PHRMP-220 Polar™ Heart Rate Monitor

Technical Note

PHRMP-220 (includes HRB-100 transmitter, sensor band, HRR-100 receiver and extension cable)

Overview

The PHRMP-220 Polar™ Heart Rate Monitor incorporates technology developed by Polar Electro, the leader in heart rate monitoring for the fitness industry, into the iWorx data recording system.

With the PHRMP-220, the voltage changes that take place during an electrocardiogram are picked up by two electrodes on the inside of a band around the subject's chest. These voltages are transformed into simple coded signals by the transmitter connected to the electrodes. The transmitter broadcasts the coded signals to a receiver that is connected to the data recording system. Since the frequency of the coded signals from the transmitter correspond to the heart rate of the subject, a periodic rate function in the recording software is used to convert the frequency of the coded signals into a display of the subject's heart rate. This technology enables relatively noise-free heart rate determination to be made from resting or exercising subjects.

Components of the PHRMP-220

The components of the PHRMP-220 include:

- HRB-100 WearLink™ coded transmitter.
- Elastic sensor band with Smart Fabric™ electrodes.
- HRR-100 coded receiver.
- Mini phone jack to mini phone plug extension cable.

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How to Use the PHRMP-220 Polar™ Heart Rate Monitor

Equipment Setup

1) Plug the HRT-100 receiver into the mini phone jack of the extension cable
2) Plug the extension cable into the EM input of an iWorx data acquisition unit with an EM input.
3) Detach the WearLink™ coded transmitter from the sensor band.
4) Moisten the electrode areas of the sensor band under warm running water. Make sure these areas are well moistened.
5) Adjust the length of the sensor band to fit snugly and comfortably around the chest of the subject. Secure the sensor band around the subject's chest so that the electrodes are just below the chest muscles.
6) Attach the transmitter to the sensor. The Polar™ logo should be upright. Adjust the sensor band so that the transmitter is in the center of the chest.
7) Check that the wet electrode areas of the sensor band are firmly against the subject's skin.
8) Set up the receiver so that it is no more than 1 meter away from the transmitter. Use the supplied extension cable if necessary.

Start the Software

1) Open the LabScribe software by clicking its icon on the Desktop.
2) When the program opens, select **Preferences** from the Windows **Edit** menu or the Macintosh **LabScribe** menu.
3) Select the **Channel Preferences** window.
4) Activate the channel to which the PHRMP-220 is connected by putting a check mark in the box to the left of the channel title.
5) Name the channel to which the PHRMP-220 is connected. Set the **Mode** for this channel to **EM1 or EM2**. Also, set the sampling rate and display time. Click **OK**.

Care of the HRB-100 Transmitter and Sensor Band

The HRB-100 transmitter is a high-tech instrument of superior design and workmanship and should be treated with care. The suggestions below will help you fulfill the guarantee obligations and enjoy this product for many years to come.

- Clean the transmitter regularly after use with a mild soap and water solution.
- Never use alcohol or any abrasive material such as steel wool or cleaning chemicals on any part of the transmitter.
- Do not dry the transmitter in any other way than with a towel. Rough handling may damage it.
- Never put the transmitter in a washing machine or a dryer!
- Rinse the band with water after each use.

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PHRMP-220 Polar™ Heart Rate Monitor

- The band can be washed in a washing machine at 104ºF/+40ºC. We recommend that you use a washing pouch.
- Dry the band in airy place after usage and wash.
- Do not spin dry the band!
- Do not put the band in a dryer!
- Do not iron the band!

Maintenance

- Store the transmitter in a cool and dry place. Do not store it in any kind of non-breathing material, such as a plastic bag or a sports bag, if it is wet. Sweat and moisture can keep its electrodes wet and the transmitter activated, which shortens the battery life.
- Keep the transmitter out of extreme cold (below 14ºF/-10ºC) and heat (above 122ºF/+50ºC).
- Do not expose transmitter to direct sunlight for extended periods, such as by leaving it in a car.
- Detach the transmitter from the band when not in use.

Service

During the two-year guarantee/warranty period we recommend that you have service done by an authorized Polar Electro Service Center only. The warranty does not cover damage or consequential damage caused by service not authorized by Polar Electro.

Batteries

The estimated average battery life span of the transmitter is 2 years (1h/day, 7 days/week). If your transmitter stops working, it might be due to the battery running out. If you choose to change the battery yourself, follow the instructions below. To change the battery, you need a coin, a sealing ring, and a battery (CR2025).

1) Open the transmitter's battery cover by turning it counterclockwise with the coin from the CLOSE position to the OPEN position. The cover pops out from its niche.
2) Remove the battery cover from the transmitter, lift the battery from the niche and replace it with a new battery.
3) Remove the sealing ring of the battery cover and replace it with a new ring.
4) Place the negative (-) side of the battery against the transmitter and the positive (+) side against the cover.
5) Put the battery in the transmitter's niche and put the cover on so that the arrow points to the OPEN position. Make sure that the cover's sealing ring is placed correctly in its groove.
6) Gently press the cover deep enough so that its exterior surface is on the same level as the transmitter's surface.

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PHRMP-220 Polar™ Heart Rate Monitor

7) Turn the cover clockwise so that the arrow on the cover turns from OPEN to CLOSE. Make sure that the cover is closed properly! In order to ensure the maximum life span of the transmitter's battery cover, open it only when you need to change the battery. We recommend that you change the sealing ring of the battery cover every time you change the battery. You can get the sealing ring/battery kits from well-equipped Polar™ retailers and authorized Polar Electro Services. In the USA and Canada: Additional sealing rings are available from an authorized Polar Electro Service Center only.

Warnings:

- Keep the batteries away from children. If swallowed, contact a doctor immediately.
- Batteries should be disposed of properly according to local regulations.

Precautions

If you are allergic to any substance that comes into contact with the skin or if you suspect an allergic reaction due to using the product, check the listed materials in the “Technical Specifications” chapter. To avoid any skin reaction risk with the transmitter, wear it over a shirt. However, moisten the shirt well under the electrodes to ensure flawless operation. The combined effect of moisture and intense abrasion may cause a black color, which might particularly stain light-colored clothes, to rub off from the transmitter’s surface and from the band. If you use insect repellent on your skin, you must ensure that it does not come into contact with the transmitter!

Using the Transmitter in a Water Environment

Your transmitter is water resistant to 100 feet (30 meters). Users measuring heart rate in a water environment may experience interference for the following reasons:

- Pool water with a high chlorine content and seawater are very conductive. The electrodes of a band may short-circuit, which prevents ECG signals from being detected by the transmitter.
- Jumping into the water or strenuous muscle movement during competitive swimming may cause water resistance that shifts the transmitter on the body to a location where it is not possible to pick up ECG signals.
- The ECG signal strength is individual and varies depending on the individual’s tissue composition and the percentage of people who have problems in heart rate measuring is considerably higher in a water environment than in other use.

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Technical Data and Specifications

SPECIFICATIONS	
HRB-100 Polar™ Wearlink-31 Coded Transmitter with Smart Fabric Sensor Band	
Battery Type	CR 2025
Battery Sealing Ring	O-ring 20.0 x 1.0 Material FPM
Battery Life	Average 2 years (1h/day, 7 days/week)
Operating Temperature	14°F to 122°F/-10°C to +50°C
Material	Transmitter, Polyamide; Band, 35% Polyester, 35% Polyamide, 30% Polyurethane
Water Resistance	Water resistant up to 100 feet/30 meters

LIMITED POLAR INTERNATIONAL GUARANTEE

- This limited Polar international guarantee is issued by Polar Electro Inc. for the consumers who have purchased this product in the USA or Canada. This limited Polar international guarantee is issued by Polar Electro Oy for the consumers who have purchased this product in other countries.
- Polar Electro Inc./ Polar Electro Oy guarantees to the original consumer/ purchaser of this product that the product will be free from defects in material or workmanship for two years from the date of purchase.
- Please keep the receipt or International Guarantee Card, which is your proof of purchase!
- The guarantee does not cover the battery, damage due to misuse, abuse, accidents, or non-compliance with the precautions; improper maintenance, commercial use, cracked or broken cases.
- Guarantee does not cover any damage/s, losses, costs or expenses, direct, indirect or incidental, consequential or special, arising out of, or related to the product. During the guarantee period the product will be either repaired or replaced at an authorized service center free of charge.
- This guarantee does not affect the consumer's statutory rights under applicable national or state laws in force, or the consumer's rights against the dealer arising from their sales/ purchase contract.

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