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User Manual

phyaction c

User Manual Phyaction C

Device for electrotherapy, ultrasound therapy and combined therapy

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Abbreviations

AQ	Accomodation Quotient
CC	Constant Current
CO	Combination therapy
CP	Courte Période
CV	Constant Voltage
DF	Diphasé Fixe
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
EL	Electrode
ET	Electrotherapy
HAC	Hospital Antiseptic Concentrate
LP	Longue Période
MF	Medium Frequency: with unidirectional and interferential currents Monophasé Fixe: with diadynamic currents
MTP	Myofascial Trigger Point
NMES	Neuro Muscular Electro Stimulation
TENS	Transcutaneous Electrical Nerve Stimulation
US	Ultrasound
VAS	Visual Analogue Scale

Symbols on the equipment


Read the manual.

Symbols in the manual


Warning or important information.

TABLE OF CONTENTS

1 SAFETY

1.1 Purpose

The Phyaction C is intended solely for medical applications. You can use the Phyaction C for electrotherapy, ultrasoundtherapy and combined therapy. The device is suited for continuous use.

1.2 Safety instructions

1.2.1 General

- Only qualified people who are trained in the application of the therapies may use the appliance.
- Only a technician authorised by GymnaUniphy N.V. may open the equipment or the accessories.
- Follow the instructions and directions in these user instructions.
- Place the equipment on a horizontal and stable base.
- Keep the ventilation openings at the bottom and rear of the equipment free.
- Do not place any objects on the equipment.
- Do not place the equipment in the sun or above a heat source.
- Do not use the equipment in a damp area.
- Do not let any liquid flow into the equipment.
- Do not disinfect or sterilise the equipment. Clean the equipment with a dry or moistened cloth. *See §5*.
- Only treat patients with electrical implants (pacemaker) after obtaining medical advice.
- The 'Directive on Medical Devices' from the European Commission (93/42/EEG) requires that safe devices are used. It is recommended to perform a yearly technical safety inspection. *See §5.1.2*.
- For optimum treatment, a patient investigation must first be performed. On the basis of the findings of the investigation, a treatment plan with objectives will be formulated. Follow the treatment plan during the therapy. This will limit possible risks, related to the treatment, to a minimum.
- Always keep these user instructions with the equipment.

1.2.2 Electrical safety

- Only use the equipment in an area with facilities that meet the applicable legal regulations.
- Connect the equipment to an outlet with a protective earth terminal. The outlet must meet the locally applicable requirements for medical areas.

1.2.3 Prevention of explosion

- Do not use the equipment in an area where combustible gases or vapours are present.
- Switch off the equipment when it is not used.

1.2.4 Electro Magnetic Compatibility

- Medical electrical equipment requires special precautions for Electro Magnetic Compatibility (EMC). Follow the instructions for the installation of the equipment. *See §2*
- Do not use mobile telephones or other radio, shortwave, or microwave equipment in the vicinity of the equipment. This kind of equipment can cause disturbances.
- Only use the accompanying accessories that are supplied by GymnaUniphy. *See §7.6, §7.7 and §7.8.*
  Other accessories can lead to an increased emission or a reduced immunity.

1.2.5 Electrotherapy

- Do not use the equipment simultaneously with high frequency surgical equipment. This combination can cause burning of the skin under the electrodes.
- Do not use adhesive electrodes with currents that have a galvanic component, such as galvanic, diadynamic, MF rectangular, pulsed rectangular and triangular currents. With these currents, etching of the skin can occur.
- Check the electrode cables and the electrodes at least once a month. Check whether the insulation is still intact. *See §5.1.*
- The safety standards for electrical stimulation advise not to exceed the current density of 2.0 mA_{rms}/cm^2.
  However, with iontophoresis treatments, we advise a maximum current density of 0.25 mÂ/cm^2, because of using the MF rectangular current. Exceeding this value can result in skin irritation and burns.
- Always use sterilised gauze with iontophoresis treatments.

1.2.6 Ultrasound therapy

- Move the US head evenly over the skin during the treatment. This prevents internal burns.
- The US treatment heads are exchangeable. The device detects the characteristics and supplies the right power at the right frequency.
- Handle the US heads carefully. With rough handling, the characteristics can change. Test the US head if it falls on the ground or knocks against something. *See §5.1.1.*
- Check the US head at least once a month. During the check, look for dents, cracks and other damage that could allow liquids to ingress. Check whether the insulation of the cable is still intact. Check whether all pins are present and straight in the connectors. Replace the US head if the head, the cable or the connector is damaged. *See §5.1.*

1.3 Medical Devices Directive

The device complies with the essential requirements of the Medical Device Directive of the European Committee (93/42/EEC) as most recently changed.

1.4 Liability

The manufacturer cannot be held liable for injury to the therapist, the patient or third parties, or for damage to or by the equipment used, if for example:

- an incorrect diagnosis is made;
- the equipment or the accessories are used incorrectly;
- the user instructions are wrongly interpreted or ignored;
- the equipment is badly maintained;
- maintenance or repairs are performed by people or organisations that are not authorised to do so by GymnaUniphy.

Neither the manufacturer nor the local GymnaUniphy dealer can be held liable, in any way whatsoever, for the transfer of infections via the vaginal, anal and rectal probes and/or other accessories.

2 INSTALLATION

2.1 Receipt

1. Check whether the equipment has been damaged during transport.
2. Check whether the accessories are intact and complete. *See §7.6, §7.7 and §7.8.*
   - Inform your supplier of any damage or defects by no later than within 3 working days after receipt. Report the damage by telephone, fax, e-mail or letter.
   - Do not use the equipment if it is damaged or defective.

2.2 Placing and connection

1. Place the equipment on a horizontal and stable base.
   - Keep the ventilation openings at the bottom and rear of the equipment free.
   - Do not place the equipment in the sun or above a heat source.
   - Do not use the equipment in a wet area.
2. Check whether the mains voltage that is stated on the rear of the equipment corresponds with the voltage of your mains supply. The equipment is suited for a nominal mains voltage from 100 V to 240 VAC / 50-60 Hz.
3. Connect the device to an outlet with protective earth terminal.

2.3 Performing the functional test

1. Switch the equipment on with the switch at the rear of the equipment.
2. When the equipment is switched on, it automatically performs a test. Check whether the indicator lamps next to Y_A and Y_B light briefly during the test.
3. If the lamps do not light up: *See §6.*

2.4 Setting contrast, language and stand-by time

1. Press ▣. The **System settings** menu appears. *See §4.10.*
2. Select **Contrast** with the corresponding blue key ●, 1st key in the row.
3. If necessary, change the contrast with △ and ▽.
4. Select **Language** with the corresponding blue key ●.
5. If necessary, change the language with △ and ▽.
6. Select **Stand-by time** with the corresponding blue key ●.
7. If necessary, change the stand-by time with △ and ▽.
8. Press guide to return to the **Guide** menu.

2.5 Use in combination with an other device

The Phyaction C can be used in combination with the Phyaction V. For information about the use of the Phyaction C with the Phyaction V, refer to the Phyaction V user manual.

2.6 Transport and storage

Take account of the following matters if the equipment has to be transported or stored:

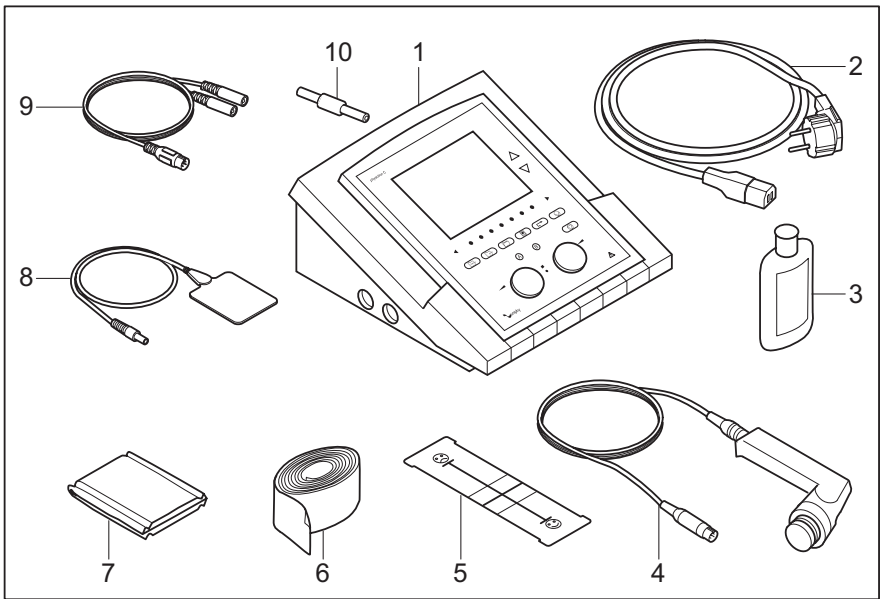
- Transport or store the equipment in the original packaging.
- The maximum period for transport or storage is: 15 weeks.
- Temperature: -20 °C to +60 °C.
- Relative humidity: 10% to 100%.
- Atmospheric pressure: 200 hPa to 1060 hPa.

2.7 Reselling

This medical equipment must be traceable. The equipment, the US head and some other accessories have a unique serial number. Provide the dealer with the name and address of the new owner.

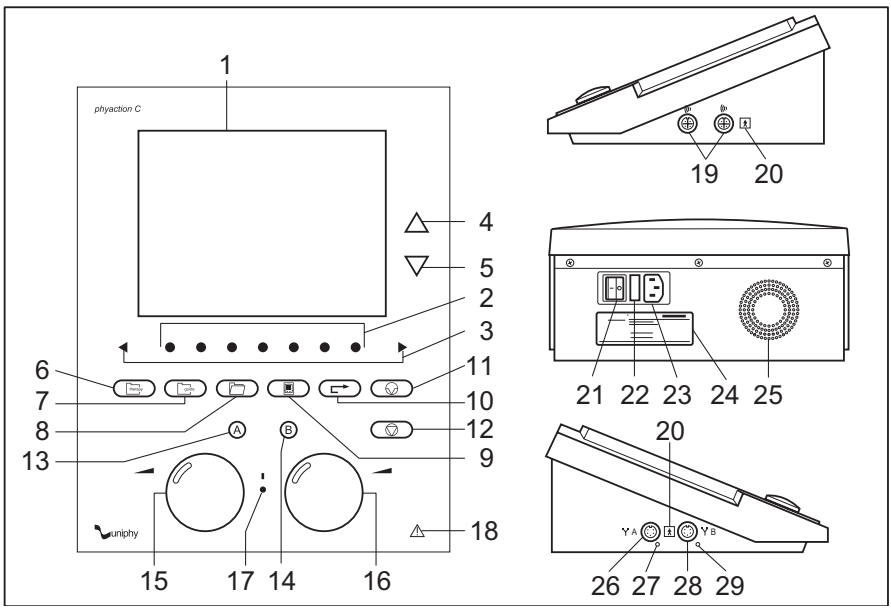
3 DESCRIPTION OF THE EQUIPMENT

3.1 Phyaction C and standard accessories



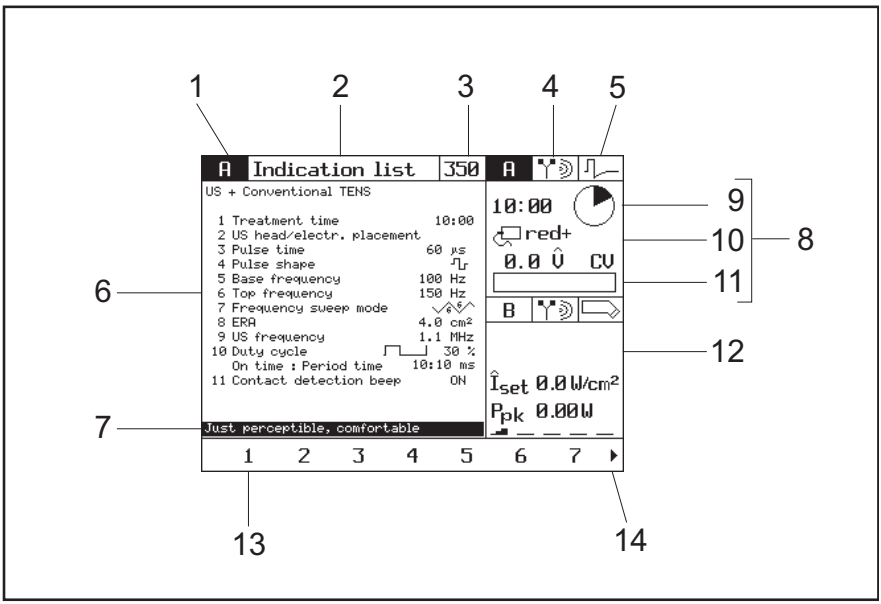
1. Phyaction C. *See §3.2.*
2. Power cord
3. Contact gel
4. US head
5. VAS score card
6. Elastic fixation straps (4 pieces)
7. EL sponges for rubber electrode (4 pieces)
8. Rubber electrodes (4 pieces)
9. Two-ply electrode cable (2 pieces)
10. Test connector

3.2 Components of Phyaction C



1. Display. *See §3.3*.
2. Select menu option or parameter
3. Scroll through the list/numbers
4. Increase or set a parameter
5. Decrease or set a parameter
6. Therapy menu
7. Guide menu
8. Memory menu
9. System settings menu
10. Back
11. Pause
12. Stop
13. Select channel A
14. Select channel B
15. Intensity of channel A
16. Intensity of channel B
17. Indicator lamp device on/off
18. Indication: Read manual
19. Connectors for US head
20. Indication: Floating patient circuit
21. On/off switch
22. Fuse holder
23. Connection to mains supply
24. Type plate
25. Ventilation opening
26. Connector for electrotherapy, channel A
27. Indicator lamp for channel A
28. Connector for electrotherapy, channel B
29. Indicator lamp for channel B

3.3 Display



1. Selected channel
2. Title of the screen
3. Program number
4. Therapy
5. Current shape
6. Parameters of the selected channel
7. Explanation or recommendation
8. Screen for channel A (here, electrotherapy). *See §4.5.5.*
9. Remaining treatment time
10. Polarity
11. Set intensity
12. Screen for channel B (here, ultrasound therapy). *See §4.6.3.*
13. Numbers, selection with the blue keys ● below display.
14. Scroll through numbers with the blue keys ◀ and ▶.

3.4 Display symbols

3.4.1 General

	Electrotherapy	**SEQ**	Sequential current shapes
	Ultrasound therapy	**A**	Channel A
	Combination therapy	**B**	Channel B
	Treatment time	**A + B**	Channel A and B simultaneously
0:00	Treatment completed	**A ⇄ B**	Alternating channels

3.4.2 Current shape groups

	Unidirectional currents		2-pole medium frequency
	Iontophoresis		Dipole vector field
	Diadynamic		Isoplanar vector field
	TENS currents		Diagnostic programs
	NMES currents		

3.5 Symbols for current shapes

	Medium frequency unidirectional current		Rectangular surge current
	Unidirectional rectangular current		Triangular surge current
	Rectangular pulse		Biphasic surge current
	Unidirectional triangular current		Intrapulse interval surge current
	Triangular pulse		2-pole medium frequency surge current

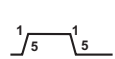
	Conventional TENS		Russian stimulation
	Low frequency TENS		2-pole medium frequency
	Random TENS		Dipole vector field
	Burst TENS		Isoplanar vector field
CP	CP (diadynamic)		S/d curve rectangular
DF	DF (diadynamic)		S/d curve triangular
LP	LP (diadynamic)		S/d curve rectangular + triangular
MF	MF (diadynamic)		Rheobase and chronaxie
			Rheobase and AQ

3.6 Parameter symbols

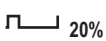
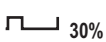
3.6.1 Electrotherapy

Red+ **Red-**	Polarity indication	**CC**	Constant Current
+ ⇆ -	Alternating polarity	**CV**	Constant Voltage
	Biphasic pulse shape, symmetrical	**mÂ**	mA peak
	Biphasic pulse shape, asymmetrical	**V̂**	Volt peak

Frequency sweep mode

	12s/12s		1s/5s -1s/5s
	6s/6s		1s/1s

3.6.2 Ultrasound therapy

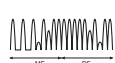
	US duty cycle 10%	**1:10 ms**	US on : period time 10%
	US duty cycle 20%	**2:10 ms**	US on : period time 20%
	US duty cycle 30%	**3:10 ms**	US on : period time 30%
	US duty cycle 40%	**4:10 ms**	US on : period time 40%
	US duty cycle 50%	**5:10 ms**	US on : period time 50%
	US duty cycle 100%	**10:10 ms**	US on : period time 100%
$\hat{I}_{set}$	Set US intensity		US head, ERA 4 cm^2
P_{pk}	Peak US output power		US head, ERA 1 cm^2
W/cm^2	Unit of the set US intensity		

3.7 Current shapes

3.7.1 Unidirectional currents

	Rectangular pulse current		Triangular pulse current
	2-5 current (UltraReiz)		Medium frequency rectangular current

3.7.2 Diadynamic currents

	MF		CP
	DF		LP

3.7.3 Interferential currents


Dipole vector field


2-pole medium frequency


Isoplanar vector field

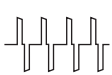
3.7.4 TENS currents


Conventional TENS, asymmetrical


Conventional TENS, alternating symmetrical


Conventional TENS, alternating asymmetrical

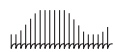

TENS burst


Conventional TENS, symmetrical


TENS burst, alternating

3.7.5 NMES currents


Rectangular surge current


Biphasic surge current


Triangular surge current


Intrapulse interval surge current


Medium frequency surge current


Russian stimulation


Isoplanar vector field surge

4 OPERATION

4.1 Therapy selection

You can select a therapy with different keys:

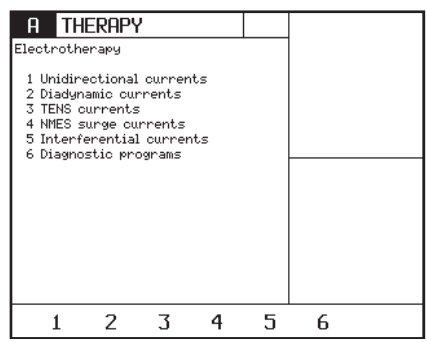
- **Therapy Menu** [therapy]: Select a therapy method. *See §4.2.*
- **Guide Menu** [guide]: Gives access to:
  - **Objectives**: Select a therapy on the basis of an objective. *See §4.3.1.*
  - **Indication list**: Select a therapy on the basis of a medical indication. *See §4.3.2.*
  - **Program number**: Select a certain program number. *See §4.3.3.*
  - **Diagnostic programs**: Perform a diagnosis, for example to determine the rheobase and the chronaxie, or an S/d curve. *See §4.3.4.*
  - **Contra indications**: Display an overview with contra indications for the different therapies. *See §4.3.5.*
- **Memory Menu** [folder]: Select a saved therapy. *See §4.9.*

Besides this, you can change the system settings. *See §4.10.*

4.2 Selection by the Therapy menu

4.2.1 Electrotherapy

1. Press [therapy] to go to the Therapy menu.
2. Select Electrotherapy with the corresponding blue key ●.
3. Select the current shape group with ●.
4. Select the current shape with ●.



4.2.2 Ultrasound therapy

1. Press [therapy].
2. Select Ultrasound therapy. The Ultrasound screen appears.

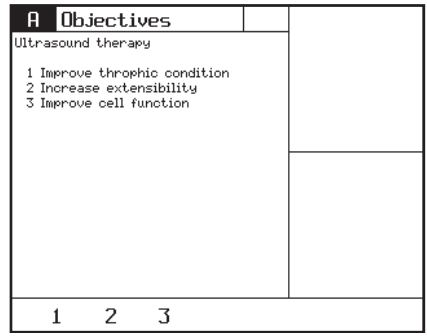
4.2.3 Combination therapy

1. Press [therapy].
2. Select Combination therapy.
3. Select the current shape. *See §4.7.1.*

4.3 Selection by the Guide menu

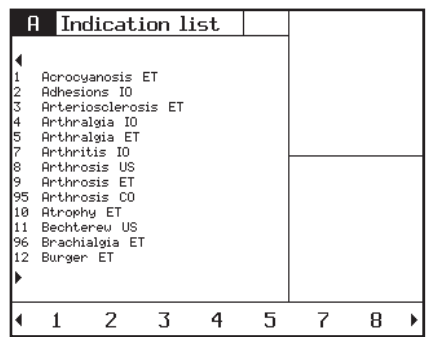
4.3.1 Therapy selection via objectives

1. Press guide to go to the Guide menu.
2. Select **Objectives**.
3. Select **Electrotherapy**, **ET iontophoresis**, **Ultrasound therapy** or **Phonophoresis**.
4. Follow the on screen options to select the desired treatment.



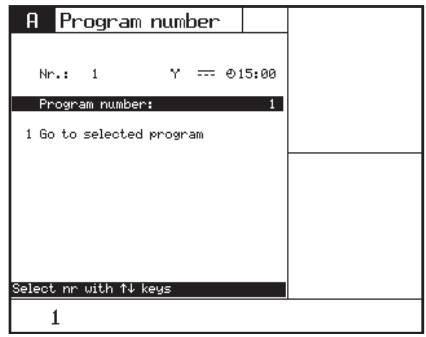
4.3.2 Therapy selection via indication list

1. Press guide.
2. Select **Indication list**.
3. Use ◀ and ▶ to select the following indications. *See §9.1.4.*
4. Select the desired indication.
   - ET: Electrotherapy
   - US: Ultrasound therapy
   - CO: Combination therapy
   - IO: Iontophoresis
5. With selection via indication list you can view the placement.
   1. Select **Electrode placement** (ET, CO), **US head placement** (US, CO) or **Treatment method** (IO).
   2. If necessary, select the location. You get an advice to place the electrodes and US head.
   3. If available, select a number for the precise anatomic location. *See §8.3.*



4.3.3 Program number selection

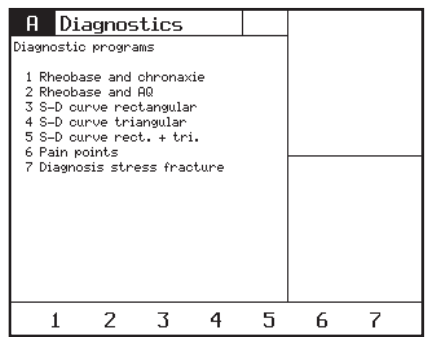
1. Press guide.
2. Select Program number.
3. Select the desired program with △ or ▽. *See §9.1.*
4. Select 1.



4.3.4 Diagnostic program selection

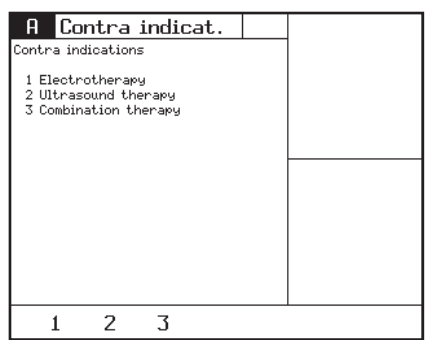
With the diagnostic programs, you can localise and treat pain points, and look for stress fractures, etc.

1. Press guide.
2. Select Diagnostic programs.
3. Select the desired diagnosis. *See §4.8.*



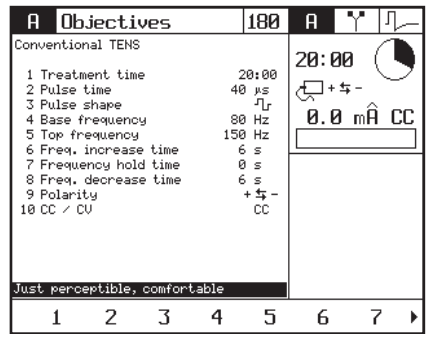
4.3.5 Contra indication selection

1. Press guide.
2. Select Contra indications.
3. Select the therapy for which you want to see the contra indications.
4. Scroll through the text with ◀ or ▶.



4.4 Performing therapy

4.4.1 Set and start therapy



1. Press guide to go to the Guide menu.
2. Select the desired menu item until the treatment appears.
3. Select the desired parameters. You can only change the pre-numbered parameters.
4. Set the **Treatment time** as follows: Select treatment time once to set the minutes, select treatment time twice to set the seconds.
5. Change the value of the parameter with △ and ▽. The setting range of the parameter is shown at the bottom of the screen. You can change the parameter as long as the parameter has a black background.
6. Rotate intensity knob A or B to start the treatment and to set the desired intensity. The set intensity is displayed in the screen.

4.4.2 Set channels A and B

The Phyaction C has two separated electrotherapy channels A and B. The only restriction is that both are in the CC mode or the CV mode.

The channels A and B can be used independently. You can treat two different indications simultaneously with two different therapies.

1. Press . The **System setting** menu appears. *See §4.10.*
2. If necessary, change the parameter **Copy channel parameters** to **OFF**.
3. The selected channel has a black background. If desired, press Ⓐ or Ⓑ to change the first channel.
4. Press therapy, guide or . Select the desired treatment. *See §4.1.*
5. Set the parameters for the first channel. *See §4.4.1.*
6. Press Ⓐ or Ⓑ to select the other channel.
7. Select the desired treatment for second channel. *See §4.1.*
8. Set the parameters for the second channel. *See §4.4.1.*

Both channels are selected simultaneously and automatically in case of:

- 4-pole current shapes
- Alternating channels choice with NMES currents (expert mode)
- Combination therapy

Copy channel

On the second channel, you can set the same parameters for electrotherapy as for the first set channel.

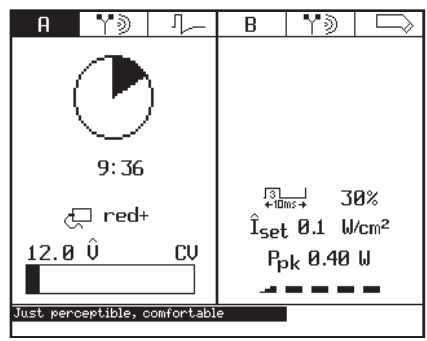
1. Press . The **System setting** menu appears. *See §4.10.*
2. If necessary, change the parameter **Copy channel parameters** to **ON**.
3. Press , or . Select the desired treatment. *See §4.1.*
4. Set the parameters for the first channel. *See §4.4.1.*
5. Press Ⓐ or Ⓑ to select the other channel. The treatment including the settings are copied to the other channel.
6. If desired you can change the parameters or the treatment of the selected channel.

Clear channel

1. Make sure that the intensity is set to zero.
2. Press Ⓐ or Ⓑ to select the channel that you want to clear.
3. Press . The channel is cleared.

4.4.3 Opening the intensity screen

1. Set the treatment. *See §4.4.1.*
2. Rotate intensity knob A or B to start the treatment.
3. Press Ⓐ or Ⓑ that corresponds to the selected channel. The intensity screen appears. The left part of the screen shows channel A. The right part of the screen shows channel B.
4. Press to return to the setting menu.



4.4.4 Temporary interruption of treatment

1. If the other channel has to pause: Select this channel with Ⓐ or Ⓑ.
2. Press during the treatment. The treatment time of the selected channel is stopped. **Pause** appears on the screen. The parameter settings are retained.
3. Press to restart the treatment. The intensity now increases gradually to the set level and the treatment time continues again.

4.4.5 Immediately stop treatment

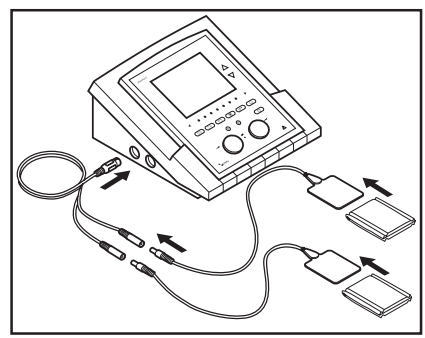
1. Press . All active treatments are stopped immediately. **Stop** appears on the screen. The parameter settings are retained.
2. Set the intensity of the channel again to continue the treatment.

4.5 Electrotherapy

4.5.1 Performing electrotherapy with electrodes

1. Select the desired electrotherapy program.
2. Place the electrodes. *See page 26: Placing rubber electrodes* and page *27: Placing the adhesive electrodes*. With Indication list treatments, the Electrode placement parameter becomes available.
3. Rotate intensity knob A or B to start the electrotherapy and to set the desired intensity. See *§4.4.1*.
4. Check the patient's reaction. Repeat this check regularly during the treatment.
5. The equipment stops the treatment and indicates that the treatment is completed. Remove the electrodes.

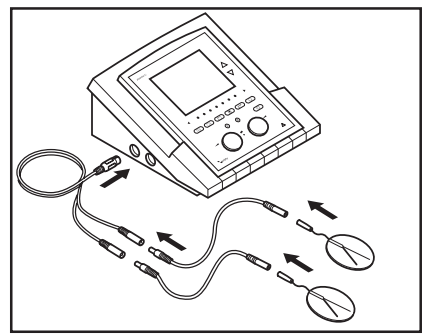
Placing rubber electrodes



1. Moisten two EL sponges.
2. Slide a rubber electrode into each sponge.
3. Place the sponges on the part of the body that must be treated.
4. Fasten the sponges to the part of the body with the elastic fixation straps.
5. Connect the rubber electrode with the red connector to the red connector of the two-ply electrode cable.
6. Connect the rubber electrode with the black connector to the black connector of the two-ply electrode cable.
7. Connect the two-ply cable to connector Y$_A$ or Y$_B$ of the Phyaction C.

Placing the adhesive electrodes

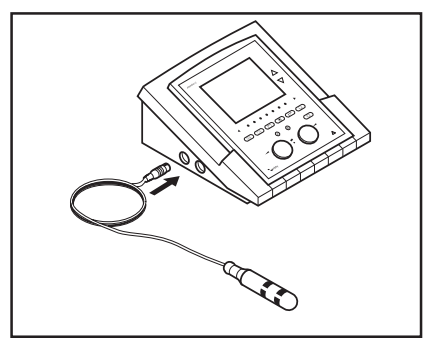
Do not use adhesive electrodes with currents that have a galvanic component, such as galvanic, diadynamic, MF rectangular, pulsed rectangular and triangular currents. These currents can cause skin etching.



1. If possible, disinfect the parts of the body where the adhesive electrodes are to be placed.
2. Place the electrodes on the part of the body that must be treated.
3. Connect the connectors of the adhesive electrodes to the adapter cables.
4. Connect the adapter cables to the two-ply electrode cable.
5. Connect the two-ply electrode cable to connector Y_A or Y_B of the Phyaction C.

4.5.2 Perform electrotherapy with vaginal, anal or rectal stimulation probe

- Considering the very personal and intimate character of these treatments, a probe may only be used for one patient.
- Never disinfect the probes in an autoclave. The probes can be damaged by the extreme temperature.



1. Clean the probe carefully with soap and water.
2. Select the desired electrotherapy program.

3. Connect the probe to the Phyaction C. The vaginal and anal probes are immediately detected by the equipment. To prevent unpleasant stimulations, you can only set alternating currents with a Constant Voltage (CV) setting, such as TENS, NMES, and 2-pole interferential currents.

The rectal stimulation probe is not detected by the equipment. With a rectal stimulation probe, select only alternating currents with a Constant Voltage (CV) setting, such as TENS, NMES, and 2-pole interferential currents. This prevents skin etching and unpleasant stimulations.

4. Apply an antiseptic lubricant to the probe.
5. Place the probe.
6. Rotate intensity knob A or B to start the treatment and to set the desired intensity.
7. Check the patient's reaction. Repeat this check regularly during the treatment.
8. The equipment stops the treatment and indicates that the treatment is completed. Remove the stimulation probe.
9. Clean the stimulation probe. See *§5.2.4*.

4.5.3 Electrotherapy with sequential steps

A treatment with sequential steps consists of a succession of the same current form, but additional with different parameter settings. When the treatment is active, you can set the time and the stimulation beep between steps.

Advantages

Electrotherapy with sequential steps has several advantages:

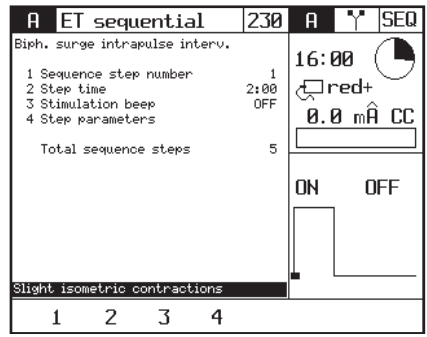
- In one electrotherapy, you can realise several objectives.
- In a treatment with one objective, you can place different accents in the objective.
- You can distinguish between different phases in a treatment, for example preparation, core effect and cooling.

Set new intensity between sequential steps

The intensity determines the peak value during the treatment. When changing to a following step, the intensity is retained if safety allows. Sometimes, it is necessary to increase the intensity for the following step. If the intensity cannot be maintained for safety reasons, the intensity returns to zero. In this case, the treatment is stopped. You must now set the intensity again.

Setting a treatment with sequential steps

1. Select a treatment whereby you can set sequential steps, for example with **Guide menu, Program number,** Select nr **230**.
2. Set the **Step time** and **Stimulation beep** parameters for the start of every individual step. Select **Sequence step number** to select a different step.
3. Rotate intensity knob A or B to start the treatment and to set the desired intensity.



Skip step in treatment

1. Press ⓥ to temporarily interrupt the treatment.
2. Select **Sequence step number** and select the desired step.
3. Rotate intensity knob A or B to continue the treatment again and to set the desired intensity.

4.5.4 Performing iontophoresis

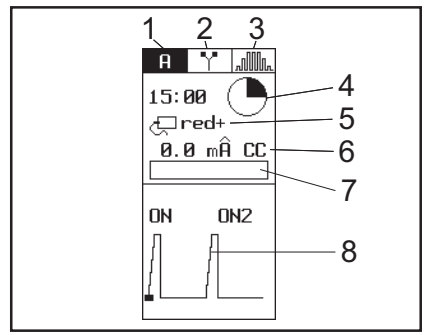
With iontophoresis, medicines are administered to the body as electrically charged parts (ions) by means of a direct current. To do this, the **Medium Frequency Rectangular current** is used.

1. Apply the medicament on a sterile gauze. See *§8.1*. Care must be taken in administering medicaments (allergies, contra indications, ...).
2. Place the gauze on the electrode. Make sure that the polarity corresponds with the medicament used.
3. Place the electrodes.
4. Select an **Iontophoresis** therapy program.
5. **Set the intensity between 0.1 and 0.25 mÂ/cm^2.** The intensity depends on the surface area of the electrodes. With electrodes of 6 x 8 cm (=48 cm^2), the current setting must be between 4.8 and 12 mÂ.

To prevent etching or burns, never exceed 0.25 mÂ/cm^2.

4.5.5 Read-out values for electrotherapy

1. Channel
2. Electrotherapy
3. Current shape
4. Remaining treatment time
5. Polarity
6. Present intensity
7. Graphical representation of intensity
8. Progress of current



Progress of current
With NMES currents and 4-pole current shapes, the progress of the current is graphically displayed. This gives a clear insight into the phase in which the current is at that moment. In this way, you can optimally guide the patient during the execution of the exercise. With the simultaneous application of two NMES currents, the current is only graphically displayed in the intensity screen.
Press Ⓐ or Ⓑ of the selected channel to open the intensity screen.

4.5.6 Parameters for electrotherapy

The following parameters are given alphabetically. The setting range or the selection possibilities of the parameters depend on the treatment chosen.

Active rest (s)
The duration of the rest period. During the rest period, a low frequency current is applied to stimulate the recovery process.

Alternating channels
The NMES current alternates between channel A and B.

Burst (Hz)
The frequency of the biphasic pulses. The burst consists of a series of pulses that is repeated several times per second. Each burst consists of a low frequency current with high internal pulse frequency (70 - 100 Hz) and a long pulse duration (100 - 250 msec).

Carrier wave (kHz)
The carrier wave frequency, expressed as the number of cycles per second. The frequency of this medium frequency current corresponds with the cycle duration. A high frequency results in a short pulse duration. A carrier wave frequency of 2 kHz is suited for muscle stimulation.

CC / CV
Constant Current (CC) or Constant Voltage (CV).

- When using a dynamic electrode technique, only use alternating currents with Constant Voltage (CV). This prevents unpleasant stimulations for the patient when the contact is temporarily interrupted during the placement, movement and removal of the electrode.
- With a rectal stimulation probe, select only alternating currents with Constant Voltage (CV), such as TENS, NMES, and 2-pole interferential currents. This prevents skin etching and unpleasant stimulations. The rectal stimulation probe is not detected by the equipment.

Characteristics of Constant Current:
- The voltage increases with an increasing load impedance (a worsening contact).
- Within the stated limits, a variation in the load impedance has hardly any effect on the current.
- Without a load, the voltage will go to the maximum level within a short time. After this, an error message will appear on the screen and the current will be switched off.

Characteristics of Constant Voltage:
- With a decreasing load impedance, the current increases.
- Without a load, the output voltage is equal to the set value.
- With a short circuit, the output current in mA is equal to the set voltage in V.

Electrode placing
Instructions for placing the electrodes. Only available with treatment selection via Indication list.

Frequency min./max. (base/top) (Hz)
The minimum and maximum frequency of the current cycles, expressed as the number of cycles per second. Within the set sweep mode, the frequency changes within these limits. During the treatment, frequency modulation is desired to prevent habituation. It is recommended to select a fairly low minimum frequency for this (< 20%).

Isodynamic (on, off)
LP and CP use two phases: MF and DF. The MF phase is more intense than the DF phase. If the patient is very sensitive, this difference in perception can be adjusted with this parameter.
On: Reduce the amplitude of the MF phase by 12.5%.

Off time (off) (s)
The interval between two series of current pulses.

On2 amplitude (%)
The amplitude of the pulses during the On2 period. This amplitude can be set as a percentage of the set amplitude during the On period.

On2 frequency (Hz)
The frequency of the pulses during the On2 time.

On time (on) (s)
The time that the series of current pulses is switched on.

Polarity
The polarity of the current pulse.

Polarity change (on, off)
Switch polarity between red+ and red- during the treatment.

Pulse pause (ms or s)
The duration between the current pulses.

Pulse shape
The shape of the electrical pulse. See *§3.6.1*.

Pulse time (µs, ms or s)
The duration of the current pulse.

Rest amplitude (%)
The amplitude of the pulses that is maintained during the active rest period. The active rest period stimulates recovery, which is otherwise realised by the "*Off* time". The amplitude during the active rest period is set as a percentage of the amplitude during the "*On* time".

Rest frequency (Hz)
The frequency that is maintained during the active rest period of the NMES current.

Rotation angle (0 - 355°)
The actual angle between the line with the maximum amplitude and the line between the electrodes of channel B. If Manual is selected for Rotation mode, you can let this angle rotate step by step. This makes it possible to localise deeper treatment points.

Rotation mode (manual, auto)
The maximum amplitude is present at one line in the rotation field (with 100% modulation depth).

- Auto: The line with maximum amplitude and 100% modulation depth automatically rotates 360° through the interference field during the set rotation time.
- Manual: Position this line manually in the interference field. You do not need to move the electrodes for this.

Rotation time (0 - 20 s)
The time in which the line with maximum amplitude and 100% modulation depth rotates 360° through the interference field. Use a short rotation time (3 - 5 s) to prevent habituation. Use a long rotation time (10-15 s) to localise deeper treatment points.

Segment angle (0 - 45°)
With the segment angle, a certain segment can be stimulated. The segment angle can be set when the Rotation angle is set to Manual.

Segment time (s)
The time in which the rotation angle changes within the set segment angle.

Sequence step number (1 - 5)
The number of the sequential step that is activated. See *§4.5.3*.

Step time (mm:ss)
The time in which the selected sequential step number is performed.

Stimulation beep (on, off)
Switch stimulation beep on or off.

Sweep mode (increase, hold, decrease time)
This parameter is only available if Frequency min. (base) deviates from Frequency max. (top). The frequency cycle consists of four steps with variable set values: increase, hold, decrease and hold. During the treatment, frequency modulation is desired to prevent habituation.

Total sequence steps
The maximum number of sequential steps. See *§4.5.3*.

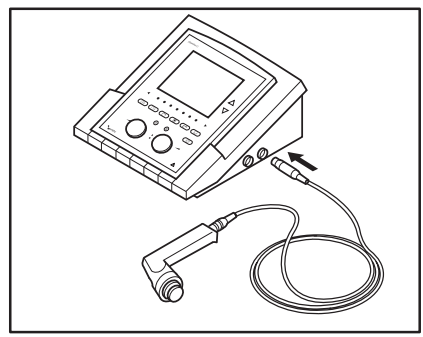
Treatment method
Treatment method for ionthophoresis. Always available with treatment selection via Indication list.

Treatment time (mm:ss)
The duration of the treatment.

4.6 Ultrasound therapy

4.6.1 Performing ultrasound therapy

Move the US head evenly over the skin during the treatment. This prevents internal burns.



1. Connects the US head into one of the two connectors ((« of the Phyaction C. You can connect two US heads, but only one US head can be in operation at one time. The device detects which US head is connected to the connector ((«.
2. Select the desired ultrasound therapy. With Indication list treatments, the parameter Head placement is available.
3. Set the parameter ERA to 1 or 4 cm^2. The corresponding US head is selected, the green indication led on the US head is on.
4. Apply contact gel to the skin to be treated and to the US head.
5. Place the head on the skin.
6. Rotate intensity knob A or B to start the ultrasound therapy.
7. Move the US head evenly over the skin during the treatment. This prevents internal burns.
8. Check the patient's reaction and the effect of the treatment. Repeat this check regularly during the treatment.
9. The equipment stops the treatment and indicates that the treatment is completed.

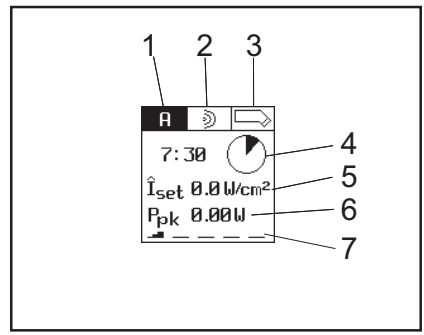
4.6.2 Phonophoresis

Phonophoresis is used to enhance transdermal transport of several drugs, especially anti-inflammatory NSAID and local anestetics.

1. Use the drugs (gel ointment) instead of the US contact gel.
2. Press guide.
3. Select Objectives.
4. Select Phonophoresis. The frequency is 1 MHz, the duty cycle is 20% and the time is at least 5 minutes.

4.6.3 Read-out values for ultrasound therapy

1. Channel
2. Ultrasound therapy
3. Type of US head
4. Remaining treatment time
5. Îset
6. Ppk
7. Contact of the US head



Contact of the US head

The contact of the US head with the skin:

- : Bad contact, US head switched off (0 W).
- : Bad contact.
- : Sufficient contact.
- : Good contact.
- : Very good contact

Test the US head if its conduction is bad. See *§5.1.1*.

$\hat{I}_{set}$ (W/cm^2)

The power (W) of the US head per cm^2.

P_{pk} (W)

The peak power of the US head (Îset * ERA). The peak power delivered therefore depends on the size of the US head and the contact with the skin. This value is 0.0 W if the contact with the skin is bad. In this case, the ultrasound treatment of the equipment is stopped to prevent overheating of the transducer.

4.6.4 Parameters for ultrasound therapy

Treatment time (mm:ss)

The duration of the treatment.

Duty cycle (10, 20, 30, 40, 50%, continuous)

Ratio of the pulse duration to the period duration.

- Continuous: Continuous ultrasound (100%).
- 10, 20, 30, 40, 50%: Pulsating ultrasound.

Select a high duty cycle for an intensive treatment. Select a low duty cycle for a mild treatment.

ERA (cm^2)
The effective radiating area expressed in cm^2 of the treatment head connected. This area equals the cross-sectional area of the beam at the treatment surface. The ERA depends on the frequency. This parameter remains empty if no US head is connected.

Head placement
Instructions for placing the US head. This is only available with treatment selection via Indication list.

US frequency (MHz)
The frequency of the US head. The absorption at a US frequency of 3 MHz is three times higher and the penetration depth is three times less than at a US frequency of 1 MHz. Use 3 MHz for superficial tissue and 1 MHz for deeper tissue.

4.6.5 Indicator light of the US head

The indicator light of the US head provides the following information.

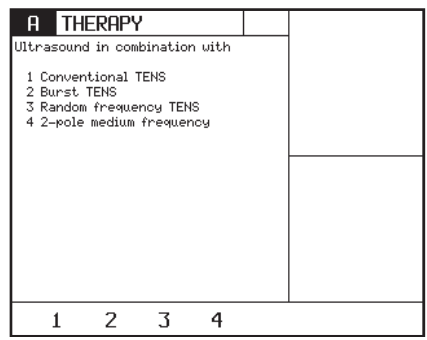
Indication light	**Situation**
Blinking green	The US head is properly connected.
Continuous green	The US head is selected.
Continuous yellow	The US-emission is in progress.
Alternating yellow/green	Bad contact of the US head with the skin.
Blinking yellow	End of the treatment

4.7 Combination therapy

4.7.1 Performing combined therapy

- With combination therapy, the US head is always the negative pole. The electrode is the positive pole.
- With combination therapy, a maximum current density of 2.0 mA_{rms}/cm^2 is advised. Exceeding this current density can result in skin irritation and burns. The intensity depends on the surface area of the US head. For US U92 (9 cm^2), the current setting may be a maximum of 18 mA_{rms}; for US U91 (3 cm^2), a maximum of 6 mA_{rms}.

1. Press therapy.
2. Select **Combination therapy**.
3. Select the current shape.
4. Connect the two-ply electrode to the connector Y A and connect the US-head to a US-connector.
5. Place the electrode which is connected to the red plug of Y A on the patient. See page *26: Placing rubber electrodes* and page *27: Placing the adhesive electrodes*.



6. Apply contact gel to the skin to be treated and to the US head.
7. Place the head on the skin.
8. Rotate intensity knob A to start the electrotherapy. Set the desired voltage.
9. Rotate intensity knob B to start the ultrasound therapy
10. Check the contact between the US head and the skin. The following indications can indicate a bad contact:
    - The treatment stops.
    - The peak power of the ultrasound treatment goes to 0.0 Watt.
11. Check the patient's reaction and the effect of the treatment. Repeat this check regularly during the treatment.
12. The equipment stops the treatment and indicates that the treatment is completed.

4.8 Diagnostic programs

With the diagnostic programs, you can investigate the state of the electrical sensitivity of the neuro-muscular system:

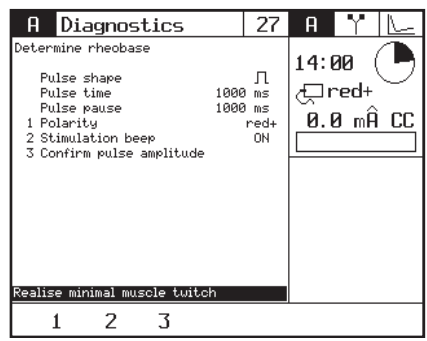
- Rheobase and chronaxie. See *§4.8.1*.
- Rheobase and AQ. See *§4.8.2*.
- Determine a S-D curve. See *§4.8.3*.

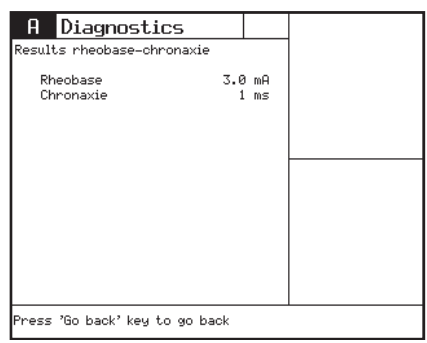
Besides this, there are diagnostic programs for localisation:

- Pain points. See *§4.8.4*.
- Stress fracture search.

4.8.1 Determining rheobase and chronaxie

1. Press guide.
2. Select **Diagnostic programs**.
3. Select **Rheobase and chronaxie**.
4. If desired, change the **Polarity** and **Stimulation beep** settings.
5. Rotate intensity knob A to start the treatment. The set intensity is displayed in the screen.
6. Increase the intensity in steps of 0.1 mÂ, until you observe a tangible or visible contraction.
7. Select **Confirm pulse amplitude**. The measured rheobase (in mÂ) is saved.
8. The equipment now doubles the rheobase (mÂ). The pulse time changes to 0.1ms. Increase the pulse time by △, until you observe a tangible or visible contraction.
9. Select **Confirm pulse time**. The chronaxie (in ms) is saved. The results screen appears.
10. If desired, press 🗀 to save the data in the memory. See *§4.9.1*.

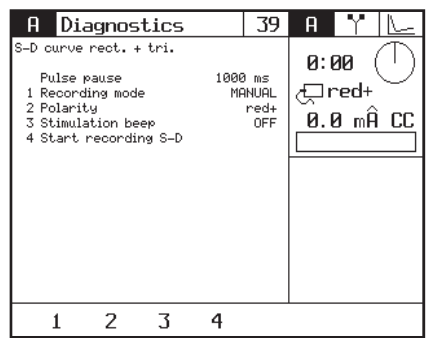




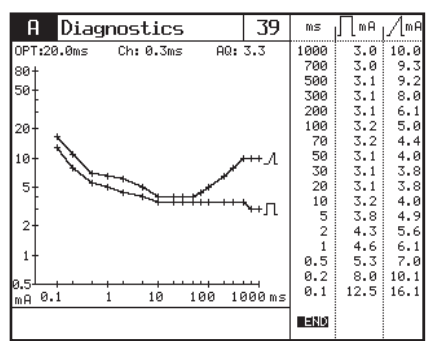
4.8.2 Determining Rheobase and Accomodation Quotient (AQ)

1. Press guide.
2. Select **Diagnostic programs**.
3. Select **Rheobase and AQ**.
4. Determine the rheobase as with **Rheobase and chronaxie**. See *§4.8.1*.
5. Select **Confirm pulse amplitude**. The measured rheobase is saved.
6. The equipment now selects a triangular pulse. Increase the intensity in steps of 0.1 mÂ, until you observe a tangible or visible contraction.
7. Select **Confirm pulse amplitude**. The measured AQ is saved. The results screen appears.
8. If desired, press to save the data in the memory. See *§4.9.1*.

4.8.3 Determine a S-D curve



1. Press guide.
2. Select **Diagnostic programs**.
3. Select **S-D curve rectangular, S-D curve triangular or S-D curve rect. + tri.**.
4. If desired, change the **Recording mode, Polarity** and **Stimulation beep** settings. If **Manual** is selected for the **Recording mode**, you can skip or repeat a measurement with △ and ▽.
5. Select Start recording S-D.



6. Rotate intensity knob A to start the treatment.
7. Increase the intensity in steps of 0.1 mÂ, until you observe a tangible or visible contraction.
8. Select **Confirm**.
9. Repeat steps 7 and 8 for all the measurements.
10. When END is marked, the S-D curve is finished. Depending on the measurement the Optimal pulse time (OPT), Rheobase (Rh), Chronaxie (Ch) and Accommodation Quotient (AQ) results are shown.
11. If desired, press to save the data in the memory. See *§4.9.1*.

4.8.4 Pain points

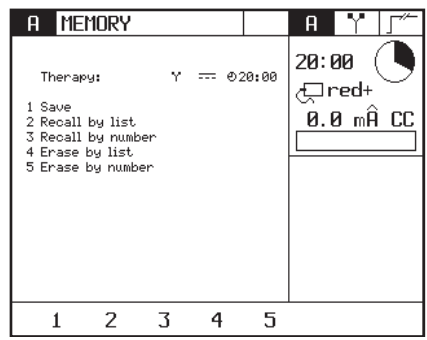
1. Press guide.
2. Select **Diagnostic programs**.
3. Select **Pain points**.
4. Select the diagnostic program for pain points.

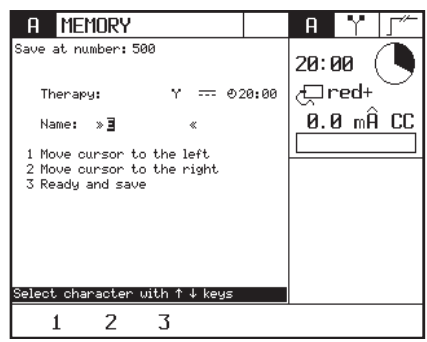
4.9 Memory

You can save 50 of your own programs for later use: programs 500 up to and including 549. You can modify these programs for much-used or specific current shapes for a certain patient.

4.9.1 Saving a program

1. Select a therapy. See *§4.1*.
2. Change the settings for the patient. See *§4.4*.
3. Press .
4. Select **Save**.
5. Select a free program number or overwrite an existing program number.
   If desired, scroll through the list with ◀ or ▶.
6. Enter the name of the program. Use the name or the number of the patient, for example.
   - Select a character with △ and ▽.
   - Select **Move cursor to the left/right** to change the cursor position.
7. Select **Ready and save**.

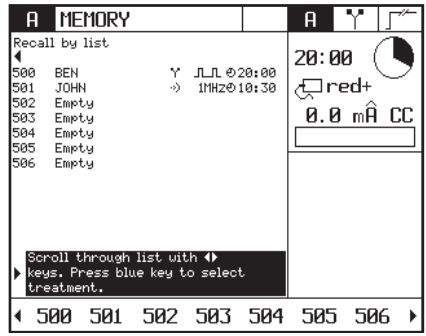




4.9.2 Selecting a saved program

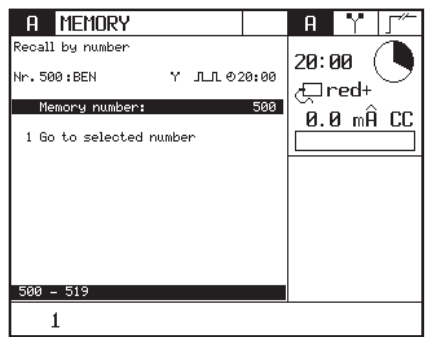
Selecting a program by the list

1. Press 🗀.
2. Select Recall by list.
3. Select the desired program.
   If necessary, scroll through the list with ◀ or ▶.



Selecting a program by the number

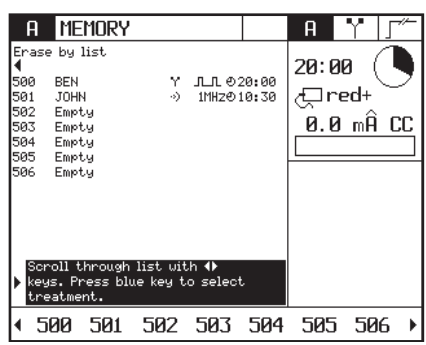
1. Press 🗀.
2. Select Recall by number.
3. Select the desired program with △ or ▽.
4. Select Go to selected number.



4.9.3 Erase a saved program

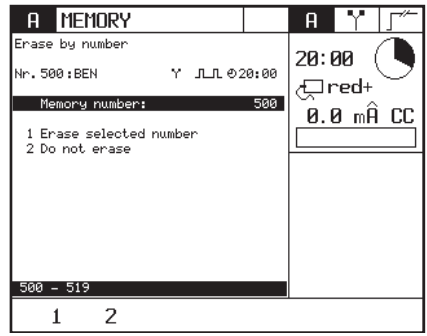
Erase a program by the list

1. Press 🗀.
2. Select Erase by list.
3. Select the desired program.
   If necessary, scroll through the list with ◀ or ▶.
4. Select Erase memory number to delete the program.



Erase a program by the number

1. Press 📂.
2. Select Erase by number.
3. Select the desired program with △ or ▽.
4. Select Erase selected number twice to delete the program.

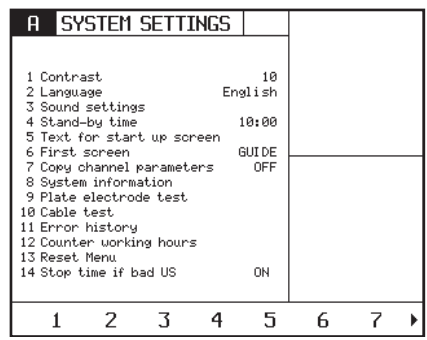


4.10 System settings

With the system settings, you can adapt the Standard settings of the equipment. You cannot change the system settings during a therapy.

4.10.1 Changing the system settings

1. Press 🖩. The System settings menu appears.
2. Change the desired system setting.



4.10.2 Parameters

Contrast (1 - 20)
The contrast of the display.

Language
The language selection: select the language with which the read-out must work.

Sound settings
Sound settings. See *§4.10.3*.

Stand-by time (5, 10,15, 20 minutes, off)
If the device is not used during the stand-by time, the device goes to the stand-by mode. Press any key to reactive the device.

Text for start up screen
The text that appears in the top of the start up screen, after the equipment is switched on. See *§4.10.6*.

First screen (guide menu, therapy menu)
The first screen you see when activating the device.

Copy channel parameters (on, off)
Choose channel A and B the same or different is set by the copy channel parameter. See *§4.4.2*.

System information
System information of the equipment
Always have this information available when you contact the technical service department.

Plate electrode test
Test the condition of the rubber electrodes. See *§4.10.8*.

Cable test
Test the cables. See *§4.10.7*.

Error history
The total number of error reports that the equipment has had and details about the last 10 error reports.
Always have this information available when you contact the technical service department.

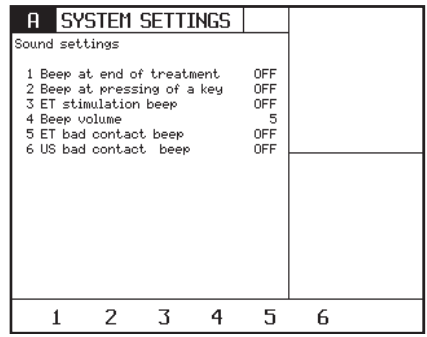
Counter working hours (hours, minutes, sec.)
The time that the accessories for electrotherapy or ultrasound therapy have been in use. For this, the output of the channel must have been higher than zero.

Reset menu
- Reset working hours: Set the number of working hours of a plate electrode or an US head to zero.
- Change therapy programs: Change the settings from the programs in the Therapy menu. See *§4.10.5*.
- Erase total memory: Restores the standard settings of the standard programs and of the edited programs.

Stop time if bad US (on, off)
When there is a bad US contact, the treatment time counter stops. When the contact is restored, the counting continues.

4.10.3 Setting the sound

1. Press .
2. Select Sound settings.
3. Change the desired sound setting.



4.10.4 parameters sound settings

End of treatment
On: A sound signal will be heard at the end of the treatment.

Pressing a key
On: A sound signal will be heard every time a key is pressed.

ET stimulation
On: A sound signal will be heard at each pulse of the electrotherapy.

Beep volume (min.1, standard 5, max.10)
The volume of the sound signals.

ET bad contact
On: A sound signal will be heard if the electrode does not make good contact with the skin.

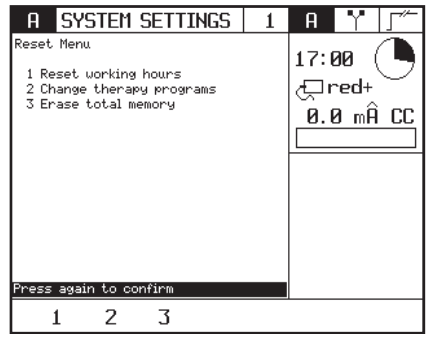
US bad contact
On: A sound signal will be heard if the US head does not make good contact with the skin.

4.10.5 Change therapy programs

Save new therapy program settings

Change the program to your required settings.

1. Use the **Therapy** menu to select a program.
2. Make the changes in the program.
3. Press .
4. Select **Reset Menu**.
5. Select **Change therapy programs**.
6. Select **Save new ther. progr. settings** twice to change the program settings.



Restore this therapy program

Change the program back to the manufacture's settings.

1. Use the **Therapy** menu to select a program.
2. Go to the **Change therapy programs** menu.
3. Select **Restore this therapy program** twice.

Restore all therapy programs

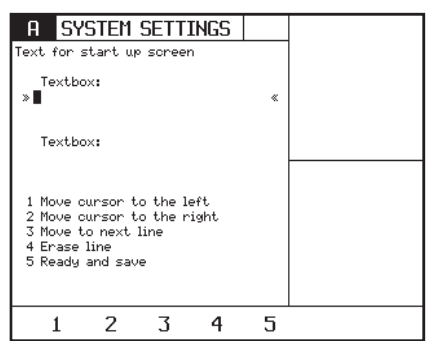
Change all therapy programs back to the manufacture's settings.

1. Go to the **Change therapy programs** menu.
2. Select **Restore ALL therapy program** twice.

4.10.6 Set text for start up screen

You can set your own text for the start up screen. For example, you can put your name or address information here.

1. Press .
2. Select **Text for start up screen**.
3. Enter the name for the start up screen.
   - Select a character with △ and ▽.
   - Select **Move cursor to the left/right** to change the cursor position.
   - Select **Move to next line** to enter a line.
4. Select **Ready and save**.



4.10.7 Cable test

1. Press .
2. Select Cable test.
3. Connect the electrode cable to channel A with the electrodes.
4. Connect the test plug to the connectors of the cable.
5. Set the amplitude to 20 mA with rotary knob A.
6. If the cables function correctly, the following message will appear Condition cable: OK.
7. Turn the amplitude back to 0 mA. Press .

4.10.8 Plate electrode test

1. Press .
2. Select Plate electrode test.
3. Connect the electrode cable to channel A with the electrodes.
4. Place the electrodes on each other, without the sponges. Make sure that the electrodes make contact over the whole surface.
5. Set the amplitude to 20 mA with rotary knob A.
6. If the electrodes function correctly, the following message will appear Condition electrodes: OK.
7. Turn the amplitude back to 0 mA.

5 INSPECTIONS AND MAINTENANCE

5.1 Inspections

Component	Check	Frequency
Electrode cables and electrodes	Damage Insulation intact	At least 1x per month
US head	Dents, cracks or other damage	At least 1x per month
	Test US head. See *§5.1.1.*	With bad operation or at least 1x per year
Cable of US head	Damage Pins in connector straight	At least 1x per month
Equipment	Technical safety inspection. See *§5.1.2.*	At least 1x per year

5.1.1 US head test

Test the US head if its conduction is bad. This is the case when the indication bar for the Ppk value displays ▂ ▁ ▁ ▁ ▁ or ▂ ▄ ▁ ▁ ▁ .

1. Select an ultrasound therapy.
2. Place the US head in a bowl with water.
3. Rotate intensity knob A or B to start the treatment.
4. Check in the screen of the channel to see if the Ppk value is increasing.
5. Contact your local GymnaUniphy dealer if the indication bar still displays ▂ ▁ ▁ ▁ ▁ or ▂ ▄ ▁ ▁ ▁ .

5.1.2 Technical safety inspection

The 'Directive on Medical Devices' from the European Commission (93/42/EEG) requires that safe devices are used. It is recommended to perform a yearly technical safety inspection. If the legislation in your country or your insurer prescribes a shorter period, you must adhere to this shorter period.

- Only a technician authorised by GymnaUniphy N.V. may open the equipment or the accessories.
- The inspection may only be performed by a suitably qualified person. In some countries this means that the person must be accredited.

Inspection points

The technical safety inspection contains the following tests:

1. Test 1: General: Visual inspection and check on the operating functions
2. Test 2: Electrotherapy
3. Test 3: Ultrasound therapy
4. Test 4: Electrical safety inspection: measurement of the earth leakage current and patient leakage current according to DIN/VDE 0751-1 ed. 2.0.

Inspection result

1. A registration must be maintained of the technical safety inspections. Use the inspection report in the appendix for this purpose. See *§8.5*.
2. Copy this appendix.
3. Complete the copied appendix.
4. Keep the inspection reports for at least 10 years.

The inspection is successful if all inspection items are passed.

Repair all faults on the equipment before the equipment is put back into operation.

By comparing the registered measurement values with previous measurements, a possible slowly-deteriorating deviation can be ascertained.

5.2 Maintenance

Component	Check	Frequency
Rubber electrodes	Cleaning. See *§5.2.1*.	After every treatment
EL sponges	Cleaning. See *§5.2.2*.	After every treatment
Fixation bandages	Cleaning. See *§5.2.3*.	If necessary
Vaginal, anal and rectal stimulation probe	Cleaning and disinfecting. See *§5.2.4*.	After each use
US head	Cleaning. See *§5.2.5*.	After each use

Accessories that come in contact with the body of the patient must be washed with pure water after the disinfection to prevent allergic reactions.

5.2.1 Cleaning the electrodes

1. Clean the electrodes in a non-aggressive soap solution or in a 70% alcohol solution.
2. Rinse the electrodes thoroughly with water.
3. Dry the electrodes.

5.2.2 Cleaning the EL sponges

1. Rinse the EL sponges thoroughly with water or clean the EL sponges with a 70% alcohol solution.
2. Rinse the EL sponges thoroughly with water.

5.2.3 Cleaning the fixation bandages

1. Clean the fixation bandages in a 70% alcohol solution or another disinfectant.
2. Rinse the fixation bandages in water.
3. Let the fixation straps dry.

5.2.4 Cleaning and disinfecting vaginal, anal and rectal stimulation probes

- Considering the very personal and intimate character of these treatments, a probe may only be used for one patient.
- Never disinfect the probes in an autoclave. The probes can be damaged by the extreme temperature.

Immediately after every treatment

1. Clean the probe carefully with soap and water.

2. Place the probe in an HAC solution of 1% or in a 70% alcohol solution for at least 30 minutes.

- Read the instruction leaflet in the packaging of the HAC.
- Make sure that the probe connector does not get into the HAC solution.

3. Dry the probe with a clean towel.
4. Store the probe in a plastic bag that is provided with the name of the patient.

Before reusing the probe:

1. Clean the probe carefully with soap and water.
2. Apply an antiseptic lubricant to the probe. See *§4.5.2*.

5.2.5 Cleaning the US head

1. Clean the US head with a lightly moistened soft cloth.
2. Disinfect the treatment surface with a cotton bud that is soaked in a 10% HAC solution.
3. Rinse the US head thoroughly with clean water.

6 MALFUNCTIONS, SERVICE AND GUARANTEE

6.1 Malfunctions

Component	Problem	Solution
Phyaction C	Equipment cannot be switched on	See *§6.1.1*.
	Equipment does not react to commands or a fault report appears	See *§6.1.3*.
	Foreign language on the screen	Change the language. See *§4.10.2*.
EL sponges	Furring	Replace the sponges
	Bad conduction	Replace the sponges

6.1.1 Equipment cannot be switched on

1. Check if the mains voltage has failed.
2. Check if the main switch is switched on ("I").
3. Check if the power cord and the fuses are in order. If necessary, replace the fuse. See *§6.1.2*.
4. Contact your dealer if the equipment still cannot be switched on.

6.1.2 Replacing a fuse

1. Switch the main switch off ("O").
2. Unplug the power cord from the equipment.
3. Pull the fuse holder carefully out of the equipment. If necessary, use a screwdriver.
4. Replace the fuse. If necessary, order new fuses from your dealer.
5. Install the fuse holder and plug in the power cord.
6. Switch the main switch on again ("I").

6.1.3 Equipment does not react to commands or a fault report appears

The safety system of the equipment has ascertained a fault. You cannot continue to work. An instruction usually appears on the screen.

1. Disconnect the connection to the patient.
2. Switch the main switch off ("O").
3. Wait 5 seconds and switch the main switch on again ("I").
4. Contact your dealer if the error message reappears.

6.2 Service

- Only a technician authorised by GymnaUniphy N.V. may open the equipment or the accessories to perform repairs. The equipment does not contain any components that may be replaced by the user.
- If possible, open the screen with the system settings before you contact the technical service department. See *§4.10*.

Service and guarantee are provided by your local GymnaUniphy dealer. The conditions of delivery of your local GymnaUniphy dealer apply.
If you have qualified technical personnel that are authorised by GymnaUniphy to perform repairs, your dealer can provide diagrams, spare parts lists, calibration instructions, spare parts and other information on request, for a fee.

6.3 Guarantee

GymnaUniphy and the local GymnaUniphy dealer declares itself to be solely responsible for the correct operation when:

- all repairs, modifications, extensions or adjustments are performed by authorised people;
- the electrical installation of the relevant area meets the applicable legal regulations;
- the equipment is only used by suitably qualified people, according to these user instructions;
- the equipment is used for the purpose for which it is designed;
- maintenance of the device is regularly performed in the way prescribed. See *§5.*;
- the technical life time of the equipment and the accessories is not exceeded;
- the legal regulations with regard to the use of the equipment have been observed.

The guarantee period for the equipment is 2 (two) years, beginning on the date of purchase. The date on the purchase invoice acts as proof. This guarantee covers all material and production faults. Consumables, such as sponges, adhesive electrodes and rubber electrodes, do not fall under this guarantee period.

This guarantee does not apply to the repair of defects that are caused:

- by incorrect use of the equipment,
- by an incorrect interpretation or not accurately following these user instructions,
- by carelessness or misuse,
- as a consequence of maintenance or repairs performed by people or organisations that are not authorised to do so by the manufacturer.

6.4 Technical life time

The expected life time of the equipment is 10 years, calculated from the date of manufacture. See the type plate for this information.
In so far as possible, GymnaUniphy will supply service, spare parts and accessories for a period of 10 years from the date of manufacture.

7 TECHNICAL INFORMATION

7.1 General

Dimensions Phyaction C (w x h x d)	265 x 275 x 122 mm
Weight Phyaction C	3,650 kg
Weight including accessories	4,6 kg
Mains voltage	100 - 240 VAC, 50 - 60 Hz
Maximum power, in operation	85 VA
Safety class	Class I (earthed socket required)
Insulation	Type BF (floating patient circuit)
Fuses	2 x T2AL250 V

7.2 Electrotherapy

7.2.1 General

Treatment time	0 - 60 min.
Current limitation	The smallest value: - 150% of the set value, or: - 110% of the maximum for the selected current shape
Accuracy	Set current value mÂ at 500 Ω - typically ± 10%
CC/CV mode	For all current shapes, with the exception of medium frequency rectangular current
Polarity	Red-, red+ and alternating polarity, if applicable

7.2.2 Current shapes

Medium frequency rectangular current

Intensity	0 - 80 mÂ with 300 to 1000 Ω

Iontophoresis MF rectangular

Electrode area	6 - 300 cm^2
Intensity	0 - 80 mÂ with 300 to 1000 Ω

Rectangular pulsed current, Triangular pulsed current, 2-5 Current (Ultra Reiz)

Pulse time	0,1 ms - 6 s
Pulse pause	1 ms - 6 s
Intensity of CC	0 - 80 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 80 V_{pk} with I < 80 mA

MF, DF, CP, LP

Intensity of CC	0 - 80 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 80 V_{pk} with I < 80 mA
Expert parameters:	
MF time	1 - 100 s
DF time	1 - 100 s
ISO	on / off

Conventional TENS, Low frequency TENS

Pulse time	10 - 650 µs
Pulse shape	symmetrical, asymmetrical
Frequency min. (base)	1 - 150 Hz
Frequency max. (top)	1 - 150 Hz
Freq. increase time	0 - 100 s
Freq. hold time	0 - 100 s
Freq. decrease time	0 - 100 s
Intensity of CC	0 - 120 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 120 V_{pk} with I < 120 mA

Random frequency TENS

See TENS currents, with the exception of:

Pulse frequency	1 - 150 Hz, with automatic stochastic frequency variation of +/-35% maximum

Burst TENS

See TENS currents, with the exception of:

Pulse frequency	20 - 150 Hz
Burst frequency	1 -10 Hz

Rectangular surge current, Triangular surge current

Pulse time	0,1 - 5 ms
Pulse frequency	1 - 150 Hz
Intensity of CC	0 - 80 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 80 V_{pk} with I < 80 mA

Biphasic surge current, Biphasic surge intrapulse interval

(with a fixed interval between positive and negative pulses of 100 µs)

Pulse time	10 - 650 µs
Pulse frequency	1 - 150 Hz
Pulse shape	symmetrical, asymmetrical (only for Biphasic surge current)
Intensity of CC	0 - 120 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 120 V_{pk} with I < 120 mA

2-pole medium frequency surge current, Isoplanar vector field surge

Carrier wave frequency	2 - 10 kHz
AM frequency	1 - 200 Hz
Intensity of CC	0 - 100 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 100 V_{pk} with I < 100 mA

Russian stimulation

Carrier wave frequency	2 - 10 kHz
Burst frequency	20 - 100 Hz
Intensity of CC	0 - 100 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 100 V_{pk} with I < 100 mA

Expert parameters for NMES currents

On time (ON)	1 - 100 s
Off time (OFF)	0 - 100 s
Rest time	0 - 100 s
Surge time	0 - 100 s
Shrink time	0 - 100 s
Special modes	OFF, REST, ON2, Frequency sweep, Manual stimulation
Alternating channels	ON/OFF (not for Isoplanar vector field surge current)
On2 amplitude	1 - 100%
Rest amplitude	1 - 100%

2-pole medium frequency current, Isoplanar vector field

Carrier wave frequency	2 - 10 kHz
AM frequency min.	0 - 200 Hz
AM frequency max.	0 - 400 Hz
Frequency variation mode	0/1/0, 1/5/1, 6/0/6, 12/0/12
Intensity of CC	0 - 100 mÂ with 300 to 1000 Ω
Intensity of CV	0 - 100 V_{pk} with I < 100 mA

Dipole vector field

See 2-pole medium frequency current

Rotation time	0 - 20 s
Rotation angle	0 - 355°
Segment angle	0 - ±45°
Segment time	0 - 10 s

Diagnostic programs: Rheobase and Chronaxie, Rheobase and AQ, S-D curve rectangular, S-D curve triangular, S-D curve rect. + tri.

Intensity of CC	0 - 80 mÂ with 300 to 1000 Ω, with Rheobase max. 40 mÂ
Variable parameter for determination Chronaxie:	
Pulse time	0,1 - 100 ms
Variable parameter for determination S-D curves:	
Pulse time	17 fixed steps between 0,1 - 1000 ms
Recording mode	auto / manual

7.3 Ultrasound therapy

7.3.1 General

Insulation classification	Type BF
Peak power	0 - 2 W/cm^2, duty cycle = 100% 0 - 3 W/cm^2, duty cycle < 100%
Accuracy of intensity	± 10% of maximum at set values above 10% of this maximum
Treatment time	0 - 30 min.
Deviation of time clock	< 0,5%
Modulation frequency	100 Hz
Modulation type	CW (rectangular on/off)
Repetition period of pulses	10 ms

7.3.2 Modulation and pulse duration

Modulation duty cycle	**100**	**50**	**40**	**30**	**20**	**10**	**%**
Pulse time	∞	5	4	3	2	1	ms
Ratio of p_{tm} - p	1	2	2,50	3,33	5	10	

7.3.3 US heads

US head, model U92			
Acoustic operating frequency	**1,1**	**3,2**	**MHz**
Output power	8,0	9,6	W
Effective intensity of output voltage	2,0	2,0	W/cm^2
Effective Radiating Area (ERA)	4,0	4,8	cm^2
Beam Non-uniform Ratio (BNR)	7,5	7,5	
Maximum intensity of beam	15,0	15,0	W/cm^2
Beam type	Collimated	Collimated	

US head, model U91			
Acoustic operating frequency	**1,1**	**3,2**	**MHz**
Output power	1,2	2,0	W
Effective intensity of output voltage	2,0	2,0	W/cm^2
Effective Radiating Area (ERA)	0,6	1,0	cm^2
Beam Non-uniform Ratio (BNR)	5,0	5,0	
Maximum intensity of beam	10,0	10,0	W/cm^2
Beam type	Divergent	Collimated	

7.4 Environmental conditions

Temperature:	+10 °C to +40 °C
Relative humidity	30% to 75%
Atmospheric pressure	700 hPa to 1060 hPa

7.5 Transport and storage

Transport weight	5,5 kg
Storage temperature	-20 °C to +60 °C
Relative humidity	10% to 100%, including condensation
Atmospheric pressure	200 hPa to 1060 hPa
Transport classification	Single pieces, by post

The transport and storage specifications apply to equipment in the original packaging.

7.6 Standard accessories

	Quantity	Description	Art. no.
	2	Two-ply electrode cable	108.725
	2	Rubber electrode no. 2: 6 x 8 cm (per 2 pces)	109.959
	1	EL sponge no. 2 for electrode 6 x 8 cm (per 4 pces)	100.658
	4	Elastic fixation bandage - 5 x 60 cm	108.935
	1	US head, 1/3 MHz - ERA 4 cm^2 incl. holder	323.584
	1	Contact gel, 500 ml	114.827
	1	Power cord[1]	100.689
	1	Test connector V/V - 4mm	108.919
	1	VAS score card	115.684
	1	User manual Phyaction C	EN: 322.824 NL: 322.868 FR: 322.912 DE: 322.956

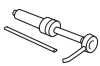
1 This power cord has a CEE 7/7 type plug. For countries with other outlets, a different power cord with the appropriate plug is supplied.

7.7 Optional accessories electrotherapy

	Quantity	Description	Art. no.
	1	Vaginal stimulation probe with 6-pole DIN plug	107.348
	1	Anal stimulation probe with 6-pole DIN plug	107.349
	1	Rectal stimulation probe	112.166
	2	Rubber electrode no. 1 - 4 x 6 cm	109.958
	2	Rubber electrode no. 3 -8 x 12 cm	109.960
	4	EL sponge no. 1 for electrode 4 x 6 cm	100.657
	4	EL sponge no. 3 for electrode 8 x 12 cm	100.659
	4	Adhesive electrode, 3 cm diameter	113.335
	4	Adhesive electrode, 3.8 x 5 cm	107.858
	4	Adhesive electrode, 5 x 5 cm	101.795
	4	Adhesive electrode, 5 x 10 cm	107.860
	1	Adapter cable for adhesive electrode - 4 > 2 mm	113.334
	1	Pin electrode 15 mm diameter with grip and sponge	114.142
	10	EL sponges for pin electrode	109.944

Advice: Replace the electrode material at least every 6 months.

7.8 Optional accessories ultrasound therapy

	Quantity	Description	Art. no.
	1	US head, multi-frequency,1/3 MHz - ERA 1 cm^2, incl. holder	323.595
	1	Contact gel, can 5 l	100.019
	1	Pump for can, 5 l	100.020

Article numbers can change in the course of time. Check the article numbers in the most recent catalogue or ask your dealer.
The drawings are merely indicative, no rights can be derived from them.

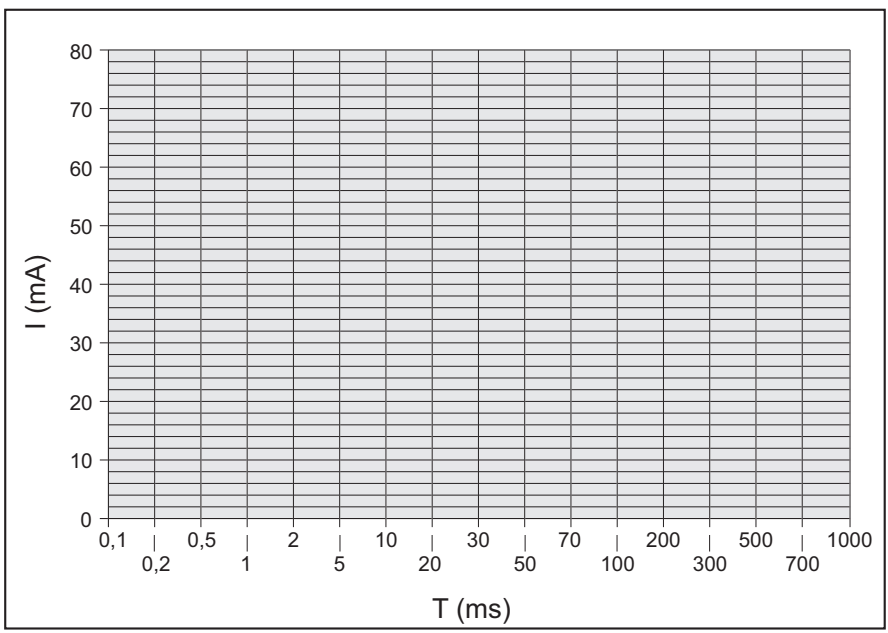
8 APPENDICES

8.1 Agents for iontophoresis

Agent	Property	Application and form
Calcium (+)	Analgeticum and sedative	Application: post-traumatic pain, distorsion, algodistrophic syndromes and neuralgia. Form: 2% calcium chloride solution.
Magnesium (+)	Analgeticum and fibrolyticum	Applications as with calcium. 10% magnesium chloride solution.
Iodine (-)	Sclerolyticum	Application: stubborn scars, cutaneous adherences, sickness of Dupuytren, stiffness of joints and adhesive capsulitis. Form: 1-2% potassium iodine solution
Salicylate (-)	Anti-inflammation agent	Application: periphlebitis, osteoarthritis, ab-articular rheumatism, articulary stiffness and adhesive capsulitis. Form: 2% sodium salicylate solution.
Procaine and lidocaine (+)	Anti-inflammation agent	Application: production of local anaesthesia, in the neuralgia of the trigeminal nerve, e.g. with acute inflammation. Form: 2% solution.
Histamine (+)	Revulsive and vasodilator	Application: degenerative and articulary rheumatic pains, such as cramp. **Maximum duration of iontophoresis: 3 min.** Longer treatment causes allergic reactions and cephalgia. Form: 0,02% bicarbonate solution.
Coltramyl (+)	Myorelaxant	Application: contractures. Form: solutions up to 0,04%. 2 ml coltramyl (4mg/ampoule), to be dissolved in 8 ml distilled water.
Indocid (-)	A.I.N.S.	Application: inflammatory illnesses Form: 1% solution. 50 mg freeze-dried powder, to be dissolved in 5 ml distilled water.
Voltaren (-)	A.I.N.S.	Application: inflammatory illnesses. Form: 0,75% solution. 3 ml (75 mg/ampoule), to be dissolved in 7 ml distilled water.
Acetic acid	A.I.N.S.	Application: To dissolve deposition layers caused by ossifying myositis and periarticular ossification. Form: 2% water solution.

8.2 Diagnostic S-D curve

Physiotherapist:	Date of investigation:
Name of patient:	Date of birth: M/F
Anamnesis:	
Evaluation (neuro-muscular):	Accommodation Quotient:
Rheobase: mA	Chronaxie: ms
Conclusion:	
Treatment:	



8.3 Electrode and US head placements

Select the therapy via indication list to get information about the placement. *See §4.3.2.*

8.3.1 Electrotherapy

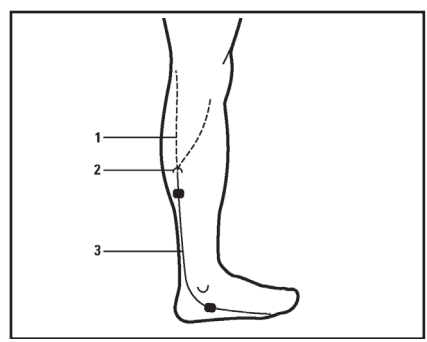
Select the **Electrode placement** parameter to show the optimal location for the placement of the electrodes.

The numbers in the illustration give information to the precise anatomic location. Select the numbers with the blue keys. The description of the location is often explained with the abbreviations:

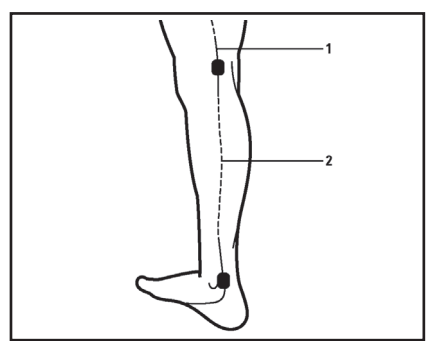
pnp	peripheral nerve point	snp	skin nerve point
mnp	motor nerve point	mtp	myofascial trigger point
n	nerve	nn	nervi
m	muscle	mm	musculi
r	ramus	rr	rami

The types of nerves are represented in a different way:

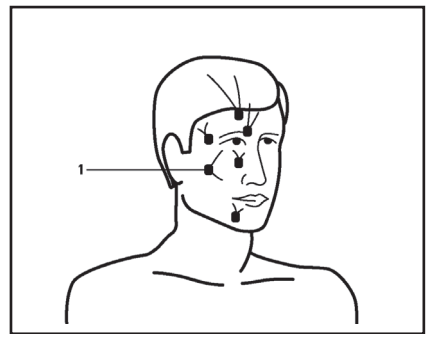
1. Peripheral nerve, deep
2. Fascia
3. Skin nerve



1. Peripheral nerve, superficial
2. Peripheral nerve, deep



1. Skin nerve on the point of the fascia



Other information in the illustrations:

- The electrodes shown on the front of the body are black.
- The electrodes shown on the rear of the body are transparent.
- The type of electrodes to use is not advised.
- The size of the shown electrodes is an indication for the advised size.
- The letters A and B give a recommendation for the choice of channel.
- The symbols + and - recommends the polarity.

8.3.2 Iontophoresis

The **electrode placement** parameter is replaced by the parameter **treatment method**. The **treatment method** shows the iontophoresis method on screen.

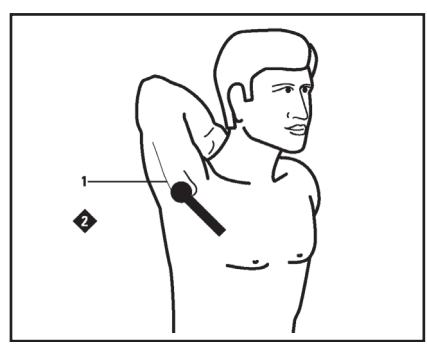
8.3.3 Ultrasound therapy

Select the **US head placement** parameter to show the optimal location for the placement of the US head.

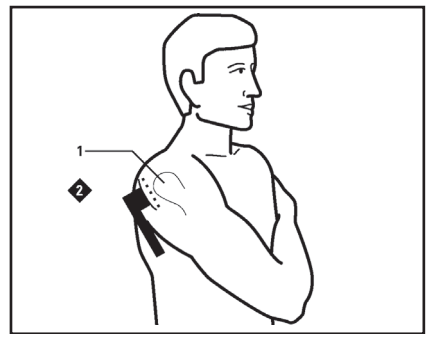
You can select the numbers in the illustration with the blue keys for more information.

1 Gives information on the precise anatomic location.

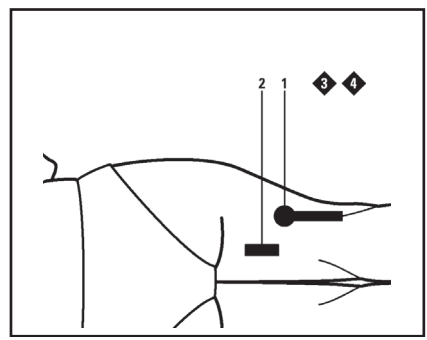
2 Numbers with a black background gives specific recommendations.



Relevant bone structures are shown for detailed information on the treated area. The number of points below the US head gives an indication of the dimensions of the treated area. The information in the illustration recommends a treatment technique. This illustration shown an example of the dynamic technique.



If other areas are possible for the US head placement a black area is shown. Select the corresponding number 2 for information on the screen. If the area is on the rear a transparent area is shown.



8.3.4 Combination Therapy

The US head/electr. placement parameter for combination therapy shows the US head placement. The electrode is not shown in the illustration. Place the electrode near to the US head.

8.4 EMC directive

Use only cables, electrodes and US heads that are specified in this manual. See *§7*. The use of other accessories can have a negative effect on the electromagnetic compatibility of the equipment.
If you use the Phyaction C in the vicinity of other equipment, you must check that the Phyaction C is functioning normally.
The following paragraphs contain information about the EMC properties of the equipment.

8.4.1 Guidance and declarations

Guidance and manufacturer's declaration - electromagnetic emissions		
The Phyaction-series devices are intended for use in the electromagnetic environment specified below. The customer or the user of a Phyaction-series device should assure that it is used in such an environment.		
Emission test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The Phyaction-series devices use RF energy only for their internal function. Therefore, their RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
	Class B	The Phyaction-series devices are suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-3	Class B	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration - electromagnetic immunity			
The Phyaction-series devices are intended for use in the electromagnetic environment specified below. The customer or the user of a Phyaction-series device should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact / ±8 kV air No loss of performance	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity must be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/ output lines	±2 kV power / ±1 kV I/O No loss of performance	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV diff. / ±2 kV comm. No loss of performance	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0,5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	U_T - 100% (0,5 period) No loss of performance U_T - 60% (5 periods) No loss of performance U_T - 30% (25 periods) No loss of performance U_T - 100% (5 seconds) Device resets to a safe state. (60601-1 § 49.2)	Mains power quality should be that of a typical commercial or hospital environment. If the user of a Phyaction-series device requires continued operation during power mains interruptions, it is recommended that the Phyaction-series device be powered from an uninterruptible power supply or a battery.
Power frequency (50/ 60 Hz) magnetic field IEC 61000-4-8	3 A/m	Not applicable	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level			

Guidance and manufacturer's declaration - electromagnetic immunity			
The Phyaction-series devices are intended for use in the electromagnetic environment specified below. The customer or the user of a Phyaction-series device should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of a Phyaction-series device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance
Conducted RF IEC 61000-4-6	3 V_{rms} AM 1 kHz 80% 150 kHz to 80 MHz	10 V.....0,15-80 Mhz 51 V.....6,78 Mhz 54 V.....13,56 Mhz 50 V.....27,12 Mhz 45 V.....40,68 Mhz	$d = 0,35\sqrt{p}$ $d = 0,07\sqrt{p}$ $d = 0,06\sqrt{p}$ $d = 0,07\sqrt{p}$ $d = 0,08\sqrt{p}$
Radiated RF IEC 61000-4-3	3 V/m AM 1 kHz 80% 80 MHz to 2,5 GHz	10 V/m..0,08-1,0 Ghz 26 V/m....1,4-2,0 Ghz 30 V/m...433,92 Mhz 30 V/m.....915 Mhz	$d = 0,35\sqrt{p}$ 80 MHz to 800 MHz $d = 0,70\sqrt{p}$ 800 MHz to 2,5 GHz $d = 0,12\sqrt{p}$ $d = 0,23\sqrt{p}$
Radiated RF ENV 50204	3 V/m CW 200 Hz d.c. 50% 895 MHz to 905 MHz	30 V/m.895-905 Mhz	$d = 0,23\sqrt{p}$
			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). 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]. Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 The 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 and 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 can be considered. If the measured field strength in the location in which a Phyaction-series device is used exceeds the applicable RF compliance level above, the Phyaction-series devices should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Phyaction-series device. b Over the frequency range 150 kHz to 80 MHz, field strengths must be less than 10 V/m.			

Recommended separation distances between portable and mobile RF communications equipment and the Phyaction-series device

The Phyaction-series device is intended for use in the electromagnetic environment in which radiated RF disturbances are contolled. The customer or the user of a Phyaction-series device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Phyaction-series devices 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 $d = 0{,}35\sqrt{p}$	80 MHz to 800 MHz $d = 0{,}35\sqrt{p}$	800 MHz to 2,5 GHz $d = 0{,}70\sqrt{p}$
0,01	0,04	0,04	0,07
0,1	0,11	0,11	0,22
1	0,35	0,35	0,70
10	1,11	1,11	2,21
100	3,50	3,50	7,00

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 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.

8.5 Technical safety inspection

Phyaction C with serial number ..... is / is not[1] in good working order		
	Inspection performed by:	Owner:
Location:	Name:	Name:
Date:	Initials:	Initials:

1 Cross out what does not apply.

If a specific test does not apply to this equipment, place a mark in the NA (not applicable) column.

8.5.1 Test 1: General

		Yes	No	NA
1.	The results of earlier safety inspections are available.	☐	☐	☐
2.	The logbook is present.	☐	☐	☐
3.	The type plate and the supplier's label are legible.	☐	☐	☐
4.	The housing, adjusting knobs, keys and display are undamaged.	☐	☐	☐
5.	The power connection and power cord are undamaged.	☐	☐	☐
6.	The output connectors are undamaged.	☐	☐	☐
7.	The electrode connectors and cables are undamaged.	☐	☐	☐
8.	The cables and connectors of the US head(s) are undamaged.	☐	☐	☐
9.	The US head(s) do not display any cracks or other damage that can endanger the insulation.	☐	☐	☐
10.	The automatic self-test at switch-on does not give an error message.	☐	☐	☐
11.	The display does not show any defective points or lines.	☐	☐	☐

8.5.2 Test 2: Electrotherapy

		Yes	No
1.	Connect loads of 500 Ω to both normal electrode pairs. Connect an oscilloscope to these pairs (black to ground).		
2.	Select channel A, program 4: MF constant.		
3.	At maximum intensity, the output currents correspond within 10% with the values on the display.	☐	☐
4.	The output signals correspond with figure 1.	☐	☐
5.	The polarity changes to negative if "RED(-)" is selected.	☐	☐
6.	The warning "Bad contact with the patient" is given if the load is disconnected.	☐	☐
7.	Select channel B, program 4: MF constant. Select CC.		
8.	At maximum intensity, the output currents correspond within 10% with the values on the display.	☐	☐
9.	The output signals correspond with figure 1.	☐	☐
10.	The polarity changes to negative if "RED(-)" is selected.	☐	☐
11.	The warning "Bad contact with the patient" is given if the load is disconnected.	☐	☐
12.	Remove the load, so that the unloaded output voltage can be measured.		
13.	Select channel A, program 23: 2-pole medium frequency. Select CV.		
14.	At maximum intensity, the output voltage corresponds within 10% with the values on the display.	☐	☐
15.	The output signals correspond with figures 2 and 3.	☐	☐
16.	The yellow lamp next to the output connectors lights if the intensity is not 0.	☐	☐
17.	Select channel B, program 23: 2-pole medium frequency. Select CV		
18.	At maximum intensity, the output voltage corresponds within 10% with the values on the display.	☐	☐
19.	The output signals correspond with figures 2 and 3.	☐	☐
20.	The yellow lamp next to the output connectors lights if the intensity is not 0.	☐	☐

Figure 1

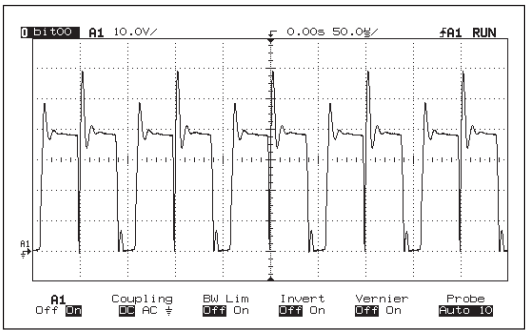


Figure 2

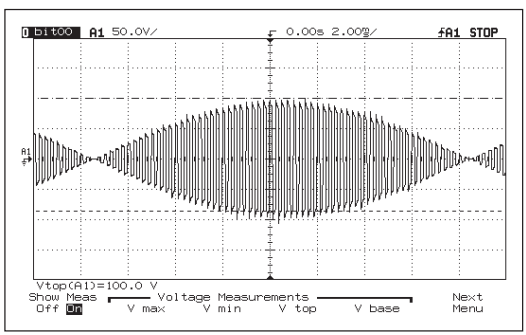
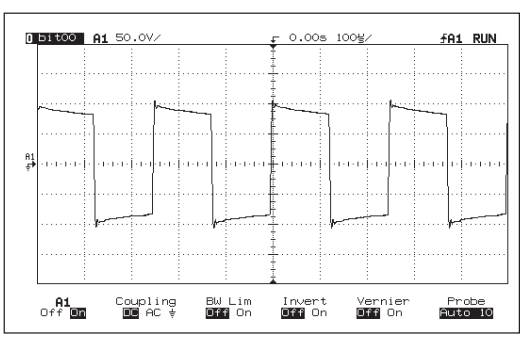


Figure 3



8.5.3 Test 3: Ultrasound

		Yes	No
1.	Connect the treatment head and place it in an ultrasound measurement device. Select an ultrasound therapy.		
2.	Select 1 MHz, continuous (duty cycle 100%), 2 W/cm^2 The measured value is within ±20% of the Ppk value in the channel window.	☐	☐
3.	Select 1 MHz, duty cycle 50%, 3 W/cm^2 The measured value is within ±20% of half the Ppk value in the channel window.	☐	☐
4.	Select 3 MHz, continuous (duty cycle 100%), 2 W/cm^2 The measured value is within ±20% of the Ppk value in the channel window.	☐	☐
5.	Select 3 MHz, duty cycle 50%, 3 W/cm^2 The measured value is ±20% of half the Ppk value in the channel window.	☐	☐
6.	Select 3 MHz, duty cycle 50%, 0.5 W/cm^2 With a dry treatment surface, the Ppk value becomes 0.	☐	☐
7.	Select 1 MHz, duty cycle 50%, 0.5 W/cm^2 With a dry treatment surface, the Ppk value becomes 0.	☐	☐

The maximum power transfer takes place at the operating frequencies. If the equipment does not function at the correct frequency, this results in a too low output power. It is therefore not necessary to check the operating frequencies.

8.5.4 Test 4: Electrical safety test (VDE 0751)

		Yes	No
1.	The resistance of the safety earth is less than 0.2 Ω	☐	☐
2.	The housing leakage current is less than 1000 µA	☐	☐
3.	The patient leakage current is less than 5000 µA	☐	☐

Notes:

8.6 Disposal

Take account of the following environmental aspects when disposing of the equipment and the accessories:

- The basic device, the cables and the electrodes fall under small chemical waste (or electronic waste). These components contain lead, tin, copper, iron, various other metals and various plastics, etc. Consult the applicable national regulations.
- Sponges, sponge bags and gels contain only organic material and do not require any special processing.
- Packaging materials and manuals can be recycled. Deliver them to the appropriate collection points or include them with the normal household waste. This depends on the local organisation of the waste processing.

9 REFERENCE

9.1 Function overview

9.1.1 Therapy menu

Press therapy .

The numbers refer to the program numbers.

Electrotherapy

Unidirectional currents

Diadynamic currents

TENS currents

NMES surge currents

Interferential currents

Diagnostic programs

Ultrasound therapy

Combination therapy

9.1.2 System settings

Press .

Contrast
Language
Sound settings
Stand-by time
Text start up screen
First screen
Copy channel parameters
System information
Plate electrode test
Cable test
Error history
Counter working hours
Reset menu
Stop time if bad US

9.1.3 Objectives

Press guide *and select* Objectives.

The numbers refer to the program numbers. The first program number from electrotherapy is the conventional therapy. If available, the second program number from electrotherapy is the therapy with sequential steps.

Electrotherapy

Decrease pain

Severe pain (VAS 75-100) ... 180/200
Moderate pain (VAS 50-75) 181/201
Slight pain (VAS 25-50) 182/202
Fluctuating pain
(VAS 20-70) 165/203
Aspecific back pain
(VAS<60)..... 172/207

Decrease muscle tone

Moderate pain 183/204
Slight pain..... 184/205
Decrease spasticy 131/206

Improve muscle function

Prevention atrophy 146/229
Decrease atrophy
Clear atrophy 186/227
Slight atrophy..... 187/228
Specific muscle function
Endurance strength 190/230
Absolute strength 147/237
Explosive strength 148/239
Anaerobic strength 150/250
Improve muscle
awareness..... 143
Pelvic floor m. dysfunction
Hypotonic muscle;
very weak..... 54/221
Hypotonic muscle;
weak 55/222
Urge incontinence 56/223
Mixed incontinence 57/224
Hypert. muscle;
tone reduction..... 136/225
Hypertonic muscle;
exhaustion..... 141/226
Denervation, limit atrophy
Triangular pulses 60
Rectangular pulses 61

Improve trophic condition

Superficial tissue 139/213
Muscular tissue 194/214
Via sympathetic nerve
system 135/215
Reduce local edema 119/216

Improve tissue repair

Skin wound..... 51/217
Skin wound+
infection/necrosis..... 52/218
Repair in connective tissue 140/219
Stimulate fracture healing 53/220

Improve activities daily life

Improve activities daily life 142

ET iontophoresis

Iontophoresis..... 40

Ultrasound therapy

Improve trophic condition

Tendinitis
Stage 3 or 4 (subacute)..... 63
Stage 1 or 2 (chronic)..... 62
Ligament lesions
Subacute..... 64
Chronic..... 144
Muscle lesions
Subacute..... 64
Chronic..... 144
Osteo-chondral lesions..... 144
Neurogenic lesions..... 64

Increase extensibilty

Superficial contractures..... 65
Partial joint contractures..... 145

Improve cell function

Phonophoresis

9.1.4 Indication list

Press guide *and select* Indication list.

ET: Electrotherapy, US: Ultrasound therapy, CO: Combination therapy, IO: Iontophoresis

The numbers refer to the program numbers.

9.1.5 Diagnostics

9.1.6 Contra indication

Electrotherapy

General
High fever
Severe cardiovascular problems
Psychological problems
Cancer with tumor metastasis
Generalised tuberculosis

Specific absolute
On demand pacemakers

Specific relative for monophasic pulses
Skin lesions
Thrombosis, thrombophlebitis
Skin infections
Varices
Increased risk to haemorrhage
Superficially implanted materials
Heart disease, rhythm disorder
Decreased sensibility
Locat. near sinus caroticus
Menses
Pregnancy

Specific for relative biphasic pulses
Skin infections
Thrombosis, thrombophlebitis
Heart disease, rhythm disorder
Locat. near sinus caroticus
Decreased sensibility
Pregnancy

Ultrasound therapy

General
High fever
Severe cardiovascular problems
Psychological problems
Cancer with tumor metastasis
Generalised tuberculosis

Specific relative for continuous ultrasound
Infections
Acute inflammations
Thrombosis, thrombophlebitis
Varices
Increased risk to haemorrhage
Pacemaker
Epiphyseal disc (children)
Decreased sensibility
Menses
Cement of endoprosthesis
Diabetes mellitus

Specific relative for pulsing ultrasound
Pacemaker
Pregnancy

Combination therapy
See contra indications
Electrotherapy and US

9.2 Literature

A literature list can be sent on request. Please contact GymnaUniphy.

9.3 Terminology

absolute muscle power: The maximum total tension that a muscle can produce.

accomodation: The ability of the nerve tissue to protect itself against stimulations that slowly increase in strength.

Pulse time	Delay in action potential of rectangular pulse: triangular pulse	Accomodation Quotient (AQ)
500 ms	1:1.5 to 1:3	1,5 - 4
1000 ms	1:2 to 1:6	2 - 6

active trigger point: A point that, with stimulation (pressure, stretch or electrical pulse), besides the local pain also generates a projected pain in the area that the patient is complaining about.

antalgic: The pain is reducing.

atrophy: Deterioration in the nourishment state of organs. As a result, the organs become smaller or shrink.

chronaxie: The time threshold that is required for a muscle contraction or a sensory impression, after the occurrence of the necessary minimum required stimulation.

denervation: Switching-off or weakening of the innervation (paralysis).

durability: Being able to frequently repeat a muscle contraction.

epithelisation: Recovery of the epithelium over the bottom of the wound. A unidirectional current can stimulate the epithelisation. Epithelisation can also be activated by an external electrical stimulation.

explosive muscle power: The highest tension that a muscle can produce in the shortest possible time.

hyperalgesia: An increased sensitiveness for pain. Apply a modified dosage in the case of acute hyperalgesia.

injury current: A small unidirectional current between the epidermis and the corium, which occurs after a wound. This current activates the recovery process. With a slow recovery process, an external unidirectional current can be applied to realise the same effect.

innervation: The effect of the nerves on the working of the muscles or glands.

iontophoresis: The flow of ions through a tissue by means of a galvanic current.

isometric contraction: A muscle contraction whereby the length of the muscle remains constant. The external resistance of the muscle must be at least as large as the power that is generated by the contraction. Under isometric circumstances, especially the tension in the muscle increases and muscle cramp is avoided.

loadability: The (maximum) load that can be carried.

loss of muscle tone: The state of tension of muscles reduces.

Myofascial Trigger Point (MTP): A trigger point that is located in the myofascial tissue. The MTP is located in a hard cord of a muscle. The MTPs can be localised with Pain points in the Diagnostics program.

Neuro Muscular Electro Stimulation (NMES): Contraction of an innervated muscle or muscle group by means of low or medium frequency electrostimulation. The purpose of NMES is to improve or maintain the movement.

pain threshold: The lowest level of stimulation that causes pain.

pain tolerance threshold: The level of stimulation that can just be tolerated by the patient. The pain tolerance threshold is past the pain threshold.

re-innervation: The restoration of the innervation.

responsiveness: The degree to which a tissue or organ reacts to a stimulation. With a high responsiveness, a mild treatment is desired. With a low responsiveness, a more intensive treatment can be desired. Make a good estimate of the responsiveness to determine the correct dosage.

rheobase: The minimum galvanic current strength required with the stimulation of the nerve to cause a muscle contraction.

sclerolysis: The solution of a hardening of the tissue. The tissue can be chemically and electrically softened with a cathode in combination with chlorine or iodine.

skin etching: Electro-chemical reactions that can be threatening for tissues and organs, especially for the skin. With correct application, a desired effect occurs, for example improvement of the circulation. Skin etching occurs with current shapes that have a direct current component.

slow twitch muscle fibre: Muscle fibres with a low contraction speed. The fibres are fairly thin, produce a small amount of power and have a low fatigue level. See also type I muscle tissue.

tetanic contraction: A persistent muscle contraction, on the basis of several contraction waves that are simultaneously in a muscle. You can cause tetanic contractions with an NMES surge current.

tone: The tension state of tissues.

trophic: The state of nourishment.

type I muscle tissue: Muscle tissue with a low contraction speed.

type II muscle tissue: Muscle tissue with a high contraction speed. Set the parameters as follows for stimulation with NMES:

NMES parameter	**type I**	**type II**
Pulse time	Long	Short
Pulse frequency	Low	High
Pulse amplitude	-	High
Series duration and series pause	Short	Long
Treatment time	Long	-

VAS score:: Score on the Visual Analogue Scale (VAS). Tool for evaluating a clinical complaint from the patient. This usually concerns the degree to which pain is felt. With a high VAS score, a mild treatment is usually adequate. With a lower VAS score, a more intensive treatment is desired.

10 INDEX

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