4. ADJUSTMENT (CALIBRATION)

The adjustment items (calibration items) of the DPR500 Reporter are as shown in Table 3. The adjustment items can be selected specifying the respective adjustment numbers.

When the main board is replaced, the below-mentioned three items must be adjusted.

- Cold junction compensation

  For temperature compensation characteristics of the cold junction compensation resistor which is installed in the input terminal.

- Zero position adjustment

  To adjust the printing start position of the printing head (0% position on the printing chart paper).

- Assignment of optional functions

  To select the required optional functions for the reporter by assigning the corresponding items in conformity with the model number indicated on the reporter nameplate.

As the above adjustment is done from the setting panel (with the CAL key, numerical keys, etc.) of the reporter, calibration data is automatically determined and saved on the EEPROM of the main board. The adjustment should be done by using measuring instruments as required.

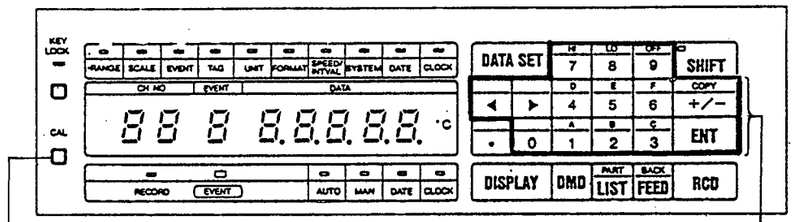


Fig. 4.1. Layout of Keys

Table 3. Adjustment Items for Main Board

Adj. No.	Adjustment item	When main board is replaced
1	A/D adjustment	Not required (done at factory before shipment)
2	RTD measuring current adjustment	Not required (done at factory before shipment)
3	Cold junction compensation adjustment	Required*
4	Zero position adjustment	Required
5	Memory diagnosis	Not required (done at factory before shipment)
97	Adjustment by setting of cold junction compensation factors (Adjusting method without using any measuring instruments)	(Note: The same as Adj. No. 3)
98	Assignment of optional functions	Required
99	EEPROM initialization	Not required (done at factory before shipment)

*: Not required if the adjustment is to be done with Adj. No. 97

4.1 Preparative Procedure for Adjustment

As a preparative procedure for adjustment, proceed as follows:

Step 1: Keeping the CAL key pressed, turn ON the POWER switch. Keep the CAL key pressed until a message "CAL" appears on the indicator.

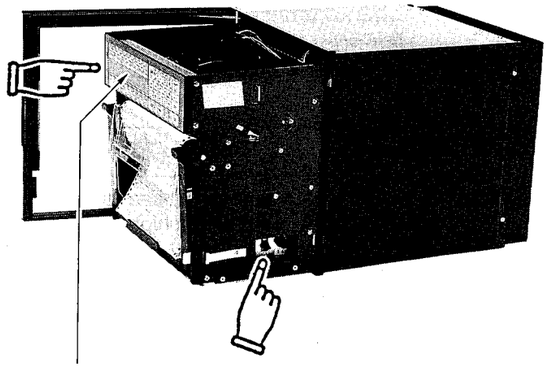
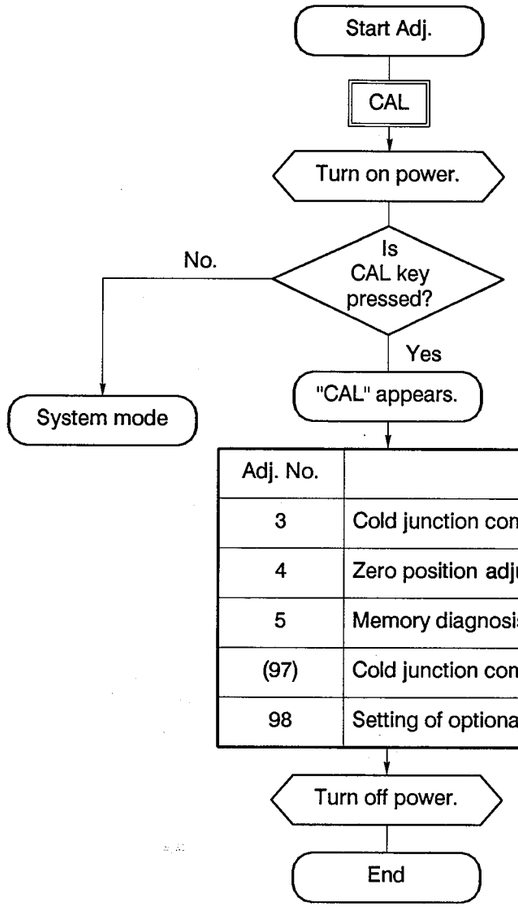


Fig. 4.2. Selecting the CAL Mode

Step 2: The preparative procedure is complete by the above and the reporter is ready to be adjusted (calibrated).

Remarks: When you have specified a wrong Adj. No. by mistake, press the CAL key. The indicator will be cleared and the reporter will be reset to the initial state of the CAL mode.



Adj. No.	Adj. Item
3	Cold junction compensation (using ZERO CON)
4	Zero position adjustment
5	Memory diagnosis
(97)	Cold junction compensation (without using ZERO CON)
98	Setting of optional functions

Fig. 4.3. Adjustment Procedure Flowchart

4.2 Adjustment of Cold Junction Compensation

Adjustment of cold junction compensation can be done in either one of the following two methods:

Method A: To save cold junction compensation data by reading it from the EEPROM of the old main board that has been removed and entering it via the setting panel onto the new EEPROM of the new main board that is to be installed.

Method B: To save cold junction compensation data by connecting a cold junction compensator (ZERO CON) to the input terminal, determining the characteristics of the cold junction compensation resistor, and entering the determined data onto the EEPROM of the new main board.

■ Method A

Preparation

Remove the EEPROM from the main board which has been removed.

Note: There are two types of main boards. The only difference between them is that the location of EEPROM differs as shown in Fig. 4.4.

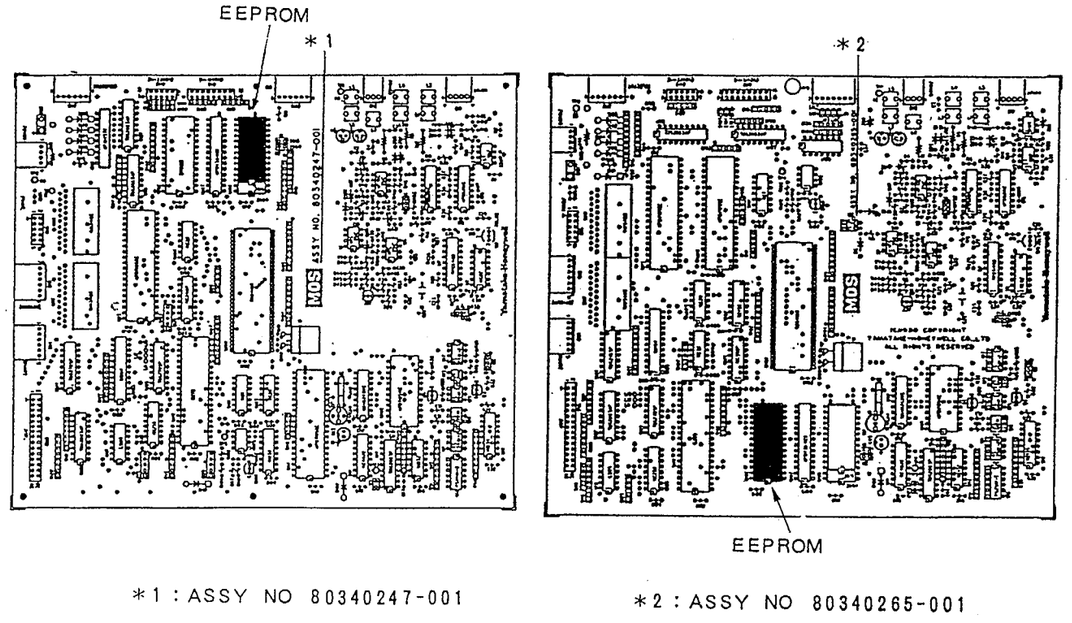


Fig. 4.4. Main Board

Step 1: Turn off power of DPR500 Reporter.

Step 2: Replace the EEPROM of the new main board (board that has been installed with the procedure of Chapter 3.8 "Replacement of Main Board") with that of the old main board (board that has been removed with the same procedure).

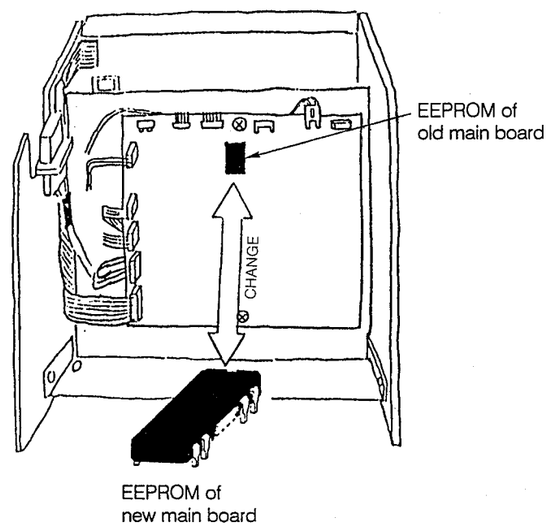
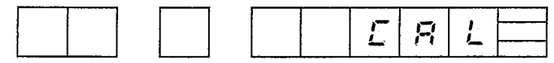
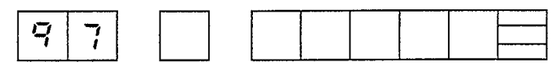


Fig. 4.5

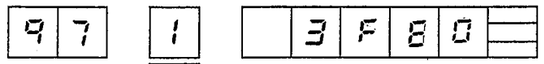
Step 3: Keeping the [CAL] key pressed, turn on power of the reporter. Keep the [CAL] key pressed until a message "CAL" appears on the indicator.

(Example of indication) 

Step 4: Select the cold junction compensation adjustment function by specifying the corresponding adjustment number (Adj. No. 97) from the data setting panel of the reporter.

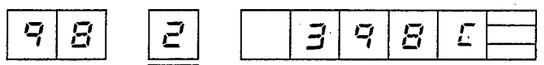
(Example of indication) 

Step 5: Press the [ENT] key. The low-order data of the cold junction compensation factor will appear on the indicator. Keep record of the data.

(Example of indication) 

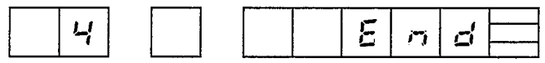
Symbol for Low-order data

Step 6: Press the [ENT] key. The high-order data of the cold junction compensation factor will appear on the indicator. Keep record of the data.

(Example of indication) 

Symbol for high-order data

Step 7: Press the [ENT] key. A message "End" will appear on the indicator. Terminate the procedure.

(Example of end indication) 

Step 8: Turn off the recorder power.

Step 9: Replace the EEPROM of the old main board (EEPROM which now is temporarily installed on the new main board to read the temperature compensation data) with the EEPROM of the new main board (EEPROM which has been detached in Step 2).

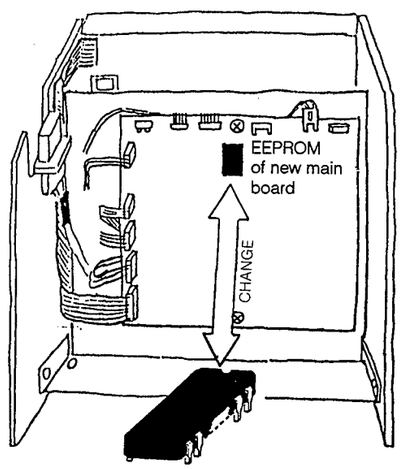
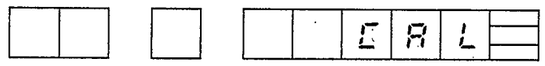
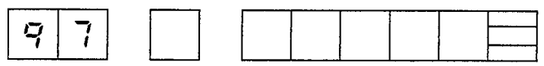


Fig. 4.6

Step 10: Keeping the [CAL] key pressed, turn on power of the reporter. Keep the [CAL] key pressed until a message "CAL" appears on the indicator.

(Example of indication) 

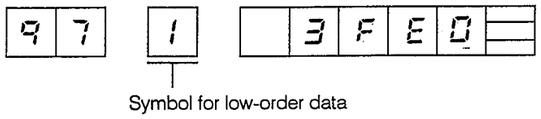
Step 11: Select the cold junction compensation adjustment function by specifying the corresponding adjustment number (Adj. No. 97) from the data setting panel of the reporter.

(Example of indication) 

Step 12: Press the [ENT] key. Specify the data read in Step 5.

[Example: Low-order data "3EFO"]

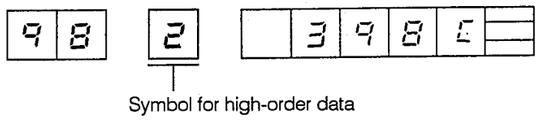
Press keys [3], [SHIFT] + [6], [SHIFT] + [5], [0].



Step 13: Press the [ENT] key. Specify the data read in Step 6.

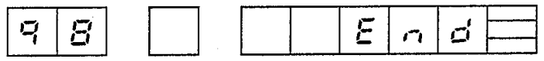
[Example: High-order data "398C"]

Press keys [3], [9], [8], [SHIFT] + [3].



Step 14: Press the [ENT] key. A message "End" will appear on the indicator. Terminate the procedure.

(Example of end indication)



Step 15: To advance to the next adjustment or to repeat adjustment, proceed as follows:

Press the [CAL] key. The reporter will be reset to the initial state of the adjustment mode and will become ready to accept another adjustment number. All data on the indicator will be cleared.

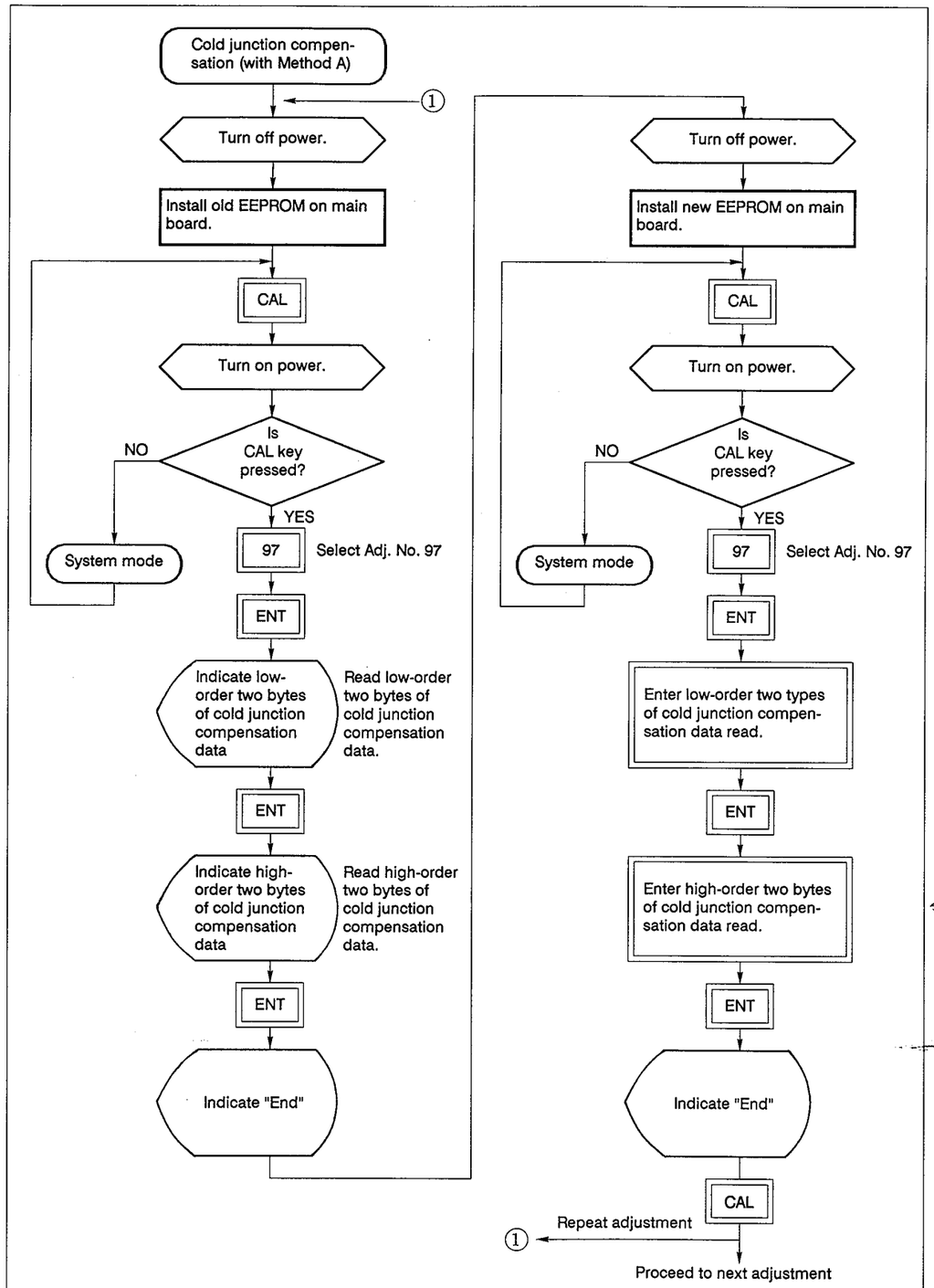


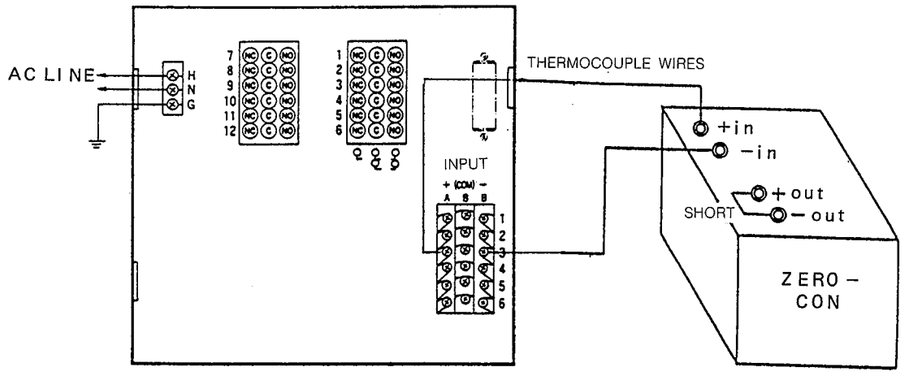
Fig. 4.7. Flowchart of Cold Junction Compensation Adjustment Procedure (Method A)

■ Method B

Preparation

(1) To measure temperature of the input terminal of DPR500 Reporter, connect the input terminal of the cold junction compensator to Channel 3 of the input terminal block.

(2) Short the output terminals of the cold junction compensator.

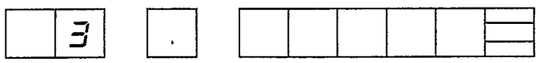


Instrument:
Cold junction compensator
(ZERO CON)

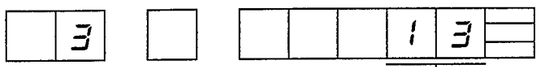
Note: For the thermocouple wires and ZERO CON terminals, use those of the type corresponding to the range code (those of T-type thermocouple are recommended).

Fig. 4.8. Example of Cold Junction Compensation Calibration Setup

Step 1: Select the cold junction compensation adjustment function (Adj. No. 3) by specifying "3" from the data setting panel of the reporter.

(Example of indication) 

Step 2: Press the ENT key. Range code "13" or "16" will appear on the indicator panel.

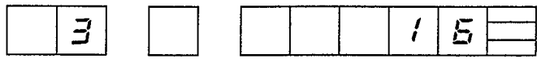
(Example of indication) 

Range code "13" or "16" will appear.

Step 3: For T-type thermocouple, specify range code "16".

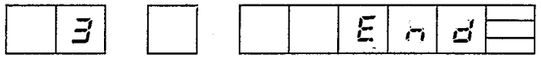
[For range code "13", press key "6".]

For range code "16", proceed to Step 4.

(Example of indication) 

Step 4: Press the ENT key. Adjustment will be executed. When the adjustment is complete, a message "End" will appear.

Remarks: If the ambient temperature is not within a range of 0 to 50°C, an error code will appear on the indicator panel.

(Example of end indication) 

Step 5: To advance to the next adjustment or to repeat adjustment, proceed as follows:

Press the CAL key. The reporter will be reset to the initial state of the adjustment mode and will become ready to accept another adjustment number. All data on the indicator will be cleared.

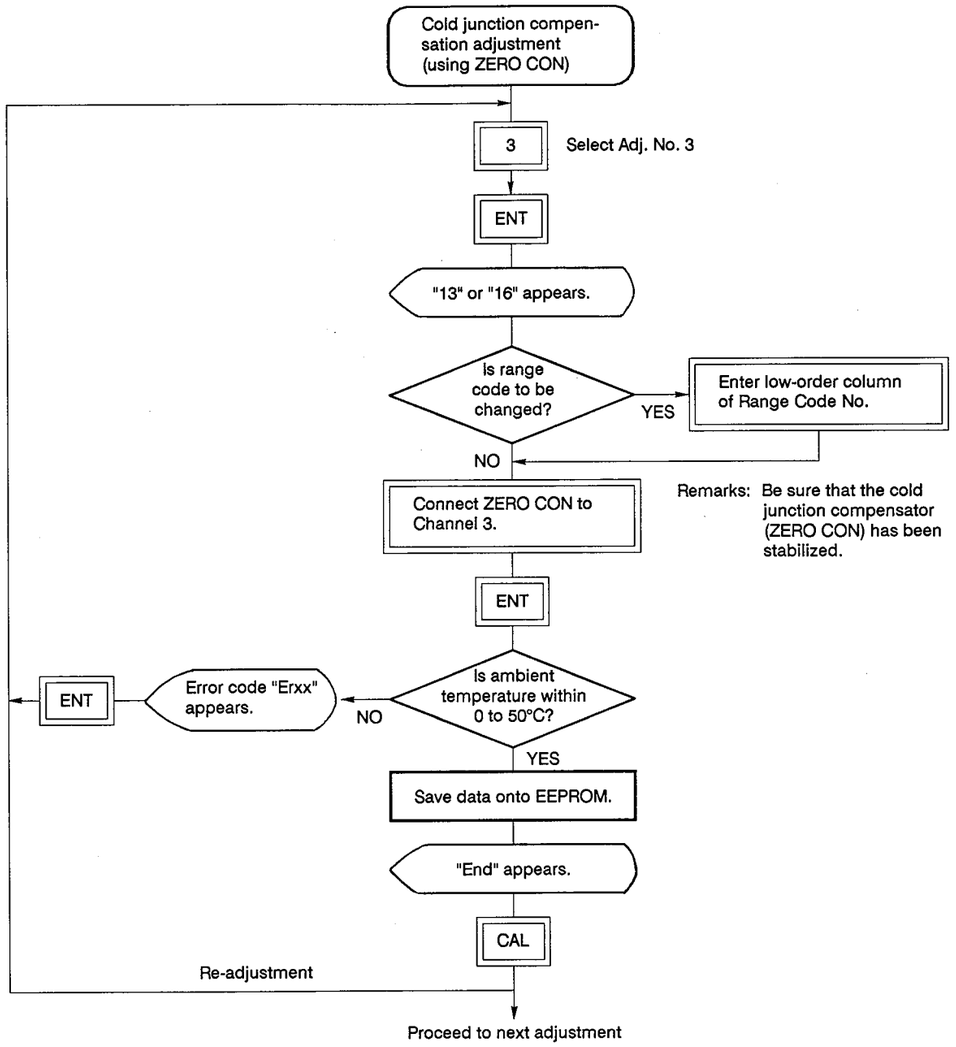


Fig. 4.9. Flowchart of Cold Junction Compensation Adjustment Procedure (Method B)

4.3 Adjustment of Zero Position

This adjustment is to align the printing head (Pen No. 1) to the 0% scale position of the recording chart paper.

Step 1: Select the zero position adjustment function (Adj. No. 4) by specifying "4" from the data setting panel of the reporter.

(Example of indication)

Step 2: Press the ENT key. The printer will start printing with its printing head (Pen No. 1).

Step 3: Move the printing head to the 0% scale position of the recording chart with the ◀ and ▶ keys.

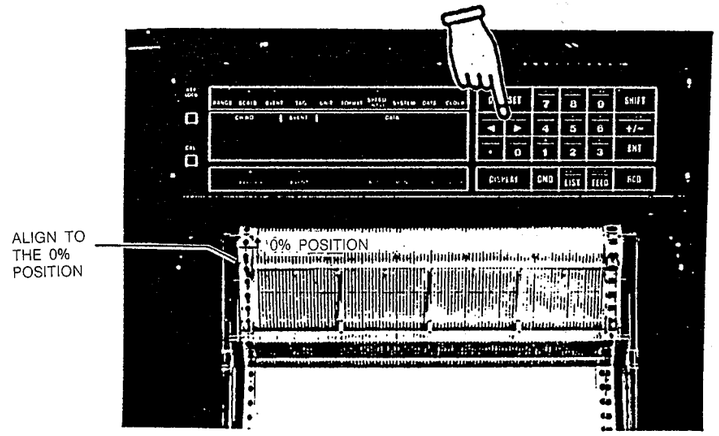


Fig. 4.10. Adjustment of Zero Position

Step 4: Press the ENT key. A message "End" will appear indicating that the adjustment is complete.

(Example of end indication)

Step 5: To advance to the next adjustment or to repeat adjustment, proceed as follows: Press the CAL key. The reporter will be reset to the initial state of the adjustment mode and will become ready to accept another adjustment number. All data on the indicator will be cleared.

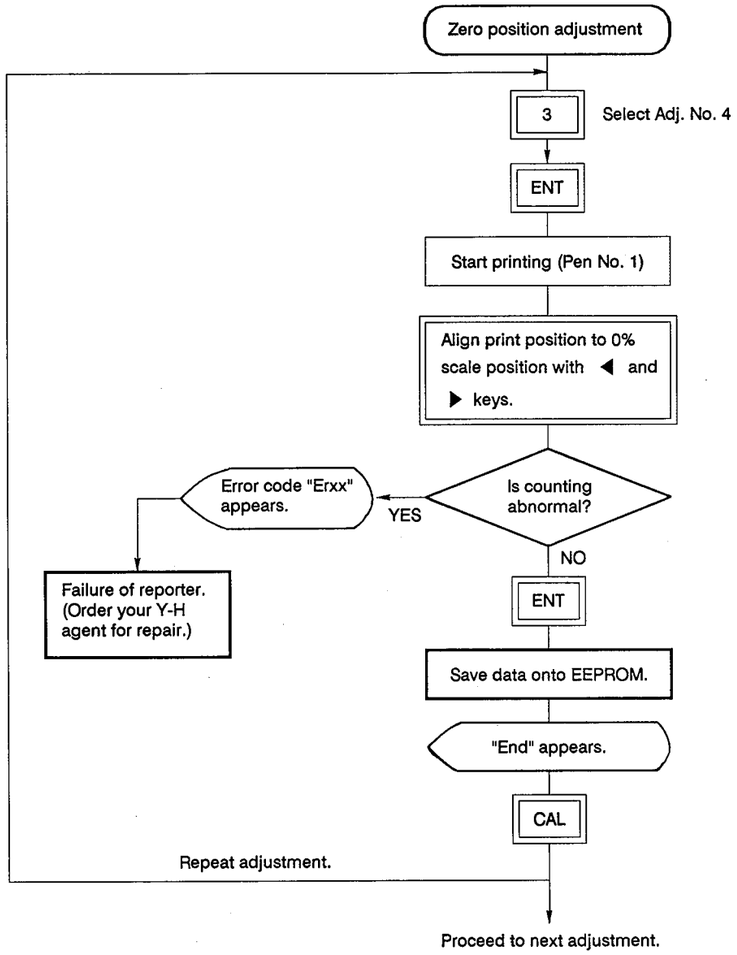
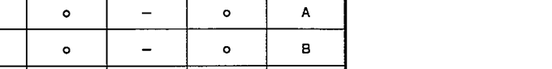


Fig. 4.11. Flowchart of Zero Position Adjustment Procedure

4.4 Entry of Model No.

Enter, in the following procedure, the model number which has been read on the nameplate of the DPR500 Reporter in Chapter 3.7 "Replacement of Main Board," Item (2) "Checking the Model No."

Step 1: Select the model number setting function (Adj. No. 98) by pressing the [9] [8] keys of the data setting panel.



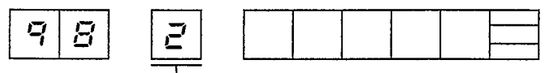
Step 2: Press the [ENT] key.

Step 3: Specify the model number (optional functions of the reporter) with a hexadecimal number. First, specify the hexadecimal code I; next, specify hexadecimal code II as shown below.

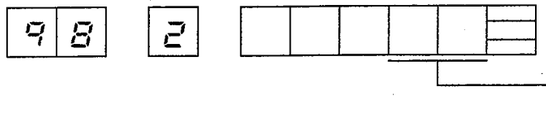
Model No.			Illumination lamp	Alarm outputs (6 points)	Alarm outputs (12 points)	External contact input	Hexadecimal code I
DPR5xx–Ax–	000	x–x	–	–	–	–	0
	001		o	–	–	–	1
	010		–	o	–	–	2
	011		o	o	–	–	3
	020		–	–	o	–	4
	021		o	–	o	–	5
	100		–	–	–	o	8
	101		o	–	–	o	9
	110		–	o	–	o	A
	111		o	o	–	o	B
	120		–	–	o	o	C
	121		o	–	o	o	D

Model No.		Inspection data sheet	Tropicalization	Communication function	Hexadecimal code II
DPR5xx–Ax–xxx	0–X	–	–	–	0
	0–D	o	–	–	1
	0–T	–	o	–	2
	0–S	o	o	–	3
	1 2 3 –X	–	–	o	C
	1 2 3 –D	o	–	o	D
	1 2 3 –T	–	o	o	E
	1 2 3 –S	o	o	o	F

Step 4: Press the [ENT] key.

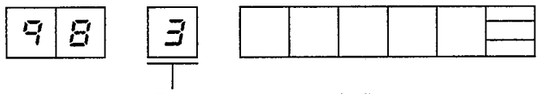


Step 5: Referring to the following table, specify the model number (basic model number and selectable ones) with a two-column hexadecimal code.

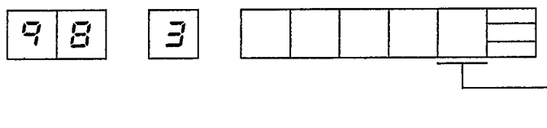


Model number structure		Model number			AC line voltage				Hexadecimal code i
		DPR506	DPR512	DPR524	AC110V	AC115V	AC200V	AC230V	
DPR506-A1	-XXXX-X	○	–	–	○	–	–	–	00
DPR506-A2		○	–	–	–	○	–	–	01
DPR506-A3		○	–	–	–	–	○	–	02
DPR506-A4		○	–	–	–	–	–	○	03
DPR512-A1		–	○	–	○	–	–	–	08
DPR512-A2		–	○	–	–	○	–	–	09
DPR512-A3		–	○	–	–	–	○	–	0A
DPR512-A4		–	○	–	–	–	–	○	0B
DPR524-A1		–	–	○	○	–	–	–	10
DPR524-A2		–	–	○	–	○	–	–	11
DPR524-A3		–	–	○	–	–	○	–	12
DPR524-A4		–	–	○	–	–	–	○	13

Step 6: Press the ENT key. "3" will appear as follows.



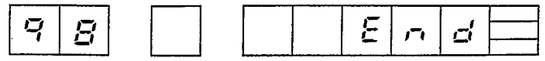
Step 7: Referring to the following table, specify the model number (communication function) with a hexadecimal code.



Model number structure			Communication function	Hexadecimal code
DPR5xx-Ax-xxx	0	-x	None	0
	1		RS – 232C	5
	2		RS – 485	9
	3		(RS – 422: CMC300 dedicated communication)	E

Step 8: Press the ENT key. A message "End" will appear indicating the end of the procedure.

(Example of end indication)



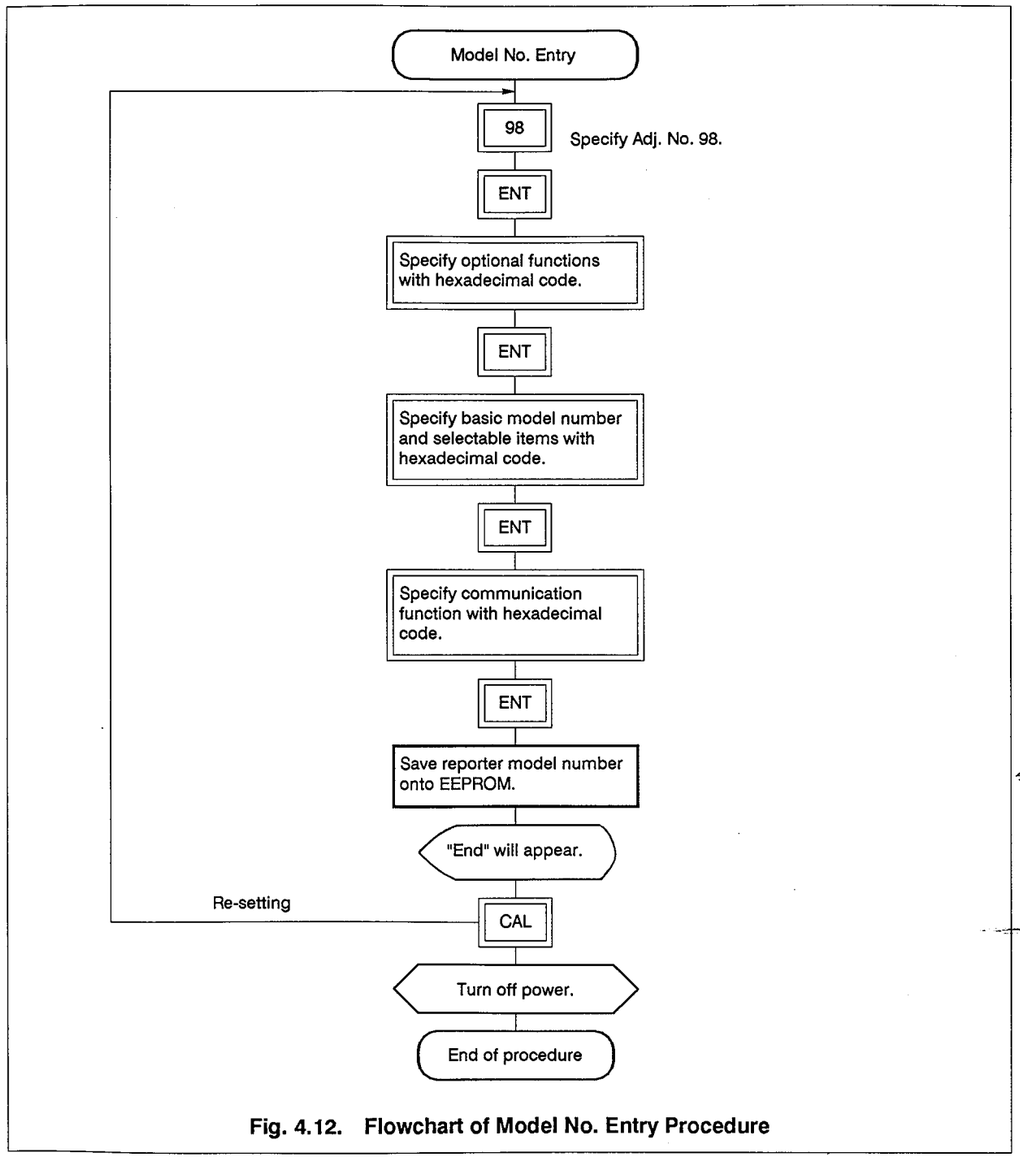


Fig. 4.12. Flowchart of Model No. Entry Procedure

The adjustment to be done replacement of the main board is complete by the above procedure. Turn off the reporter power once. Turn it on again and then proceed to the configuration procedure for the reporter.