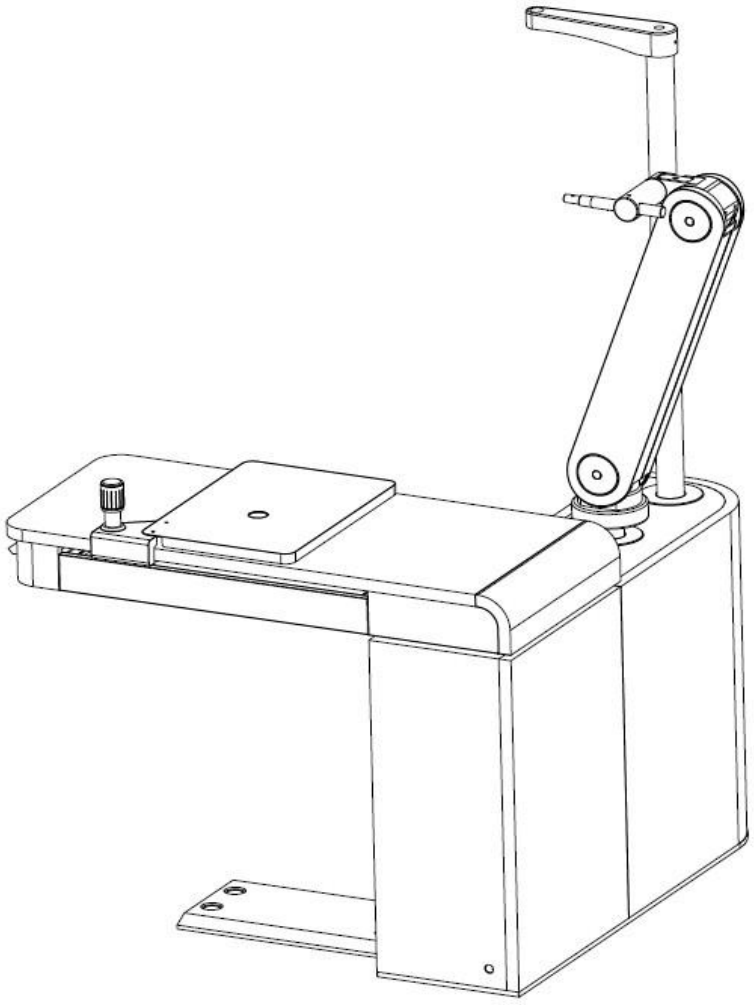
User Manual

REFRACTION TABLE

HRT-7000



Huvitz

Notice

This product might cause a malfunction due to the electromagnetic waves of the cell phones, walkie-talkie, and wireless tuning machines. Take the appliance which has effects on this product away.
This equipment observes the restrictions on medical appliances through the electromagnetic compatibility testing. This restriction is designed to provide the adequate protection about the harmful interference for installing the typical medical equipment.
The contents of this user manual were tested carefully and were considered as correct overall. But Huvitz is not responsible for any potential mistakes and omissions from use of the information contained in this user manual.

Power Cord
For use of equipment in rated voltage less than 125Vac,minimum 6A,Type SJT or SVT , 18/3AWG,10A, max 3.0m long : One end with Hospital Grade Type, NEMA 5-15P Other end with appliance coupler. For use of equipment in rated voltage less than 250Vac,minimum 6A,Type SJT or SVT , 18/3AWG,10A, max 3.0m long : One end terminated with blade attachment plug(HAR) Type, NEMA 6-15P

Huvitz has right to modify this product or product specification without special notice anytime, and such changes may not be renewed in this article

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(2026.10.22)

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14055, Republic of Korea

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1. Introduction

1.1 Intended Use

This equipment is the product which is composed with the table which the equipment and parts can be put on in the optometrist, optician shop and the chair for the examinee for the eyesight test, and it is produced for being used by loading the necessary equipment for the medical care act. After the AC100-120/200-220V power supply is approved in the control PCB through the transformer, it can be controlled by operating the power supply for the lamp, ARM, chair.

1.2 Classification

(1) Protection against electric shock : Class I

(2) Protection against harmful ingress of water: Ordinary, IPX0

(3) Degree of safety in the presence of a flammable anesthetics mixture with air or with oxygen or with nitrous oxide: Not intended to be used in the presence of flammable mixture

(4) Mode of operation: Continuous

2. Safety information

2.1 Introduction

The safety is everyone's duty and responsibility. The safe use of this appliance is related to the installer, user, operator and appliance manager. To learn and study this user manual personally for sure before installation, use, cleaning, repairs, or adjustments of this appliance or its parts is the mandatory obligation. It cannot be emphasized enough that understanding the direction of this manual enough in order to improve the safety of patients, users. For this reason, the following safety caution statements are included in the suitable part of this manual in order to remind information or safety-related information which the special cautions are required to. All users or administrators should be used to "WARNING" or "CAUTION" in manual and should pay attention to especially.

⚠ WARNING

"WARNING": Ignoring these warnings may cause severe injury or death as a result of incorrect operation.

"WARNING" Ignorer ces avertissements peut entraîner des blessures graves ou la mort en raison d'un fonctionnement incorrect.

⚠ CAUTION

CAUTION: Ignoring these cautions may cause moderate injury or property damage as a result of incorrect operation.

"CAUTION" Ignorer ces mises en garde peut provoquer des blessures modérées ou des dommages matériels suite à un fonctionnement incorrect.

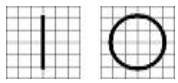
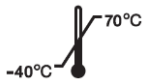
NOTE

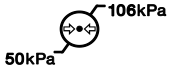
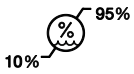
"NOTE" emphasizes the essential information. This information should be read carefully to avoid the malfunction of appliance.

"NOTE" met l'accent sur les informations essentielles. Ces informations doivent être lues attentivement pour éviter le dysfonctionnement de l'appareil.

2.2 Safety signs

The International Electro technical Commission (IEC) has announced the symbol showing the caution about the power connection or possible disaster of the medical electronic equipment. The classification and the symbol are as follows.

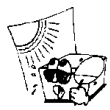
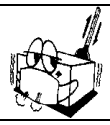
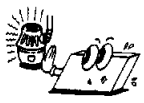
	I and O on power switch represent ON and OFF respectively. (O sur l'interrupteur d'alimentation représentent respectivement ON et OFF.)
	This symbol identifies a safety note. Ensure you understand the function of this control before using it. Control function is described in the appropriate User's or Service Manual. (Ce symbole identifie une note de sécurité. Assurez-vous de comprendre la fonction de ce contrôle avant de l'utiliser. La fonction de contrôle est décrite dans le manuel d'utilisation ou d'entretien approprié.)
	It indicates the year of manufacture and the manufacturer. (Il indique l'année de fabrication et le fabricant.)
	Manufacturer (Fabricant)
	Authorised Representative in the European Community (Représentant autorisé dans la Communauté européenne)
	Alternating Current (Courant alternative)
	Direct Current (Courant continu)
	Temperature Limitation (Limitation de température)
	Keep DRY (Garder au sec)

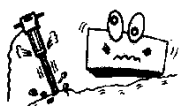
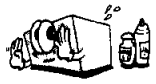
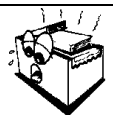
	WEEE mark Disposal of your old appliance When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product. (Mise au rebut de votre ancien appareil Lorsque ce symbole de poubelle barrée est joint à un produit, cela signifie que le produit est couvert par la directive européenne 2002/96 / CE. Tous les produits électriques et électroniques doivent être éliminés séparément du flux des déchets municipaux via des installations de collecte désignées par le gouvernement ou les autorités locales. L'élimination correcte de votre ancien appareil aidera à prévenir les conséquences négatives potentielles sur l'environnement et la santé humaine. Pour plus d'informations sur l'élimination de votre ancien appareil, veuillez contacter votre mairie, le service d'élimination des déchets ou le magasin où vous avez acheté le produit.)
	CE Mark (Marque CE)
	CE for RoHS RoHS Directive Compliance 2011/65/EU (CE pour RoHS Conformité à la directive RoHS 2011/65 / UE)
	Atmospheric pressure limitation (Limitation de pression atmosphérique)
	Humidity limitation (Limite d'humidité)
	Stack direction (Direction de la pile)
	Fragile , handle with care (Fragile, manipuler avec soin)

	Keep away from sunlight (Tenir à l'écart de la lumière du soleil)
	Stack layer limitation (Limiter la couche de pile)
	Use no hooks (N'utilisez aucun crochet)
	Consult instructions for use (Consulter les instructions d'utilisation)
	Serial Number Symbol (Symbole du numéro de série)

2.3 Environment-related matters

Please avoid the following environments for operation and storage:

	Place where the appliance is exposed directly to the moisture(Please do not operate the appliance by wet hands)
	Place where the appliance is exposed directly to the sun.
	Place where the temperature changes are severe (Normal operating temp is 10℃ and 35℃, humidity is 30% and 90%).
	Place near the heat equipments
	Place where the humidity is high and with the heat dissipation problem

	Place where the appliance is exposed to excessive shock or vibration
	Place where there is chemicals or flammable gases
	Be careful not to get dust or metals inside the structural of appliances.
	Do not open or disassemble the appliance. The manufacturer is not responsible for arising problems.
	Do not block the heat gate in the upper part of the appliance.
	Do not connect AC power cord when the appliance parts do not connected completely. It may harm to the appliance.
	Do not remove the power cord with holding the code.

This equipment must be used in the following environmental conditions:

1. Usage environment

- Temperature: 10℃ ~ 35℃
- Humidity: 30% ~ 90%
- Atmospheric pressure: 800 ~ 1060hpa

2. Transportation environment

- Temperature: -40℃ ~ 70℃
- Humidity: 10% ~ 95%
- Atmospheric pressure: 500 ~ 1060hpa

3. Storage environment

- Temperature: -10℃ ~ 55℃
- Humidity: 10% ~ 95%
- Atmospheric pressure: 700 ~ 1060hpa

Please be careful excessive impact or vibration to the appliance.

2.4 Safety Precaution

This appliance is developed and validated following the national and international safety standards. It ensures the high degree of safety of this appliance. Legally the manufacturer should explain about the matters related to the safety of the appliance enough to the appliance user. Use by the manual of this appliance is the compulsory particulars for the security matters. So before power supply on, please read and understand the directions of manual enough. About more information related, please contact the dealer whom you purchased appliance.

1. This appliance must not be kept or installed on the (a) place where there is a danger of explosion or place with the volatile chemicals such as (b) alcohol-benzene etc. or the flammable, explosive substances.

2. It must not be kept or installed on the high humidity place. The humidity should be within 30% and 90% for normal working. The appliance should not be exposed in the place where there are a lot of splashing, dropping or sprinkled water. Do not put the container with the liquid or gas on the top of the appliance.

3. This appliance should be worked by the highly-trained, qualified person or his direction.

4. The modification of this appliance should be conducted by only the service technician of Huvitz or equivalent qualified people.

5. The equipment management by customer should be conducted following the user's manual or service manual. More management should be conducted by only the service technician of Huvitz or equivalent qualified people.

6. The manufacturer is responsible for the safety, reliability and performance of this appliance when only being satisfied with following conditions: (1) Installation on the reasonable space by these provisions of the manual. (2) When this appliance is used and maintained following the procedures regulated by this manual or service manual.

7. The manufacturer is not responsible for the loss due to the unauthorized changing of this appliance. The unauthorized alteration of this appliance may be cause of being deprived of right during the warranty period.

8. This appliance should be used with the parts provided by Huvitz. If the customer uses the parts of other manufacturers, the safety of those parts should be checked by the Huvitz or the manufacturer of the parts.

9. Only the people who complete the proper training or curriculum can conduct the installation and operation and maintenance of this appliance.

10. The user's manual or service manual should be kept in the place where the people who manage and use this appliance can approach easy.

11. Do not put the excessive force on the cable connection parts. If the cable is not connected easy, please check whether the connector (plug) is suitable for the socket or not. If the connector or socket is damaged, the qualified service technician should repair it.

12. Do not pull the appliance cable. If you open up the cable, please pull the plug.

13. Before use it, test the appliance exterior condition and check whether it is operated well or not always.

14. Please do not block the heat gate of appliance.

15. There are the strange noise or smell smoke, sparks of appliance, turn off the power supply immediately and pull the plug off.

16. For connecting the external appliance with the input/output signal or other connectors, it should be satisfied by IEC standard. (IT equipment is IEC 60950, the medical electrical equipment is IEC 60601). In addition, all systems should be satisfied by the safety requirements IEC 60601-1-1 about the medical electrical systems. People who connect the external appliances with the input/output signal or other connectors are responsible for IEC60601-1-1. If in doubt, please contact a local technician or your dealer.

17. To avoid the risk of electric shock, this appliance should be connected with the protective earth for sure for the power connection.

18. For installation/use of equipments, use the power cord after positioning it on the place where is easy for insertion/removal.

19. If the examinee's knee is touched to the lower part of the table, the chair will be stopped.

3. Characteristic

1. This equipment, the power arms and chair can be controlled up and down, so the examinees like the children and adults can be tested comfortably.
2. By the drawer which is equipped, the optometrist lens set or other optometrist's tools can be kept easy.
3. By the arm which is rotated 40 degree (Test Mode: 25 degree, Rest Mode: 15 degree), the space can be used efficiently.
4. By the side table, the optometrist and slit lamp can be settled and used at the same time.
5. By the LED lamp, it can be used in a variety of optometric environment conveniently.
6. The power arm and chair can be controlled by KEYPAD of button operation mode conveniently.
7. The power lines and operations panel connectors which are used for reflector, chart projectors, optometrist, slit lamp are installed, so the product is easy to be installed.

4. Caution for using

1. The shock may be cause of the internal and external damage, so please handle it carefully.
2. When the product is exposed in the direct sun's rays or too bright indoor lighting, it may have effect on the precision measurement. The measurement is recommended to be conducted in the dark optometrist room.
3. If you use it by connecting with other equipment, you should receive the guidance from sales agents.
4. When the smoke and smell are produced, pull the power supply plug on for separating the power supply and receive the guide of the sales agents.
5. If you wipe this equipment surfaces with the organic solvents such as the alcohol, thinner, benzene, the equipment may be damaged, so do not use it.
6. Move the product after separating each module by turning the power switch off always.

5. Basic components

This appliance is supplied with the package. So when you put the device out from the package, you should check the following components.

- The whole contents are about MAIN BODY ASSY, TABLE ASSY, POWER ARM ASSY, and CHAIR ASSY.
- LED lamp & HDR HEAD SHAFT
- Accessories: One type of CHAIR CABLE, POWER CORD, ASSY&BASE&POWER CABLE for CCP, CABLE TIE, BOLT COVER, wrench bolt M6*15, M6 Spring washer

6. Name and function of each part

1) POWER ARM ASSY: After fixing the reflector and move it following the examinee.

2) HCP PIPE ASSY : It fixes chart projector

3) MAIN BODY ASSY : It is composed with hardware, power and control input/output part for controlling SET

4) TABLE ASSY : It rotates in 90 degree and includes the drawer.

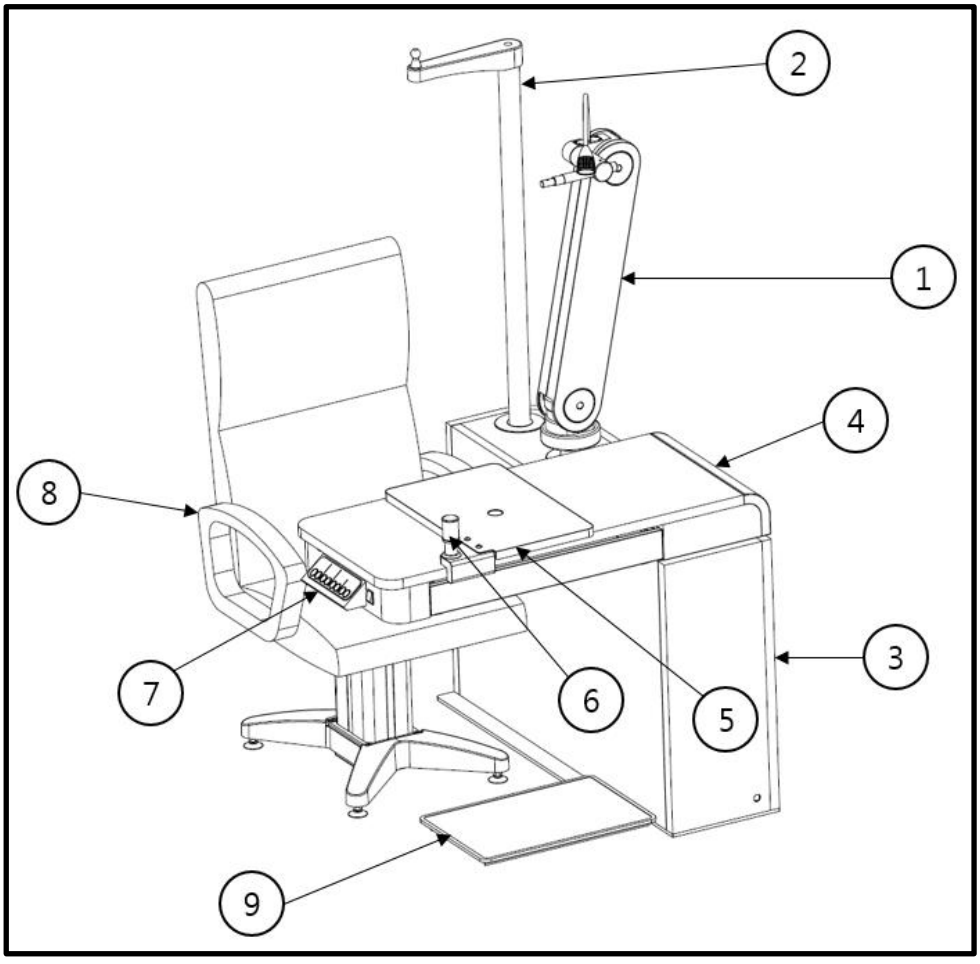
5) HRK BASE ASSY : It loads the optometrist, slit lamp and it can be moved to the left and right side.

6) HANDLE ASSY : It can move the HRK BASE ASSY.

7) TABLE BUTTON ASSY : It can operate the power arm and chair

8) CHAIR ASSY : The examinee can seat for the measurement.

9) MAT : The foot stand of examinee



<Fig. 1> Name of Parts

7. Installation of the equipment

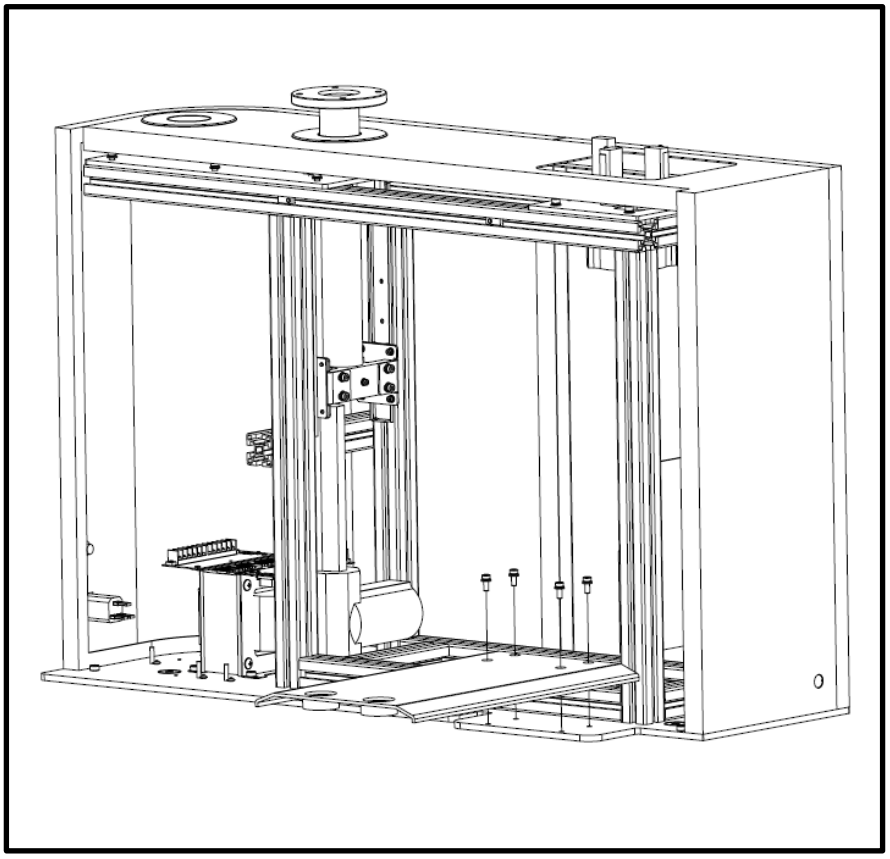
NOTE

The products will be provided in the packing condition that can endure the various transportations, and standard storage conditions. If it is the abnormal condition after repacked the unpacking, please contact the sales agents.

Les produits seront fournis dans un état d'emballage pouvant supporter les différents transports et conditions de stockage standard. S'il s'agit d'une condition anormale après le remballage du déballage, veuillez contacter les agents commerciaux.

7.1. Equipment assembly

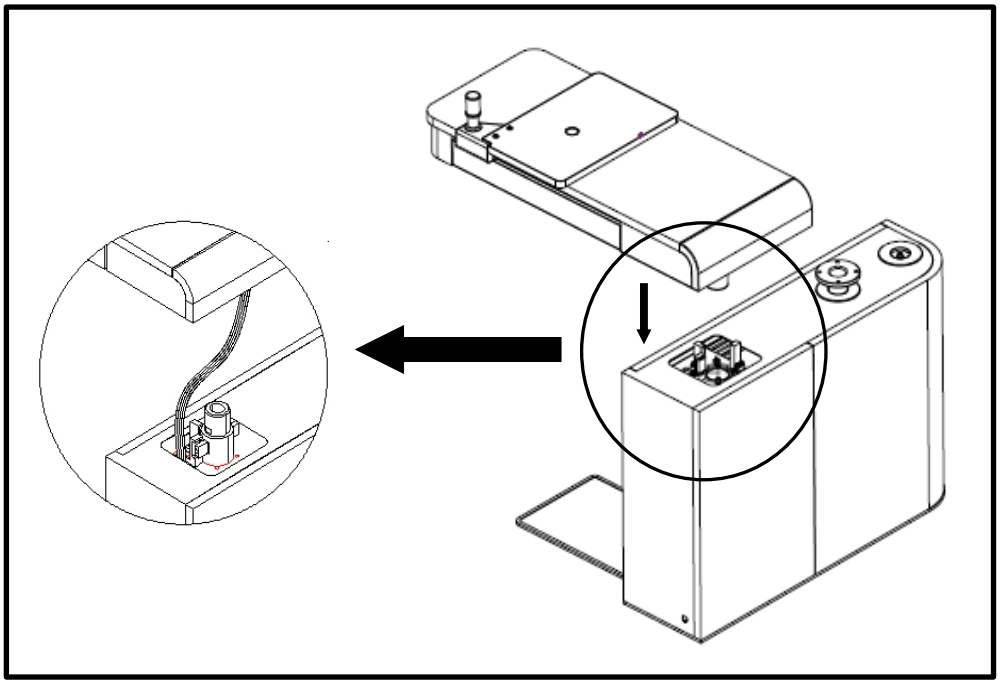
1. FOOT assembling in MAIN BODY ASSY



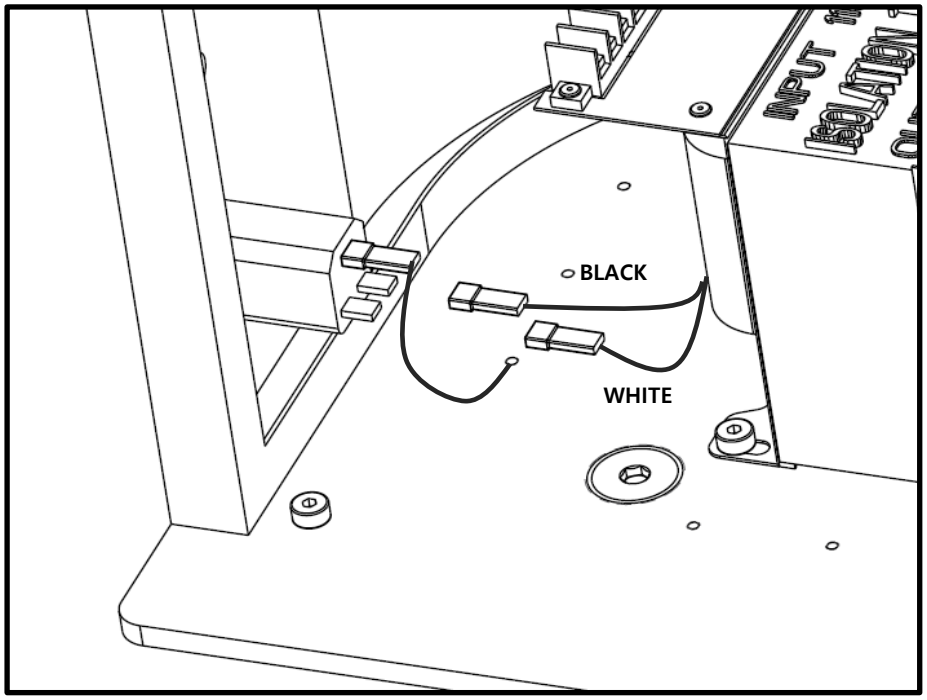
<Fig. 1 > FOOT assembling

WRENCH BOLT M8, L15 : 4ea
SPRING WASHER Ø6, T1.5 : 4ea

2. TABLE ASSY assembling in MAIN BODY ASSY



<Fig. 2-1 > TABLE assembling

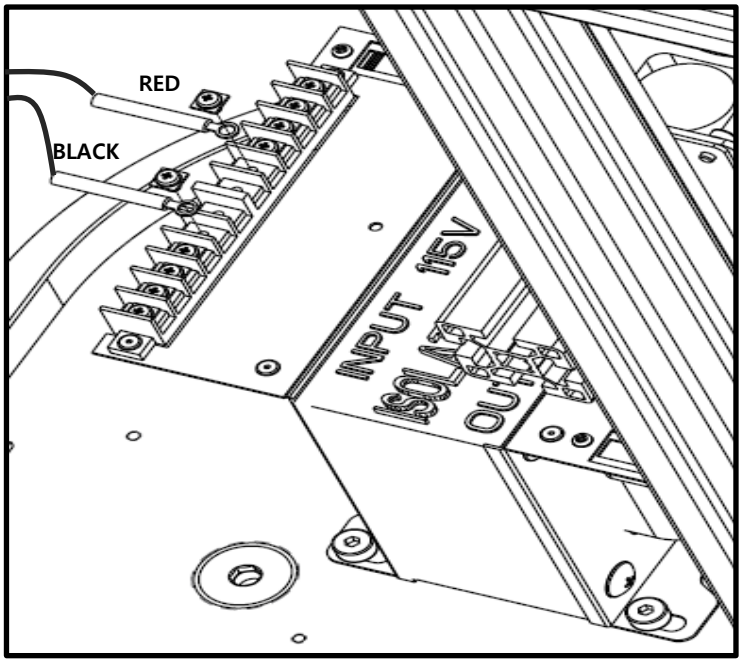


< Fig. 2-2 > TABLE POWER INLET HARNESS assembling

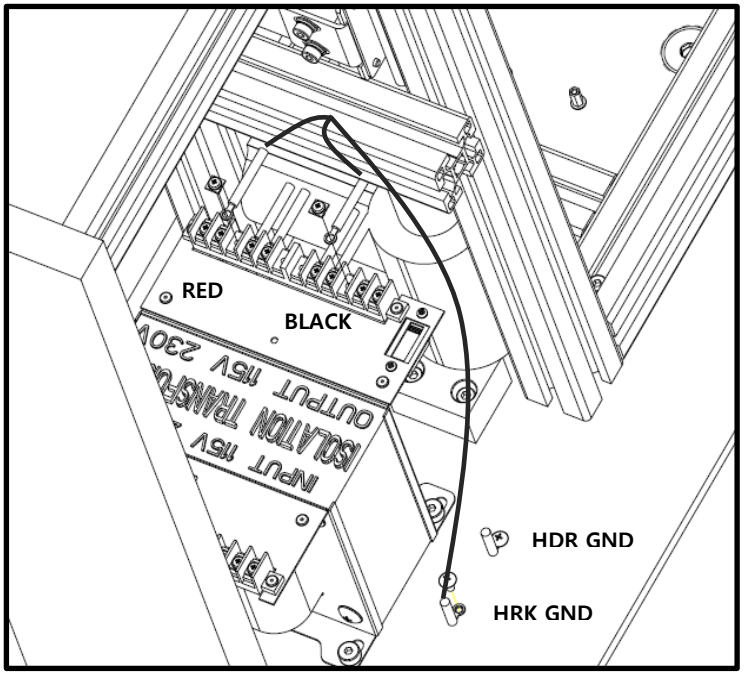
NOTE

1. AC 100-120V IN PUT & OUT PUT SELECT : 115 V
2. AC 200-240V IN PUT & OUT PUT SELECT : 230V

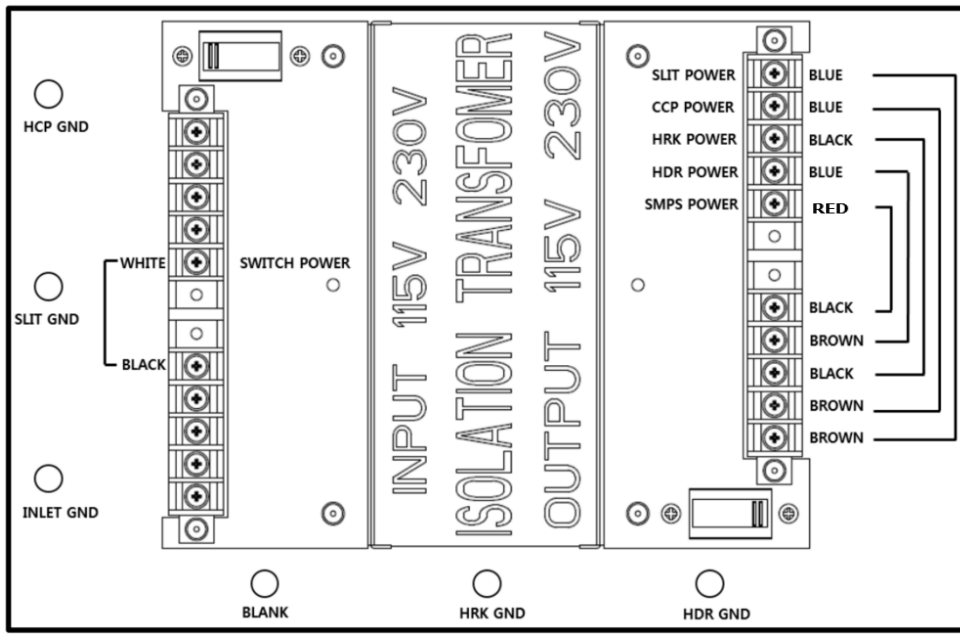
1. AC 100-120V ENTRÉE ET SORTIE PUT SELECT: 115 V
2. AC 200-240V ENTRÉE ET SORTIE PUT SELECT: 230V



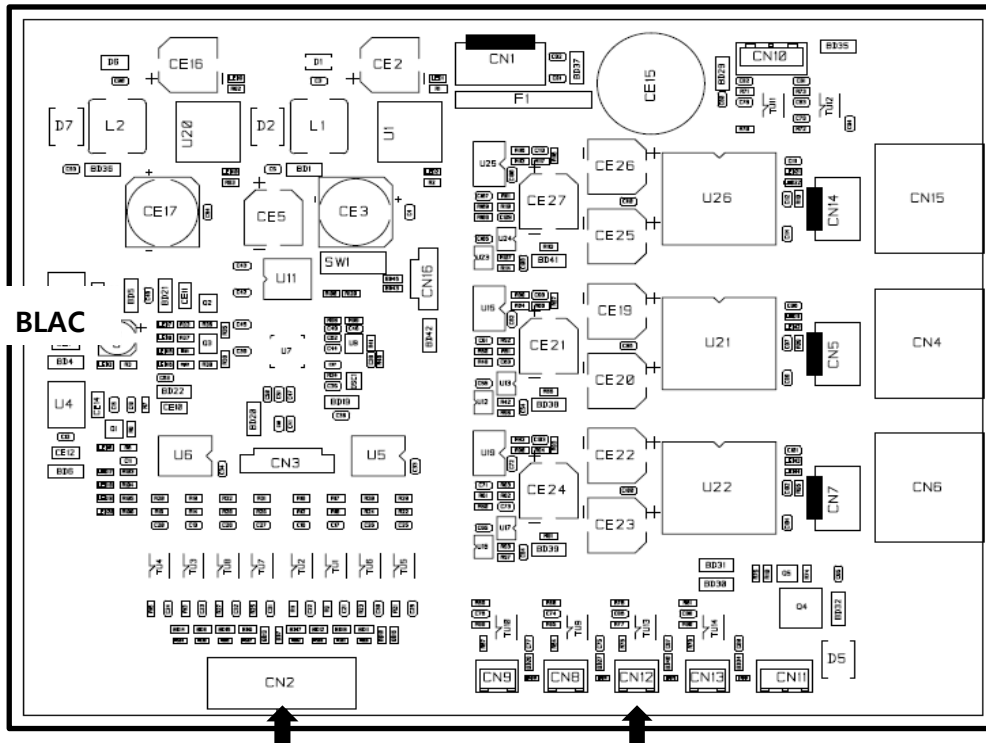
<Fig. 2-3 > TABLE POWER SWITH HARNESS assembling



< Fig. 2-4 > HRK POWER HARNESS assembling

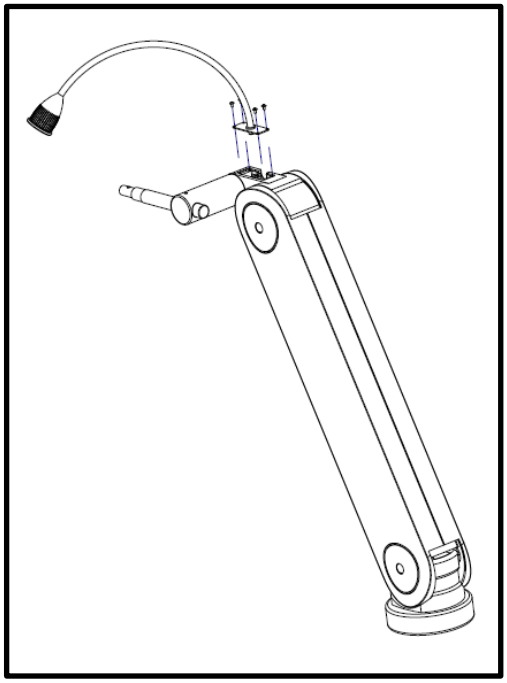


< Fig. 2-5 > HCP & SLIT POWER HARNESS assemble (Option)



< Fig. 2-6 > MAIN BOARD BUTTON & LEG LIMIT HARNESS assemble

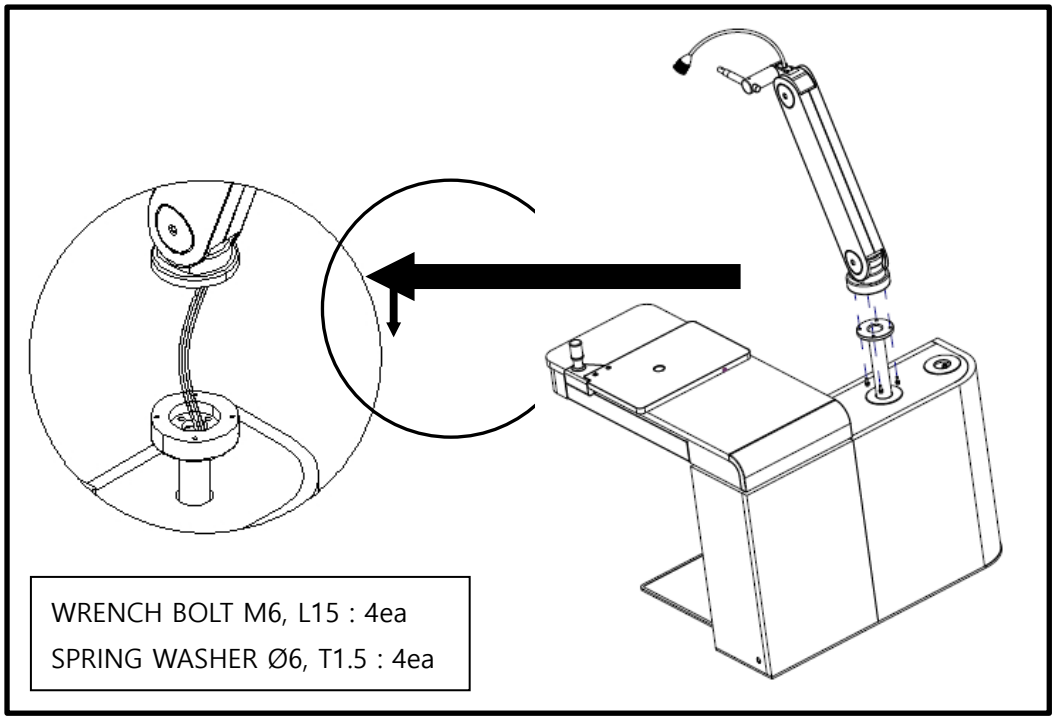
3. LAMP ASSY assembling in POWER ARM



PAN HEAD M3, L6 : 4ea

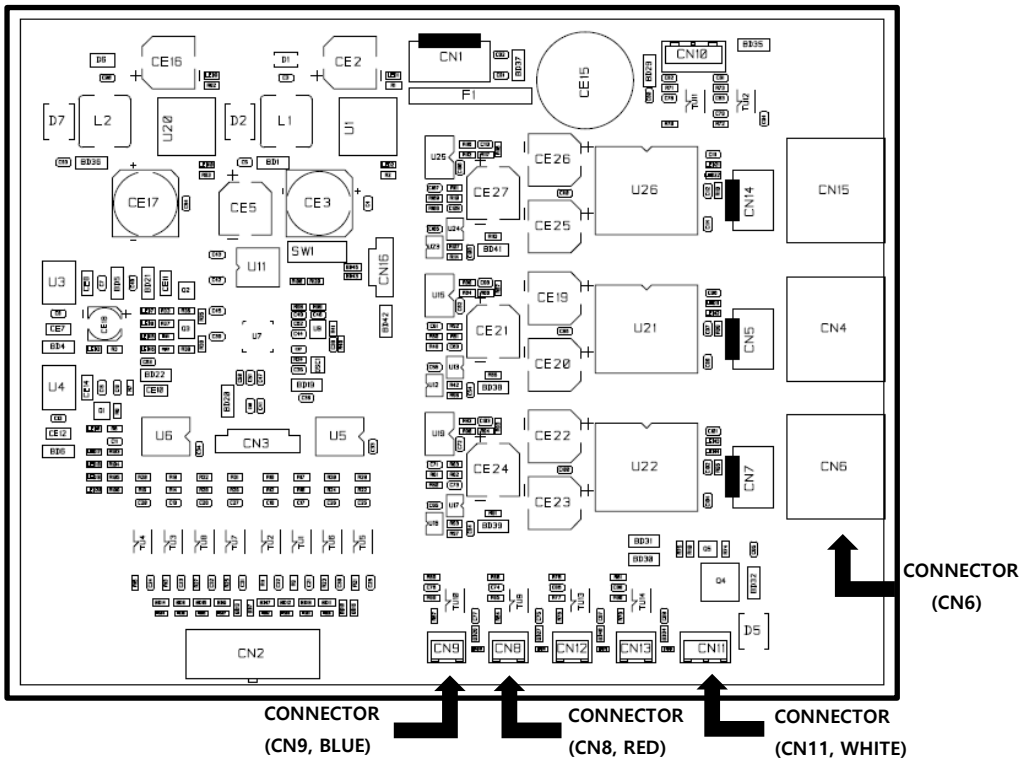
<Fig. 3 > LAMP assembling

4. POWER ARM ASSY assembling in MAIN BODY ASSY



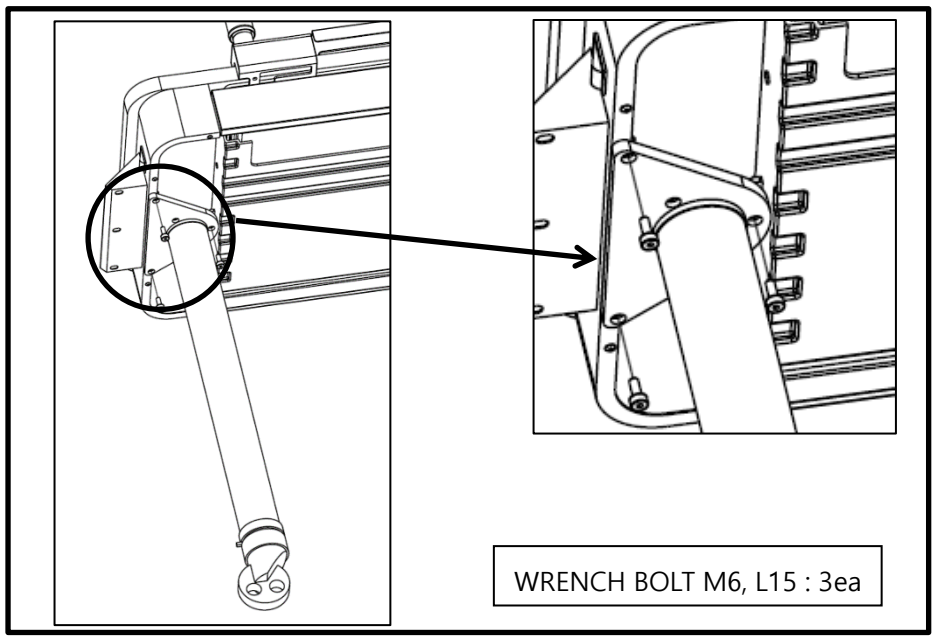
WRENCH BOLT M6, L15 : 4ea
SPRING WASHER Ø6, T1.5 : 4ea

<Fig. 4-1 > POWER ARM assembling



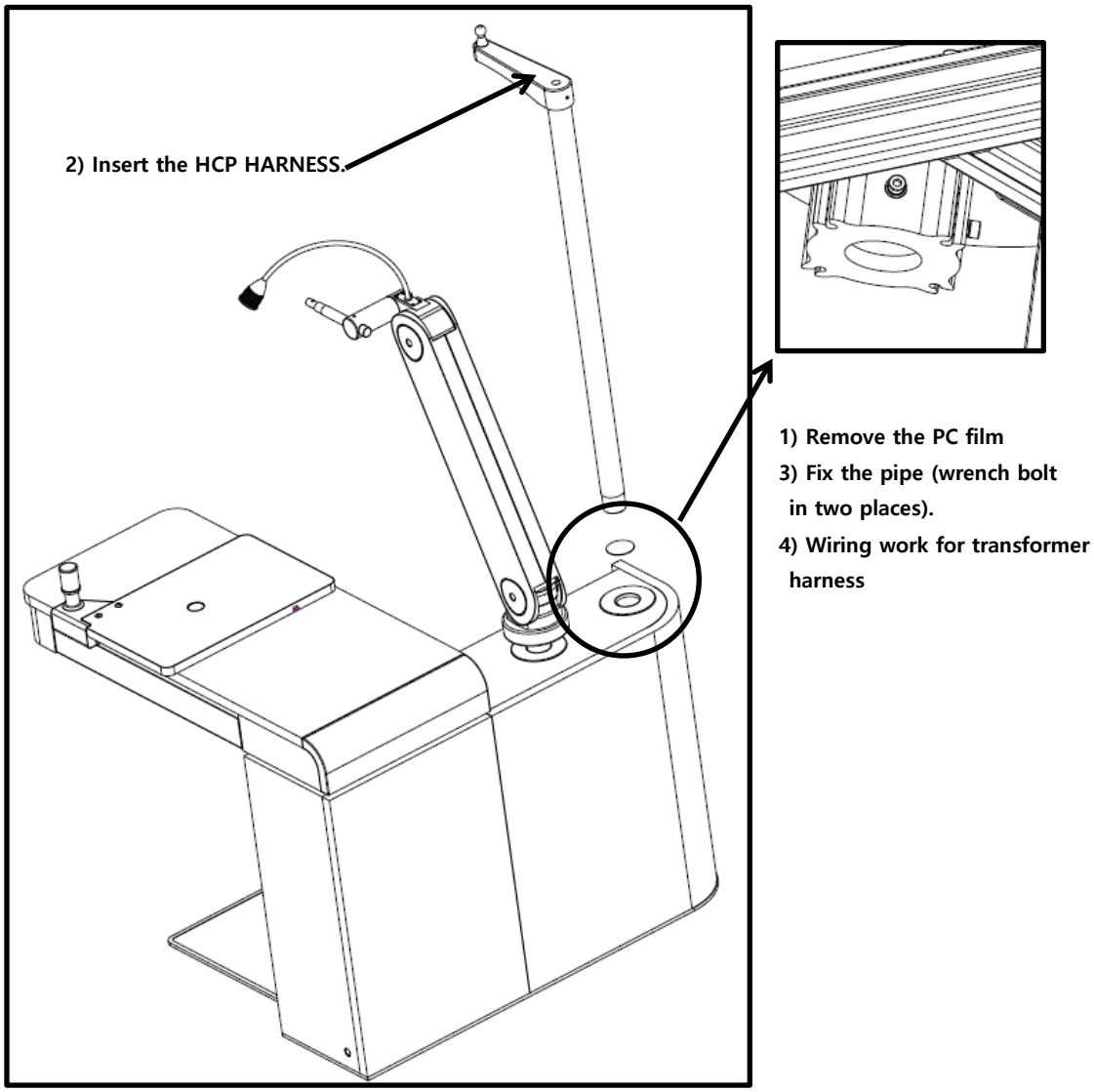
< Fig. 4-2 > ARM MOTOR & TEST & REDY & LED HARNESS assembling

5. Auxiliary Foot support assembling in MAIN BODY ASSY(Optional)



<Fig. 5 > Auxiliary Foot assembling

6. HCP PIPE ASSY assembling in MAIN BODY ASSY(Optional)



< Fig. 6 > HCP PIPE ASSY assembling

8. How to use

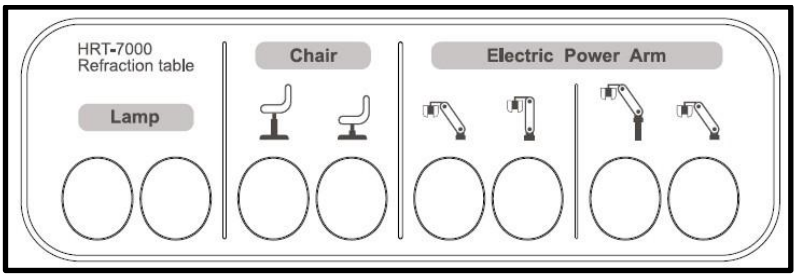
8.1. Preparation before use

1. Make sure that the product is located on a flat surface.
2. It must be installed according to the installation manual.
3. If the optometrist, slit lamp, chart projectors are connected, check whether the cable is connected correctly.
4. If you have connected a reflector, it can be operated normally when only the cable is connected to the junction boxes and operation panel correctly.
5. The junction box and operation panel is provided with the reflector.
6. For each of the optometrists' equipment, refer the user's manual of the corresponding product.

8.2. How to operate

1. Connect the required cables such as the tables and the cable of chair.
2. Put the optometrists' equipment on the table or hang it.
3. Connect the power cable of installing the optometric equipments.
4. Connect the power cable to the table.
5. Turn on the power switch, and verify that the power switch is turned on.

8.3. How to use



< Fig. 1-1 > TABLE BUTTON

1. Lamp control: Control the ON/OFF of Lamp.
2. Chair control: Control the UP/DOWN of chair.
3. Electric Power Arm: Control the UP/DOWN of ARM and control its angle by TEST/REST for test of ARM.
4. For the use method of other installed optometrist, slit lamp, chart projectors, reflector, refer the user's manual of the corresponding product.

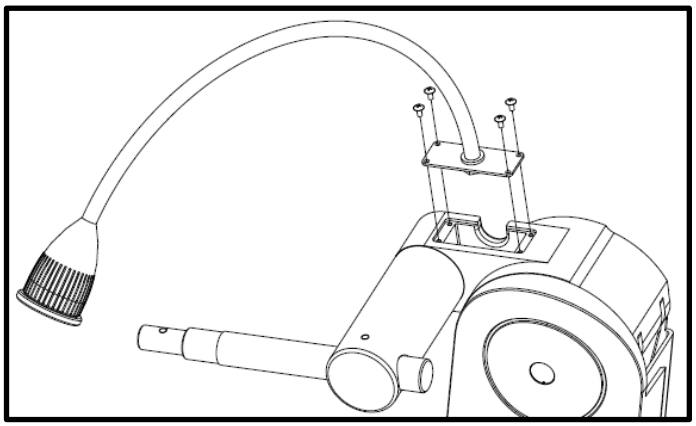
8.4. Storage and management methods after using

1. Turn off power by switch
2. Do not pull the power cord and do not use excessive force by holding code
3. If you do not use for a long time, disconnect the power from the outlet for storing
4. Clean and arrange the parts, code.
5. Always keep a clean the appliance for using next time
6. Do not open or disassemble the appliance. The manufacturer is not responsible for the problem due to it.
7. Do not connect the power cord without connecting the appliance parts completely. It may be harmful for the appliance.
8. The repair should be conducted after separating the plug from the power socket or outlet. If the problem is not solved by following described manipulation, contact to the place of purchase.
9. Turn off the power switch for replacement of LED lamp. You may get electric shock.

8.5. LED lamp replacement

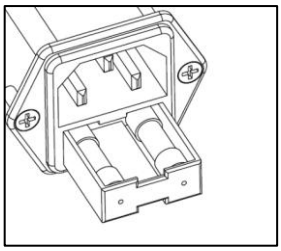
Replace the lamp in the following sequence. (In case of integral type)

- Disconnect power.
- Remove 4 screws.
- Remove the connector and place the new lamp.
- Assemble in the reverse procedure of disassembly.
- When the assembly is completed, connect the power.



< Fig. 1-2 > LAMP REPLACEMENT

8.6. Fuse replacement



< Fig.1-3 > POWER SOKET

Replace the fuse by following order.

- First, completely remove the cable from the power socket.
- Disconnect the fuse slot from the power socket.
- Replace the fuse and assemble the fuse slot with the power socket.
- When the assembly is completed, connect the cable to the power socket.

9. Self-diagnostics and maintenance

9.1. Before calling service man

1. If there is no reaction after turning on the power switch.
   - Check that the power line is inserted correctly into the power socket. If the connection is not complete, the product does not turn on properly.
   - Check whether the power supply line is put on the socket, and the switch-on location.
   - After turning the power on, verify that the Green LED turns on power switch.
   - Check whether the fuse in power socket is off.
   - If the fuse in power socket is out, it should be replaced with new one.
   - If this does not resolve the issue, in order to obtain service, contact your original place of purchase.
2. If nothing happens when you push the arm switch
   - After turning the power on, verify that the Green LED turns on power switch.
   - If this does not resolve the issue, in order to obtain service, contact your original place of purchase.
3. If the lamp does not turn on
   - After turning the power on, verify that the Green LED turns on power switch
   - Exchange the lamp with new one.
   - If this does not resolve the issue, in order to obtain service, contact your original place of purchase.

9.2. Equipment cleaning

- The equipment shall be kept clean by default and do not use strong volatile substances such as the thinner, benzene.
- After run a little soapy water over the soft cloth, and clean each part with it.

9.3. When moving equipment installation place

- Turn off the power switch of the main unit.
- Remove the power connection cable.

10. Service information

How to use the service: If there is occurrence of malfunction in some appliance, the following steps should be performed.

- After system installation, If there is problem, contact your original place of purchase.

- Before you contact with the sales agents, you better check the information like the model number and serial number. So you better write it on the following table soon after purchasing the product. Then you can view this information at any time. The serial number can be confirmed on the back side of the appliance. The serial number is a unique number for each appliance. This documentation should be kept on ongoing by the records for the purchase. The purchase receipt should be kept on ongoing by the evidence for purchase.

Date of purchase: _____

Account name: _____

Account address: _____

Account Contacts: _____

Model number: _____

Serial number: _____

If you can't make contact with distributor purchased, you can contact with the service department of Huvitz directly by using the address and telephone number listed in the table below.

Huvitz Co., Ltd 38, Burim-ro 170beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055 Republic of Korea	**Tel:** +82-31-428-9100 **Fax**: +82-31-477-9022(FA) **URL : http://www.huvitz.com** **e-mail:** svc@huvitz.com

Main features and specifications

10.1. Main features of the product

1. Many optometrists' related equipments can be used by being mounted and fixed.
2. The suitable test for the examinee is possible by adjusting the chair and the power-arm.
3. The additional optometrists' equipment can be loaded by purchasing the secondary table if necessary.
4. The table direction can be selected in left/right side as option.
5. LED lamp is installed, so it can be used for the various optometric environments conveniently.

10.2. Main specifications

Refraction Table HRT-7000 size(mm)	1,089(W) x 1,045(D) x 1,447(H)
Power arm operates the Z axis	200mm(±20mm)
Power arm left and right transferred angle	40° (Left: 25°/Right: 15°)
Chair size(mm)	650(W) x 743(D) x 1360(H)
Chair up/down motion	150mm(±10mm)
Power	AC100-120/200-240V, 7/4.5A, 50/60Hz
Light bulb	LED Lamp 3W

11. Parts

The standard parts are as follows.

- One type of CHAIR CABLE (No. 1) : 1ea

- POWER CORD (No. 2) : 1ea

- ASS'Y &BASE & POWER CABLE for CCP (No. 3) : 1ea

- HDR HEAD SHAFT (No. 4) : 1ea

- LED lamp (No. 5) : 1 SET

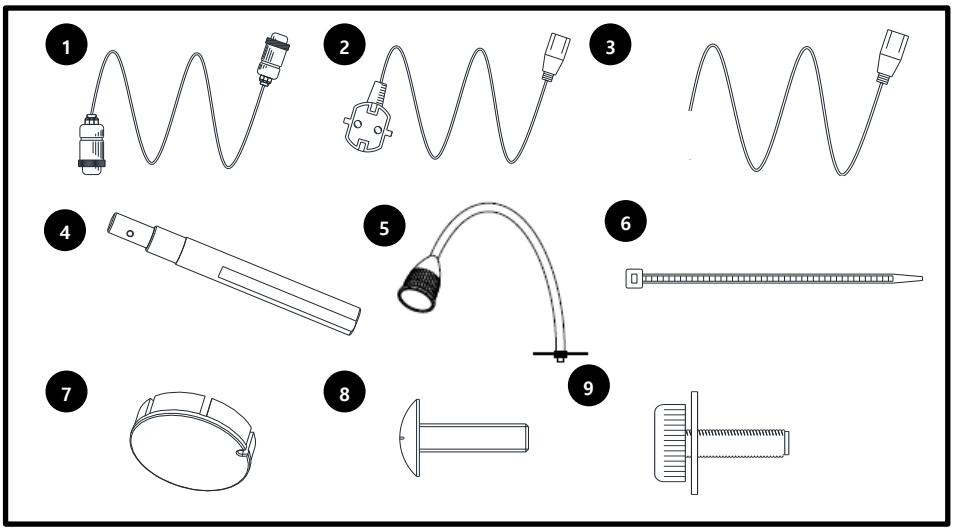
- CABLE TIE (No. 6) : 100mm X 2ea, 200mm X2ea

- BOLT COVER (No. 7) : 2ea

- Truss M6X30 (No. 8) : 2ea

- Wrench bolt M6x15, M6 Spring washer: Each 4ea,

- Wrench bolt M8x15: 4ea (No.9)



<Fig. 1> Parts

12. EMC INFORMATION

Manufacturer announcement – electromagnetic waves trouble

- **Electromagnetic waves trouble**
  HRT-7000 should be used in the below mentioned electromagnetic wave environment. HRT-7000 purchaser or user needs to confirm whether HRT-7000 is used in this type of environment.

Trouble test	Question of appropriateness
RF emissions CISPR 11	Group 1
RF emissions CISPR 11	Class B
Harmonic emissions IEC 61000-3-2	Class A
Voltage fluctuations/flicker IEC 61000-3-3	Complies

- **Electromagnetic waves tolerance**
  HRT-7000 is to be used in the below designated electromagnetic wave environment. HRT-7000 customer and user need to guarantee that the HRT-7000 will be used in this type of environment.

Tolerance test	IEC 60601 test level	Appropriateness level
Electrostatic discharge(ESD) IEC 61000－4－2	contact ±8 kV in the air ±15 kV	contact ±8 kV in the air ±15 kV
Electric rapid transients/bust IEC 61000－4－4	power supplying line ±2 kV input/output line ±1 kV	power supplying line ±2 kV input/output line ±1 kV
Surge IEC 61000－4－5	between lines ±1 kV between line and grounding ±2 kV	differential mode ±1 kV common mode ±2 kV
Voltage dip, instantaneous interruption, voltage fluctuation at the power input line IEC 61000－4－11	For 0.5 cycle < 5 %UT (UT's > 95 % decrease) For 5 cycle, 40 % UT (UT's 60 % decrease) For 25 cycle, 70 %UT (UT's 30 % decrease) For 5 seconds < 5 % UT(UT's > 95 % decrease)	For 0.5 cycle < 5 %UT (UT's > 95 % decrease) For 5 cycle, 40 % UT (UT's 60 % decrease) For 25 cycle, 70 %UT (UT's 30 % decrease) For 5 seconds, < 5 %UT(UT's > 95 % decrease)
Power frequency magnetic field (50/60 Hz)	30 A/m	30 A/m

IEC 61000－4－8		
Other UT is the a.c. power voltage for before approving the test level.		

- **Electromagnetic waves tolerance**

  HRT-7000 is to be used in the below mentioned electromagnetic wave environment. HRT-7000 purchaser or user needs to confirm whether HRT-7000 is used at this environment.

Tolerance test	IEC 60601 test conditions	Appropriateness level
Conductivity RF electromagnetic field IEC 61000－4－6	3 Vrms 150 kHz~80 MHz	3 Vrms
Radioactivity RF electromagnetic field tolerance IEC 61000－4－3	10 V/m 80 MHz~2.7 GHz scope	10 V/m