

Introduction

1. For proper use	2
2. Efficacy and effectiveness	6
3. Configuration	6
4. Name and function of each main body part	7

Before use

1. Safety precautions for conductive plates	8
2. Method of use	9
3. How to connect conductive plates	10
4. How to wrap with spiral tubes	10
5. How to fit the cover with velcro loop	11
6. How to fit the velcro with square buckle	11
7. How to connect AC adapter	12
8. Placing insulating mat	13

How to apply conductive plate

How to apply to wrist	14
How to apply to hand	14
How to apply to foot	15
How to apply to neck or back	15

How to use

How to operate	16
----------------	----

Troubleshooting

18

Care and storage

19

Specifications

20

Other information

23

MsD reltec maintenance list

Please maintain your device in accordance with the following table for proper and safe use as well as maintenance of the efficacy and effectiveness.
If you find any abnormalities, discontinue use and unplug the AC adapter. Then contact your dealer.

	Check items	What to check	Solution
Monthly Check	Cleaning of body unit	<ul style="list-style-type: none"> The exterior must not have cracking, breakage, etc. 	Contact your dealer if your device has any of the symptoms shown in the left.
	AC adapter	<ul style="list-style-type: none"> Is the AC adapter broken? Is there a cut in the AC adapter? 	Contact your dealer if your device has any of the symptoms shown in the left.
Weekly Check		Conductive plates	<ul style="list-style-type: none"> Is there dust between the outlet and the AC adapter plug?
	<ul style="list-style-type: none"> The conductive plates are not wet or damp, and are completely dry. 		Remove the velcro after use, and let the velcro and conductive plates dry naturally, placing them apart.
	<ul style="list-style-type: none"> Is there any breakage, cut, or deformation in the conductive plates (applied parts) and the conductive plate cables? Do you feel a shock similar to an electric shock during operation? 		Contact your dealer if your device has any of the symptoms shown in the left.
Daily Check	Covers and velcro	<ul style="list-style-type: none"> Are the covers and velcro kept clean? 	Wash them frequently as ingredients such as sweat, etc. stick to them.

- Before cleaning, unplug the AC adapter from the outlet as it may cause electric shock.
- Wipe with a dried soft cloth and never use benzine or thinner for cleaning.
- Wet or damp conductive plates must be dried naturally. Do not dry them with a hair dryer or a heater.
- Do not touch conductive plates with wet hands.

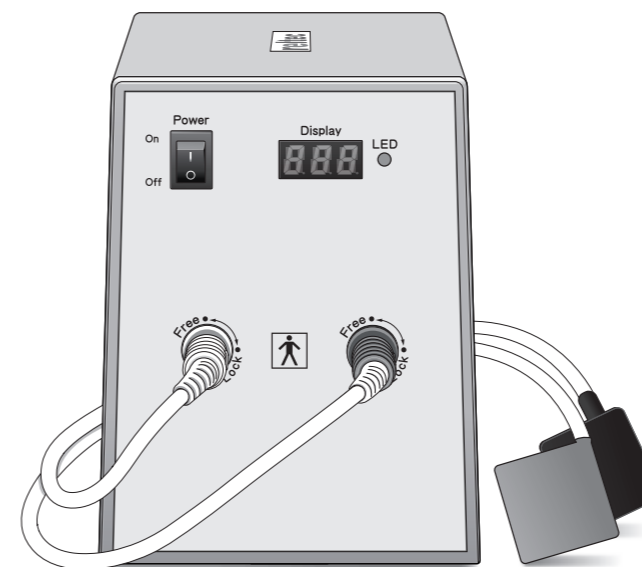
Please fill out the following information for easy reference.
Check the product name and serial number before contacting your dealer to place an order or ask for inspection, repair, etc.

Serial Number	Date of Purchase	Dealer
		TEL () —

Electric Therapy Equipment

MsD reltec

INSTRUCTION MANUAL



Please read before use

Thank you for purchasing MsD reltec.
Be sure to read this instruction manual carefully before use this device appropriately.
Keep this manual at hand for quick reference at any time necessary.

Manufacturer
RELTEC Medical Devices Corporation

3795-1, Kawatsu-cho, Sakaide-shi, Kagawa, 762-0025, Japan

<https://reltec.co.jp>

1. For proper use

Thank you for purchasing MsD reltec.

MsD reltec is an electric therapy equipment which is intended to alleviate headache, stiff shoulder, insomnia and chronic constipation.

Be sure to read this manual carefully before use this device appropriately.

The following signs indicate the possibility of causing harm or physical damage to users and other persons when the device is handled incorrectly disregarding the signs.

 **Warning** This sign indicates the possibility of causing “death or serious injury” when the device is handled incorrectly disregarding the sign.

 **Caution** This sign indicates the possibility of causing “injury or physical damage” when the device is handled incorrectly disregarding the sign.

The following signs indicate prohibited actions or mandatory actions.

 **Prohibitions** This sign indicates prohibited actions.

 **Compulsory** This sign indicates mandatory actions.

Pay special attention to the following instructions before use.

Caution

People with the following symptoms should consult a medical doctor before use and pay attention to their physical condition.

1. Person with acute illness.
2. Person with malignant tumor.
3. Person with heart diseases. (Person with heart problems)
4. Person with high fever
Person with his body temperature of 38 °C or above (incidence of fever) .
(Person suffering from symptoms of severe acute inflammation
(fatigue, chill, blood pressure fluctuation, etc.) (and person who is debilitated.)
5. Pregnant woman
Especially person in the early stage of her pregnancy, or immediately after childbirth.
6. Person who requires bed rest.
7. Person with acute (painful) diseases such as spinal fracture, sprain and muscle strain.
8. Person with sensory disturbance due to advanced peripheral circulatory disorders caused by diabetes, etc.
9. Person who is likely to get low temperature burned.
10. Person with esthesiodermia or skin abnormality (infection or wound, etc.)
11. Person with other severe illness.

Contraindications to combined use

Do not use the device in combination with any of the following electronic medical devices and mechanical organs since it may result in malfunction.

1. VHF therapy device, Microwave therapy device, the device emitting powerful electromagnetic wave like electrocauterizer, high-power magnetic line, and X-ray.
2. Life-support devices such as an artificial heart-lung machine.
3. Wearable electronic medical devices such as an electrocardiograph.
4. Life supporting electronic medical devices such as artificial heart lung.
5. Artificial middle ear, artificial inner ear, metallic artificial heart valves, etc.

Warning

1. Do not allow this device to be used alone by babies, toddlers, children and persons who are unable to express his own intention.
2. Discontinue use immediately and consult your doctor if you feel any abnormalities in your body.
3. Do not use the device when the conductive plates are wet.
4. Make sure not to touch the third parties or surrounding electric machines under a operating. Failure to do so may results in causing electric shock. The operator should not touch the person being used and the device at the same time.
5. Use of this device adjacent to or stacked with other device should be avoided because it could result in improper operation.
6. AC adapter and conductive plate ACs, BD are applicable as accessories with the possibility of impacting on compliance with electromagnetic emissions and electromagnetic immunity.
7. Do not use accessories other than those (AC adapter, conductive plate ACs, BD) provided by us. This is because use of accessories other than those (AC adapter, conductive plate ACs, BD) provided by us could result in increased electromagnetic emissions or decreased electromagnetic immunity and result in improper operation.
8. A warning statement to the effect that: “WARNING: Portable RF communications device (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the MsD reltec, including cables specified by the manufac turer. Otherwise, degradation of the performance of this device could result.”

1. For proper use

Caution



Do not disassemble

- Never open the case as high voltage is generated inside of the main body.
- Do not disassemble, repair, or modify the main body and accessories.
- Do not use the main body and accessories for any other purpose. It may cause injuries such as electric shock or a malfunction.



Keep fire away

- Keep flammable materials and cigarettes away from the device.
- Keep the main body and accessories away from heaters. Failure to do so may cause a fire or a malfunction.



- Do not use this device in very humid and moist places such as in a bathroom. Failure to do so may cause injuries such as electric shock or malfunction.
- Do not wash the main body and accessories in water. If liquid enters the main body or accessories, switch off the device immediately, unplug the AC adapter from the outlet and discontinue use.
- Do not touch with wet hands. Failure to do so may cause injury or malfunction such as electric shock.



Unplug the AC adapter from the outlet










- When you notice any abnormalities such as unusual odor, abnormal sound, smoke, etc., switch off the device, unplug the AC adapter from the outlet and discontinue use.
- When the device is dropped, pushed down, or subjected to a strong shock, switch off the device immediately, unplug the AC adapter from the outlet and discontinue the use.
*Contact your dealer if you have any of the problems mentioned above.
- While lightning is occurring, stop using the device and unplug the AC adapter from the outlet. In the event of a blackout, switch off the device immediately.




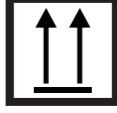
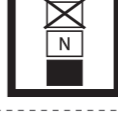





Caution

- Do not bundle the AC adapter.
- Do not place heavy objects such as furniture on the AC adapter.
- Do not pull or twist the AC adapter.
- Do not put the machine at the place where the AC adapter can not be inserted or removed.

Graphical symbols for electrical device in medical practice

	Dangerous voltage		BF-type applied part
	Operator's manual		Alternating Current
	Date of manufacture		Serial number
	Manufacturer		Model number
	Electric shock protection classification Class II		

Graphical symbols for both transport and storage

	Fragile; Handle with care		This way up
	Stacking limit by number		Do not roll
	Keep away from sunlight		Keep away from rain
	Temperature limit		Humidity limitation

2. Efficacy and effectiveness

For relief of the following symptoms

Headache

Insomnia

Stiff shoulder

Chronic constipation

3. Configuration

※ Please check if all the components listed below are provided by checking the following boxes.

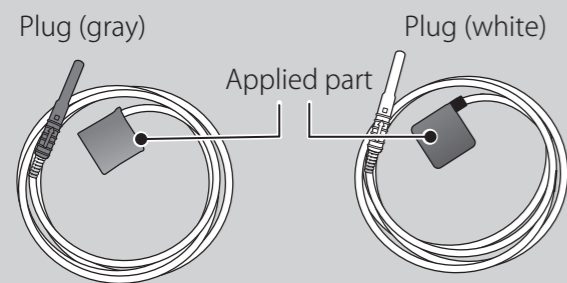


Main body
(1unit)



Instruction manual
(1copy)

Accessories [Not covered by warranty]



Conductive plate ACs
(1 pc)

Conductive plate BD
(1 pc)



Cover with velcro loop
(4 pcs)



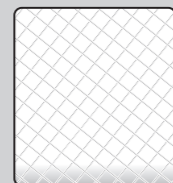
Spiral tube (5 pcs)



AC adapter (1 pc)



DC plug cover
(1 pc)



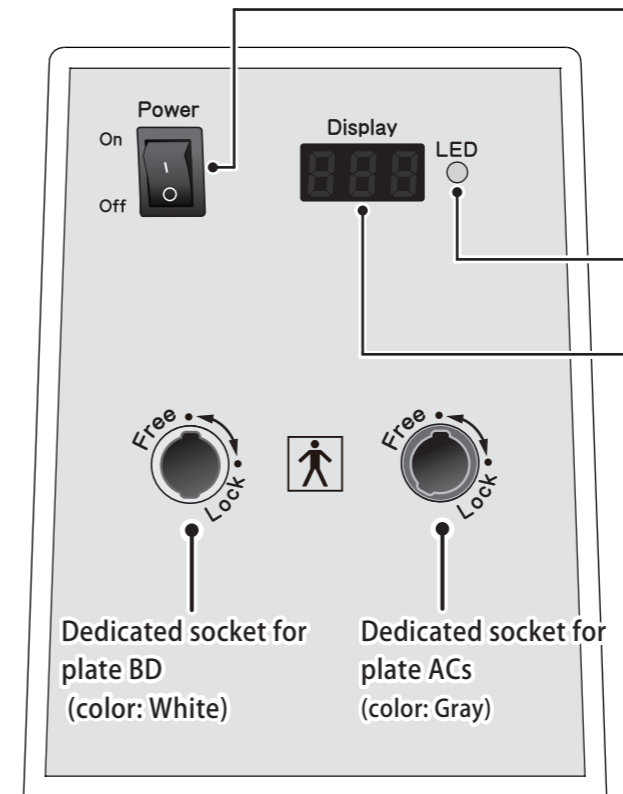
Insulating mat
(1 pc)



Velcro with square buckle
(1 pc)

※All of the accessories in the box are consumables and are not covered by warranty.

4. Name and function of each part of the main body



Front

Power switch

○ indicates "OFF", and ■ indicates "ON".

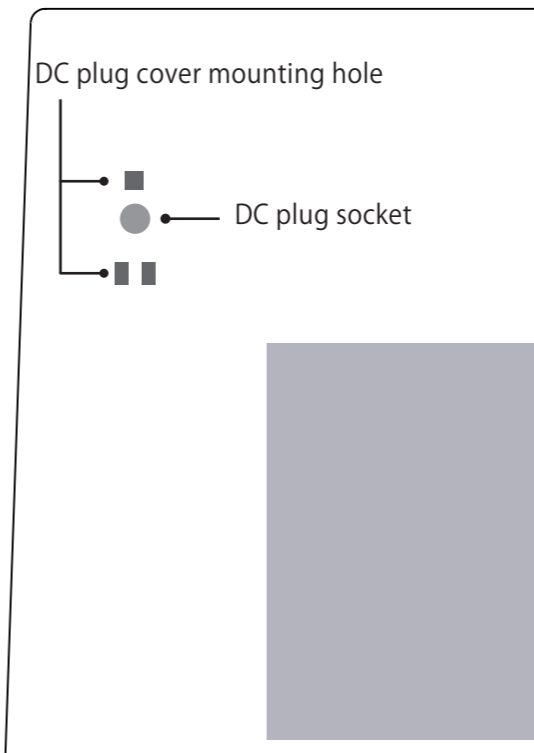
Operation starts when turned On, operation stops when turned Off.

LED

Lights up when the power is On (during operation).
In addition, when the main body malfunctions or the output voltage drops, LED flashes and the buzzer makes sound.
(See page 18.)

Display screen

The time from the start of operation is displayed in minutes.
When the conductive plate is not properly inserted or comes off during operation, the Display flashes and the buzzer makes sound.
(See page 18.)



Back

Rating label

Information such as serial number is written.

1. Safety precautions for conductive plates

Pay attention to the following instructions and use the equipment properly.

● Make sure to apply the conductive plates to the body before starting operation

If you apply the conductive plates after starting operation, the conductive plates may be damaged and you may feel an unpleasant electric stimulation similar to static shock. Stop operating the device firstly in case of removing the conductive plates from applied parts.

● These actions may break the cable

Be careful not to apply excessive force to the conductive plate cables. The cables must not be excessively bent, pulled, twisted, or rolled up into a small bundle. In addition, do not place heavy objects on the cables. Failure to do so may shorten the life of the cables and cause a fire, electric shock, or an accident. Be careful not to shock the plug part as this may cause damage to the plug.

● Do not bend too sharply

When you apply the conductive plates to the body, be careful not to bend them too sharply by tightening them excessively. The conductive plates may be damaged if bent too much.

● Watch out for ointment and sweat!

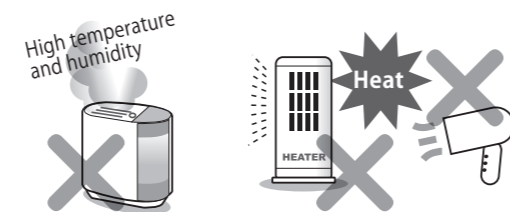
If your hands are wet with sweat or coated with ointment, please make be sure to wipe them off before using the conductive plates.

● Do not allow metal objects to contact

Do not let metal (beds, chairs, precious metals, etc.) come into contact with your body or conductive plates during operation, as static electricity may be generated.

● Hot and humid conditions damage conductive plates

When a conductive plate is wet or damp with sweat, dry it completely before use. Never attempt to dry it by using a hair dryer or a heater as they may result in damage.



● Watch out for wet conditions!

Use both sides of each conductive plate alternately. After operation is completed, remove velcro and dry the velcro, conductive plates ACs and BD naturally, while placing them apart. In addition, wash the provided covers frequently since ingredients such as sweat stick to them.

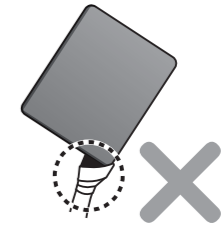
● When a conductive plate is damaged

There is a risk of injury or electric shock, so if the conductive plate is even slightly damaged, do not use it and replace it with a new one.

● In the event of malfunction

If any of the conductive plates are damaged or in a fault condition, discontinue use immediately. Consult your dealer as it is dangerous to make a repair by yourself or use the device continuously.

Ex) Fixed with tape



2. Method of use

Typical use case

Period	Single use time	If you feel temporary body sluggishness, shorten the duration of each use.
Day 1 - Day 3	5 to 10 min	
Day 4 - Day 7	10 to 15 min	
Day 8 ~	15 to 30 min	

Use per day
1 to 5 times
(standard)

Single use time
5 to 30 min
(standard)

- The table above shows an example of typical use. Please adjust period, duration, and frequency of treatment depending on your health condition.
- When you use the device for the first time, start with a short-time operating (approximately 5 minutes). Have your body get accustomed to it gradually as you receive the operating repetitively.
- Excessive use may cause temporary sluggishness. Adjust operating time depending on your age, health condition and physical condition.
- Children and persons who have a weak constitution are recommended to adjust operating time (e.g., limit operating time to within 20 minutes) when necessary depending on their age, body strength and weight.
- Follow your doctor's advice, if any.
- Use both sides of each conductive plate alternately.
- Make sure to stop toperating before letting another person to use the device or putting the conductive plates on other parts of the body in the middle of operating.
- When you feel any abnormalities in your body, stop using the device immediately and follow your doctor's advice.
- If you have not used the device for a month or more, please use it for a short period of time (about 5 minutes) as you did when you first started using it, and gradually acclimate your body to it.

3. How to connect conductive plates

Insert the plug while holding the main body so that it does not move.

Conductive plate BD
[Color: White]

Hold the conductive plate BD plug (white) with the arrow ↑ facing up and insert it all the way into the socket (white) straight and firmly. Then turn the plug 90 degrees to the right.
(Conductive plate BD can be inserted with the arrow ↑ facing downward.)

Conductive plate ACs
[Color: Gray]

Hold the conductive plate ACs plug (gray) with the arrow ↑ facing up and insert it all the way into the socket (gray) straight and firmly. Then turn the plug 90 degrees to the right.

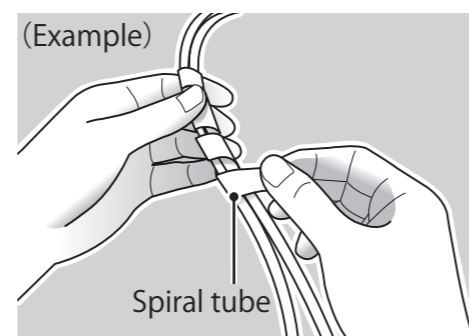
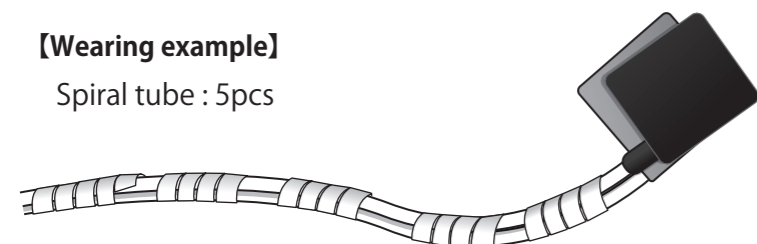
Caution

- Make sure to turn the plug 90 degrees to the right. Otherwise, the plug cannot be firmly fixed and it may fall from the socket.
- Please match the colors of the plug and socket when you insert. Inserting the plug into incorrect socket may result in damage or inability to pull out the plug.

4. How to wrap with spiral tubes

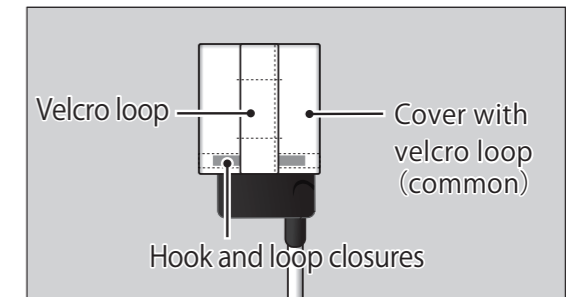
Wrap the conductive plate cables with the provided spiral tubes in spots.

[Wearing example]
Spiral tube : 5pcs



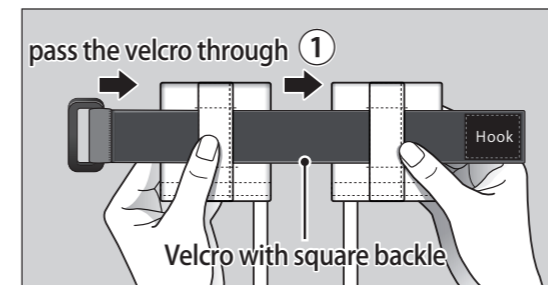
5. How to fit the cover with velcro loop

Fit a provided cover with velcro loop. Open the hook and loop closure on one side of the cover with velcro loop, and insert the conductive plate in it. Then close the hook and loop closure.

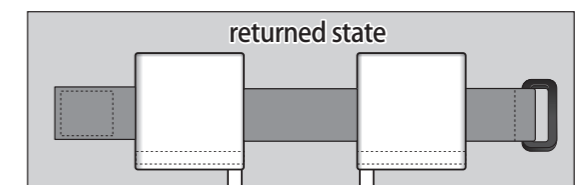
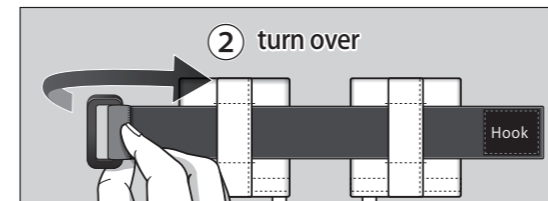


6. How to fit the velcro with square buckle

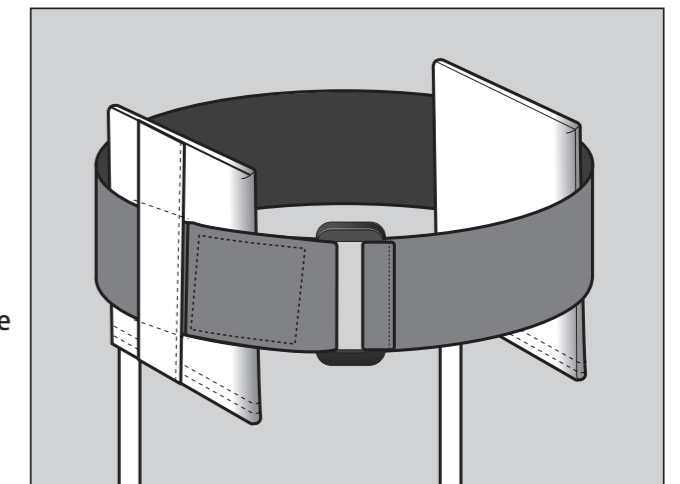
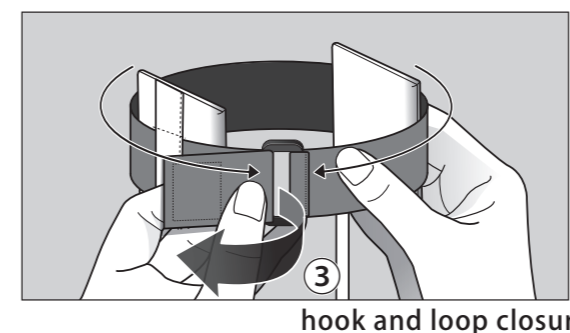
① Pass the velcro through the velcro loop of the cover with velcro loop as shown in the figure on the right. Pay attention to the orientation of the velcro and cover.



② Turn it over so that the surface of the cover is facing you.

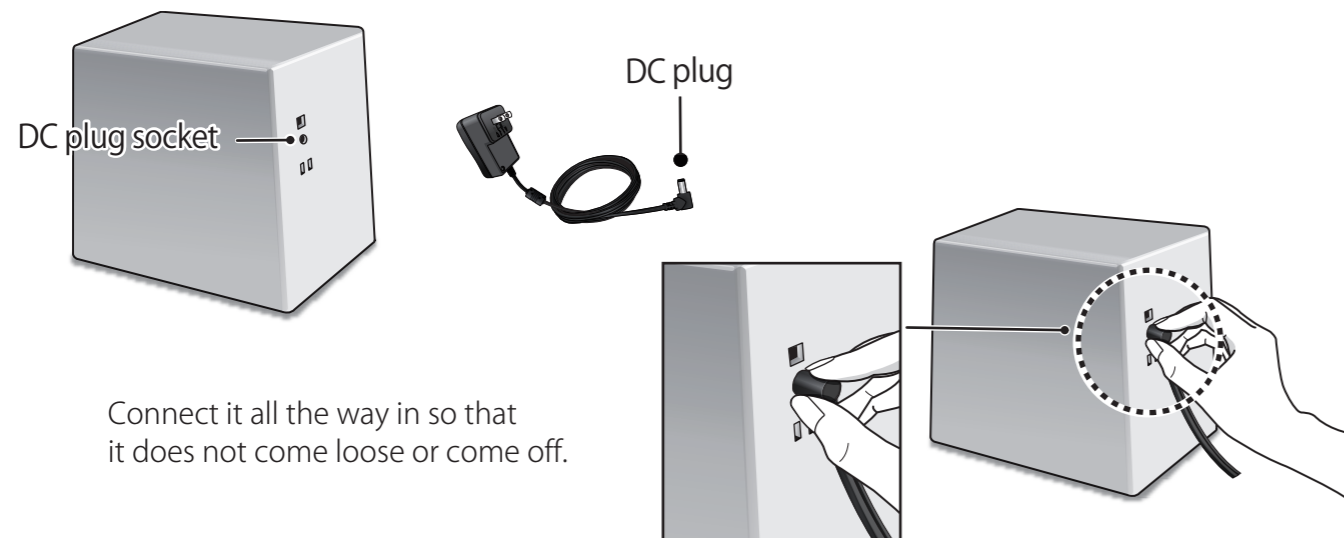


③ Secure the velcro through the square buckle with hook and loop closure.



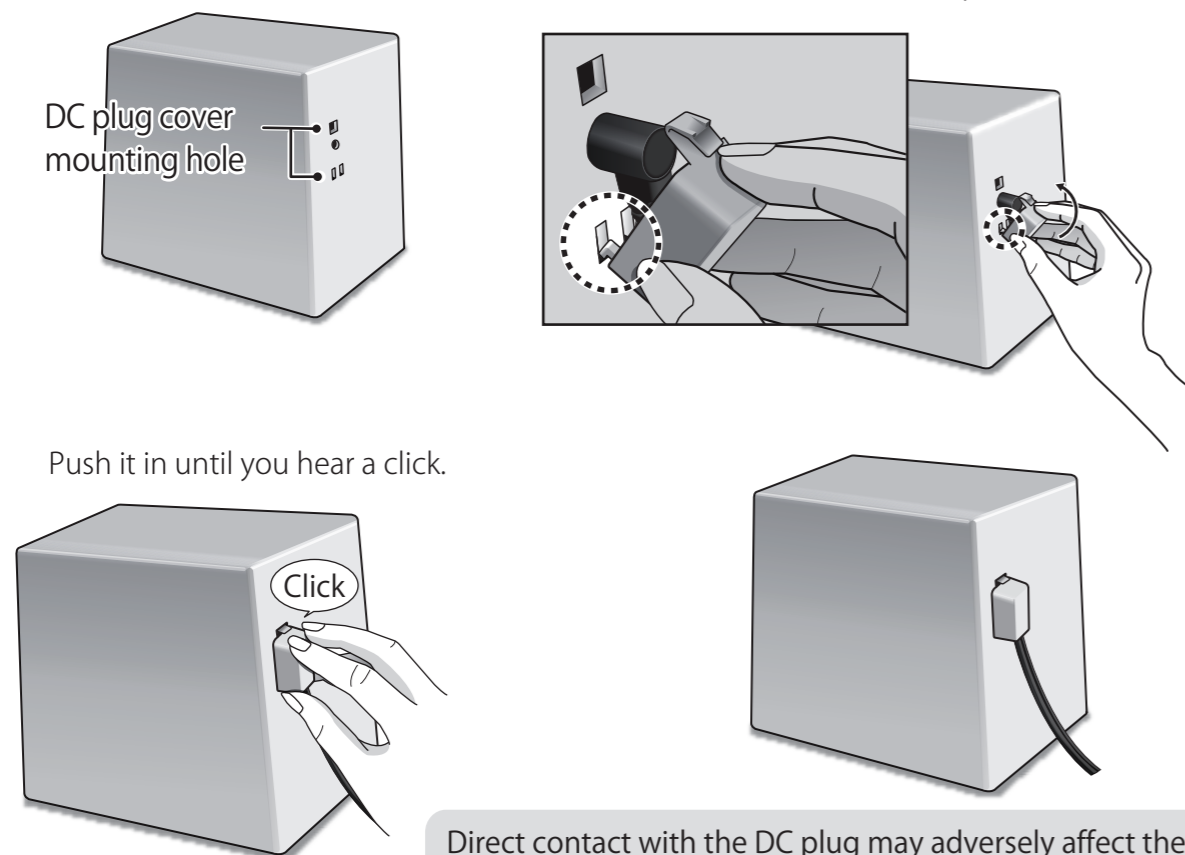
6. How to connect AC adapter

1. Connect the DC plug of the AC adapter into the DC plug socket on the back of the main body.



2. Install the DC plug cover.

Hook the cover over the bottom hole and then insert it into the top hole.



Direct contact with the DC plug may adversely affect the inside of the device due to static electricity, etc., so be sure to install the DC plug cover.

3. Insert the AC plug into the outlet

- ① Put the device on a fixed, stable and flat place avoiding direct sunlight.
- ② Hold the AC adapter plug and insert it all the way into the outlet (household 100-240V AC) straight and firmly to avoid loosening or disconnecting.

8. Placing insulating mat

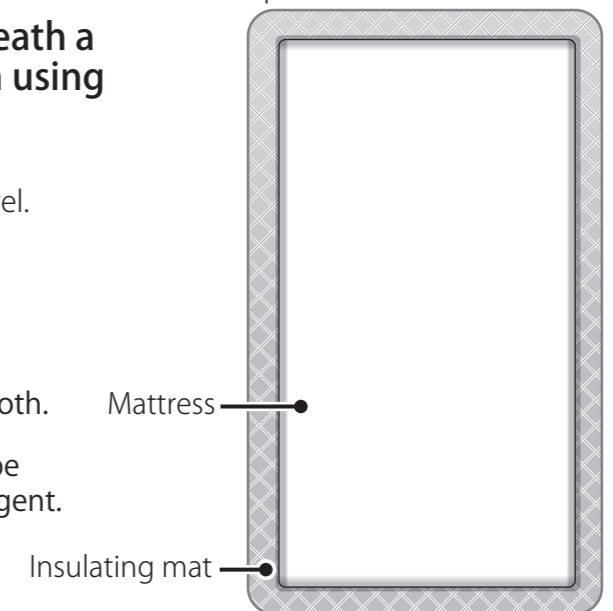
Place the insulating mat on or beneath a mattress, or on a therapy bed when using it while lying down.

Adjust the room temperature to a desired level.

How to care

- Wipe the insulating mat with a dry, soft cloth.
- If stains are difficult to remove, please wipe with a cloth moistured with neutral detergent.
- Let it dry well in the shade.

Example



Caution



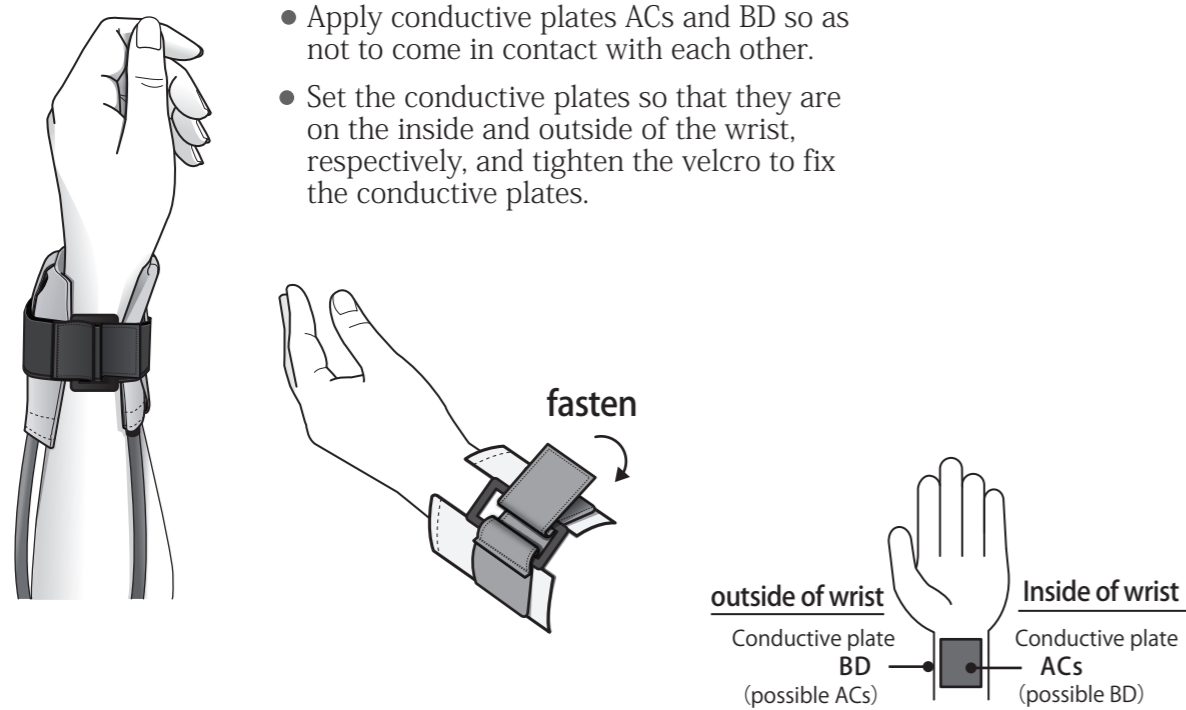
Prohibitions

- Keep the main body and accessories away from a container of liquid such as a vase or an aquarium. If liquid enters the device, it may cause a fire or a breakdown.
- Do not put the device on an inclined surface or in an unstable location where it is subjected to shock or frequent vibrations.
- Do not place the device in a hot place where there is a heater nearby or where it is exposed to direct sunlight.
- Do not put the device in a place where it can be adversely affected by dust, salt, sulfur etc.
- Do not use the device in a place close to MRI generating strong electromagnetic field, shortwave therapy device, and high frequency scalpel. Do not put the device in a place where it is exposed to megnetism or direct irradiation from a microwave therapy device which generates electromagnetic waves.
- Keep the device away from other electrical appliances.
- Do not place anything on top of the device.
- Do not use the device with wet hands as it may cause electric shock or a breakdown.
- Do not use the device in conjunction with other therapy device and electrical appliances such as an electric blanket, an electric footwarmer and so on.
- Do not use the device in combination with a mattress made of conductive substances such as metallic fibers.
- Do not insert a metal rod, etc. into the sockets for conductive plates.
- Do not cause the damage on the cable during in use or in storage.

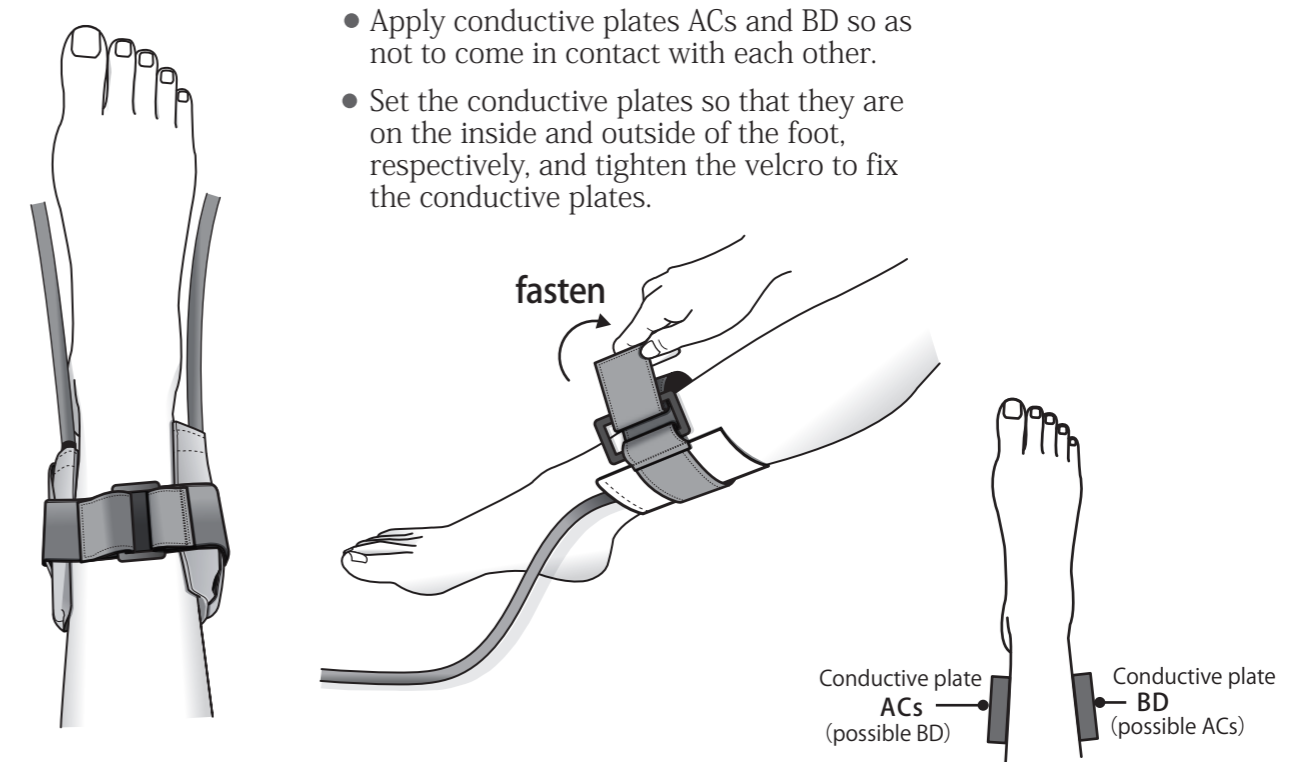
How to apply conductive plate

Before starting operation, appropriately apply conductive plates ACs and BD to the body using the provided velcro.

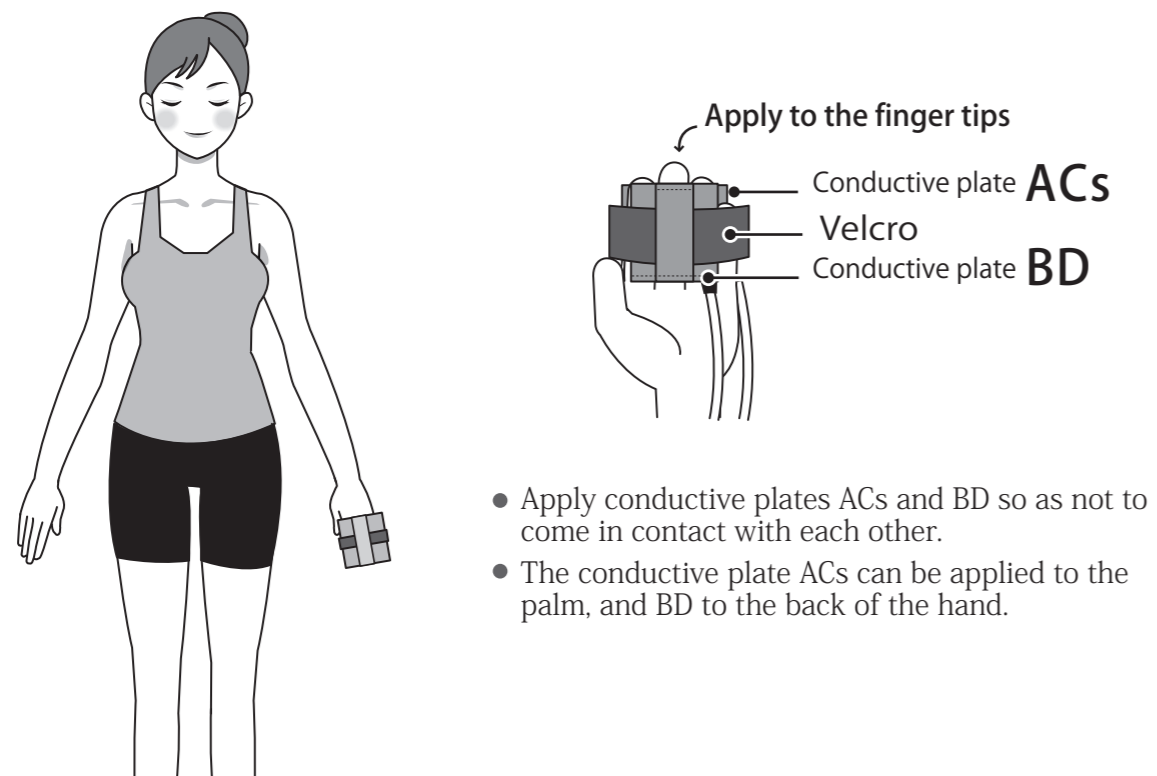
How to apply to wrist



How to apply to foot

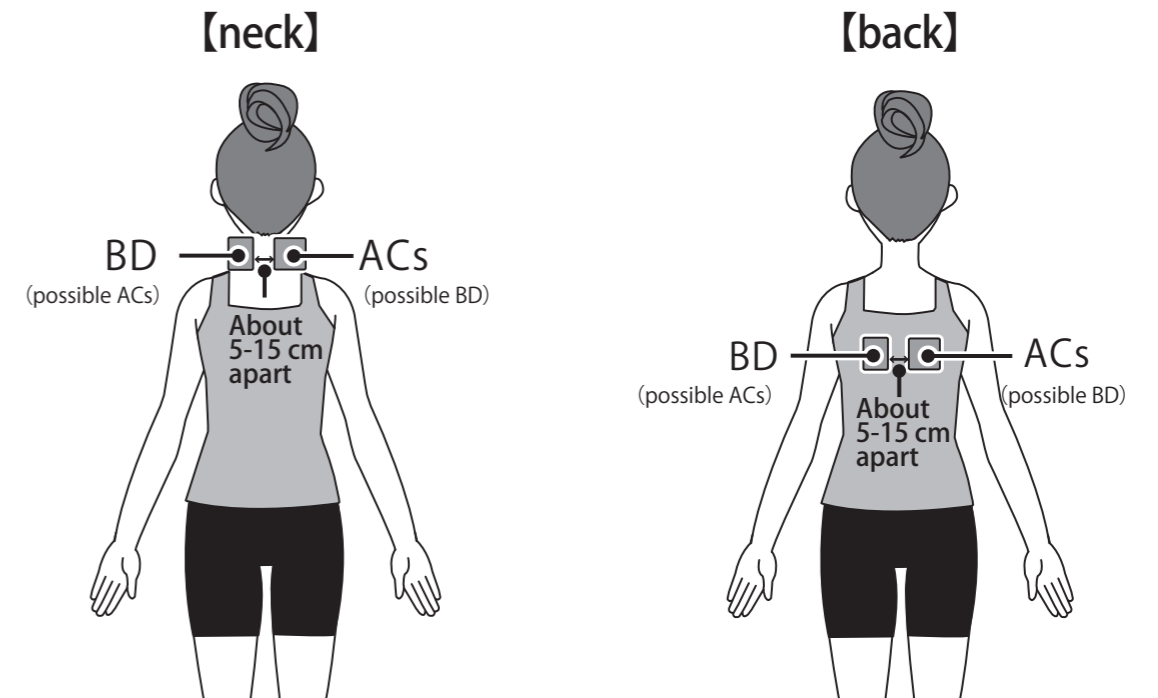


How to apply to hand



How to apply to neck or back

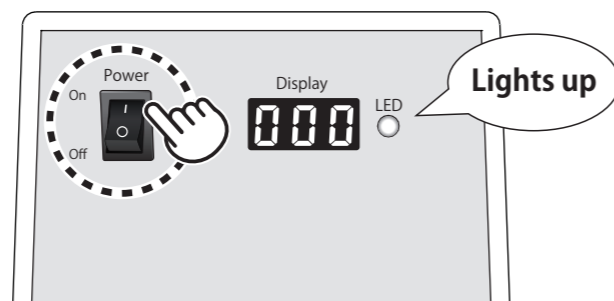
Apply conductive plate ACs to the base of the neck or the back and conductive plate BD by the side, placing them about 5 to 15 cm apart so as not to come in contact with one another. (Use the weight of the body to secure the conductive plates.)



How to operate

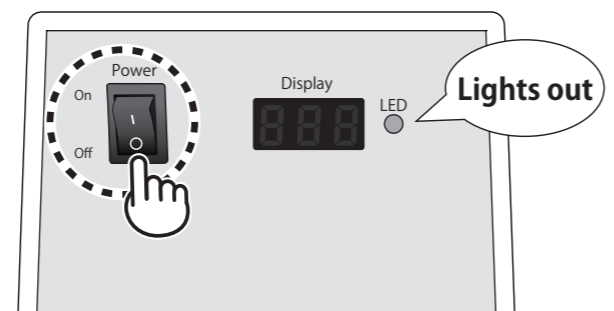
Start operation

Connect the conductive plate and turn the power switch on the front of the main body to "On". The LED lights and operation starts. Also, the time displayed on the Display is "000". "001". "002". "003"... It counts up in minutes from "000".



Stop operation

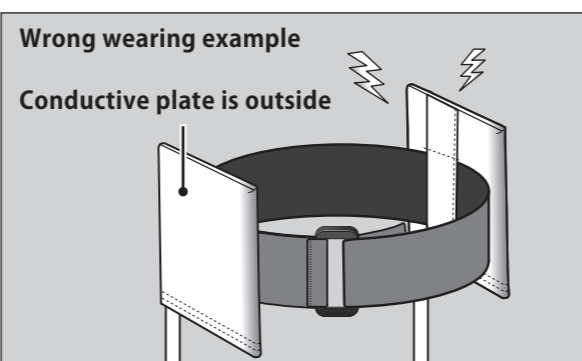
Please turn off the power switch.



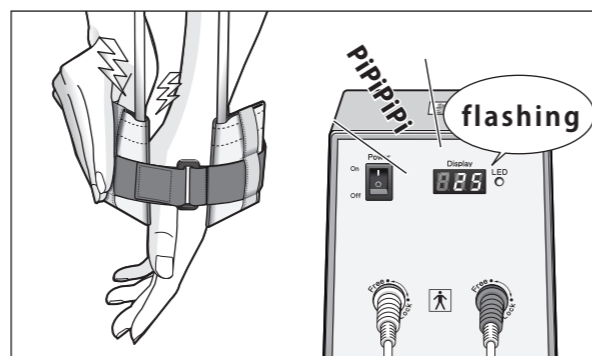
⚠ Please note the following

If you start driving with square buckle velcro on the inside, it will be considered as "energization abnormality", which results in causing error sound after 30 seconds. Also, if you use it with the conductive plate attached in such an incorrect state, you may receive an electric shock.

(See page 11 "How to fit the velcro with square buckle")

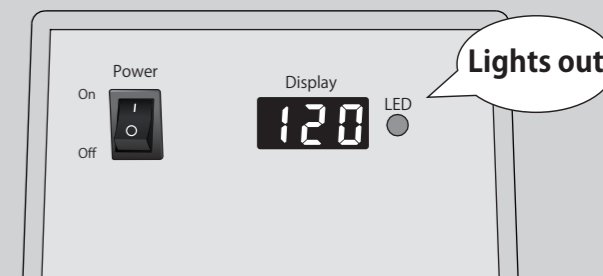


During operation, if the conductive plate is removed before the power switch is turned "Off", which will be regarded as "energization failure" and an error will sound after 30 seconds. Also, if you remove the conductive plate without turning off the power switch, you may receive an electric shock. Please be sure to turn the power switch to "Off" before removing the conductive plates.



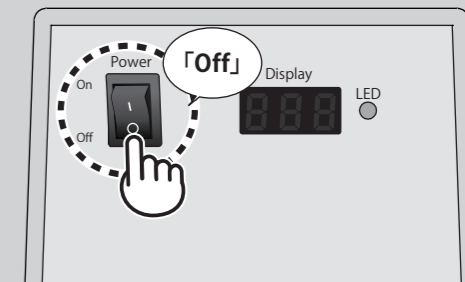
Automatic termination of operation

Maximum operating time is 120 minutes. When the maximum operating time is reached, the end buzzer sounds, the LED turns off, and operation stops. Display shows "120".



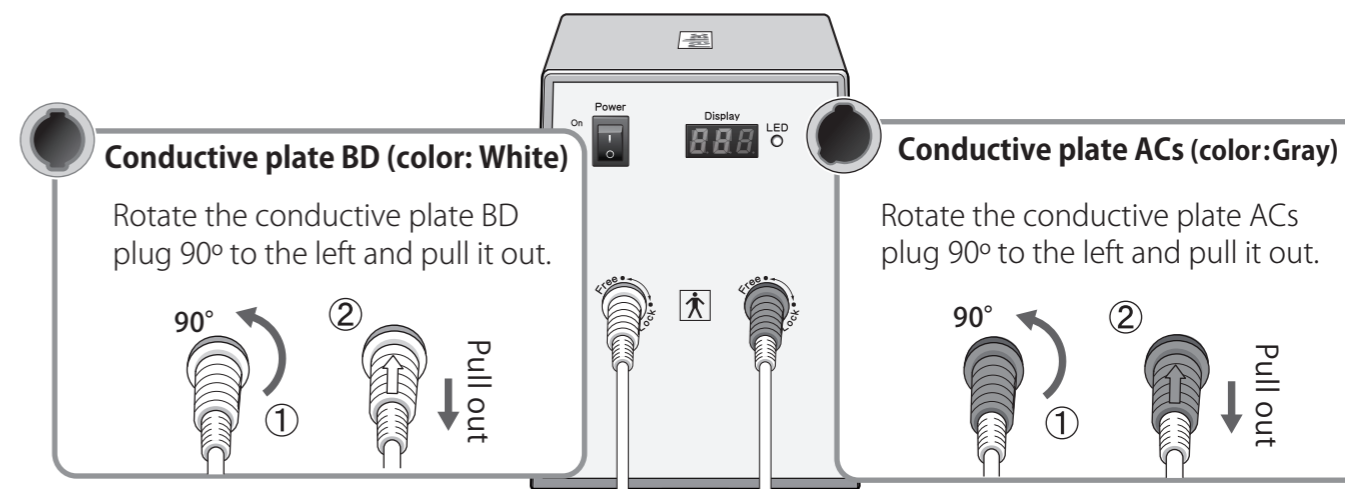
After automatic termination

After the operation has finished automatically, turn the power switch on the front of the main body to "Off"



Remove the conductive plates ACs and BD in reverse order.

Please make sure to remove the plug from the main body, holding down the main body so that it will not slip out of place.



⚠ Attention

Please keep the accessories clean and place them in a place with less moisture to ensure normal use for the next time.

- After the treatment is completed, remove the velcro and dry it naturally in the state where the conductive plates ACs and BD are separated.
- The attached protective cover will be exposed to sweat and other materials, so wash it carefully.

Before moving the main body, remove the AC adapter and conductive plates from the main body. In addition, hold the main body with both hands to prevent accidental dropping.

If you accidentally drop the main body, be sure to contact the dealer where you purchased it for inspection.

- Otherwise, even if the appearance and operation are normal, there may be malfunctions and accidents in the future.

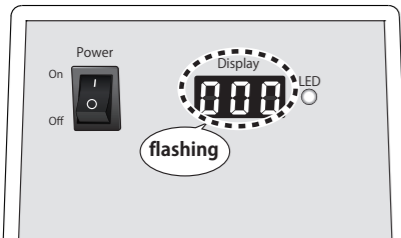
Troubleshooting

If you think something is wrong

Fault	Check	Measures
The main body is not energized after the power switch is turned on. The display screen area is off.	Is the AC adapter connected correctly?	Insert the plug of the AC adapter into the special socket on the back of the unit.
		Plug the AC adapter into the socket (100-240VAC).
Display is blinking and an error tone sounds. (See below)	Is the plug of the conductive plate properly connected to the socket?	Insert the plug of the conductive plate into the its socket. (P10)
	Is the velcro with square buckle attached correctly?	"How to fit the velcro with square buckle" (See page 11)
	Did you remove the conductive plate during operation?	Turn the power switch to "Off" to stop operation.
Blinking LED (power-on indicator lamp) and notification sound	Is the applied part wet with sweat etc?	Dry the conductive plate away from your body.
	Is the environment humid?	Prepare the usage environment.

※ If the situation does not improve after taking countermeasures, the main body is malfunctioning. Ask your dealer for repair.

Fault display



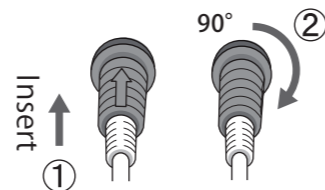
If operation is started without the conductive plate plug being properly connected, or if the plug is removed during operation, the operation will stop, the buzzer will sound intermittently, and the display will flash.

Please insert the conductive plate properly.

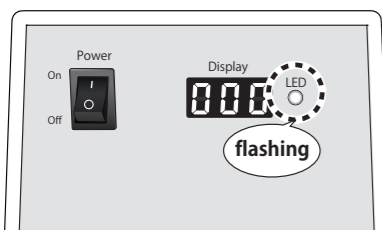
Turn off the power switch once, check for insufficient insertion of the plug, and make sure to insert it securely.

After attaching the conductive plate to the body, turn on the power switch again and start operation.

If an error occurs even after starting operation with the conductive plates plug correctly connected and attached to the main body, the conductive plates may be faulty so discontinue use and contact your dealer.



Blinking LED (power-on indicator lamp) and notification sound



If the area where the product is attached is damp or the room becomes hot and humid during usage, the operation will stop, the alarm will sound continuously and the LED will flash.

Turn off the power switch immediately.

As a countermeasure, remove the conductive plate from your body, wipe off any sweat, and dry it thoroughly.

You may use the air conditioner and fan to adjust the temperature and humidity in the room before using.

If the above measures do not improve the situation, the main unit may be damaged. Stop using it and contact your dealer.

Other questions

Question	Answer
No or low sound from the conductive plates.	The sound coming from a conductive plate is a discharge sound generated when electrons pass through inside space of the conductive plate. It varies depending on various reasons such as the usage environment and deterioration of the conductive plate. The loudness of the sound cannot be used as a criterion for output as it varies depending on the environment.

Care and storage

1. Replacement of consumables (Not covered by warranty)

- The conductive plate is consumable.
- Replacement of consumables on a regular basis is recommended to maintain the efficacy and effectiveness.
- If you use a broken or damaged conductive plate BD, you may receive an electric shock, so we recommend that you inspect the conductive plate BD every 1 to 2 years.
- When the AC adapter or any of the conductive plates is damaged, discontinue use as it is dangerous to use it continuously. Replace damaged one with new one.
- A conductive plate which has been used for many years may cause burns, electric shock or fire due to cable breakage, etc.

2. How to store the device

- Keep the main body and accessories clean, wash covers, etc. and then store them in a dry place in order so that they work properly when used next time.
- When the device is used after an extended period of no use, connect the conductive plates to the main body and confirm that the power switch operates correctly and safely.
- When you use the device after a long period of storage, contact your dealer and have it inspected.
- Please keep the product away from dust and insects, etc.
- Please keep the product away from fire or heat source.
- Do not store the products in precarious places.
- Do not expose the product to direct sunlight.
- Please keep the product out of reach of child.
- Please remove dust between outlet and AC adapter plug.

3. How to dispose of or transfer the device

- If you wish to dispose of or transfer the device, contact your dealer for safety and legal reasons.

Specifications

*Please note that the product specifications and appearance may be subject to change for reasons such as improvement, etc. without prior notice.

General name	Electric therapy equipment	Electric shock protection classification	Class II	
Brand Name	MsD reltec	Degree of electric shock protection	BF-type applied part	
Model	MsD-12	Degree of protection	IPX0	
External dimensions	140(W) × 180(H) × 200(D)(mm) (Does not include DC plug cover)	Operation mode	Consecutive operation	
Mains voltage	100-240 V ~	Usage/Storage environment	operating temperature	10~39°C
Rated frequency	50-60 Hz		operating humidity	30~85%RH (no condensation)
Power consumption	50VA		transport and storage temperature	0~50°C
Weight	Approx. 1.4Kg (main body)		transport and storage humidity	10~90%RH (no condensation)
Treatment time	Max 120 minutes	Essential Performance		
Output voltage	DC-5000 ± 1000 V	The essential performance of this product is "output voltage DC-5000V ± 1000V". If the essential performance is lost or deteriorated due to electromagnetic interference, the display may flash or become malfunction. In this case, turn off the power of the device and stop the operation		
Output pole	monopole mode	Safety features		
		<ul style="list-style-type: none"> •The device automatically stops when a conductive plate plug is disconnected. •The device automatically stops when a conductive plate plug is not properly inserted. •The device automatically stops when the main body is installed improperly. 		

Accessories	Conductive Plate ACs (2.5m)	1 pc
	Conductive Plate BD (2.5m)	1 pc
	Cover with velcro loop	4 pcs
	Velcro with square buckle (30cm)	1 pc
	AC adapter (1.30m)	1 pc
	Instruction manual	1 copy
	Insulating mat (90 cm × 190 cm)	1 pc
	Spiral tube	5 pcs
	DC plug cover	1 pc

User Profile

Operator	Doctor, Nurse, Physiotherapist Occupational therapist	Patient	
Gender	Men and Women	Gender	≥7 years old
Age	≥ 20 years old	Weight	≥20 kg
Professional Competence	Medical License, Nurse's License, Physiotherapy certificate, Occupational therapist certificate	Part of the body applied to	Limb, Shoulder, Back of head, Abdomen
Use Frequency	30 minutes/time several times/ day	Location of Use	Professional healthcare facility environment
Linguistic	English		
Knowledge	At least 11 years old – 5 years intensive reading experience(school)		

Electromagnetic immunity

The MsD reltec is intended for use in the electromagnetic environment specified below. The customer or the user of the MsD reltec should assure that it is used in such an environment.

Immunity test	Test level	Compliance level	Electromagnetic environment—guidance
Electrostatic discharge (ESD) IEC 61000-4-2	contact: ±8kV air: ±2, 4, 8, 15kV	contact: ±8kV air: ±2, 4, 8, 15kV	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC61000-4-4	power supply lines: ±2kV Repeated frequency 100kHz	power supply lines: ±2kV Repeated frequency 100kHz	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC61000-4-5	Between line and line ±0.5kV and ±1kV Between line and ground ±0.5kV, ±1kV and ±2kV	Between line and line ±0.5kV and ±1kV Between line and ground ±0.5kV, ±1kV and ±2kV	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency magnetic field IEC61000-4-8	30A/m (50 or 60Hz)	30A/m (50Hz)	If image distortion occurs, it may be necessary to position MsD reltec further from sources of power frequency magnetic fields or to install magnetic shielding. The power frequency magnetic field should be measured in the intended installation location to assure that it is sufficiently low.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	0%UT: for 0.5 cycle 0°,45°,90°,135°180°, 225°,270°or 315° 0%UT: 1cycle or 70%UT: 25/30 cycle single phase 0°	0%UT: for 0.5 cycle 0°,45°,90°,135°180°, 225°,270°or 315° 0%UT: 1cycle or 70%UT: 25/30 cycle single phase 0°	Mains power quality should be that of a typical commercial or hospital environment. If the user of the MsD reltec requires continued operation during power mains interruptions, it is recommended that the MsD reltec be powered from an uninterruptible power supply or a battery.

Electromagnetic immunity- for device and system that are not life-supporting

The MsD reltec is intended for use in the electromagnetic environment specified below. The customer or the user of the MsD reltec should assure that it is used in such an environment.

Immunity test	Test level	Compliance level	Electromagnetic environment—guidance
Conducted RF IEC 61000-4-6	3V/m 150kHz~ 80MHz 6V/m ISM Band during 150kHz~80MHz	3V/m 150kHz~ 80MHz 6V/m ISM Band during 150kHz~80MHz	Portable and mobile RF communications device should be used no closer to any part of the MsD reltec, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Immunity test level $E = \left(\frac{6}{d} \right) \sqrt{P}$
Radiated RF IEC 61000-4-3	3V/m 80MHz z ~ 2.7GHz	3V/m 80MHz z ~ 2.7GHz	Where P is the maximum output rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres(m) Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of device marked with the following symbol.

Recommended separation distances between portable and mobile RF communications device and the MsD reltec - for device and system that are not life-supporting.

The MsD reltec is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the MsD reltec can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications device (transmitters) and the MsD reltec as recommended below, according to the maximum output power of the communications device.

RF Test specification of exterior port immunity to radio communication device

Frequency (MHz)	Band ^{a)} (MHz)	Communication service ^{a)}	Modulation ^{b)}	Maximum power (w)	Separation distance (m)	Immunity test level (V/m)
385	380~390	TETRA 400	Pulse modulation ^{b)} 18Hz	1.8	0.3	27
450	430~470	GMRS460 FRS460	Pulse modulation ^{c)} 18Hz	2	0.3	28
710	704~787	LTE Band 13,17	Pulse modulation ^{b)} 217Hz	0.2	0.3	9
745						
780						
810	800~960	GSM800/900 TETRA800 iDEN820 CDMA850 LTE Band 5	Pulse modulation ^{b)} 18Hz	2	0.3	28
870						
930						
1500	1475.9~1510.9	LTE Band 11,22	Pulse modulation ^{b)} 217Hz	0.25	0.3	10
1720	1700~1990	GSM1800 CDMA1900 GSM1900 DECT LTE Band 1,3,4,25 UMTS	Pulse modulation ^{b)} 217Hz	2	0.3	28
1845						
1970						
2450	2400~2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band 7	Pulse modulation ^{b)} 217Hz	2	0.3	28
3500	3400~3560	LTE Band 42	Pulse modulation ^{b)} 217Hz	0.2	0.3	9
5240	5100~5800	WLAN 802.11 a/n	Pulse modulation ^{b)} 217Hz	0.2	0.3	9
5500						
5785						

a) Include only uplink line frequency in some services

b) Carrier is modulated by duty ratio 50%

c) 50% pulse modulation in 18Hz may be used instead of frequency modulation.

This does not show the actual modulation, but can be considered as a worst situation.

Electromagnetic emissions

The MsD reltec is intended for use in the electromagnetic environment specified below.

The customer or the user of the MsD reltec should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment-guidance
RF missions CISPR11	Group1	The MsD reltec uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic device.
RF emissions CISPR11	Class A	The MsD reltec is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	N/A	NOTE: The EMISSIONS characteristics of this device make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this device might not offer adequate protection to radio -frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the device.
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Other information

After-sales service and service life

- **If you think something is wrong**

Before asking for repair, please refer to "If you think something is wrong" on page 18.

In case the problem still remains, discontinue use and disconnect the AC adapter. Then contact your dealer.

- **The service life of this device is seven years.**