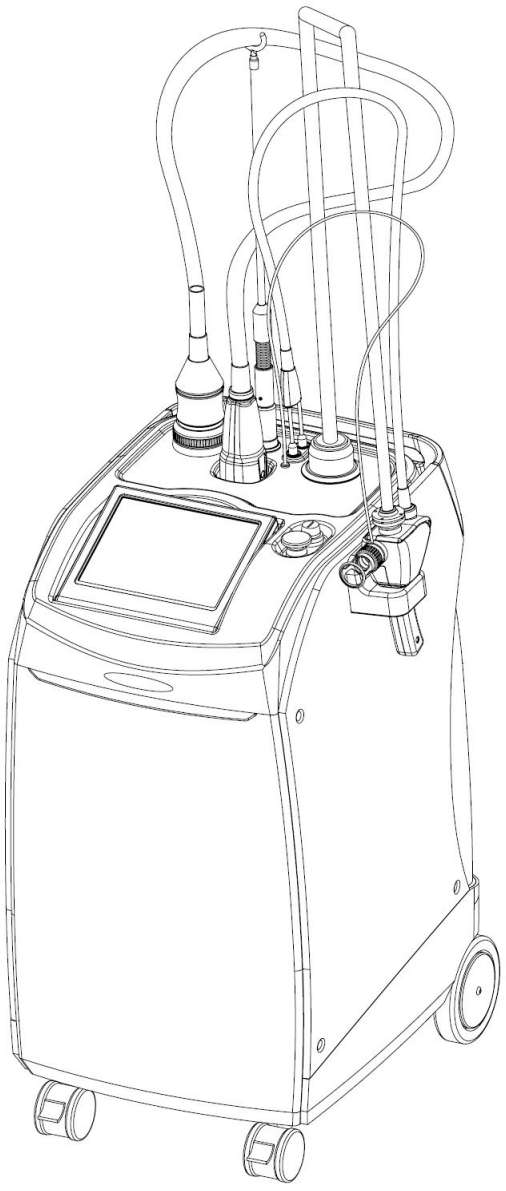
Qray FRX

Service Manual

Model : **Qray-FRX**



Qray FRX

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Contents

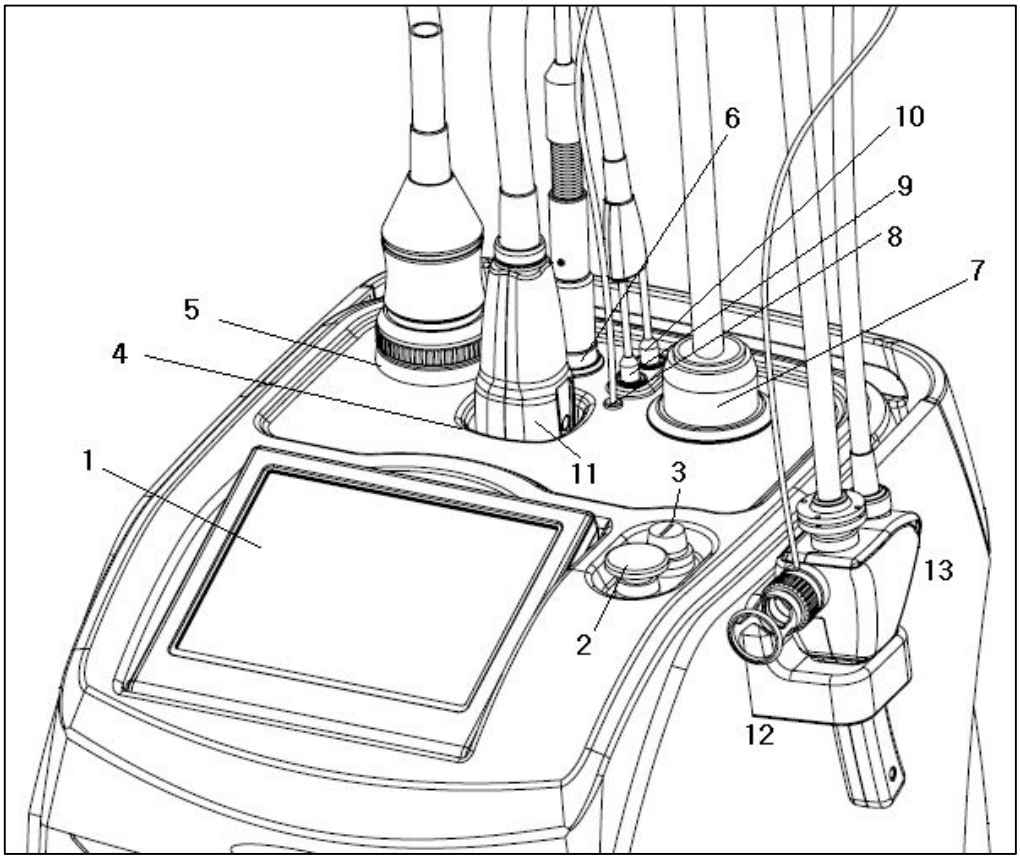
1. Overview

1) System Overview

This Laser Surgical Apparatus is composed of main body, hand-piece and articulated arm for laser output, foot switch, and power cord. Radiated laser will be used mainly for skin rejuvenation, wrinkle restoration and skin resurfacing.

2) Function and

a. Main Body (upper unit)



① LCD Monitor : LCD touch screen for control each mode and operation

② Emergency stop switch : Switch for operation halt at emergency

③ KEY switch: Main power switch. Used for on/off of equipment

④ Light Hand-piece holder : A holder for store hand-piece when it's not in the operation

⑤ Light Connecter : Terminal that connects main body and hand-piece

⑥ Light Hand-piece cable holder : Holder for hanging hand-piece cable

⑦ Articular arm part: Articular part that allows hand-piece freely moving and used for the path which transfers energy to laser hand-piece.

⑧ AIR Joint: Compressed air supply terminal

⑨ Scanner cable connector X : Connection terminal for X axis

⑩ Scanner cable connector Y : Connection terminal for Y axis

⑪ Light Hand-piece : Hand-piece that outputs Light

⑫ Laser Hand-piece :Hand-piece that outputs Laser

⑬ Laser Hand-piece : Hoder for hanging Hand-piece when it is not in use

b.Main Body(backside)

① Handle : Handle for equipment movement

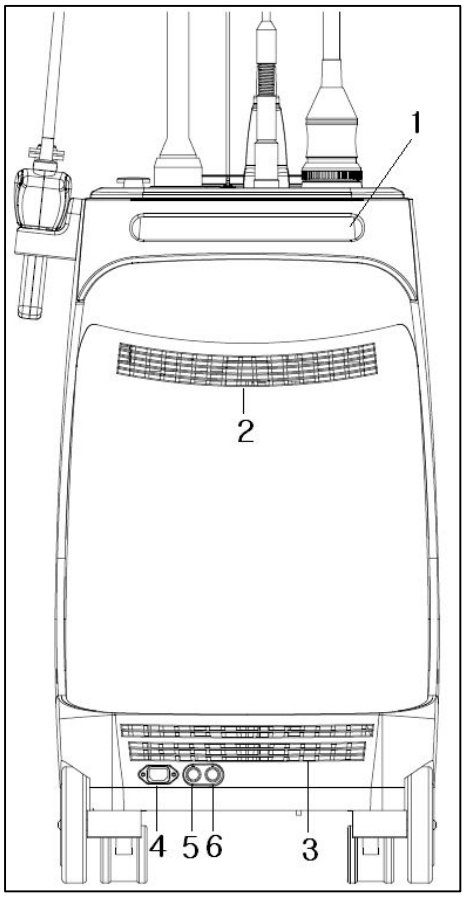
② Exhaust port :Heat discharging port(upper)

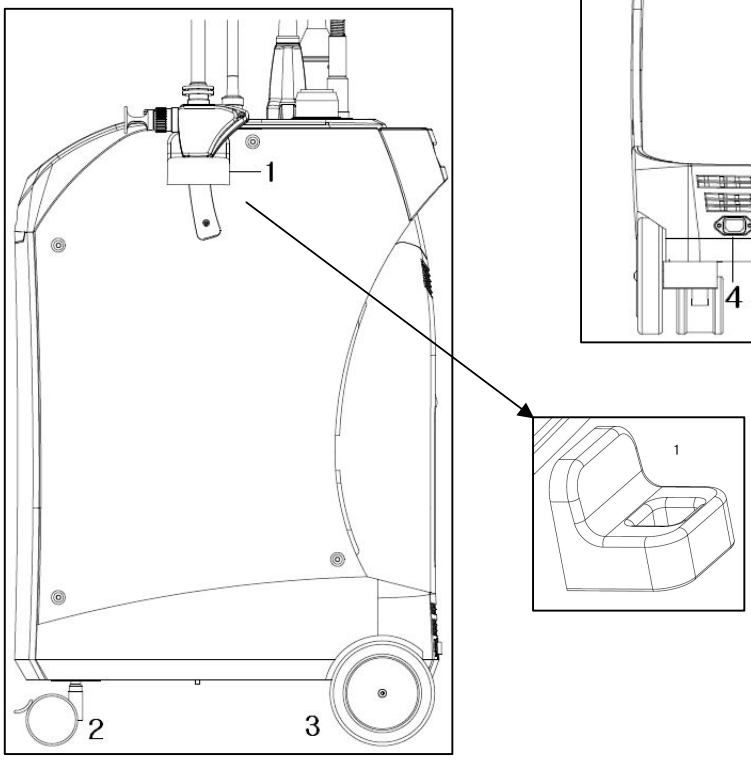
③ Exhaust port :Heat discharging port(lower)

④ Power : Power connection terminal

⑤ Remot Interlock connector : Terminal for Interlock connection

⑥ Foot switch connector : Terminal for Foot switch





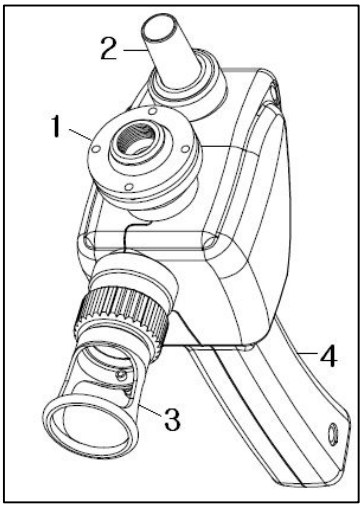
c. Side view

① Laser Hand-piece Holder: Hoder for hanging Hand-piece when it is not in use (Refer to the Front view ⑬)

② Front Wheel : Wheel for convenient movement of equipment

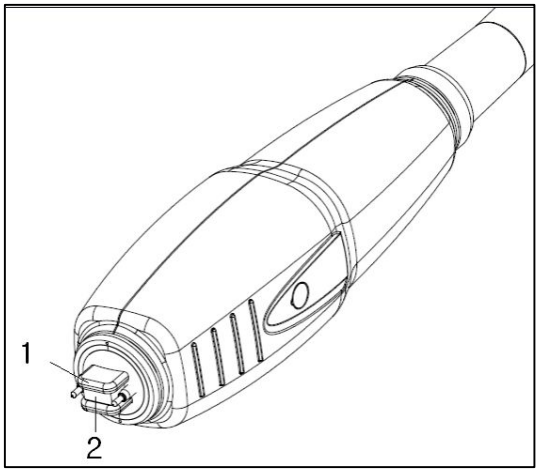
③ Rear wheel: Wheel for convenient movement of equipment

d. Handpiece (Laser)



① Articular arm connector: Connector for hand-piece and articular arm
② AIR Joint : Terminal supplying compressed air
③ Guide : Laser is emitted onto patient's skin by this guide
④ Hand-piece handle :Handle for laser irradiation

e Handpiece (Light)



① Light guide : Light is emitted onto patient's skin by this
② RF guide : RF is emitted onto patient's skin by this

3) Components

a. Main body ---------- 1ea
b. Laser protection goggle ---------- 1ea
c. Eye guard for patient ---------- 1ea
d. Remote interlock connector ---------- 1ea
e. Foot switch ---------- 1ea
f. Power cord ---------- 1ea

4) Symbols in the equipment

Warning label for laser radiation at backside

Warning label for laser power of Main body and hand-piece

Stop signal for laser output in emergency

Warning alert Label for potential risks in usage of Laser devices, will be adhered on main body

2. Installation of Qray

1) Installation

a. Connect articulate arm and hand-piece of CO_2 Fractional Laser on to the main body.Co2 Fractional Laser

b. Connect X-axis connector and Y-axis connector on the CO_2 Fractional Laser to X-axis and Y-axis socket on the main body

c. Connect Air-hose on the articulate arm of CO_2 Fractional Laser to Socket on the main body and also connect to Air joint on the Hand-piece(laser).

d. Connect Hand-piece (Light) to Hand-piece socket on the main body.

e. Connect Remote interlock connector to socket and check surrounding safety conditions.

f. Connect foot switch cable to appropriate socket.

g. Check the rated voltage and connect power cord.

h. Check if the laser guide is polluted or any foreign substances are found from the laser guide.

3. Specification

1) Electrical Specification

a. Protection class and type for electrical shock: Class 1 and type B

b. Laser type and warning class for laser according to IEC60825-1(2001): Semiconductor laser, Class 4

c. Rated voltage and power consumption : 220VAC±10% , 50/60Hz, 700 VA

d. CO2 Laser

[1] Co2 Tube : RF Co2

[2] Laser Power : 30Watt.(Peak)

[3] Wavelength : 10.6um

[4] Scan Area : Max 20mm * 20mm

[5] Pulse Duration : Max. 20~9540㎲

5) Main Display : 10.4" Color TFT LCD Panel with CCFL Back Light (800*600)

2) Mechanical Specification

7.1 Dimension : 505mm * 630mm * 927mm [WxDxH]

7.2 Handpiece Length (Laser) : 220mm * 72mm * 195mm [WxDxH]

7.3 Handpiece Length (Light) : 215mm * 60mm * 60mm [WxDxH]

7.4 Weight : About 60 Kg

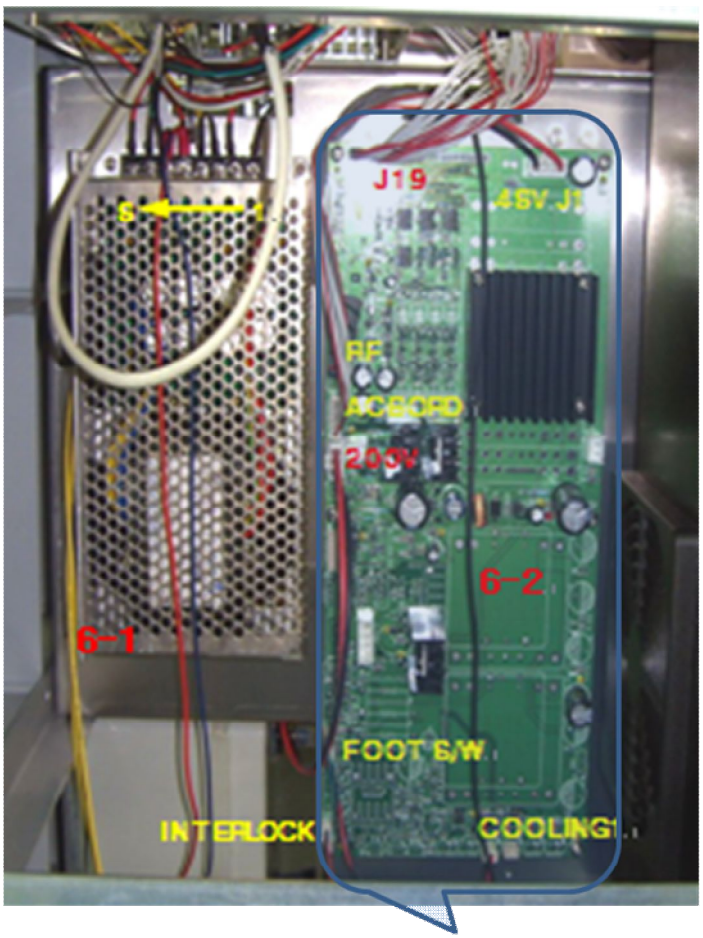
4. Parts

1) Board

a. Control B/D

- Function : This board controls IR+RF main power, input signal and temperature sensor. It also supplies voltage to IR+RF Cooling fan.

- Input Voltage: DC 48V



Control Board

b. RF B/D

- Function : This board is related to RF output in Light Mode

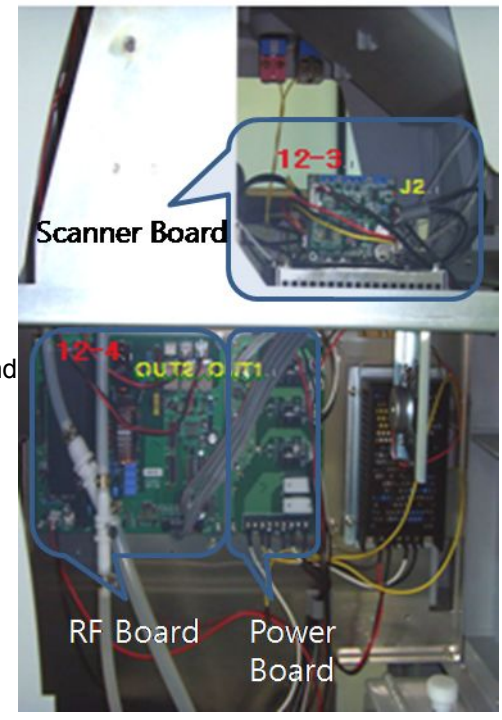
- Input Voltage : DC 48V

c. Scanner B/D

- Function : This board controls input/output voltage of scanner and operation of scanner mirror in Fractional Mode.

- Input Voltage : DC 48V

d. AC(Power) B/D



-Function : This board supplies voltage to each SMPS and Water & Air Pump.

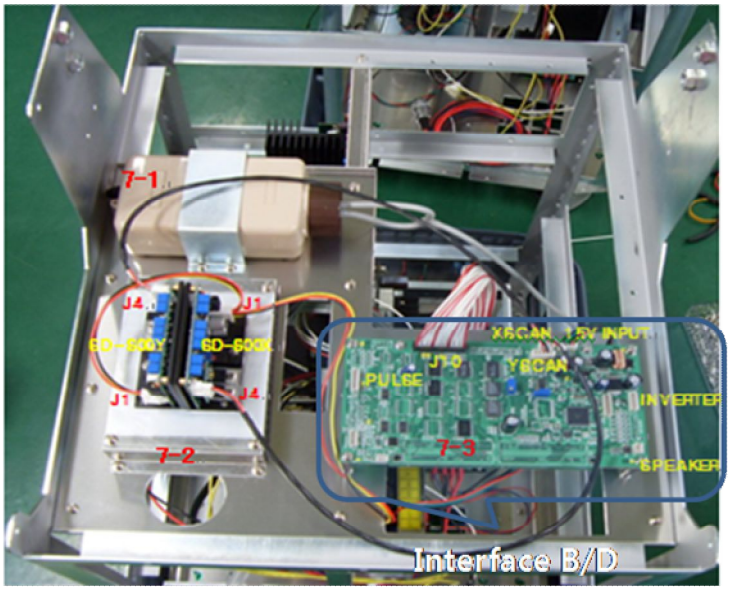
- Input Voltage : AC 240V

e. Interface B/D

- Function : This board controls display,

Scanner signal and CO_2 power.

-Input Voltage : DC 48V



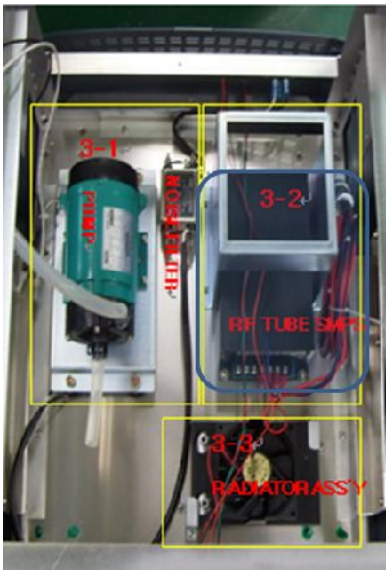
2) SMPS

a. Tube SMPS

- Function : This SMPS supplies voltage to CO_2 Tube.

Input voltage: AC 220V

Output voltage: DC 48V



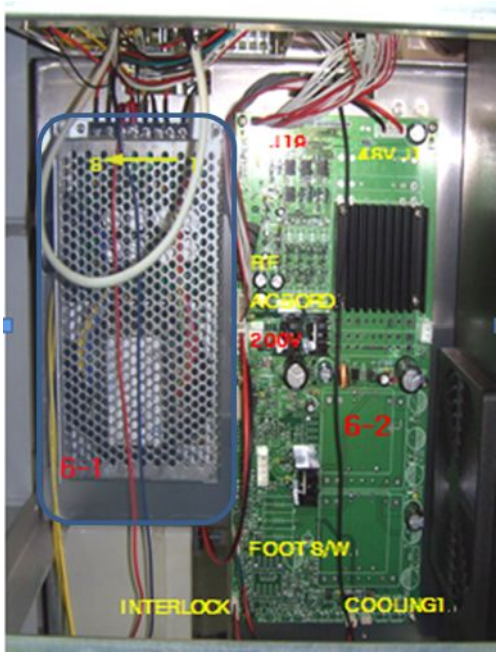
b. Scanner & Interface B/D SMPS

- Function :This SMPS supplies power to

Scanner & Interface B/D.

- Input voltage : AC 220V

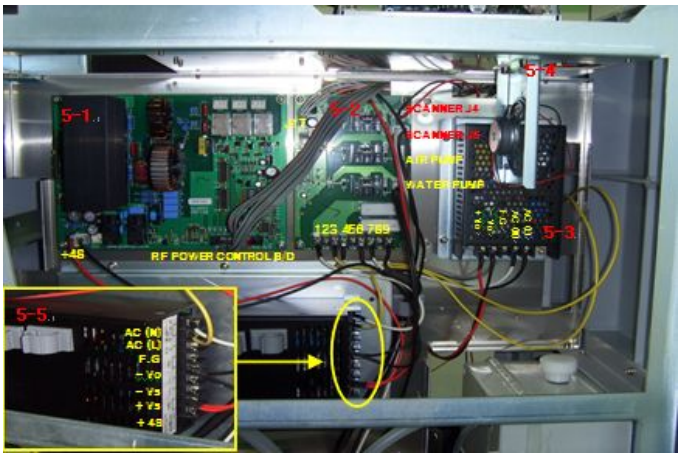
Output voltage: DC 24V, DC 15V



c. RF B/D

- Function: This board supplies power to RF B/D.
- Input voltage : AC 220V

  Output voltage: DC 48V

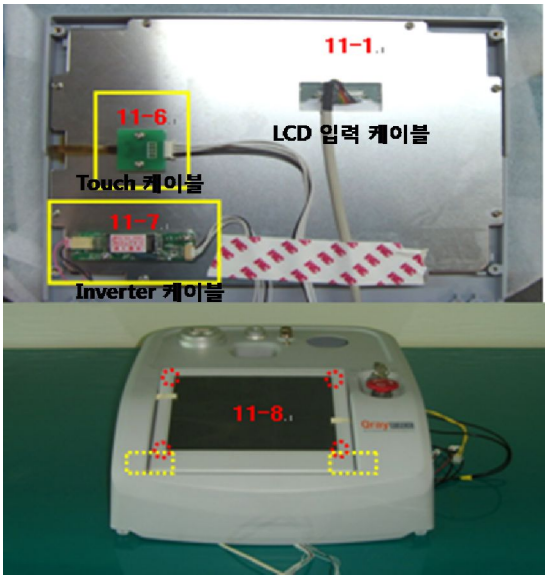


3) Display part

a. Touch cable Function : This cable connects touch sensor on the touch screen.

b. LCD Input cable Function :This cable connects LCD input to LCD window.

c. Inverter cable Function : This cable supplies power to LCD window.



5. Error Message Management

1) Handpiece didn't connect

a. Explanation : This error message comes up in case hand-piece is not connected to main body in Light Mode

b. Solution : Connect Hand-piece(Light) to main body.

2) INTERLOCK ERROR

a. Explanation : This error message comes up in case remote interlock connector and remote interlock on the backside are not connected well.

b. Solution : Connect Remote interlock to interlock connecter on the main body.

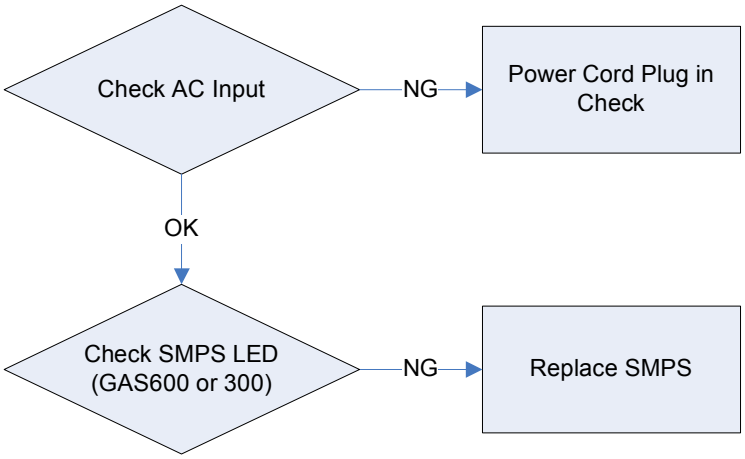
3) FOOT SWITCH ERROR

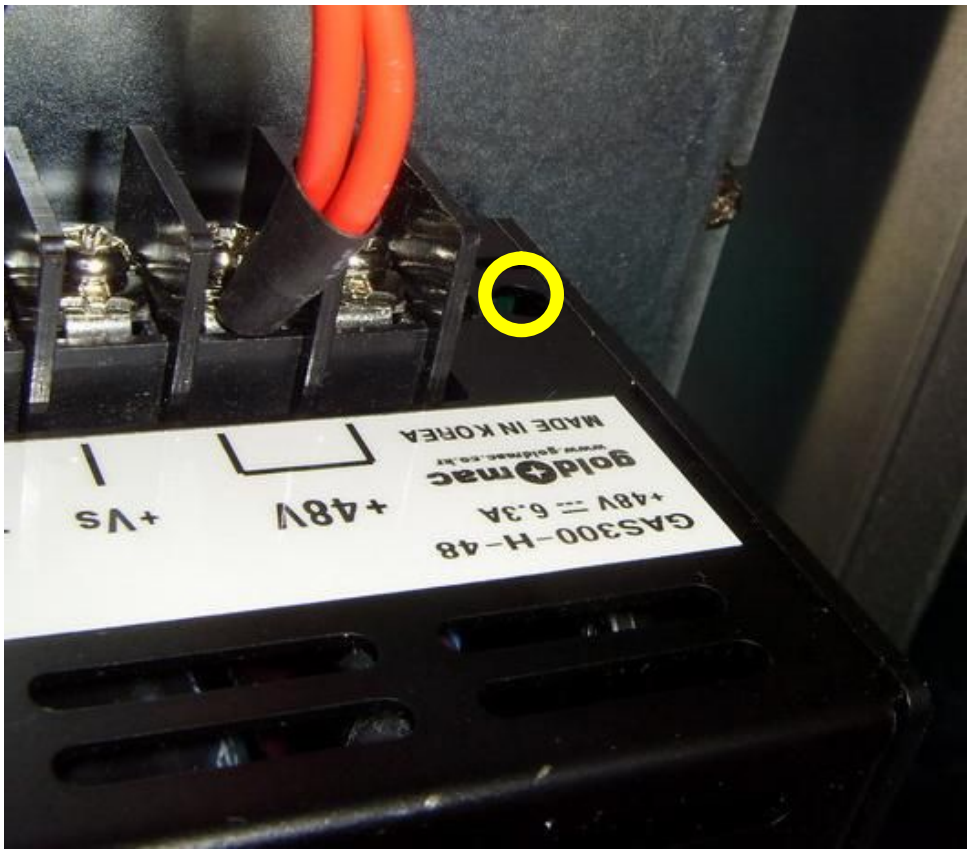
a. Explanation : This error message come up in case Foot switch is not connected to foot switch connector on the backside of main body.

b. solution : Connect foot switch to foot switch connector on the backside of the machine.

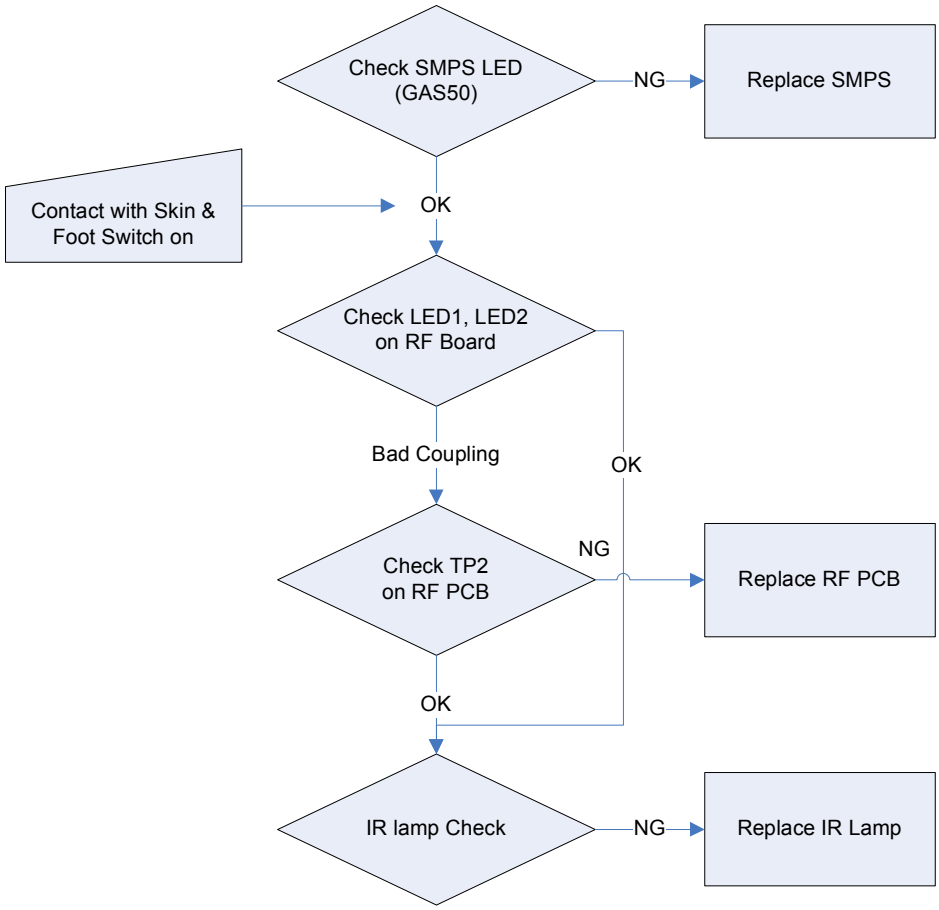
6. TROUBLE SHOOTING

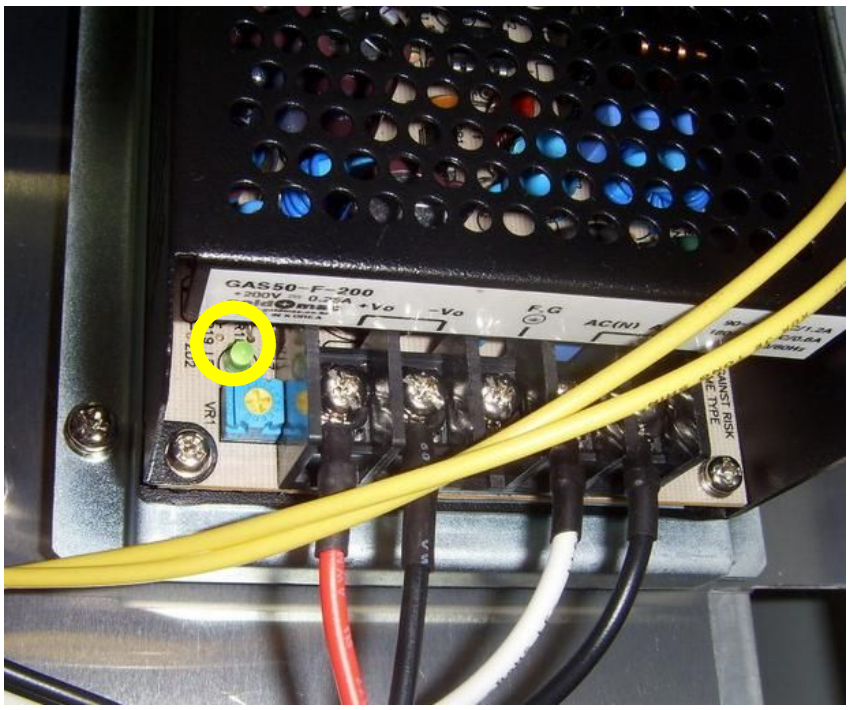
1. In case of “No Power”





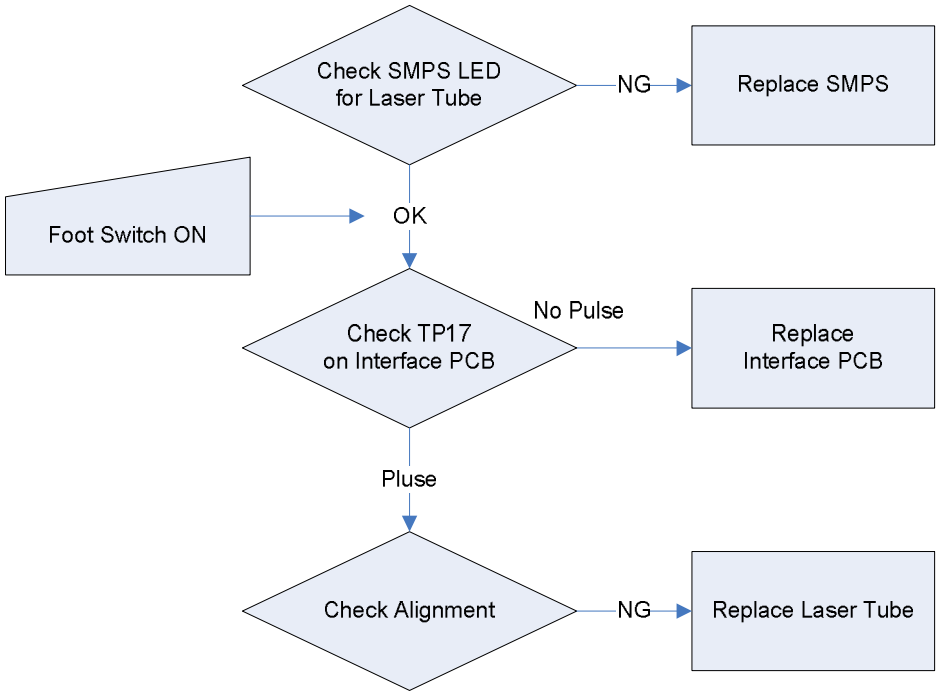
2. In case of “No Output of IR+RF”

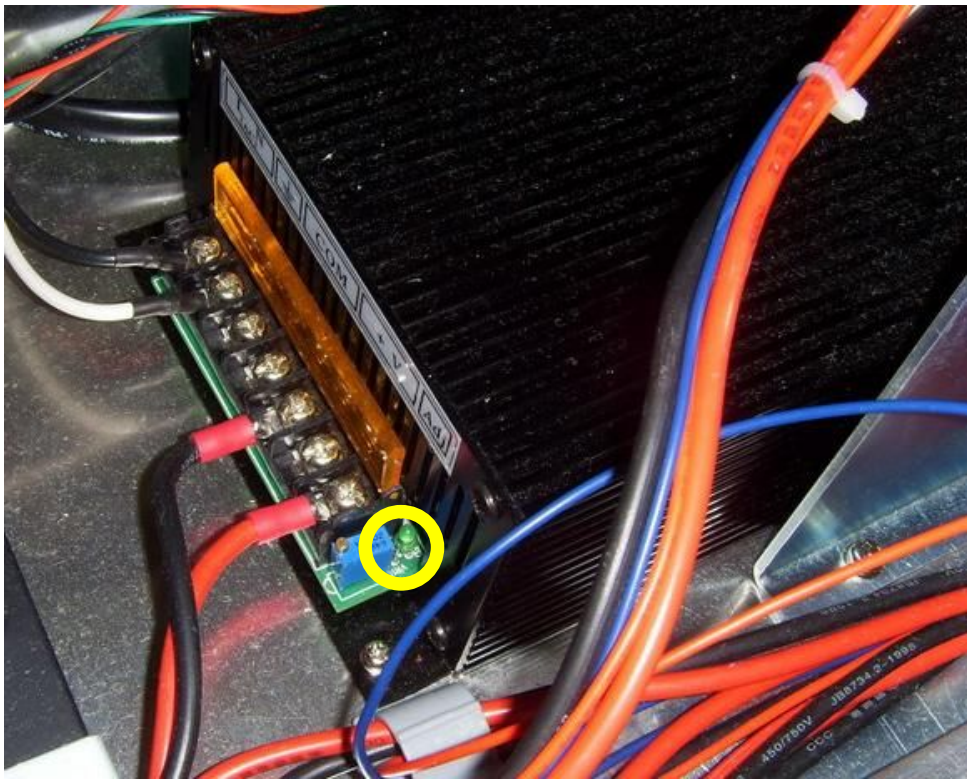




** Refer to page 4 (PCB Working Order)

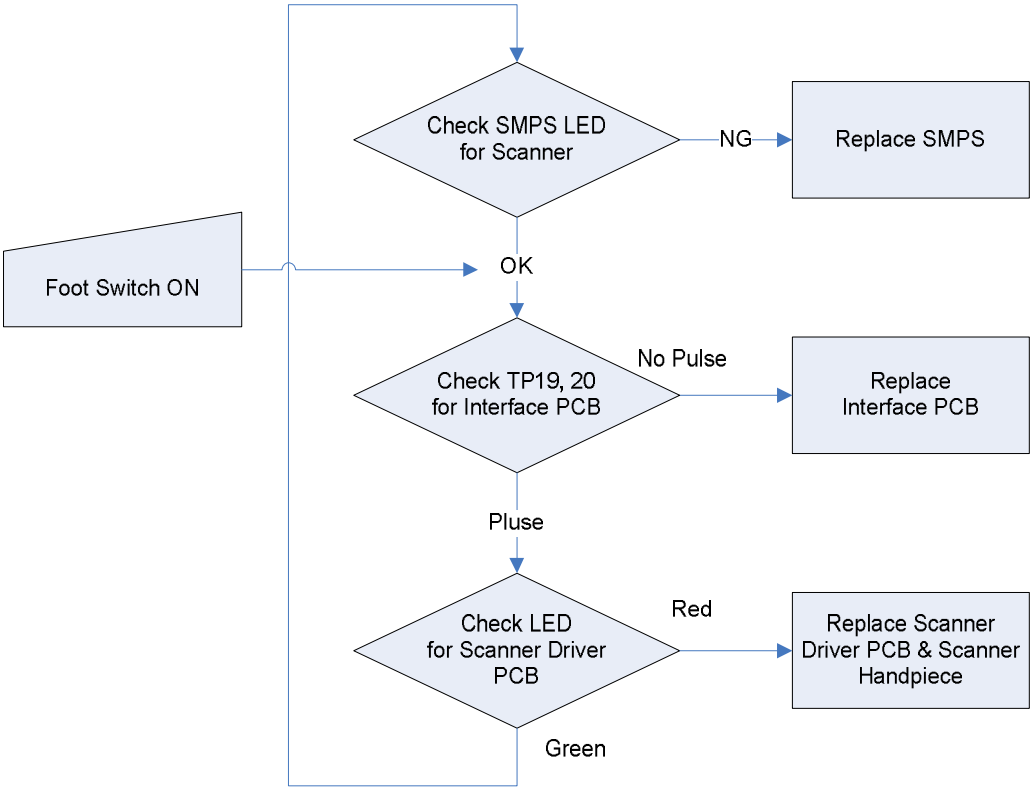
3. In case of “No Laser Power”

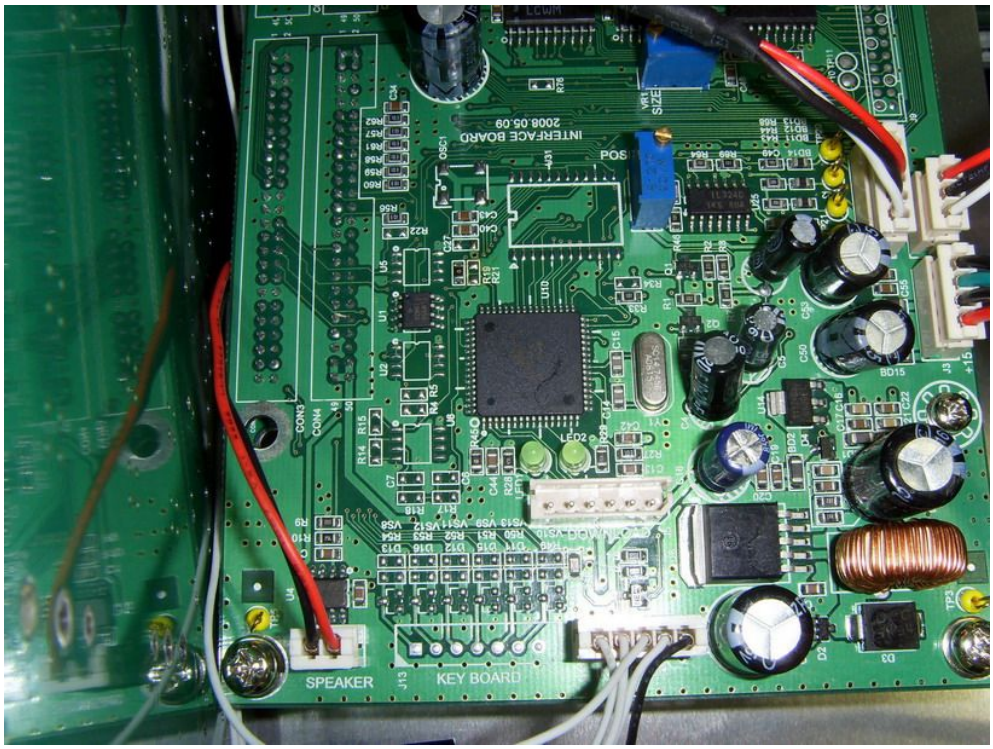




** Refer to page 6 (PCB Working Order)

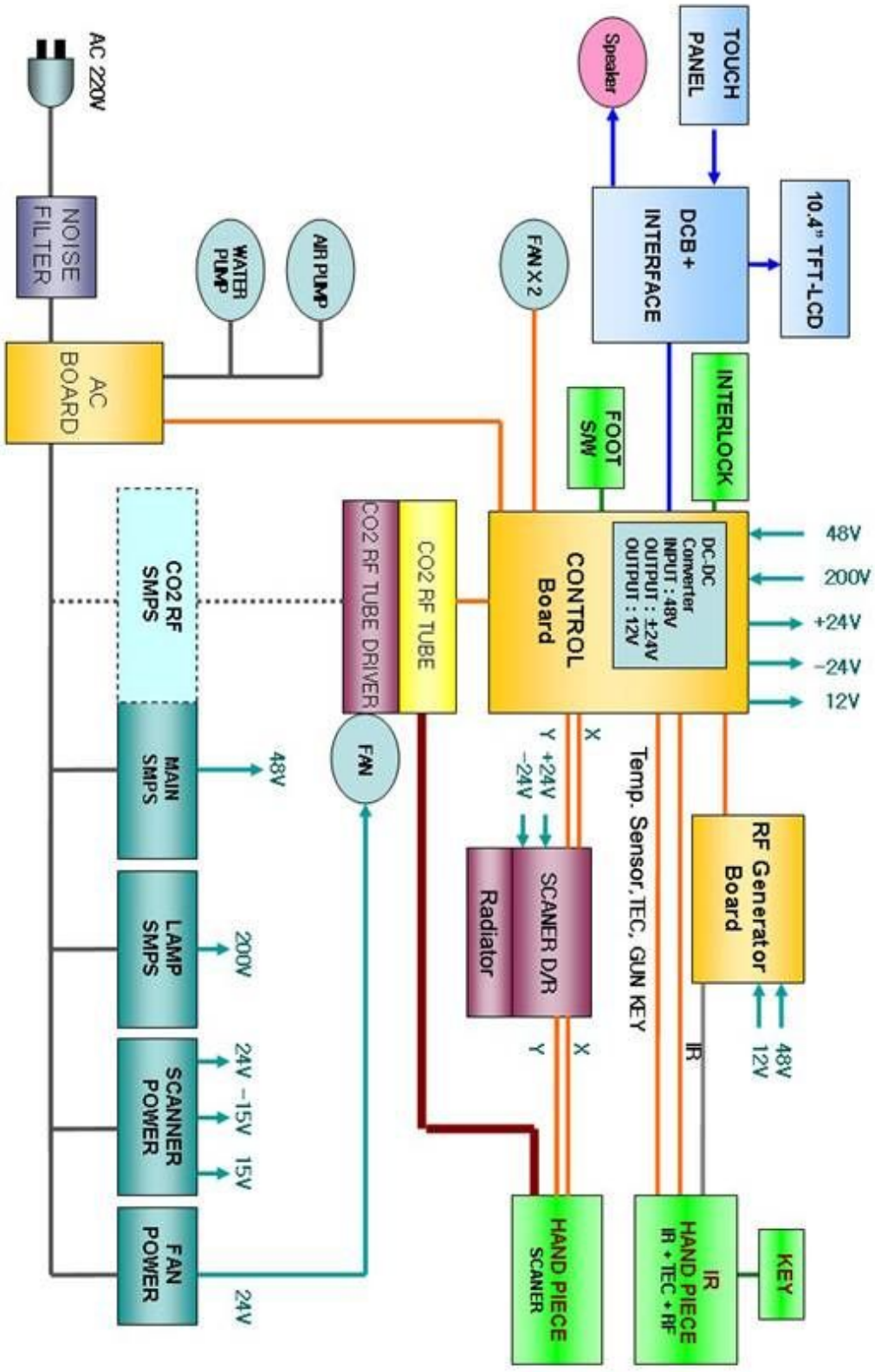
4. In case of “Abnormal working of Scanner” on <u>fractional mode</u>



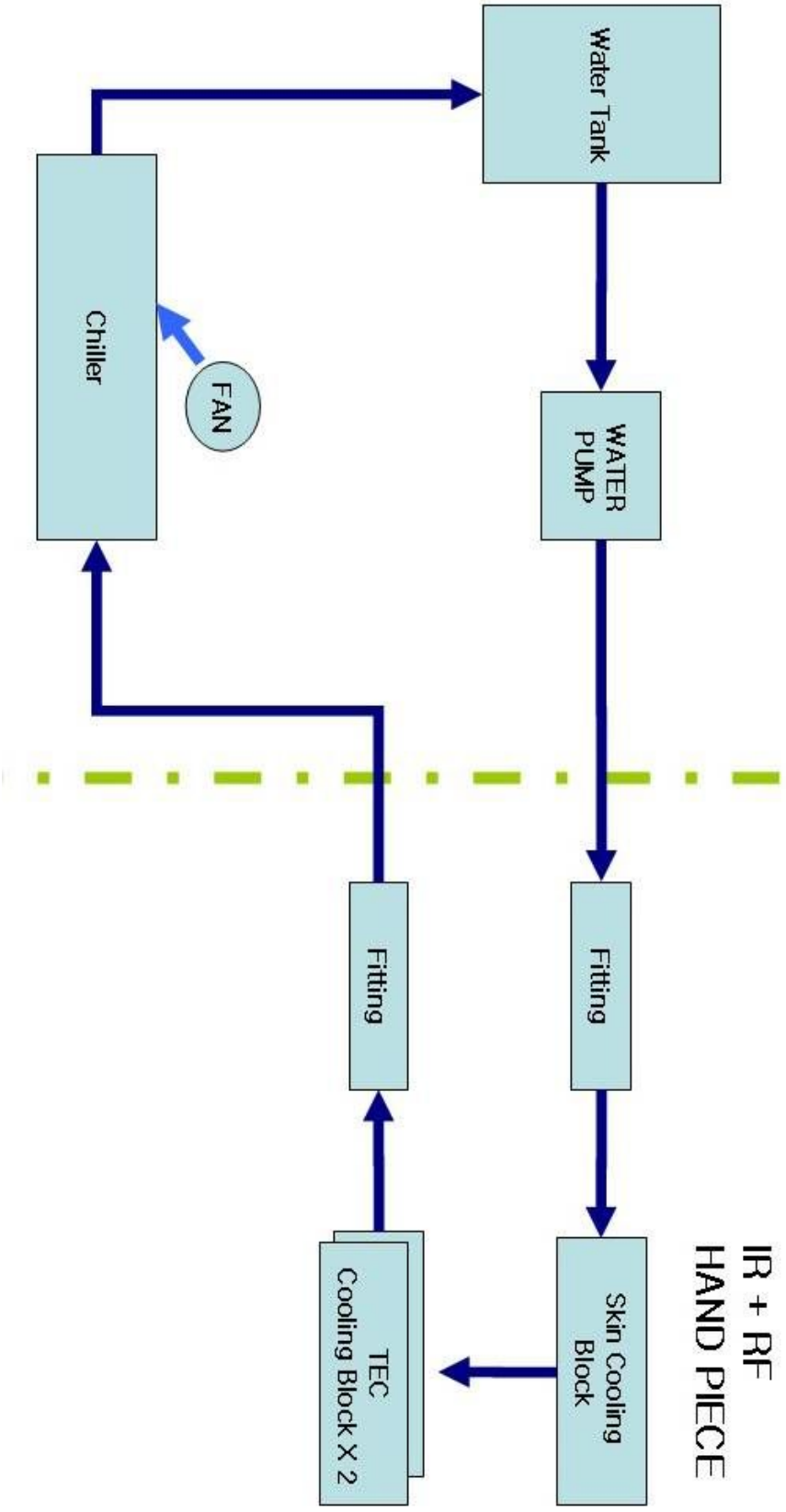


** Refer to page 3 and 5 (PCB Working Order)

Functional Block Diagram



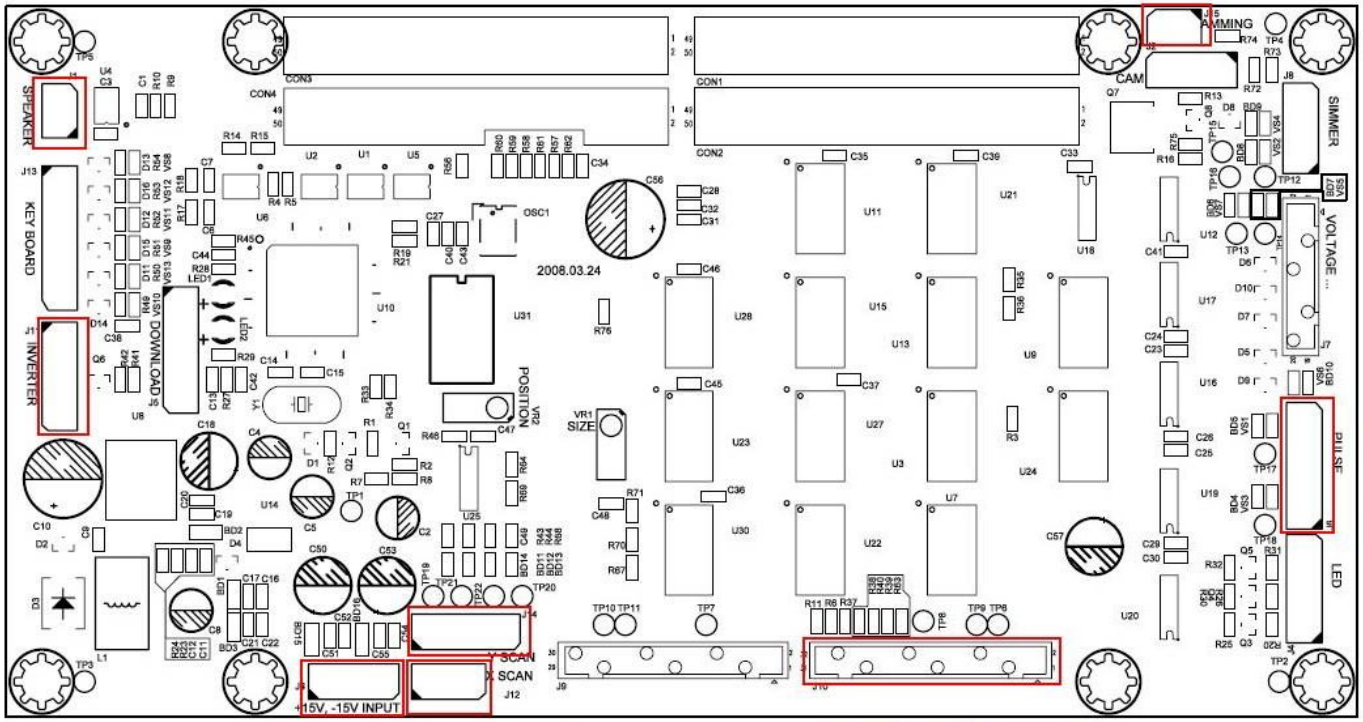
Cooling Block Diagram



Interface PCB

AIMING

SPEAKER



INVERTER
#1 : 12V
#2 : 5V
#3 : 5V(Backlight enable)
#4 : NC
#5 : GND

RF_TUBE
PULSE CABLE
#1~4 : NC
#5 : GND
#6 : PULSE

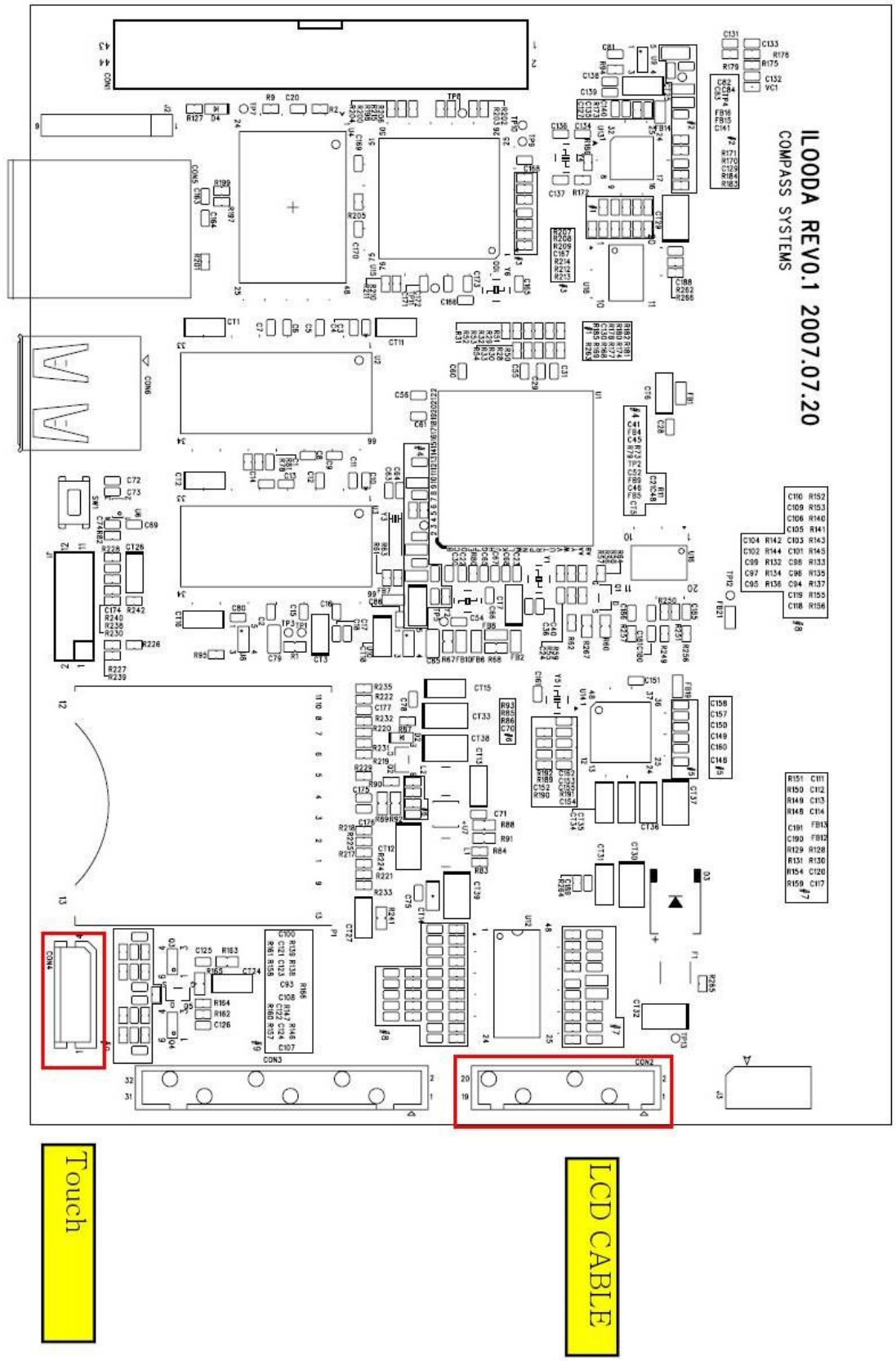
#1: +15
#3: −15
#2,4: GND

Y CABLE
#1 : Negative
#2 : GND
#3 : Positive

X CABLE
#1 : Negative
#2 : GND
#3 : Positive

DATA CABLE
1,2 : 12V Input
20 : Foot Switch
25 : Interlock

DCB Board


ILOODA REV0.1 2007.07.20
COMPASS SYSTEMS
CON4
CON3
CON2
Touch
LCD CABLE

7. Precautions

1) Environment and operating conditions

a. Environment

- Avoid using in high humidity or wet area

b. Operating conditions

- Recommend the operation at room temperature (10 ℃ ~ 40℃)
- Maximum relative humidity: 10% ~ 80%
- Atmospheric pressure: 500 ~ 1060 hPa

c. Storage and handling conditions

- Surrounding temperature: 10 ℃ ~ 60℃
- Relative humidity: 10% ~ 90%
- Atmospheric pressure: 500 ~ 1060 hPa

B. Precautions before operation

a. Check the operation previously.

b. Check switch, etc, and confirm the right operation.

c. No modification.

d. Precisely connect cord to prevent detachment.

e. Check the operation status of gauge including previous check points if the apparatus will not be used for long time.

f. Do not use tied cord to prevent overheating.

g. Do not step on plug, etc to prevent strong shock.

h. Do not use the apparatus near fire.

C. Precautions during operation

a. Please equip goggle for user and eye guard for patient upon usage.

b. If failure is detected from equipment, immediately stop the operation, and turn off the power.

c. If power is interrupted, turn off power immediately, and return handle, switch, etc to original position.

d. This equipment should not be used near to patient surveillance unit.

e. Operation should be conducted by professionally trained personnel.

f. Apparatus should be used after consulting with doctor.

g. Please be cautious about the following during the operation of equipment.

①Check on any abnormality of patient or equipment during operation.

②Take care of patient safety upon abnormality of patient or equipment.

③Interrupt the operation immediately, and restart the apparatus if there is no abnormality in equipment and patient.

④Equipment should not be touched by patient or other personnel.

⑤Laser beam should not be irradiated directly on other personnel.

⑥Do not smoke cigarette during laser radiation.

⑦Eye irradiation danger: Do not stare direct or reflected laser.

⑧Do not operate equipment at chemical storage or gas generating location.

D. Precautions after operation

a. Operation handle, switch, etc should be returned after operation, and turn off the power.

b. Cord connector should not be pulled excessively.