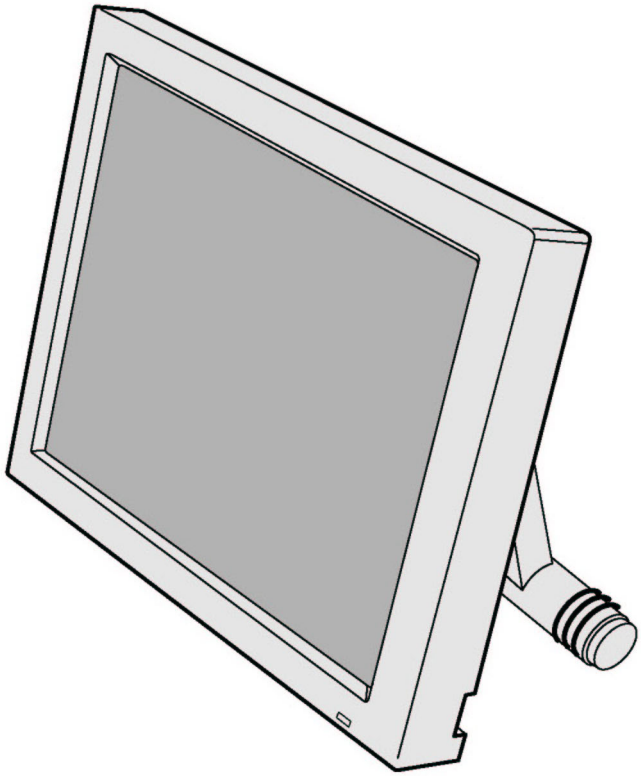
SERVICE MANUAL

LMU-TK12AS(SS)
LMU-TK12AS(K) (SS)
LMU-TK12ASTR (SS)
LMU-TK12ASTR(K) (SS)
LMU-TK12ASTR(K) (UK)

INDUSTRIAL MONITOR

PRODUCT CODE No.	
LMU-TK12AS/SS	1938 102 39
LMU-TK12AS(K)/SS	1938 102 86
LMU-TK12ASTR/SS	1938 102 40
LMU-TK12ASTR(K)/SS	1938 115 02
LMU-TK12ASTR(K)/UK	1938 115 05



REFERENCE NO.SM 920020

INDEX

Refer to the separate volume User’ s Manual
That included for instruction.

PRECAUTIONS

Placement precautions

- Avoid placing the unit in humid or dusty places, or where it will be exposed to excessive heat (direct sunlight, heaters, etc.)
- Do not step on or set anything on the AC power cord. DAMAGE TO THE AC POWER CORD IS A SAFETY RISK AND CAN CAUSE A FIRE.
- For use with specified AC adapter (GI40-US1225) only.
- Install the unit only on a stable and smooth surface.
- Do not connect the unit to the same AC as outlet with appliances that generate large amounts of interference (such as heaters with thermostats, appliances with motors, etc.). It is best to use a completely separate electrical outlet.
- Keep the unit away from water. If water accidentally enters the unit, unplug the AC power cord immediately. DO NOT PLUG IN THE UNIT AGAIN.

Handling precautions

- Avoid bending, kinking or damaging the AC power cord.
- Never insert or remove the power cord with wet hands. Also, be sure to hold cord by the plug when removing it from the outlet.
- Do not remove any parts that are held in place with screws. (The unit does not contain any user-serviceable items.)
- Maintain standard room temperature (5˚C to 35℃, or 41˚F to 104˚F) during use. Do not subject the unit to shock or vibration. Do not move the unit while it is in use.
- A rapid increase in room temperature in cool weather can cause condensation to form inside the unit. If this occurs, wait at least 15 minutes after turning the unit on before attempting to operate it.

1.MAIN SPECIFICATION

LCD

Liquid Crystal Panel	TFT
Display Size	12.1"
Pixel Configuration	800 x 600
Pixel Pitch	0.308 x 0.308 mm
Brightness	200 cd/m^2
Response Time	50 ms
Contrast	150 : 1 typ.
Angle of Visibility	Up 30, Down 45, Right 60, Left 60 degrees (contrast ratio of less than 10)

Video

Horizontal signal	31.4 - 48.1kHz
Vertical signal	56 - 75Hz
Video Signal	Analog RGB 75ohm 0.7Vp-p
No. of Colors	16.19 million
OSD Language	English, German, French, Spanish
Plug & Play	VESA DDC1, DDC2B
Power Management	VESA DPMS

Touch Screen

Type	Resistive
Electrical Resolution	4095 x 4095 (0.1 mm)
Communication	Bi-directional asynchronous RS-232C serial communication

Physical

Dimensions	295 (W) x 233 (H) x 42 (D) mm	
Weight	2.0 kg	
Operating Conditions	Operating Temperature:	5°C to 35℃
	Humidity:	30% to 85% RH (no condensation)
Power Supply/AC Adapter	Model Name:	GI40-US1225
	Input:	115-240VAC 1.0A-0.55A, 50-60Hz
	Output:	DC 12V 2.5A
Power Consumption	17W (3W in Energy Saving mode)	

Note : To improve this LCD monitor's performance level, its specifications and appearance are subject to change without notice.

2.TROUBLESHOOTING

The "TROUBLESHOOTING for LCD Monitor" is described in below.
Please refer to the manual "TROUBLE SHOOTING for Touch-Screen" in CD-ROM that included in LMU-TK12ASTR/SS. LMU-TK12ASTR(K)/SS. LUM-TK12ASTR(K)/UK

Sympton		Check Points	Treatments	Class
No Picture with LCD back light OFF				
	1	Is the Power to a LCD monitor "ON"?	Check AC outlet, AC cord, DC Jack and Power switch for a LCD monitor	A
	2	Is an AC Adapter defective?	Replace an AC Adapter with the new one	B
	3	Is the Power to a computer "ON"?	Check AC outlet, AC cord, DC Jack and Power switch for a computer	A
	4	Is a computer standing by ?	Be out of standing by condition, by operating to a computer	A
	5	Is the wire harness between main PCB and Rotary volume disconnected?	Check the connection of wire harness	C
	6	Is the wire harness between main PCB and DC-DC PCB disconnected ?	Check the connection of wire harness	C
	7	Is the wire harness between Inverter PCB and a LCD module disconnected ?	Check the connection of wire harness	C
	8	Is the wire harness between main PCB and Inverter PCB disconnected ?	Check the connection of wire harness	C
	9	Is the Inverter unit defective ?	Replace an Inverter unit with the new one	C
	10	Is the rotaly volume defective?	Replace a sub PCB with the new one	C
	11	Is a LCD module defective ?	Replace a LCD module with the new one	C
	12	Is the main PCB defective ?	Replace the main PCB with the new one	C
No Picture with LCD back light ON				
	1	Is a signal cable connected securely ?	Check the connection of a signal cable	A
	2	Disconnected a signal cable ? or Bent a terminal pin ?	Replace a signal cable with the new one	B
	3	Is the wire harness between main PCB and a LCD module disconnected ?	Check the connection of wire harness	C
	4	Is the Brightness control volume defective ?	Replace the Volume PCB with new one, and check the screen	C
	5	Is a LCD module defective ?	Replace a LCD module with the new one	C
	6	Is the computer's signal timing not agreeable to the LCD's specification ?	Adjust the computer's signal timing, if possible	B
	7	Is the main PCB defective ?	Replace the main PCB with the new one	C

CLASS

A It is possible to treated by end-user

B It might be possible to treate by end-user in some case.

C It must be treated by Professional Technical Staff

Sympton		Check Points	Treatments	Class
Screen's display range is incorrect				
	1	Is the adjustment for screen performed correctly ?	Adjust the screen correctly	A
	2	Is the size of screen set correctly ?	Set the size of screen again(refer to User's Manual for the computer)	A
	3	Is the switch setting for adapter to convert signals performed correctly ?	Check the specification of an adapter to convert signals and a computer	B
Screen is distorted				
	1	Is a signal cable connected securely ?	Check the connection of a signal cable	A
	2	Ia a signal cable extended too long ?	Not to extend a signal cable	A
	3	Is the output level of a computer screen not agreeable to the LCD's specification ?	Check the specification of a computer	B
	4	Is the main PCB defective ?	Replace the main PCB with the new one	C
Part of colors(R/G/B) is not displayed Black line is appeared vertically				
	1	Is a signal cable connected securely ?	Check the connection of a signal cable	A
	2	Is the connection between main PCB and a LCD module securely ?	Check the connector	C
	3	Is the main PCB defective ?	Replace the main PCB with the new one	C

CLASS

A It is possible to treated by end-user

B It might be possible to treate by end-user in some case.

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3.MAINTENANCE

3-1 LMU-TK12AS

Disassembling the major components

（1） Cabinet

1.Unscrew to secure the cabinet(8-position)
2.Pull the cabinet upward to remove it

（2） LCD Panel

1.Unscrew to secure the LCD Panel(4-position)
2.Pull the LCD Panel up carefully.Disconnect the FPC from main PCB,and pull the connector out to inverter unit.

（3） Inverter Unit

1.Unscrew to secure the Inverter Unit(3-position)
2.Disconnect the cable from the main PCB

（4） Main PCB

1.Pull the RGB signal cable out
2.Unscrew to secure the main PCB(4-position)
3.Disconnect the cables on the main PCB(5-position)
/One cable have already been disconnected
/One connector from Joint PCB
/One connector from the VR PCB
/One connector from the DC-IN PCB
/One connector from the Inverter PCB
4.Unscrew to secure the bracket for RGB Connector(2-position)

（5） Joint PCB

1.Unscrew to secure the Joint PCB(2-position)
2.Disconnect the cables from the main PCB and the LED PCB

（6） VR PCB

1.Unscrew to secure the VR PCB(2-position)
2.Disconnect the cable to the main PCB

（7） DC-IN PCB

1.Unscrew to secure the DC-IN PCB(2-position)
2.Disconnect one cable from Power Switch,and another cable from the main PCB

（8） Power Switch

1.Remove the Power Switch,while pressing the hook of the Power Switch

（9） LED PCB

1.Unscrew to secure the LED PCB(1-position)
2.One cable has already been disconnected.

3-2 LMU-TK12ASTR

Disassembling the major components

(1) Cabinet

1.Unscrew to secure the cabinet(8-position)
2.Pull the cabinet upward to remove it

(2) LCD Panel and Touch Panel

1.The Touch panel is on the LCD panel.The clearance between the Touch Panel and the bottom case are filled with 8 rubber pieces.Pull the right-side of the Touch panel upward carefuiiy,then turn it over at the left side of a bottom case.
2.Unscrew to secure the LCD Panel(4-position)
3.Pull the LCD Panel up carefully.Disconnect the FPC from main PCB,and pull the connector out to inverter unit.
4.Disconnect the cable on the Touch Controller PCB

(3) Inverter Unit

1.Unscrew to secure the Inverter Unit(3-position)
2.Disconnect the cable from the main PCB

(4) Main PCB

1.Pull the RGB signal cable out
2.Unscrew to secure the main PCB(4-position)
3.Disconnect the cables on the main PCB(6-position)
/One cable have already been disconnected
/One connector from Joint PCB
/One connector from the Touch Controller PCB
/One connector from the DC-IN PCB
/One connector from the Inverter PCB
/One connector from the VR PCB
4.Unscrew to secure the bracket for RGB Connector(2-position)

(5) Touch Controller PCB

1.Unscrew to secure the Touch controller PCB(2-position)
2.Disconnect the serial cable

(6) Serial Cable(Connector and Cable with bracket)

1.Unscrew to secure the beacket for serial cable(2-position)

(7) Joint PCB

1.Unscrew to secure the Joint PCB(2-position)
2.Disconnect the cables from the main PCB and the LED PCB

(8) VR PCB

1.Unscrew to secure the VR PCB(2-position)
2.Disconnect the cable to the main PCB

(9) DC-IN PCB

1.Unscrew to secure the DC-IN PCB(2-position)
2.Disconnect one cable from Power Switch,and another cable from the main PCB

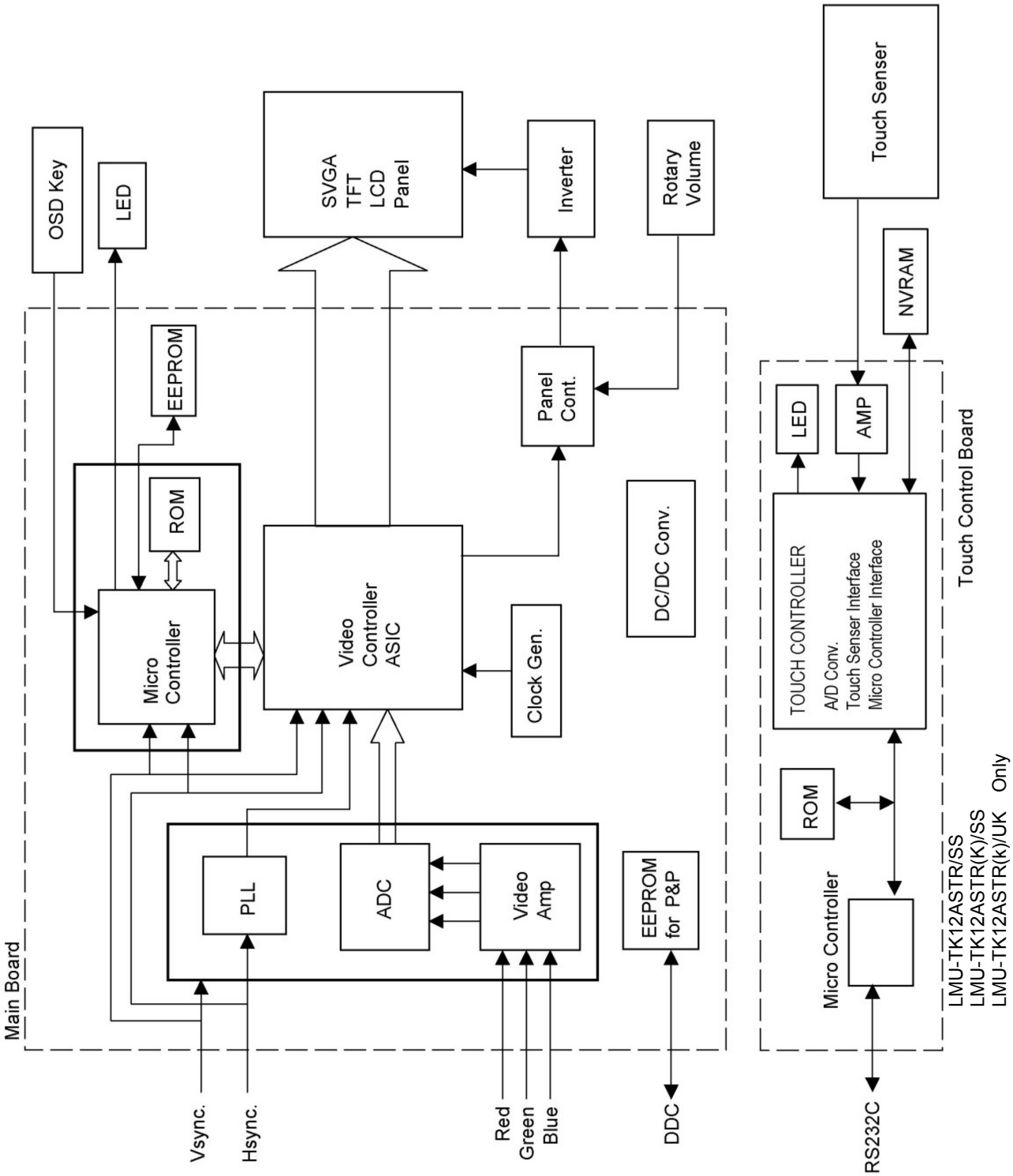
(10) Power Switch

1.Remove the Power Switch,while pressing the hook of the Power Switch

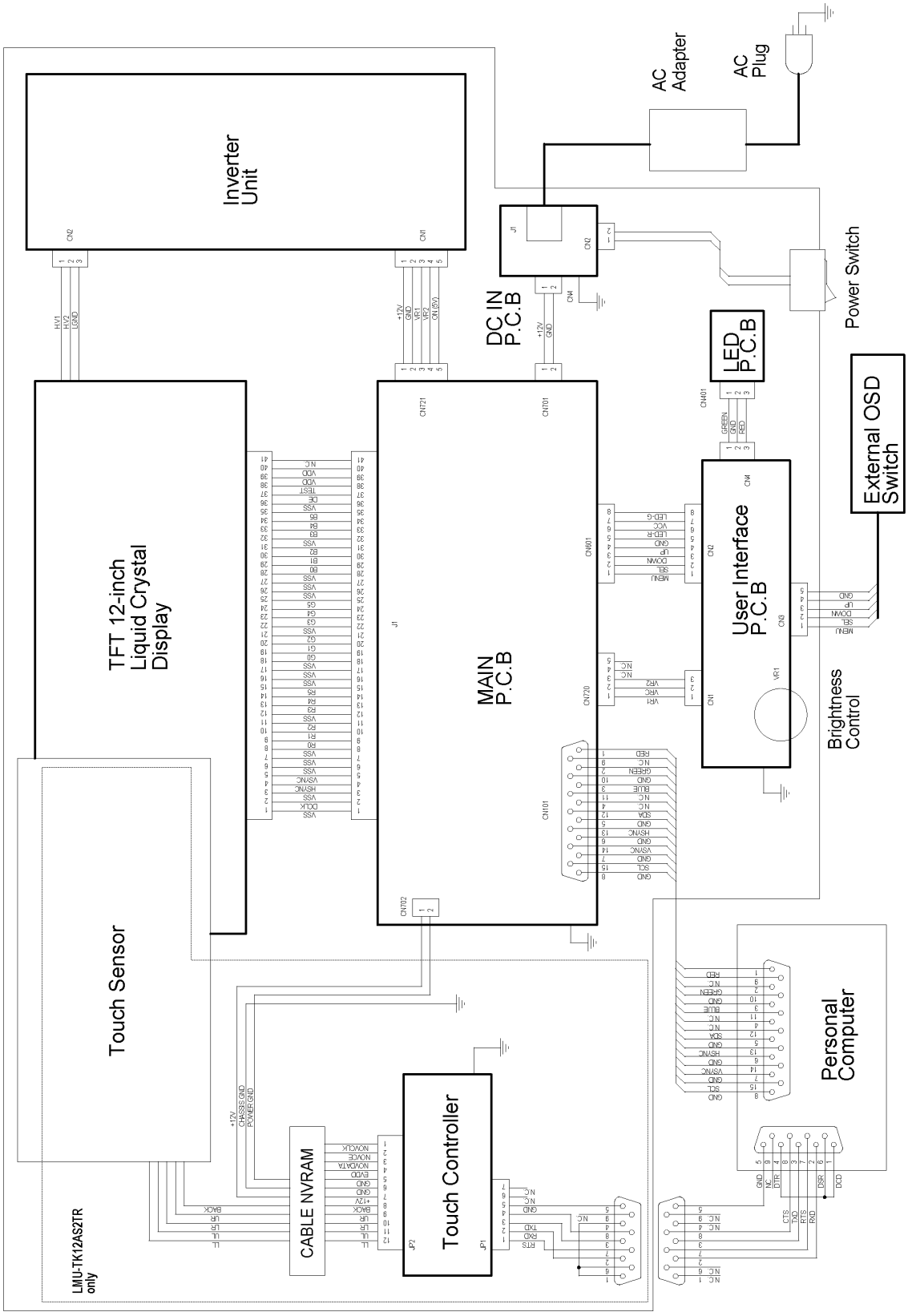
(11) LED PCB

1.Unscrew to secure the LED PCB(1-position)
2.One cable has already been disconnected.

4.BLOCK DIAGRAM



5.CONNECTION DIAGRAM



6.TABLE OF SIGNAL NAME

Main board

Symbol	Signal Name	Location	Notes
DCLK	Data Clock	J1-2	
HSYNC	Horizontal Sync.	J1-4	This signal is invalid, input H or L.
VSYNC	Vertical Sync.	J1-5	This signal is invalid, input H or L.
R0	Red Data (LSB)	J1-9	
R1	Red Data	J1-10	
R2	Red Data	J1-11	
R3	Red Data	J1-13	
R4	Red Data	J1-14	
R5	Red Data (MSB)	J1-15	
G0	Green Data (LSB)	J1-19	
G1	Green Data	J1-20	
G2	Green Data	J1-21	
G3	Green Data	J1-23	
G4	Green Data	J1-24	
G5	Green Data (MSB)	J1-25	
B0	Blue Data (LSB)	J1-29	
B1	Blue Data	J1-30	
B2	Blue Data	J1-31	
B3	Blue Data	J1-33	
B4	Blue Data	J1-34	
B5	Blue Data (MSB)	J1-35	
DE	Data Enable (positive)	J1-37	
TEST	Display test	J1-38	For display test, to be L.
VDD	Power Supply	J1-39	3.3V
VDD	Power Supply	J1-40	3.3V
VIN	Inverter Power	CN721-1	12V
VR1,2	Controlled Voltage	CN721-3,4	
ON	Back Light Control	CN721-5	H : Light ON
VR1,2	Brightness Volume	CN720-1,3	
VRC	Brightness Volume	CN720-2	
MENU	MENU Key	CN601-1	
ENTER	ENTER Key	CN601-2	
DOWN	DOWN Key	CN601-3	
UP	UP Key	CN601-4	
LED-R	LED Red	CN601-6	
LED-G	LED Green	CN601-8	
RED	VIDEO Red Signal	CN101-1	
GREEN	VIDEO Green Signal	CN101-2	
BLUE	VIDEO Blue Signal	CN101-3	
HSYNC	Horizontal Sync.	CN101-13	
VSYNC	Vertical Sync.	CN101-14	
SDA	DDC Data	CN101-12	
SCL	DDC Clock	CN101-15	
VR1,2	Controlled Voltage	CN720-3,4	
ON	Back Light Control	CN720-5	H : Light ON

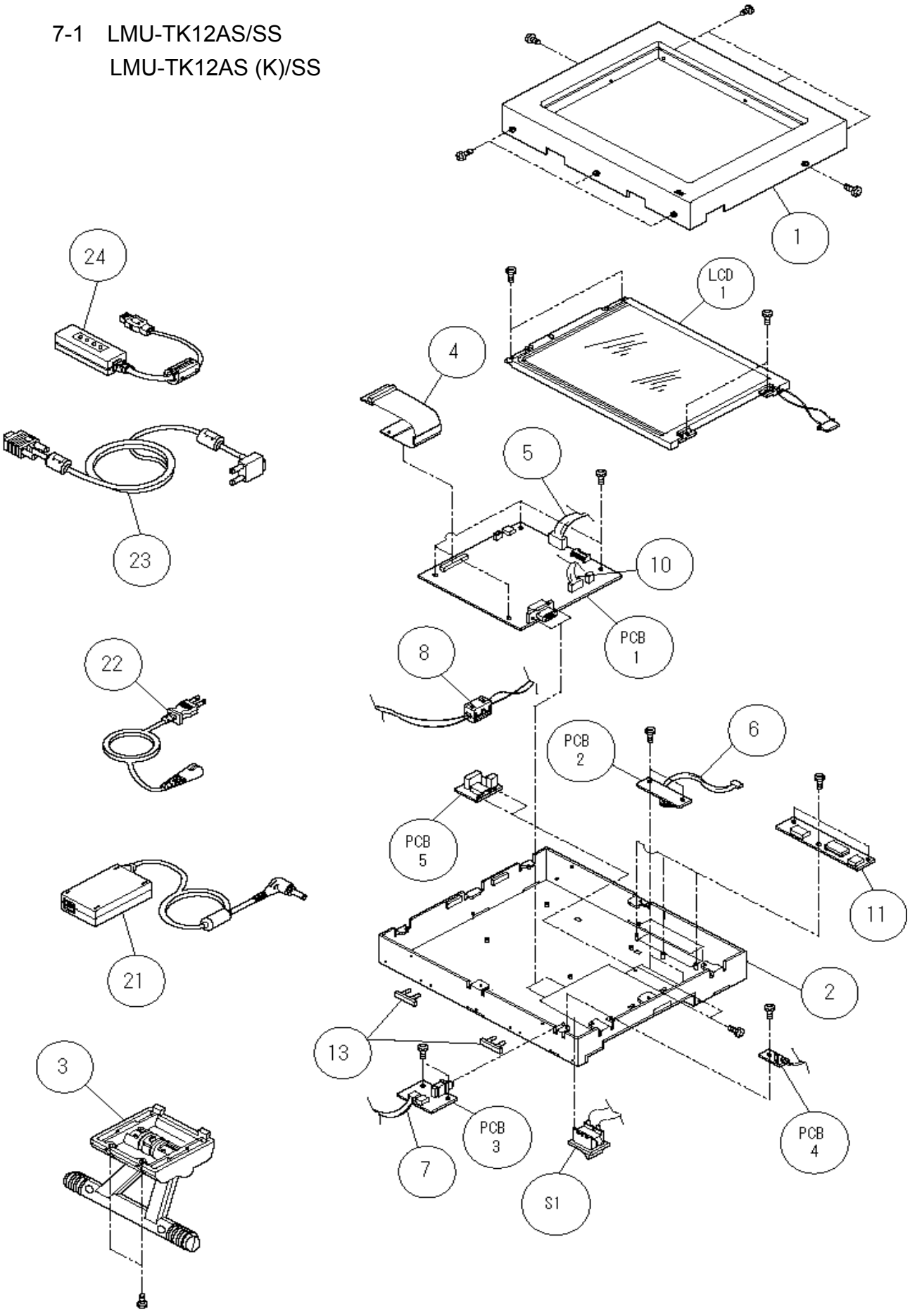
Touch Controller Board

LMU-TK12ASTR/SS, LMU-TK12ASTR(K)/SS, LMU-TK12ASTR(K)/UK only

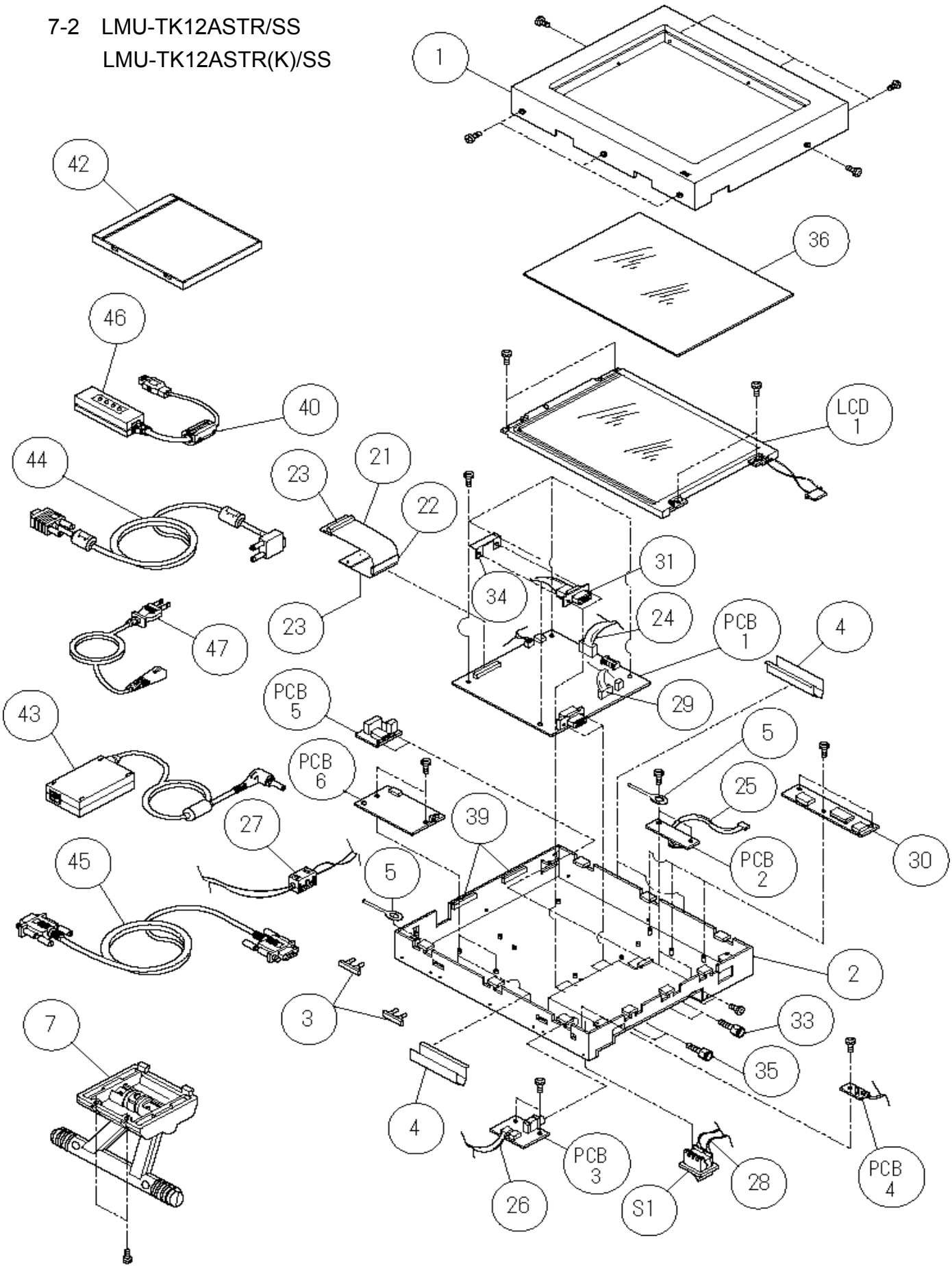
Symbol	Signal Name	Location	Notes
RTS	Request To Send	JP1-1	
RXD	Receive Data	JP1-2	
TXD	Transmit Data	JP1-3	
CTS	Clear To Send	JP1-4	
DCD	Data Carrier Detect	NC	
DTR	Data Terminal Ready	NC	
GND	Signal ground	NC	
DSR	Data Set Ready	NC	
GND	Chassis (earth) ground	NC	
UR	Upper right (UR) corner	JP2-9	
LR	Lower right (LR) corner	JP2-10	
UL	Upper left (UL) corner	JP2-11	
LL	Lower left (LL) corner	JP2-12	

7.EXPLODED VIEW

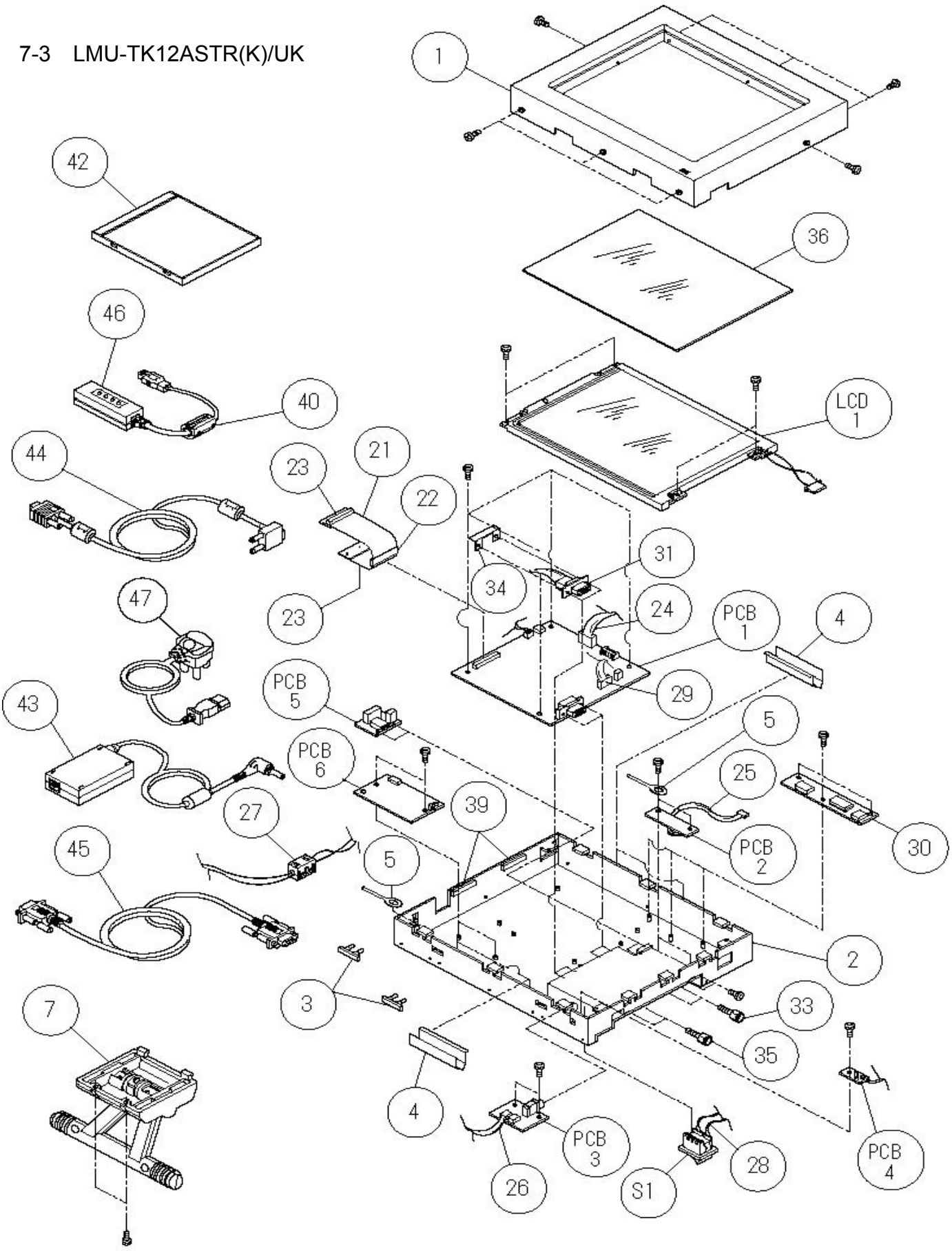
7-1 LMU-TK12AS/SS
LMU-TK12AS (K)/SS



7-2 LMU-TK12ASTR/SS
LMU-TK12ASTR(K)/SS



7-3 LMU-TK12ASTR(K)/UK



8.Parts Lis

⚠ CAUTION

Parts marked as ⚠ Are very important to secure safety.
In case of replacement, it is required to use designted parts for safety.

8-1 LUM-TK12AS/SS LMU-TK12AS(K)/SS

REF No	⚠	PART No.	DESCRIPTION	Q'ty	NOTES
	OUTER				
		632 872 2563	OUTER CARTON	1	
		632 758 4209	LABEL,BAR CODE	1	
	INDIVIDUAL				
		632 872 2570	PAD,BOTTOM	1	
		632 872 2587	PAD,SIDE	1	
		632 872 2594	PAD,ACCESSORY	1	
		632 872 2600	PAD,TOP	1	
		632 809 9450	POLY COVER,120X320	1	FOR CONTROL BOX
		632 822 4425	POLYETHYLENE BAG, 300X450	1	FOR LCD MONITOR
		632 607 4824	POLYETHYLENE BAG,L180X270	1	FOR MANUAL
		632 567 2588	POLYETHYLENE BAG,200X300	1	FOR RGB CABLE
	ACCESSORY				
		661 021 9788	INSTRUCTION MANUAL,ENGLISH	1	
21		632 880 5488	AC ADAPTOR	1	
22	⚠	632 880 1596	AC CODO,1.8M	1	
22	⚠	632 873 0926	AC CODO	1	
23		632 873 4696	VGA CABLE,150CM	1	
24		661 001 3164	REMOTE CONTROLLER ASSY	1	
	CABINET1				
1		632 868 5622	TOP LID	1	
1		632 880 4719	TOP LID	1	LMU-TK12AS(K)/SS
	CHASSI				
2		661 039 5598	BOTTOM LID ASS'Y, CHASSIS	1	
2		661 020 0694	BOTTOM LID ASS'Y, CHASSIS	1	LMU-TK12AS(K)/SS
13		632 868 5615	BASE,CUSHION	2	
	STAND				
3		661 020 3398	STAND ASSY	1	
	CHASSIS ELC				
4		661 020 3329	FPC BOARD ASSY	1	
5		661 036 9636	WIRE HARNESS,MAIN-INV	1	

6		661 020 8621	WIRE HANESS,5P-80MM	1	
6		661 042 8340	WIRE HANESS,5P-80MM	1	LMU-TK12AS(K)/SS
7		661 046 9138	WIRE HANESS,2P-370MM	1	
8		632 837 2713	CORE	1	
10		661 039 8056	WIRE HANESS,MAIN-JOINT	1	
11		661 006 3626	DC-AC INVERTER	1	
S1		661 020 4333	SEESAW SWITCH ASSY	1	
LCD1		632 884 7655	LIQUID CRYSTAL DISPLAY	1	
	PC BOARD 1				
PCB 1		661 039 7271	PW BOARD ASS'Y, MAIN	1	
	PC BOARD 2				
PCB 2		632 843 3469	PW BOARD ASS'Y, VR	1	
	PC BOARD 3				
PCB 3		632 873 4146	PW BOARD ASS'Y, DC IN	1	
	PC BOARD 4				
PCB 4		661 034 9478	PW BOARD ASS'Y, LED	1	
	PC BOARD 5				
PCB 5		661 003 0741	PW BOARD ASS'Y, JOINT	1	

⚠ CAUTION

Parts marked as ⚠ Are very important to secure safety.
In case of replacement, it is required to use designted parts for safety.

8-2 LUM-TK12ASTR / SS LMU-TK12ASTR(K) /SS LUM-TK12ASTR(K) / UK

REF No	⚠	PART No.	DESCRIPTION	Q'ty	NOTES
	OUTER				
		632 872 2563	OUTER CARTON	1	TC(K)
		632 758 4209	LABEL,BAR CODE	1	
		632 779 1492	LABEL,COLOR,ORANGE 10	1	
		661 004 8852	LABEL,COLOR,LIGHTBLUE 10	1	LMU-TK12ASTR(K)/SS LMU-TK12ASTR(K)/UK
	INDIVIDUAL				
		632 872 2570	PAD,BOTTOM	1	
		632 872 2587	PAD,SIDE	1	
		632 872 2594	PAD,ACCESSORY	1	
		632 872 2600	PAD,TOP	1	
		632 298 2376	POLYETHYLENE BAG	1	SERIAL CABLE CNT
		632 822 4425	POLYETHYLENE BAG, 300X450	1	FOR LCD MONITOR
		632 607 4824	POLYETHYLENE BAG,L180X270	1	FOR MANUAL
		632 567 2588	POLYETHYLENE BAG,200X300	1	FOR RGB CABLE
		632 607 4824	POLYETHYLENE BAG,L180X270	1	FOR SERIAL CABLE
	ACCESSORY				
		661 021 9788	INSTRUCTION MANUAL,ENGLISH	1	
		661 021 9795	LEAFLET,SOFTWARE,JPN/ENGLIS	1	
		661 023 0790	INSTRUCTION MANUAL,GERMAN	1	
42		661 015 1705	CD-ROM DISK,FUJITSU	1	
43		632 880 5488	AC ADAPTOR	1	
44		661 049 6967	RGB CABLE,1.8M	1	
45		632 866 8397	SERIAL CABLE,1.8M	3	
46		661 001 3164	REMOTE CONTROLLER ASS'Y	1	
47	⚠	632 873 0926	AC CORD,	1	
47	⚠	632 880 1596	AC CORD,1.8M	1	
47	⚠	632 892 0792	AC CORD,1.8M	1	LMU-TK12ASTR/UK
	CABINET1				
1		632 880 1336	TOP LID ASSY	1	
1		632 880 4719	TOP LID ASSY	1	LMU-TK12ASTR(K)/SS LMU-TK12ASTR(K)/UK
2		661 042 5851	BOTTOM LID ASSY,CHASSIS	1	

2		661 050 7328	BOTTOM LID ASSY,CHASSIS	1	LMU-TK12ASTR(K)/SS LMU-TK12ASTR(K)/UK
3		632 868 5615	BASE,CUSHION	2	
4		661 039 9510	PLATE SPRING,EARTH	4	
5		632 250 0655	WIRE FIXTURE	2	
	STAND				
7		661 020 3398	STAND ASSY	1	
	CHASSIS ELC				
21		632 877 1837	FPC BOARD	1	
22		632 839 3800	CORE,80	1	
23		632 879 6052	SOCKET,41P	2	
24		661 036 9636	WIRE HARNESS,MAIN-INV	1	
25		661 042 8340	WIRE HARNESS,5P-80MM	1	
26		661 046 1934	WIRE HARNESS,2P-370MM	1	LMU-TK12ASTR(K)/UK
26		661 046 9138	WIRE HARNESS,2P-370MM	1	
27		632 837 2713	CORE	1	
28		661 039 8032	WIRE HARNESS,DC IN-PWR	1	
29		661 039 8056	WIRE HARNESS,MAIN-JOINT	1	
30		661 052 6725	POWER UNIT INVERTER	1	
30		661 038 2253	DC-AC INVERTER ASSY	1	LMU-TK12ASTR(K)/SS LMU-TK12ASTR(K)/UK
31		661 039 8070	CABLE,RS232C	1	
33		661 001 2570	SPECIAL SCREW	2	
34		632 889 5083	BRACKET,SERIAL	1	
35		661 001 2570	SPECIAL SCREW	2	
36		661 042 5868	TOUCH SENSOR ASSY	1	
39		632 873 4139	GASKET	2	
40		632 887 7072	CORE,50	1	
40		632 876 0480	CORE,50	1	
40		661 001 7278	CORE	1	LMU-TK12ASTR/SS LMU-TK12ASTR(K)/SS
LCD1		632 884 7655	LIQUID CRYSTAL DISPLAY,	1	
S1		632 887 8024	SEESAW SWITCH	1	
	PC BOARD 1				
PCB 1		661 051 1608	PCB-ML ASSY,MAIN	1	
PCB 1		661 042 5875	PW BOARD ASSY,MAIN	1	LMU-TK12ASTR(K)/SS LMU-TK12ASTR(K)/UK
	PC BOARD 2				
PCB 2		632 843 3469	PW BOARD ASS'Y, VR	1	

	PC BOARD 3				
PCB 3		632 873 4146	PW BOARD ASS'Y, DC IN	1	
	PC BOARD 4				
PCB 4		661 020 6344	PW BOARD ASS'Y, LED	1	
	PC BOARD 5				
PCB 5		661 020 6535	PW BOARD ASS'Y, JOINT	1	
	PC BOARD 6				
PCB 6		661 014 9337	PCB-W ASS'Y,	1	

8.APPENDIX

Version of Firmware

The Version of Firmware is displayed on screen.

Turn the Power Switch to 'OFF'. While pressing of the [ENTER] button, turn the Power Switch to 'ON'.