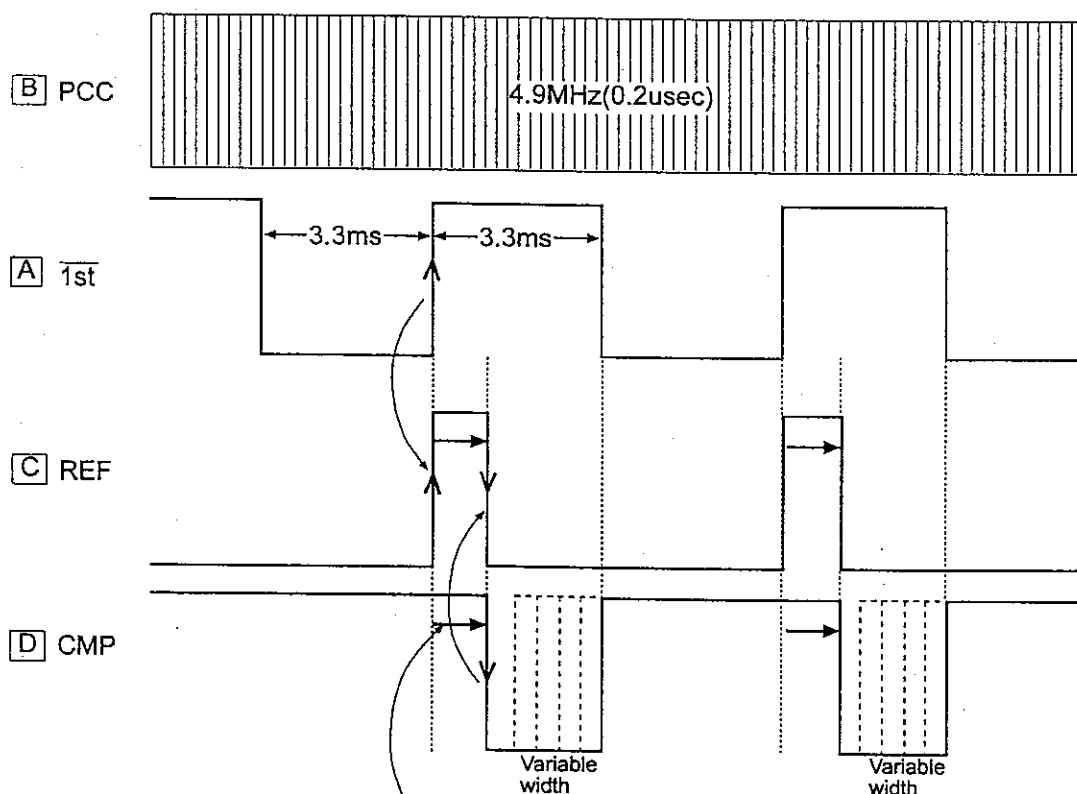
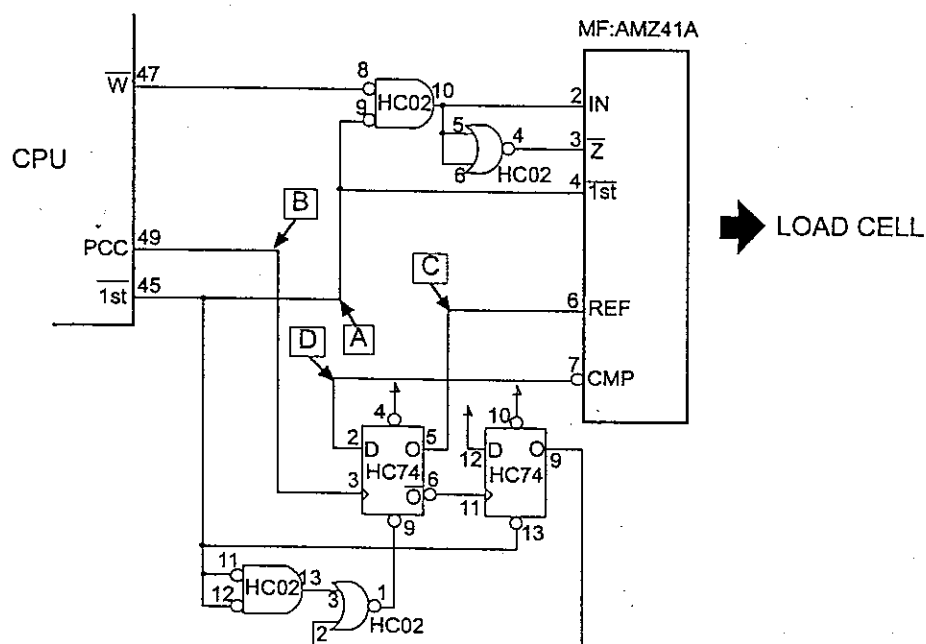
1-2 Block diagram



2. Operations

2-1 A/D converter

Circuit diagram, timing chart



Depends on the load cell input.
(The greater the load cell input is,
the greater this width is.)

Operation

A/D conversion is of the double integrating type.

During the $\overline{1st}$ LO state (3.3 ms), a given amount of electric charge is applied to the capacitor. Then, the electric charge is released by a constant amount (the duration when REF is HI). The time in which the whole process is performed is the A/D converted value.

During A/D conversion of the weighing value, the conversion operation is interrupted at a certain interval and the offset value of the amplifier inside the AMZ41A is measured.

- Interval

Upon power-on: eight seconds for the first 48 seconds

During the normal operation, if stabilized: 48 seconds.

(Waits until the indicator is stabilized)

- Control

With \overline{W} being in the LO state, A/D conversion of the weighing value, with \overline{W} being in the HI state, A/D conversion of the offset value.

Operational flow

1. $\overline{1st}$ is set to LO and the LO state is maintained for 3.3 ms. Electric charge starts to be applied and CMP becomes HI.
2. $\overline{1st}$ is set to HI and the HI state is maintained for 3.3 ms. When $\overline{1st}$ starts to be HI, the HC74 RESET is released. Due to the HI state of CMP, RFE becomes HI in synchronization with the PCC clock. (Start of 2nd)
3. CMP becomes LO after the time corresponding to the load cell input has elapsed. Then, the operation is as follows:
HC74 (1/2) Q becomes HI in synchronization with the PCC clock. → HC74 (2/2) Q becomes HI. → HC74 (1/2) is reset. → REF becomes LO in synchronization with the PCC clock. (End of 2nd)
4. Hereafter, the operation is repeated from step 1.

Example of abnormal operation

If some malfunction exists between the MF:AMZ41A and the load cell, CMP may remain LO even after $\overline{1st}$ is ended or CMP may not become LO during the HI state of $\overline{1st}$.

2-2 Power supply

Operation

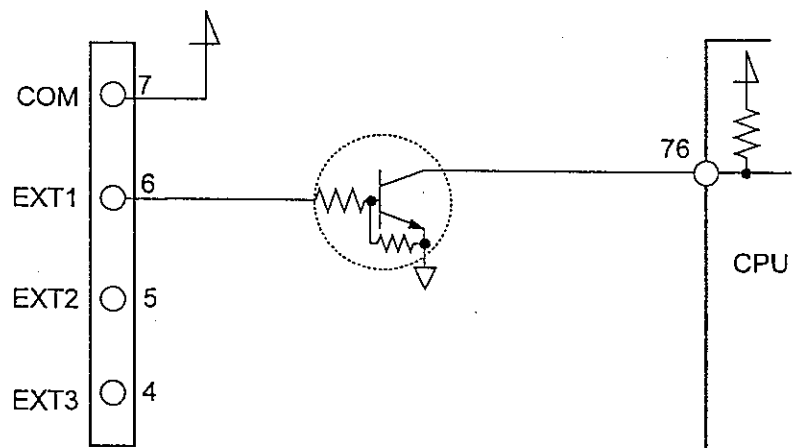
The AC adapter supply voltage is converted to 5 V using a 5-V regulator and is supplied to the indicator interior. The indicator interior operates on 5 V.

The external power supply from the terminal strip enters the AC adapter jack through J3 via the main board. The power is supplied to the main board via a contact in the AC adapter jack. The contact is open when the AC adapter is inserted into the jack. Which means that external DC power is not supplied to the indicator interior while the AC adapter is connected.

2-3 External input

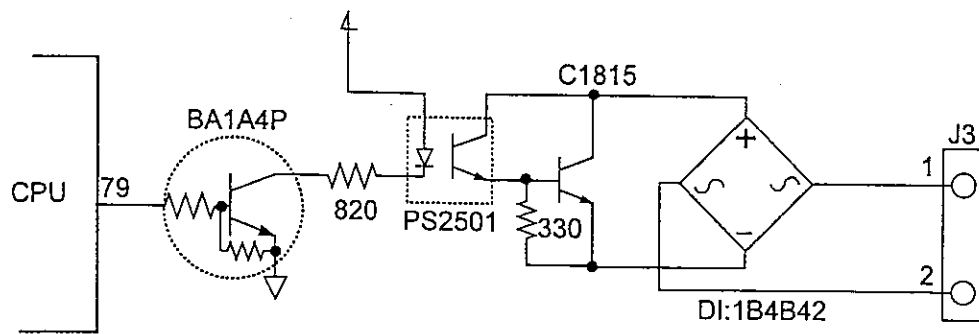
External input is a contact input. When shorted to COMMON, it can perform the same operation as the key input. Three inputs are available. FUNCTION assigns a function to each input.

Circuit diagram and operation



The CPU port becomes HI when EXT is open; LO when shorted to COM.

2-4 Current loop output

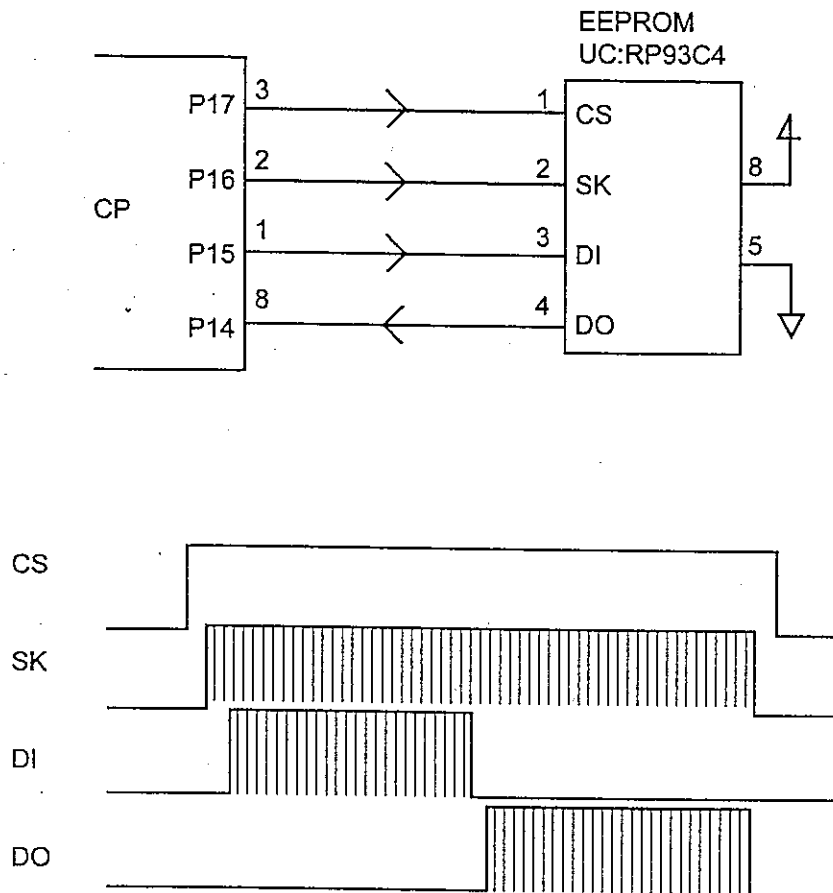


In a mark (no signal) condition, the CPU port is HI and current loop is closed.

In a space condition, the CPU port is LO and current loop is open.

2-5 EEPROM

Circuit diagram, timing chart



Operation

The EEPROM stores the function and calibration data. Read/write operation is performed upon power-on and when writing the function and calibration data.

- | | |
|-------------------|---|
| CS (Chip Select) | HI during the read/write operation. |
| SK (Serial Clock) | The read/write operation is performed in synchronization with this clock. |
| DI (Data In) | Data input to the EEPROM. The contents are commands and addresses. For the write operation, data is stored. |
| DO (Data Out) | Data output from the EEPROM. Data is output for the read operation; write ending data for the write operation. |

The timing chart above indicates the performance roughly.

During the write operation, the written data is read and compared. If found no good, "EEP Err" is displayed.

2-6 Options

Using 2 logic bits input through pins 6 and 7 on the option board J1, the main CPU recognizes which options are connected. The options are controlled based on the recognition. Therefore, correct recognition is required for the options performance. In the check mode, how the main CPU recognizes the options can be checked. The recognition port for each option is as follows:

| Option | J1, pin 7 | J1, pin 6 |
|-----------|-----------|-----------|
| OP-01 | LO | LO |
| OP-02, 04 | LO | OPEN |
| OP-03 | OPEN | LO |

When OPEN, pulled up to the 5-V supply of the main board.

OP-01 (BCD OUT)

Serial data is sent from the main CPU in synchronization with the clock. The HC595 converts the data to parallel and outputs the data (open collector) via the photo coupler, TLP627.

| | | | |
|----|--------|-------------------|--|
| J1 | pin 9 | SCK | Serial data synchronizing clock |
| | Pin 10 | SI | Serial data |
| | Pin 4 | \bar{G} | Enables HC595 output (Usually HI when outputting data) |
| | Pin 5 | \overline{SCLR} | Clears HC595 internal shift register (Usually HI when outputting data) |
| | Pin 8 | RCK | Latches HC595 output (LO when sending serial data, HI after the sending operation) |

OP-02 (Comparator output, open collector)

Signals from the main CPU are output (open collector) via the photo coupler, PS2501.

| | | | |
|----|--------|----|-------------------|
| J1 | pin 8 | HI | HI when HI is ON. |
| | pin 10 | GO | HI when GO is ON. |
| | pin 9 | LO | HI when LO is ON. |

OP-03 (RS422/485 + comparator output, Photo MOS relay)

Signals from the main CPU are output (comparator output) via the photo MOS relay, AQV253.

The RS422/485 performs serial communication via the RS422/485 driver, LTC485.

Due to 1:N connection of the RS422/485, the output is required to be set to high impedance (HI) when the sending operation is not being performed. $\overline{EN/DIS}$ controls this.

| | | | |
|----|--------|---------------------|---|
| J1 | pin 8 | HI | HI when HI is ON. |
| | pin 10 | GO | HI when GO is ON. |
| | pin 9 | LO | HI when LO is ON. |
| | pin 4 | TXD | HI when Send serial data is in a mark condition (no signal). |
| | pin 3 | RXD | HI when Receive serial data is in a mark condition (no signal). |
| | Pin 5 | $\overline{EN/DIS}$ | HI when outputting data; LO when waiting for data. |

OP-04 (RS232 + current loop output + comparator output, Photo MOS relay)

Signals from the main CPU are output (comparator output) via the photo MOS relay, AQV253.

The RS232 performs serial communication via the RS232 driver, MAX232.

In the current loop output, signals are taken in parallel with the serial output and are output via the current loop drive circuit.

| | | | |
|----|--------|-----|---|
| J1 | pin 8 | HI | HI when HI is ON. |
| | pin 10 | GO | HI when GO is ON. |
| | pin 9 | LO | HI when LO is ON. |
| | pin 4 | TXD | HI when Send serial data is in a mark condition (no signal). |
| | pin 3 | RXD | HI when Receive serial data is in a mark condition (no signal). |

3. Calibration by Digital Input

For information on regular calibration, refer to "4. CALIBRATION" of the AD-4328 instruction manual.

3-1 Outline

Generally, calibration is performed using weights. But calibration without weights is possible if the load cell output voltages (zero and span) are known. Calibration will be performed by entering the output voltage values.

When calibration is performed using weights, the output values are displayed as an absolute value. So, by entering the values into a new indicator, when replaced, the indicator can be calibrated without weights.

To provide the indicator this function, absolute values must be assigned to the internal AD counts. When adjustment is performed, a dummy cell with the absolute values entered is used to store the internal AD counts at 0.0 mV/V and 3.2 mV/V in the indicator. (Hereafter, this operation is called "standard calibration".)

3-2 Adjustment

When the standard calibration value is destroyed or the AD module (MF:AMZ41A) is replaced, standard calibration is required. All adjustments are performed in the check mode.

In the check mode, the following is performed for calibration by digital input.

- Displaying the internal AD counts at 0.0 mV/V and 3.2 mV/V
- Standard calibration

4. Check Mode

4-1 Entering the check mode

With the display-off state, while holding down [MODE] and [CAL], press [OPR/STB]. "init" appears. Pressing [MODE] displays the following items one after another:

"init" → "ChECK" → "r XXX" → "SC 0" → "SC1" → "AD0" → "AD1" → "AD2" → "AD3" →
"CAL 0C" → "CAL 1C" → "CAL 2C" → "init"

(With "CAL 2C" displayed, pressing [MODE] will return to the "init" display.)

→ "init A"

(With "CAL 2C" displayed, pressing [M+] while holding down [MODE] will proceed to "init A".)

4-2 Description of items displayed

- "init" : Initialize

Initializes the following value to the value indicated in parentheses:

- F-functions and CF-functions (factory setting values)
- Upper and lower limit values (zero)
- Setpoint (zero)
- Accumulated data (zero)
- Number of times of accumulation (zero).

To prevent misoperation, a special key combination is required to perform initialization.

With "init" displayed, hold down [TARE] and press [ENTER] to initialize.

- **"ChECK"** : Checks the display, keys, EXT in and the options currently connected.

With "ChECK" displayed, press [ENTER]. All the display segments are on.

Perform the following to check each item.

All display segments ON

↓ Press [MODE].

Segment check

↓ Press [MODE].

Digit check

↓ Press [MODE].

Key check, option check (See below for details.)

↓ Press [PRESET TARE] and [OPR/STB] to proceed to the "r XXX" display.

Option check : Example display "10000"

The most significant indicates the option recognized by the CPU.

1: OP-01

3: OP-03

4: OP-02 or OP-04 (no single definition)

9: none

Key check : The value with each key value added will be displayed.

| | |
|------------|------|
| CAL | 8000 |
| EXT3 | 400 |
| EXT2 | 200 |
| EXT1 | 100 |
| PRINT | 80 |
| TARE | 40 |
| ZERO | 20 |
| NET/GROSS | 10 |
| MODE | 8 |
| M+ | 4 |
| RESET TARE | 2 |
| OPR/STB | 1 |

- **"r XXX"** : Displays the ROM version

A three-digit number is displayed in XXX. For example, "r 104", of which 104 is the ROM version.

- **"SC 0"** : Displays the value at 0.0 mV/V for standard calibration (the value stored in the indicator)

With "SC 0" displayed, press [ENTER]. The value stored in the indicator is displayed.

With "SC 0" displayed, hold down [M+] for five seconds or more. "STD 0" appears. Pressing [ENTER] displays the current AD count and pressing [ENTER] again stores the value as 0 mV/V. Then, "STD 1" appears to prompt to enter the value at 3.2 mV/V.

- **"SC1"** : Displays the value at 3.2 mV/V for standard calibration (the value stored in the indicator)
The value displayed is (AD count at 3.2 mV/V – AD count at 0 mV/V).
With "SC 1" displayed, press [ENTER] to display the value.
- **"AD0"** : Displays the raw weight AD count
With "AD0" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.
Press [ZERO] to set the zero point and press [TARE] to return to the value before [ZERO] was pressed.
- **"AD1"** : Displays the internal count
The internal count is 1d=4.
With "AD1" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.
Press [ZERO] to set the zero point and press [TARE] to return to the value before [ZERO] was pressed.
- **"AD2"** : Displays the input short count (Updating is the same as that of the weighing mode)
With "AD2" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.
- **"AD3"** : Displays the input short count (Updating all)
With "AD3" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.
Press [ZERO] to set the zero point and press [TARE] to return to the value before [ZERO] was pressed.
- **"CAL 0C"** : Displays the CAL 0 absolute value (unit: mV/V)
With "CAL 0C" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.
- **"CAL 1C"** : Displays the SPAN absolute value (Unit: mV/V)
With "CAL 1C" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.
- **"CAL 2C"** : Displays the weight value for SPAN calibration.
When calibration is performed in the unit "lb", the LED above the unit illuminates.
With "CAL 2C" displayed, press [ENTER] to enter the mode and press [MODE] to exit the mode.

With "CAL 2C" displayed, pressing [MODE] will return to the "init" display; pressing [M+] while holding down [MODE] will proceed to the "init A".

- "init A" : Initializes all, that is, C functions, minimum division and password in addition to those initialized by "init".

With "init A" displayed, hold down [TARE] and press [ENTER] to initialize. The key combination is to prevent misoperation.

The following values are initialized to the value indicated in parentheses:

F-functions and CF-functions (factory setting values)

C functions (refer to chapter 7)

Upper and lower limit values (zero)

Setpoint (zero)

Accumulated data (zero)

Number of times of accumulation (zero)

CAL minimum division (kg=1, lb=2) and weighing capacity (kg=10000, lb=20000).

5. Function mode

There are three kinds of functions: F functions, CF functions and C functions.

F functions: Changes will not affect the domestic or international verification. These settings can be changed even after a seal is affixed to the [CAL] key access plate. Refer to the instruction manual for details.

CF functions: Changes will affect the domestic or international verification. These settings can not be changed after a seal is affixed to the [CAL] key access plate. Refer to the instruction manual for details.

C functions: Not described in the instruction manual. These settings can not be changed after a seal is affixed to the [CAL] key access plate. C functions are factory setting functions. Thus, a special operation is required to enter the mode.

5-1 Entering the C functions mode

1. While holding down [MODE], press [OPR/STB] to turn the display on.
2. Release [OPR/STB] only. With [MODE] held down, press [PRESET TARE] and [CAL]. Perform this procedure within one second.

5-2 Description of C functions

(* = default value, the value "init A" initializes to)

- **C1 : Type**

- 0 Universal (All C functions can be changed.)
- *1 OIML (C2 to C7=0, can not be changed.)
- 2 CANADA/USA (C2 to C7=1, can not be changed.)

C1 gives only a limitation to other function values. The C1 value will not affect the indicator function.

- **C2 : lb**

- *0 Disabled
- 1 Enabled

Setting C2.=1, will enable CF2 (Display unit) =2 (lb), =3 (lb/kg).

- **C3 : Condition to illuminate the zero indicator near GROSS ZERO**

- *0 Illuminates in both the GROSS and NET display.
- 1 Illuminates only in the GROSS display.

When "1" is selected, the zero indicator will not illuminate near GROSS ZERO in the NET display. This is automatically selected if "2" is selected for C1.

- **C4 : Condition to illuminate the zero indicator near NET ZERO**

- *0 Illuminates in the NET display. (Does not illuminate when "1" is selected for C6.)
- 1 Does not illuminate.

With C4=0, the zero indicator illuminates near NET ZERO in the NET display. When "1" is selected for C6, the zero indicator does not illuminate regardless of this setting.

- **C5 : Zero suppression**

- *0 0
- 1 00

With C5=1, the weight zero is displayed as "00" when the minimum division is 10 or greater. This is the NTEP rule which prohibits the leading zero.

- **C6 : Tare with the TARE key**

- *0 Internal count (PRESET TARE is performed using the displayed count regardless of this setting.)
- 1 Displayed count

With C6=1, tare is performed using the displayed count. So, the following relation is always correct: Gross weight displayed – tare = net weight.

- **C7 : The ZERO key during tare operation**

- *0 Disabled in the NET display. Enabled in the GROSS display (clears the tare).
- 1 Enabled in both the NET and GROSS display (does not clear the tare).

- **C8 : Condition to illuminate the stable indicator**

- *0 Illuminates when the indicator display is stabilized.
- 1 Illuminates when the indicator display is not stabilized.

Two filters are available, English and Japanese. To use the Japanese filter, select "0"; English, "1".

- **C9 : Resolution**

- *0 1/10000
- 1 1/20000

The maximum display resolution can be 1/20000 while the other specifications are the same.

6. Parts List

6-1 AD-4328 (PZ:3071)

| Parts No | Parts code | Parts name | Q'ty |
|--------------|-----------------|--------------------------------|------|
| C1 | CK:SME25VB470 | ALUMINUM CAPACITOR | 1 |
| C2,5,8,10-19 | CC:0.1U25V | CERAMIC CAPACITOR | 13 |
| C3,4,9 | CT:1V010 | TANTALUM CAPACITOR 1U25V | 3 |
| C6 | CK:SME16VB100 | ALUMINUM CAPACITOR | 1 |
| C7 | CC:0.0033U1KV | CERAMIC CAPACITOR | 1 |
| DB1 | DI:1B4B42 | BRIDGE DIODE | 1 |
| J1 | JE:0486-01-010 | DC JACK | 1 |
| J2 | JI:3P-S2T2-EF | IL-S-3P-S2T2-EF PIN HEADER | 1 |
| J3 | JI:9P-S2T2-EF | IL-S-9P-S2T2-EF PIN HEADER | 1 |
| J4 | JI:10P-S2T2-EF | IL-S-10P-S2T2-EF PIN HEADER | 1 |
| J5 | JI:7P-S2T2-EF | IL-S-7P-S2T2-EF PIN HEADER | 1 |
| LED1-6 | DL:HDSP-5501 | 7 SEGMENT LED | 6 |
| LED7-14 | DL:GL8HD22 | LED (RED) | 8 |
| NF1 | NF:EXCEMT103DT | NOISE FILTER | 1 |
| PHC1 | DF:PS2501-1L/K | PHOTO COUPLER K,L LANK | 1 |
| Q1 | QT:C1815Y | TRANSISTOR 2SC1815Y | 1 |
| Q2-5,13-20 | QT:BA1A4P | TRANSISTOR BA1A4P | 12 |
| Q6-12 | QT:AB1L3N | TRANSISTOR AB1L3N | 7 |
| R1 | RC:NAT330R | CARBON RESISTOR NAT330R | 1 |
| R2 | RC:NAT820R | CARBON RESISTOR NAT820R | 1 |
| R3 | RC:NAT1M | CARBON RESISTOR NAT1M | 1 |
| R4-11 | RC:NAT180R | CARBON RESISTOR NAT180R | 8 |
| S1-8 | SK:EVQ-QS307K | SWITCH EVQ-QS307K | 8 |
| S9 | SK:SKHHAK | SWITCH | 1 |
| U1 | UR:24M05HF | UPC24M05AHF REGULATOR | 1 |
| U2 | UC:RP93C46 | EEPROM | 1 |
| U3 | UC:D78053GC-166 | CPU for AD4328 | 1 |
| U4 | UC:HC74 | D FLIP FLOP IC | 1 |
| U5 | UC:HC02 | NOR GATE IC | 1 |
| U6 | UA:S-8054ALB | VOLTAGE COMPARATOR | 1 |
| X1 | XT:KBR4.91MKSTF | CERAMIC OSCILLATOR | 1 |
| | DA:LM-1 | LED SPACER | 8 |
| | HT:6073PB | HEAT SINK | 1 |
| | KO:964-10W020-S | CABLE WITH 2mm PITCH CONNECTOR | 1 |
| | KO:964-3S030 | CABLE WITH 2mm PITCH CONNECTOR | 1 |
| | KO:964-7S030 | CABLE WITH 2mm PITCH CONNECTOR | 1 |
| | KO:964-9S030 | CABLE WITH 2mm PITCH CONNECTOR | 1 |
| | LR:DF-R-19A-M-A | FERRITE CORE | 3 |
| | MF:AMZ41A | A/D MODULE | 1 |
| | PC:3071B | PCB AD4328 | 1 |
| | QA:AC256-1674 | ISOLATION SHEET | 1 |
| | TM:F2023AM3-7P | 7P TERMINAL | 1 |
| | TM:F2023AM3-9P | 9P TERMINAL | 1 |

6-2 AD-4328-01 (PZ:3078A)

| Parts No | Parts Code | Parts Name | Q'ty |
|----------------------|-----------------|------------------------------|------|
| Accessory | 10:CV-90 | CONVEX CV-90 | 1 |
| Accessory | JI:360C040-B | CONNECTOR CASE | 1 |
| Accessory | JI:361J040-AG | CONNECTOR | 1 |
| Accessory | LR:DF-R-19A-M-A | FERRITE CORE | 1 |
| | | | |
| C1 | CK:SME16VB100 | ALUMINUM CAPACITOR | 1 |
| C12,13 | CC:470P | CERAMIC CAPACITOR | 3 |
| C2,7 | CC:0.1U25V | CERAMIC CAPACITOR | 6 |
| C9,11 | CC:100P | CERAMIC CAPACITOR | 2 |
| J1 | JI:10P-S2T2-EF | IL-S-10P-S2T2-EF PIN HEADER | 1 |
| (J1) (J2) | JI:360A2 | METAL FITTINGS for CONNECTOR | 2 |
| (J1) J2 | JI:365P040-AG | CONNECTOR | 1 |
| PHC1,2,4,5,7,9,10,11 | DF:TLP627-4 | PHOTO COUPLER | 8 |
| PHC3,6,8 | DF:TLP627-2 | PHOTO COUPLER | 3 |
| RA1-5 | RN:IHR-8-472MA | RKC1/8B 8B4.7K | 5 |
| U1-5 | UC:HC595 | SHIFT REGISTER IC | 5 |
| | | | |
| | 01:3001776 | OP-01 PANEL AD4328 | 1 |
| | 04:4004446 | L METAL AD4328 | 2 |
| | | | |
| | PC:3078A | PCB AD4328-01 | 1 |
| | TM:T-10 | EARTH TERMINAL | 1 |

6-3 AD-4328-02 (PZ:3122)

| Parts No | Parts Code | Parts Name | Q'ty |
|--------------------|-----------------|-----------------------------|------|
| Accessory | 10:CV-90 | CONVEX CV-90 | 1 |
| Accessory | JA:TCP0586 | DIN 8pin | 1 |
| Accessory | LR:DF-R-19A-M-A | FERRITE CORE | 1 |
| | | | |
| C1 | CC:0.1U25V | CERAMIC CAPACITOR | 1 |
| C2 | CK:SME16VB100 | ALUMINUM CAPACITOR | 1 |
| J1 | JI:10P-S2L2-EF | IL-S-10P-S2L2-EF PIN HEADER | 1 |
| J2 | JA:4480-01-4151 | DIN CONNECTOR 8pin | 1 |
| PHC1-3 | DF:PS2501-1L/K | PHOTO COUPLER K,L LANK | 3 |
| Q1,2,3 | QT:C1815Y | TRANSISTOR 2SC1815Y | 6 |
| R1,2,3 | RC:NAT330R | CARBON RESISTOR NAT330R | 3 |
| R4,5,6 | RC:NAT820R | CARBON RESISTOR NAT820R | 3 |
| R5,7,9,10,11,12,13 | RC:NAT10K | CARBON RESISTOR NAT10K | 7 |
| | | | |
| | 01:3001777 | OP-02 PANEL AD4328 | 1 |
| | 04:4004446 | L METAL AD4328 | 2 |
| | | | |
| | PC:3122 | PCB AD4328-02 | 1 |
| | TM:T-10 | EARTH TERMINAL | 1 |

6-4 AD-4328-03 (PZ:3079A)

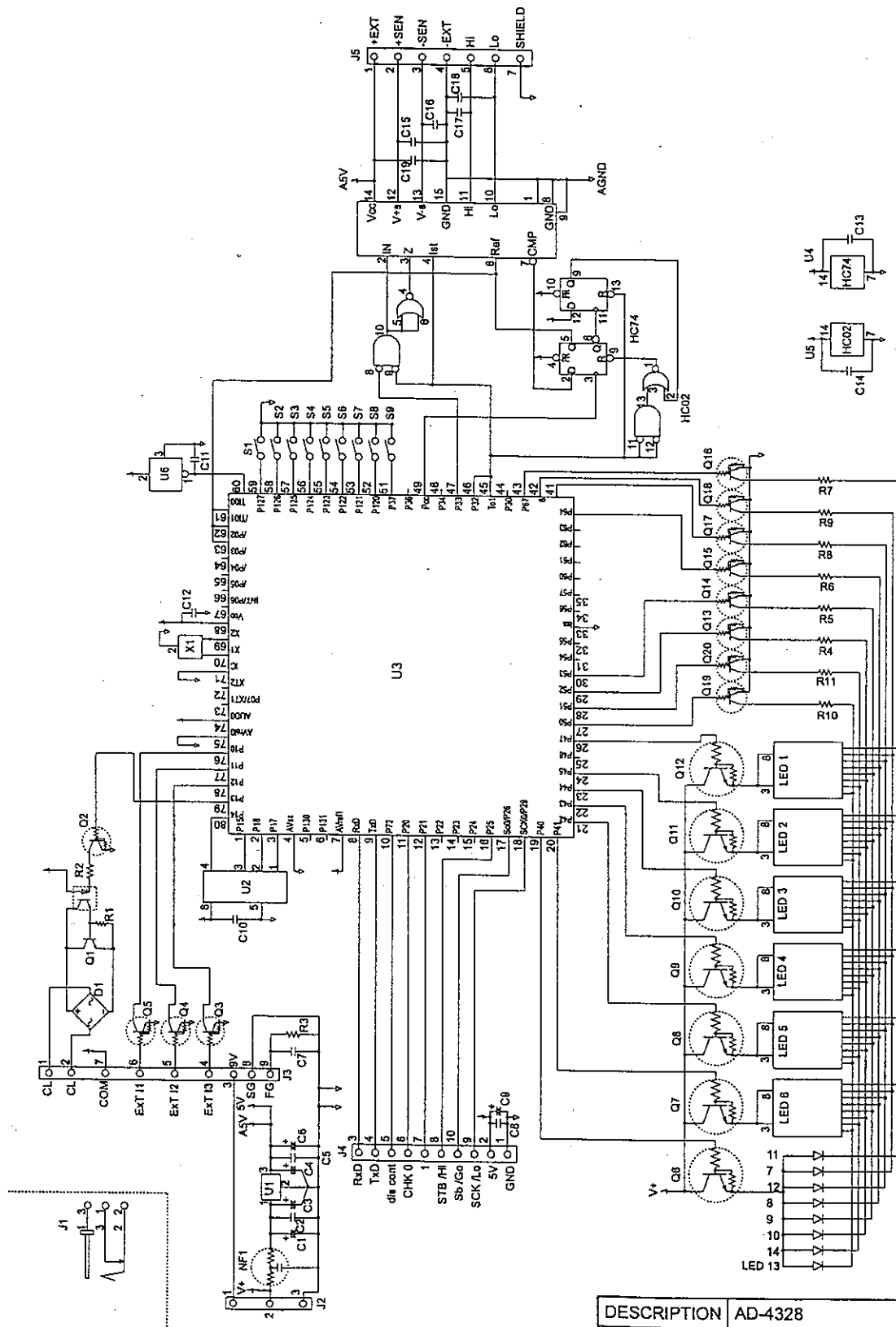
| Parts No | Parts Code | Parts Name | Q'ty |
|--------------------|-----------------|-----------------------------|------|
| Accessory | 10:CV-90 | CONVEX CV-90 | 1 |
| Accessory | JA:TCP0576 | DIN 7pin | 2 |
| Accessory | JA:TCP0586 | DIN 8pin | 1 |
| Accessory | LR:DF-R-19A-M-A | FERRITE CORE | 1 |
| | | | |
| C1,2,4,5,6,9,10 | CC:0.1U25V | CERAMIC CAPACITOR | 7 |
| C11 | CT:1V010 | TANTALUM CAPACITOR 1U25V | 1 |
| C13 | CK:SME25VB470 | ALUMINUM CAPACITOR | 1 |
| C3,7 | CK:SME16VB100 | ALUMINUM CAPACITOR | 2 |
| C8 | CT:1D2R2 | TANTALUM CAPACITOR 2.2M/20V | 1 |
| J1,2 | JA:4470-01-1111 | DIN CONNECTOR 7pin | 2 |
| J3 | EJ:0470-01-230 | DC JACK | 1 |
| J4 | JI:10P-S2L2-EF | IL-S-10P-S2L2-EF PIN HEADER | 1 |
| J5 | JA:4480-01-4151 | DIN CONNECTOR 8pin | 1 |
| L1,2 | NF:ZJY51R5-2P | NOISE FILTER on PCB | 2 |
| PHC1,2,3 | DF:PS2501-1L/K | PHOTO COUPLER K,L LANK | 3 |
| PHC4,5,6 | DF:AQV253 | PHOTO MOS RELAY | 3 |
| Q1-5 | QT:C1815Y | TRANSISTOR 2SC1815Y | 5 |
| R1,9 | RC:NAT820R | CARBON RESISTOR NAT820R | 2 |
| R13,14 | RC:NAT47K | CARBON RESISTOR NAT47K | 2 |
| R16 | RC:1/2100R | CARBON RESISTOR 1/2W 100R | 1 |
| R18,21,24 | RC:NAT1.5K | CARBON RESISTOR NAT1.5K | 3 |
| R19,20,22,23,25,26 | RC:NAT10K | CARBON RESISTOR NAT10K | 6 |
| R2,7 | RC:NAT330R | CARBON RESISTOR NAT330R | 2 |
| R3,8 | RC:NAT100R | CARBON RESISTOR NAT100R | 2 |
| R4,6,10,11,12,15 | RC:NAT4.7K | CARBON RESISTOR NAT4.7K | 6 |
| R5 | RC:NAT1.8K | CARBON RESISTOR NAT1.8K | 1 |
| S1 | SS:2NB2X2AG | SLIDE SWITCH | 1 |
| U1 | UC:HC14 | SCHMITT TRIGGER INVERTER IC | 1 |
| U2,3 | UC:LTC485 | BUS TRANSCEIVER LTC | 2 |
| U4 | UC:HC08 | AND GATE IC | 1 |
| U5 | HT:6073PB | HEAT SINK | 1 |
| U5 | UR:24M05HF | UPC24M05AHF REGULATOR | 1 |
| | | | |
| | | | |
| | 01:3001778 | OP-03 PANEL AD4328 | 1 |
| | 04:4004446 | L METAL AD4328 | 2 |
| | | | |
| | PC:3079B | PCB AD4328-03 | 1 |
| | TM:T-10 | EARTH TERMINAL | 1 |

6-5 AD-4328-04 (PZ:3080)

| Parts No | Parts Code | Parts Name | Q'ty |
|--------------------|-----------------|--------------------------------|------|
| Accessory | 10:CV-90 | CONVEX CV-90 | 1 |
| Accessory | JA:TCP0586 | DIN 8pin | 1 |
| Accessory | LR:DF-R-19A-M-A | FERRITE CORE | 1 |
| | | | |
| C1,3,4,5,6 | CK:SME25VB22 | ALUMINUM CAPACITOR | 5 |
| C2,7 | CC:0.1U25V | CERAMIC CAPACITOR | 2 |
| C8 | CK:SME16VB100 | ALUMINUM CAPACITOR | 1 |
| D1 | DI:1B4B42 | BRIDGE DIODE | 1 |
| J1 | JA:17LE-13250 | 17LE-13250-27 D3AB DDK | 1 |
| J2 | JA:4480-01-4151 | DIN CONNECTOR 8pin | 1 |
| J3 | JI:10P-S2L2-EF | IL-S-10P-S2L2-EF PIN HEADER | 1 |
| NF1 | NF:D-42C | D-42C COMMON MODE NOISE FILTER | 1 |
| NF2 | NF:ZJY51R5-2P | NOISE FILTER on PCB | 1 |
| PHC1 | DF:PS2501-1L/K | PHOTO COUPLER K,L LANK | 1 |
| PHC2,3,4 | DF:AQV253 | PHOTO MOS RELAY | 3 |
| Q1-5 | QT:C1815Y | TRANSISTOR 2SC1815Y | 5 |
| R1,2,4,5,7,8,10,11 | RC:NAT10K | CARBON RESISTOR NAT10K | 8 |
| R14 | RC:NAT330R | CARBON RESISTOR NAT330R | 1 |
| R3 | RC:NAT820R | CARBON RESISTOR NAT820R | 1 |
| R6,9,12 | RC:NAT1.5K | CARBON RESISTOR NAT1.5K | 3 |
| U1 | UC:MAX232CPE | ADM232LJN | 1 |
| | | | |
| | 01:3001779 | OP-04 PANEL AD4328 | 1 |
| | 04:4004446 | L METAL AD4328 | 2 |
| | | | |
| | PC:3080A | PCB AD4328-04 | 1 |
| | TM:T-10 | EARTH TERMINAL | 1 |

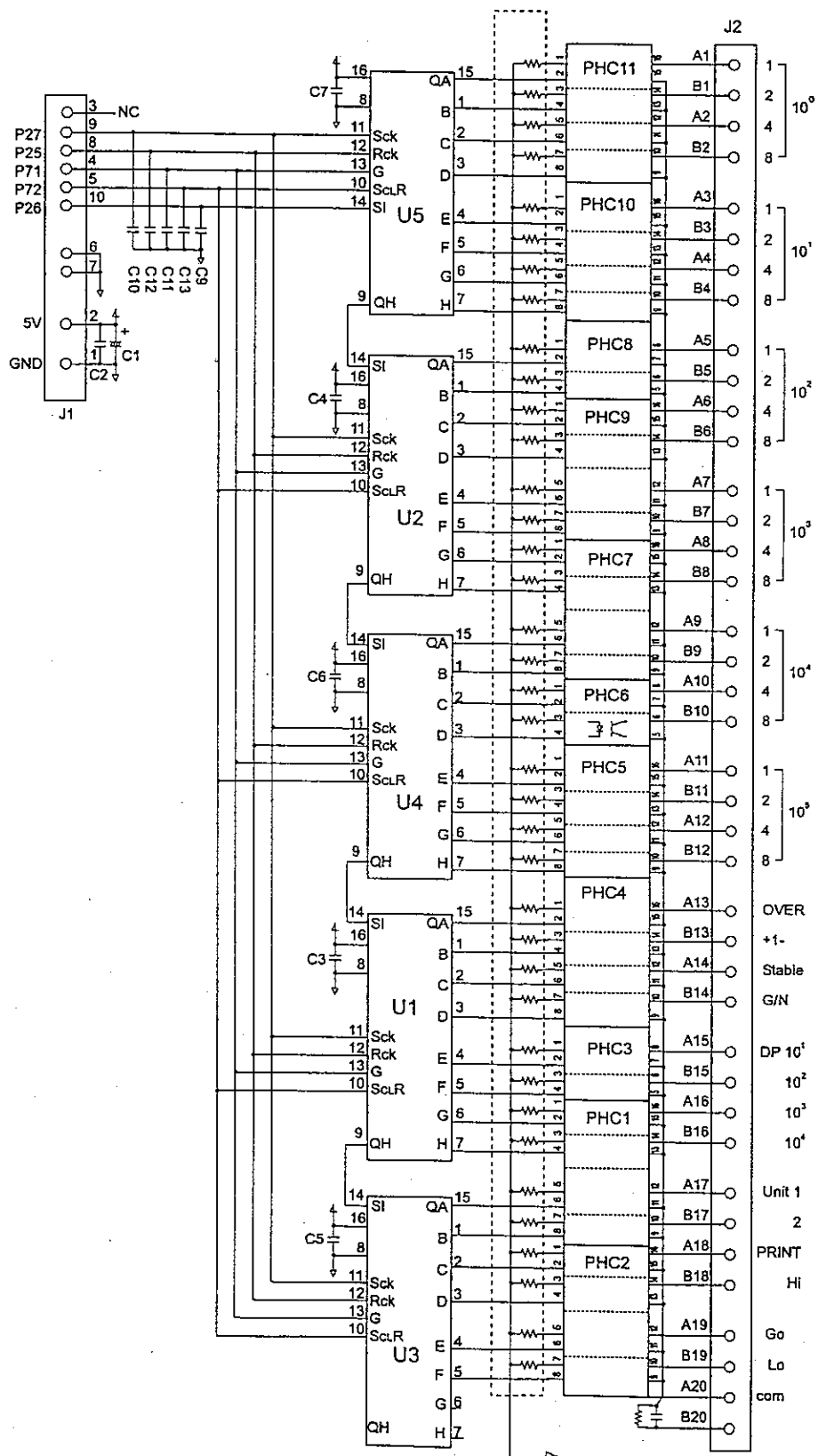
7. Circuit Diagram

7-1 AD-4328 (PZ:3071)



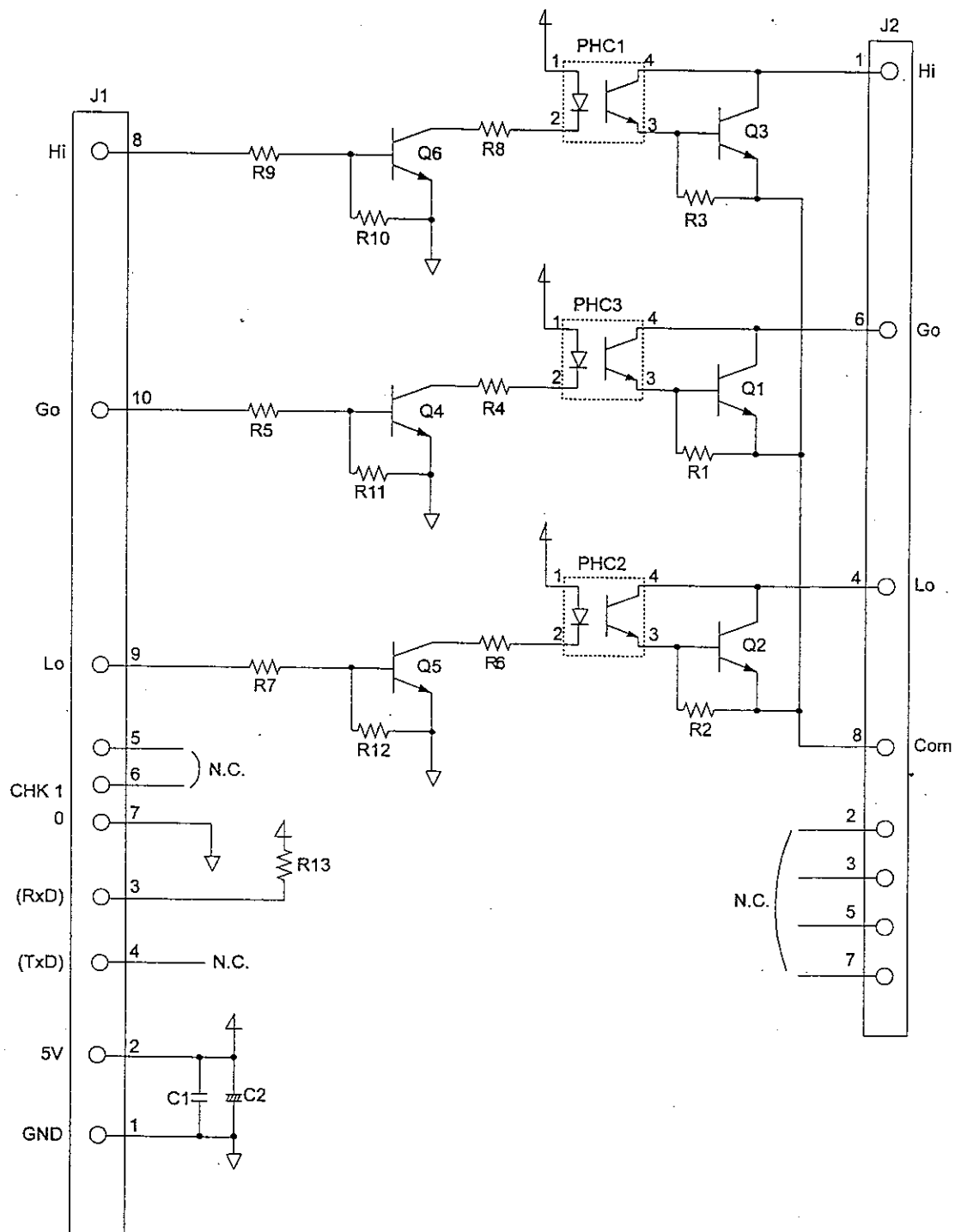
| | |
|-------------|---------------|
| DESCRIPTION | AD-4328 |
| STOCK No. | PZ:3071 |
| DRWG. No. | QD-EC3-000267 |

7-2 AD-4328-01 (PZ:3078A)



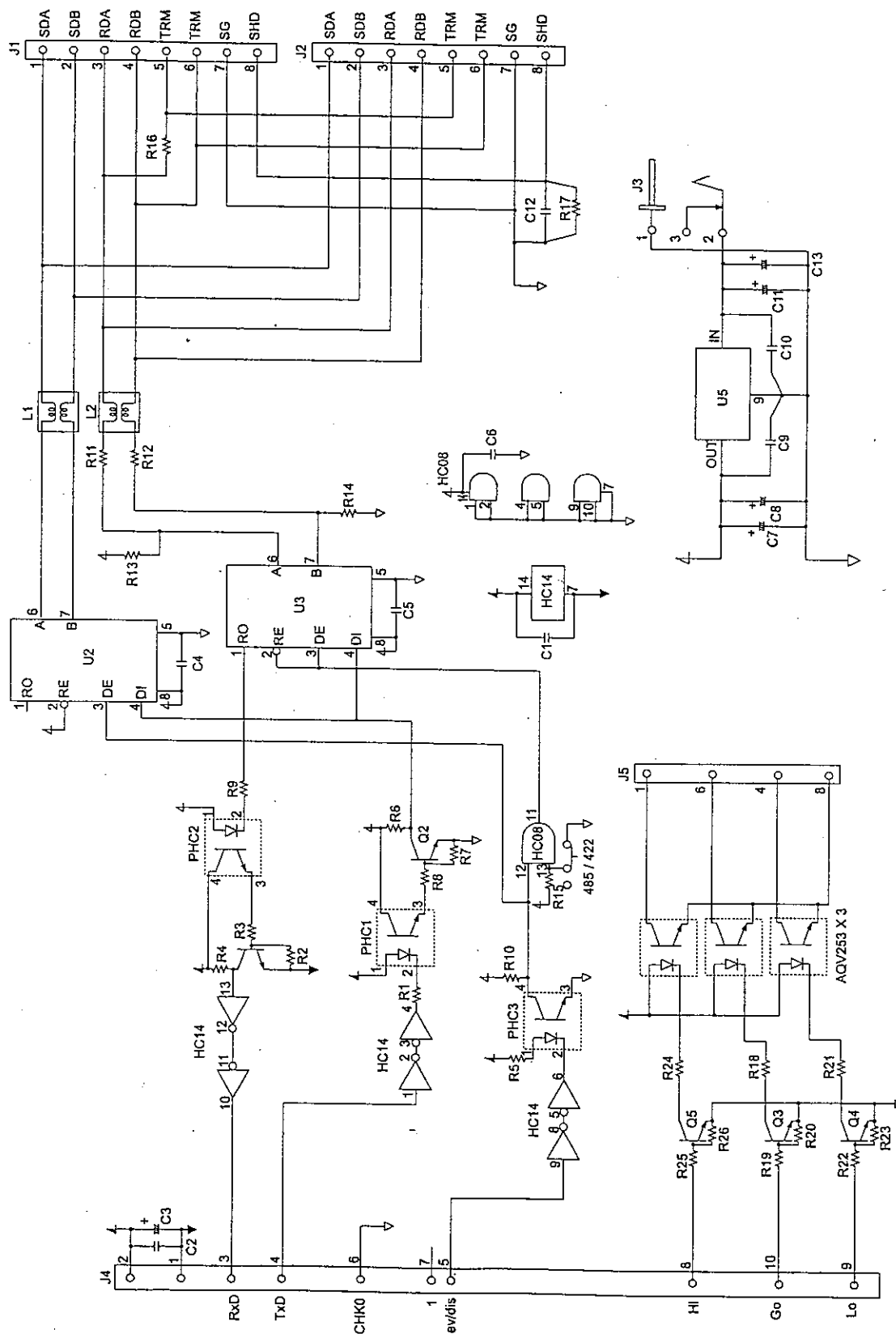
| | |
|-------------|---------------|
| DESCRIPTION | AD-4328-01 |
| STOCK No. | PZ:3078A |
| DRWG. No. | QD-EC3-000268 |

7-3 AD-4328-02 (PZ:3122)



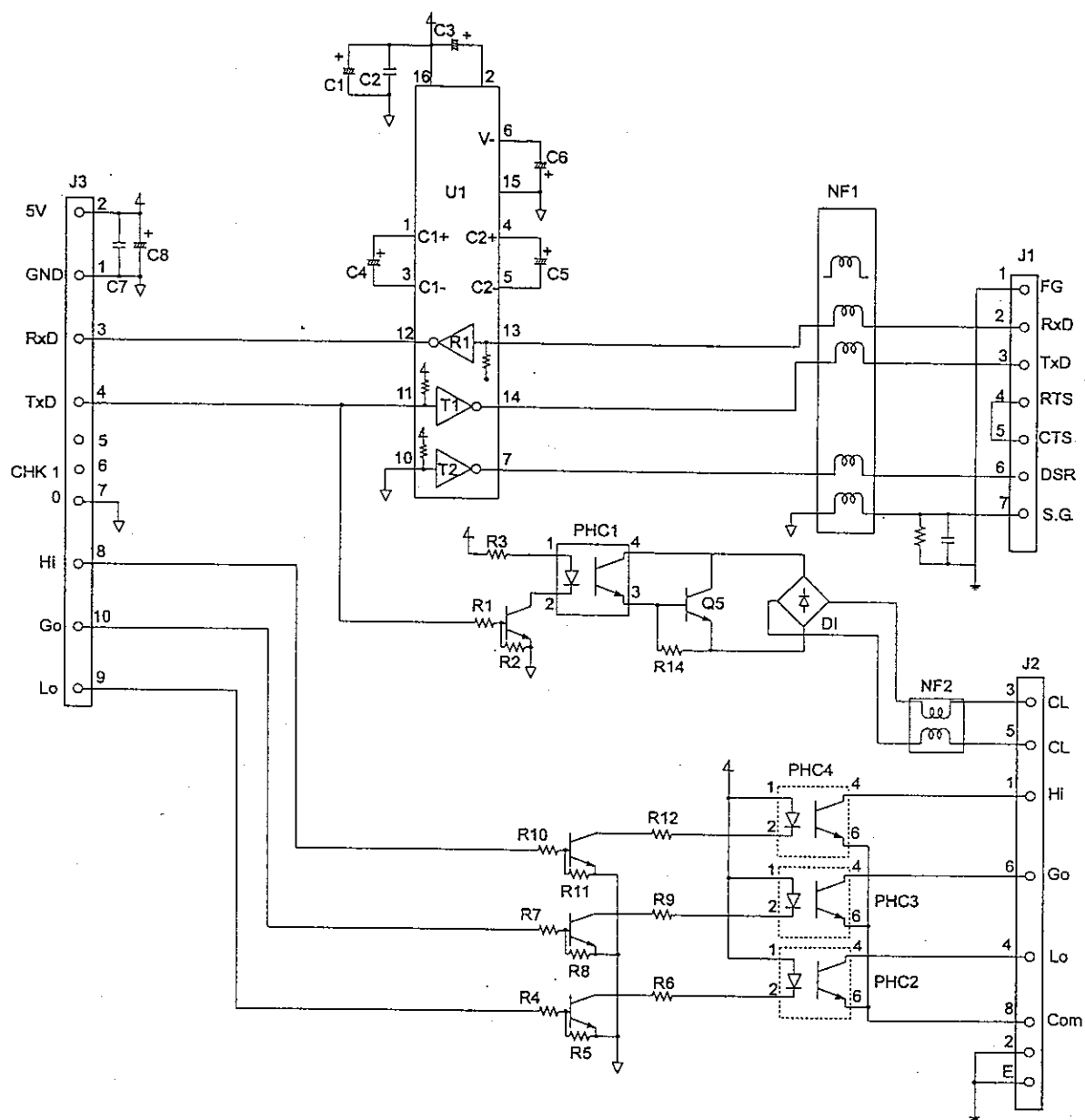
| | |
|-------------|---------------|
| DESCRIPTION | AD-4328-02 |
| STOCK No. | PZ:3122 |
| DRWG. No. | QD-EC4-000098 |

7-4 AD-4328-03 (PZ:3079A)



| | |
|-------------|----------------|
| DESCRIPTION | AD-4328-03 |
| STOCK No. | PZ:3079A |
| DRWG. No. | QD-EC4-000099A |

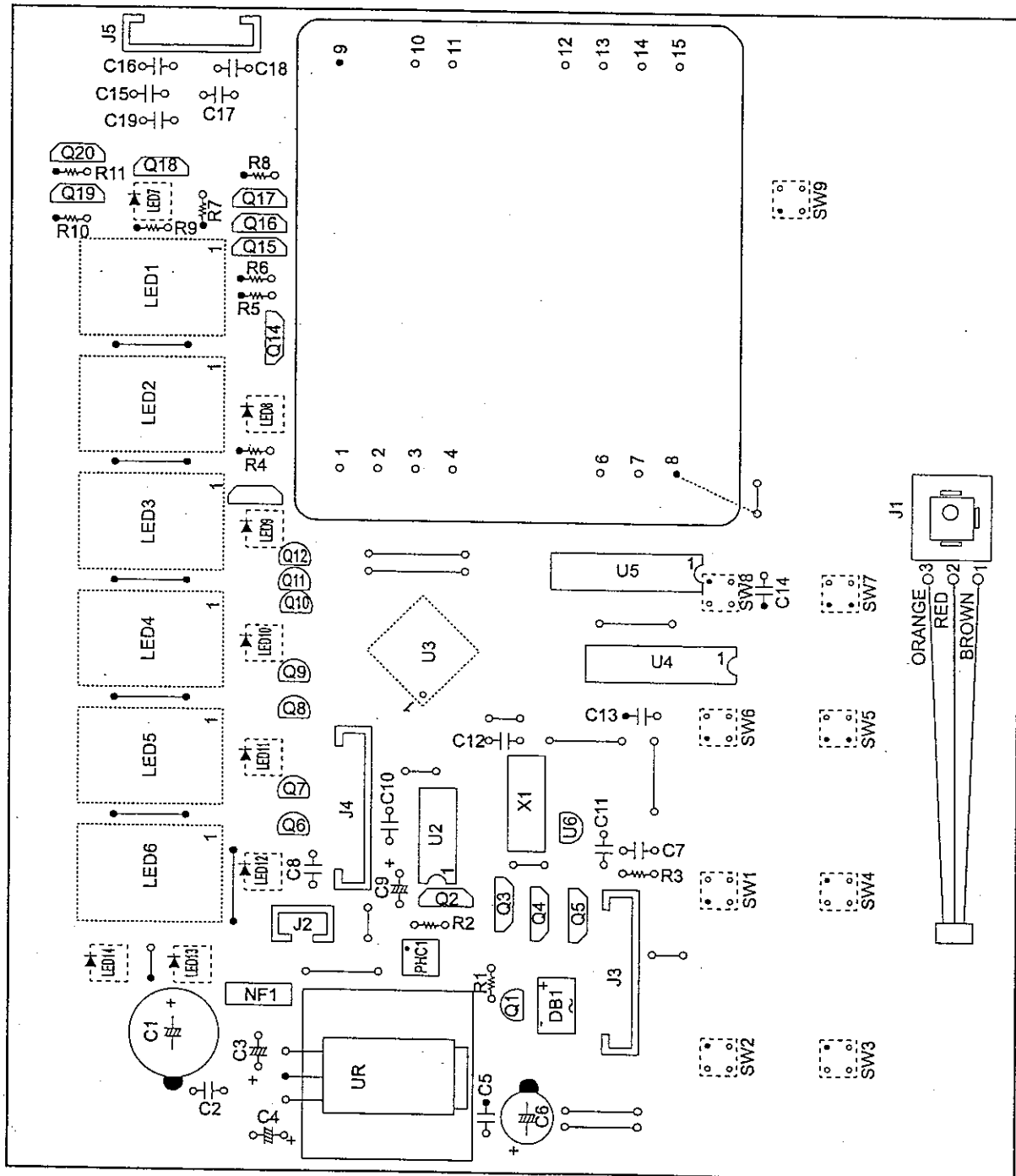
7-5 AD-4328-04 (PZ:3080)



| | |
|-------------|---------------|
| DESCRIPTION | AD-4328-04 |
| STOCK No. | PZ:3080 |
| DRWG. No. | QD-EC4-000100 |

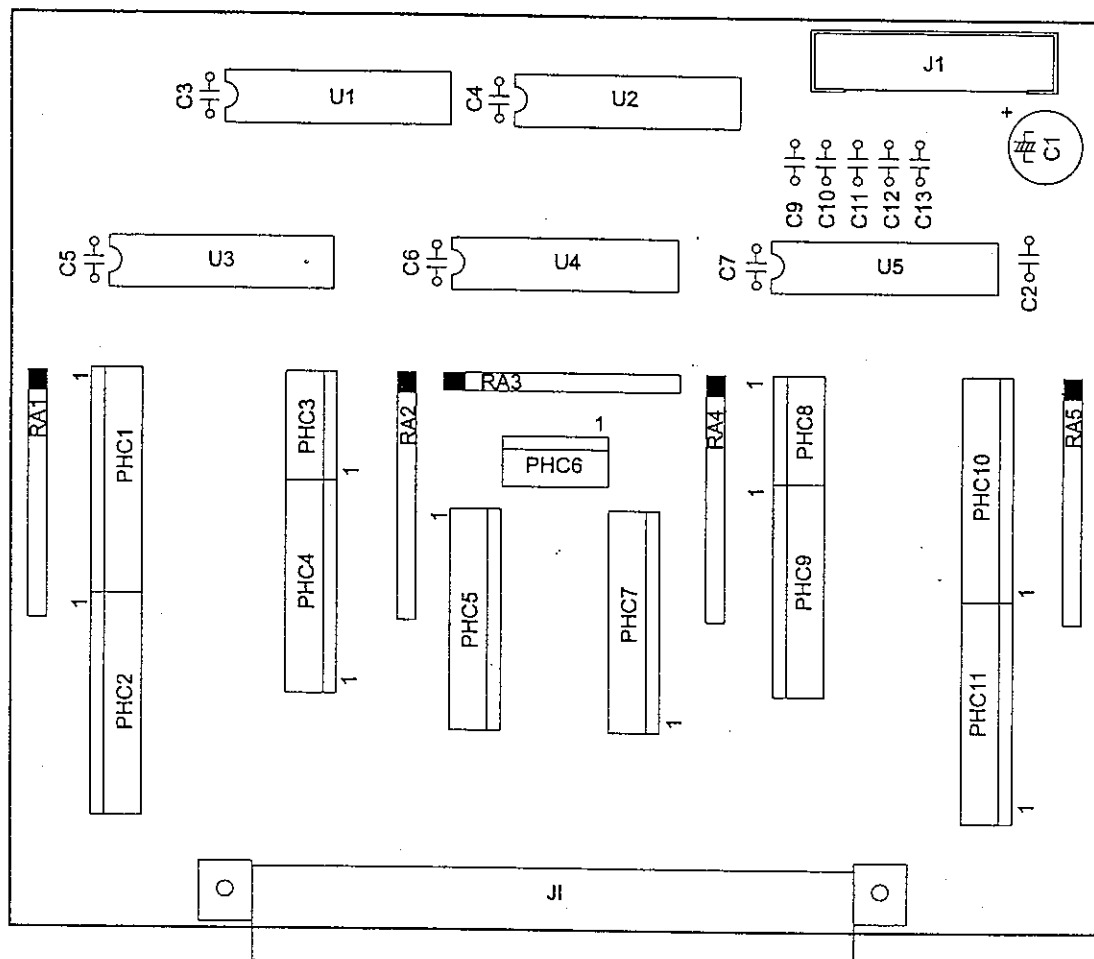
8. Board Component Location

8-1 AD-4328 (PZ:3071)



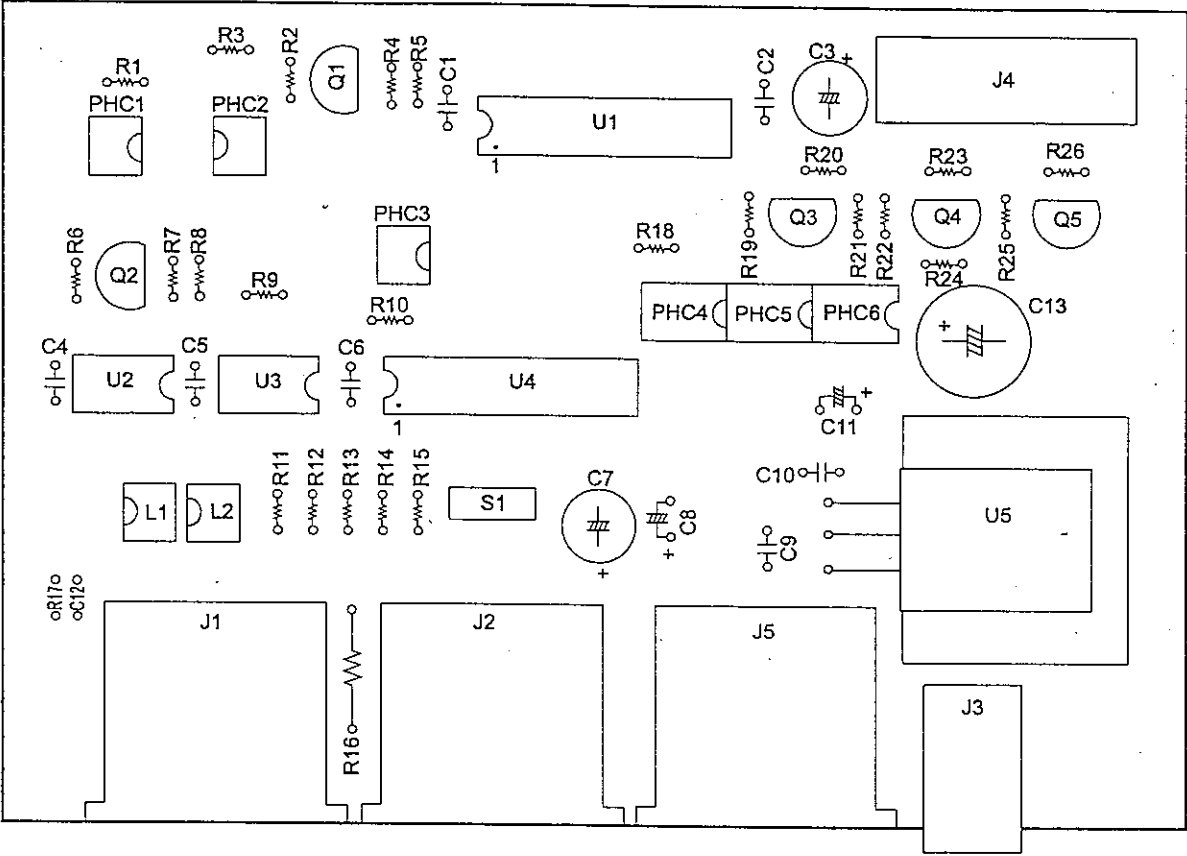
| | |
|-------------|----------------|
| DESCRIPTION | AD-4328 |
| STOCK No. | PZ:3071 |
| DRWG. No. | QD-KZ3-000242A |

8-2 AD-4328-01 (PZ:3078A)



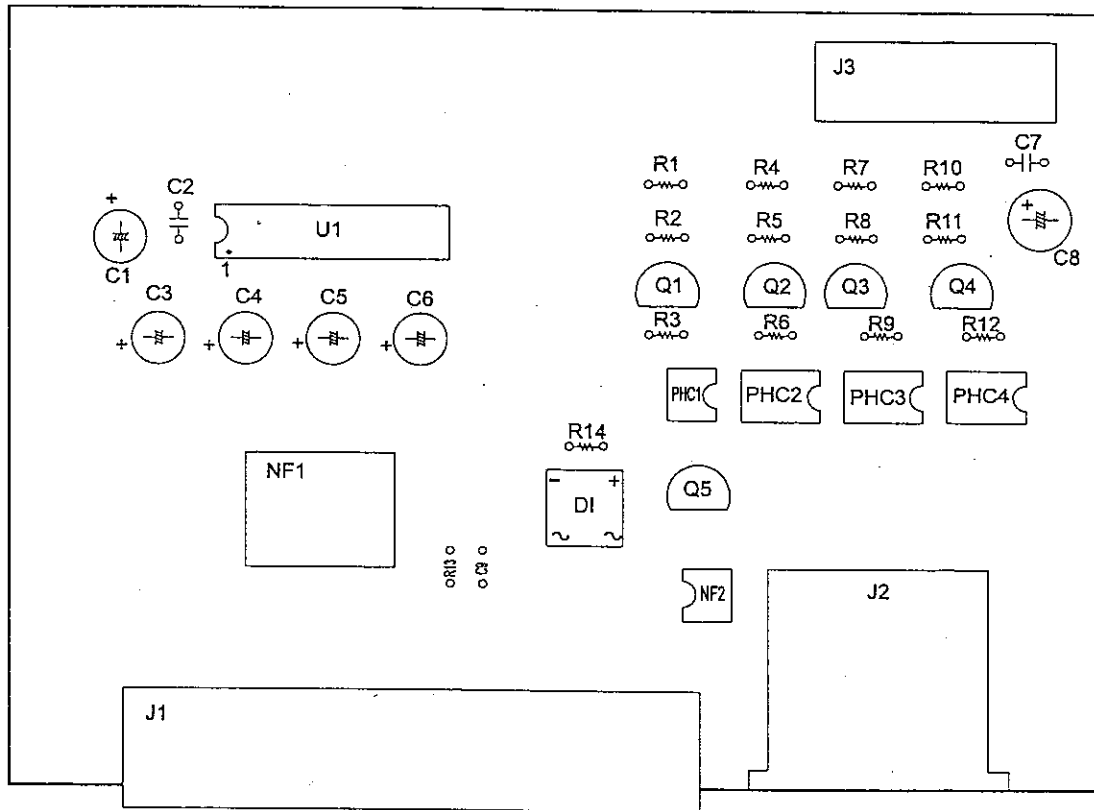
| | |
|-------------|---------------|
| DESCRIPTION | AD-4328-01 |
| STOCK No. | PZ:3078A |
| DRWG. No. | QD-KZ3-000243 |

8-4 AD-4328-03 (PZ:3079A)



| | |
|-------------|----------------|
| DESCRIPTION | AD-4328-03 |
| STOCK No. | PZ:3079A |
| DRWG. No. | QD-KZ3-000245A |

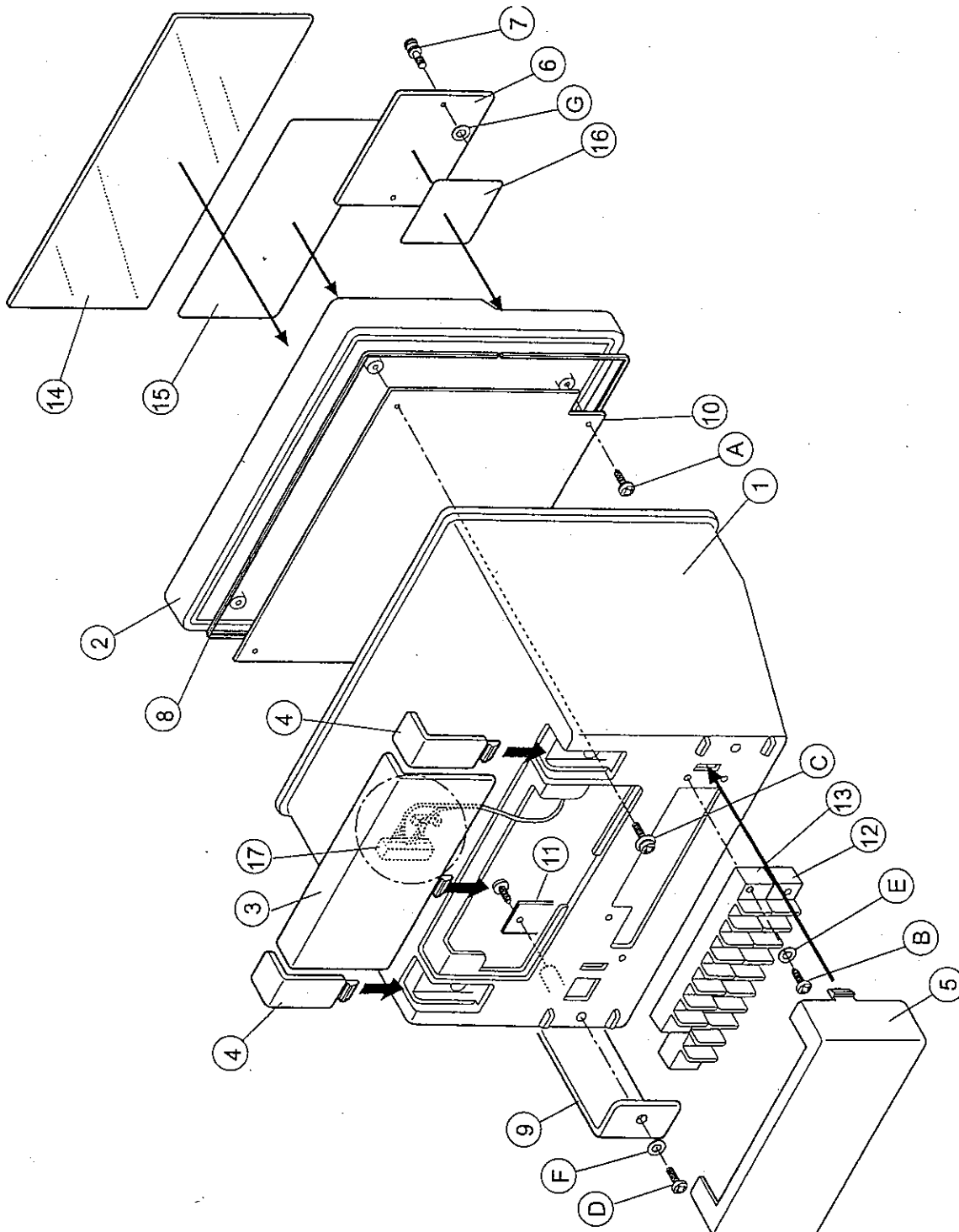
8-5 AD-4328-04 (PZ:3080)



| | |
|-------------|---------------|
| DESCRIPTION | AD-4328-04 |
| STOCK No. | PZ:3080 |
| DRWG. No. | QD-KZ3-000246 |

9. Exploded View

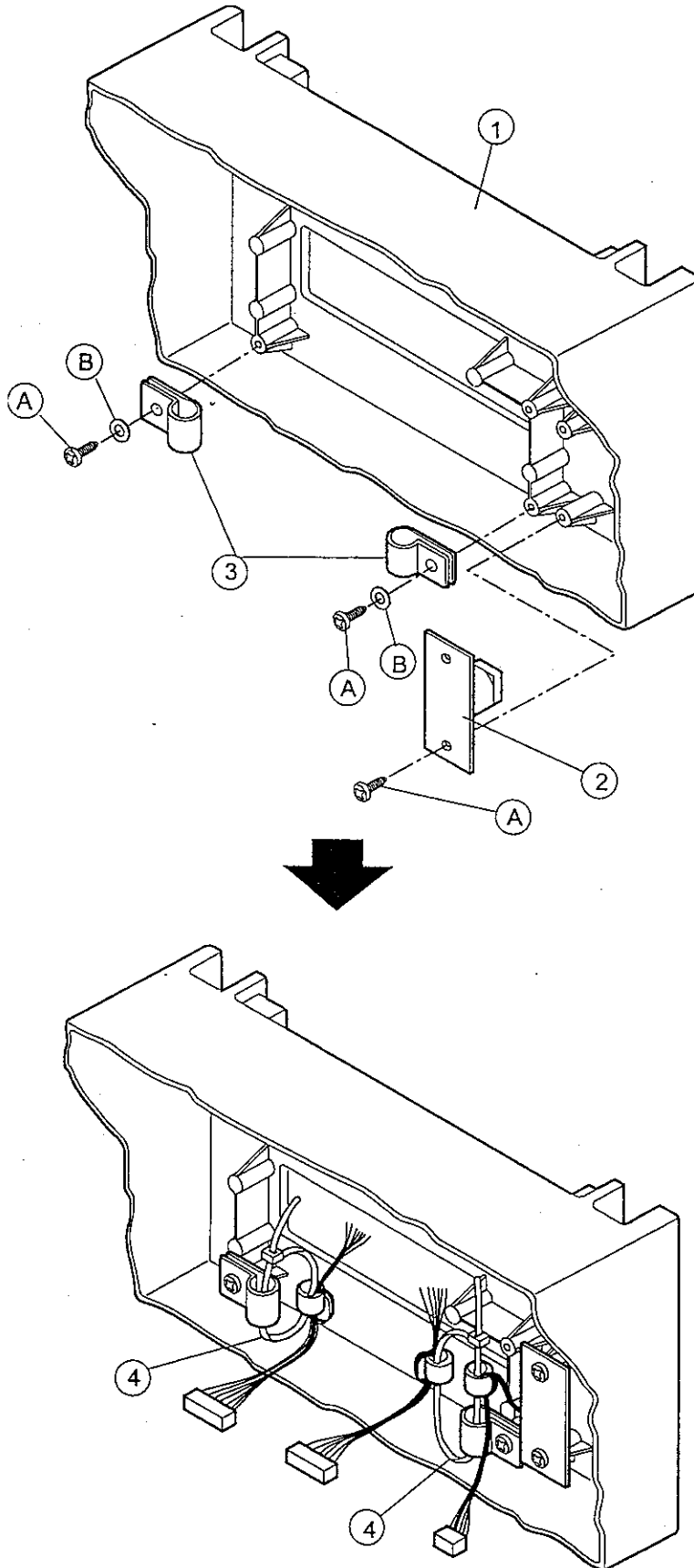
9-1 View-1 AD-4328



**EXPLODED VIEW-1
AD-4328**

| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|-----------------|---|------|
| 1 | 07:1000027 | CASE | 1 |
| 2 | 07:2000204 | FRONT PANEL | 1 |
| 3 | 07:3001492 | OPTION COVER | 1 |
| 4 | 07:3001493 | COVER | 2 |
| 5 | 07:3001494 | TERMINAL COVER | 1 |
| 6 | 07:4003865 | CAL PANEL | 1 |
| 7 | 07:A45440 | LOCK SCREW | 2 |
| 8 | 06:4004439 | PACKING (600) | 1 |
| 9 | 04:4004438 | L LOCK | 2 |
| 10 | | PC3071-1 | 1 |
| 11 | | PC3071-2 | 1 |
| 12 | TM:F2023AM3-9P | TERMINAL | 1 |
| 13 | TM:F2023AM3-7P | TERMINAL | 1 |
| 14 | 07:3001495 | FILTER (EX) | 1 |
| | 07:3001496 | FILTER (EG) | 1 |
| | 07:3001497 | FILTER (JA) | 1 |
| 15 | 08:3001773 | KEY SHEET (EG/EX) | 1 |
| | 08:3001774 | KEY SHEET (JA) | 1 |
| 16 | 08:4004441 | CAL LABEL | 1 |
| 17 | KO:964-10W020-S | CABLE | 1 |
| A | | PAN HEAD TAPPING SCREW M3 X 6 | 3 |
| B | | PAN HEAD TAPPING SCREW M3 X 15 | 4 |
| C | | PAN HEAD WITH WASHER AND SPRING WASHER M3 X 8 | 4 |
| D | | TRUSS HEAD M4 X 12 | 2 |
| E | | WASHER M3 | 4 |
| F | | NYLON WASHER M4 | 2 |
| G | | E RING 2.5 | 2 |

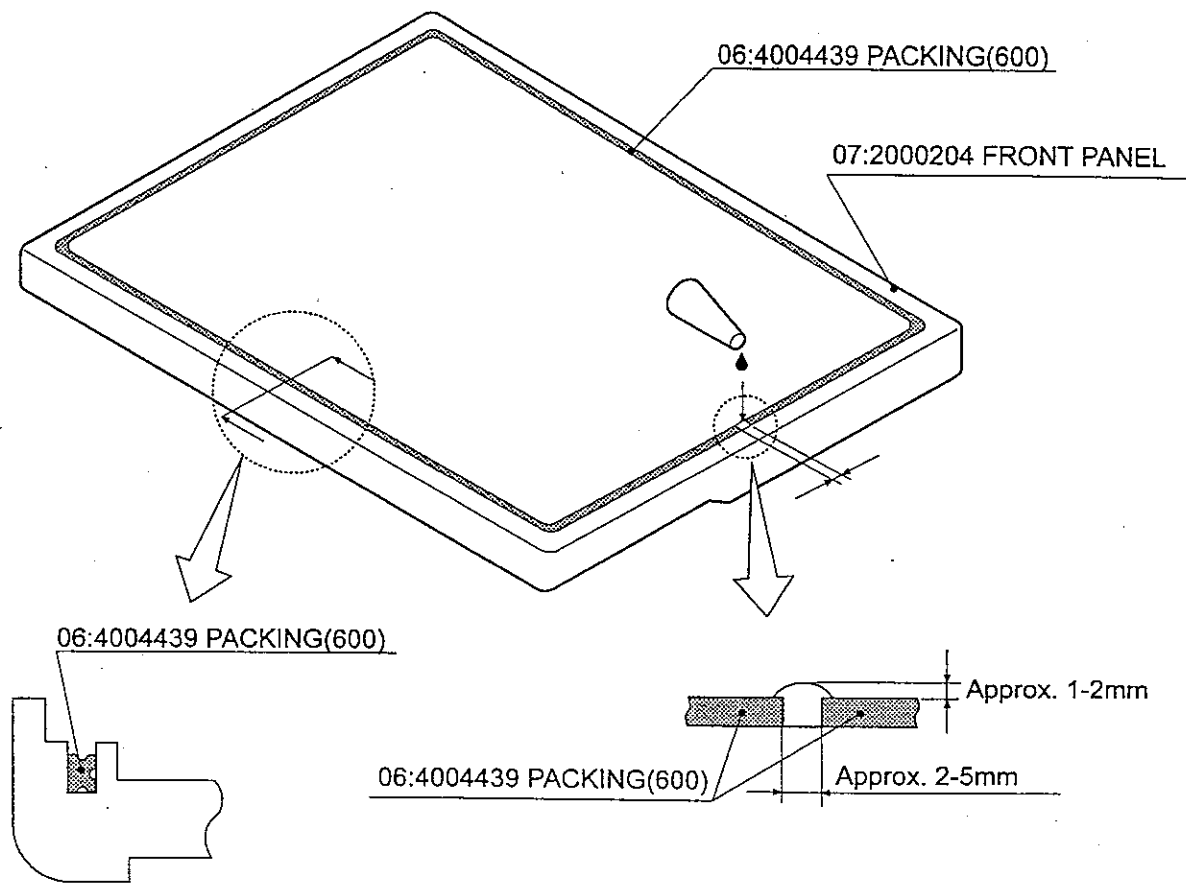
9-2 View-2 AD-4328



**EXPLODED VIEW-2
AD-4328**

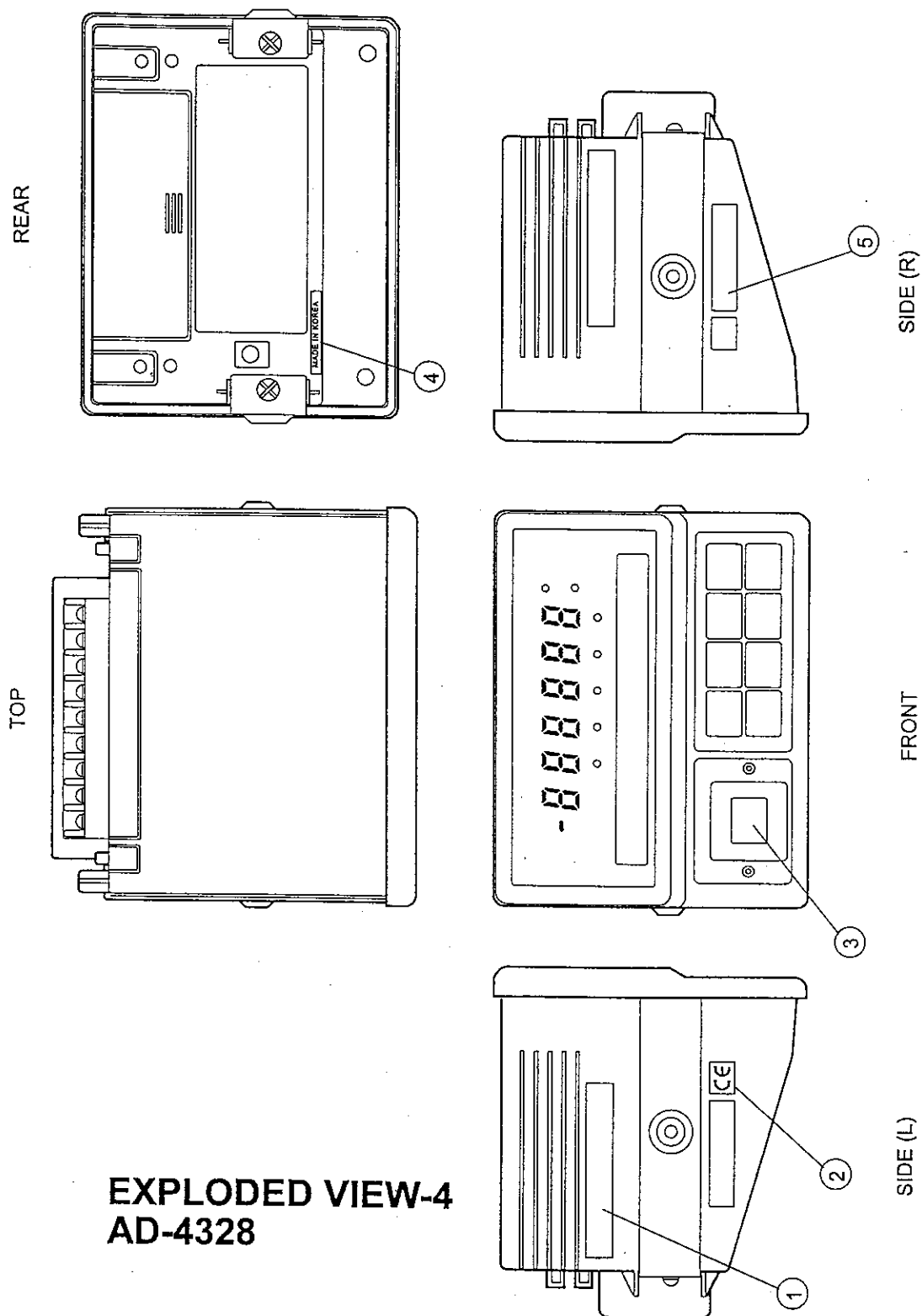
| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|------------|--------------------------------|------|
| 1 | 07:1000027 | CASE | 1 |
| 2 | | PC3071-2 | 1 |
| 3 | 10:NK-6N | NYLON CLAMP | 2 |
| 4 | CV-150N | CONVEX | 2 |
| A | | PAN HEAD TAPPING SCREW M3 X 10 | 4 |
| B | | WASHER M3 | 2 |

9-3 View-3 AD-4328



**EXPLODED VIEW-3
AD-4328 FRONT PANEL**

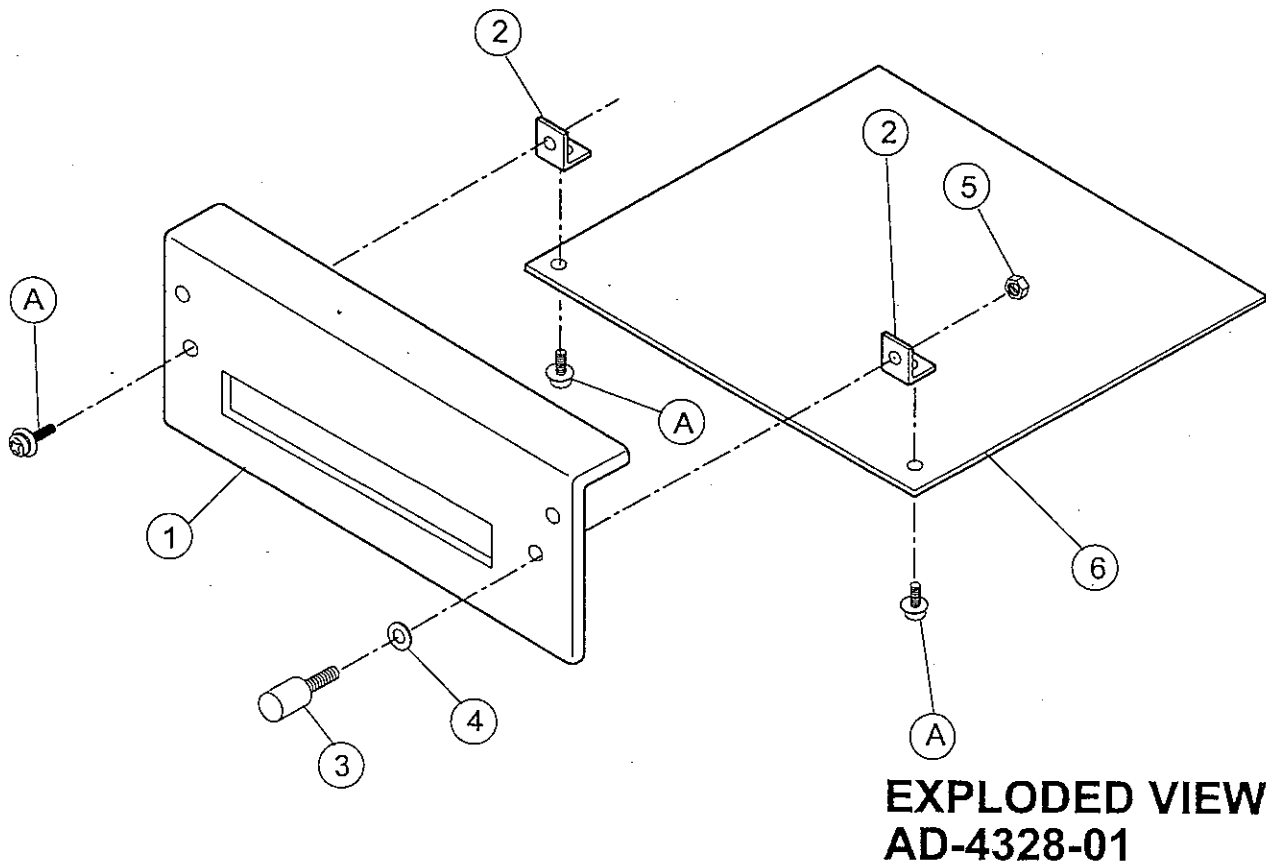
9-4 View-4 AD-4328



**EXPLODED VIEW-4
AD-4328**

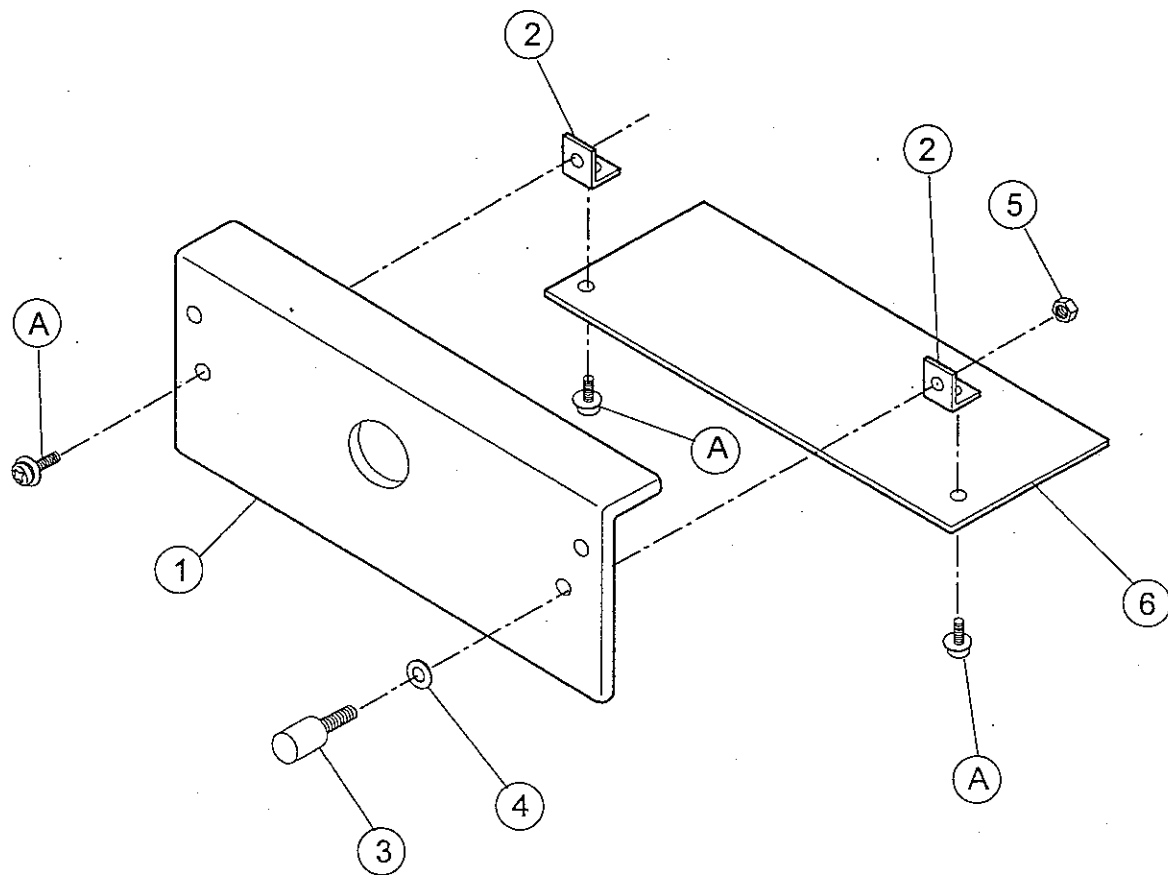
| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|------------|-----------------------------|------|
| 1 | 08:4004442 | WEIGHT CAPACITY LABEL INT'L | |
| 2 | 08:4004991 | CE MARK | |
| 3 | 08:4004441 | CAL LABEL | |
| 4 | 08:4003502 | MADE IN KOREA LABEL | |
| 5 | 08:4004444 | SERIAL LABEL EX | |
| | 08:4005326 | SERIAL LABEL EG | |

9-5 View AD-4328-01



| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|------------|---|------|
| 1 | 01:3001776 | OP-01 PANEL | 1 |
| 2 | 04:4004446 | L PARTS | 2 |
| 3 | TM:T-10 | TERMINAL | 1 |
| 4 | | WASHER (FOR TM:T-10) | 1 |
| 5 | | NUT (FOR TM:T-10) | 1 |
| 6 | | PC3078 | 1 |
| A | | PAN HEAD WITH WASHER AND SPRING WASHER M3 X 6 | 3 |

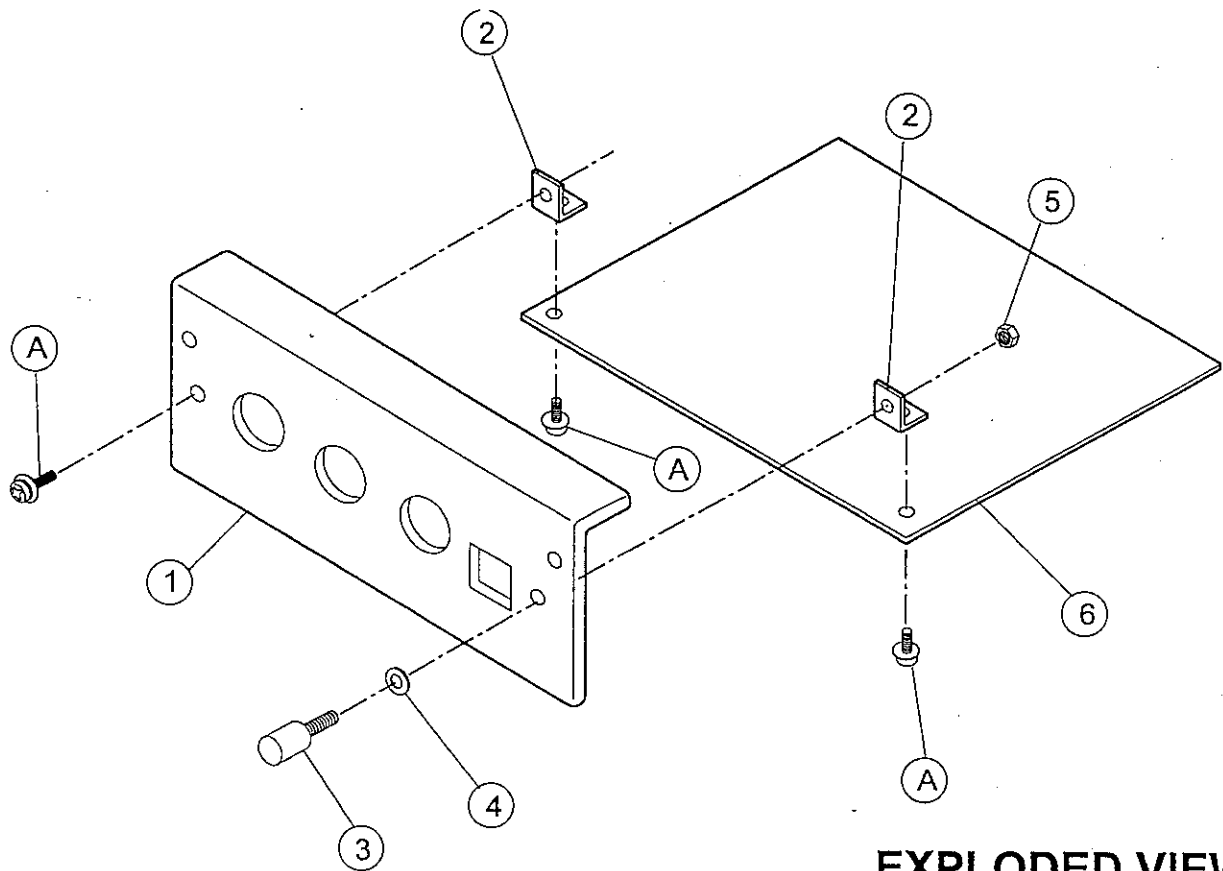
9-6 View AD-4328-02



**EXPLODED VIEW
AD-4328-02**

| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|------------|---|------|
| 1 | 01:3001777 | OP-02 PANEL | 1 |
| 2 | 04:4004446 | L PARTS | 2 |
| 3 | TM:T-10 | TERMINAL | 1 |
| 4 | | WASHER (FOR TM:T-10) | 1 |
| 5 | | NUT (FOR TM:T-10) | 1 |
| 6 | | PC3122 | 1 |
| A | | PAN HEAD WITH WASHER AND SPRING WASHER M3 X 6 | 3 |

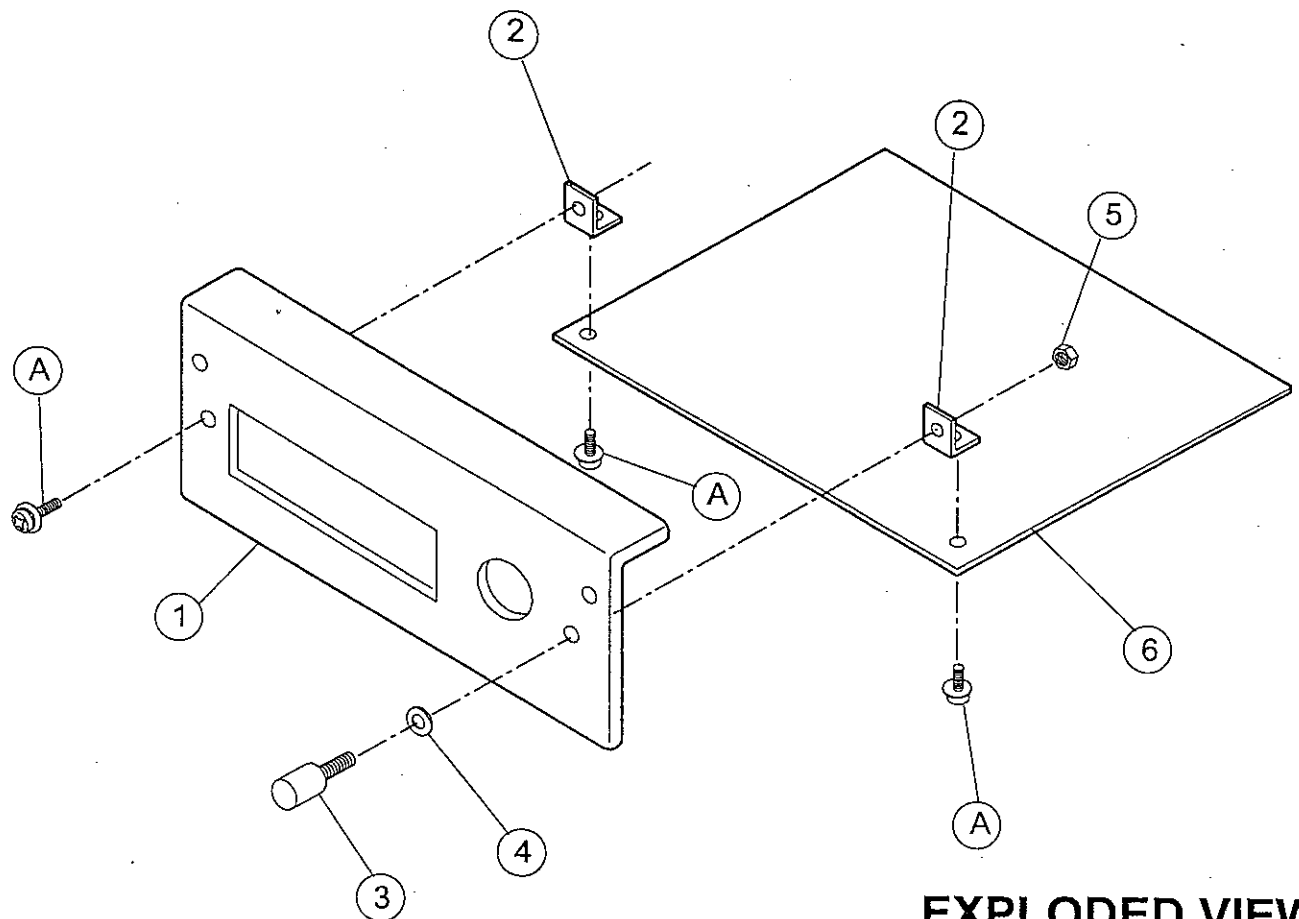
9-7 View AD-4328-03



**EXPLODED VIEW
AD-4328-03**

| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|------------|---|------|
| 1 | 01:3001778 | OP-03 PANEL | 1 |
| 2 | 04:4004446 | L PARTS | 2 |
| 3 | TM:T-10 | TERMINAL | 1 |
| 4 | | WASHER (FOR TM:T-10) | 1 |
| 5 | | NUT (FOR TM:T-10) | 1 |
| 6 | | PC3079 | 1 |
| A | | PAN HEAD WITH WASHER AND SPRING WASHER M3 X 6 | 3 |

9-8 View AD-4328-04



**EXPLODED VIEW
AD-4328-04**

| No. | PARTS NAME | DESCRIPTION | Q'TY |
|-----|------------|---|------|
| 1 | 01:3001779 | OP-04 PANEL | 1 |
| 2 | 04:4004446 | L PARTS | 2 |
| 3 | TM:T-10 | TERMINAL | 1 |
| 4 | | WASHER (FOR TM:T-10) | 1 |
| 5 | | NUT (FOR TM:T-10) | 1 |
| 6 | | PC3080 | 1 |
| A | | PAN HEAD WITH WASHER AND SPRING WASHER M3 X 6 | 3 |

[illegible]