



Heartrate Manual

INTRODUCTION

Congratulations on your choice of the WaterRower Heart Rate Monitoring attachment. We are sure that it will greatly assist the quality of your exercise program.

Exercising at the correct intensity is a very important part of optimizing the effectiveness of your exercise program.

Exercise intensity measured in terms of distance or speed is very subjective because it depends on the individual's physiology, age, weight, sex, physical condition, etc.

Additionally, tiredness, hydration, stress, energy stores and physiological cycle have a great bearing.

Individual exercise intensity is a measure of how much work your body is doing. Controlling the intensity of exercise is essential in targeting and achieving your desired exercise objective.

This manual attempts to explain how you, as an individual, may best achieve your exercise objective.

Should you want more information please contact us or consult an exercise physiologist.

EXERCISE PHYSIOLOGY

Exercise physiology is discussed in detail in the WaterRower owners manual and we recommend that you review this information.

Exercise and the benefits derived from exercise rely on the processes by which the body generates the energy to perform work over prolonged periods.

The principal fuels the body uses to produce energy over prolonged periods are derived from the body's stores of fat, carbohydrate or protein. The body converts these fuels into energy by one of two processes, the Aerobic metabolic process and the Anaerobic metabolic process.

Aerobic- the aerobic metabolic process produces energy by consuming fuel stores in the presence of oxygen (supplied by the flow of blood) producing bi-products, carbon dioxide and water (which are expelled by respiration and perspiration).

As exercise intensity is increased the more energy is required to perform the work and the more oxygen is consumed. Hence an increase in breathing and heart rate.

Similarly as exercise intensity increases the body recruits different fuel stores as the main source of fuel.

Anaerobic- the anaerobic metabolic process occurs when there is insufficient oxygen in the blood supply to produce energy by the aerobic metabolic process alone. The anaerobic process consumes carbohydrate as its primary source of fuel and does so in the absence of oxygen to produce a product called lactate.

It is lactate which causes the fatigue and muscle soreness associated with excessive exercise. At high exercise intensities lactate will quickly build in the muscles until exercise must cease.

EXERCISE INTENSITY

It is common to measure exercise intensity in terms of a percentage. This percentage figure may be seen as the range of sustainable exercise with 0% representing rest and 100% representing maximal sustainable output. Maximal sustainable output is the level above which exercise must cease due to lactate buildup and fatigue.

At low intensities of exercise (50-60%) the body will function purely aerobically and burn fat stores as the primary source of fuel.

At moderate intensities of exercise (60-70%) the body will function purely aerobically and burn a combination of fat stores and carbohydrate stores as its primary source of fuel.

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At high intensities of exercise (>80%) the body will function aerobically and burn carbohydrate stores as its primary source of fuel. At this level lactate will accumulate in the blood stream faster than the body is able to expel it (though the respiration, sweat, the liver and kidneys). Eventually the lactate levels will increase to a level where exercise must stop.

You may use these various intensity levels to optimize achievement of your specific exercise objectives.

EXERCISE OBJECTIVE

You may use these various exercise intensities to achieve a range of exercise objectives. For example;

Fat Burn (Weight Maintenance) training- the main objective is to burn fat stores as the primary source of fuel, reducing weight. To achieve this exercise objective low exercise intensities (60-70%) and longer exercise durations are required.

Aerobic (Cardio Vascular) training- the main objective is to improve the efficiency with which the cardio vascular system can supply oxygen, enhancing endurance and well being. To achieve this exercise objective moderate intensities (70-80%) and moderate durations are required.

Maximal (Fatigue Tolerance) training- the main objective is to improve the recovery of the aerobic system after short bursts of intensive exercise. To achieve this exercise objective high intensities (>80%) are required for short sharp bursts followed by a period of recovery to avoid the onset of fatigue.

MONITORING EXERCISE INTENSITY

The WaterRower like most other exercise machines contain several means of monitoring your progress. The WaterRower Series III Monitor provides a choice between speed in meters per second (m/s), power in watts (watts), average speed (ave m/s) and average watts (ave watts).

While these measurements give an indication of your progress they are extremely subjective as an accurate measure of ones individual exercise intensity. Most importantly they fail to take account of exercise objective, level of fitness, age, sex, tiredness, hydration, stress, energy stores, physiological cycle, as mentioned earlier.

There are various means of monitoring ones individual exercise intensities and hence accurately targeting your exercise objective. One of the best researched (and convenient) means relies on the correlation between exercise intensity and heart rate.

HEART RATE TRAINING

There are numerous means of measuring your heart rate, the simplest being measuring your pulse. There are however severally commercially available heart rate monitors which vary from the crude (and often inaccurate) ear and thumb clip types to the extremely accurate (and complex) Electro Cardiographs (ECGs) as seen in hospitals.

Probably the most popular (and accurate) means of measuring heart rate are the wrist watch type monitors as made by companies such as Polar™ (for more information contact your Authorized WaterRower Agent or visit www.polar.fi).

Polar™ heart rate monitors measure the electrical impulse of the heart using a chest belt and transmit the data to a wrist watch read out via telemetry.

The WaterRower Series III monitor has been designed to incorporate Polar™ technology. By incorporating a small receiver box and using a Polar chest belt, the Series III monitor will display heart rate (Contact your Authorized WaterRower Agent for details).

On the WaterRower Series III Monitor, when a heart rate signal is being received, the monitor will display heart rate in lieu of stroke rate in the bottom right-hand window for 7 out of every 10 seconds.

The WaterRower Series III Monitor will also allow you to set your heart rate zones by a number of different methods which will be discussed later.

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CALCULATING MAXIMUM HEART RATE

Your maximum heart rate (MHR) is the highest possible heart rate you can achieve. It corresponds to your maximum aerobic output, and is based on your physiology and fitness level.

Maximum heart rates vary according to the number and size of the muscle groups used during exercise, a cycling test, for example, will have a MHR a few beats lower than a WaterRower test due to the fewer muscle groups being used.

MHR will vary from individual to individual and there are numerous laboratory based means of accurately calculating it.

Here we will use a simple "rule of thumb" as follows;

Women: MHR = 226 - Your age
Men: MHR = 220 - Your age

For example:

A 40 year woman would calculate her maximum heart rate as follows; $226 - 40 = 186$ beats per minute (bpm).

You should consider this formula only as a convenient guideline and be aware that it does not cater for variation from individual to individual.

Should you wish to determine your MHR more accurately we recommend that you consult an Exercise Physiologist.

CALCULATING RESTING HEART RATE

Your resting heart rate (RHR) is your heart rate taken at complete rest. This is best calculated in the morning before you rise.

TIP: Count your heart beats over a 10 second period and then multiply by 6. Take readings every day over a few days and then average these.

Periodically measuring RHR is an excellent means of detecting the onset of illness. If you notice your RHR suddenly increase it may be a sign of pending illness and it may be best to lay off exercise for a while and/or consult a physician.

CALCULATING YOUR TARGET HEART RATE

Once you have your MHR and RHR it is simple to calculate your target heart rate by the following formula;

$$\text{Target HR} = \text{RHR} + \text{Exercise Intensity (\%)} \times (\text{MHR} - \text{RHR})$$

For Example, if your RHR is 60, your MHR is 190 and your desired exercise intensity is 70% then;

$$\begin{aligned} \text{Target HR} &= 60 + 70\% \times (190 - 60) \\ \text{Target HR} &= 60 + 70\% \times 130 \\ \text{Target HR} &= 60 + 81 \\ \text{Target HR} &= 141 \end{aligned}$$

CALCULATING FAT BURNING HEART RATE

Fat burning is best achieved by training in the 60-70% zone.

For Example, if your RHR is 60 and your MHR is 190 then your optimal Fat Burn HR zone will be;

$$\begin{aligned} \text{HR Zone} &= 60 + 60\% \times (190 - 60) \text{ and } 60 + 70\% \times (190 - 60) \\ \text{HR Zone} &= 60 + 60\% \times 130 \text{ and } 60 + 70\% \times 130 \\ \text{HR Zone} &= 60 + 78 \text{ and } 60 + 91 \\ \text{HR Zone} &= \text{greater than } 138 \text{ and less than } 151 \end{aligned}$$

Best results will occur when you stay within this heart rate zone for longer durations. i.e. 40 minutes. Build up your workout time gradually. Begin with 20 mins, 3 times a week and over a few months progress to 30 mins, 4 times a week.

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CALCULATING AEROBIC TRAINING HEART RATE

Aerobic training is best achieved by training in the 70-80% zone.

For Example, if your RHR is 60 and your MHR is 190 then your optimal Aerobic Training HR zone will be;

$$\begin{aligned} \text{HR Zone} &= 60 + 70\% \times (190 - 60) \text{ and } 60 + 80\% \times (190 - 60) \\ \text{HR Zone} &= 60 + 70\% \times 130 \text{ and } 60 + 80\% \times 130 \\ \text{HR Zone} &= 60 + 91 \text{ and } 60 + 104 \\ \text{HR Zone} &= \text{greater than } 151 \text{ and less than } 164 \end{aligned}$$

Best results will occur when you stay within this heart rate zone for medium to long durations. i.e. 30 - 40 minutes. The fitter you become the longer you are able to train within this zone and at an intensity closer to 80%.

CALCULATING ANAEROBIC TRAINING HEART RATE

Anaerobic Training is best achieved by training in the 80-90% zone.

For Example, if your RHR is 60 and your MHR is 190 and then your optimal Anaerobic HR zone will be;

$$\begin{aligned} \text{HR Zone} &= 60 + 80\% \times (190 - 60) \text{ and } 60 + 90\% \times (190 - 60) \\ \text{HR Zone} &= 60 + 80\% \times 130 \text{ and } 60 + 90\% \times 130 \\ \text{HR Zone} &= 60 + 104 \text{ and } 60 + 117 \\ \text{HR Zone} &= \text{greater than } 164 \text{ and less than } 177 \end{aligned}$$

At these intensities lactic acid is produced in the working muscles so you will start to feel a burning sensation and fatigue in the muscles quite quickly (as soon as 1-2 minutes after exercise is begun). Be aware that this onset of fatigue can effect posture and technique.

To avoid the onset of fatigue it may be best to alternate periods of work with periods of rest (interval training). For example, 3 minutes of work separated by 3 minutes of rest.

MAINTAINING MOTIVATION

To maintain your enthusiasm and motivation, try to vary your exercise program by watching television, listening to music or holding a conversation whilst working out.

In order to ensure that you continue to improve your fitness levels try to vary your exercise program as much as possible. For example, introduce walking, swimming, or weight-training into your exercise program.

Interval training can also be a way of improving variety.

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WATERROWER MONITOR HEART RATE OPERATION

The WaterRower Series III monitor incorporates a heart rate monitoring facility which requires additional hardware to activate.




When the WaterRower monitor is detecting a heart rate signal it displays heart rate in the stroke rate window for 7 out of every 10 seconds.

If you are having difficulty detecting HR refer to the troubleshooters guide later in this manual.

The WaterRower monitor also incorporates heart rate zone setting options which allow you to set zones, objectives or desired exercise intensities. When the limits of the zone are reached the WaterRower monitor exhibits a visual and audible alarm.

SETTING HEART RATE ZONES



To access the Heart rate zone setting menu press the Mode button  until you obtain the Heart Rate Setting Menu as shown. Use the scroll buttons   to select the required heart rate zone option, Hi-Lo, Maximal HR, Objective HR and Intensity HR.

HI-LO HEART RATE OPTION

The Hi Lo HR Zone allows you to manually set a maximum HR above which the HI warning will activate and the minimum HR below which the LO warning will activate.

To program the Hi Lo HR option;



Enter the heart rate zone window using the Mode button



Select the Hi Lo option using the scroll buttons
Confirm the selection of the Hi Lo option using the Mode button



Enter the maximum desired heart rate using the scroll buttons
Confirm the selection using the Mode button



Enter the minimum desired heart rate using the scroll buttons
Confirm the selection using the Mode button

The monitor will return to Ready Mode with the desired heart rate zone set.

MAXIMAL INTENSITY HEART RATE OPTION

Maximal Intensity HR Zone allows you to input your maximal HR (MHR), your resting HR (RHR) and your desired exercise intensity (%). The Series III monitor will automatically calculate your desired HR and set the maximum and minimum thresholds (desired HR +/-10 beats). You may change your calculated thresholds manually if you so desire.

To program the Maximal Intensity option;



Enter the heart rate zone window using the Mode button



Select the Maximal Intensity option using the scroll buttons
Confirm the selection using the Mode button

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Enter the MHR using the scroll buttons
Confirm the selection using the Mode button



Enter the RHR using the scroll buttons
Confirm the selection using the Mode button



Enter the Desired Intensity using the scroll buttons
Confirm the selection using the Mode button



Change the calculated Max HR using the scroll button if required
Confirm the selection using the Mode button



Change the calculated Min HR using the scroll button if required
Confirm the selection using the Mode button

The monitor will return to Ready Mode with the desired heart rate zone set.

OBJECTIVE HEART RATE OPTION

Objective HR Zone allows you to input your age, your resting HR (RHR) and your desired exercise objective (either Fat Burn, Aerobic or Maximal). The Series III monitor will automatically calculate your desired HR and set the maximum and minimum thresholds (desired HR +/-10 beats). You may change your calculated thresholds manually if you so desire.

To Program the Objective Heart Rate option;



Enter the heart rate zone window using the Mode button



Select the Objective option using the scroll buttons
Confirm the selection using the Mode button



Input your Age using the scroll buttons
Confirm the selection using the Mode button



Input your Resting Heart Rate (RHR) using the scroll buttons
Confirm the selection using the Mode button



Select your objective, Fat Burn, Aerobic or Maximal using the scroll buttons
Confirm the selection using the Mode button



Change the calculated Max HR using the scroll button if required
Confirm the selection using the Mode button



Change the calculated Min HR using the scroll button if required
Confirm the selection using the Mode button

The monitor will return to Ready Mode with the desired heart rate zone set.

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INTENSITY HEART RATE OPTION

Intensity HR Zone allows you to input your age, your resting HR (RHR) and your desired exercise intensity (%). The Series III monitor will automatically calculate your desired HR and set the maximum and minimum thresholds (desired HR +/- 10 beats). You may change your calculated thresholds manually if you so desire.

To program the Intensity HR option;



Enter the heart rate zone window using the Mode button



Select the Intensity option using the scroll buttons
Confirm your selection using the Mode button



Input your Age using the scroll buttons
Confirm the selection using the Mode button



Input your Resting Heart Rate (RHR) using the scroll buttons
Confirm the selection using the Mode button



Input your desired Exercise Intensity using the scroll buttons
Confirm the selection using the Mode button



Change the calculated Max HR using the scroll button if required
Confirm the selection using the Mode button



Change the calculated Min HR using the scroll button if required
Confirm the selection using the Mode button
The monitor will return to Ready Mode with the desired heart rate zone set.

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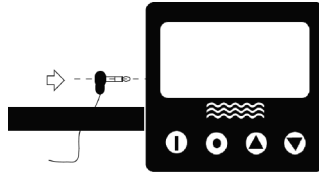
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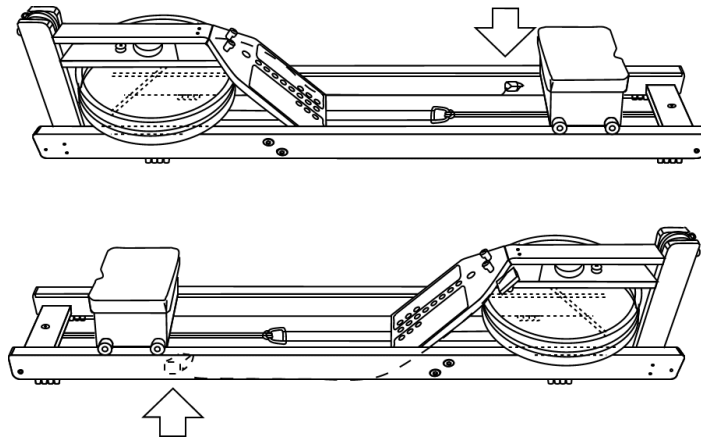
HEART RATE RECEIVER INSTALLATION

Install the WaterRower HRM Receiver as follows;

Fit the ear plug socket into the side of the WaterRower Series III monitor as shown.



Pass the receiver box underneath the footboard and along the inside of the rail until the cable is in the fully extended position as shown.



The receiver box should be positioned towards the bottom edge of the rail ensuring that it is clear from the seat. The receiver box should be orientated so that the joint in the box is horizontal (parallel with the top of the rail) and the circle on the side of the receiver box facing up.

Peel the self adhesive back from the receiver box and fix to rail. Fasten the cable along the rail using the cable clips provided.

THE POLAR CHEST BELT

The Polar Chest Belt Transmitter is designed to pick up the electrical charges from the heart.

The Transmitter should be worn centrally on the torso just beneath the chest, using the elasticised belt to hold it in place.

To improve conductivity it will be necessary to moisten the two electrical contacts on the back of the belt prior to use.

TROUBLESHOOTING

Should you experience any difficulty with your HRM function please check the following items;

Have the chest belt transmitter contacts been moistened?

Is the Chest Belt being worn centrally on the torso, just below the chest adjacent to the heart?

Has the receiver plug been inserted correctly?

Has the receiver box been positioned so that the joint in the box is horizontal and the circle is facing up?

Should you be unable to rectify these problems then please contact your authorized WaterRower agent.

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