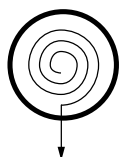


5. Alignment and Adjustments

5-1 Lens and Mirror Cleaning

1. Mix the alcohol and ethyl in appropriate proportions.
2. Use a clean cotton cloth or a cleaning paper.
3. Clean the top of the lens by turning it as shown. The pattern starts at the center and proceeds outward, as shown below:



4. Use minimal pressure when rubbing the mirror. Otherwise, the surface will be damaged.

5-2 Focus Adjustment for projection Lens

1. Loosen the 4 screws that secure the optical assembly.
2. After setting the optical assembly on the front cabinet, secure the unit temporarily using the two screws.
3. After applying the liquid crystal panel signal, input a lion head pattern from a pattern generator.
4. Move the focus adjustment screws right and left until the liquid crystal picture element is clearly displayed on the screen.
5. Reposition the optical assembly, and fasten all 4 screws.
6. Check the focus adjustment.
7. Repeat adjustments 1~5, if necessary.

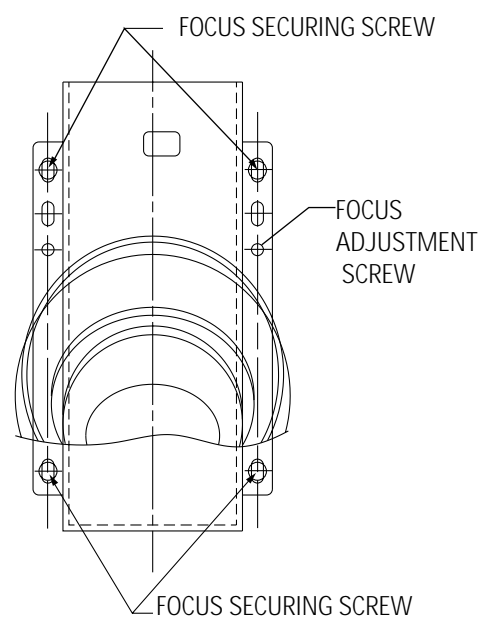


Fig. 5-1

5-3 Liquid Crystal Screen Center Adjustment

After replacing with the new liquid crystal panel, make sure that the liquid crystal screen center is aligned with the screen center. If they are not aligned, make the following adjustments:

1. Using a hexagonal wrench, loosen the two screws that secure the liquid crystal panel.

Note: Loosen the screws just until the panel can move easily.

2. Using two fingers, lift the liquid crystal upward. (The screen moves downward.)
3. When moving the liquid crystal panel towards the left, the screen moves right (and vice versa).
5. Repeat adjustments 2~4 until the screen center is aligned vertically and horizontally.
6. Using a hexagonal wrench, refasten the two screws.

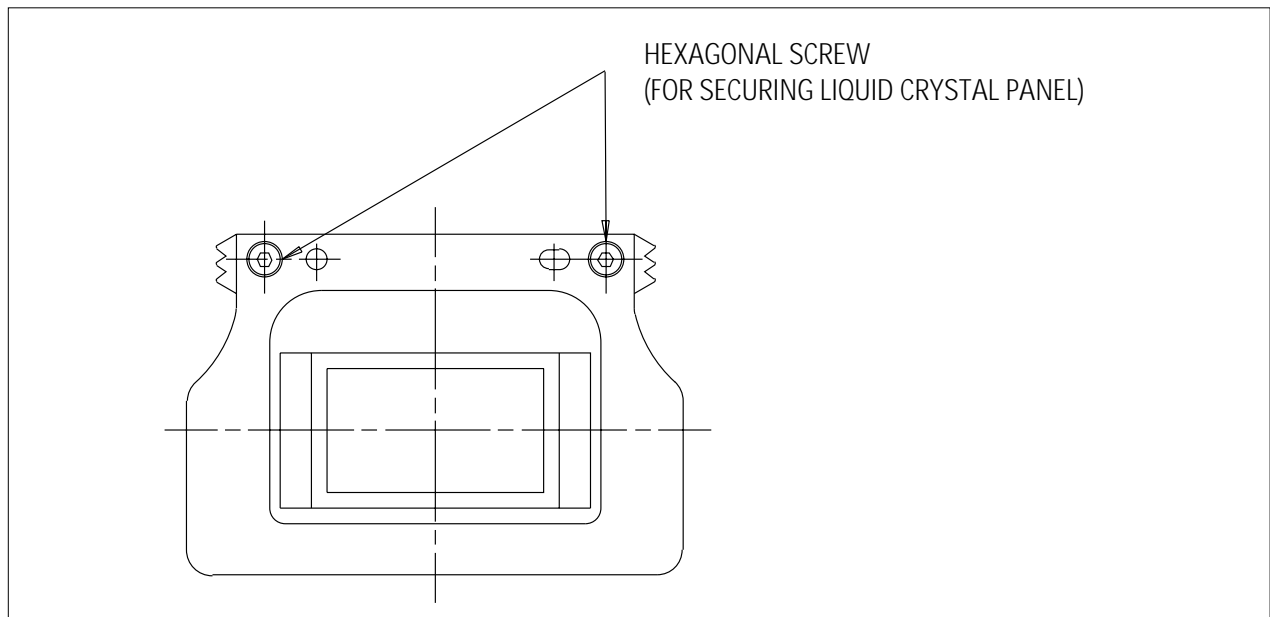
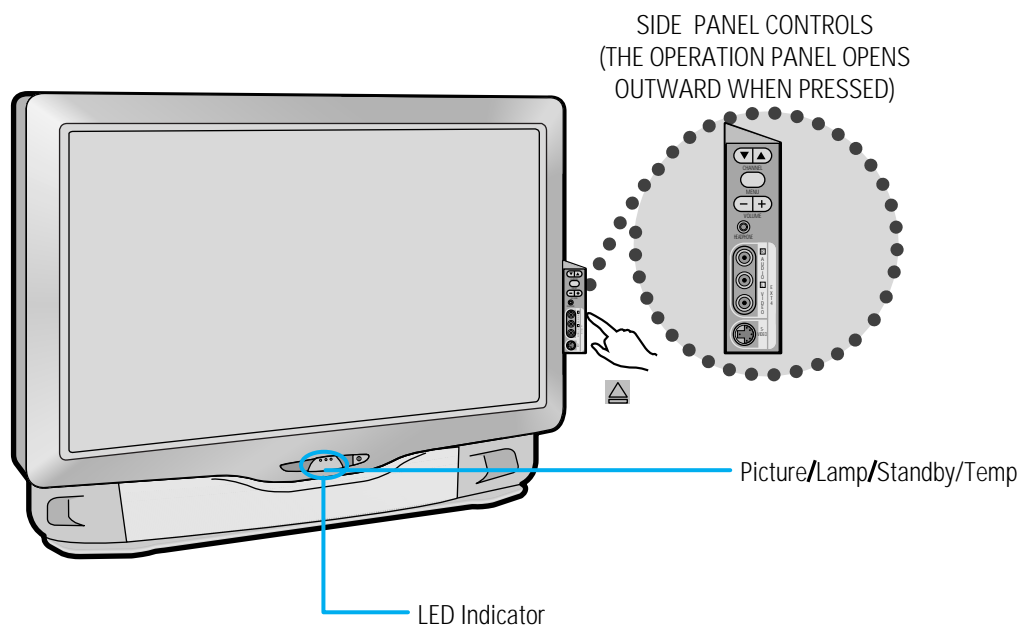
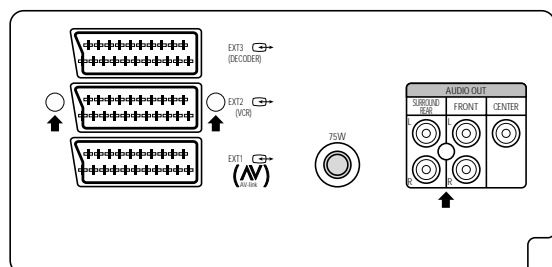


Fig. 5-2

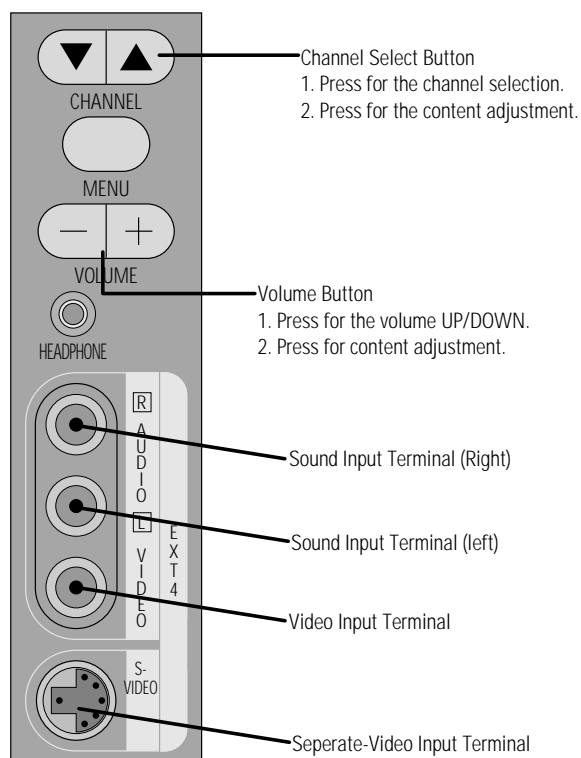
5-4 Side Panel Controls



4-4-1 Rear Panel Jacks



5-4-2 Side Operation Panel



5-5 Service Mode Adjustments

5-5-1 MATRIX IC (TDA4780) Adjustment

No.	Item	Range	Initial value	Description
00	RED DRIVE	63	52	Adjustment for the R gain
01	GREEN DRIVE	63	48	Adjustment for the G gain
02	BLUE DRIVE	63	53	Adjustment for the B gain
03	RED CUTOFF	63	32	Adjustment for the R cutoff
04	GREEN CUTOFF	63	32	Adjustment for the G cutoff
05	BLUE CUTOFF	63	32	Adjustment for the B cutoff
06	SUB BRIGHTNESS	20	14	Adjustment for the brightness
07	SUB CONTRAST	20	20	Adjustment for the contrast
08	SUB COLOR	20	00	Adjusts the color difference signal level of YUVIN 1
09	PEAK DRIVE LIMIT	63	43	Adjustment for the peak drive limit
10	P.YC DELAY	15	13	Adjustment for the P.YC delay
11	SUB TINT	17	09	Adjusts the center of tint (0 →R 9 →CENTER 17 →G)
12	γ CORRECTION	63	63	Adjustment for the γ correction

5-5-2 LCD Interface IC (CXA1853_A) Adjustment

No.	Item	Range	Initial value	Description
00	Gamma gain 1	63	41	Adjusts the gain of black side on the gamma curve (R,G,B)
01	R gamma gain 1	63	39	Adjusts the gain of black side on the gamma curve for R
02	B gamma gain 1	63	48	Adjusts the gain of black side on the gamma curve for B
03	Gamma gain 2	63	16	Adjusts the gain of white side on the gamma curve (R,G,B)
04	R gamma gain 2	63	36	Adjusts the gain of white side on the gamma curve for R
05	B gamma gain 2	63	36	Adjusts the gain of white side on the gamma curve for R
06	Gamma ctrl 2	63	34	Adjusts the change point of the white side on the gamma curve (R,G,B). The smaller the value, the more it moves towards white.
07	Main bright	63	42	Adjust the DC level of R,G,B signal before doing the gamma adjustment. It determines the change point of the gamma curve. The greater the value, the darker it gets.
08	R main bright	63	36	Adjusts the DC level of R before doing the gamma adjustment. It determines the change point of the gamma curve. The greater the value, the darker it gets.
09	B main bright	63	36	Adjusts the DC level of B before doing the gamma adjustment. It determines the change point of the gamma curve. The greater the value, the darker it gets.
10	White limit	63	41	Adjusts the limiter voltage of white peak of R,G,B video signal (applied to LCD). The greater the value, the lower the limiter voltage becomes.

5-5-3 LCD Interface IC (CXA1853_B) Adjustment

No.	Item	Range	Initial value	Description
00	Gamma ctrl 1 off	63	36	Adjusts the change point of the black side on the gamma curve (R,G,B). The greater the value, the more it moves towards black
01	Black Stretch On	36	33	Adjusts the change point of the back side on the (R,G,B) gamma curve. Moves the change point to the white side. The value is always less than the one of the gamma ctrl 1 off.
02	R gamma ctrl 1	63	40	Adjusts the change point of the back side on the gamma curve for R. The greater the value, the more it moves towards black.
03	B gamma ctrl 1	63	32	Adjusts the change point of the black side on the gamma curve for B. The greater the value, the more it moves towards black.
04	Sub bright	20	10	Adjusts the brightness of R, G, B after doing the gamma adjustment. No change of the gamma curve. The greater the value, the darker it gets.
05	R sub bright	63	35	Adjusts the brightness of R after doing the gamma adjustment. No change on the gamma curve. The greater the value, the darker it gets.
06	B sub bright	63	42	Adjusts the brightness of B after doing the gamma adjustment. No change on the gamma curve. The greater the value, the darker it gets.
07	Common ctrl	63	30	Adjusts the common voltage (applied to LCD)
08	Signal center	63	15	Adjusts the DC level of composite video signals (applied to LCD). Set the signal center to 7V.
09	Sub contrast	63	47	Adjusts the gain of R, G, B (applied to LCD).
10	R sub contrast	63	42	Adjusts the gain of R (applied to LCD).
11	B sub contrast	63	34	Adjusts the gain of B (applied to LCD).

5-5-4 LCD CONTROLLER (CXD2443Q) Adjustment

No.	Item	Range	Initial value	Description
00	LCD h pos	255	70	Determines the start location of horizontal indication by picture element.
01	LCD v pos	15	3	Determines the start location of vertical indication (within 1H)
02	SH position	15	6	Determines the phase of the sample/hold pulse.

5-5-5 Lamp's Total Hours

No.	Item	Range	Initial value	Description
00	lamp total time	05999		Records total elapsed time (from the time where power is first applied). Reset not possible
01	lamp time	05999		Records total elapsed time (from the point where power is first applied). Reset (using the cancel key). The lamp time is displayed by using the Display key. Reset must be done during the set shipment. Reset must be done after lamp replacement.

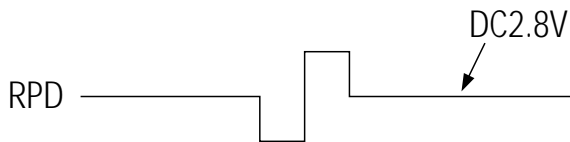
5-5-6 Option

No.	Item	Range	Initial value	Description
00	Epg	on/off	off	Electronic program guide
01	Av_link	on/off	on	Av_link
02	Palplus	on/off	off	-
03	27Mhz external	on/off	on	27Mhz external
04	16 : 9 wide	on/off	on	16 : 9 wide
05	Dolby prologic	on/off	on	Dolby prologic
06	3d sound	on/off	off	3d sound
07	S-audio mute	on/off	on	Scart audio mute
08	Blue screen	on/off	on	Blue screen
09	UHF only	on/off	off	UHF only
10	Vga	on/off	off	Vga input
11	Atm one run	on/off	on	Atm one run ("OFF" for France)
12	Size key	on/off	off	Size key
13	Vip option	on/off	on	Vip option

5-6 Circuit Adjustments

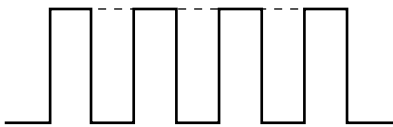
5-6-1 LCD Control Board PLL Adjustment

1. Input a color bar signal.
2. Connect CNL06,RPD to an oscilloscope, and check the waveforms.
(1 V/div, 20 u sec/div)



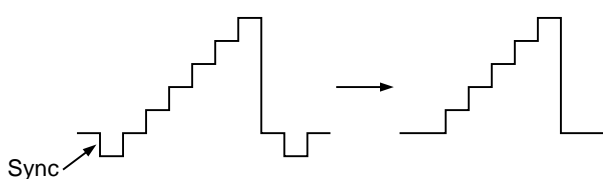
5-6-2 Matrix IC (TDA4780) Sub Tint Adjustment

1. Input a color bar signal.
2. Connect CNL07 (B output) to an oscilloscope, and check the waveform.
(0.5 V/div, 20 u sec/div)



5-6-3 Matrix R Output Signal Amplitude Adjustment (Red Drive)

1. Input a 10-step signal (Color OFF).
2. Connect CNL07 (R output) to an oscilloscope, and check the waveform.
(0.5 V/div, 10 u sec/div)
3. Adjust the red drive so that the signal amplitude becomes 0.7Vp-p.
4. Adjust the Sub-brightness of TDA4780 so that the waveform (without sync) is seen as shown in the figure below.



5-6-4 Matrix G Output Signal Amplitude Adjustment (Green Drive)

1. Input a 10-step signal (Color OFF).
2. Connect CNL07 (G output) to an oscilloscope, and check the waveform.
(0.5 V/div, 10 u sec/div)
3. Adjust the green drive so that the signal amplitude becomes 0.7Vp-p.

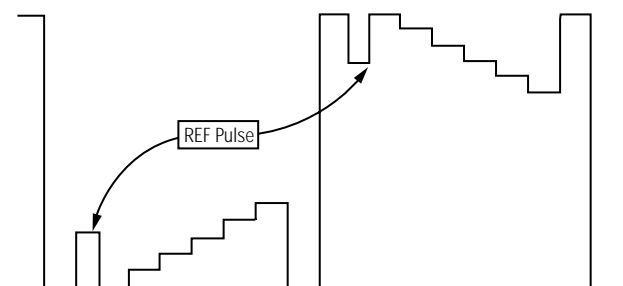
5-6-5 Matrix B Output Signal Amplitude Adjustment (Blue Drive)

1. Input a 10-step signal (Color OFF).
2. Connect CNL07 (B output) to an oscilloscope, and check the waveform.
(0.5 V/div, 10 u sec/div)
3. Adjust the blue drive so that the signal amplitude becomes 0.7Vp-p.

5-6-6 Main Brightness Adjustment

1. Input a 10-step signal (Color OFF).
2. Connect LCD CNL08(R1) input to an oscilloscope, and check the waveform.
(2 V/div, 10 u sec/div)
3. Adjust the main brightness so that the Ref pulse is positioned on the center of signal.

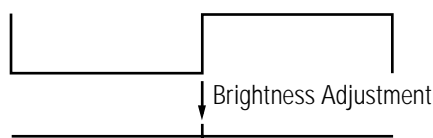
Note : The change point (on gamma curve) is determined by Ref.



5-6-7 R Main Brightness & B Main Brightness Adjustments

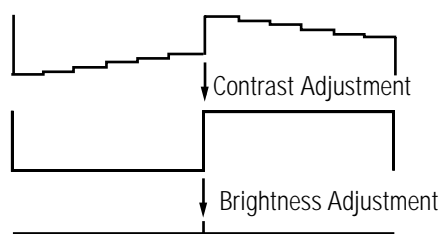
1. Input a 5-step signal (Color OFF).
2. Connect CH1 to LCD G1 input and CH2 to LCD R,B input. (1 V/div, 10 u sec/div)
3. Reverse the CH2 signal, and add CH1 and CH2 in ADD mode.
4. Adjust R,B main brightness for the waveform shown below.

Note: The R,B main brightness adjustment should be done with Gamma Adjustment OFF (gamma ctrl1 = 63, gamma ctrl2 = 17).



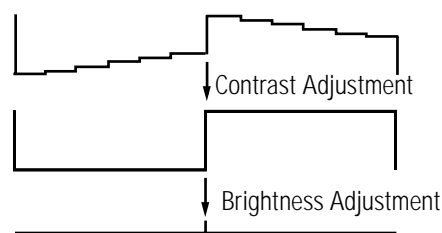
5-6-8 R Sub-brightness & R Contrast Adjustments

1. Input a 5-step signal (Color OFF).
2. Connect CH1 to LCD G1 input and CH2 to LCD R1 input. (1 V/div, 10 u sec/div)
3. Reverse the CH2 signal, and add CH1 and CH2 in ADD mode.
4. Adjust R sub-contrast and R sub-brightness waveforms, as shown below:



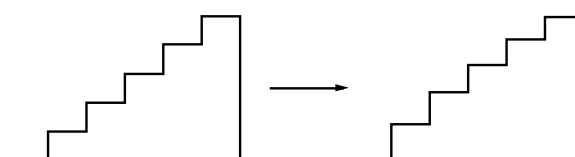
5-6-9 B Sub-brightness & B Contrast Adjustments

1. Input a 5-step signal (Color OFF).
2. Connect CH1 to LCD G1 input and CH2 to LCD B1 input. (1 V/div, 10 u sec/div)
3. Reverse the CH2 signal, and add CH1 and CH2 in ADD mode.
4. Adjust B sub-contrast and B sub-brightness waveforms, as shown below:



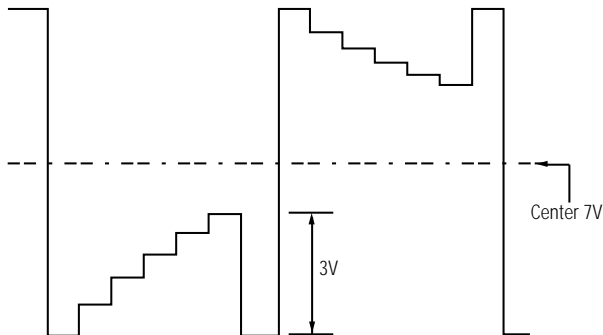
5-6-10 Gamma Adjustment

1. Input a 5-step signal (Color OFF).
2. Connect LCD G1 input to an oscilloscope. (2 V/div, 10 u sec/div)
3. Adjust the gamma gain1, gain2 and the gamma ctrl1, ctrl2 for the waveform shown below.



5-6-11 Sub-Contrast Adjustment

1. Input a 5-step signal (Color OFF).
2. Connect LCD G1 input to an oscilloscope.
(2 V/div, 10 u sec/div)
3. Adjust the sub-contrast so that the signal level is 3V, as shown below:



5-6-12 Signal Center Adjustment

1. Input a 5-step signal (Color OFF).
2. Connect LCD G1 input to an oscilloscope, and check the waveform.
(2 V/div, 10 u sec/div)
3. Set the signal center to 7V.

5-6-13 Common Voltage Adjustment

1. Connect LCD COMMON input to an oscilloscope, and check the waveform.
(1 V/div, 10 u sec/div)
2. Set the common control to 6.8V.

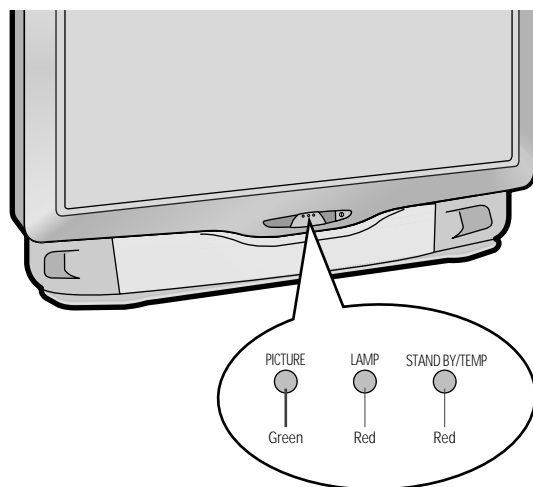
5-6-14 White Balance Adjustment

1. Input a lion head pattern from a pattern generator.
2. Adjust the sub-brightness so that the white cannot be saturated.
3. Adjust R,B contrast for the high light of white balance.
4. Adjust R,B sub-brightness when the middle tone is not black and white, but colored. Repeat adjustments 3 ~ 4 for optimum.
5. Adjust gamma ctrl1 for adjusting the brightness of the black side.
6. Adjust R,B gamma ctrl1 while checking the tone of the black side so that any color is not seen.
7. Repeat adjustments 2 ~ 6, if necessary.

5-6-15 Center Convergence Adjustment

1. Input a lion head pattern from a pattern generator.
2. Adjust the LCD Horizontal/Vertical POS.

5-7 LED Display Check



○ : OFF ● : ON ◐ : Blinking

No	Status	Picture	Lamp	Stand By Temp
1	Master Power ON (in the Stand-by Mode)	○	○	●
2	Normal operation	●	●	○
3	Lamp is warming up. The normal picture comes on after 25 seconds.	◐ ○	● or ◐	○ ○
4	Air vent cover in the rear of the TV is not properly installed.	○	◐	◐
5	Inside temperature of the TV is over normal. Clean the air vent cover in the rear of the TV. Turn the TV back on after 1 hour. (see below "Temperature")	○	○	◐
6	The lamp needs to be replaced.	◐	◐	◐

◆ Temperature

When the inside temperature of the TV becomes too high, the TV set is automatically turned off. You will observe the following.

1. "TEMP" LED is blinking for about 5 ~ 6 seconds.
2. The picture is turned to blue screen and "TEMPERATURE" character blinks for about 5 ~ 6 seconds.
3. The power is turned off and "TEMP" LED is blinking for about 20 seconds.
(This is not a TV set failure and normal operation)