

Fitting the equipment

Using Surface Electrodes

The RT300-S System provides stimulation through adhesive surface electrodes placed on the skin over the following muscle groups:

- right and left gluteals
- right and left hamstrings
- right and left quadriceps

i Your clinician will advise you on which size electrodes are most suitable for you.

i Before you fit the surface electrodes to your body, you must read the Warnings, Precautions and Safety Measures section at the front of this guide. Also read the following sections – Surface Electrode Placement Precautions and Caring for Surface Electrodes.

Surface Electrode Placement Precautions

- If there is poor contact between your skin and an electrode, or an electrode does not adhere to your skin, you may need to trim hair from the electrode site. It is recommended you clip, not shave, the hair.
- Following each session, always check electrode sites for any redness or other adverse reactions. If your skin becomes irritated, move the electrode to a slightly different area until the irritation clears. If irritation persists, or you experience a burn, contact your clinician.
- Do not use any surface electrodes that are smaller than those provided with the RT300-S System.
- Renew electrodes after 10-15 uses. See page 13 for re-ordering information.
- Periodically check the electrodes are in full contact with your skin. If an electrode repeatedly fails to adhere properly, replace it with a new one.
- Rough edges on a surface electrode may also cause electrical burns so replace the electrode if this occurs.
- Be especially careful to check the condition of the electrodes that you use on your gluteal muscles as these are subject to more wear.

Caring for Surface Electrodes

- Use the self-adhering surface electrodes supplied by Restorative Therapies Inc. See the details in Table 3 for ordering new electrodes.
- A surface electrode is expected to last for 10 to 15 applications with normal use. Throw a surface electrode away if it adheres poorly or shows signs of wear and tear (e.g. rough edges).
- Gently remove a surface electrode by lifting it from one corner. Do not pull on the connecting lead as this may damage the connection.
- Replace surface electrodes on the plastic carriers when they are not in use.

i See the surface electrode pack for more instructions on use, care and storage.

Fitting the Surface Electrodes

i To use the RT300-S System, you must have all 12 surface electrodes correctly fitted to your body, as shown in Figure 23.

To fit the surface electrodes:

1. Make sure the skin where the electrodes are to be placed is clean and dry. Remove any lotion with an alcohol wipe.
2. Peel the plastic carrier off a pair of surface electrodes.
3. Place the two surface electrodes on your body at the correct location. (See Figure 23).
4. Apply light finger pressure to the entire surface of each surface electrode to make sure it is in full contact with your skin.
5. Repeat steps 2 to 4 for the remaining five pairs of surface electrodes.

Where to Place Surface Electrodes

Figure 23 indicates the sites for electrode placement. However, as placement varies slightly between individuals, your clinician will determine the locations that provide the most effective stimulation for you.

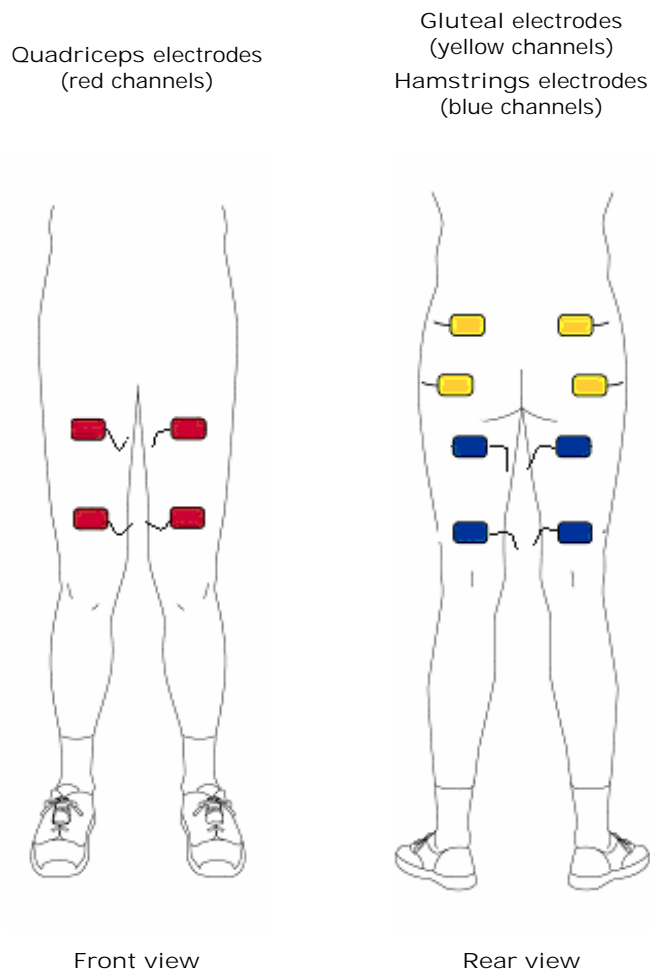


Figure 23: Surface electrode sites

i The Gluteal electrode leads should face outward (lateral). It is often easiest to attach the stimulation cable to the Gluteal electrodes before placing them on your skin. All other electrode leads should face inwards (medial) as shown in Figure 23.

Connecting the surface electrodes to the ergometer

Stimulation Cable Set

Once you have fitted the surface electrodes, connect them to the stimulation cable.

One end of the stimulation cable splits into 12 leads. Six leads for the left side of your body and 6 leads for the right side. Each lead is color coded and labeled with two letters.



Figure 24: Color-coded, marked leads

Table 4 shows how the color and letters on a lead represents a particular muscle group.

Letters	Color code	Muscle Group
LG	Yellow	Left Gluteals
LH	Blue	Left Hamstrings
LQ	Red	Left Quadriceps
RG	Yellow	Right Gluteals
RH	Blue	Right Hamstrings
RQ	Red	Right Quadriceps

Table 4: Color-code/letter on stimulation cable leads

Each lead must be fitted to the corresponding surface electrode according to the color and letter.



Leads with an “R” on the label are for the right side of your body. Leads with an “L” on the label are for the left side of your body.

Examples

A surface electrode fitted to your right quadriceps connects to a red lead marked RQ.

A surface electrode fitted to your left gluteals connects to a yellow lead marked LG.

Connecting the Surface Electrodes

To connect the stimulation cables:

1. Using the color-coding and letters on each lead as a guide:
 - connect the leads from the stimulation cable to the electrodes placed on your body.

i Make sure all lead pins are fully inserted (see Figure 25). Press your finger tip across the top of the socket to be sure.

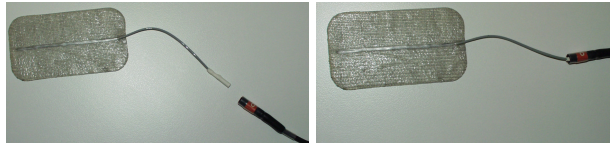


Figure 25: Connecting a lead to an electrode

2. Plug the stimulation cable into the outlet on the bottom of the Controller / stimulator – it will only fit in one way (vertical arrow on the connector to the front) and it will click into place.

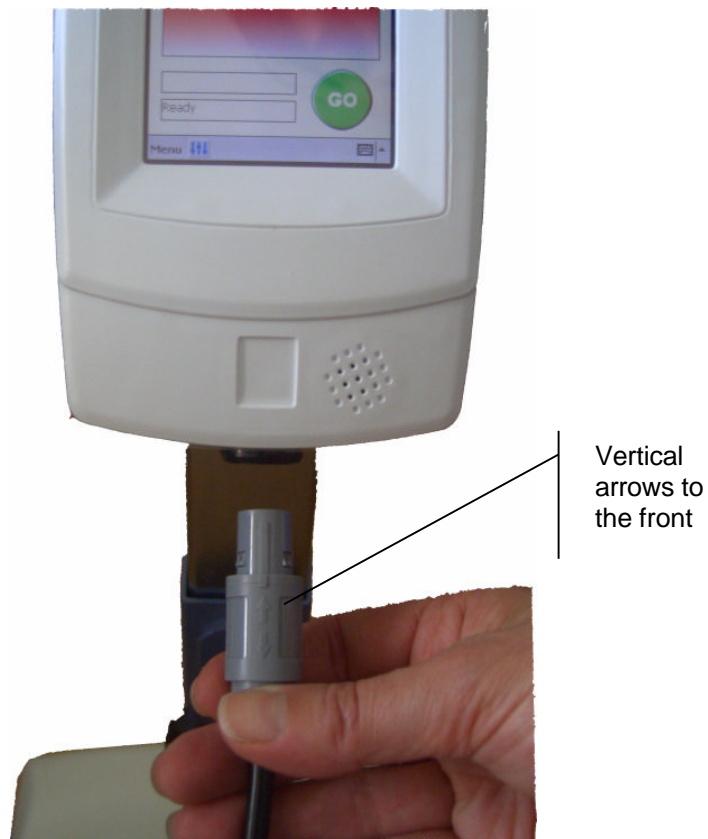


Figure 26 Attaching the stimulation cable

Using the RT300-S System

Using the RT300-S System involves:

- initial setup
- correctly positioning yourself on the ergometer and making any necessary adjustments
- fixing your feet in the footrests and your legs in the calf rests
- restraining your wheelchair so that it does not move during the therapy session
- understanding what happens during a typical therapy session
- understanding the functions of the RT300-S controller / stimulator
- starting and stopping a session
- knowing what happens if muscle spasm occurs
- being aware of the possibility of autonomic dysreflexia

Initial setup

When you first power on the RT300-S it is necessary to calibrate the Controller's touch screen.

The procedure to do this is described below.



Once you have calibrated your controller's touch screen you should leave the RT300-S connected to a power outlet. This will ensure that the RT300-S controller's back up battery remains charged.

If you disconnect your system from a power outlet you will need to repeat this calibration procedure.

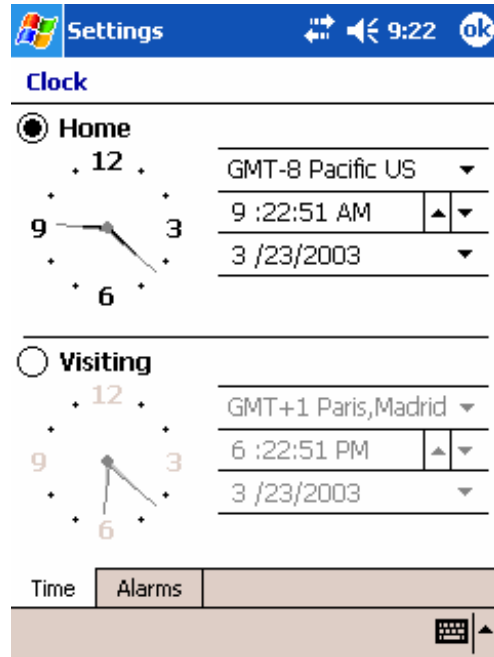
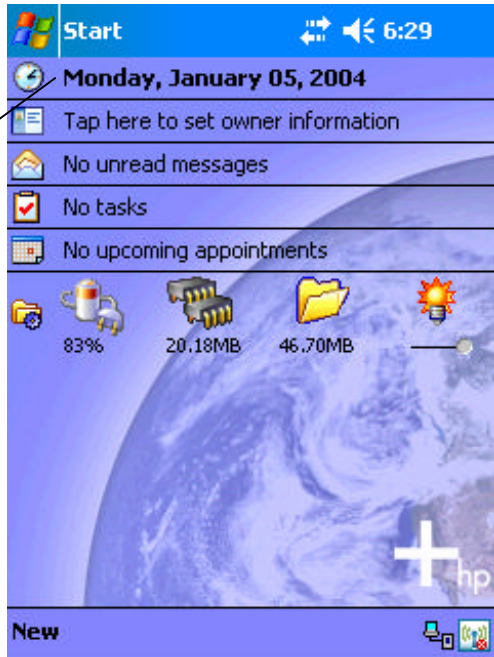
Calibrate the touch screen

1. Follow the instructions provided by the Controller
 - Using the Stylus touch the screen in the positions requested by the controller.
 - Cut and paste the demonstration appointment
 - Select your time zone

Set the time and date

1. Set the Home time on the system as shown below:

1. Press the date



2. Enter the correct time and date here

Positioning on the Ergometer

Getting into the correct position on the ergometer involves:

- setting the distance between your wheelchair and the ergometer
- strapping your feet into the footrests and legs against the calf rests

Setting the distance

The distance you should set between your wheelchair and the ergometer is affected by:

- the type of wheelchair you use
- the length of your legs
- your height

The most effective way to check you are correctly positioned is to check the angle of your knee joint when your foot is in the footrest and your leg is fully extended.

To set the correct distance:

1. Place your foot in a footrest, resting your leg in the leg guide.
2. Move your wheelchair slowly back or forward until your knee joint reaches a 45° angle, as shown in Figure 27.

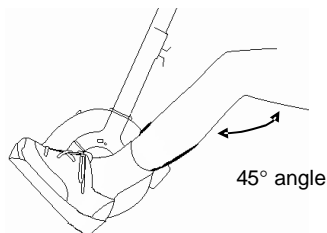


Figure 27: Knee joint at 45° angle

Using the Calf Rests and Footrests

It is recommended you always wear shoes (e.g. running shoes) when using the RT300-S System. The footrests are designed to accommodate shoes, while the calf rests help support the legs.

Both the footrests and calf rests have straps for added support and safety.



Do not put your whole body weight on the pedals when you place your feet in the footrests.

To use the footrests and calf rests:

1. Open the straps on the footrests and calf rests.
2. Place your left foot in the footrest, resting your leg against the leg guide.

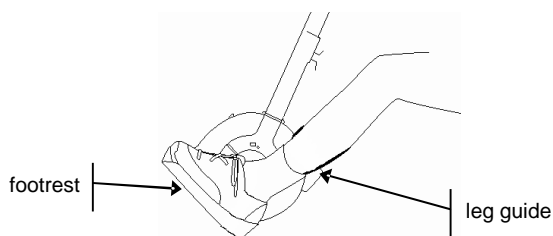


Figure 28: Foot and leg position

3. When you are correctly positioned, fasten the straps on the footrest and leg guide.

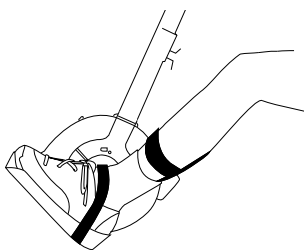


Figure 29: Straps fastened on footrest and leg guide

4. Repeat steps 2 and 3 for your right foot.

Using the wheelchair restraints

Once you have correctly positioned your wheelchair you should use the restraining straps provided to ensure that your wheelchair does not move during your therapy session.

1. Hold down the red lever on the front of one of the restraining straps and pull out the strap
2. Hook the strap to a secure point on your wheelchair beneath the level of your seat.
3. If necessary turn the tightening knob to take up any slack
4. Repeat for the other restraining strap

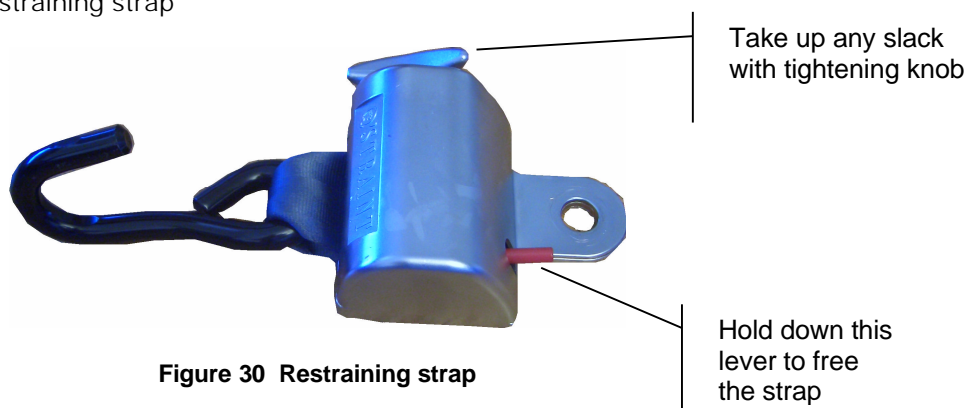


Figure 30 Restraining strap

To remove the wheelchair restraint:

1. Hold down the red lever on the front of one of the restraining strap and pull out enough slack to allow you to unhook the strap from your wheelchair
2. Release the strap and it will retract back into the restraint system.

Using the Controller

The controller's Therapy Session screen shows what is happening at any particular time during a therapy session. The controller's touch-sensitive screen allows you to:

- Start and stop your therapy session
- Monitor the progress of your therapy session
- See any warnings or errors that occur
- Update your stimulation parameters

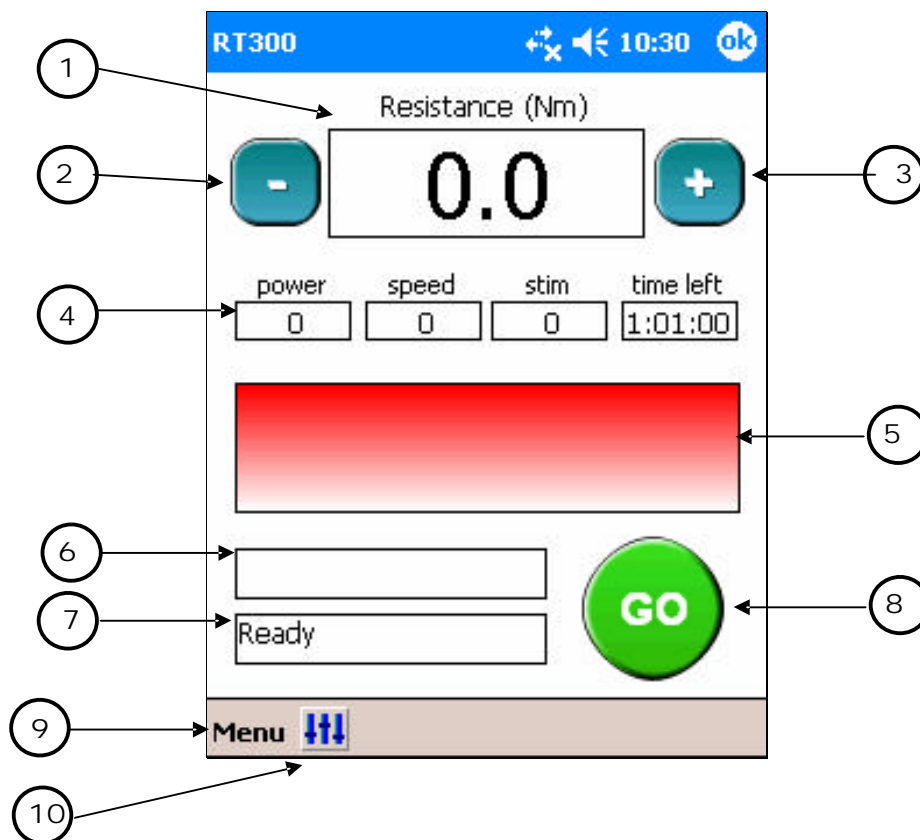


Figure 31: Controller - Therapy Session screen

- 1 Main display window shows one of:
 - Ø Time left
 - Ø Cycling speed
 - Ø Stimulation level (by default)
 - Ø Resistance
 - Ø PowerTap this window to cycle the displayed data.
- 2 Decrease button
This button is only shown if Resistance is being displayed in the main display window AND patient adjustment has been enabled by the Clinician (see note below). Tap this button to reduce your resistance level during active therapy.
- 3 Increase button
This is only shown if Resistance is being displayed in the main display window AND patient adjustment has been enabled by the Clinician (see note below). Tap this button to increase your resistance level during active therapy.
- 4 Secondary display windows.
Tap these windows to transfer their data to the main display window.
- 5 Graphical display of data as your therapy session progresses
 - Ø The green tracing shows your stimulation level history
 - Ø The blue area represents time and stimulation level remaining
- 6 Notices of a pending change in the phase of your therapy session (see page 37)
- 7 Therapy State:
 - Ø Ready
 - Ø Warm up (initial passive cycling)
 - Ø Active cycling (stimulation operating)
 - Ø Passive cycling (fatigue has been detected)
 - Ø Cool down
 - Ø Finished
- 8 Start and Stop button
"Start" when the system is stopped and "Stop" when the system is operating.
 - Ø Press "Start" to commence your therapy session.
 - Ø Press "Stop" if you want to stop your therapy session early.
- 9 Menu bar allows for
 - Ø About RT300... displays the version of the RT300 software
 - Ø Log in... allows your clinician to log in to the system to adjust therapy parameters
- 10 Configuration button
See page 41 for how to adjust your stimulation settings

i Clinician note: To enable or disable patient control of resistance tap on “Resistance” and enter the Clinician code when prompted.

Therapy Sessions

Once you are correctly positioned (page 33) and your wheelchair is restrained (page 34) you are ready to begin a therapy session.

RT300-S System therapy sessions help you to pedal using your own muscle power, providing the opportunity to make continual progress over the course of your therapy plan.

The RT300-S System is designed with pre-set (default) therapy settings. Your clinician may also make adjustments to settings like the:

- length of your therapy session
- amount of power your muscles generate during a therapy session

How the therapy session progresses

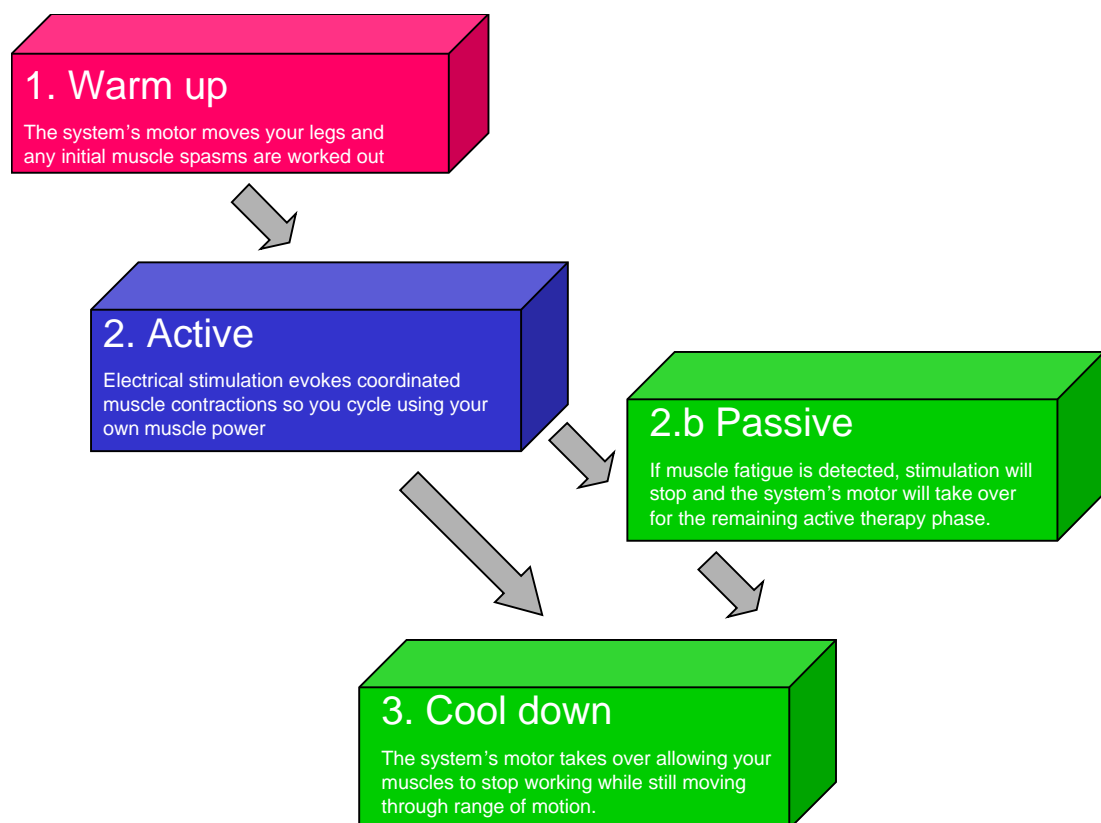


Figure 32 Phases of your therapy session

Inbuilt Safety Measures

At the end of each session, the RT300-S System automatically switches off. There are also inbuilt safety measures to help protect you during therapy. You should be aware that:

- if the system registers muscle fatigue, the ergometer’s motor takes over for the remainder of the session. You will see that the display swaps from displaying “Active cycling” to “Passive cycling”.
- if an electrode falls off, the system immediately pauses by ceasing stimulation and switching off the motor. An error message is displayed on the controller Therapy Session screen to let you know what has happened. After you fix the problem, tap Go to restart the session.

Handling Muscle Spasm

At the beginning of the Warm Up phase, muscle spasms may occur. These usually subside before the Warm Up period ends.

If the spasms persist, wait approximately 5 minutes and then begin the therapy session again. If the spasms still do not subside, the therapy session should be postponed.

Starting and Stopping a Therapy Session

i Before every therapy session, always empty your bladder to minimize the risk of autonomic dysreflexia occurring. If you have any concerns, talk to your clinician.

Starting a Session

To start a therapy session:

1. If the screen is dark, touch the controller screen to turn the system on.
2. Tap Go. The ergometer starts operating and your therapy session begins.

i Tapping...
You can tap the screen using the stylus provided or your fingernail. If your fingernails are short, simply use the back of your finger to allow your fingernail to contact the screen.

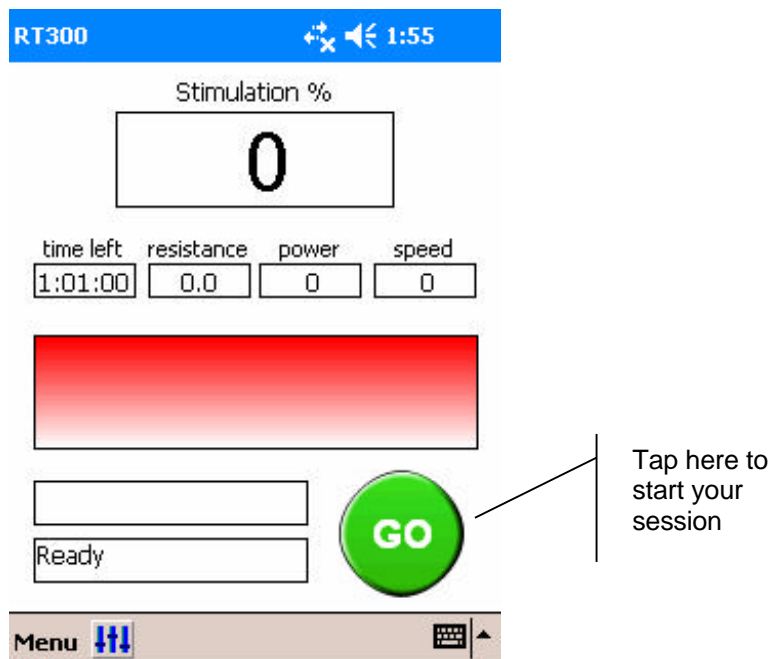


Figure 33 Starting a session

Stopping a Session Early

The RT300-S System automatically stops once the end of the session is reached. However, you can stop the session at any time if you wish. To stop a therapy session early:

1. Tap Stop. The session is ended.

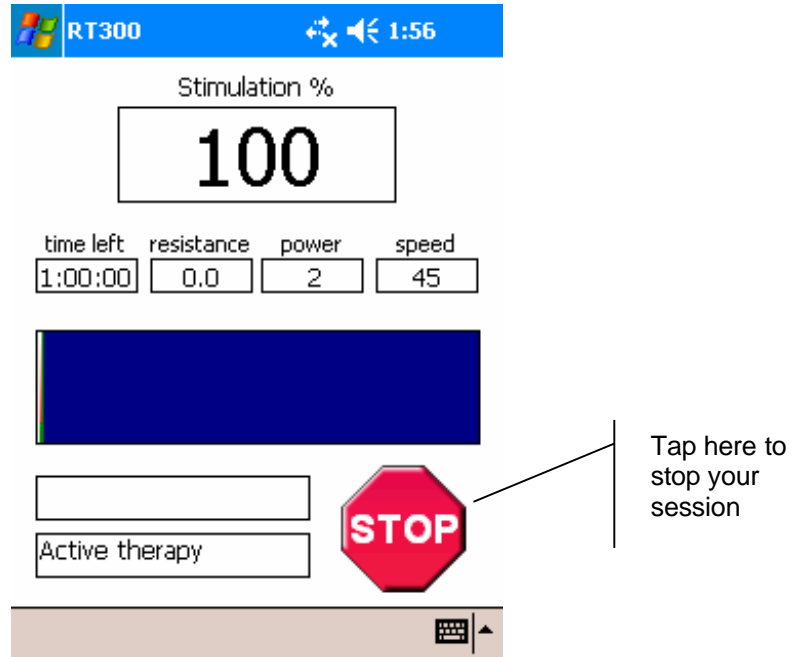


Figure 34 Stopping a session early

Restarting a Session

The RT300-S will give you the option of either restarting your session or commencing a new session if you press GO within 5 minutes of stopping the session early.

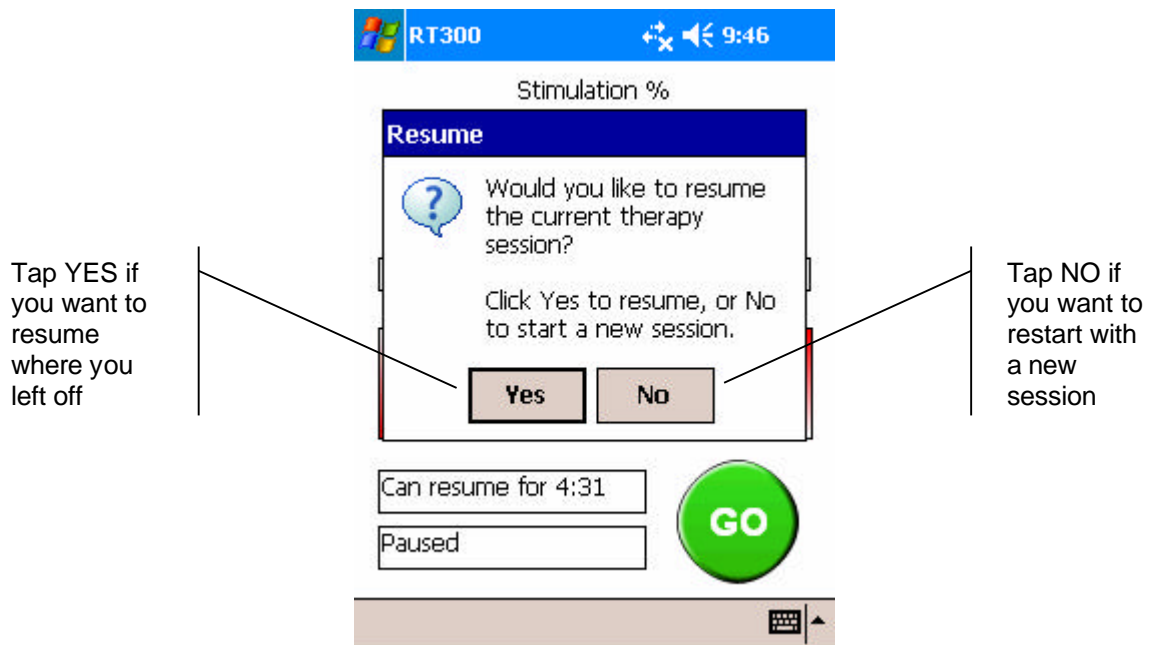


Figure 35 Resume the session or restart ?

Data display graph

The figure below illustrates the meaning of the data display graph which shows you how your session is progressing.

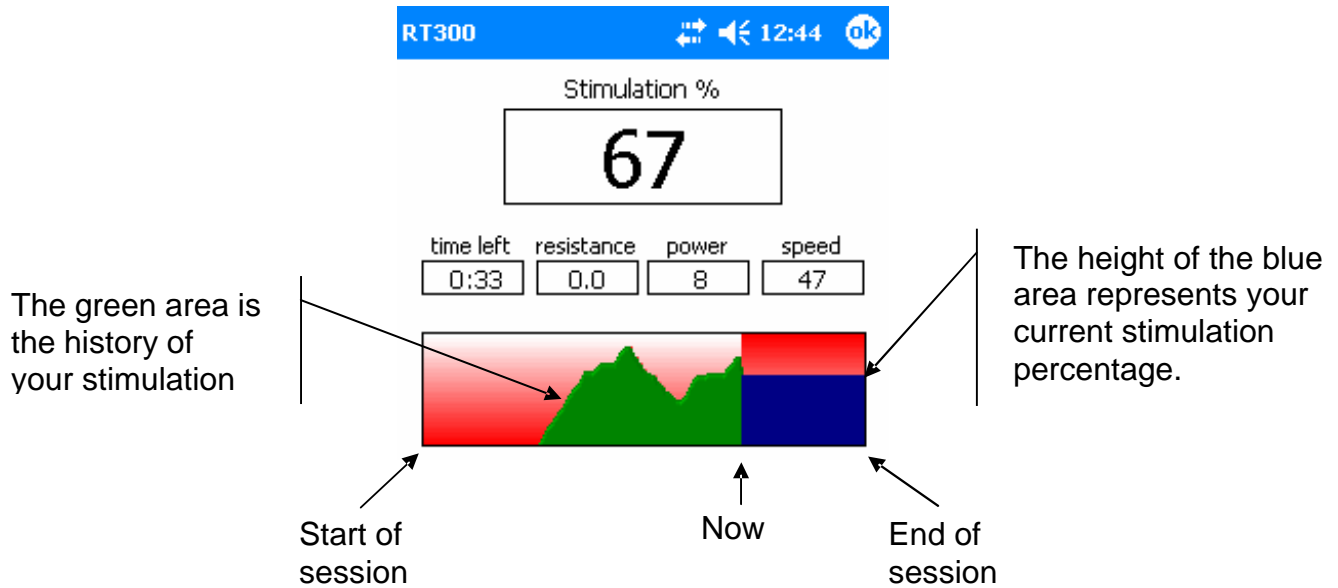


Figure 36 Data display

Adjusting parameters

- ❗ Clinicians should be cautious in setting initial maximum stimulation levels. Children in particular may require initial levels to be set lower than the default level.
- ❗ You should only adjust these parameters after consulting with your clinician.

Stimulation parameters

The stimulation parameter page is accessed via button  

Enter the password when prompted. This password can be requested from your Clinician; it is designed to prevent unintended access to the stimulation parameters by children.

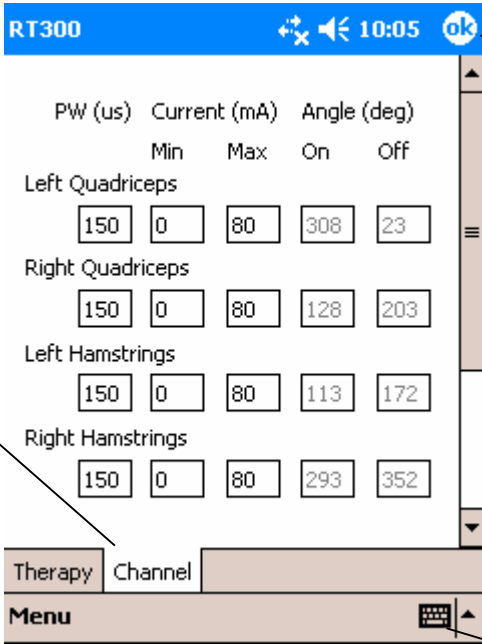
Select the Channel page by tapping on the Channel tab (see figure below).

This page allows you to change the pulse width, minimum current and maximum current that is delivered by the RT300-S system to each of your muscle groups. This page will default to initial appropriate levels depending on whether you have an adult or pediatric RT300-S system.

During active therapy the RT300-S system will use as much electrical stimulation as is required to keep you cycling at the set cycling velocity. However, the stimulation amplitude on any channel will never exceed the maximum (Max) that has been set for that channel (see Figure 37).

Normally, if sensation to stimulus is not an issue, the maximum (Max) stimulation levels should be left at 140 mA for adults or 80mA for children.

The minimum (Min) stimulation is the amplitude in milliamps (mA) where a muscle first begins to contract as a result of surface electrical stimulation.



Tap OK when done

Select the "Channel" tab

Scroll down to see the Gluteal settings

Tap the keyboard to display the data entry keyboard

	PW (us)	Current (mA)		Angle (deg)	
		Min	Max	On	Off
Left Quadriceps	150	0	80	308	23
Right Quadriceps	150	0	80	128	203
Left Hamstrings	150	0	80	113	172
Right Hamstrings	150	0	80	293	352

Figure 37 Stimulation parameter page

Making changes

To make a change to the stimulation parameters:

1. Tap the keyboard in the lower right corner of the screen
2. Highlight the number to be changed
3. Enter the new number using the displayed keyboard
4. Tap OK in the top right of the display

Therapy parameters

The stimulation parameter page is accessed via button 



Enter the password when prompted. This password can be requested from your Clinician; it is designed to prevent unintended access to the stimulation parameters by children.

Select the Therapy page by tapping on the Therapy tab (see figure below).

This page allows you to change one or more therapy parameters if enabled by your Clinician.

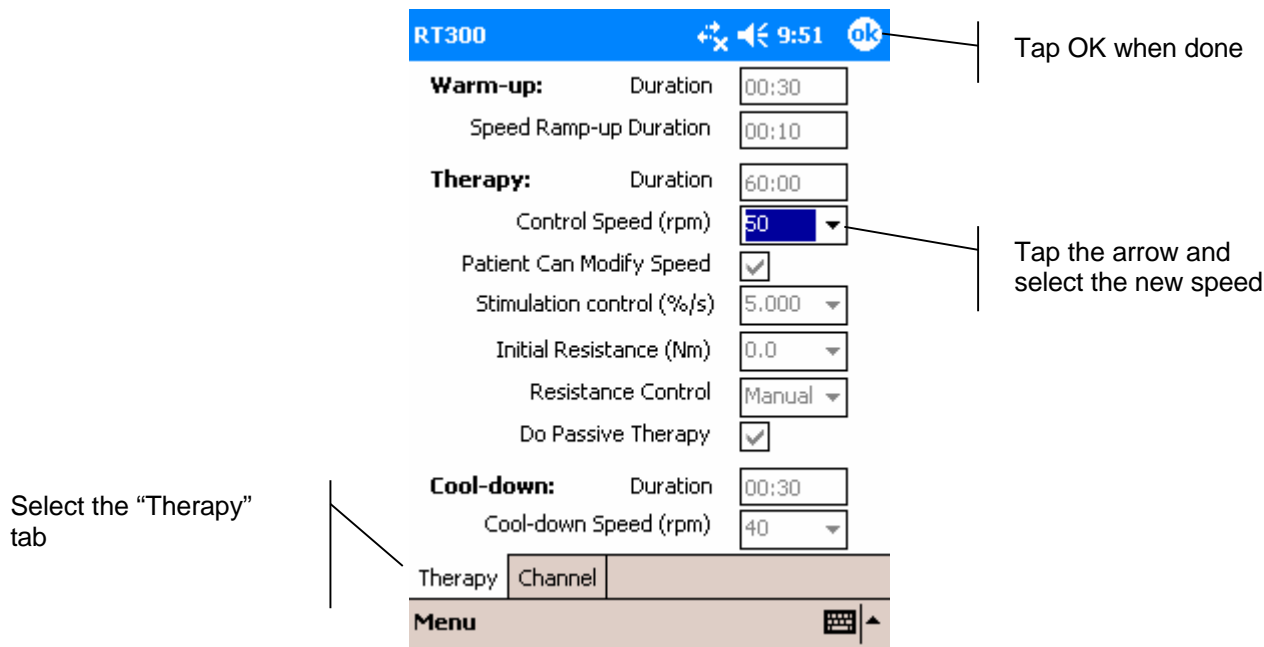


Figure 38 Therapy parameter page

Making changes

To make a change to the cycling speed:

1. Tap the keyboard arrow to the right of the speed selection box
2. Tap the required new speed setting
3. Tap OK

Restoring default values

To restore values to their default settings:

1. Tap on the menu button
2. Tap Restore Defaults

Select either This Screen Only to restore the values displayed on the currently shown screen OR All Data to restore all values on all of the configuration pages to their default values.

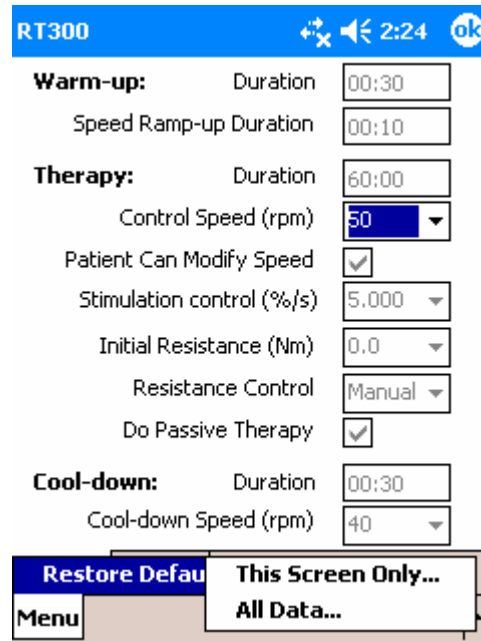


Figure 39 Restoring default values

Troubleshooting

Resetting the Controller

You may need to reset the RT300-S System controller in some situations, for example, if the controller does not respond when you tap the screen.

To reset the controller:

1. Press the Reset button on the back of the controller using the stylus or a pen.

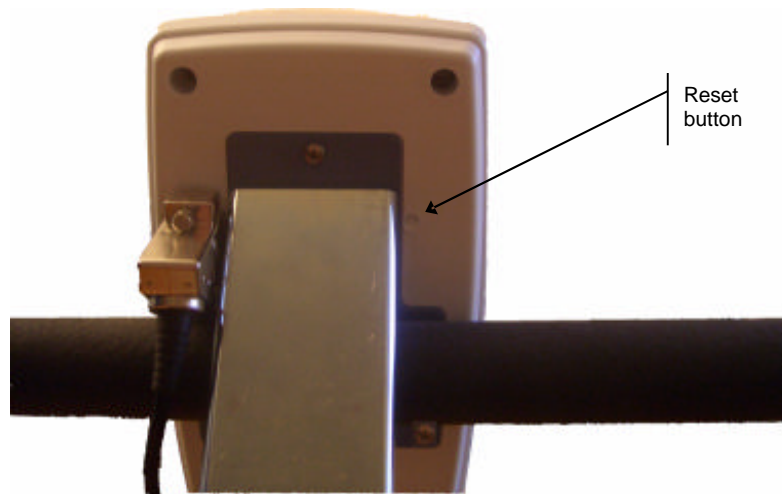


Figure 40: Reset button on controller

2. Wait until the controller displays the Therapy Session screen.

Care of the RT300-S System

Cleaning and Maintenance

Regularly cleaning the equipment prevents a build-up of dirt.

i Always unplug the power cord from the power outlet before you start cleaning.

- Never use solvent-based or corrosive on the RT300-S System.
- Wipe the controller screen with a dry clean cloth. Don't use any water - make sure no moisture gets into the controller.
- Use a damp, soft cloth to clean the RT300-S System surfaces.
- Take care not to damage or remove labels during cleaning.
- After 2 years (or 2,000 hours) of use, the controller displays a message to let you know that it is time for a maintenance check. Contact RTI Technical Support to arrange the service.

Storing the RT300-S

When you are not using the RT300-S System:

- store the RT300-S System equipment in temperatures between -20°C (-4°F) and $+50^{\circ}\text{C}$ ($+122^{\circ}\text{F}$)

Moving the RT300-S System

i Always unplug the power cord from the power outlet and the RT300-S System before moving the device.

The RT300-S System is fitted with castors and a handle to facilitate moving the RT300-S System short distances over a smooth surface. Hold the handle with one hand and place the other hand under the power unit.

To move the RT300-S System, tilt it backwards as shown in Figure 41 and push it in front of you.



Figure 41 Moving the RT300-S System

i The castors are not suitable for the transport on uneven or rough surfaces. Two people are required to carry the RT300-S System up or down stairs.







Shipping Instructions

The RT300-S Cycle Ergometer should be shipped in its original packaging.

The package dimensions are: 27" x 23" x 20"

The package weight is: 90lbs

Symbols

Symbol	Meaning
	Fragile
	See instructions for use
 2004-05-30	Date of manufacture
 +50°C (+122°F) -20°C (-4°F)	Temperature limit
 LOT 12345	Lot number or Batch number
REF 12345	Reference number or Part number
IN 123456	RTI's Serial Number
Model FA100052	Model Number
	Type BF Part

Technical Specifications

	115V	230V
Motorized Ergometer		
Length	31.5" or 80cm	
Width	19.3" or 49cm	
Height	36.2" – 40.6" or 92 – 103cm	
Shipping weight	86lbs or 40kg	
Length of pedal:		
• RT300-S	4.3" or 110mm	
• RT300-S-P (pediatric)	4.3" or 110mm	
Speed range	0 – 55 rev/min (± 2 rev/min)	
Torque range	0 – 16Nm (± 1N)	
Power connection	115V~, 50/60Hz	230V~, 5/60Hz
Power input	130VA	130VA
Fuses	2 x 1.6 A 250V slow	2 x 1.0 A 250V slow
Key materials	Aluminum, Steel, Polystyrol, Polyurethane	
Protective type	I	
Degree of protection	Type BF Applied Part 	
Noise emission	Lpa ≤ 70dB (A)	
Noise emission value	According to DIN 45635-19-01-KL2	
Mode of operation	This device is for continuous use.	
Conditions:		
• In use	5°C (41°F) to 40°C (104°F) 0 to 90% Rh 970 to 1030hPa	
• Transporting/storing	-20°C (-4°F) to +50C (+122°F) 0 to 90% Rh 970 to 1030hPa	
Controller		
Display / interface	Touch-sensitive LCD	
Communications	Wireless (BlueTooth)	
Operating system	Windows CE 2003	
Inbuilt stimulator		
Maximum voltage output	200V	
Number of channels	6	
Current output per channel	0 – 140mA (± 2mA) with 0 to 1500Ω load	
Waveform type	Biphasic, charged balanced	
Pulse frequency	20Hz	
Phase width	0 – 250μs	

RT300-S Ergometer Limited Warranty (USA)

This document is important. It contains your Limited Warranty for each of the product(s) identified below that you purchase (the "Product") and register with Restorative Therapies Inc. The terms and conditions of your Warranty, including important limitations on how the Product should be used, are set out below.

Product	Part Number	Warranty Period
RT300-S	FA100052	1 year
RT300-S-P	FA100053	1 year
Ergometer platform	FA100019	1 year

Limited Warranty, Terms and Conditions

A. Introduction

Words which appear in italics, like this, are given defined meanings in clause D below. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from State to State. This Limited Warranty applies in all jurisdictions.

B. Enquiries and Warranty Service

If you have an enquiry about this Limited Warranty or you want to have a Product repaired, please contact Restorative Therapies Inc. Do not ship Product to us without first obtaining a Return Material Authorization Number.

2363 Boston St
Baltimore, MD 21224
USA

Phone: (800) 609-9166
Fax: (410) 534-6263
Email: warranty@restorative-therapies.com

C. Your Warranties and Rights

3. We, Restorative Therapies Inc ("we"), warrant to you, the owner of the Product ("you"), that:
 - a. each Product is reasonably fit for the purpose or purposes for which it is supplied by us; and
 - b. each Product will be free from defects in workmanship and materials for the Warranty Period listed above.
4. If your Product is found not to be reasonably fit for the purpose or purposes for which it was supplied, or if it has defects in workmanship or materials during the Warranty Period, we will at our choice either:
 - a. repair the Product at your home or clinic; or
 - b. ship the Product to our facility for repair or replacement
5. Unless otherwise required by local laws, where a Product is replaced under clause 2 in this Section of the Warranty, the warranties set out in the table above will continue to apply for the unexpired portion of the Warranty Period of the original Product.

D. Warranty limitations

6. We will not be liable to you or any other person under any circumstances for any incidental or consequential loss or damage, including without limitation, any liability for third party claims against you for damages or for Product not being available for use. Our liability will be no more than the amount you paid for the Product that is the subject of a claim. Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
7. Any implied warranties of merchantability and fitness for a particular purpose are limited to the Warranty Period. Some States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.
8. All terms, warranties and conditions which are not set out in this Warranty as to the state, quality, fitness or otherwise for purpose, merchantability are expressly excluded and will not apply to the Product except where such terms, conditions and warranties are implied by applicable local laws and cannot be excluded or modified.

E. Restrictions on product use

9. The Product is designed and manufactured to operate according to the specifications contained in the RT300-S Ergometer User Manual.
10. The Product is designed and manufactured to operate within the temperature range of +5°C (+41°F) to +40°C (+104°F) and the Product should not be subject at any time to temperatures below -20°C (-4°F) or above +50°C (+122°F) otherwise this Warranty will be void for the Product.
11. The Product is supplied to you/your clinic/your clinician subject to our Standard Conditions of Sale. In the event of any inconsistency between the terms of this Warranty and our Standard Conditions of Sale, our Standard Conditions of Sale will prevail.
12. This Warranty will be void should we find evidence of alteration or repair of the Product or by anyone other than personnel authorised by us.
13. This Warranty will be void should we find evidence of any misuse, negligence or accident in respect of the Product by you or any other person.

F. Keywords

Local laws means applicable statutes and other laws of the jurisdiction in which the Product is supplied to you.

Owner means the person who originally purchased the Product or a person who later acquires it.

Product means an item of equipment manufactured or supplied by us to you, which has been identified on the first page of this Warranty.

Warranty Period in relation to a Product, means the period set out opposite the Product on the first page of this Warranty commencing from the date we ship the Product to the purchaser.



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www.restorative-therapies.com

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