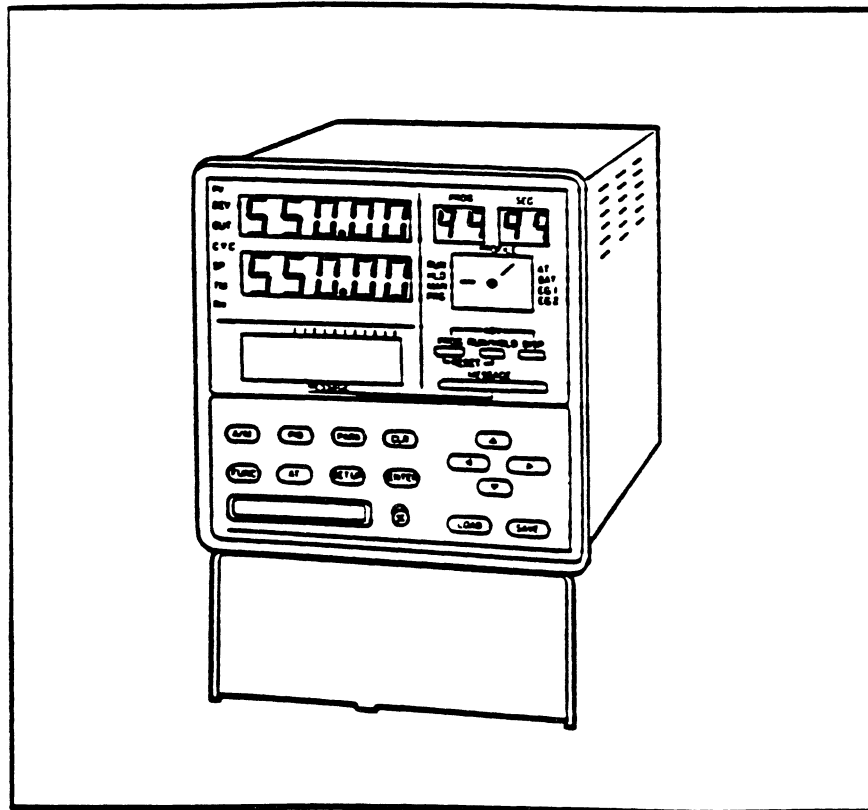


DCP550 Digital Program Controller

Calibration Manual



Warranty

The device described herein has been manufactured and tested for correct operation and is warranted as follows:

The DCP 550 Digital Control Programmer carries a one year warranty. This warranty includes immediate technical assistance via a toll free telephone number and complete replacement of the controller, if necessary.

Technical Assistance

If you encounter a problem with your DCP 550, review all the configuration data to verify that your selections are consistent with your application; i.e. Inputs, Outputs, Alarms, Limits, etc. If the problem persists after checking the above, you can get technical assistance by dialing

1 - 800 - 423 - 9883

An engineer will discuss your problem with you. Please have your complete model number, serial number, and configuration data available. The model and serial numbers can be found on the outside of the case.

1. INTRODUCTION

This manual describes the field caribration procedures for analog/digital inputs and outputs.

2. CALIBRATION ITEMS

fig2-1

DCP550 5G T 00001000						
I T E M	S U B I T E M	O U T P U T		I N P U T		
		5G	6D	T	R	L
0	KEY TEST	APPLY FOR ALL MODE L				
	INDICATION					
	DIGITAL INPUT					
	DIGITAL OUTPUT					
1	INPUT CALIBRATION			○	○	○
2	C/J SENSOR CALIBRATION			○		
6	OUTPUT CALIBRATION	○				

3. EQUIPMENT NEEDED

3-1 Thermocouple inputs

- A calibrating device with $\pm 0.02\%$ accuracy for use signal generator.
(range 0~50.000mv)
- Two insulated copper leads for connecting the generator to the controller.

3-2 RTD inputs

- A decade box with $\pm 0.02\%$ accuracy, capable of providing stepped resistance values over a minimum range of 0 to 500 Ω with a resolution of 0.1 Ω .
- Three insulated copper leads for connecting the decade box to the controller.

3-3 MA, MV, V inputs

- A calibrating device with $\pm 0.02\%$ accuracy for use signal generator.
MA 0.000 to 25.000mA
range MV 0.000 to 50.000mV
V 0.000 to 5.000 V
- Two insulated copper leads for connecting the generator to the controller.

3-4 Outputs(MV, AUX)

- A measurement device with $\pm 0.02\%$ accuracy for use as a digital multi meter.
(range 0~25.000mA)

4. ADJUSTMENT PRECAUTION

- 4-1 Please do not attempt critical and extremely accurate adjustments until at least 60 minutes after the power source has been connected to the reference input generator, digital voltmeter and the DCP550
- 4-2 The factory adjustment utilizes as a standard temperature of $23.5 \pm 1^\circ\text{C}$. Please adjust the DCP550 in this range, but never in an environment where the temperature fluctuates markedly, more than 1°C .
- 4-3 Please calibrate PV(T/C RTD) after C/J or WIRE calibration.
- 4-4 Please write all the data into EEPROM(see 7-9 page20) when you finish the calibration. If you finish the calibration without writing it into EEPROM, all the data that you calibrate will be lost.

5. SET UP

Figure5-1 Thermocouple inputs

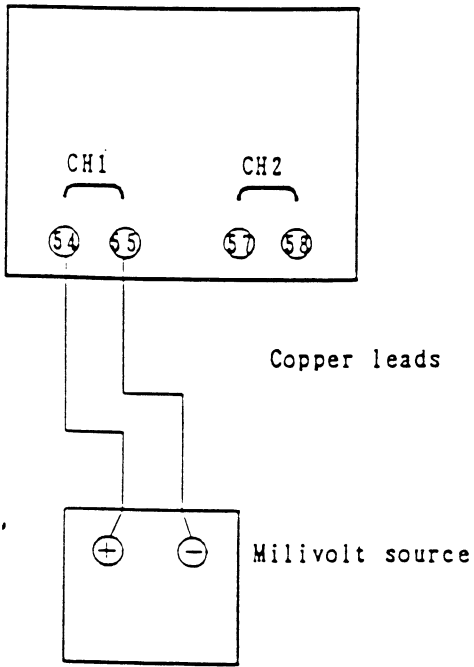


Figure5-2 RTD inputs

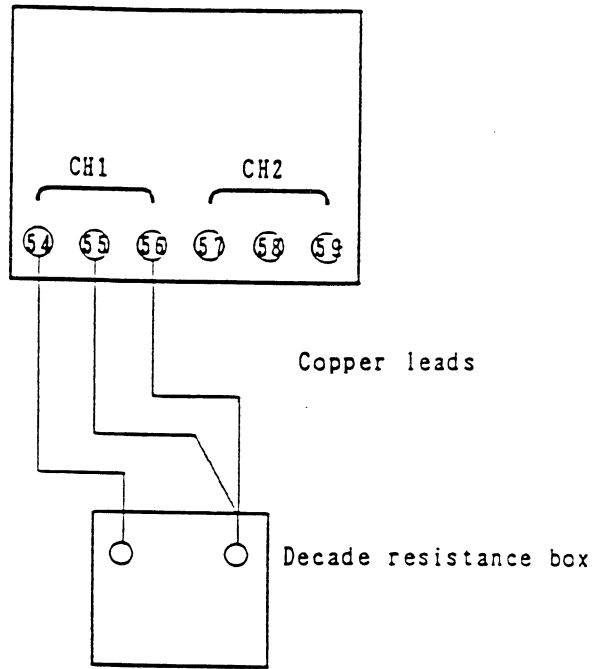


Figure5-3 MV, V. inputs

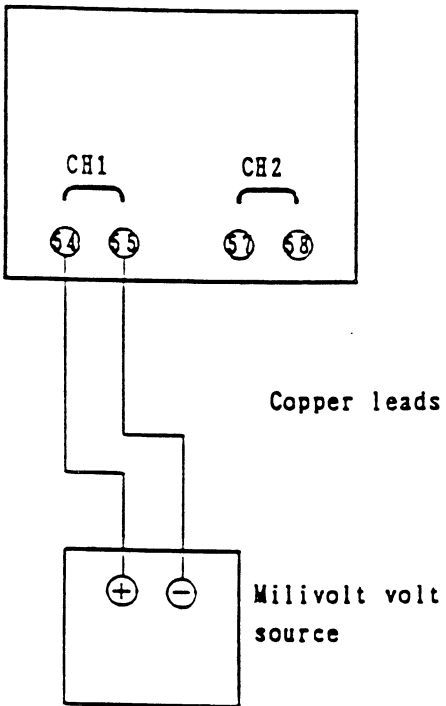


Figure5-4 MA inputs

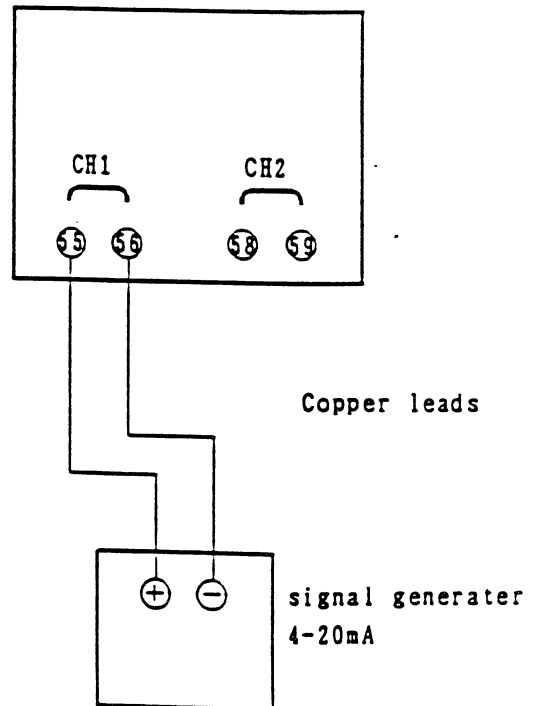
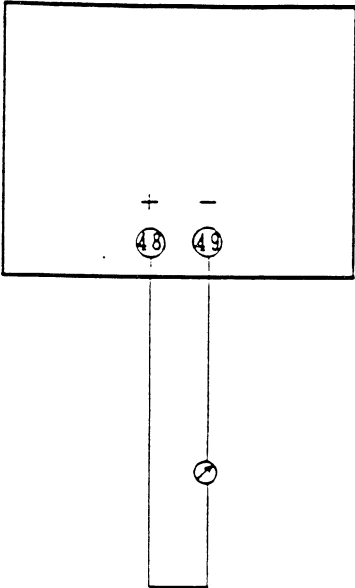


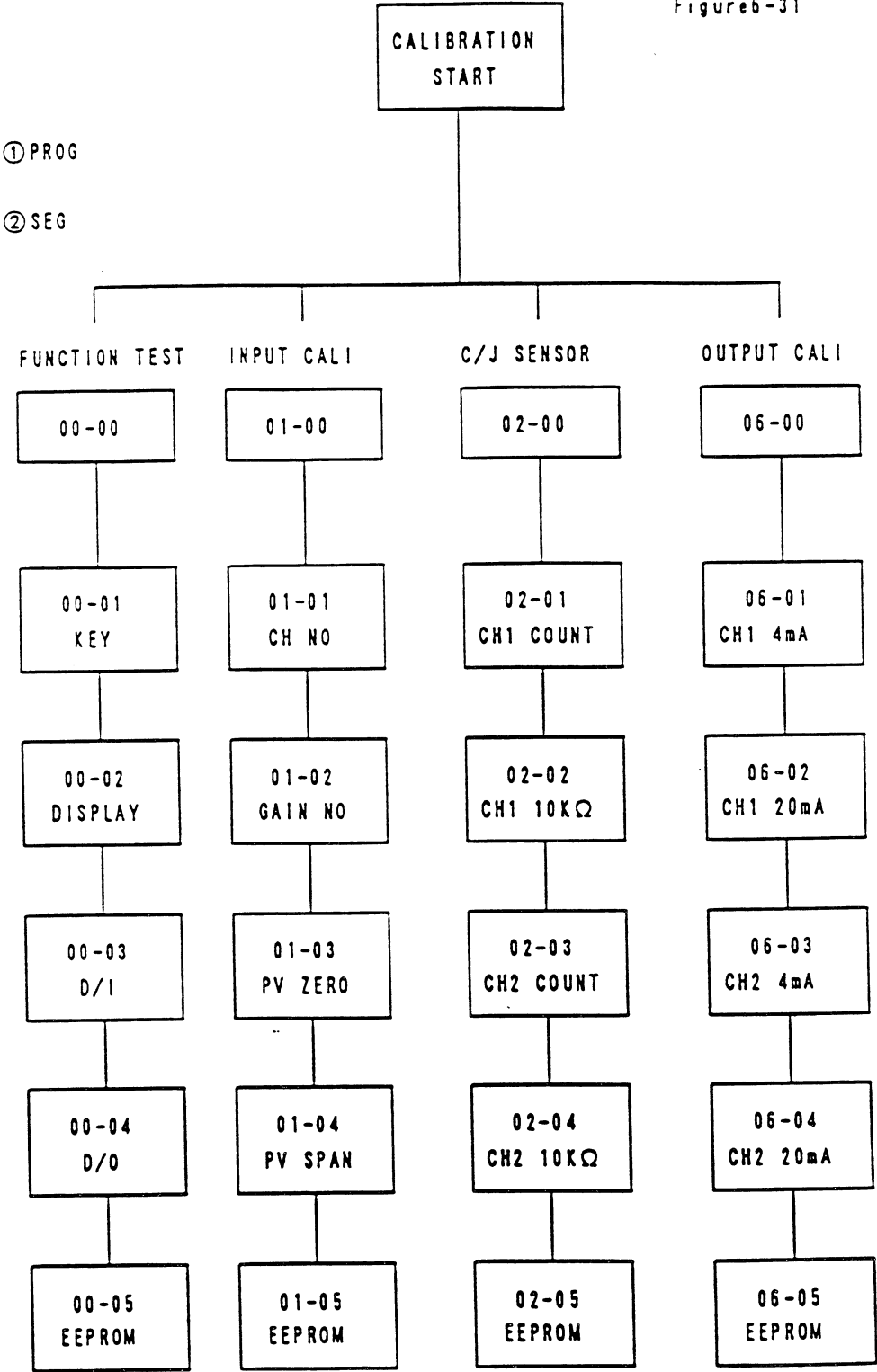
Figure5-5 Current outputs



Item and Subitem Table For Manual Adjustment

Item	Subitem	Detail	Upper indicator	Lower indicator	
0	0	Item change Code	0000,etc.	ADJS	
	1	Key Test			
	2	Indicator Test			
	3	Input Test			
	4	Output Test(Control)			
	5	Output Test(Event)			
1	0	Item change Code	1011	ADJS	
	1	Channel No.			
	2	Gain No.			
	3	PV input 0%	1111		
	4	PV input 100%			
	5	Writing into EEPROM			
2	0	Item change Code	2022	ADJS	
	1	CH1 CJ Count			previous adjustment value
	2	CH1 10K Ω Resistance			
	3	CH2 CJ Count			
	4	CH2 10K Ω Resistance			
	5	Writing into EEPROM			
6	0	Item change Code	6066	ADJS	
	1	CH1 4 mA Output			previous adjustment value
	2	CH1 20 mA Output			
	3	CH2 4 mA Output			
	4	CH2 20 mA Output			
	5	Writing into EEPROM			

Figure 6-31



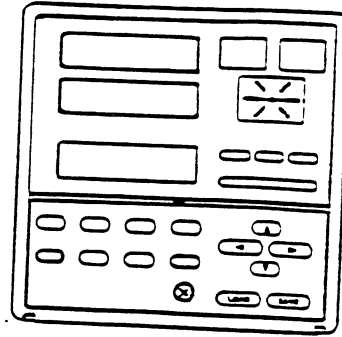
6. CALIBRATION PROCEDURES

6-1 Adjustment

- ① Press **DISP** key to change to ordinary-indication condition.

RUN LED is OFF
HOLD LED is OFF
MAN LED is OFF

Figure6-1

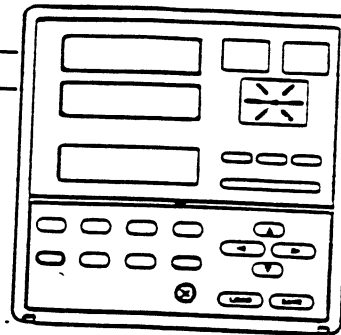


- ② While pressing **FUNC** key, press **SETUP** key and **ENTER** key simultaneously.

Indicator shown in Figure6-2 will appear.

Figure6-2

0.0.0.0.
A.D.J.S.



6-2 Function test

Press **ENTER** key when upper indicator shows 0.0.0.0.

6-2-1 Key test (00-01)

Press **SETUP** key until SEG indicator= 01

When you press each key, the data appears in the upper indicator (shown in Figure 6-6) and in the lower indicator (shown in Figure 6-7)

Figure 6-6 (upper indicator)





key	data	key	data	key	data
	0.0.0.1.	SETUP	0.0.2.0.	PID	0.4.0.0.
	0.0.0.2.	AT	0.0.4.0.	A/M	0.8.0.0.
	0.0.0.4.	FUNC	0.0.8.0.	PROC	1.0.0.0.
	0.0.0.8.	CLR	0.1.0.0.	RUN/HOLD	2.0.0.0.
ENTER	0.0.1.0.	PARA	0.2.0.0.	DISP	4.0.0.0.
				MESSAGE	8.0.0.0.

Fig 6-7 (lower indicator)

key	data	key	data
LOAD	0.0.0.1.	SAVE	0.0.0.2.

6-2-2 Display test(00-02)

Press **SETUP** key until SEG indicator= 02

Then each 7segment LED lamp,LED lamp and LCD lamp is on in order every 2sec.

6-2-3 Digital input test(00-03)

Press **SETUP** key until SEG indicator= 03

Upper indicator shows 1-16 digital inputs conditions (ON or OFF) by 4 digits hexa cord as shown below.

Bit No.-	0 : 0.0.0.1.	4 : 0.0.1.0.	8 : 0.1.0.0.	1 2 : 1.0.0.0.
Hexa cord	1 : 0.0.0.2.	5 : 0.0.2.0.	9 : 0.2.0.0.	1 3 : 2.0.0.0.
Display	2 : 0.0.0.4.	6 : 0.0.4.0.	1 0 : 0.4.0.0.	1 4 : 4.0.0.0.
	3 : 0.0.0.8.	7 : 0.0.8.0.	1 1 : 0.8.0.0.	1 5 : 8.0.0.0.

6-2-4 Digital output test for control output(00-04)

Press **SETUP** key until SEG indicator= 04


0: 6D or 8D output (CH1)
1: 6D or 8D output (CH2)
2: 2G Open output
3: 2G Close output

6-2-5 Digital output test for event(00-05)

Press **SETUP** key until SEG indicator= 05


6-3 PV calibration

Press **SETUP** key to show (1011) on upper indicator

then press  key.

6-3-1 Input CH NO select

Press **SETUP** key to show 01 on SEG indicator.


Input the channel NO by  key.

CH NO	upper indicator
1	0.0.0.0.0.
2	0.0.0.0.1.

6-3-2 Gain NO select

Press **SETUP** key to show 02 on SEG indicator.

Input the gain number (Refer to Table 6-1 and 6-2)

by  key on upper indicator.

6-3-3 PV zero, span

① PV zero adjustment

(a) Press **SETUP** key to show 03 on SEG indicator.

(b) Adjust your calibration device to an output signal equal to the 0% range value (refer to Table 6-1)

(c) Press **ENTER** key after display stabilized.

② PV span adjustment

(a) Press **SETUP** key to show 04 on SEG indicator.

(b) Adjust your calibration device to an output signal equal to the 100% range value (refer to Table 6-1)

(c) Press **ENTER** key after display stabilizes.


If input model type is T or L, please repeat 6-3-2 and 6-3-3.

Table-1

Input model type	Gain	Zero input	Span input
T I/C mV mA	0	0 mV	105.1 mV
	1	0 mV	62.3 mV
	2	0 mV	44.6 mV
	3	0 mV	21.2 mV
	4	0 mV	11.2 mV
	5	4 mA	20.0 mA
R RTD	0	100 Ω	300 Ω
L V mA	0	0 V	10 V
	2	0 V	5 V
	4	0 V	1 V
	5	4 mA	20 mA

6-3-4 Writing into EEPROM

Press **SETUP** key to show 05 on SEG indicator.

Press  key to show 1.1.1.1. on upper indicator.

Press **ENTER** key.

Table-2

Range Table of PV input cat.listing I

Group	Type	Code	G
T / C	K (CA)	K09	1
	K (CA)	K08	2
	K (CA)	K04	3
	E (CRC)	E08	0
	J (IC)	J08	1
	T (CC)	T44	3
	B (PR30-6)	B18	3
	R (PR13)	R16	3
	S (PR10)	S16	3
	W (WRe5-26)	W23	2
	W (WRe5-26)	W14	2
	PR40-20	D19	4
	N	U13	1
	P L II	Y13	1
	Ni-Ni·Mo	Z13	0
	Gold + 0.07% Iron-chromel	Z06	4
	K (CA)	K46	3
Linearm A	4~20 mA	C01	5
Linearm V	0~10 mV	M01	3
	-10~10 mV	L02	3
	0~100 mV	L01	0
Linearm A	2.4~20 mV	Z51	5


Range Table of PV input cat.listing R

Group	Type	Code	G
RTD	JIS'89 Pt100 (IEC Pt100Ω)	F50	0
		F46	
		F32	
		F36	
		F33	
		F01	
		F03	
		F05	
		P50	
	JIS'89 JPt100	P46	
		P32	
		P36	
		P33	
		P01	
		P03	
		P05	

Range Table of PV input cat.listing L

Group	Type	Code	G
Linearm A	4~20 mA	C01	5
Linear V	0 ~ 1 V	L04	4
	-1 ~ 1 V	L08	4
	1 ~ 5 V	V01	2
	0 ~ 5 V	L05	2
	0 ~ 10 V	L07	0
Linearm A	2.4~20 mV	Z51	5

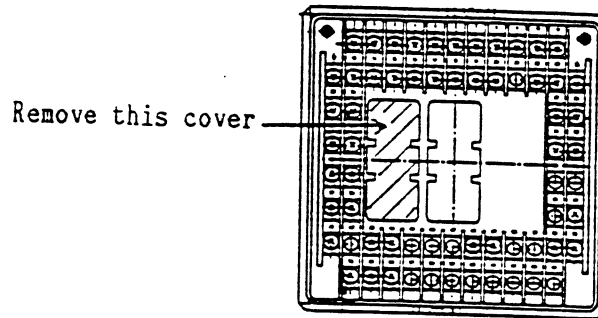
6-4 Cold junction sensor calibration (Input model type T only)

Press  key to show(2022) on upper indicator,

then press **ENTER** key.

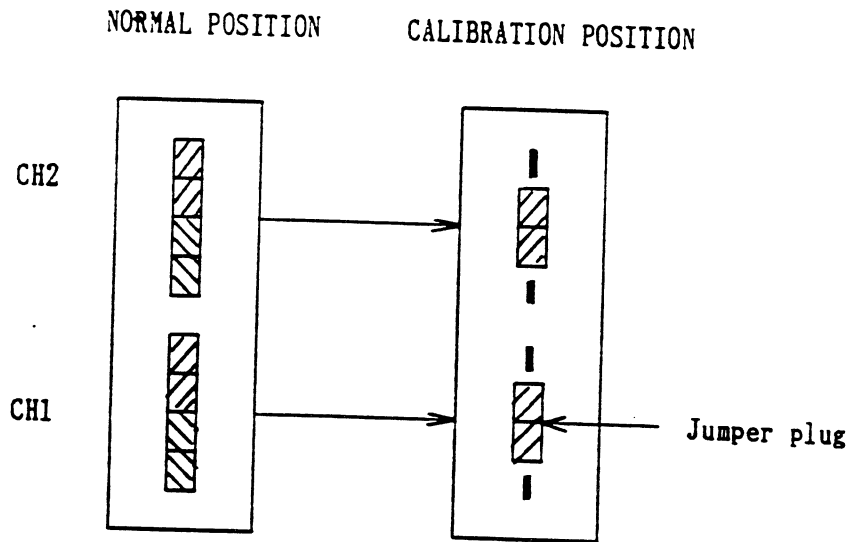
6-4-1 Change the jumper position

① Remove the cover.(shown in Fig 6-18)



② Change the position(shown in Fig 6-19)


Figure6-19



6-4-2 The cold junction data(CH1)

- ① Press **SETUP** key to show 01 on SEG indicator.
- ② Connect the decade resistance box between B and C, and then input $10k\Omega$.
- ③ Press **ENTER** key after display stabilized, AD count is shown on lower indicator.

6-4-3 $10k\Omega$ resistance value(CH1)

- ① Press **SETUP** key to show 02 on SEG indicator.
- ② Press  key to set above resistance value

used in 6-4-2, then the setting value is shown on upper indicator.

Press **ENTER** key, then the setting value is shown on lower indicator.


6-4-4 The cold junction data(CH2)

- ① Press **SETUP** key to show 03 on SEG indicator.

6-4-5 $10k\Omega$ resistance value(CH2)

- ① Press **SETUP** key to show 04 on SEG indicator.


6-4-6 Writing into EEPROM

- ① Press **SETUP** key to show 05 on SEG indicator.
- ② Press  key to show 1.1.1.1. on upper indicator.
- ② Press **ENTER** key.

6-4-7 Restore jumpers

Restore jumpers to the normal position.

6-6-1 Output calibration (Output model 5G only)


At first press **SETUP** key to show 00 on SEG indicator and next press  key to show 01 on PROG indicator.

And then 6.0.6.6. appears in the upper indicator.


6-6-1 CH1 output calibration

① Press **SETUP** key to show 01 on SEG indicator. zero

Connect the digital multi meter across terminals.
(Refer to Fig5-5)


Press  key until meter indicates 4.00mA.

② Press **SETUP** key to show 02 on SEG indicator. span


Press  key until meter indicates 20.00mA.

6-6-2 CH2 output calibration

① Press **SETUP** key to show 03 on SEG indicator. zero


Press  key until meter indicates 4.00mA.

② Press **SETUP** key to show 04 on SEG indicator. span

Press  key until meter indicates 20.00mA.

6-6-3 Writing into EEPROM

① Press **SETUP** key to show 05 on SEG indicator.

Press  key to show 1.1.1.1. on upper indicator.

② Press **ENTER** key.

