2-Channel Electrotherapy/Ultrasound Combo

# EU-921

## OPERATION MANUAL


To ensure correct use, please read this manual carefully before operating the unit. After reading, store the manual in a safe place for future reference.

CE 0197

ITO PHYSIOTHERAPY &REHABILITATION

## contents



# Symbols

- Symbol for “WARNING”
- Symbol for “CAUTION”
- Symbol for “CONSULT INSTRUCTIONS FOR USE”
- Symbol for “SERIAL NUMBER” — SN
- Symbol for “CATALOGUE NUMBER” — REF
- Symbol for “AUTHORISED REPRESENTATIVE IN THE EUROPEAN COMMUNITY” — EC REP
- Symbol for “MANUFACTURER”
- Symbol for “DATE OF MANUFACTURE”
- Symbol for “TEMPERATURE LIMIT”
- Symbol for “HUMIDITY LIMITATION”
- Symbol for “ATMOSPHERIC PRESSURE LIMITATION”
- Symbol for “AC (alternating current)”
- Symbol for “TYPE BF APPLIED PART”
- Symbol for “cTUVus Certification Mark” — C US
- Symbol for “Waste Electrical and Electronic Equipment (WEEE), Directive”
  * This symbol is only valid in European Union.
- Symbol for “NON-IONIZING ELECTROMAGNETIC RADIATION”
- Symbol for “ELECTROSTATIC SENSITIVE DEVICES”
- These marks are to be used to indicate conformity to European Community harmonisation legislations. — CE 0197, CE
- Symbol for “POWER ON” (Power switch)
- Symbol for “POWER OFF” (Power switch)
- Symbol for “PAUSE” (Pause switch)
- Symbol for “STOP” (Stop switch)
- Symbol for “Probe output port”
- Symbol for “Vacuum Unit connection port”
- Symbol for “ULTRASOUND RADIATION WARNING SIGN” by Canadian ultrasound therapy devices standard

# To Ensure Correct and Safe Use

* This unit should be used by a licensed practitioner.

## Intended use

### Intended use for electrotherapy

**Intended use for IF-4, IF-2, Hi-Voltage, TENS, MCR, Galvanic, Diadynamic, Faradic, Traebert**

1) Relief of post-traumatic or postoperative pain
2) Symptomatic relief of chronic intractable pain
3) Promote wound healing

**Intended use for EMS, Russian, Hi-Voltage (Independent, Co-Cont, Alternate), and TENS (Independent, Co-Cont, Alternate) modes**

1) Reduce muscle spasm
2) Prevention or retardation of disuse atrophy
3) Increase muscle strength
4) Increase range of motion
5) Muscle re-education
6) Increase local blood flow

### Intended use for therapeutic ultrasound

1) Relief of pain in joints, tendons, muscles, nerves, bursa, joint capsules and other tissues.
2) Reduction of muscle spasms
3) Relief of joint contracture
4) Promote tissue repair

### Intended use for combination therapy of therapeutic ultrasound and electrotherapy

1) Relief of pain

## Contraindications

### Contraindications for electrotherapy

1) Anterior neck of the carotid sinus region
2) Patients with cardiac demand pacemakers or any other implanted electronic devices
3) The abdominal and low back region of pregnant women
4) Over cancerous lesions or areas suspected of malignant tumors
5) Patients with serious infection
6) Transcranial placement of electrodes (the head in between the electrodes)
7) Over or area near the eyes
8) Over and areas near deep vein thrombosis or thrombophlebitis
9) People with hemorrhagic disorders or areas with active bleeding
10) Areas with loss of sensation
11) Areas where metal objects protrude from the skin such as skin staples
12) Recently radiated tissue
13) Electrical stimulation causing muscle contraction should not be used in patients or areas where exercise is contraindicated
14) Electrode placement on the chest where electrical stimulation may be applied to the heart which may result in cardiac fibrillation.
15) Patients with cognition or communication impairments not being able to give accurate and timely feedback during treatment

### Contraindications for therapeutic ultrasound

1) Over the uterus during pregnancy
2) Over thoracic area of patients with cardiac pacemakers
3) Over the site of any implanted electronic devices
4) Over or to the eyes
5) Over the heart
6) Regions of diagnosed or suspected malignancy
7) To reproductive organs such as testes
8) Over regions with thrombophlebitis, deep vein thrombosis, or embolism
9) Over tissues recently treated by deep X-ray or other radiation
10) Over areas with impaired circulation
11) Over areas with impaired sensation especially when using continuous (duty 100%) thermal ultrasound
12) Over or near bone growth centers (active epiphysis) in children until bone growth is complete
13) Patients with cognition or communication impairments not being able to give accurate and timely feedback during treatment
14) Over open wounds
15) Over implants that contain plastic or cement
16) Patients with serious infection such as tuberculosis
17) Over acute inflamed tissue especially when using continuous (duty 100%) thermal ultrasound
18) Over active bleeding tissue or patients with untreated hemorrhagic disorders
19) Over anterior neck or carotid sinus
20) Applying thermal doses where heat therapy is contraindicated

### Contraindications for combination therapy of therapeutic ultrasound and electrotherapy

1) Contraindication for combination therapy refers to the contraindications under therapeutic ultrasound and electrotherapy

# To Ensure Correct and Safe Use

## Precautions

### Precautions for electrotherapy

1) Patients with heart disease
2) Patients diagnosed with epilepsy or seizure disorders
3) Avoid using self-adhesive electrodes which the surface is dry since this may result in burns.
4) Current density of 2 mA r.m.s/cm$^2$ on the electrode surface is not to be exceeded when using IF-4, IF-2, EMS, Russian, TENS, Hi-Voltage, Galvanic, Diadynamic, Faradic, Traebert, I/T, and AQ mode. Excessive output may result in burns.
5) Error between indication and actual value at settings of low output (≦4 mA) may be 30% and more.
6) Long term effects of chronic electrical stimulation are unknown
7) Careful caution is needed when using the Galvanic, Diadynamic, Faradic, and Traebert mode because electrolysis or burns on the skin under the electrode may occur.

### Precautions for therapeutic ultrasound

1) Therapeutic ultrasound may delay or prevent callous formation in a healing fracture
2) Spinal cord after laminectomy
3) Burns may occur in following application of therapeutic ultrasound
   ① High intensity
   ② Stationary technique
   ③ Moving sound head too slowly.
   ④ Treating area with sensory nerve damage.
   ⑤ Desensitized areas for example in patients with diabetes, neural damage, and etc.
   ⑥ Bony prominences are especially vulnerable.
4) Handle the ultrasound probe with great care. Mishandling may affect performance characteristics.
5) Do not use gels that are not provided with this device.

### Precautions for combination therapy of therapeutic ultrasound and electrotherapy

1) Precautions for combination therapy refers to the precautions under therapeutic ultrasound and electrotherapy

### General precautions

1) Do not operate this device near high frequency devices such as shortwave or microwave therapeutic devices. For example, distance of more than 1.5 m is recommended.
2) Do not use this device if the patient is connected to a high-frequency surgical instrument as this could cause skin irritations or burns and possible damage to the device.
3) Electronic monitoring equipment (such as ECG monitors and ECG alarms) may not operate properly when stimulation of this device is in use.
4) When using this device for the purpose of Symptomatic relief of pain, the etiology of the pain should be established or the pain syndrome should be diagnosed.
5) Make sure the patient is free of contagious disease or conditions, since these can be transmitted to other individuals via the device or accessories.



6) Over the uterus during menstruation
7) Treatment over bony areas may cause irritation.
8) Areas with implanted metals near the skin surface.
9) Determining treatment intensity can be problematic with babies or infants (aged 6 or under), patients with senile dementia, or other patients who for any other reason are unable to express their preferences. Proceed carefully before deciding whether to use this device on such patients.
10) Have the patient remain in a relaxed and comfortable position during treatment.
11) Accessories from other devices should not be used with this device
12) Note the power supply frequency, voltage, and allowable current (or power consumption).
13) Use an outlet set aside exclusively for this device.
14) To avoid the risk of electric shock, this device must only be connected to a supply mains with protective earth.
15) Do not paste the self-adhesive electrode (adhesive pad) to the coated surface of the product. The product may be stained or its coating may be damaged.
16) Before initiating therapy with this device, check for any short circuiting of the attached electrodes (probe). Do not place the electrodes (probe) too close to each other or else they may short circuit. If the output is activated with short-circuited electrodes (probe), the output may be delivered abruptly as soon as the short circuiting is cleared. Meanwhile if adjacent channels are used in the same electrotherapy mode, do not bring the electrodes (probe) too close to each other. Such proximity could cause overlapping outputs, depending on the mode in use, resulting in excessively intense stimulation.
17) When using this device keep a distance where the device is reachable.

### Precautions before use

1) Carefully review the patient's diagnosis and prescription for special precautions or instructions.
   ① Make sure pacemakers or other medical devices are not implanted in the treatment area.
   ② For areas in which skin sensation is reduced, carefully consider the relevant factors before determining whether to use this system with the patient.
2) Have the patient inform the operator, incase of experiencing unusual sensations (e.g., pain, heat sensations, or pressure) during treatment.
3) Carefully weigh all pertinent factors before determining to use this device with the following individuals or on the following areas:
   ① Carefully select the output level and treatment durations when treating facial areas.
   ② Do not place the electrode on the chest; doing so will increase the risk of cardiac fibrillation.*1
   ③ When using the device on a child according to a physician's prescription, take great care when treating bony regions that no irritations occur.*2
4) Check the switches and keys to determine that the device is operating properly.
5) Make sure all cables are correctly connected and safely configured.
6) Make sure that the ultrasound probe is clean and free of any cracks.*2

# To Ensure Correct and Safe Use

### Precautions during use

1) Make sure the treatment duration and intensity are suitable for the treatment purpose.
2) Monitor the device and the patient to ensure that no problems arise. In the event of any trouble, take appropriate measures, safely shut down the device and contact the distributor or manufacturer.
3) To prevent accidents, make sure the patient does not operate or touch the device.
4) When using the strap for electrotherapy, make sure the strap will not be in contact with bare skin for many hours. The strap may cause allergic symptoms, such as itching, redness, hives, swelling, fever, breathing difficulties, asthma-like symptoms, drop in blood pressure, and shock. Should such symptoms appear, immediately halt operations and take adequate measures.
5) If the patient reports abnormal pain or heat sensation, halt treatment and see if the pain goes away. A problem may have occurred, or heat may have built up in the patient's body, in which case burns may result if treatment is continued, even at a reduced output.
6) If a rash, redness, itching or any other symptoms emerge, halt use immediately and take adequate measures.
7) Only touch one point on the touch panel at a time; do not touch multiple points simultaneously.
8) If the patient complains of periosteal pain, reduce the intensity.*2
9) Make sure the ultrasound probe is positioned correctly on the treatment area. Incorrect positioning can affect effectiveness and results.*2
10) Do not leave the device with the output turned on. Buildup of heat may damage the device.*2
11) When the ultrasound probe is not in use, return and set the probe on the probe holder.*2
12) Please be careful not to put excessive pressure between the electrode and the treatment area while the device is outputting. Please avoid actions such as putting pressure on the electrode between the treatment area and the bed or the back of the chair during treatment lying down or sitting. Those actions may cause an accident.*1

### Precautions after use

1) After using this device, go through the specified steps, turn off the power and disconnect the power supply cord from the outlet.
2) When disconnecting the power supply cord from the outlet, make sure the power switch is off. Always grasp the cable by the plug when connecting or disconnecting.
3) Rinse the ultrasound probe with lukewarm water lightly and thoroughly wipe it dry.*2
4) Keep the device and accessories clean to avoid inconvenience for the next therapy session and store them in a safe place.

*1: Precautions relating to electrotherapy
*2: Precautions relating to ultrasound
Unmarked precautions apply to all modes.



## Storage condition

1) To avoid malfunctions, follow the instructions given below when storing and installing the device.
   ① Avoid locations where the device will be subjected to water. Water entering the device may cause malfunction.
   ② Avoid locations where the system may be unduly affected by atmospheric pressure, temperature, humidity, sunlight, dust, salt, sulfur or any other adverse factors.
   ③ Make sure the device is kept on a stable surface. Avoid tilting the device, or applying vibrations and shock (these warnings also apply during transportation).
   ④ Avoid flammable atmospheres, such as flammable anesthetic gas mixed with oxygen, nitrous oxide and air, and flammable disinfectant or cleanser mixed with air.
   ⑤ Avoid locations where chemicals are stored or where gas may be generated.
   ⑥ Do not install the device near a flame. Doing so may result in deformation or accidents.

## Precautions on Handling

1) Do not operate the main unit with wet hands.
2) Do not subject the product to strong vibrations or impact, whether by knocking it against another object, tipping it over, or dropping it. Even if the product appears to function normally after being exposed to impact or vibration, internal damage may gradually progress and result in equipment malfunctions or accidents.
3) When disposing of consumable parts, residual materials, or end-of-life equipment/accessories, observe all applicable local laws and regulations in the area where the equipment is installed to minimize environmental effects.

## Maintenance and Inspection

### Precautions

1) In the event of product malfunction or failure, do not attempt to correct the problem. Contact the manufacturer or dealer.
2) Do not modify the product.
3) Do not open the product case.
4) Do not clean the main unit or accessories by wiping with volatile oils (such as thinner, gasoline, and kerosene), polishing powder, hot water, or chemicals. Such materials can discolor or degrade the product. To clean, soak a cloth with alcohol, cold water, lukewarm water, or neutral detergent, wring thoroughly, then wipe.
5) The probe head features a waterproof structure. Do not remove the probe head. Removing the head may degrade waterproofing performance and oscillator performance and lead to equipment malfunctions.

# To Ensure Correct and Safe Use

### Maintenance and inspection by the user

1) Inspect the product and accessories routinely before use to ensure proper functioning.
2) If any abnormalities are found (insulation damage in accessories, scratches/cracking on cord sheaths, almost disconnected wires, faulty connector contacts, etc.) during pre-operation checks or inspections, contact the dealer or the manufacturer.
3) When using the product after an extended period without use, make sure the product functions normally and safely before use.

### Maintenance and inspection by a contractor

1) Ask the dealer or manufacturer for periodic inspections (about once a year) to maintain equipment performance and ensure safety.
2) Replace consumable parts (including accessories) periodically to prevent hazardous situations resulting from use of equipment/accessories in improper condition.

### Maintenance and inspection items

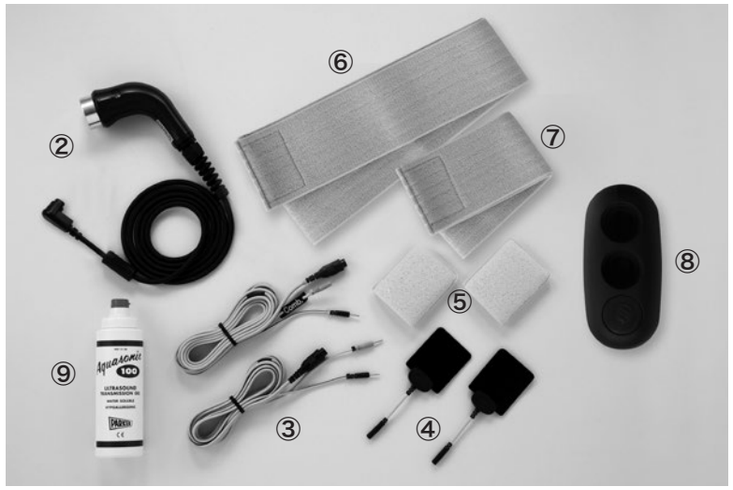
| Item | Description | Method |
|---|---|---|
| Exterior and display | Check the exterior for damage. Check the LCD panel to make sure there is no deformation or flickering of the display. | Visual inspection |
| Operation | · Turn on the power switch and confirm that the product functions normally, without problems.<br>· Confirm that the product functions normally as described in the operation manual. | Operational inspection |
| Accessories | · Check the accessories for damage.<br>· Confirm that there are no wire breaks in the cords or cables. | Visual inspection |
| Safety inspection | · While the product is producing low frequency output, disconnect the electrode cable from the output port. Confirm that an error indication appears and that the output stops.<br>· Connect and disconnect the ultrasound probe from the product during treatment. Confirm that an error indication appears and that the output stops.<br>· Set the ultrasound output level and allow the product to stand at least three minutes without operating it. Confirm that the output stops automatically. | Operational inspection |
| Ultrasound output check | Place water on the probe head and turn output on. Check to make sure that the water vibrates. | Operational inspection |
| Ultrasound probe check | Make sure that the head section has no cracks and that the cable connecting areas have no flaws that may allow water, ultrasound gel, or other materials to enter the probe head. | Visual and operational inspections |
| | Check the cable and connector for faulty connections. | Operational inspection |



# Device Configuration

## ●Main unit and standard accessories

①

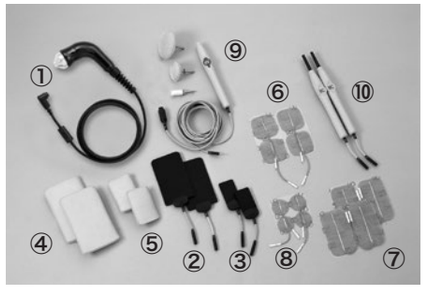




| | | |
|---|---|---|
| ① | —— | Main Unit |
| ② | 012418 | Ultrasound Probe (L)【USP016】* or |
| | 012556 | Ultrasound Probe (L) (Canada version)【USP016】* |
| ③ | B180534 | Electrode Cable (Brown)【ESC007】 |
| ③ | B180537 | Electrode Cable (Yellow) |
| ④ | 011151 | Rubber Electrode (M), 60×50 mm, 2pcs/pack, 2×【ESE005】 |
| ⑤ | 011148 | Electrode Sponge A (M), 80×65 mm, 2pcs/pack, 2×【ESE011】* |
| ⑥ | 011655 | Strap (L), 80×1200 mm, 2× |
| ⑦ | 011654 | Strap (S), 80×600 mm, 2× |
| ⑧ | 012298 | Probe Holder |
| ⑨ | B120612 | Ultrasound Gel (250 ml) * |
| | B180562 | Power Supply Cord (220–240 V, Type F) or |
| | B180559 | Power Supply Cord (110–120 V, Type A) |

*: APPLIED PARTS

# Device Configuration

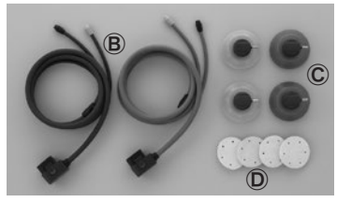
## ●Optional accessories

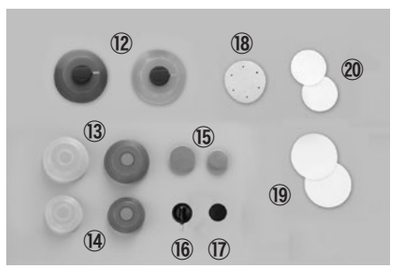



① 012416 Ultrasound Probe (S)【USP017】* or
012555 Ultrasound Probe (S) (Canada version)【USP017】*
② 011152 Rubber Electrode (L), 100×60 mm, 2pcs/pack【ESE004】
③ 011150 Rubber Electrode (S), 50×30 mm, 2pcs/pack【ESE006】
④ 011149 Electrode Sponge A (L), 120×80 mm, 2pcs/pack【ESE010】*
⑤ 011147 Electrode Sponge A (S), 70×45 mm, 2pcs/pack【ESE012】*
⑥ B010306 Self-adhesive Electrode, 49×49 mm, 4pcs/pack *
⑦ B010747 Self-adhesive Electrode, 89×51 mm, 4pcs/pack *
⑧ B010886 Self-adhesive Electrode, Ø32, 4pcs/pack *
⑨ 011356 HV/DC Probe【ESE015】*
⑩ 011172 MCR (Microcurrent) Probe, 2pcs/pack【ESE013】


⑪Vacuum Unit SU-520〈BK〉

[Standard accessories]
Ⓐ —— Vacuum Unit
Ⓑ 011771 Electrode Hose (Blue)【ESC008】
011772 Electrode Hose (Gray)
Ⓒ 012399 Vacuum Electrode B (S), Ø80 (Gray), 2×【ESE016】
012400 Vacuum Electrode B (S), Ø80 (Blue), 2×
Ⓓ 011276 Electrode Sponge B (S), Ø70, 4pcs/pack, 2×【ESE018】*
B180562 Power Supply Cord (220–240 V, Type F) or
B180559 Power Supply Cord (110–120 V, Type A)




[Optional accessories]
⑫ 012401 Vacuum Electrode B (L), Ø100 (Gray)【ESE017】
012402 Vacuum Electrode B (L), Ø100 (Blue)
⑬ B120974 Suction Cup (L),Ø100 (Gray) (cup only)
B120975 Suction Cup (L),Ø100 (Blue) (cup only)
⑭ B120976 Suction Cup (S),Ø80 (Gray) (cup only)
B120977 Suction Cup (S),Ø80 (Blue) (cup only)
⑮ B151157 Suction Steel Plate (L), Ø55
B151083 Suction Steel Plate (S), Ø45
⑯ 012403 Suction Head
⑰ 012404 Suction Head Cup
⑱ 011277 Electrode Sponge B (L), Ø90, 4pcs/pack【ESE019】*
⑲ 220278 Paper Disk (L), Ø90, 100pcs/pack *
⑳ 220279 Paper Disk (S), Ø70, 100pcs/pack *

*: APPLIED PARTS



# Specifications

## ●Main unit specifications

| | | | | |
|---|---|---|---|---|
| Power supply | | | AC100−240 V, 50/60 Hz | |
| Power consumption | | | 140 VA | |
| Electrotherapy | Output current | | Max. 600 mA ±15% peak (500 Ω load), Max. 70 mArms ±15% (500 Ω load) | |
| | Output voltage | | Max. 300 V ±15% peak (500 Ω load) | |
| | Output frequency | | Max. 10 kHz ±5% | |
| | Timer | | Max. 60 min. ±5% | |
| Ultrasound | Ultrasound frequency | | 1.0 MHz, 3.0 MHz ±10% | |
| | Intensity | | Limit value and accuracy: 3.0 W/cm² ±20%<br>Maximum effective intensity: 2.0 W/cm² ±20% (continuous)<br>Peak intensity: 3.0 W/cm² ±20% (pulsed) | |
| | Pulse frequency | | 16 Hz, 48 Hz, 100 Hz ±5% | |
| | Output mode | | Duty 5%, 10%, 20%, 30%, 40%, 50%, 100% ±5% | |
| | Timer | | Max. 30 min. ±5% | |
| | Oscillator characteristics | ERA | Ultrasound Probe (L) | 1 MHz: 5.0 cm² ±20% (IEC), 5.5 cm² ±20% (FDA)<br>3 MHz; 5.0 cm² ±20% (IEC), 6.0 cm² ±20% (FDA) |
| | | | Ultrasound Probe (S) | 1 MHz: 0.7 cm² ±20% (IEC), 0.9 cm² ±20% (FDA)<br>3 MHz: 0.5 cm² ±20% (IEC), 0.9 cm² ±20% (FDA) |
| | | BNR | Ultrasound Probe (L) | 1 MHz: 4.6 ±30% (IEC), 4.6 ±30% (FDA)<br>3 MHz: 2.4 ±30% (IEC), 2.9 ±30% (FDA) |
| | | | Ultrasound Probe (S) | 1 MHz: 2.9 ±30% (IEC), 2.9 ±30% (FDA)<br>3 MHz: 2.4 ±30% (IEC), 2.9 ±30% (FDA) |
| | Output stability | | ±20% | |
| | Probe head maximum temperature | | 43℃ | |
| Safety class according to IEC 60601-1 | | | Class I, Type BF | |
| Class of protection against ingress of harmful water | | | Main unit: IPX 0<br>Ultrasound probe: IPX 7 | |
| Dimensions | | | 350 (W) x 270 (D) x 145 (H) mm | |
| Weight | | | Approx. 3.5 kg | |

| Environmental conditions | Temperature | Humidity | Pressure |
|---|---|---|---|
| In use | 10−40℃ | 30−75% | 800−1060 hPa |
| Storage | -10−60℃ | 30−95% | 700−1060 hPa |
| Transportation | -10−60℃ | 30−95% | 700−1060 hPa |

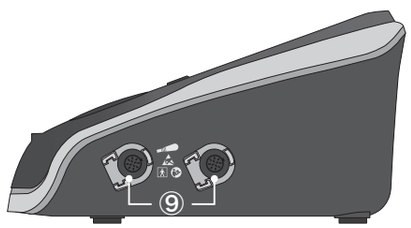
## ●Vacuum unit specifications (optional)

| | |
|---|---|
| Power supply | AC110 V, 120 V, 50/60 Hz or 220–240 V, 50/60 Hz |
| Power consumption | AC110 V, 120 V: 70 VA or 220–240 V: 90 VA |
| Suction pressure | 0 to -100 mmHg ±30% |
| Dimensions | 345 (W) x 267 (D) x 116 (H) mm |
| Weight | Approx. 8.0 kg |

# Names of Parts

## ● Main Unit


① LCD touch panel
② Stop switch
③ Current intensity control dial (CH1)
④ Current intensity control dial (CH2)
⑤ Ultrasound intensity control dial (US)

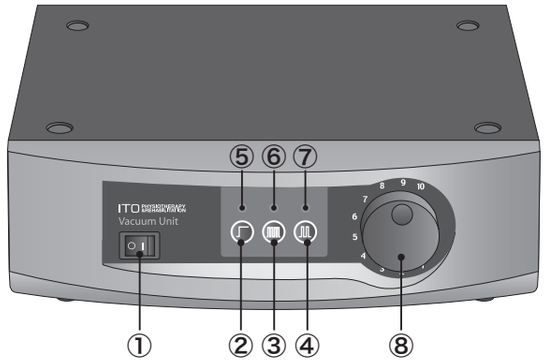




⑥ Electrode cable connection port (CH1)
⑧ LED

⑦ Electrode cable connection port (CH2)
⑨ Ultrasound Probe connection port


⑩ Vacuum unit connection port
⑪ Power switch
⑫ Power supply cord connection port

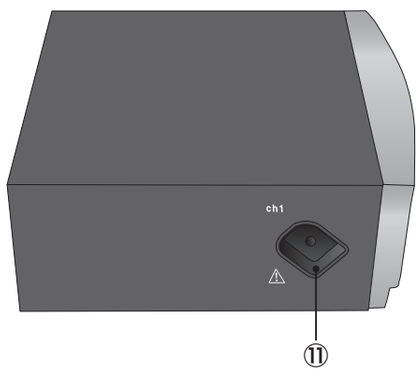
## ● Vacuum Unit (optional)

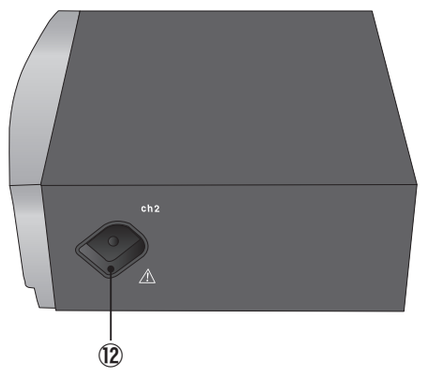



① Power switch
② Continuous mode key
③ Intermittent (FAST) mode key
④ Intermittent (SLOW) mode key
⑤ Continuous mode LED
⑥ Intermittent (FAST) mode LED
⑦ Intermittent (SLOW) mode LED
⑧ Pressure control dial


⑨ Main unit connection cable
⑩ Power supply cord connection port

⑪ Electrode hose connection port (CH1)
⑫ Electrode hose connection port (CH2)



# Preparations for Electrotherapy

**1 Make sure the power switch for the Main Unit is turned off.**

**2 Connect the power supply cord to the power supply cord connection port on the Main Unit.**

**3 Connect the power supply cord to an AC power outlet.**


**4 Select the electrode suitable for the treatment to be performed and the treatment area, then connect the electrode cable to the electrode cable connection port on the Main Unit.**

- The Rubber Electrode and Self-adhesive Electrode (optional) can be used in any treatment mode.
- The HV/DC Probe can be used only in Hi-Voltage, Galvanic, Diadynamic, Faradic, and Traebert modes.
- The MCR Probes (optional) can be used only in Microcurrent mode.
- Use of Vacuum Electrodes (optional) requires the Vacuum Unit (optional).


* For information on using each electrode, see pages 15 to 23.

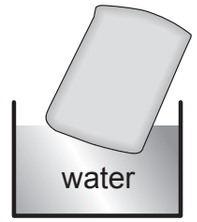
**5 Turn on the power switch for the Main Unit.**

When the power switch is turned on, the LED on the front panel of the Main Unit lights up.
After the initial check is completed, the treatment screen appears.

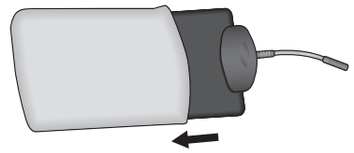


## ● Using Rubber Electrodes

**1 Soak Electrode Sponges (optional) with water and wring gently so that no water drips from the pads.**

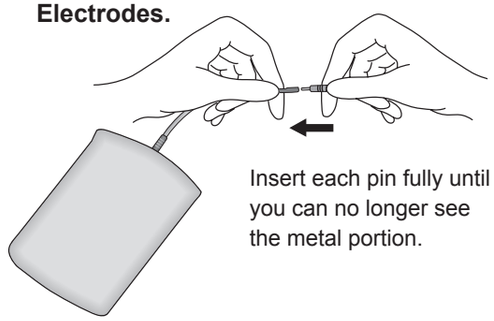



**2 Place each Rubber Electrode into an Electrode Sponge.**



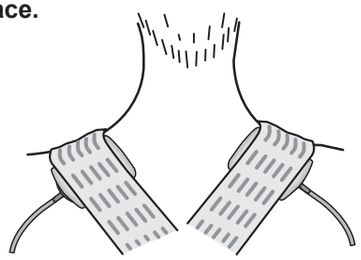
Insert each Rubber Electrode all the way until it contacts the bottom of the Electrode Sponge.

**3 Connect the electrode cable to the Rubber Electrodes.**



Insert each pin fully until you can no longer see the metal portion.

**4 Wrap the straps (optional) around the treatment area. Insert each Rubber Electrode between the skin and strap. Confirm that they are held securely in place.**



**5 Plug the connector for the electrode cable into the electrode cable connection port on the Main Unit.**

**6 When the power switch is turned on, an icon appears.**

**Maintenance of Rubber Electrodes and Electrode Sponges**

- Rubber Electrode: Wash thoroughly in lukewarm water after each use. To remove stubborn stains, clean with 70% alcohol solution.
- Electrode Sponge: Wash thoroughly in lukewarm water containing neutral detergent after each use. Completely rinse off all detergent, allow to dry, then store.

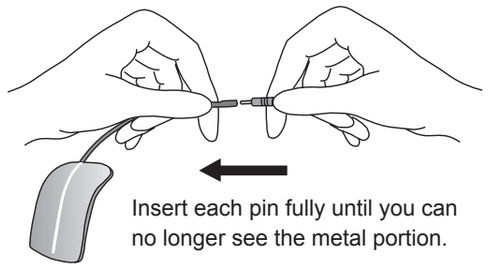
# Preparations for Electrotherapy

## ● Using the Self-adhesive Electrode (optional)

**1 Connect the electrode cable to the Self-adhesive Electrode.**

Insert the connection pins of the electrode cable into the cord for the corresponding parts of the Self-adhesive Electrode.

* The electrode cable has two connection pins. Be sure to connect the two corresponding parts of the Self-adhesive Electrode to the two pins.
* While the tips of the two electrode cables are black and gray, the pins can be interchangeably connected with the two parts of the Self-adhesive Electrode.




**2 Apply the two parts of the Self-adhesive Electrode securely to the treatment area.**

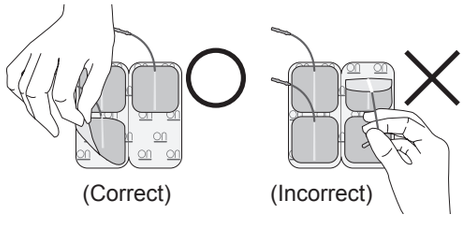
* If the two parts of the Self-adhesive Electrode are not securely applied when treatment (output) starts, an error will result.

**3 Connect the connector for the electrode cable to the electrode cable connection port on the Main Unit.**

**4 When the power switch is turned on, an icon appears.**

**How to peel Self-adhesive Electrode**

To peel the Self-adhesive Electrode from the transparent film or skin, hold a corner of the pad and lift slowly. Do not pull the cord to peel.




**⚠CAUTION About the Self-adhesive Electrode**

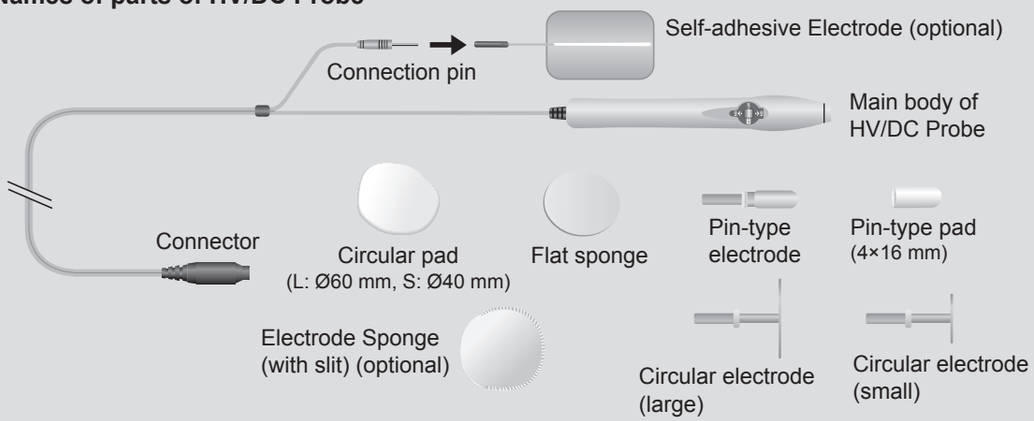
① Do not use the Self-adhesive Electrode on injured areas of the skin.
② Do not use the Self-adhesive Electrode if it loses its adhesion strength. The electric current may concentrate in a certain area, depending on conditions of contact with the skin, resulting in burns or inflammation.
③ If chapping of the skin or burn/inflammation occurs, stop using the product immediately.
④ If a cosmetic product such as lotion or oil is left on the skin, the Self-adhesive Electrode will not adhere well to the skin. Clean the skin with soap and lukewarm water and dry thoroughly before attaching the Self-adhesive Electrode.
⑤ If the skin surface is wet with sweat, such as after exercising or warming (with a hot pad, etc.), wipe off the sweat with a dry towel or other material before attaching the Self-adhesive Electrode. Do not heat the treatment area by placing hot packs or similar products on top of the Self-adhesive Electrode. Heat may concentrate in a small area and cause burns or inflammation.
⑥ Make sure the connection pins of the electrode cords are free of dirt before use. If dirty, wipe with a soft cloth moistened with lukewarm water or alcohol. Dirty pins can cause contact failures, resulting in a sudden change of electric current and resulting in burns or inflammation. Contact failures can also occur if the Self-adhesive Electrode has a loose connection. If you notice any loose connections, replace the Self-adhesive Electrode with new ones.
⑦ Insert each pin of the electrode cable into the end of each cord firmly until you can no longer see the metal portion.
⑧ When removing the Self-adhesive Electrode from the storage plate or the skin, grasp a corner and slowly lift. Never pull the cord to remove.
⑨ When attaching the Self-adhesive Electrode, make sure they are in firm contact with the skin. If there is any space between the Self-adhesive Electrode and the skin, simulation will be unusually strong causing pain and in some cases resulting in burns or other injury to the skin.
⑩ Be sure to turn off the power switch for the Main Unit before removing the Self-adhesive Electrode from the skin.
⑪ After use, return the Self-adhesive Electrode to the storage plate, then place in the bag. Store at room temperature.
⑫ The validity period for the Self-adhesive Electrode is indicated on the bag. Do not use past the expiration date.
⑬ The Self-adhesive Electrode features consumable parts. When adhesion weakens, replace the Self-adhesive Electrode with new ones.
⑭ Note that if a patient has a transmittable disease, the disease may be transmitted to other people via the Self-adhesive Electrode.
⑮ Be careful when using the Self-adhesive Electrode on people who tend to display skin rash reactions to poultices or adhesive plaster, etc. The Self-adhesive Electrode may cause skin rashes or reddening of the skin with such individuals.
⑯ If using the Self-adhesive Electrode causes a skin rash, redness of the skin, skin irritation, etc. during use, immediately stop using the product and consult your dealer.
⑰ When attaching the Self-adhesive Electrode, do not place over or in contact with metal items (necklace, belt, watch, etc.).
⑱ Do not apply excessive force to the Self-adhesive Electrode during use, for example, by placing it under the body. The electric current will concentrate in a small area, causing burns or inflammation.
⑲ Do not use the Self-adhesive Electrode past its expiration date or if it has poor adhesion strength. Using the electrode in these states as well as compensating with tape, bands, underwear, etc. will not provide appropriate effects and may in some cases result in sudden and strong stimulation, causing burns or other injury to the skin.
⑳ Use only genuine Self-adhesive Electrodes manufactured under rigid quality control to ensure safety. The manufacturer is not responsible for burns, equipment malfunctions, or other problems resulting from use of counterfeit products.

# Preparations for Electrotherapy

## ● Using HV/DC Probe

* Do not use the HV/DC Probe in any mode other than Hi-Voltage, Galvanic, Diadynamic, Faradic, or Traebert mode.
* When the HV/DC probe is connected, the output sets automatically to 1/10 (except for Hi-Voltage mode), and the open error detection function will be turned off.

**Names of parts of HV/DC Probe**




* Apply the Self-adhesive Electrode to an area of the body close to the treatment area, and use the HV/DC Probe as the active electrode.

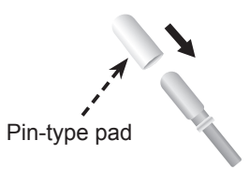
**1 Connect the electrode cable to the Self-adhesive Electrode.**

Insert the connection pin of the HV/DC Probe into the cord for the Self-adhesive Electrode.

Insert the pin fully until you can no longer see the metal portion.

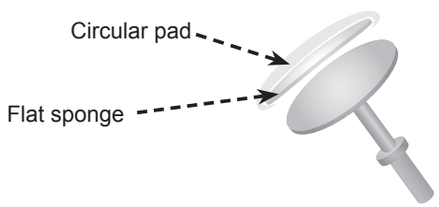
**2 Soak the pad and sponge thoroughly with water and wring gently so that no water drips from them. Attach them to the electrode.**

[When using the pin-type electrode]




* The sponge is not used with the pin-type electrode. Make sure the pad is sufficiently wet during use.

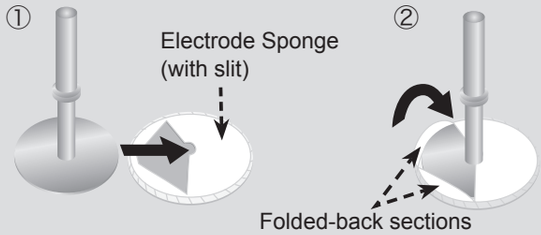
[When using the flat sponge and circular pad]




* Place the flat sponge inside the circular pad.

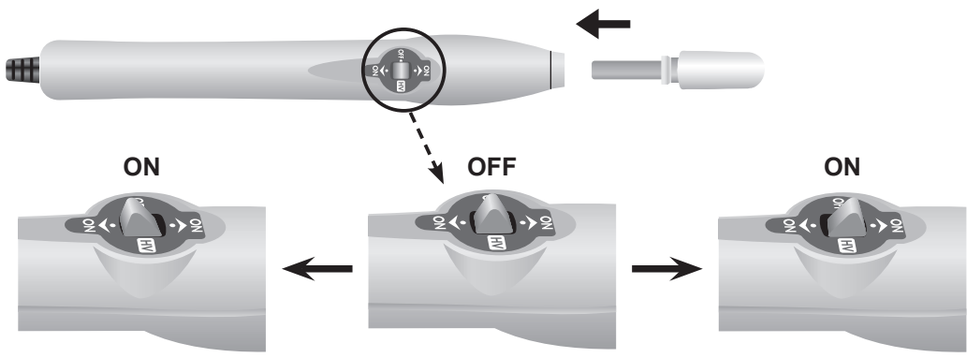


**[When using the Electrode Sponge (with slit) (optional)]**




When using the Electrode Sponge (with slit), slide it from the side so that the steel plate of the circular electrode is enclosed by the sponge, then cover the steel plate with the folded-back sections of the felt.

**3 Insert the electrode pin into the tip of the HV/DC Probe.**




Electric current is outputted while the switch is pressed forward or backward. To turn off the current, release the switch.

* The output level cannot be increased or decreased unless the switch is in the ON position.

**4 Connect the connector to the electrode cable connection port on the Main Unit.**

**5 When the power switch is turned on, an icon**  **appears.**

**⚠CAUTION About HV/DC Probe**

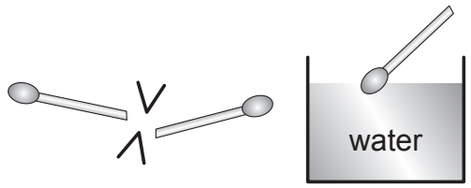
① Thoroughly soak the pad at the tip of the HV/DC Probe with water before each treatment. Be careful to avoid burns when using the HV/DC Probe.
② Limit the use of HV/DC Probe to 3 to 10 seconds (or less than 5 seconds) at each treatment area.
③ Apply the Self-adhesive Electrode so that the heart is not positioned between the Self-adhesive Electrode and HV/DC Probe. Make sure the Self-adhesive Electrode is at a safe distance from the HV/DC Probe.

# Preparations for Electrotherapy

## ● Using MCR (Microcurrent) Probes (optional)

* Do not use the MCR Probes in any mode other than Microcurrent mode.
* Use two MCR Probes as a set.

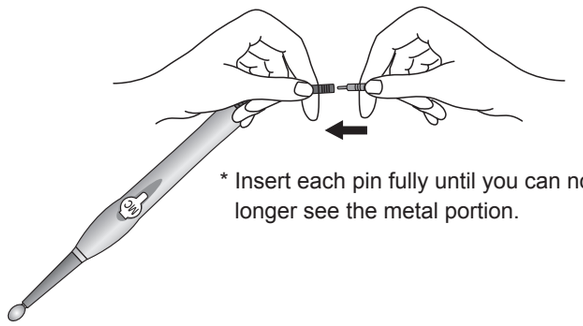
**1 Break a cotton swab in half at the center. Soak the cotton in water and let it absorb ample water.**




**2 Insert the stick portion of the cotton swab into the tip of each MCR (Microcurrent) probe.**


* Make sure the water-containing cotton is in contact with the metal tip section.

**3 Connect the electrode cable to the MCR Probes.**




* Insert each pin fully until you can no longer see the metal portion.

**4 Plug the connector for the electrode cable into the electrode cable connection port on the Main Unit.**

**5 When the power switch is turned on, an icon appears.**

* Since the cotton swab dries quickly, apply water to the cotton from time to time.
* If the MCR Probes are applied to an area of the optic nerve (area below the outer corner of the eye), vision may be disturbed momentarily, depending on output level. While this will not result in health issues, reduce the output level if it bothers the patient.
* Cotton swabs are disposable. Once they are used with a patient, do not reuse on another patient.

**⚠CAUTION** When using the product on an arm, leg, trunk of the body, joint, etc. in MCR mode for an extended period of time, use the Self-adhesive Electrode or Rubber Electrodes.



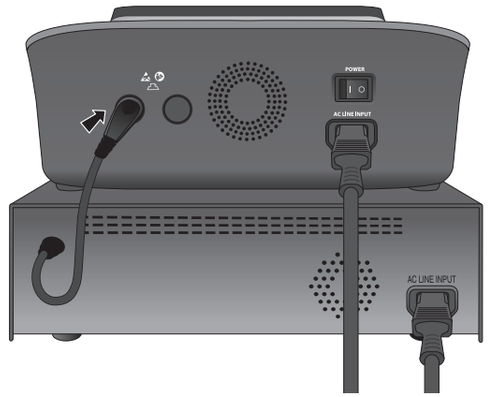
## ● Using Vacuum Electrodes (optional)

**1 Make sure the power switch for the Vacuum Unit is turned off.**

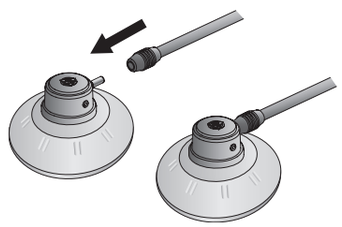
**2 Connect the power supply cord to the power supply cord connection port on the Vacuum Unit.**

**3 Connect the power supply cord to an AC power outlet.**

**4 Place the Main Unit on top of the Vacuum Unit, then connect the Main Unit connection cable of the Vacuum Unit to the Vacuum unit connection port on the Main Unit.**




**5 Connect the electrode hose to the Vacuum Electrodes.**

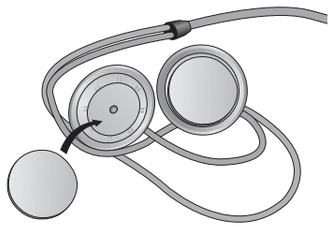


* When using two channels, connect the gray Vacuum Electrodes to one channel and the blue Vacuum Electrodes to the other channel. (Make sure each channel is connected to Vacuum Electrodes of the same color.)

**6 Connect the electrode hose to the electrode hose connector on the Vacuum Unit.**

# Preparations for Electrotherapy

**7 Soak the Electrode Sponges or paper disks with water and gently wring so that no water drips. Attach to each Vacuum Electrode.**



**8 Make sure the power supply cord, Main Unit connection cable, and electrode hose are connected properly, then turn on the power switch.**

Select the icon using the electrode selection button.

**9 Attach the Vacuum Electrodes securely to the treatment area.**

**10 Select the suction mode.**

**Continuous mode**

When the continuous mode key is pressed, suction pressure is provided continuously.

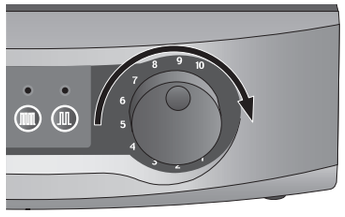
**Intermittent (FAST) mode [High]**

When the intermittent (FAST) mode key is pressed, suction On/Off will repeat at a rate of 60 times per minute.

**Intermittent (SLOW) mode [Low]**

When the intermittent (SLOW) mode key is pressed, suction On/Off will repeat at a rate of 30 times per minute.

**11 Adjust and set the suction pressure with the suction pressure adjustment dial.**
**The suction pressure can be adjusted in 10 steps from 1 to 10.**



**12 After treatment, turn off power to the vacuum unit.**

* Wash the Electrode Sponge with neutral detergent after each treatment.
* Paper disks are disposable. Once they are used with a patient, do not reuse on another patient.
* For information on setting parameters for each treatment mode, see pages 29 to 65.



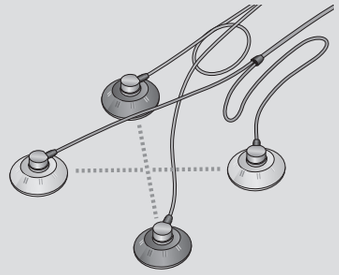
**How to set Vacuum Electrodes**

**When using two channels simultaneously (when using 4-pole interferential)**

Position the set of gray Vacuum Electrodes of one channel and the set of blue Vacuum Electrodes of the other channel in a crisscrossing manner around the treatment area.

**When using only one channel**

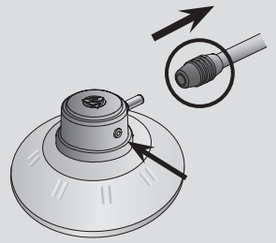
Position the two Vacuum Electrodes on both sides of the treatment area.



[Example of use of two channels simultaneously]

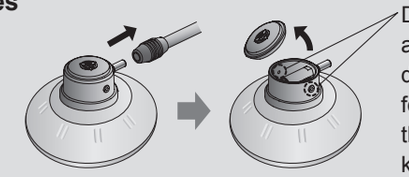
**Caution in handling Vacuum Electrodes**

To remove the electrode hose from the Vacuum Electrodes, hold the connecting area of the electrode hose and pull horizontally. If the hose section is held, pulled or excessive force were to be applied, it may result to degradation of the connecting area.
When removing the Vacuum Electrodes from the treatment area, be sure to press the air vent holes located on both sides of the suction head with your fingers.



**Maintenance of Vacuum Electrodes**

Depending on the volume of water that the sponge contains, water may accumulate inside the cup. Water may spurt out if you continue to use the cup with water accumulating inside. Check frequently to keep it clean.



Dirt buildup in the air vent holes may decrease the suction force. Regularly wash the suction head and keep it clean.

① Detach the electrode hose from the suction head.
② Remove the cap and wash frequently.

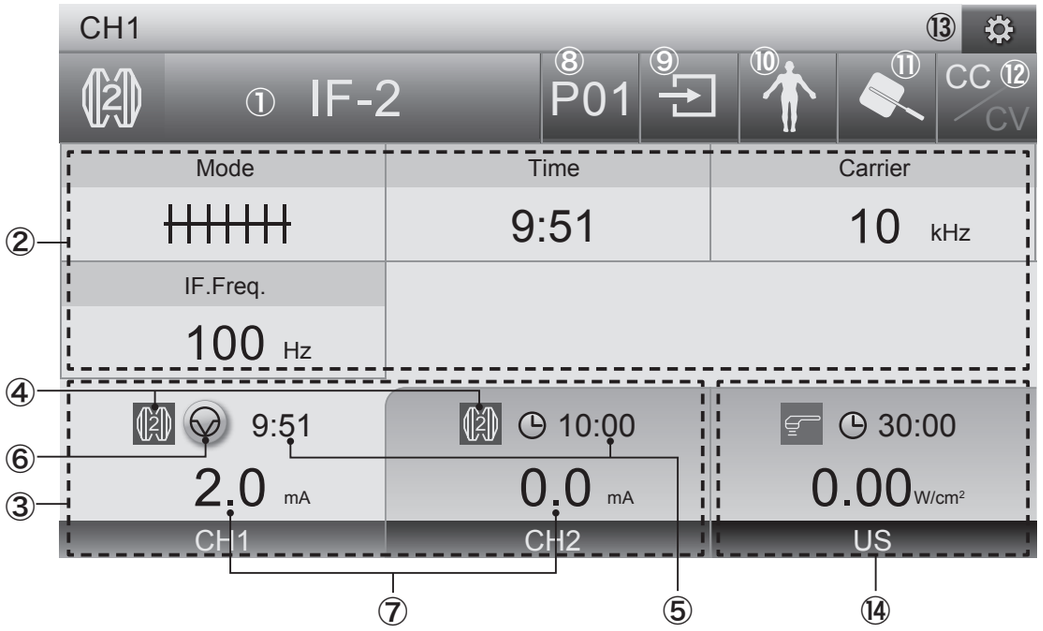
**How to reassemble the Vacuum Electrode**

1. Securely insert the head section into the cup of the Vacuum Electrode.
2. Mount the suction steel plate to the head section. Turn the suction steel plate in the clockwise direction. Be sure to tighten it firmly to ensure secure installation.

* To disassemble the Vacuum Electrode, first remove the suction steel plate, then detach the head section.

# Display of Electrotherapy Screen

## Treatment screen




**① Treatment mode selection button**

This button is used to select electrotherapy mode or measurement mode.
Touch the button to display the sub-window for selecting treatment mode.

**② Parameter setting buttons**

These buttons are used to set treatment parameters.
The parameters that can be set vary depending on the treatment mode.

* For information on setting parameters for each treatment mode, see pages 29 to 65.

**③ Channel selection buttons**

These buttons are used to select the channel for which treatment parameters are to be set.
The channel selection buttons show the treatment mode, remaining time, pause button (only during output operation), and output level of each channel.

**④ Treatment mode icons**

These icons indicate the treatment modes of individual channels.

**⑤ Remaining time display**

The remaining treatment time of each channel is shown.

**⑥ Pause button**

This button appears only for the channel in output operation. It is used to pause, resume, or stop the output from each channel.
When the pause button is touched, the output from the corresponding channel pauses.
When the button is touched again, the output resumes.
When the pause button is pressed and held, the output from the corresponding channel stops and the treatment ends.

**⑦ Output level display**

The output level of each channel is shown.
The unit displayed will automatically switch according to the current output control.
CC: mA, μA  CV: V

**⑧ Program load button**

This button is used to change the display to the load screen.

* The button is inoperable for the channel in output operation.
* For information on loading a program, see pages 96 to 97.

**⑨ Program save button**

This button is used to change the display to the save screen.

* The button is inoperable for the channel in output operation.
* For information on saving a program, see pages 94 to 95.

**⑩ Clinical program button**

This button is used to change the display to the clinical program screen.

* The button is inoperable for the channel in output operation.
* For details of clinical programs, see pages 90 to 93.

**⑪ Electrode selection button**

The type of connected electrodes is indicated with an icon.
When the Vacuum Unit is connected, this button is used to switch between the electrodes connected to the Main Unit and Vacuum Electrodes.

* The button is inoperable for the channel in output operation.

**⑫ CC/CV selection button**

This button is used to change the current output control system.
CC: Constant current system  CV: Constant voltage system

* The button is inoperable for the channel during output operation.
* The button can't be selected according to the treatment mode or electrode connected to the device. For details refer to the page of each treatment mode.

**⑬ Config button**

This button is used to change the display to the setting screen.

* This button is inoperable during output operation.
* For details of the setting screen, see pages 98 to 100.

**⑭ Ultrasound channel selection button**

This button is used to change the display to the treatment screen for ultrasound therapy and combination therapy.

* For details of ultrasound therapy, see pages 74 to 81. For details of combination therapy, see pages 82 to 89.

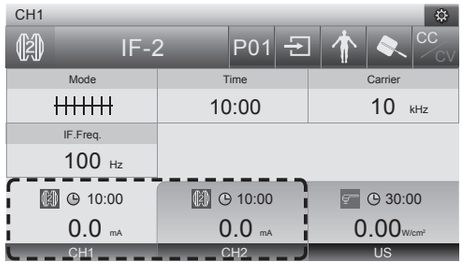
# Operation for Electrotherapy

* Make sure the electrodes that are used for the treatment are connected to the Main Unit and attached to the treatment area.
* If Vacuum Electrodes are used, turn on the power switch for the Vacuum Unit and attach the Vacuum Electrodes to the treatment area.

## 1 Select the channel to use.

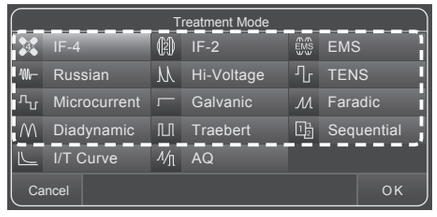
Touch the appropriate channel selection button and display the channel (CH1 and CH2) to use.

* Use a combination of CH1 and CH2 for all IF-4 (4-pole interferential) modes as well as IF-2 (2-pole interferential), EMS, Russian, TENS, and Hi-Voltage (Co-Cont mode and Alternate mode) modes.




## 2 Select the treatment mode.

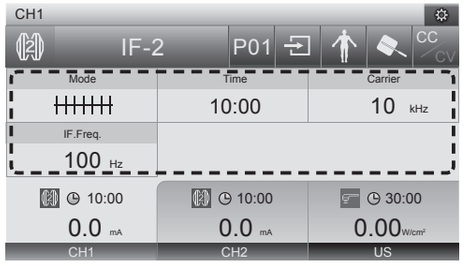
Touch the treatment mode selection button.
A sub-window opens. Select the treatment mode to use, then touch the OK button to close the sub-window.




## 3 Set the treatment parameters.

Touch each parameter setting button and set the treatment parameters.

* The parameters that can be set vary depending on the selected treatment mode. For information on setting parameters for each treatment mode, see pages 29 to 65.
* To save the selected treatment parameters, see pages 94 to 95.
  To retrieve saved treatment parameters, see pages 96 to 97.
* To use a clinical program, see pages 90 to 93.

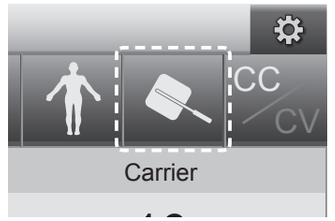



## 4 Select the electrode to use.

The icon displayed on the electrode selection button shows the connected electrode.

If electrodes are connected to both the Main Unit and the Vacuum Unit, touch the button and select the electrode to use.

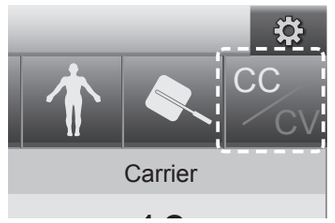
* If an electrode that cannot be used for the selected treatment mode is connected, the electrode selection button indicates ⃠.
* Regarding the electrodes that can be used in each treatment mode, see pages 29 to 65.




## 5 Set the current output control system.

Set the current output control system to CC (Constant Current) or CV (Constant Voltage).

* The button is inoperable for the channel during output operation.
* The button can't be selected according to the treatment mode or electrode connected to the device. For details refer to the page of each treatment mode.




## 6 Start the output.

Turn the intensity control dial for the selected channel to the right and set the output level.

The channel selection button displays the pause button when output starts. The LED around the intensity control dial lights up, and a treatment melody will play.

* There will be no treatment melody if the treatment melody sound level is set to Mute. For information on setting treatment melody, see page 98.
* The settings of the timer, output level, and parameters can be changed during output operation (some parameters cannot be changed).
* Note that if the frequency, pulse duration or duty is changed during the output operation, the stimulation felt by the patient changes.

# Operation for Electrotherapy

## Pausing treatment

To pause treatment, touch the pause button for the channel in output operation.
The output indication flashes and the output pauses.

To resume the treatment, touch the pause button again or increase the output level by operating the intensity control dial. The output will be produced for the remaining treatment time.


* During the pause phase of the treatment, when the current intensity control dial is set to “0”, the treatment will end.

## To end treatment

To stop treatment, either press and hold the pause button, set the current intensity control dial to “0” or press the stop switch.

* When the stop switch is pressed, all channels in output operation will stop.

**7 When the timer reaches “00:00,” the end melody plays and the output stops.**

*There will be no end melody if the sound level setting is set to Mute.
For information on setting end melody, see page 98.

**8 Turn off the power switch for the Main Unit and remove the electrodes from the treatment area.**

If the Vacuum Unit is used, also turn off the power switch for the Vacuum Unit before removing the electrodes.

**9 Unplug the power supply cord from the AC power outlet.**

* Store the Main Unit and accessories neatly to ensure trouble-free operation in the next treatment.

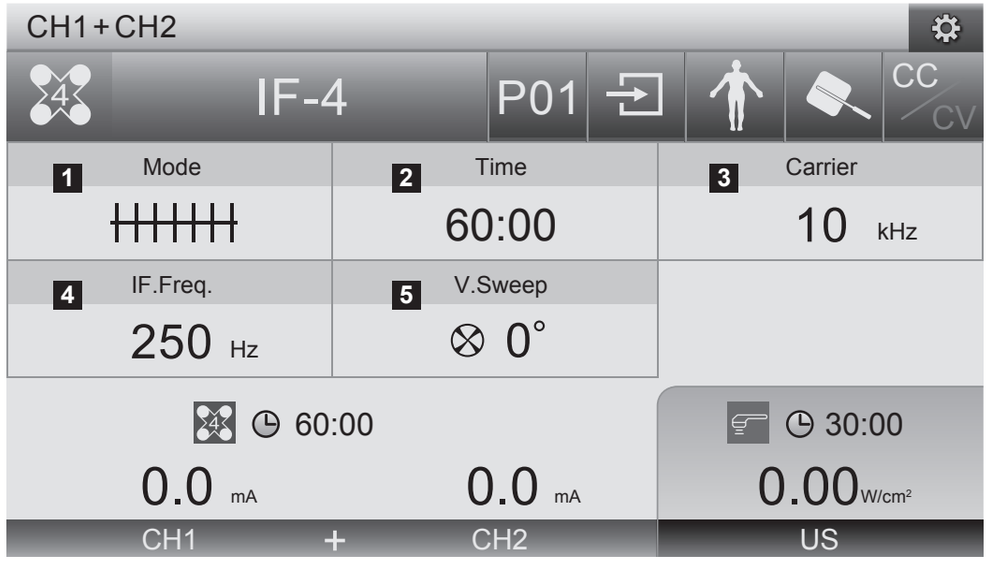


# Setting Parameters for 4-Pole Interferential Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | Combination of CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen

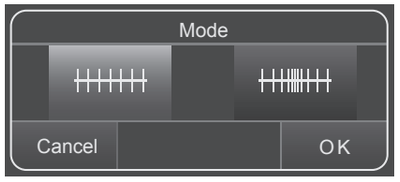



**1** Output mode setting button
**2** Timer setting button
**3** Carrier frequency setting button
**4** Interferential frequency setting button
**5** Vector sweep setting button

# Setting Parameters for 4-Pole Interferential Mode

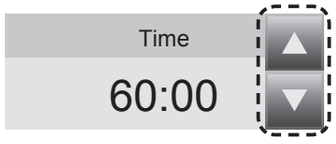
## 1 Output mode setting

When the output mode setting button is touched, a sub-window opens.
Touch either (Constant) or (Sweep), then touch the OK button to close the sub-window.



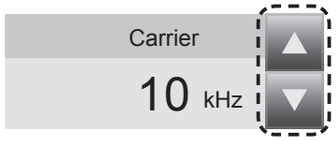

## 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




## 3 Carrier frequency setting

When the carrier frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the carrier frequency by using the up/down keys.




## 4 Interferential frequency setting

**When (Constant) is selected as the output mode**

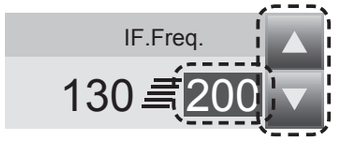
When the interferential frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the interferential frequency by using the up/down keys.


Constant mode

**When (Sweep) is selected as the output mode**

Touch the minimum frequency or maximum frequency indication.
The selected numeric indication becomes highlighted, and up/down keys will appear to the right of the button.
Set each frequency by using the up/down keys.

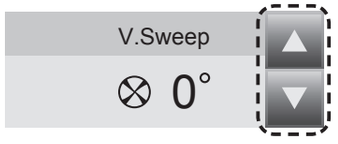

Sweep mode: Minimum frequency setting




Sweep mode: Maximum frequency setting

## 5 Vector sweep setting

Touch the vector sweep setting button and set the vector sweep angle.
Set the vector sweep angle by using the up/down keys.

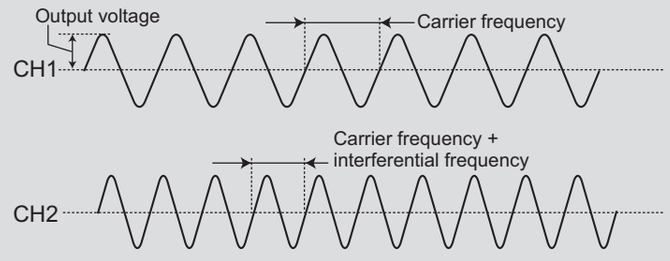



* If the target area is not clear, set a wide vector sweep angle. When the vector sweep angle is wide, the stimulation will feel gentle.

0° : No sweeping (to be used when target section is clear)
15°: 33% of area surrounded by electrodes can be stimulated.
30°: 50% of area surrounded by electrodes can be stimulated
45°: 100% of area surrounded by electrodes can be stimulated

### Parameter setting range for 4-Pole Interferential mode

Output mode: Constant, Sweep
Carrier frequency: 2 kHz, 4 kHz, 5 kHz, 8 kHz, 10 kHz
Interferential frequency: 1 to 250 Hz [1 to 10 Hz (1-Hz steps), 10 to 250 Hz (10-Hz steps)]
Vector sweep angle: 0°, 15°, 30°, 45°
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 100 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 50 V (0.2-V steps)
Waveform:

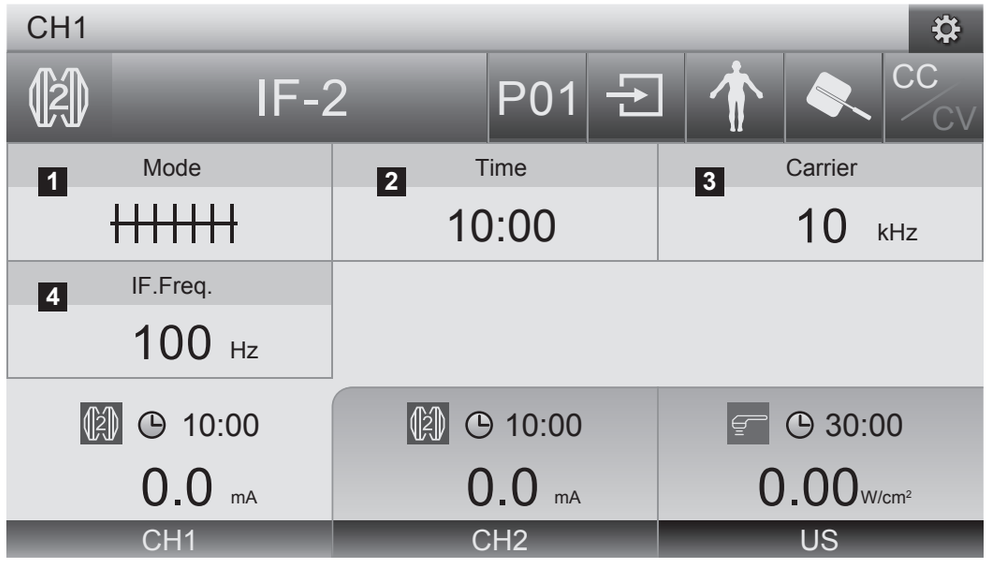


# Setting Parameters for 2-Pole Interferential Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen




**1** Output mode setting button

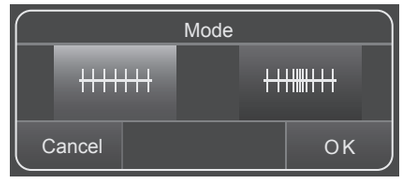
**2** Timer setting button

**3** Carrier frequency setting button

**4** Interferential frequency setting button

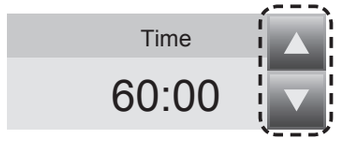
### 1 Output mode setting

When the output mode setting button is touched, a sub-window opens.
Touch either (Constant) or (Sweep), then touch the OK button to close the sub-window.



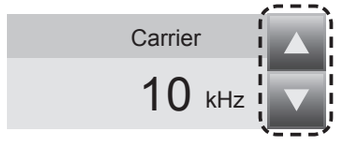

### 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




### 3 Carrier frequency setting

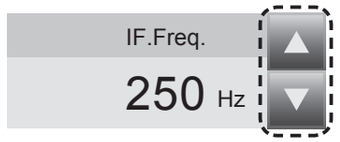
When the carrier frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the carrier frequency by using the up/down keys.




### 4 Interferential frequency setting

**When (Constant) is selected as the output mode**

When the interferential frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the interferential frequency by using the up/down keys.



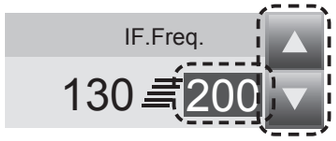

Constant mode

# Setting Parameters for 2-Pole Interferential Mode

**When (Sweep) is selected as the output mode**

Touch the minimum frequency or maximum frequency indication.
The selected numeric indication becomes highlighted, and up/down keys will appear to the right of the button.
Set each frequency by using the up/down keys.

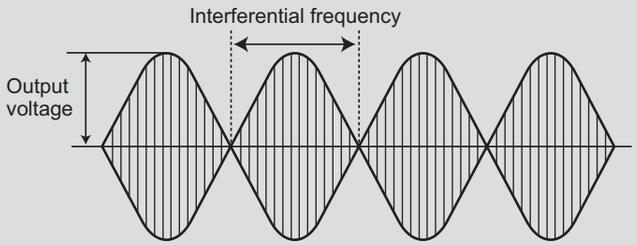

Sweep mode: Minimum frequency setting




Sweep mode: Maximum frequency setting

### Parameter setting range for 2-Pole Interferential mode

Output mode: Constant, Sweep
Carrier frequency: 2 kHz, 4 kHz, 5 kHz, 8 kHz, 10 kHz
Interferential frequency: 1 to 250 Hz [1 to 10 Hz (1-Hz steps), 10 to 250 Hz (10-Hz steps)]
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 mA to 100 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 50 V (0.2-V steps)
Waveform:

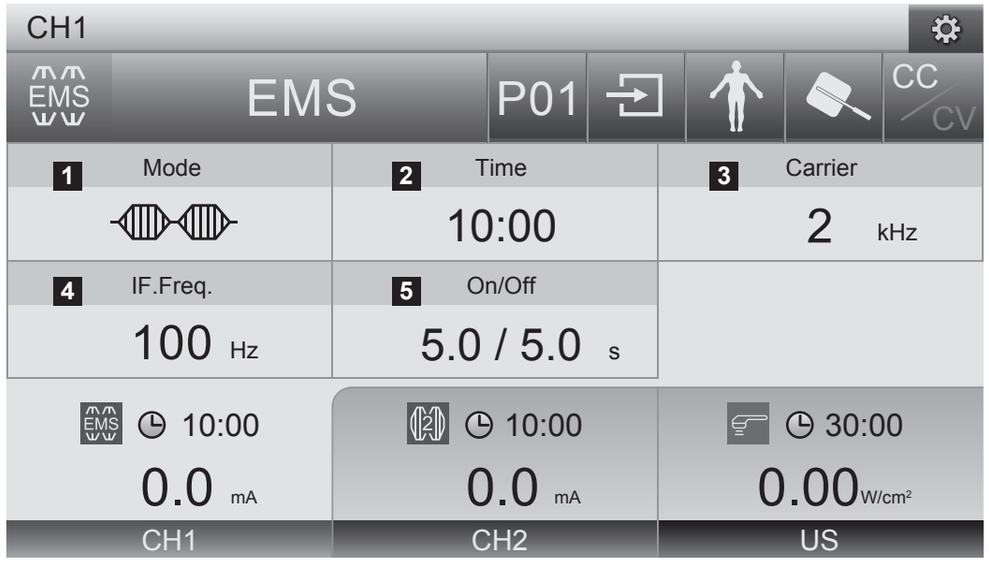



# Setting Parameters for EMS Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | Surge Independent: CH1 and CH2<br>Surge Co-Cont, Surge Alternate: Combination of CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

### Treatment screen

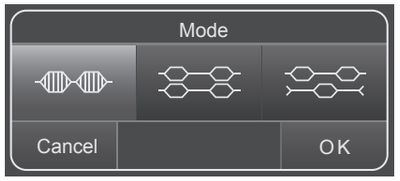



**1** Output mode setting button
**2** Timer setting button
**3** Carrier frequency setting button
**4** Interferential frequency setting button
**5** On/Off setting button

# Setting Parameters for EMS Mode

## 1 Output mode setting

When the output mode setting button is touched, a sub-window opens.
Touch (Surge Independent), (Surge Co-Cont), or (Surge Alternate), then touch the OK button to close the sub-window.



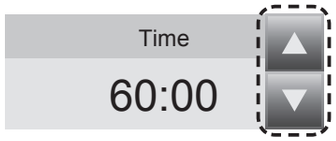

* For Surge Co-Cont and Surge Alternate use two channels.

: Simultaneous output from 2 channels

: Alternating output from 2 channels

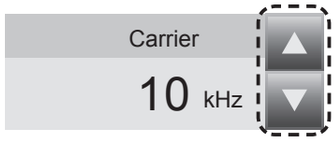
## 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.



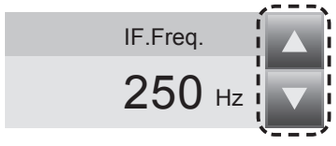

## 3 Carrier frequency setting

When the carrier frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the carrier frequency by using the up/down keys.




## 4 Interferential frequency setting

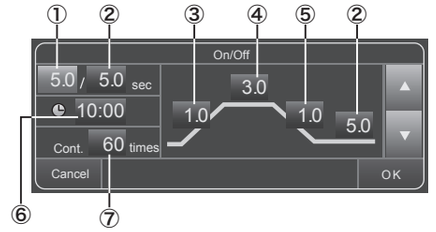
When the interferential frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the interferential frequency by using the up/down keys.




## 5 On/Off setting

When the On/Off button is touched, a sub-window opens.

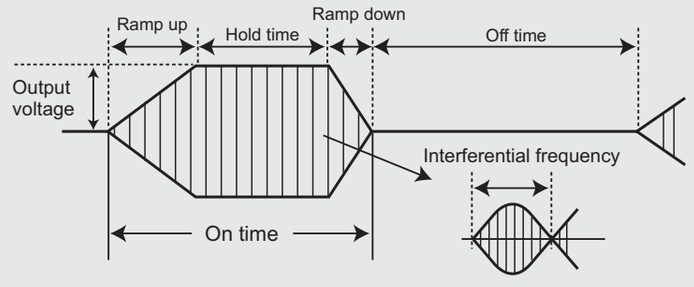
Touch the item to change, and set the parameters using the up/down keys on the right side of the sub-window.




① On time setting button
② Off time setting button
③ Ramp up time setting button
④ Hold time setting button
⑤ Ramp down time setting button
⑥ Timer setting button
⑦ Number-of-contractions setting button

### Parameter setting range for EMS mode

Output mode: Surge Independent, Surge Co-Cont, Surge Alternate
Carrier frequency: 2 kHz, 4 kHz, 5 kHz, 8 kHz, 10 kHz
Interferential frequency: 20 to 250 Hz (10-Hz steps)
On time: 0.1 to 36 sec
Ramp up time: 0 to 3 sec. (0.1-sec. steps)
Hold time: 0 to 30 sec. (0.5-sec. steps)
Ramp down time: 0 to 3 sec. (0.1-sec. steps)
Off time: 1 to 99 sec. (0.5-sec. steps)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 100 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 50 V (0.2-V steps)
Waveform:

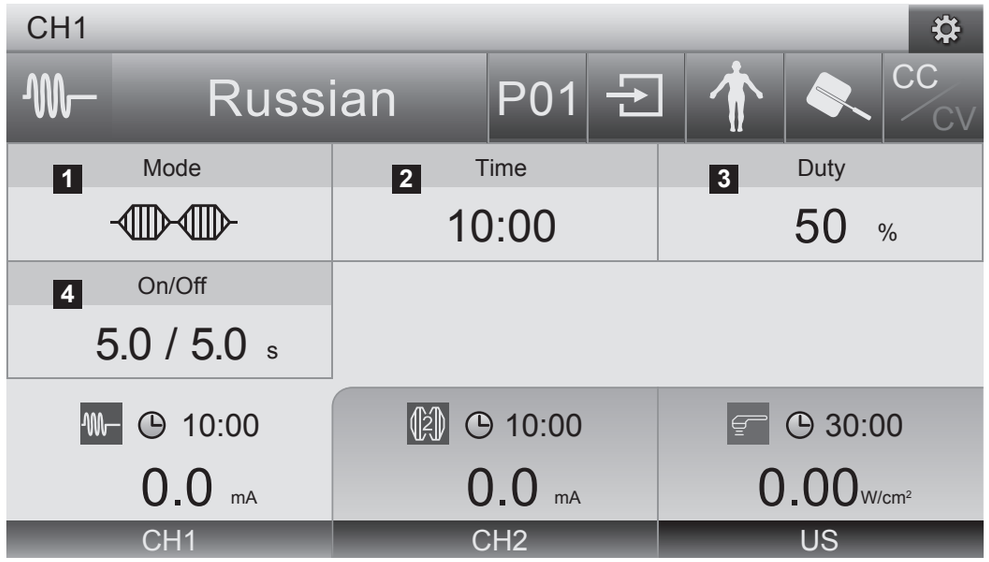


# Setting Parameters for Russian Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | Independent: CH1 and CH2<br>Co-Cont/Alternate: Combination of CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

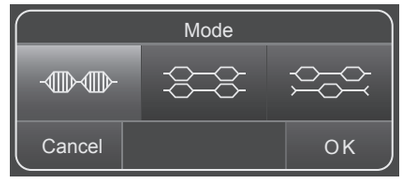
## Treatment screen




**1** Output mode setting button
**2** Timer setting button
**3** Duty setting button
**4** On/Off setting button

### 1 Output mode setting

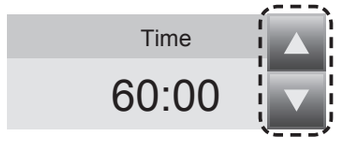
When the output mode setting button is touched, a sub-window opens.
Touch (Surge Independent), (Surge Co-Cont), or (Surge Alternate), then touch the OK button to close the sub-window.




* For Surge Co-Cont and Surge Alternate use two channels.
: Simultaneous output from 2 channels
: Alternating output from 2 channels

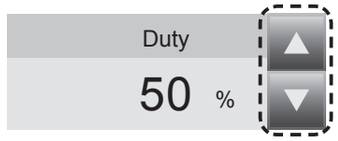
### 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




### 3 Duty setting

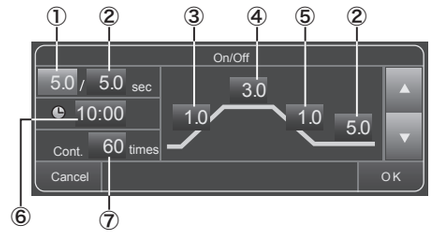
When the duty setting button is touched, the up/down keys will appear to the right of the button.
Set the duty by using the up/down keys.



# Setting Parameters for Russian Mode

### 4 On/Off setting

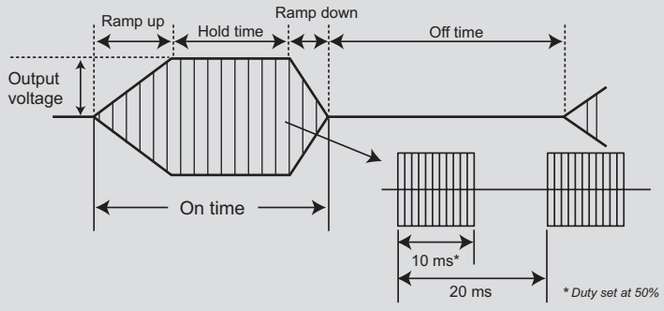
When the On/Off button is touched, a sub-window opens.
Touch the item to change, and set the parameters using the up/down keys on the right side of the sub-window.




① On time setting button
② Off time setting button
③ Ramp up time setting button
④ Hold time setting button
⑤ Ramp down time setting button
⑥ Timer setting button
⑦ Number-of-contractions setting button

### Parameter setting range for Russian mode

Output mode: Surge Independent, Surge Co-Cont, Surge Alternate
Carrier frequency: 2.5 kHz (fixed)
Duty: 10 to 100% (10% steps)
On time: 0.1 to 36 sec
Ramp up time: 0 to 3 sec. (0.1-sec. steps)
Hold time: 0 to 30 sec. (0.5-sec. steps)
Ramp down time: 0 to 3 sec. (0.1-sec. steps)
Off time: 1 to 99 sec. (0.5-sec. steps)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 100 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 50 V (0.2-V steps)
Waveform:

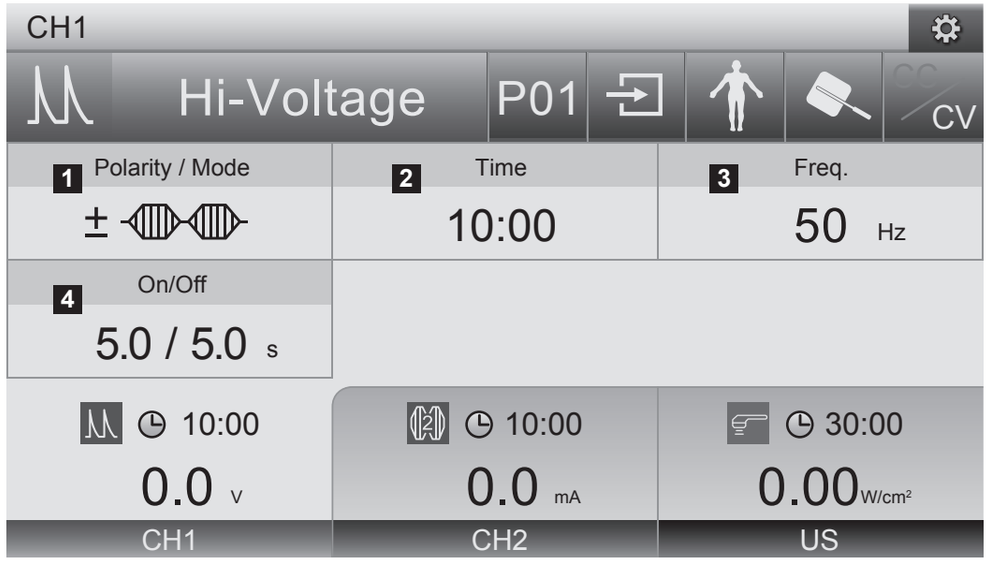



# Setting Parameters for Hi-Voltage Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), HV/DC Probe (optional), Vacuum Electrode (optional) |
| **Usable channels** | Constant, Sweep, Burst, Surge Independent: CH1 and CH2<br>Surge Co-Cont, Surge Alternate: Combination of CH1 and CH2 |

* When HV/DC Probes are connected, the open error detection function turns off.
* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

### Treatment screen




**1** Polarity/output mode setting button
**2** Timer setting button
**3** Frequency setting button
**4** On/Off setting button

* The On/Off setting button appears only when Surge Independent, Surge Co-Cont, or Surge Alternate is selected.
* In Hi-Voltage mode, CV is automatically set. CC cannot be selected.

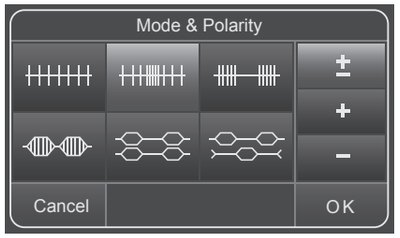
# Setting Parameters for Hi-Voltage Mode

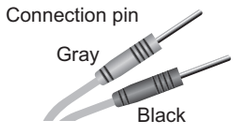
## 1 Polarity/output mode setting

When the polarity/output mode setting button is touched, a sub-window opens.
Select the output mode by touching the (Constant), (Sweep), (Burst), (Surge Independent) (Surge Co-Cont), or (Surge Alternate) button.

Select the polarity from +, −, or ±, then touch the OK button to close the sub-window.

* For Surge Co-Cont and Surge Alternate use two channels.
  : Simultaneous output from 2 channels
  : Alternating output from 2 channels

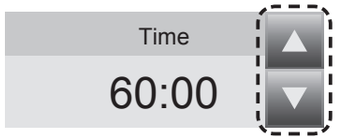



* The set polarity applies to the gray connection pins of the electrode cable.

## 2 Timer setting

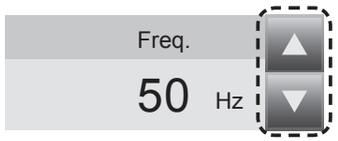
When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




## 3 Frequency setting

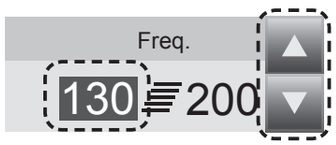
When the frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the frequency by using the up/down keys.

**When selecting modes other than (Sweep) as the output mode**
When the frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the frequency by using the up/down keys.

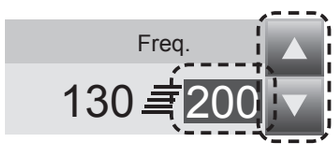



Mode other than Sweep mode

**When selecting (Sweep) as the output mode**
Touch either minimum frequency or maximum frequency indication.
The selected numeric indication becomes highlighted, and up/down keys will appear to the right of the button.
Set each frequency by using the up/down keys.



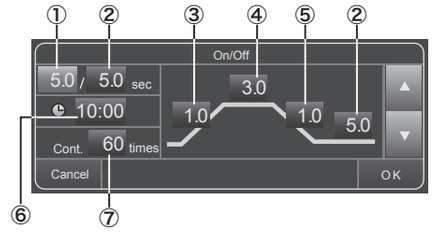

Sweep mode: Minimum frequency setting




Sweep mode: Maximum frequency setting

## 4 On/Off setting (Surge mode only)

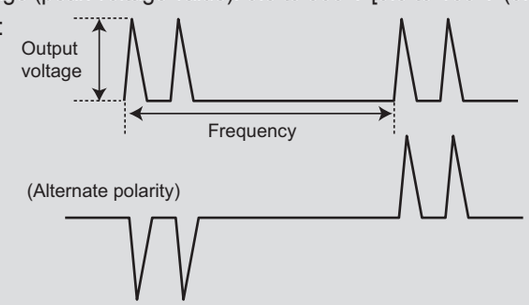
When (Surge Independent), (Surge Co-Cont), or (Surge Alternate) is selected, the On/Off setting button appears.
When the On/Off setting button is touched, a sub-window opens.
Touch the item to change, and set the parameters using the up/down keys on the right side of the sub-window.




① On time setting button ② Off time setting button ③ Ramp up time setting button
④ Hold time setting button ⑤ Ramp down time setting button ⑥ Timer setting button
⑦ Number-of-contractions setting button

### Parameter setting range for Hi-Voltage mode

Output mode: Constant, Sweep, Burst, Surge Independent, Surge Co-Cont, Surge Alternate
Polarity: positive, negative, alternate
Frequency:
Constant 0.5 to 200 Hz [0.5 Hz, 0.7 Hz, 1 to 10 Hz (1-Hz steps), 10 to 200 Hz (10-Hz steps)]
Sweep 1 to 200 Hz [1 to 10 Hz (1-Hz steps), 10 to 200 Hz (10-Hz steps)]
Burst 0.5 to 7 Hz [0.5 Hz, 0.7 Hz, 1 to 7 Hz (1-Hz steps)]
Surge Independent, Surge Co-Cont, Surge Alternate 20 to 200 Hz (10-Hz steps)
Pulse duration: 10 µs (fixed)*
* Pulse width at half the output voltage (500 Ω load).
On time: 0.1 to 36 sec
Ramp up time: 0 to 3 sec. (0.1-sec. steps)
Hold time: 0 to 30 sec. (0.5-sec. steps)
Ramp down time: 0 to 3 sec. (0.1-sec. steps)
Off time: 1 to 99 sec. (0.5-sec. steps)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output voltage (peak voltage value): 0.5 to 300 V [0.5 to 100 V (0.5-V steps), 100 to 300 V (1-V steps)]
Waveform:

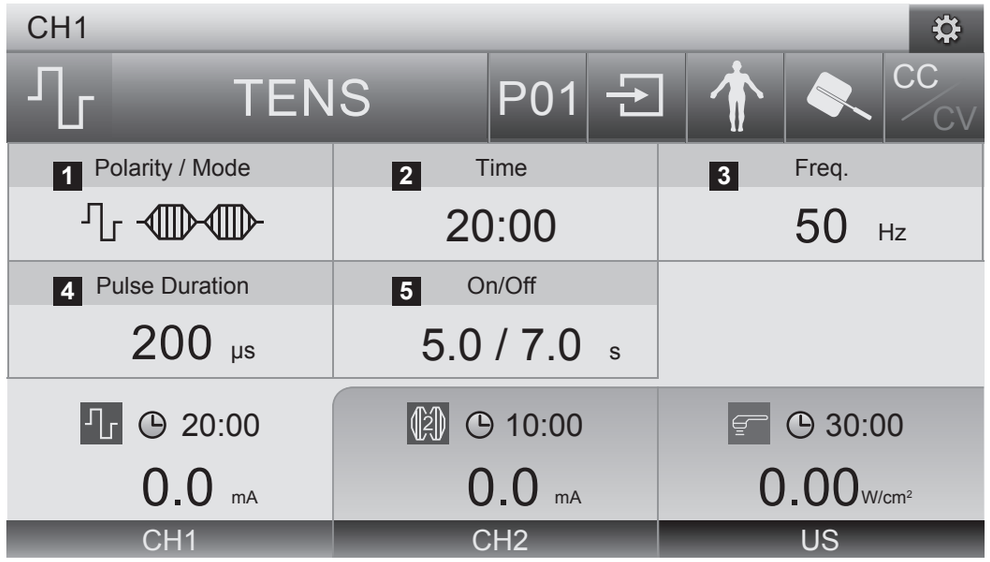


# Setting Parameters for TENS Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | Constant, Sweep, Burst, Surge Independent: CH1 and CH2<br>Surge Co-Cont, Surge Alternate: Combination of CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen



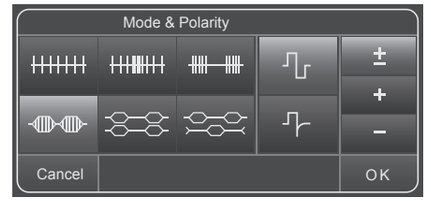

**1** Polarity/output mode setting button
**2** Timer setting button
**3** Frequency setting button
**4** Pulse duration setting button
**5** On/Off setting button

* The On/Off setting button appears only when Surge Independent, Surge Co-Cont, or Surge Alternate is selected.

### 1 Polarity/output mode setting

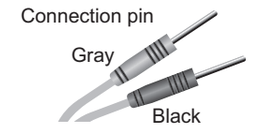
When the polarity/output mode setting button is touched, a sub-window opens.
Select the output mode by touching the (Constant), (Sweep), (Burst), (Surge Independent) (Surge Co-Cont), or (Surge Alternate) button.

Select (Symmetrical Waveform) or (Asymmetrical Waveform).




* When symmetrical waveform is chosen, the polarity cannot be changed.

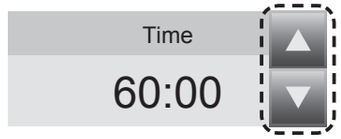
* For Surge Co-Cont and Surge Alternate use two channels.
  : Simultaneous output from 2 channels
  : Alternating output from 2 channels




* The set polarity applies to the gray connection pins of the electrode cable.

### 2 Timer setting

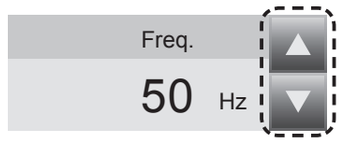
When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




### 3 Frequency setting

When the frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the frequency by using the up/down keys.

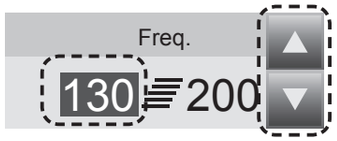
**When selecting modes other than (Sweep) as the output mode**
When the frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the frequency by using the up/down keys.



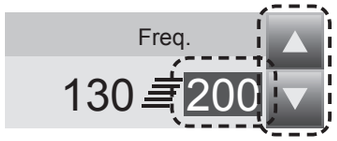

Mode other than Sweep mode

# Setting Parameters for TENS Mode

**When selecting (Sweep) as the output mode**
Touch either minimum frequency or maximum frequency indication.
The selected numeric indication becomes highlighted, and up/down keys will appear to the right of the button.
Set each frequency by using the up/down keys.



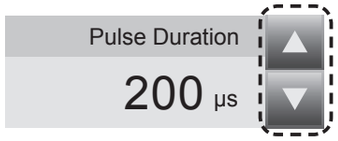
Sweep mode: Minimum frequency setting



Sweep mode: Maximum frequency setting

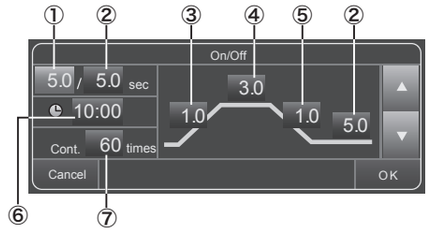
**4 Pulse duration setting**

When the pulse duration setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




**5 On/Off setting (Surge mode only)**

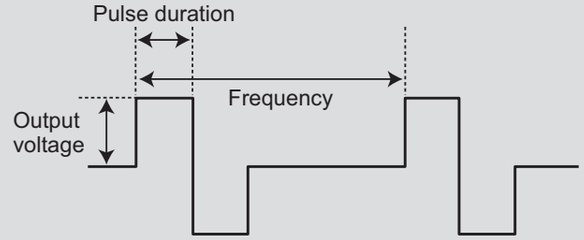
When (Surge Independent), (Surge Co-Cont), or (Surge Alternate) is selected, the On/Off setting button appears.
When the On/Off setting button is touched, a sub-window opens.
Touch the item to change, and set the parameters using the up/down keys on the right side of the sub-window.




① On time setting button
② Off time setting button
③ Ramp up time setting button
④ Hold time setting button
⑤ Ramp down time setting button
⑥ Timer setting button
⑦ Number-of-contractions setting button

## Parameter setting range for TENS mode

Output mode: Constant, Sweep, Burst, Surge Independent, Surge Co-Cont, Surge Alternate
Waveform setting: Symmetrical waveform, asymmetrical waveform
Polarity: positive, negative, alternate
Frequency:
Constant 0.5 to 250 Hz [0.5 Hz, 0.7 Hz, 1 to 10 Hz (1-Hz steps), 10 to 250 Hz (10-Hz steps)]
Sweep 1 to 250 Hz [1 to 10 Hz (1-Hz steps), 10 to 250 Hz (10-Hz steps)]
Burst 0.5 to 7 Hz [0.5, 0.7, 1 to 7 Hz (1-Hz steps)]
Surge Independent, Surge Co-Cont, Surge Alternate 20 to 250 Hz (10-Hz steps)
Pulse duration: 50 to 300 µs (10-µs steps)
On time: 0.1 to 36 sec
Ramp up time: 0 to 3 sec. (0.1-sec. steps)
Hold time: 0 to 30 sec. (0.5-sec. steps)
Ramp down time: 0 to 3 sec. (0.1-sec. steps)
Off time: 1 to 99 sec. (0.5-sec. steps)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 100 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 50 V (0.2-V steps)
Waveform:

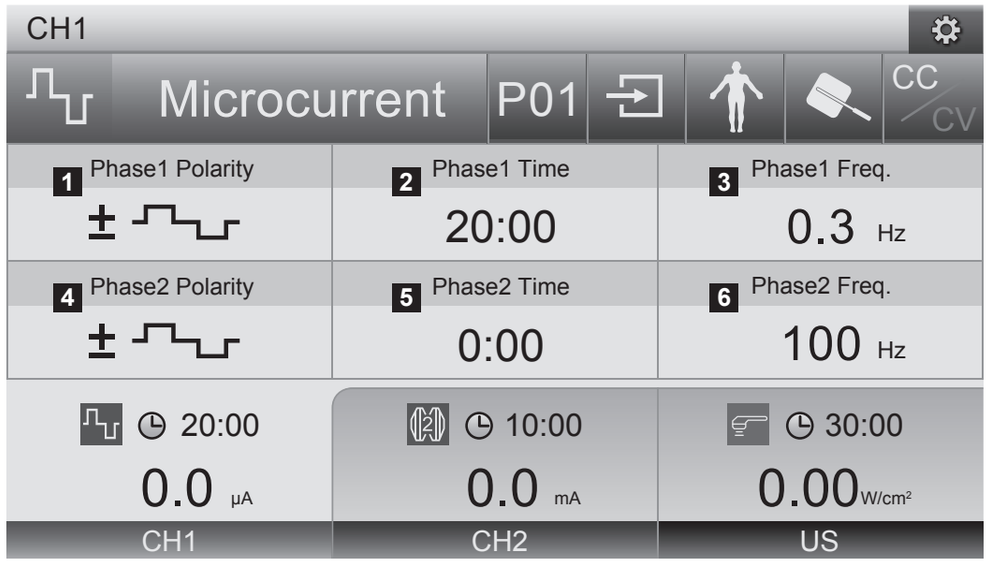


# Setting Parameters for Microcurrent Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), MCR (Microcurrent) probe (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen

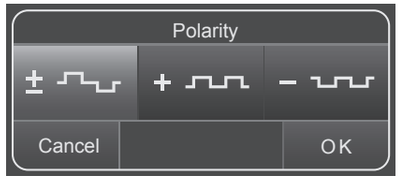



**1** Phase 1 polarity setting button
**2** Phase 1 timer setting button
**3** Phase 1 frequency setting button
**4** Phase 2 polarity setting button
**5** Phase 2 timer setting button
**6** Phase 2 frequency setting button

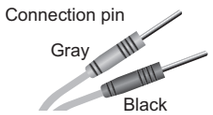
* In Microcurrent mode, electric currents of different settings can output continuously. When using only Phase 1, set the Phase 2 timer to “0.”
* In Microcurrent mode, CC is automatically set. CV cannot be selected.

### 1 Phase 1 polarity mode setting

When the Phase 1 polarity setting button is touched, a sub-window opens.
Select the Phase 1 polarity from ±, +, or −, and touch the OK button to close the sub-window.




* The set polarity applies to the gray connection pins of the electrode cable.



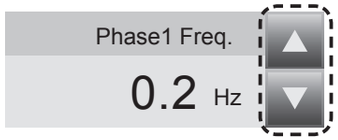

### 2 Phase 1 timer setting

When the Phase 1 timer setting button is touched, the up/down keys will appear to the right of the button.
Set the Phase 1 treatment time by using the up/down keys.


* The timer can be set to up to 60 minutes for the total time of Phase 1 and Phase 2.

### 3 Phase 1 frequency setting

When the Phase 1 frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the Phase 1 frequency by using the up/down keys.



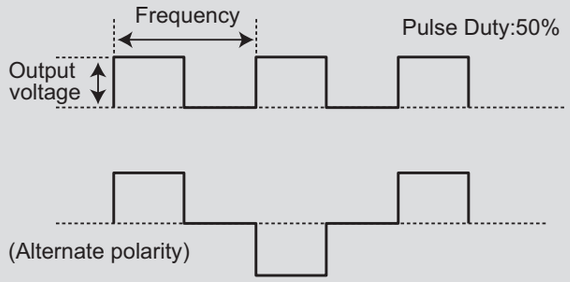

### 4 Phase 2 setting

When using Phase 2, set the Phase 2 polarity, timer, and frequency in the same manner.

# Setting Parameters for Microcurrent Mode

### Parameter setting range for Microcurrent mode

Polarity: positive, negative, alternate
Frequency: 0.2 to 400 Hz [0.2 Hz, 0.3 Hz, 0.5 Hz, 0.7 Hz, 1 to 10 Hz (1-Hz steps),
10 to 400 Hz (10-Hz steps)]
Pulse duty: 50% (fixed)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps),
Phase 1 + Phase 2 ≤ 60 min)]
Output current (peak current value): 10 to 750 μA (10-μA steps)
Waveform:

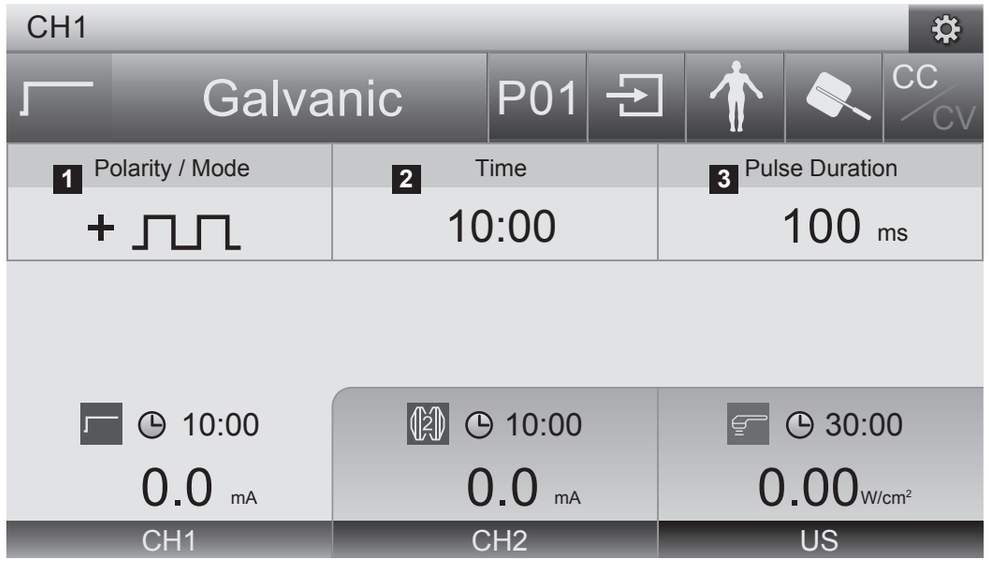



# Setting Parameters for Galvanic Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), HV/DC Probe (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* When HV/DC Probes are connected, output is automatically set to 1/10, and the open error detection function turns off.
* When HV/DC Probes are connected, CV is automatically set. CC cannot be selected.
* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

### Treatment screen



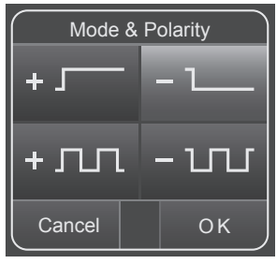

**1** Polarity/output mode setting button
**2** Timer setting button
**3** Pulse duration setting button

* The pulse duration setting button appears only when the output mode is set to Positive/Interrupted or Negative/Interrupted.

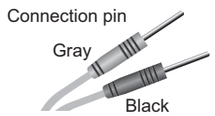
# Setting Parameters for Galvanic Mode

## 1 Polarity/output mode setting

When the polarity/output mode setting button is touched, a sub-window opens.
Select (Positive/Continuous), (Negative/Continuous), (Positive/Interrupted), or (Negative/Interrupted), and touch the OK button to close the sub-window.

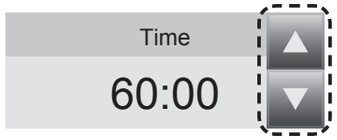



* The set polarity applies to the gray connection pins of the electrode cable.



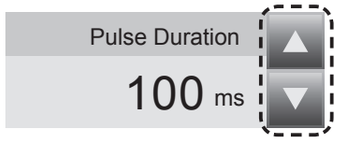

## 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




## 3 Pulse duration setting

When the pulse duration setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.

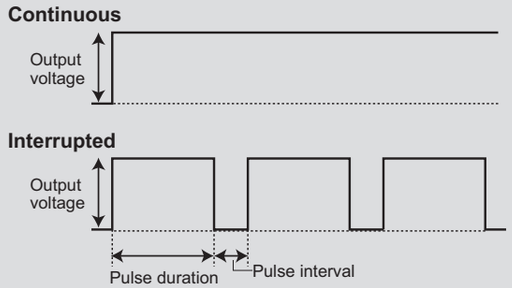



* The pulse duration setting button appears only when the output mode is set to Positive/Interrupted or Negative/Interrupted.



## Parameter setting range for Galvanic mode

Output mode: Continuous, Interrupted
Polarity: positive, negative
Pulse duration (interrupted): 60 ms, 100 ms, 300 ms, 500 ms, 1000 ms
(pulse duty fixed at 95%)
Frequency (interrupted): 0.95 to 15.8 Hz
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.2 to 20 mA (0.2-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.1 to 10 V (0.1-V steps)
Waveform:

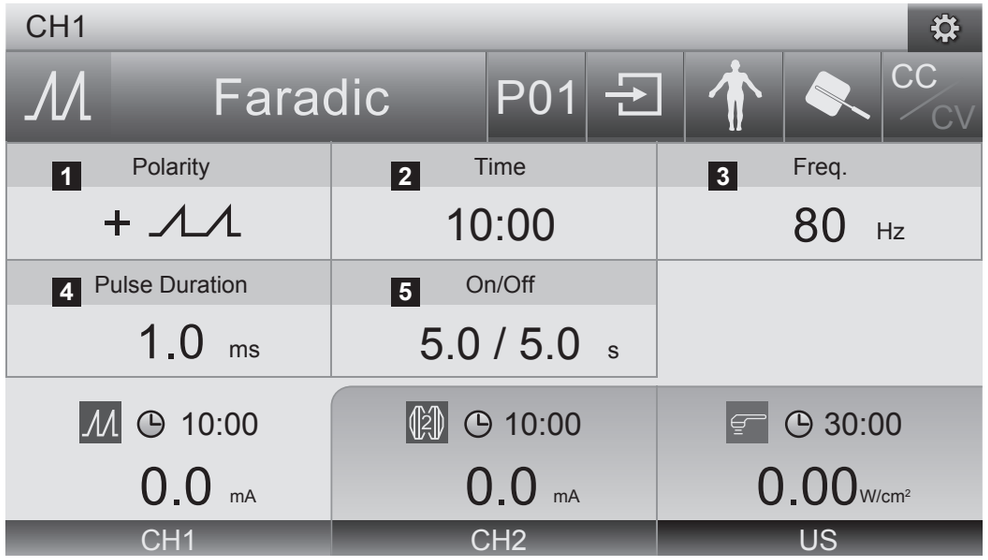


# Setting Parameters for Faradic Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), HV/DC Probe (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* When HV/DC Probes are connected, output is automatically set to 1/10, and the open error detection function turns off.
* When HV/DC Probes are connected, CV is automatically set. CC cannot be selected.
* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

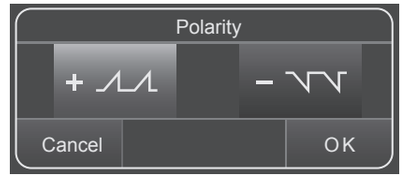
## Treatment screen



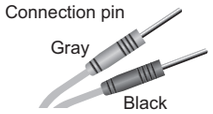

**1** Polarity setting button
**2** Timer setting button
**3** Frequency setting button
**4** Pulse duration setting button
**5** On/Off setting button

### 1 Polarity/output mode setting

When the polarity setting button is touched, a sub-window opens.
Select + or −, then touch the OK button to close the sub-window.

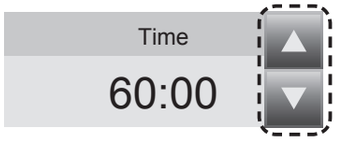



* The set polarity applies to the gray connection pins of the electrode cable.



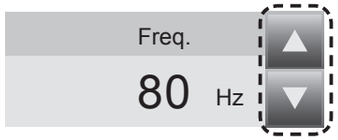

### 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.



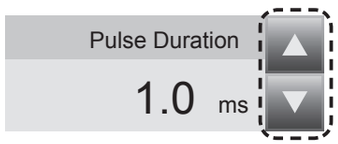

### 3 Frequency setting

When the frequency setting button is touched, the up/down keys will appear to the right of the button.
Set the frequency by using the up/down keys.




### 4 Pulse duration setting

When the pulse duration setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.

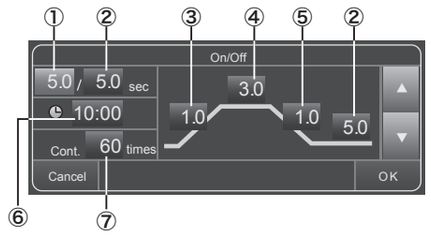


# Setting Parameters for Faradic Mode

**5 On/Off setting**

When the On/Off button is touched, a sub-window opens.

Touch the item to change, and set the parameters using the up/down keys on the right side of the sub-window.

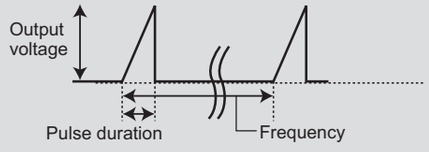



① On time setting button
② Off time setting button
③ Ramp up time setting button
④ Hold time setting button
⑤ Ramp down time setting button
⑥ Timer setting button
⑦ Number-of-contractions setting button

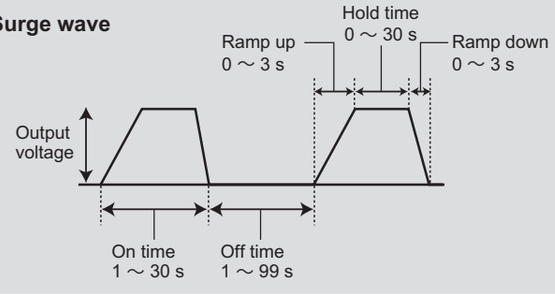
### Parameter setting range for Faradic mode

Polarity: Positive, negative
Frequency: 20 to 250 Hz (10-Hz steps)
Pulse duration: 0.1 to 1 ms (0.1-ms steps)
On time: 0.1 to 36 sec
Ramp up time: 0 to 3 sec. (0.1-sec. steps)
Hold time: 0 to 30 sec. (0.5-sec. steps)
Ramp down time: 0 to 3 sec. (0.1-sec. steps)
Off time: 1 to 99 sec. (0.5-sec. steps)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 70 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 35 V (0.2-V steps)
Waveform:

**Triangular wave**




**Surge wave**



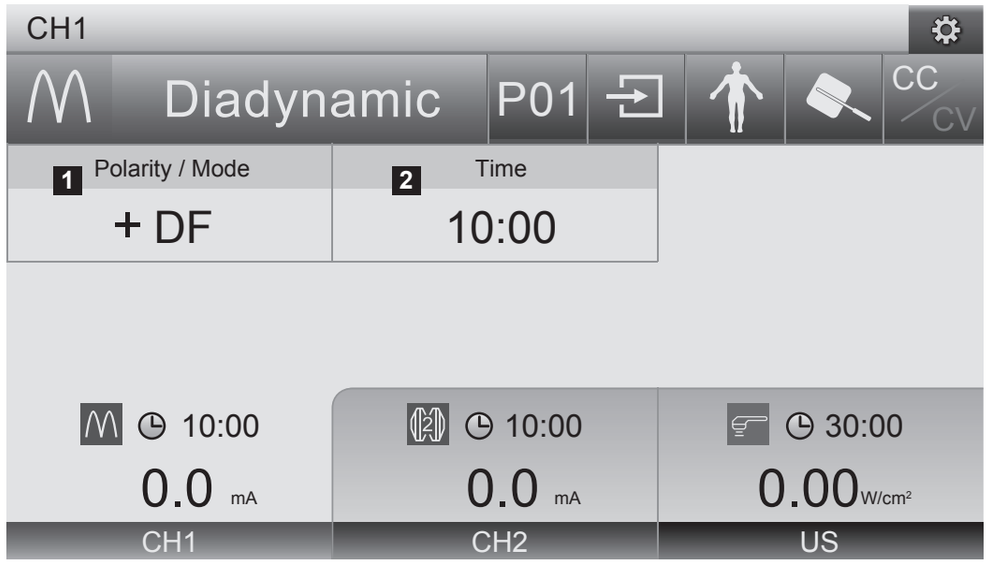



# Setting Parameters for Diadynamic Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), HV/DC Probe (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* When HV/DC Probes are connected, output is automatically set to 1/10, and the open error detection function turns off.
* When HV/DC Probes are connected, CV is automatically set. CC cannot be selected.
* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

### Treatment screen



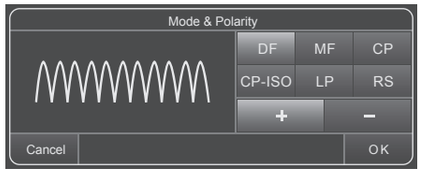

**1** Polarity/output mode setting button

**2** Timer setting button

# Setting Parameters for Diadynamic Mode

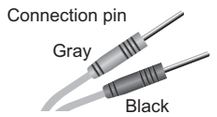
## 1 Polarity/output mode setting

When the polarity/output mode setting button is touched, a sub-window opens.
Set the output mode by touching DF, MF, CP, CP-ISO, LP, or RS.



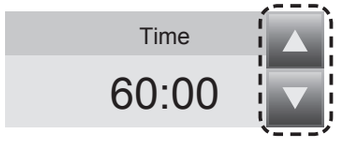

Select the polarity from + or –, then touch the OK button to close the sub-window.

* The set polarity applies to the gray connection pins of the electrode cable.



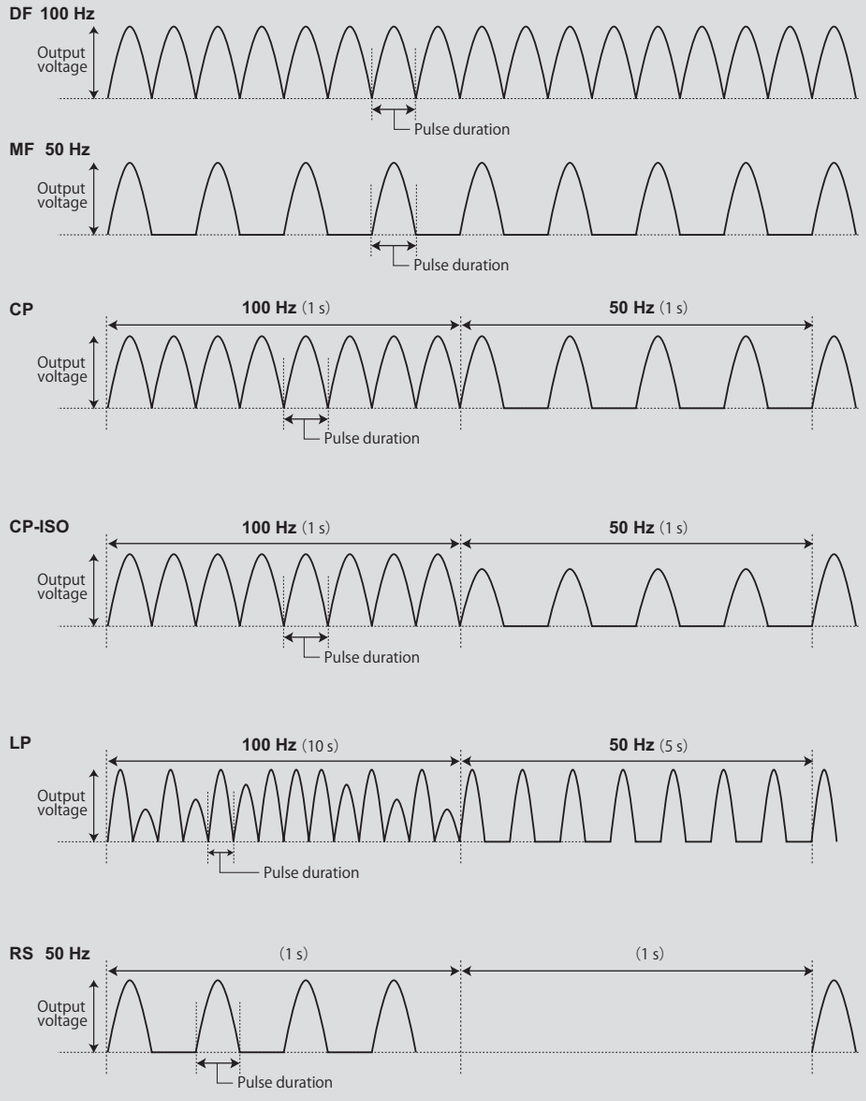

## 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




## Parameter setting range for Diadynamic mode

Output mode: DF, MF, CP, CP-ISO, LP, RS
Polarity: positive, negative
Frequency: 50 Hz or 100 Hz
Pulse duration: 10 ms (fixed)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 70 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 35 V (0.2-V steps)
Waveform:

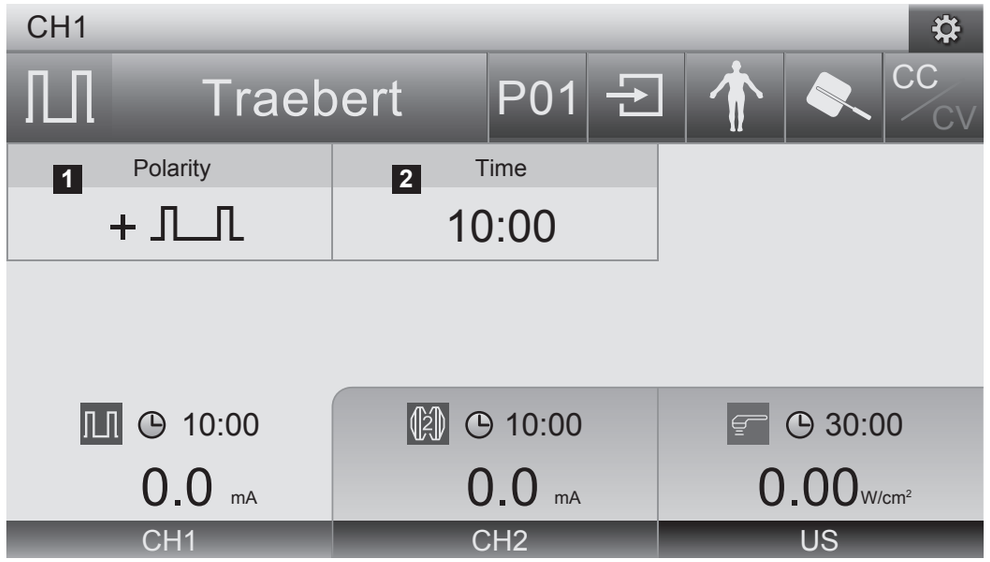


# Setting Parameters for Traebert Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), HV/DC Probe (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* When HV/DC Probes are connected, output is automatically set to 1/10, and the open error detection function turns off.
* When HV/DC Probes are connected, CV is automatically set. CC cannot be selected.
* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen

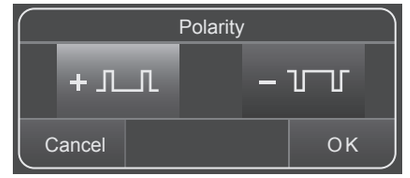



**1** Polarity setting button

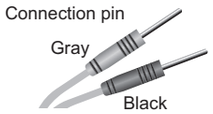
**2** Timer setting button

### 1 Polarity/output mode setting

When the polarity setting button is touched, a sub-window opens.
Select + or −, then touch the OK button to close the sub-window.

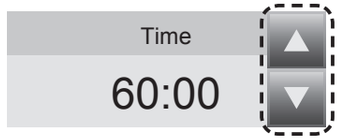



* The set polarity applies to the gray connection pins of the electrode cable.



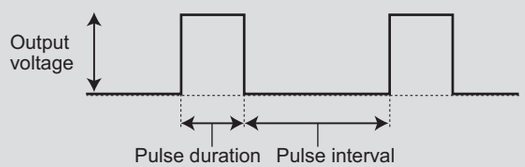

### 2 Timer setting

When the timer setting button is touched, the up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.




### Parameter setting range for Traebert mode

Polarity: positive, negative
Frequency: 142 Hz (fixed)
Pulse duration: 2 ms (fixed)
Pulse interval: 5 ms (fixed)
Timer: 1 to 60 minutes [1 to 30 minutes (1-minute steps), 30 to 60 minutes (5-minute steps)]
Output current (peak current value): 0.5 to 70 mA (0.5-mA steps)
Output voltage (peak voltage value at 500 Ω load): 0.2 to 35 V (0.2-V steps)
Waveform: **Rectangular wave**

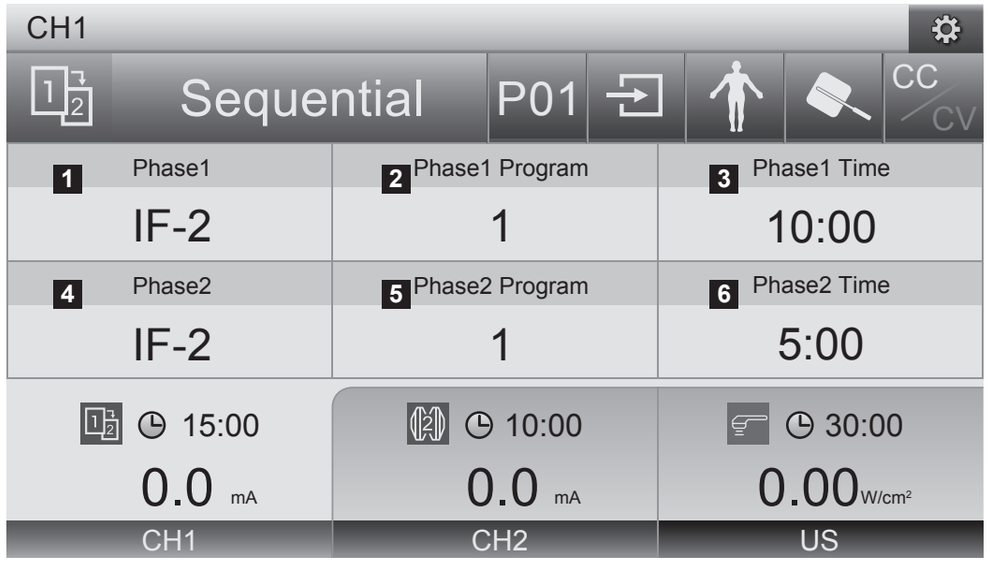


# Setting Parameters for Sequential Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen

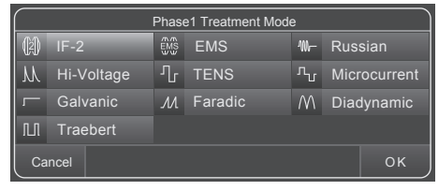



**1** Phase 1 treatment mode selection button
**2** Phase 1 program selection button
**3** Phase 1 timer setting button
**4** Phase 2 treatment mode selection button
**5** Phase 2 program selection button
**6** Phase 2 timer setting button

* Sequential mode allows successive output for two treatment modes.
  The treatment mode set for Phase 2 starts automatically when output for the treatment mode set for Phase 1 ends.
* CC/CV selection button is invalid under Sequential mode. The device automatically switches to CV when Hi-Voltage mode is selected and switches to CC in the other modes.

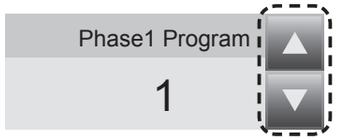
### 1 Phase 1 treatment mode selection

When the Phase 1 treatment mode selection button is touched, a sub-window opens.
Select Phase 1 treatment mode, then touch the OK button to close the sub-window.




### 2 Phase 1 program selection

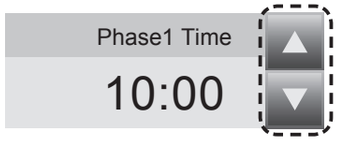
When the Phase 1 program selection button is touched, up/down keys will appear to the right of the button.
Select the program number by using the up/down keys.




### 3 Phase 1 timer setting

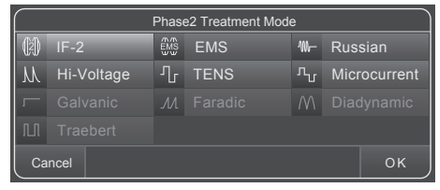
When the Phase 1 timer setting button is touched, the up/down keys will appear to the right of the button.
Set the Phase 1 treatment time by using the up/down keys.

* The timer can be set to 60 minutes for the total time of Phase 1 and Phase 2.




### 4 Phase 2 treatment mode selection

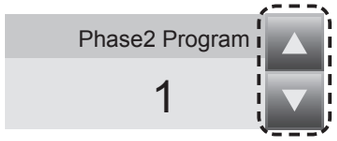
Set parameters for Phase 2 in the same way.
When the Phase 2 treatment mode selection button is touched, a sub-window opens.
Select Phase 2 treatment mode, then touch the OK button to close the sub-window.



# Setting Parameters for Sequential Mode

### 5 Phase 2 program selection

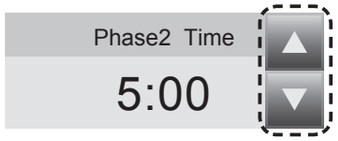
When the Phase 2 program selection button is touched, up/down keys will appear to the right of the button.
Select the program number by using the up/down keys.




### 6 Phase 2 timer setting

When the Phase 2 timer setting button is touched, the up/down keys will appear to the right of the button.
Set the Phase 2 treatment time by using the up/down keys.

* The timer can be set to up to 60 minutes for the total time of Phase 1 and Phase 2.




## Treatment modes that can be set for Sequential mode

The following treatment modes can be set for each Phase:

| Phase1 \ Phase2 | IF-4 | IF-2 | EMS 1) | Russian 1) | Hi-Voltage 1) | TENS 1) | Microcurrent 2) | Galvanic | Faradic | Diadynamic | Traebert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IF-4 | × | × | × | × | × | × | × | × | × | × | × |
| IF-2 | × | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × |
| EMS 1) | × | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × |
| Russian 1) | × | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × |
| Hi-Voltage 1) | × | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × |
| TENS 1) | × | ○ | ○ | ○ | ○ | ○ | ○ | × | × | × | × |
| Microcurrent 2) | × | × | × | × | × | × | ○ | × | × | × | × |
| Galvanic | × | × | × | × | × | × | ○ | ○ | ○ | ○ | ○ |
| Faradic | × | × | × | × | × | × | ○ | ○ | ○ | ○ | ○ |
| Diadynamic | × | × | × | × | × | × | ○ | ○ | ○ | ○ | ○ |
| Traebert | × | × | × | × | × | × | ○ | ○ | ○ | ○ | ○ |

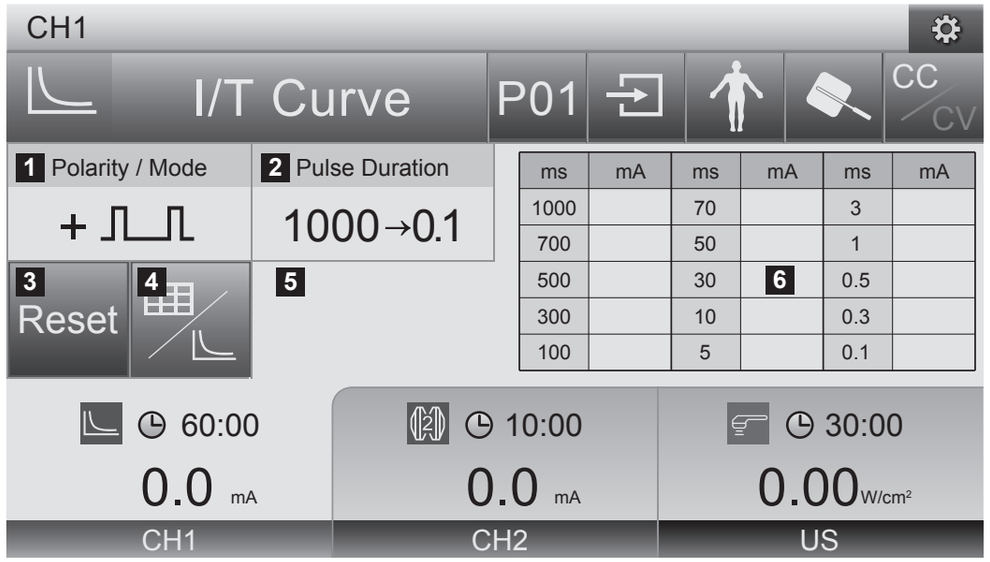
1): Surge Co-Cont, and Surge Alternate mode for EMS, Russian, Hi-Voltage and TENS cannot be set for both Phase 1 and Phase 2.
2): Only Phase 1 for the selected Microcurrent program is applied.

# Operation in I/T Curve Measurement Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen




**1** Polarity/output mode setting button
**2** Measurement sequence setting button
**3** Reset button
**4** List/Graph toggle button
**5** Enter button
**6** Measurement result display area

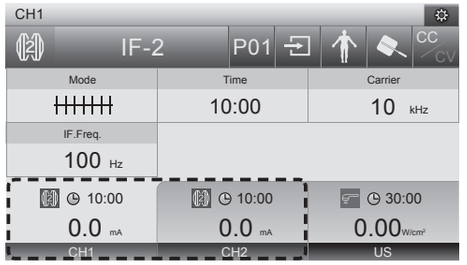
* The Enter button appears after the measurement has started.
* In I/T Curve Measurement mode, CC is set automatically. CV cannot be selected.

* Make sure the electrodes used are connected to the Main Unit.
* When using Vacuum Electrodes, turn on the power switch for the Vacuum Unit.
* For information on using electrodes, see pages 15 to 23.

### 1 Select the channel to be used.

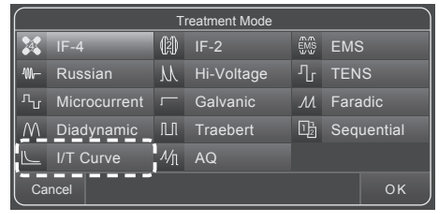
Touch the channel selection button to display the channel (CH1 and CH2) to be used.

* Other channels cannot be used in a measurement mode.




### 2 Select the measurement mode.

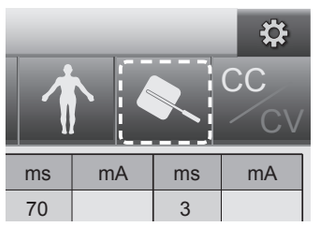
Touch the treatment mode selection button.
A sub-window appears. Select I/T Curve Measurement mode, then touch the OK button to close the sub-window.




### 3 Select the electrode to be used.

The electrode selection button shows the icon corresponding to the connected electrode.
If both the Main Unit and Vacuum Unit are connected to electrodes, touch the button and select the electrode to be used.

* If electrodes that cannot be used in the measurement mode are connected, the electrode selection button will indicate ⃠.

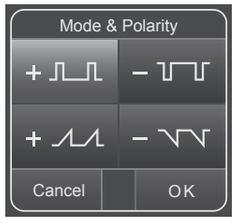



### 4 Set the electrode on the motor point of the muscle to be measured.

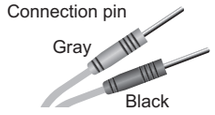
# Operation in I/T Curve Measurement Mode

## 5 Polarity/output mode setting

When the polarity/output mode setting button is touched, a sub-window opens.
Select (Positive/Rectangular Wave), (Negative /Rectangular Wave), (Positive/Triangular Wave), or (Negative/Triangular Wave), then touch the OK button to close the sub-window.

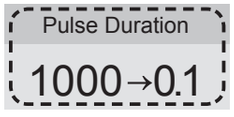



* The set polarity applies to the gray connection pins of the electrode cable.




## 6 Set the pulse duration measurement sequence.

Set the pulse duration measurement sequence using the measurement sequence setting button.
Each time the button is touched, the setting will toggle between descending order (1000 ms → 0.1 ms) and ascending order (0.1 ms → 1000 ms).




## 7 Start measurement.

Turn the intensity control dial for the selected channel to the right to gradually increase the output level. A buzzer will sound during output operation.
When the muscle starts contracting, touch Enter.
The measurement value will appear in the measurement result display area. The next pulse duration is set automatically.
Repeat the above procedure to complete the measurements.

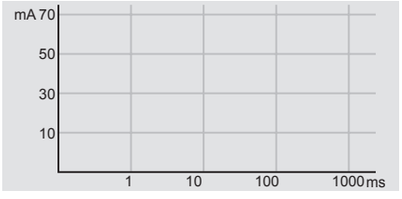

* No buzzer will sound if the operation notification sound is set to Mute.
For information on setting the operation notification sound, see page 98.
* Selecting a pulse duration from the list allows measurements using a desired pulse duration.
Measurements can be repeated with the same pulse duration.

## 8 Switching the measurement result display.

The display toggles between list display and graph display each time the List/Graph toggle button is pressed.

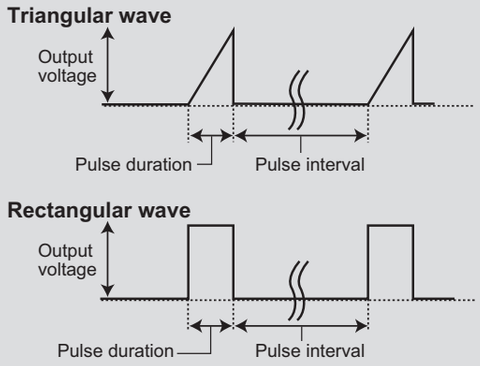
* Touch the reset button to repeat measurements from the beginning.

| ms | mA | ms | mA | ms | mA |
|---|---|---|---|---|---|
| 1000 | | 70 | | 3 | |
| 700 | | 50 | | 1 | |
| 500 | | 30 | | 0.5 | |
| 300 | | 10 | | 0.3 | |
| 100 | | 5 | | 0.1 | |




### Parameter setting range for I/T Curve Measurement mode

Polarity: positive, negative
Waveform: Rectangular wave, Triangular wave
Pulse duration: 1000 ms, 700 ms, 500 ms, 300 ms, 100 ms, 70 ms, 50 ms, 30 ms, 10 ms, 5 ms, 3 ms, 1 ms, 0.5 ms, 0.3 ms, 0.1 ms
Pulse interval: 2000 ms (fixed)
Output current (peak current value): 0.5 to 70 mA (0.5-mA steps)
Waveform:

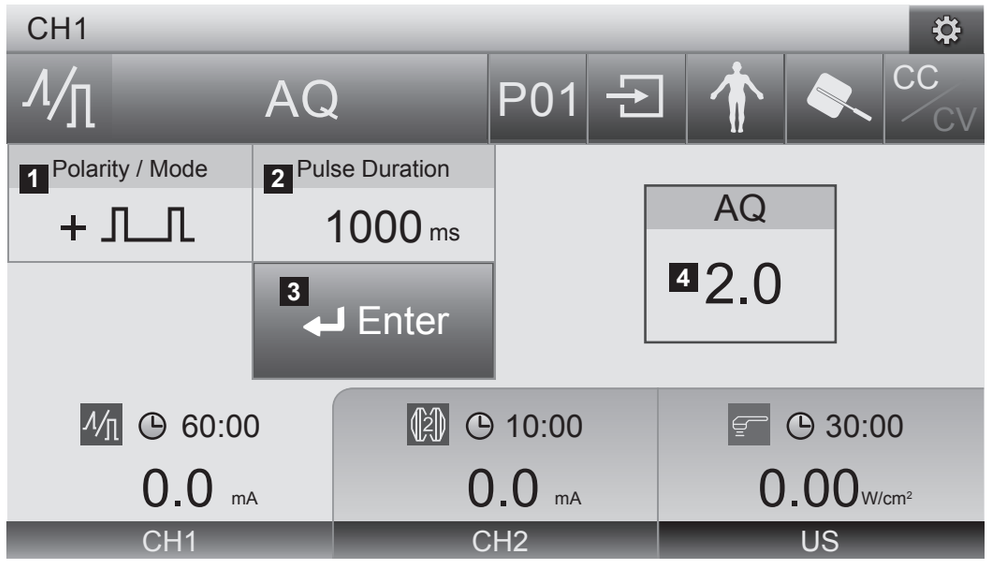


# Operation in AQ Measurement Mode

| | |
|---|---|
| **Connectable electrodes** | Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional) |
| **Usable channels** | CH1 and CH2 |

* To use Vacuum Electrodes, the Vacuum Unit (optional) is required.

## Treatment screen




**1** Polarity/output mode setting button

**2** Pulse duration display area

**3** Confirm button

**4** Measurement result display area

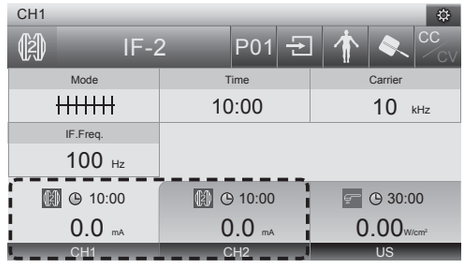
* The pulse duration display area has only a display function. The setting cannot be changed.
* The confirm button automatically changes to the Enter button, Back button, or Retry button, depending on the stage of measurement.
* In AQ Measurement mode, CC is set automatically. CV cannot be selected.

* Make sure the electrodes used are connected to the Main Unit.
* When using Vacuum Electrodes, turn on the power switch for the Vacuum Unit.
* For information on using electrodes, see pages 15 to 23.

### 1 Select the channel to be used.

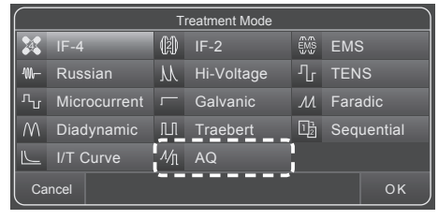
Touch the channel selection button to display the channel (CH1 and CH2) to be used.

* Other channels cannot be used in the measurement mode.




### 2 Select the measurement mode.

Touch the treatment mode selection button.
A sub-window appears. Select AQ Measurement mode, then touch the OK button to close the sub-window.




### 3 Select the electrode to be used.

The electrode selection button shows the icon corresponding to the connected electrode.
If both the Main Unit and Vacuum Unit are connected to electrodes, touch the button and select the electrode to be used.

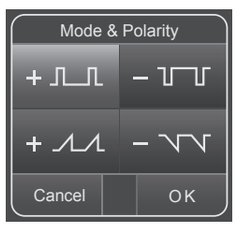
* If electrodes that cannot be used in a measurement mode are connected, the electrode selection button will indicate ⃠.


### 4 Set the electrode on the motor point of the muscle to be measured.

# Operation in AQ Measurement Mode

### 5 Polarity/output mode setting

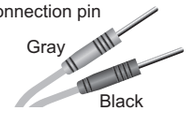
When the polarity/output mode setting button is touched, a sub-window opens.
Select the waveform and polarity of the first output from (Positive/Rectangular Wave), (Negative/Rectangular Wave), (Positive/Triangular Wave), or (Negative/Triangular Wave), then touch the OK button to close the sub-window.




* In AQ Measurement mode, measurement is conducted twice.
  The first measurement is based on the selected polarity and output mode. The second measurement is based on the polarity used in the first measurement but an output mode different from that of the first measurement.

  When is selected: (first measurement) → (second measurement)
  When is selected: (first measurement) → (second measurement)
  When is selected: (first measurement) → (second measurement)
  When is selected: (first measurement) → (second measurement)

* The set polarity applies to the gray connection pins of the electrode cable.




### 6 Start measurement.

Turn the intensity control dial for the selected channel to the right to gradually increase the output level. A buzzer will sound during output operation.
When the muscle starts contracting, touch Enter.

* The confirm button changes to Back. To repeat the first measurement, touch the Back button.

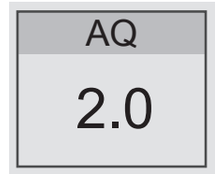
When the output level is increased again, the second measurement will start.
When the muscle starts contracting, touch Enter.
When the second measurement ends, the measurement operation is completed.

* No buzzer will sound if the operation notification sound is set to Mute.
  For information on setting the operation notification sound, see page 98.


### 7 The measurement result is displayed.

After the measurements are completed, the result is displayed automatically.

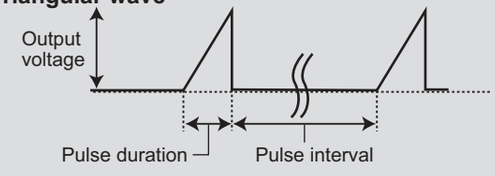
* After the measurements are completed, the confirm button changes to Retry. To repeat the measurements, touch the Retry button.



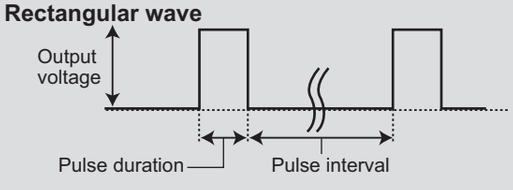

## Parameter setting range for AQ mode

Polarity: positive, negative
Waveform: Rectangular wave, Triangular wave
Pulse duration: 1000 ms (fixed)
Pulse interval: 2000 ms (fixed)
Output current (peak current value): 0.5 to 70 mA (0.5-mA steps)
Waveform:

**Triangular wave**



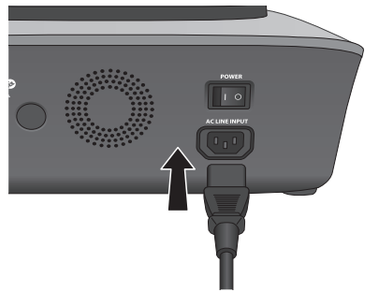

**Rectangular wave**



# Preparing for Ultrasound Therapy

**1 Make sure the power switch for the Main Unit is turned off.**

**2 Connect the power supply cord to the power supply cord connection port on the Main Unit.**




**3 Connect the power supply cord to an AC power outlet.**

**4 Connect one of the Ultrasound Probe (L) and Ultrasound Probe (S) (optional), or both to the Ultrasound Probe connection port.**

* The Ultrasound Probe cable can be connected to either connection port.

* Do not connect Ultrasound Probes of the same size to the Main Unit at the same time.

**5 Turn on the power switch for the Main Unit.**

After the initial check is completed, the treatment screen will appear.

**⚠WARNING**

1. To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
2. MULTIPLE SOCKET-OUTLET or extension cord shall not be connected to the EU-921.

**⚠CAUTION**

1. In order to disconnect from a wall socket, pull the plug.
2. Do not position the EU-921 where it is difficult to pull out the plug.

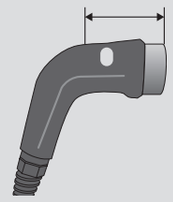


**⚠WARNING** To avoid electric shock, do not perform any operations other than the operation of the Ultrasound Probe when your hands are wet.

**⚠ Caution regarding auto contact function**

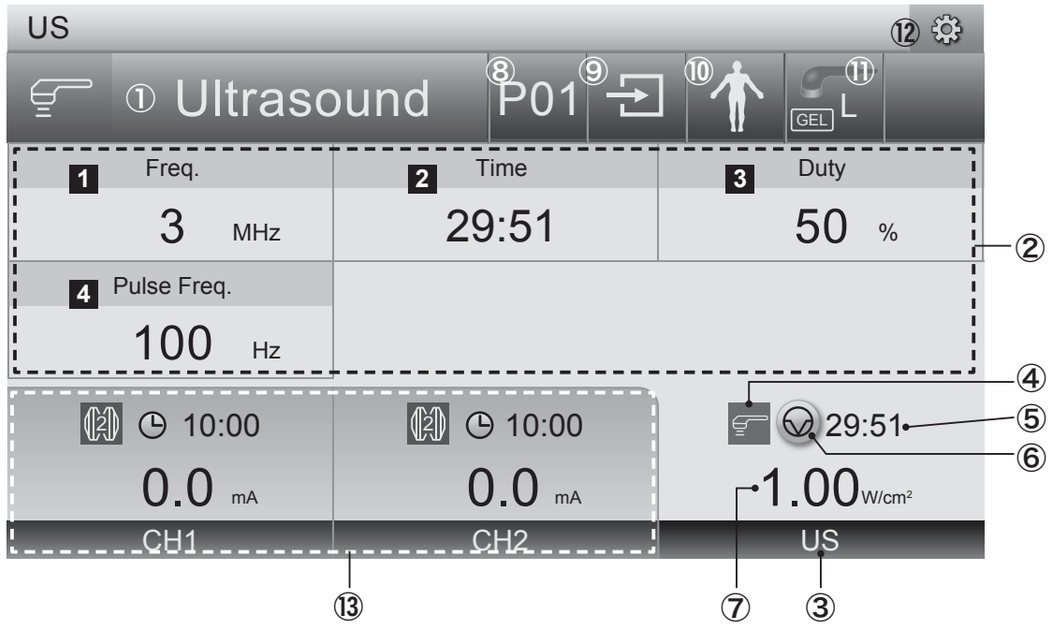
- The auto contact function adjusts output to minimum levels when the Ultrasound Probe is moved away from the treatment area (skin) but does not completely shut off output. Do not leave the Ultrasound Probe unattended while the power switch is turned on. Be sure to turn off the power switch when not performing a treatment with the Ultrasound Probe. Avoid leaving ultrasound gel on the probe head. Be sure to wipe off ultrasound gel after each use.
- To prevent burns, check the temperature of the probe head before resuming use of the Ultrasound Probe after allowing it to stand for more than 1 minute.
- If the Ultrasound Probe is left unused for 3 minutes or more, the output will shut down automatically.

**⚠CAUTION** Do not hold the head of the ultrasound probe or LED area of the probe for a long period during treatment, due to heating of these locations.



# Ultrasound Therapy Screen

## Treatment screen




**① Treatment mode selection button**

This button is used to select the treatment mode for ultrasound therapy or combination therapy.

Touch the button to display the sub-window for selecting treatment mode.

**② Parameter setting buttons**

These buttons are used to set ultrasound therapy parameters.

**1** Frequency setting button
**2** Timer setting button
**3** Duty setting button
**4** Pulse frequency setting button

**③ Ultrasound channel selection button**

This button is used to change the display to the treatment screen for ultrasound therapy and combination therapy.

The channel selection button shows the treatment mode, remaining time, pause button (during output operation only), and output level.

**④ Treatment mode icon**

This icon indicates the treatment mode.

**⑤ Remaining time display**

The remaining treatment time is shown.



**⑥ Pause button**

This button appears during output operation only. It is used to pause, resume, or stop output.

When the pause button is touched, the output pauses. When the button is touched again, the output resumes.

When the pause button is pressed and held, the output stops and the treatment ends.

**⑦ Output level display**

The output level is shown.

**⑧ Program load button**

This button is used to change the display to the load screen.

* The button is inoperable for the channel in output operation.
* For information on loading a program, see pages 96 to 97.

**⑨ Program save button**

This button is used to change the display to the save screen.

* The button is inoperable for the channel in output operation.
* For information on saving a program, see pages 94 to 95.

**⑩ Clinical program button**

This button is used to change the display to the clinical program screen.

* The button is inoperable for the channel in output operation.
* For details of clinical programs, see pages 90 to 93.

**⑪ Ultrasound Probe selection button**

The size of the selected Ultrasound Probe and type of coupler is shown.

* When both the Ultrasound Probe (L) and Ultrasound Probe (S) is connected, size selection of the probe is accessible by pressing this button.
* For details of the Ultrasound coupler settings, see page 99.

**⑫ Config button**

This button is used to change the display to the setting screen.

* This button is inoperable during output operation.
* For details of the setting screen, see pages 98 to 100.

**⑬ Electrotherapy channel selection buttons**

These buttons are used to change the display to the treatment screen for electrotherapy and measurement mode.

* For details of electrotherapy, see pages 29 to 65. For details of measurement mode, see pages 66 to 73.

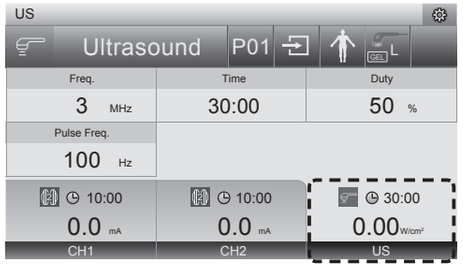
# Operation for Ultrasound Therapy

| | |
|---|---|
| **Connectable electrodes** | Ultrasound Probe (L), Ultrasound Probe (S) (optional) |
| **Usable channels** | US only |

* Make sure the Ultrasound Probe to be used is connected to the Main Unit.

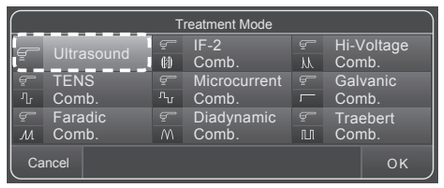
**1 Select the US channel.**

Touch the ultrasound channel selection button to display the US channel.




**2 Select the treatment mode.**

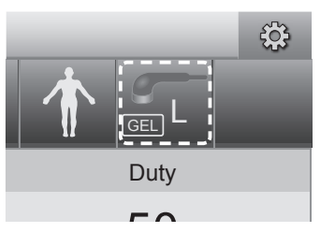
Touch the treatment mode selection button.
A sub-window opens. Select Ultrasound, then touch the OK button to close the sub-window.




**3 Select the Ultrasound Probe to be used.**

Touch the ultrasound probe selection button and select the size of the Ultrasound Probe to be used.

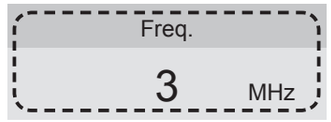
* When only one Ultrasound Probe is connected, the button cannot be selected.
* Ultrasound coupler can be set on the setting screen. For details of the Ultrasound coupler settings, see page 99.





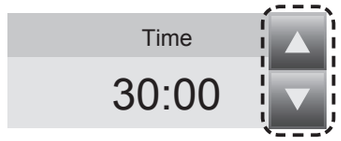

**4 Set the frequency.**

Touch the frequency setting button to set the ultrasound frequency.
Touch the button to toggle between “1 MHz” and “3 MHz.”



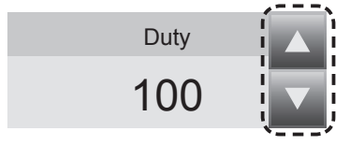

**5 Set the timer.**

When the timer setting button is touched, up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.



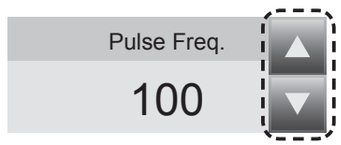

**6 Set the duty.**

When the duty setting button is touched, up/down keys will appear to the right of the button.
Set the duty by using the up/down keys.




**7 Set the pulse frequency.**

When the pulse frequency setting button is touched, up/down keys will appear to the right of the button.
Set the pulse frequency by using the up/down keys.

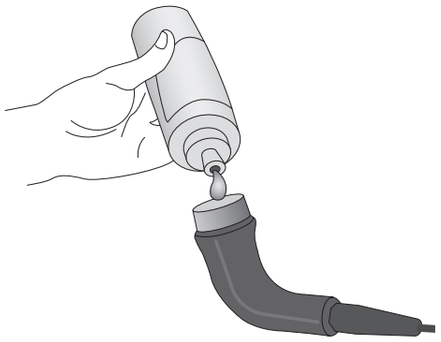



* Settings cannot be changed during output operation.
* When duty is set at 100%, settings cannot be changed.
* To save the set treatment parameters, see pages 94 to 95. To retrieve saved treatment parameters, see pages 96 to 97.
* To use a clinical program, see pages 90 to 93.

# Operation for Ultrasound Therapy

**8 Apply ultrasound gel to the probe head.**

* When using ointment as the ultrasound coupler, select OTM with the GEL/OTM setting button on the setting screen/treatment setting.
  For information on GEL/OTM settings, see page 99.



**9 Start output.**

Turn the ultrasound intensity control dial to the right to increase output and start treatment.

When output starts, the LED around the ultrasound intensity control dial will light up.


* A treatment melody will play during output operation. There will be no treatment melody if the treatment melody is set to mute. For information on setting the treatment sound, see page 98.
* The timer and output level settings can be changed during output operation.

## Pausing treatment

To pause treatment, touch the pause button. The output indication flashes and the output pauses.

To resume the treatment, touch the pause button again or increase the output level by operating the ultrasound intensity control dial. The output will be produced for the remaining treatment time.

* During the pause phase of the treatment, when the ultrasound intensity control dial is set to “0”, the treatment will end.

## To end treatment

To stop treatment, either press and hold the pause button, set the ultrasound intensity control dial to “0” or press the stop switch.

* When the stop switch is pressed, all channels in output operation stop.

**10 When the timer reaches “00:00,” the end melody plays and the output stops.**

*There will be no end melody if the sound level setting is set to Mute.
For information on setting end melody, see page 98.

**11 Turn off the power switch for the Main Unit.**

Wipe off ultrasound gel from the probe head and disconnect the Ultrasound Probe from the Main Unit.

**12 Unplug the power supply cord from the AC power outlet.**

* Store the Main Unit, accessories, etc. neatly to ensure trouble-free use during the next treatment.

**Note:**

Basis for the measurement conditions for sound pressure level is determined as the distance able to be reached by hand (about 60 cm away).

### Parameter setting range for Ultrasound mode

Ultrasound frequency: 1 MHz, 3 MHz
Duty: 5%, 10%, 20%, 30%, 40%, 50%, 100%
Pulse frequency: 16 Hz, 48 Hz, 100 Hz
Timer: 1 to 30 minutes (1-minute steps)
Intensity (max.): 2.0 W/cm$^2$ (Continuous), 3.0 W/cm$^2$ (Pulse)

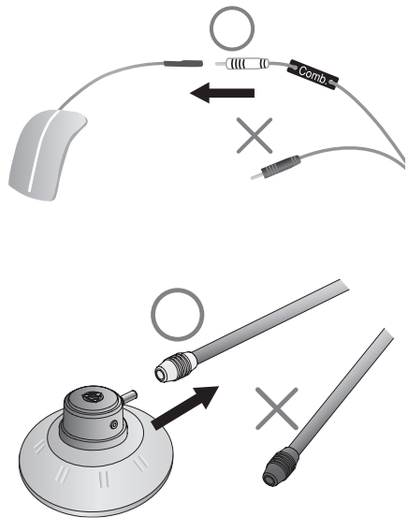
# Preparing for Combination Therapy

**1** **Make sure the power switch for the Main Unit is turned off.**

**2** **Connect the power supply cord to the power supply cord connection port on the Main Unit.**


**3** **Connect the power supply cord to an AC power outlet.**

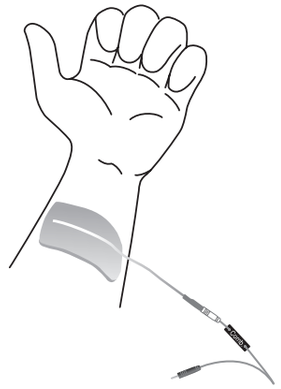
**4** **Select the electrode for electrotherapy and connect the electrode to the connection pin of the electrode cable for CH2 that has a “Comb.” tag.**




- Only rubber electrodes, self-adhesive electrodes (optional) and vacuum electrodes(optional) can be used for combination therapy.
- When using vacuum electrodes, be sure to use the gray side of the electrode hose.

* For information on using each electrode, see pages 15 to 17 and 21 to 23.

**5** **Attach the electrode securely close to the treatment area.**



**6** **Connect the electrode cable to the electrode cable connection port for CH2.**

* Only the combination of CH2 and US channels can be used in Combination mode.


**7** **Connect one of the Ultrasound Probe (L) and Ultrasound Probe (S) (optional), or both to the Ultrasound Probe connection port.**

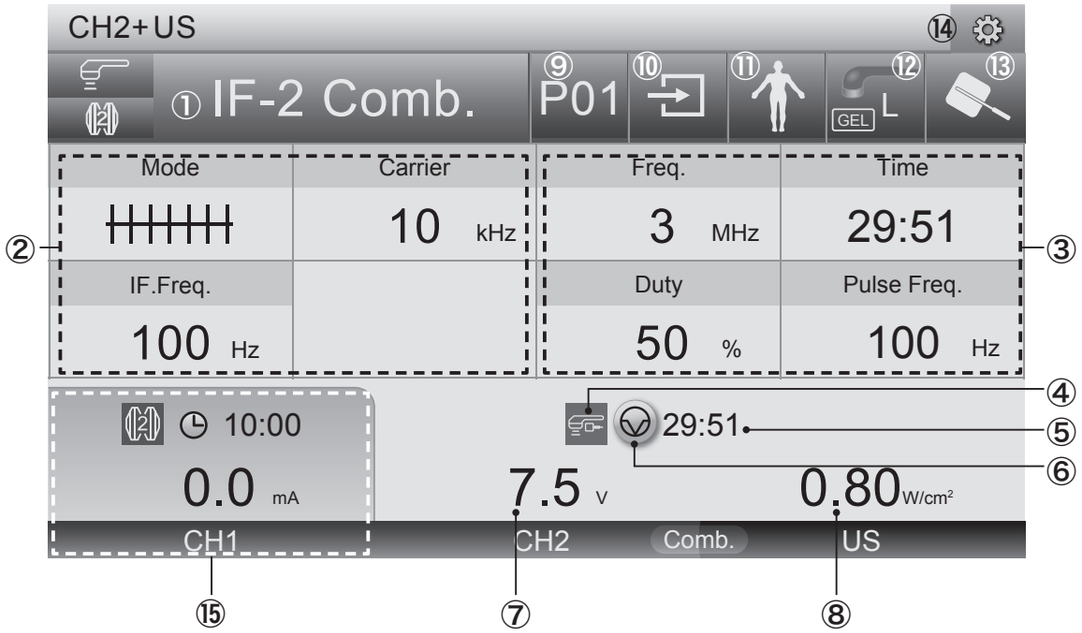
* The Ultrasound Probe cable can be connected to either connection port.
* Do not connect Ultrasound Probes of the same size to the Main Unit at the same time.

**8** **Turn on the power switch for the Main Unit.**

After the initial check is completed, the treatment screen will appear.

# Combination Therapy Screen

## Treatment screen




**① Treatment mode selection button**

This button is used to select ultrasound therapy mode or combination therapy mode.

Touch this button to display a sub-window for selecting a treatment mode.

**② Electrotherapy parameter setting area**

This area is used to set treatment parameters for electrotherapy.

The parameters that can be set depend on the treatment mode.

* For information on setting electrotherapy parameters, see pages 29 to 61.
* All output modes of IF-4, EMS, Russian, Hi-Voltage Surge mode, and TENS Surge mode cannot be set for combination therapy.

**③ Ultrasound parameter selection area**

This area is used to set treatment parameters for ultrasound therapy.

* For information on setting ultrasound therapy parameters, see pages 76 to 81.

**④ Treatment mode icon**

The treatment mode is indicated with an icon.

**⑤ Remaining time display**

The remaining treatment time is shown.



**⑥ Pause button**

This button appears only for the channel in output operation. It is used to pause, resume, or stop the output from each channel.

When the pause button is touched, the output from the corresponding channel pauses. When the button is touched again, the output resumes.

When the pause button is pressed and held, the output from the corresponding channel stops and the treatment ends.

**⑦ Electric current output level display**

The electric current output level is shown.

**⑧ Ultrasound output level display**

The ultrasound output level is shown.

**⑨ Program load button**

This button is used to change the display to the load screen.

* The button is inoperable for the channel during output operation.
* For information on loading a program, see pages 96 to 97.

**⑩ Program save button**

This button is used to change the display to the screen to save programs.

* The button is inoperable for the channel in output operation.
* For information on saving a program, see pages 94 to 95.

**⑪ Clinical program button**

This button is used to change the display to the clinical program screen.

* The button is inoperable for the channel in output operation.
* For details of clinical programs, see pages 90 to 93.

**⑫ Ultrasound Probe selection button**

The size of the selected Ultrasound Probe is shown.

**⑬ Electrode selection button**

The type of connected electrodes is indicated with an icon.

When the Vacuum Unit is connected, this button is used to switch between the electrodes connected to the Main Unit and Vacuum Electrodes.

* The button is inoperable for the channel during output operation.

**⑭ Config button**

This button is used to change the display to the setting screen.

* This button is inoperable during output operation.
* For details of setting screen, see pages 98 to 100.

**⑮ Electrotherapy channel selection button**

This button is used to change the display to the treatment screen for electrotherapy and measurement mode.

* For details of electrotherapy, see pages 29 to 65. For details of measurement mode, see pages 66 to 73.

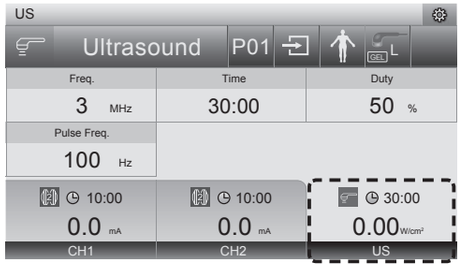
# Operation for Combination Therapy

| | |
|---|---|
| **Connectable electrodes** | Electrotherapy: Rubber Electrode, Self-adhesive Electrode (optional), Vacuum Electrode (optional)<br>Ultrasound therapy: Ultrasound Probe (L), Ultrasound Probe (S) (optional) |
| **Usable channels** | Combination of CH2 and US only |

* Make sure the electrode used is connected to the Main Unit or the Vacuum Unit (optional) and attached to the treatment area.
* Make sure the Ultrasound Probe is connected to the Main Unit.

**1 Select the US channel.**

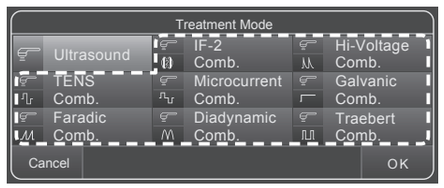
Touch the ultrasound channel selection button to display the US channel.




**2 Select the treatment mode.**

Touch the treatment mode selection button.
A sub-window opens. Select the combination therapy mode to use, then touch the OK button to close the sub-window.

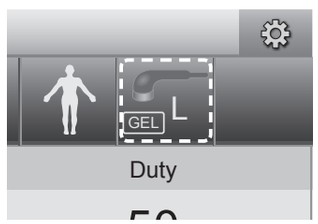
* IF-4, EMS, and Russian modes cannot be set for combination therapy.




**3 Select the Ultrasound Probe to be used.**

Touch the electrode selection button and select the size of the Ultrasound Probe to be used.

* When only one Ultrasound Probe is connected, the button cannot be selected.
* Ultrasound coupler can be set on the setting screen. For details of the ultrasound coupler settings, see page 99.

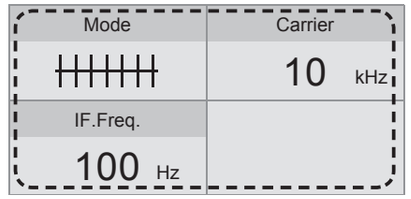





**4 Set the treatment parameters for electrotherapy.**

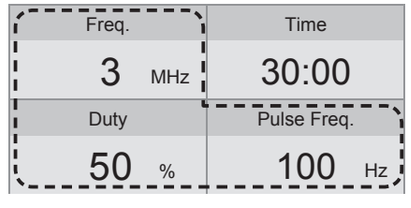
The parameters that can be set depend on the treatment mode set.

* Surge Independent, Surge Co-Cont, and Surge Alternate modes for Hi-Voltage and TENS cannot be used for combination therapy.
* For information on setting electrotherapy parameters, see pages 29 to 61.
* The set polarity applies to the Ultrasound Probe side.
* During combination therapy, the current output will automatically be set to CV mode.




**5 Set the treatment parameters for ultrasound therapy.**

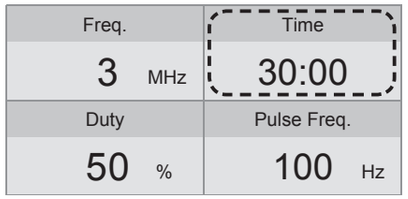
* For information on setting ultrasound therapy parameters, see pages 76 to 81.




**6 Set the timer.**

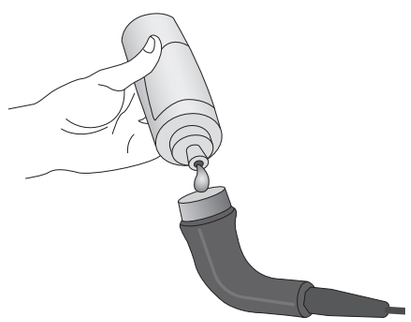
When the timer setting button is touched, up/down keys will appear to the right of the button.
Set the treatment time by using the up/down keys.

* To save the set treatment parameters, see pages 94 to 95. To retrieve saved treatment parameters, see pages 96 to 97.
* To use a clinical protocol, see pages 90 to 93.




**7 Apply ultrasound gel to the probe head.**

* When using ointment as the ultrasound coupler, select OTM with the GEL/OTM setting button on the setting screen/ treatment setting.
For information on the GEL/OTM setting, see page 99.



# Operation for Combination Therapy

**8 Start ultrasound output.**

Turn the ultrasound intensity control dial to the right to increase output and start treatment.

When output starts, the LED around the ultrasound intensity control dial will light up.

* A treatment melody will play during output operation. There will be no treatment melody if the treatment melody is set to mute. For information on setting the treatment sound, see page 98.
* The timer and output level settings can be changed during output operation.


**9 Start the output for electrotherapy.**

Turn the current intensity control dial for CH2 to the right to set the output level.

When output starts, the pause button will appear in the channel selection button for CH2. The LED around the current intensity control dial will light up.

* The settings for the timer, output level, and parameters can be changed during output operation (some parameters cannot be changed).
* Note that if the pulse duration is changed during output operation, the stimulation felt by the patient changes.


## Pausing treatment

To pause treatment, touch the pause button. The output indication flashes and the output pauses.

To resume the treatment, touch the pause button again or increase the output level by operating the ultrasound intensity control dial. The output will be produced for the remaining treatment time.

* During the pause phase of the treatment, when the ultrasound intensity control dial is set to “0”, the treatment will end.

## To end treatment

To stop treatment, either press and hold the pause button, set the ultrasound intensity control dial to “0” or press the stop switch.

* When the stop switch is pressed, all channels in output operation stop.

**10 When the timer reaches “00:00,” the end melody plays and the output stops.**

*There will be no end melody if the sound level setting is set to Mute.
For information on setting end melody, see page 98.

**11 Turn off the power switch for the Main Unit**

Wipe off ultrasound gel from the probe head and disconnect the Ultrasound Probe from the Main Unit.

**12 Unplug the power supply cord from the AC power outlet.**

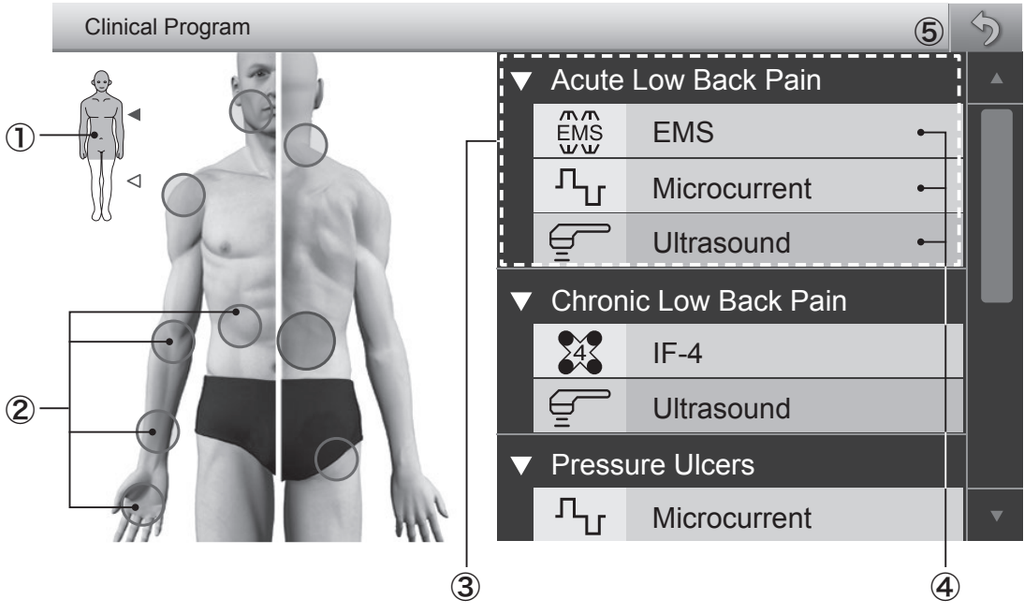
* Store the Main Unit, accessories, etc. neatly to ensure trouble-free use during the next treatment.

**⚠CAUTION**

- Avoid short circuits between the Self-adhesive Electrode and Ultrasound Probe head.
- Set the output level low at the beginning and increase gradually.
- Do not perform combination therapy in water.
- When performing combination therapy, make sure the Ultrasound Probe head is in firm contact with the skin of the treatment area. Otherwise, electric current density will increase in certain areas and may lead to electric shock or burns.
- The maximum electric current density must be kept below 2 mArms/cm² during combination therapy. Note that the electric density of the Ultrasound Probe (S) [size: 16 mm] may exceed 2 mArms/cm². Adjust the output to appropriate levels and do not allow electric current density to exceed this limit.

# Display of Clinical Program Screen

## Clinical program selection screen




**① Upper-/lower-body selection button**

This button is used to change the treatment area of the body.
Press the button to toggle between the upper body and lower body.

**② Treatment area selection buttons**

These buttons are used to select the treatment area.

**③ Clinical program list**

This area displays the names of clinical programs associated with the selected treatment area.

**④ Treatment program selection buttons**

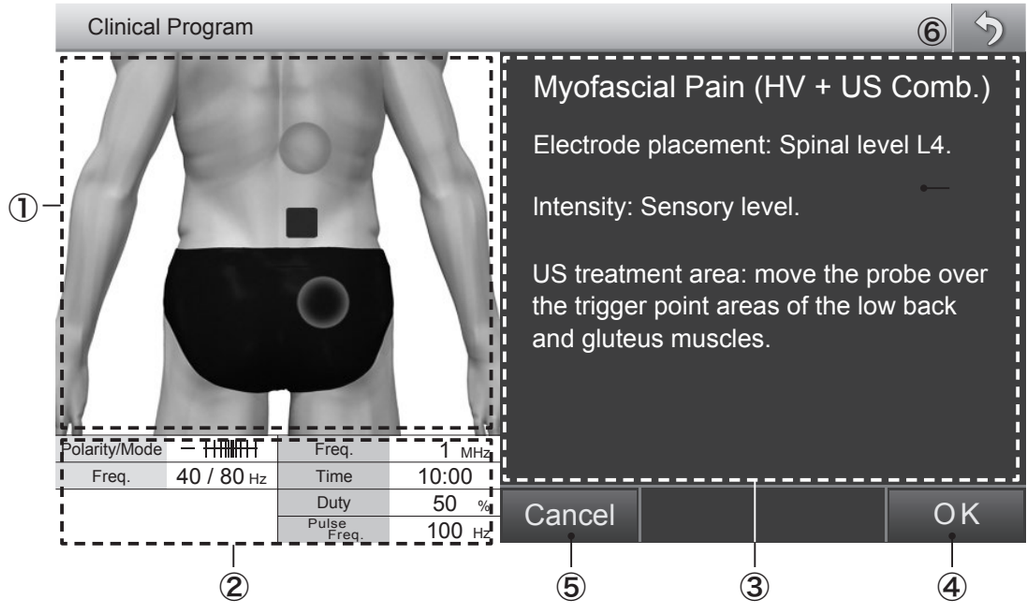
These buttons are used to select the treatment program.
Press a button to change the display to the corresponding treatment guidance screen.

**⑤ Back button**

This button returns the display to the treatment screen.



## Treatment guidance screen




**① Treatment area display**

This screen area shows treatment areas.
Blue or green square: This indicates the electrode attachment position for electrotherapy.
If the polarity is set, a “+” or “-” sign is also indicated.
When two channels are used, the squares are displayed in different colors to make it possible to distinguish channels.
Orange area: This shows the ultrasound therapy area.

**② Parameter display**

This screen area shows the parameters of the treatment program.

**③ Treatment guidance**

This screen area displays information on the treatment program.

**④ OK button**

This button is used to confirm the selection of the treatment program.
Touch this button to change the display to the treatment program.

**⑤ Cancel button**

This button returns the display to the clinical program selection screen.

**⑥ Back button**

This button returns the display to the treatment screen.

# Operation of Clinical Program

**⚠CAUTION**

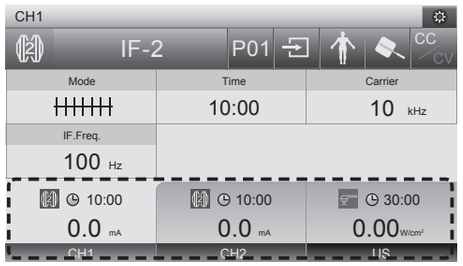
Clinical programs are reference examples and should not be considered the most suitable programs for specific indications.
When performing a treatment, qualified persons should determine the program based on the patient's condition and symptoms.

* Make sure the electrode and Ultrasound Probe used are connected to the Main Unit.
* When using a Vacuum Electrode, turn on the power switch for the Vacuum Unit and attach the Vacuum Electrode to the treatment area.

## 1 Select the channel to be used.

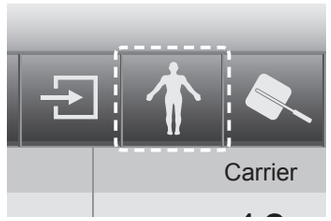
Touch the channel selection button and display the channel to be used.

* The clinical program button is inoperable for the channel in output operation. Be sure to select a channel that is not in use.



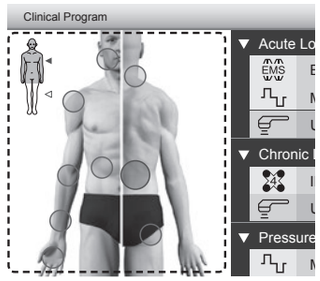

## 2 Display the clinical program screen.

Touch the clinical program button to display the clinical program selection screen.




## 3 Select the treatment area.

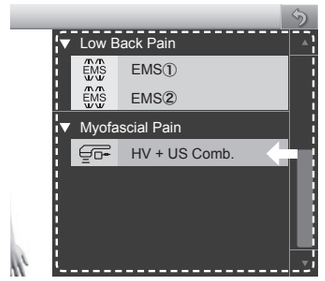
Touch the upper-/lower-body selection button and the treatment area selection button, then select the treatment area.






## 4 Select the treatment program.

After the treatment area is selected, the right half of the screen will display the names of clinical programs based on the treatment area selected.
Touch the desired treatment program from the programs available for the indications to be treated. The display changes to the treatment guidance screen.




* In the case of treatment programs that require use of a combination of channels (IF-4 or Surge Co-Cont and Alternate modes for EMS, Russian, Hi-Voltage, and TENS, or Combination), an error sound is generated if one of the combination channels is in use and the program cannot be selected.
* Treatment program can't be specified for the active channels.
* When ultrasound channel is selected and the clinical program screen is displayed, treatment program of electrotherapy can't be selected.

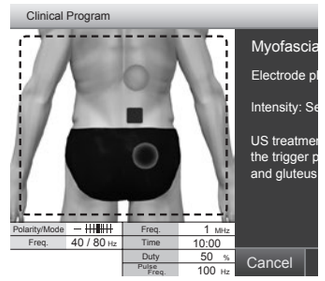
## 5 Attach the electrode to the treatment area.

Confirm the parameters and treatment guidance, then attach the electrode as indicated in the treatment area display.

* Blue or green square:
  This indicates the electrode attachment position for electrotherapy.
  If the polarity is set, a "+" or "-" sign is also indicated.
  If two channels are used, the squares are displayed in different colors to make it possible to distinguish channels.

  Orange area: This shows the ultrasound treatment area.

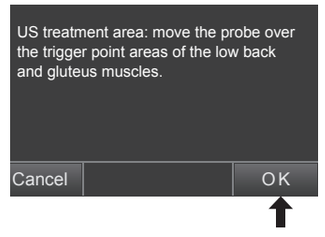
* To select a treatment program once again, touch the cancel button to return to the clinical program selection screen.




## 6 Start output.

Touch the OK button to change the display to the treatment screen. Turn the intensity control dial for the selected channel to set the output level.

* For information on operation during output operation, see the pages describing corresponding treatment modes.

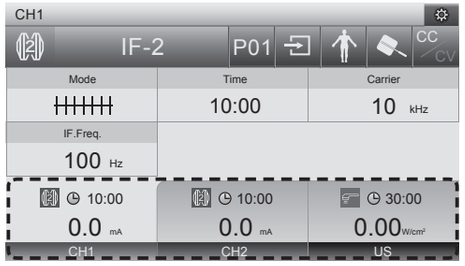


# Saving Programs

Up to 10 programs can be saved for each treatment mode
(except for I/T Measurement mode and AQ Measurement mode).

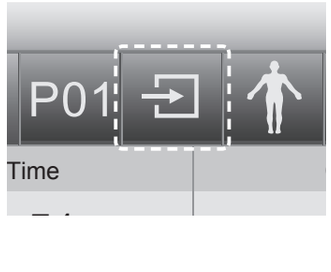
**1 Select a channel.**

Touch the channel selection button to display the channel for which the parameters to be saved are set.




**2 Display the save screen.**

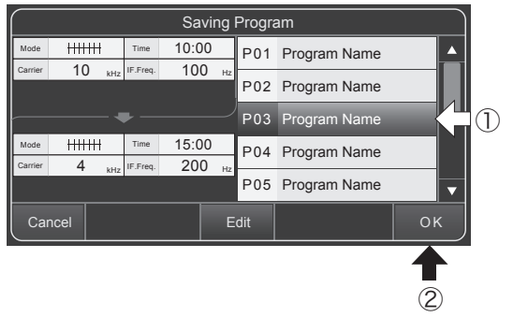
Touch the program save button to display the sub-window.




**3 Select the program number for the program to be saved.**

In the program list on the right side of the screen, touch the program number for the program to be saved.
Confirm the parameters and touch the OK button to save the program.

* The upper side of the screen on the left side shows the parameters to be saved. The lower side displays the parameters currently saved in the selected program number.
* To stop saving the program, touch the cancel button.



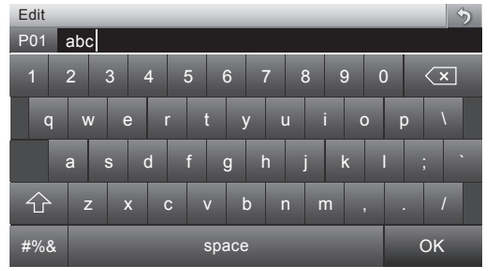



## To rename a program

Touch the edit button in the program save sub-window to change the display to the program name editing screen.

Use the keyboard to rename the program. Touch OK to confirm the change and to return to the sub-window.

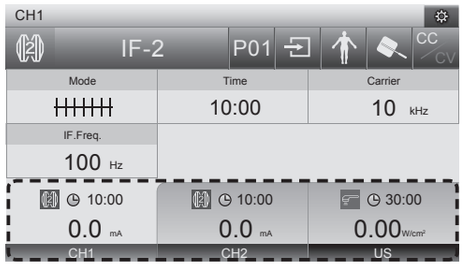
* To cancel renaming, touch the back button at the upper right corner of the screen.
* To enter a signed character, press and hold the desired key to display candidate characters.
  To cancel the input, touch ✕.




# Loading Programs

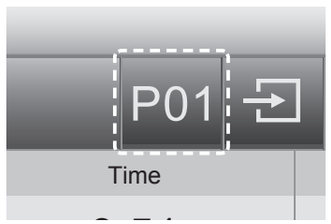
**1 Select the channel.**

Touch the channel selection button to display the channel for which a previously saved program is to be loaded.




**2 Display the loading screen.**

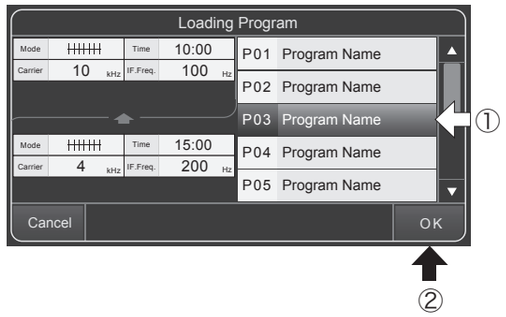
Touch the program load button to display the sub-window.




**3 Select the program number of the program to be loaded.**

In the program list, select the program number to be loaded.
Confirm the parameters and touch the OK button to load the program.

* The upper left side of the screen shows the current parameter setting and the lower side displays the newly selected parameters ready to be uploaded.
* To stop loading the program, touch the cancel button.



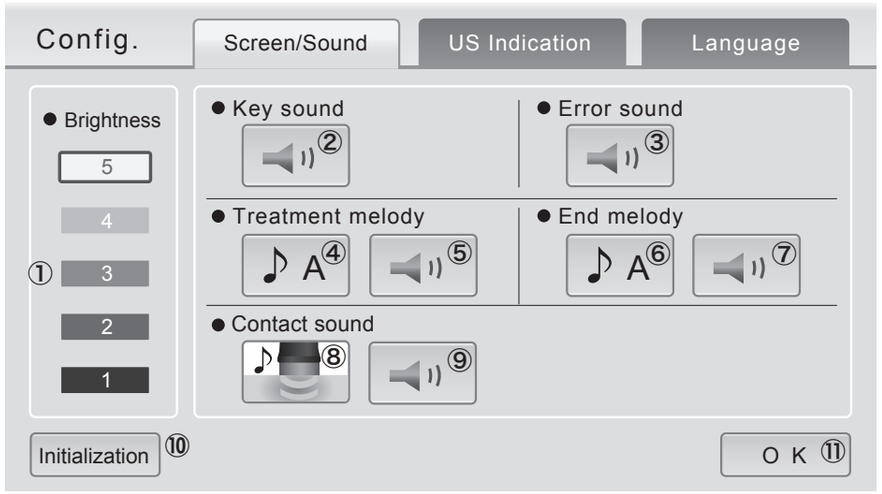

**4 The program number display.**

After the program is loaded, the display returns to the treatment screen. Confirm that the program load button indicates the program number of the loaded program.

* If any parameters in the loaded program have changed, the color of the program number display will change.


# Setting Screen

## Screen/Sound screen




**① Brightness setting buttons**
These buttons are used to set screen brightness.

**② Key sound setting button**
This button is used to set the volume of the key sound.
Touch this button to display a sound level setting sub-window.

**③ Error sound setting button**
This button is used to set the volume of the error sound.
Touch this button to display a sound level setting sub-window.

**④ Treatment melody selection button**
This button is used to select the type of melody to play during treatment.

**⑤ Treatment melody sound level setting button**
This button is used to set the volume of the treatment melody.
Touch this button to display a sound level setting sub-window.

**⑥ End melody selection button**
This button is used to select the type of melody to play at the end of treatment.

**⑦ End melody sound level setting button**
This button is used to set the volume of the end melody.
Touch this button to display a sound level setting sub-window.

**⑧ Contact sound setting button**
This button is used to set the contact sound to play during ultrasound therapy.
A sound plays when the Ultrasound Probe is in contact with the treatment area.
A sound plays when the Ultrasound Probe is not in contact with the treatment area.

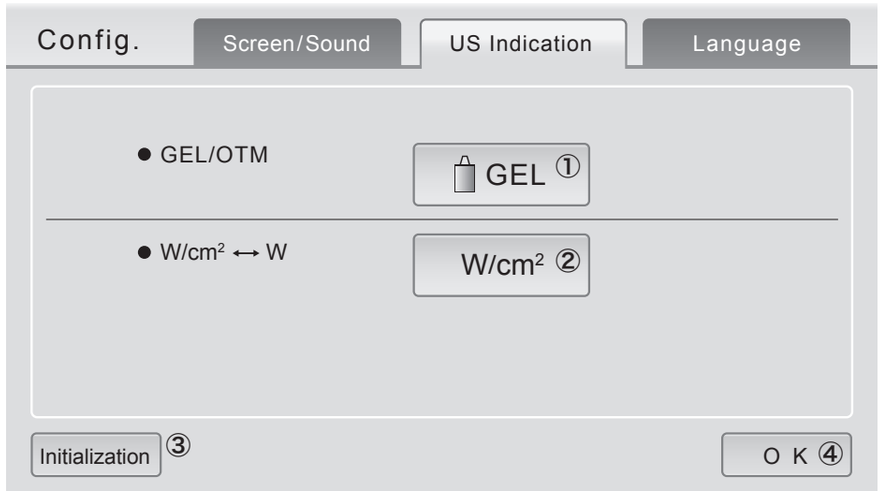
[Sound level setting sub-window]

**⑨ Contact sound level setting button**
This button is used to set the volume of the contact sound.
Touch this button to display a sound level setting sub-window.

**⑩ Initialization button**
This button returns settings and all program content to factory set conditions.

**⑪ OK button**
This button finalizes the settings and returns the display to the treatment screen.

## US Indication screen




**① GEL/OTM setting button**
This button is used to set the type of ultrasound coupler. [GEL, OTM (ointment)]

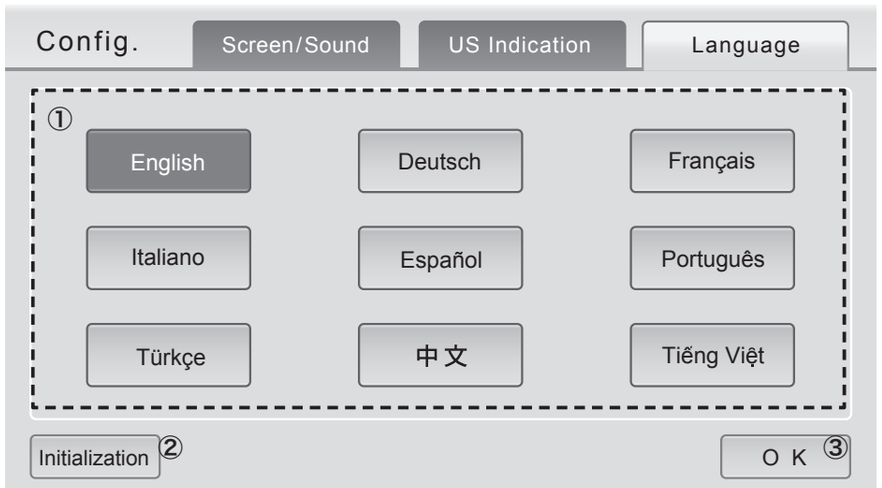
**② Unit setting button**
This button is used to set the measurement unit of ultrasound output. [W/cm², W]

**③ Initialization button**
This button returns settings and all program content to factory set conditions.

**④ OK button**
This button finalizes the settings and returns the display to the treatment screen.

# Setting Screen

## Language screen




**① Language setting button**

These buttons are used to select the language of the display.
Set the language to any of the following nine languages:
English, German, French, Italian, Spanish, Portuguese, Turkish, Vietnamese, or Chinese

**② Initialization button**

This button returns settings and all program content to factory set conditions.

**③ OK button**

This button finalizes the settings and returns the display to the treatment screen.

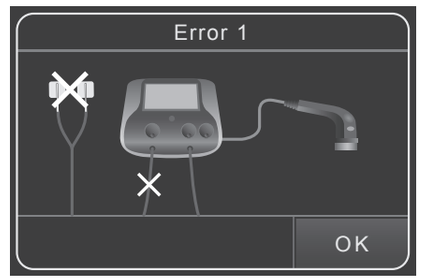


# Error Screen

**● Error 1: Open error**

This error is displayed if the electrode or Ultrasound Probe is disconnected from the Main Unit or if the electrode detaches from the treatment area.
If this error occurs, connect the electrode or Ultrasound Probe securely to the Main Unit. Also, confirm that the electrodes are attached securely to the treatment area.

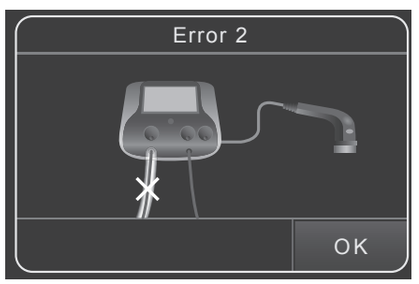
* This error will not be display when using HV/DC Probes or when in Microcurrent mode or Combination mode.
* This error will not be display when CV is set.




**● Error 2: Overcurrent error**

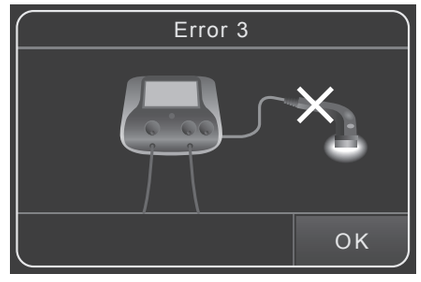
This error will be displayed when there is a decline in amount of resistance, such as when electrodes make contact with each other.
Check to make sure the electrodes are properly attached to the treatment area.

* This error will not be displayed in Microcurrent mode.




**● Error 3: Ultrasound probe temperature error**

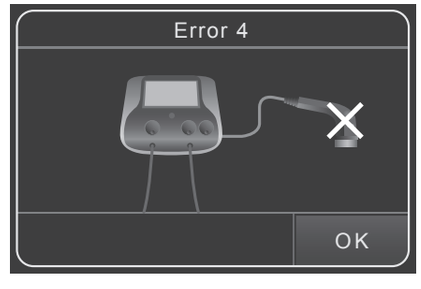
This error is displayed when the probe head becomes extremely hot.
Terminate treatment and restart when the probe head has cooled down.




**● Error 4: Probe error**

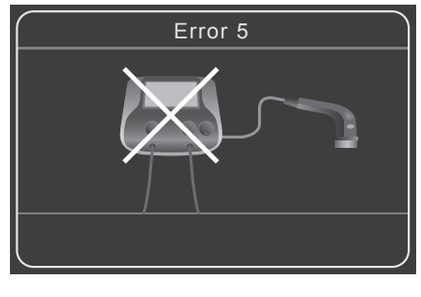
This error is displayed if a broken wire inside the Ultrasound Probe is detected.
If this error occurs, replace the Ultrasound Probe.

* When two Ultrasound Probes are connected to the Main Unit, disconnect both probes and reset the probe error.




**● Error 5: System error**

This error is displayed if the Main Unit generates any abnormality.
Turn off the Main Unit, then turn it back on.



# EMC

- Always consider EMC issues when using electronic medical equipment. Be sure to observe the EMC information provided in the accompanying document when installing and using the product.
- Do not use portable and/or mobile RF communication devices closer than 30 cm within the medical electronic device. If it is brought closer than 30 cm, the performance of the medical equipment may deteriorate.
- Cable lengths ① Ultrasound Probe (L): 2.0 m ② Ultrasound Probe (S): 2.0 m ③ Electrode Cable: 2.0 m ④ HV/DC Probe: 2.09 m ⑤ Power Supply Cord: 2.44 m
- Using accessory products other than replacement parts sold by the manufacturer may increase product emissions and decrease immunity.
- Avoid using the product when it is placed next to or on top of other equipment. If the product must be placed next to or on top of other equipment, make sure the product and other equipment function properly before use.

## Guidance and manufacturer's declaration — electromagnetic emissions

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

| Emissions test | Compliance | Electromagnetic environment — guidance |
|---|---|---|
| RF emissions<br>CISPR 11 | Group 1 | This unit 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 equipment. |
| RF emissions<br>CISPR 11 | Class B | This unit 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<br>IEC 61000-3-2 | Class A | |
| Voltage fluctuations/<br>flicker emissions<br>IEC 61000-3-3 | Complies | |



## Guidance and manufacturer's declaration — electromagnetic immunity

This unit is intended for use in the electromagnetic environment specified below. The customer or the user of this unit should assure that it is used in such an environment.
It does not harm users and patients within the electromagnetic environment shown below.
However, it is possible to affect the medical equipment (error indication, output stop etc.). If you suspect any abnormality with the equipment, please suspend use and inspect it.

| Immunity test | IEC 60601-1-2 test level | compliance level | Electromagnetic environment — guidance |
|---|---|---|---|
| Electrostatic discharge (ESD)<br>IEC 61000-4-2 | ±8 kV contact<br>±15 kV air | | 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<br>IEC 61000-4-4 | ±2 kV for power supply lines<br>±1 kV for input/output lines | ±2 kV for power supply lines | Mains power quality should be that of a typical home, commercial or hospital environment. |
| Surge<br>IEC 61000-4-5 | ±1 kV line(s) to line(s)<br>±2 kV line(s) to earth | | Mains power quality should be that of a typical home, commercial or hospital environment. |
| Voltage dips, short interruptions and voltage variations on power supply input lines<br>IEC 61000-4-11 | 0%$U_T$: for 0.5 cycle<br>0%$U_T$: for 1 cycle<br>70%$U_T$: for 25 cycles | | Mains power quality should be that of a typical home, commercial or hospital environment. If the user of this unit requires continued operation during power mains interruptions, it is recommended that this unit be powered from an uninterruptible power supply or a battery. |
| Power frequency (50/60 Hz) magnetic field<br>IEC 61000-4-8 | 30 A/m | | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical home, commercial or hospital environment. |

NOTE 1 $U_T$ is the a.c. mains voltage prior to application of the test level.
NOTE 2 To prevent electrostatic discharge, the operator must remove any static charge from his or her body before connecting or disconnecting the connector near the symbol .

# EMC

## Guidance and manufacturer's declaration — electromagnetic immunity

This unit is intended for use in the electromagnetic environment specified below. The customer or the user of this unit should assure that it is used in such an environment.
It does not harm users and patients within the electromagnetic environment shown below.
However, it is possible to affect the medical equipment (error indication, output stop etc.). If you suspect any abnormality with the equipment, please suspend use and inspect it.

| Immunity test | IEC 60601-1-2 test level | compliance level | Electromagnetic environment — guidance |
|---|---|---|---|
| Conducted RF<br>IEC 61000-4-6 | 3 Vrms<br>150 kHz<br>~80 MHz<br><br>6 Vrms<br>ISM and amateur radio bands between 150 kHz ~80 MHz | 3 Vrms<br><br>6 Vrms | Portable and mobile RF communications equipment should be used no closer to any part of this unit. including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.<br>Recommended separation distance<br>Conducted RF d = 1.2 $\sqrt{P}$ 150 kHz to 80 MHz<br>d = 0.58 $\sqrt{P}$ 150 kHz to 80 MHz<br>(ISM and amateur radio bands)<br>Radiated RF d = 0.35 $\sqrt{P}$ 80 MHz to 800 MHz<br>d = 0.7 $\sqrt{P}$ 800 MHz to 2.7 GHz<br>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).<br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b]<br>Interference may occur in the vicinity of equipment marked with the following symbol: |
| Radiated RF<br>IEC 61000-4-3 | 10 V/m<br>80 MHz<br>~2.7 GHz<br><br>IEC60601 -1-2: 2014 Table 9 | 10 V/m | |

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which this unit is used exceeds the applicable RF compliance level above, this unit should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating this unit.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.



## Recommended separation distances between portable and mobile RF communications equipment and this unit

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

| Rated maximum output power of transmitter W | Separation distance according to frequency of transmitter m | | | |
|---|---|---|---|---|
| | 150 kHz to 80 MHz | | 80 MHz to 800 MHz | 800 MHz to 2.7 GHz |
| | d = 1.2 $\sqrt{P}$ | d = 0.58 $\sqrt{P}$ | d = 0.35 $\sqrt{P}$ | d = 0.7 $\sqrt{P}$ |
| 0.01 | 0.12 | 0.06 | 0.04 | 0.07 |
| 0.1 | 0.38 | 0.18 | 0.11 | 0.22 |
| 1 | 1.2 | 0.58 | 0.35 | 0.7 |
| 10 | 3.8 | 1.8 | 1.1 | 2.2 |
| 100 | 12 | 5.8 | 3.5 | 7.0 |

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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